

**REPUBLIC OF TAJIKISTAN**

**ADDENDUM TO ENVIRONMENTAL AND SOCIAL  
IMPACT ASSESSMENT (ESIA)  
Draft Final Report**

Central Asia Regional Economic Cooperation Corridors 2, 3, and 5  
(Obigarm-Nurobod) Road Project. Package 3: Construction of the  
Permanent Long Bridge



**Project Implementation Unit for Roads Rehabilitation  
Ministry of Transport  
Government of Republic of Tajikistan**

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## LIST OF ACRONYMS AND ABBRIVIATIONS

ACM	Asbestos Containing Materials
ADB	Asian Development Bank
AIIB	Asian Infrastructure Investment Bank
AE	Affected Entity
AH	Affected Household
AOI	Area of Influence
AP	Affected Person
amsl	Above Mean Sea Level
BOD	Biological Oxygen Demand
CAREC	Central Asia Regional Economic Cooperation
CBM	Cubic Meter
CEP	Committee for Environmental Protection
CIS	Commonwealth of Independent States
CWFA	Committee for Women and Family Affairs
CO	Carbon Monoxide
CO <sub>2</sub>	Carbon Dioxide
COD	Chemical Oxygen Demand
CSC	Construction Supervision Consultant
D/F	Dehkan Farm
DMC	Detailed Measurements Survey
DP	Displaced People
DRS	District of Republic Subordination
EA	Executive Agency
EAEAF	East Asian-East African Flyway
EASM	Euro-Asian Consul for Standardization, Methodology and Certification
EBRD	European Bank for Reconstruction and Development
EIA	Environmental Impact Assessment
EM	Entitlement Matrix
E&S	Environmental and Social
ESF	Environmental and Social Framework
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESP	Environmental and Social Policy
ESS	Environmental and Social Standard
FS	Feasibility Study
GBAO	Gorno-Badakhshan Autonomous Region
GBV	Gender Based Violence
GoT	Government of Tajikistan
GRC	Grievance Redress Commission
GRM	Grievance Redress Mechanism
HPP	Hydropower Plant
H&S	Health and Safety
IA	Implementing Agency
IFI	International Financial Institution
IES	International Environmental Specialist
ILO	International Labor Organization
IOL	Inventory of Losses

ISS	International Social Specialist
IUCN	International Union for Conservation of Nature
LAR	Land Acquisition and Resettlement
LARDDR	Land Acquisition and Resettlement Due Diligence Report
LARP	Land Acquisition and Resettlement Plan
LHS	Left-Hand Side
Ln.m	Linear meter
m	meter
mb	millibar
MoHSPP	Ministry of Health and Social Protection of Population
MOLME	Ministry of Labor, Migration and Employment Population
MoT	Ministry of Transport
MPC	Maximum Permissible Concentration
MSK-64	Medvedev–Sponheuer–Karnik scale
NO	Nitrogen Monoxide
NO <sub>2</sub>	Nitrogen Dioxide
OHS	Occupational Health and Safety
PAP	Project Affected People
PD	Preliminary Design
PFD	Personal Flotation Devices
PIURR	Project Implementation Unit for Roads Rehabilitation
PM	Particulate Matter
PMT	Project Management Team
PPE	Personal Protective Equipment
PSC	Pre-Stressed Concrete
PwD	People with Disabilities
RBT	Red Book of Tajikistan
RE	Road Engineer
RoW	Right of Way
SEA/SH	Sexual Abuse and Exploitation/Sexual Harassment
SEE	State Environmental Expertise
SO <sub>2</sub>	Sulfur Dioxide
STLMG	State Committee for Land Management and Geodesy
TB	Tuberculosis
TCC	Traffic Control Coordinator
TJS	Tajikistan Somoni
TMP	Traffic Management Plan
TOR	Terms of Reference
TSP	Total Suspended Particles
TSS	Total Suspended Solids
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollars

**Glossary of Terms**

<b>Affected Persons (APs)/ Affected Entities (AEs)</b>	In the context of Involuntary resettlement, affected persons and affected entities are those who are physically displaced (relocation, loss of residence, or loss of shelter) and/or economically displaced (loss of land, assets, access to assets, income sources, or means of livelihood) as a result of: involuntary acquisition of land, or involuntary restrictions on land use or access to legally designated parks and protected areas
<b>Detailed Measurement Survey (DMS)</b>	With the aid of the approved detailed engineering design, this activity involves the finalization and/or validation of the results of the inventory of losses (IOL), severity of impacts and list of APs.
<b>Compensation</b>	Payment in cash or in-kind to replace losses of lands, housing, income and other assets caused by the Project. All compensation is based on the principle of replacement cost, which is a method of valuing assets to replace the loss at current market rates, plus any transaction costs
<b>Cut-off Date</b>	The last day of social impact assessment and inventory. The date after which people will not be considered eligible for compensation.
<b>Dehkan Farm</b>	Mid-size land, which is legally and physically distinct from the household plot for which full land use right, but not ownership is allocated either to individual, group of individuals, or legal entity. The Law No 48 of Dehkan Farms (dated 2002) regulate Dehkan Farms in Tajikistan.
<b>Informal users</b>	Informal users are people who have extended their occupation of land from their titled land into adjacent state land (usually ROW) .
<b>Entitlements</b>	The range of measures comprising cash or in-kind compensation, relocation cost, rehabilitation and transfer assistance, income substitution/business restoration, which are due to APs, depending on type, extent and nature of their losses, and which suffice to restore their social and economic base.
<b>Eligibility</b>	Any person who resided in the Project area before the cut-off date that suffers from: Loss of house, Loss of assets or ability to access such assets, permanently or temporarily, or Loss of income sources or livelihood, will be entitled to compensation and/or assistance.
<b>Hukumat</b>	District Administration in Tajikistan
<b>Income Restoration</b>	This is the re-establishment of sources of income and livelihood of the affected households.
<b>Inventory of Losses (IOL)</b>	This is a process in which all fixed assets (i.e., lands used for residence, commerce, or agriculture; houses; kiosks, stalls and shops; ancillary structures, such as fence, gates, paved areas and wells, affected trees and crops etc.) with commercial value and sources of income and livelihood inside the Project right-of-way (Project area) are identified, measured, their owners identified, their exact location determined, and their replacement costs calculated.
<b>Jamoat</b>	Sub-district level administration unit
<b>GOST</b>	Type of the technical standard that is in use in a number of countries of the former Soviet Union
<b>Land Acquisition</b>	Refers to the process whereby an individual, household, firm or private institution is compelled by a public agency to alienate all or part of the land/assets for public purposes in return for in-kind replacement or compensation at replacement costs.
<b>Resettlement Plan</b>	A time-bound action plan with budget setting out compensation for affected land/assets and resettlement strategies, objectives, entitlement, actions, responsibilities, monitoring and evaluation.
<b>Non-titled</b>	Means those who have no recognizable rights or claims to the land that they are occupying.
<b>Poor</b>	Means households whose combined monthly income falls below TJS 1020/-1. WB poverty line (standard) is used by different government and non-government institutions to identify poverty level for the given period.

<b>Rehabilitation</b>	This refers to additional support provided to APs losing productive assets, income, employment or sources of living, to supplement payment of compensation for acquired assets, in order to achieve, at a minimum, full restoration of living standards and quality of life.
<b>Replacement Cost</b>	The calculation of full replacement cost will be based on the following elements: fair market value; transaction costs; interest accrued; transitional and restoration costs; and other applicable payments, if any.
<b>Resettlement</b>	This includes all measures taken to mitigate all adverse impacts of the Project on AP/DP's property and/or livelihood. It includes compensation, relocation (where relevant), and rehabilitation as needed.
<b>Road Corridor</b>	Relates to the Packages 1&2
<b>Significant Impact</b>	Being physically relocated from a house, or losing 10% or more of income generating assets. Projects where 200 or more people will experience significant impact are considered category A for involuntary resettlement.
<b>Severely Affected</b>	This refers to affected households who will: lose 10% or more of their total productive land and/or assets, have to relocate; and/or lose 10% or more of their total income sources due to the Project.
<b>Vulnerable</b>	Anyone who might suffer disproportionately or face the risk of being marginalized from the effects of resettlement and includes: female-headed households with dependents; disabled heads of household; poor households; landless people; elderly households with no means of support; households without security of tenure; ethnic minorities; and small farmers (with landholdings of 0,2 hectares or less).

## Executive Summary

1 This Environmental and Social Impact Assessment (ESIA) report covers the construction of the 920m long bridge across the Surkhob river (the proposed project) in the Republic of Tajikistan. This ESIA represents an Addendum to Environmental Impact Assessment (EIA) for the Obigarm -Nurobod Project that is a part of Central Asia Regional Economic Cooperation Corridors (CAREC) 2, 3, and 5. The Asian Infrastructure Investment Bank (AIIB) is providing financing for the construction of a 920m long bridge across the Surkhob river. Hence this ESIA study has been conducted to meet the requirements of the Republic of Tajikistan regulations and the AIIB Environmental and Social Framework (ESF).

### Project Background

2 The Government of Tajikistan (GoT) through its Project Implementation Unit for Roads Rehabilitation (PIURR) under the Ministry of Transport (MOT), is undertaking the construction of the 75-kilometer (km) long Obigarm- Nurobod Road to replace the existing section of M41 highway that will be inundated by the reservoir of the under-construction Rogun Hydropower Project (HPP). The Bridge to be constructed under the proposed project is part of the above-mentioned Obigarm- Nurobod Road.

3 The Rogun Hydro Power Project (HPP) located about 100 km east of Dushanbe, is being built to harness the hydropower potential of the Vakhsh River. Following the impoundment, the Rogun reservoir will be filled and in time it will cover the existing M-41 road that runs from Dushanbe to the border with the Kyrgyzstan Republic at Karamyk.

4 The M41 highway is an important part of CAREC, connecting the northeast region of Tajikistan with the Kyrgyz Republic and China. As part of the development of CAREC corridors, PIURR is realigning a 75-km long segment of M-41 road in the mountain range to the north of the Vakhsh River Valley (Obigarm–Nurobod). The new road will include three new tunnels and 17 bridges. The construction of the new road is currently under implementation.

5 The road project also comprises the construction of about 920m long bridge over Surkhob river (which will become the part of reservoir of the future Rogun HPP) to connect the newly constructed road with the existing M41 highway sections located outside of the flooding zone. The road project has been divided into three packages; Packages 1 and 2 for the construction of the new road and Package 3 (the proposed project for this ESIA) for the construction of the 920m long bridge across the Surkhob river.

### Project Overview

6 The proposed project as Package 3 of the broader road corridor represents a pre-stressed Concrete Box Girder Bridge in length of about 920m and approaches roads from the sides in total length of about 480m. The bridge supports are supposed to be built on pile foundations. The bridge alignment will generally follow the same alignment that was studied and selected during the Soviet period. The bridge will be built across the Surkhob river to connect the end of the Package 2 road section with the village of Darband, the center of the Nurobod district, which in the future will be located on the bank of the Rogun HPP reservoir. The proposed project will have the following three distinct components:

7 **Component 1: Construction of the Long Bridge and Its Approaches.** This is the major component of the Project which includes the following sub-components: *Sub-component 1a: Civil works for construction of long bridge and its road approaches.* It includes financing a Design, Build and Maintenance works contract for the bridge. According to the Bridge Options and Feasibility Study and the State Expertise Conclusion, the price estimation for the direct construction cost for this sub-component is USD56.92 million. This sub-component includes the works for auxiliary and landscape construction in the adjacent area to the bridge, as well as provisions for independent design review checker, insurance

coverage during the construction; and contingencies for inflation and unforeseeable circumstances. *Sub-component 1b: Construction supervision consultancy for the works contract.* This sub-component will finance the role of Engineer according to the FIDIC Yellow Book 2017 (2nd Edition), to supervise and administer the civil works contract, as well as monitor the contract's compliance with environmental, social, health and safety requirements.

**8 Component 2: Project Implementation Capacity Strengthening.** This component aims to enhance the capacity of the Project Implementation Unit for Roads Rehabilitation by furnishing it with necessary resources to timely deliver this complex Project in quality. Under the component, the following activities are proposed to be included: *Sub-component 2a: Project implementation support*, which will be achieved through hiring experienced individual consultants with expertise in procurement and contract management, bridge engineering, project management, financial management, and environmental and social (E&S). *Sub-component 2b: incremental operational expenses.* This sub-component is to cover the operational expenses related to project implementation.

**9 Component 3: Economic Empowerment for Women.** This component will (i) conduct the scoping study and skills needs assessment to identify potential business and livelihood opportunities for women living in the project-affected area of Section 3; (ii) develop women's entrepreneurship program, based on the skills needs assessment, and included possible list of participants and selection criteria; (iii) work together with ADB and with the National Committee of Women and Family Affairs, and local authorities on allocation of grants to support women entrepreneurs.

10 The Ministry of Transport will be the Executing Agency and its Project Implementation Unit for Roads Rehabilitation (PIURR) will be the Project Implementing Entity. PIURR will manage the project implementation from its inception to completion. PIURR will be responsible for communication between AIB, Government, and other relevant parties. PIURR will also be responsible for coordinating the day-to-day project implementation activities through the dedicated Project Management Team (PMT), supported by individual consultants.

## **Analysis of Project Alternatives**

11 Various alternatives were analyzed as part of this ESIA including the 'No Project' option and alternatives for bridge design. These are summarized below.

12 'No-Project' option was rejected because without the Bridge construction under the proposed project, the under-construction Obigarm- Nurobod Road will not be able to connect with the M41 highway and the entire road project will render useless.

13 Bridge Alternatives: The Feasibility Study (FS) team analyzed and compared various technical and financial aspects of three alternatives of bridge type, to propose the final option for further design and construction activities. The ESIA team supplemented this analysis by the comparison of anticipated environmental and social consequences for each alternative. The alternatives include:

- Alternative 1 Pre-stressed Concrete (PSC) Girder Bridge
- Alternative 2 Extradosed Bridge
- Alternative 3 Cable-Stayed Bridge

14 The parameters compared included road safety, seismic and wind stability, construction cost and time, impacts on landscape, resilience to climate change, impacts on the natural and social environment, and Occupational Health and Safety (OHS) considerations. Based on the FS and ESIA findings, Alternative 1 (Box Girder Bridge) was selected as the Final Option for further implementation steps.

## Regulatory and Policy Review

15 As stated earlier, this ESIA has been conducted to meet the requirements of the Republic of Tajikistan regulations and the AIIB environmental and social framework (ESF). During the project implementation also, these requirements will need to be complied. The basis of environmental, social and OHS legislation in Tajikistan is sufficient and is not in conflict with the AIIB ESP (2019) and safeguard regulations of the other International Financial Institutions. Based on the comparison of the National and International standards and regulations the most stringent standards were accepted for the project implementation.

## Baseline Environment and Social Conditions

16 The project area of influence (AOI) has been determined to extend 100 m from the edge of either side of the right of way (RoW) of bridge and its approach roads. Given that RoW is 60 m wide, the AoI is a 260 m wide corridor along the bridge and its approach roads. Similarly, the AOI is determined to be within a radius of 100m around the proposed quarries, borrow areas, construction camps, and other Project facilities (location of such facilities is not known at this stage). For the Surkhob River, the area of influence has indicatively been determined as 100m downstream and 50m upstream the bridge location due to possible minor impacts during the project implementation period including piling and other construction activities.

17 The project site is located in the Nurobod district of the Republican Subordination. It is adjacent to the Darband township- the center of the Nurobod District from the south and Gulmon village of the Safedchashma Jamoat on the west. The Darband township was built as a new district center to replace Komsomolobad, which is planned to be inundated by the Rogun Reservoir. This township is distinguished by proper urban planning with asphalt paved streets and has administrative and cultural buildings, and numerous small businesses. The Gulmon village is a small rural settlement with several houses, and the local population is mainly involved in agricultural production. There are no major industries present in the broader project area. Similarly, no sensitive receptors or any sites of archeological, cultural or religious significance were identified within and in the immediate surrounding of AOI.

18 Although these villages are outside of Project AOI, they are located relatively close to the project site. Therefore, they are of particular concern as the Project can indirectly affect them. Therefore, the socio-economic review conducted for the project includes the details for the broader area comprising the jamoats along the Obigarm-Nurobod road, which are primary Project beneficiaries.

19 The project AOI is an uninhabited area with no agricultural, industrial, or other business activities observed. The small groups of domestic cattle (sheep and goats) owned by residents of surrounding settlements from time to time enter Project AOI for occasional grazing. However, the local authorities have already provided alternative areas for grazing outside Project AOI. The nearest settlements are the Gulonom village on the right bank and the Darband township on the left bank of Surkhob river. These settlements are located over 500m from the start/end points of the proposed project. The lands adjacent to the bridge were acquired by the state for the purpose of the bridge construction in the early 1980s.

20 After the suspension of the construction activities due to political reasons the lands were transferred to the Nurobod District authority as reserve lands and never been formally made available for any kind of use by the local communities.

21 Topographically, the project area is located in a mountainous area within about 3km wide valley of the Surkhob River between the Karategyn and Peter I mountainous ranges. Hydrologically, the future bridge is about 11km upstream from the confluence with the Obihingou River, which forms the Vakhsh River. The area is characterized by widespread development of erosion processes and complex seismic conditions. AOI mostly belongs to the inundation zone of the future Rogun HPP reservoir and the area surrounding or buffering

this zone. The project site had already been subjected to construction activities before the suspension of the Rogun HPP project in 1993 due to financial restrictions following the collapse of the Soviet Union. One of the most prominent features within the project site is remains of the bridge embankment built during the previous construction activities.

22 There are no significant sources of air emissions and noise generation in the area except the vehicular traffic on the Obigarm- Nurobod Road. Similarly, there are no sources of soil or water contamination in the project AOI. Analysis of air, noise and water quality were carried out as part of this ESIA and all the relevant parameters were found to be within the acceptable limits.

23 With respect to the biological resources, the habitats within the project AOI are artificial and represent the bridge construction site abandoned in early 1990-s surrounded by the spots of the stony soils used for the grazing and sporadic rein-fed agriculture activities. The study reveal that the local vegetation represented by the common species having no special protective status both by International Union for Conservation Nature (IUCN) and Red Book of Tajikistan (RBT) lists. No fauna except the small birds and insects were observed during the field studies. The most prominent feature within AOI is an old embankment built on the left bank to serve as a foundation for the future approach road and bridge abutment. The surface of the embankment looks like an artificial hill and is already overgrown with rather sparse vegetation cover. No sensitive habitats were identified within or around AOI.

## Potential Impacts

24 The potential impacts of the proposed project on physical resources, environmental quality, ecological, economic, social and cultural resources have been identified for design, construction and operation phases and assessed according to the standard methodologies to ascertain the project's environmental and social sustainability. Appropriate mitigation and control measures have been proposed for each of the assessed impact, using the mitigation hierarchy – Avoidance; Reduction; Mitigation; and Compensation/Offset.

25 As part of this ESIA, a risk assessment methodology, by combining the magnitude of each potential impact with the sensitivity of receptor of that impact, has been adopted to assess the impact of the proposed activities on the various parameters of environmental, social and biological environments. The ESIA findings are that all the potential adverse environmental and social (E&S) impacts of the proposed project are mostly of low to moderate significance and can be prevented and/or mitigated adequately and positive impacts strengthened with the effective implementation of mitigation and enhancement measures identified in this ESIA. The potential impacts and their significance as well as residual impacts (ie, impacts that are likely to exist after the implementation of mitigation measures) and their significance are provided in **Table ES 1**.

26 The key impacts with high significance include waste generation, occupational health and safety risks, community health and safety (CHS) risks, and accidents as well as emergency situations. As stated above, appropriate mitigation and control measures have been proposed in this ESIA to address these potential impacts and to bring down the significance of the residual impacts to an acceptable level (Low or Minimal). As can be seen from **Table ES 1**, all of the residual impacts are of Low or Minimal significance, meaning that the project implementation will not cause any significant impact on environment and people.

27 Due Diligence was conducted for the Project area to determine possible land related impacts which can arise during the project implementation. The study confirmed the absence of the project affected people (PAPs) within the project AOI. No land acquisition or resettlement impacts are expected, as all land in the Project AOI is owned and managed by the state under the "reserve land" category and has already been allocated for the Project. Temporary land will, however, be required for the temporary construction facilities and labor camps.

**Table ES 1: Summary of the E&S and OHS Risks**

Potential Impacts	Duration of Impact	Spatial Extent	Reversible or not	Likelihood	Magnitude	Sensitivity	Significance Prior to Mitigation	Significance after Mitigation
Improved Transport System	Long-term	Local	Yes	Certain	Major	N/A	High Positive	
<b>Design Phase Impacts and Risks</b>								
Land acquisition and resettlement including temporary land requirements for camps and other project facilities	N/A	N/A	N/A	Unlikely	Minor	Low	Low	Minimal
Loss of farmlands and income	N/A	N/A	N/A	Unlikely	Minor	Low	Low	Minimal
<b>Environment impacts during construction phase</b>								
Dust and Air pollution	Short term	Widespread	Yes	Certain	Medium	Mild	Moderate	Low
Landscape and Topography	Mostly long-term	Local	Mostly no	Certain	Medium to major	Mild	Moderate	Low
Soil and land use changes	Short term	Within project boundary	Yes	Certain	Medium	Mild	Moderate	Minimal
Impacts of borrow areas	Short term	Local	Yes	Certain	Medium	Mild	Moderate	Low
Water Quality	Short term	Local	Yes	Certain	Medium	Mild	Moderate	Low
Groundwater	Short-term	Local	Yes	Uncertain	Minor	Mild	Low	Minimal
Hydrology	Short-term	local	yes	Uncertain	Minor	Mild	Low	Minimal
Wastes (including spoil, domestic and hazardous)	Short term	Local	Yes	Certain	Medium	Severe	High	Low
Geological Resources	Short term	Local	Yes	Certain	Medium	Mild	Low	Minimal
Noise and vibration	Short term	Local	Yes	Certain	Medium	Mild	Moderate	Low
Impacts on cultural resources	Short term	Local	Yes	Unlikely	Minor	Mild	Low	Minimal
Impacts of batching plant and crushing plant	Short term	Local	Yes	likely	Medium	Mild	Moderate	Low

Potential Impacts	Duration of Impact	Spatial Extent	Reversible or not	Likelihood	Magnitude	Sensitivity	Significance Prior to Mitigation	Significance after Mitigation
Impacts on Biodiversity and Habitats including loss of trees	Long-term	Local	No	Unlikely	Minor	Mild	Low	Minimal
Impact of Camps	Short -term	Local	Yes	Likely	Medium	Mild	Moderate	Minimal
Occupational health and safety	Short term	Local	Yes	Certain	Medium	Severe	High	Low
<b>Social impacts during construction phase</b>								
Community health and safety including Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH)	Short term	Mostly local	Yes	Likely	Medium	Mild	Moderate	Low
Disturbance to the traffic	Short term	Local	Yes	Certain	Medium	Mild	Moderate	Minimal
Influx of workers and labor issues	Short term	Local	Yes	Likely	Medium	Mild	Moderate	Low
<b>Environmental impacts during O&amp;M</b>								
Accidents with the spills of the harmful substances	Short term	Local	No	Occasional	Medium	Severe	High	Low
Generation of wastes including hazardous materials	Long term	Local	Yes	Certain	Major	Mild	Moderate	Low
Air pollution	Long term	Widespread	Yes	Certain	Medium	Mild	Moderate	Low
Noise and vibration	Long term	Local	Yes	Certain	Medium	Severe	Moderate	Low
Water pollution	Long term	Widespread	Yes	Certain	Major	Mild	Moderate	Low
Occupational health and safety	Short term	Local	Yes	Likely	Medium	Severe	High	Low
Climate Change	Long term	Widespread	No	Likely	Medium	Mild	Moderate	Low
<b>Social impacts during O&amp;M</b>								
Emergency situations	Short term	Local	Yes	Occasional	Medium	Severe	High	Low

## **Environmental and Social Management Plan**

28 This ESIA includes a comprehensive Environmental and Social Management Plan (ESMP) that includes institutional arrangements to manage the E&S requirements of the proposed project including implementation of ESIA and ESMP, mitigation and monitoring plan to list all potential impacts assessed during this ESIA and the associated mitigation measures as well as monitoring requirements, instrument monitoring to be carried out during the construction phase, E&S documentation and reporting requirements, and E&S training requirements.

29 As stated earlier, PIURR will manage the overall project during the construction phase. Therefore, PIURR will also have the overall responsibility for this ESIA and ESMP implementation. PIURR will engage Construction Supervision Consultants (CSC) for the day-to-day supervision and monitoring of the construction activities. CSC will also be tasked to monitor and supervise the construction contractor to effectively implement all of the E&S requirements defined by the national law, AIIB ESF and this ESIA and ESMP. To meet these obligations, PIURR, CSC and contractor(s) will have E&S specialists appointed at the site. PIURR will engage an environment specialist, a social specialist and an OHS specialist; CSC will engage an international environment specialist, an international OHS specialist, a national environment specialist and a national social specialist; and finally, the contractor(s) will engage environment and safety officers and deputy environment and safety officers.

30 Before starting work, the Contractor will prepare the site-specific ESMP (SSESMP) based upon this ESIA and ESMP, international best practice and site conditions. SSESMP will be submitted to CSC and PIURR for their review and approval and no site activities will commence before its approval. SSESMP as a minimum will cover the following aspects: (a) pollution prevention, (b) air quality and dust management; (c) noise and vibration management; (d) waste effluent management; (e) solid waste management; (f) construction camp management; (g) borrow pit management; (h) OHS management and CHS management; (i) Emergency Response Plan; (j) traffic management; (k) access road plan; (l) complaints resolution; (m) tree cutting and planting; (n) pest management; and (o) soil erosion, reinstatement and landscape management. SSESMP will need to be finalized and agreed with the CSC and approved by PIURR prior to the construction commencement. All the subsequent E&S monitoring will be carried out on the basis of the approved SSESMP, which may need to be reviewed and updated from time to time, typically once in six months.

31 ESMP includes a comprehensive instrument monitoring regime that includes the suggested parameters, location and frequency of monitoring covering the key environmental parameters such as air quality, noise, water quality and others. The purpose of this monitoring is to establish how effective the mitigation measures to be implemented at the site are. In case high values of any parameters are being observed, additional measures may have to be added to SSESMP.

32 ESMP also defines the reporting and documentation requirements for CSC and contractors. These requirements include preparation of accident reports, monthly progress reports and quarterly E&S reports prepared by contractor, preparation of quarterly and semi-annual E&S reports prepared by CSC, preparation of project completion report covering E&S aspects after completion of construction phase.

33 The E&S training requirements included in ESMP cover aspects such as national and AIIB E&S requirements, ESIA and ESMP, SSESMP, code of conduct for all site personnel to address local norms and acceptable behavior, camp management, OHS and CHS aspects and grievance redress mechanism (covered later in the Executive Summary).

34 The ESMP implementation cost has been estimated to be about United State Dollars (USD) 526,350, however most of this would be embedded in the civil works cost. The contractor would need about USD 28,000 for instrument monitoring, while CSC costs (mostly related to E&S personnel) are estimated to be about USD 375,000.

## Stakeholder Engagement<sup>1</sup>

35 According to the AIIB ESF (2019), transparency and meaningful consultation are essential for the design and implementation of a Project and works closely with its Clients to achieve this objective. Additionally, the Government of Tajikistan's requirements on public consultation are set forth in the Law on Environmental Protection (Articles 12-13). In accordance with this Law, citizens have the right to environmental information and participation in the development, adoption and implementation of decisions regarding environmental impact. To meet these requirements, PIURR and ESIA consultants carried out several rounds of consultations with the key stakeholders including the local communities.

36 From October 2022 to March 2023, several stakeholder engagement events have been held by ESIA consultants. More events will be organized by PIURR before and during the construction phase. These events have included public meetings, focus group discussions and one-on-one meetings with potentially affected individuals, communities, and experts.

37 During the site visits, the ESIA consultants conducted individual and group consultations with the local population, farm owners and governmental authorities. Consultations covered a number of meetings in February and July 2023. A summary of these discussions is provided in **Table ES-2**.

**Table ES-2. Summary of Questions and Responses during Consultations**

No.	Question	Response
<b>Darband community</b>		
1	When does construction start, will there be given preferences in hiring of workers from local residents?	Regarding the timing of the start of construction, the population will be informed as soon as the work related to the preliminary design and organization of a tender for hiring a contractor for the construction of the bridge is completed. When hiring workers, preference will be given to local residents, especially by profession welders, concrete workers, drivers of construction equipment etc.
2	Who will be responsible for quality control during construction?	During the construction works, the quality and timing will be controlled by consulting engineers.
3	If we have any complaints about the Contractor, to whom can we complain?	Grievance Redress Committee has been set up at the jamoat level to which you can file grievances. There will also be a construction supervision consultant company that can handle complaints.
4	Will there be any opportunities for women to work as cooks, bakers, cleaners, etc. during the construction of the bridge?	Yes. People will be informed about the positions that the contractor will require.
5	If the bridge is built, it will certainly make life easier for us, primarily due to the fact that the travel time to the village of Safedchashma will be reduced, there will be additional opportunities for the organization of trade and, in general, earnings.	The bridge will be built, as already noted, it should be noted that this project is large-scale and the bridge that will be built will be the largest in the country.
<b>Safedchashma Community</b>		
1	We are looking forward to the construction of the bridge, we think that everything will be	Indeed, the bridge will significantly reduce the travel time to the district center and, as a result, save money on transport.

<sup>1</sup> A standalone Stakeholder Engagement Plan (SEP) has also been prepared for the proposed project.

No.	Question	Response
	better when it is completed. Almost all of us have relatives and friends living in the Darband Jamoat, and given that the regional center is located there, we very often travel there, covering a long distance, which is also costly considering the cost of fuel and lubricants	When hiring workers, yes, preference will be given to local residents, especially by profession welders, concrete workers, drivers of construction equipment.
2	Who will be responsible for quality control during construction?	During the construction works, the quality and timing will be controlled by consulting engineers.
3	When will the bridge construction start?	Regarding the timing of the start of construction, the population will be informed as soon as the work related to the preliminary design and organization of a tender for hiring a contractor for the construction of the bridge is completed.
4	How will environmental standards be observed during construction in order to prevent environmental pollution during construction?	During the construction of the bridge, in accordance with the requirements of national legislation and the standards of the Asian Infrastructure Bank, which is very strict in monitoring environmental compliance, the contractor, as well as the project supervision consultant, will be strictly monitored to ensure the reduction of environmental impact during construction.

## ESIA Disclosure

38 ESIA once finalized will be disclosed by PIURR at the local and national level. ESIA Executive Summary will be translated in local languages for disclosure purposes. AIIB will also disclose ESIA on its website. PIURR will also disclose relevant information about the investment work under Package 3 as appropriate throughout the Project.

## Grievance Redress Mechanism

39 Grievance Redress Mechanisms (GRMs) are locally based, formalized way to accept, assess, and resolve community feedback or complaints. They provide predictable, transparent, and credible processes to all parties, resulting in outcomes that are relatively low cost, fair, and effective. They build on trust as an integral component and facilitate corrective action and preemptive engagement. GRMs also set out a timeframe in the resolution of complaints.

40 PIURR will also establish a GRM for the proposed project to be implemented at the construction site. This GRM will serve as a venue for receiving and addressing project-affected peoples' concerns and grievances about environment and social impacts. It will address concerns promptly through an understandable and transparent process that is accessible to all members of the community, gender responsive and culturally appropriate. The overall approach of GRM is to deal with grievances at a local level first in an efficient manner and escalate to the next level or higher level of authority if grievance cannot be resolved.

41 A local grievance redress committee (GRC) will be established at the Jamoat (local government) level. Complaints can be submitted to GRC where the project-related cases will be reviewed in coordination and consultation with the PIURR and CSC representatives. The complaint will be assigned to a responsible person who will have 14 days to resolve the issue. If the case is complex or requires more detailed investigation (e.g. inspection by technical experts or legal opinion from the state or certified private entities), the complaint review period may be extended to 30 calendar days or more, if necessary. In such cases, written notification will be sent to the complainant explaining the reasons for extension, describing the process and

indicating the expected dates for the delivery of the results of the revision. The supporting documents relating to the complaints will be collected and maintained as the GRM record. Once the complaint is resolved, GRC will organize a complaint closure meeting, where the complainant will confirm the closure of the complaint. The PIURR representative will oversee the resolution of the complaint. During all this time, the complainants will have the right to submit their cases to a court of law or any other forum.

42 PIURR will maintain a Complaint Register in which all the complaints lodged to them, CSC or contractor will be registered. The Register will maintain a complete record of the complaint receiving, processing, closing, and informing the complainant.

## **Conclusion**

43 The analysis of the environmental and social consequences of the proposed bridge indicates that the type and level of impacts will be mostly insignificant and easily mitigated. The social implications of the project alternatives are also minor, provided that safe and convenient access to the structure for the local communities is ensured.

44 This ESIA confirms that environmental and social benefits of the project far outweigh the minor and temporary inconveniences that will arise during project implementation, provided the ESMP is fully implemented. ESIA including its ESMP are considered sufficient to meet the environmental assessment requirements of AIIB and Government of Tajikistan.

## 1. INTRODUCTION

45 This Environmental and Social Impact Assessment (ESIA) report covers the construction of the 920m long bridge across the Surkhob river (the proposed project) in the Republic of Tajikistan. This ESIA represents an Addendum to Environmental Impact Assessment (EIA) for the Obigarm -Nurobod Project that is a part of Central Asia Regional Economic Cooperation Corridors (CAREC) 2, 3, and 5. The Asian Infrastructure Investment Bank (AIIB) is providing financing for the construction of 920m long bridge across the Surkhob river. Hence this ESIA has been conducted to meet the requirements of the Republic of Tajikistan regulations and the AIIB environmental and social framework (ESF).

### 1.1 Project Background

46 The Government of Tajikistan (GoT) through its Project Implementation Unit for Roads Rehabilitation (PIURR) under the Ministry of Transport (MOT), is undertaking the construction of the 75-kilometer (km) long Obigarm- Nurobod Road to replace the existing section of M41 highway that will be inundated by the reservoir of the under-construction Rogun Hydropower Project (HPP).

47 Tajikistan is a landlocked country in Central Asia. It relies on road transport for international trade. The Rogun Hydro Power Project (HPP), including the Rogun Dam, located approximately 100 km east of Dushanbe, is being built to harness the hydropower potential of the Vakhsh River. Following the impoundment of the dam, the reservoir will be filled and in time it will cover the existing M-41 road that runs from Dushanbe to the border with the Kyrgyzstan Republic at Karamyk.

48 The M41 highway is an important part of CAREC, connecting the northeast region of Tajikistan with the Kyrgyz Republic and China. As part of the development of CAREC corridors, PIURR of MOT is implementing the construction of a replacement of a 75-km long segment of M-41 road in the mountain range to the north of the Vakhsh River Valley (Obigarm–Nurobod). The new road will include three new tunnels and 17 bridges, through a combination of repairs, upgrades, and the construction of new bridges. The construction of the new road is currently under implementation.

49 The road project also comprises the construction of the approximately 920m long bridge over Surkhob river (which will become the reservoir of the future Rogun HPP) to connect the newly constructed road with the existing M41 highway sections located outside of the flooding zone. The road project has been divided into three packages; Packages 1 and 2 for the construction of the new road and Package 3 for the construction of the 920m long bridge across the Surkhob river. See **Figure 1** for the project location.

50 Due to the significant time span required for the design and construction of the long bridge, an approximately 130m long temporary concrete bridge is also being constructed to serve when the existing road section is underwater, but the new bridge will not be completed yet. After the completion of the permanent long bridge, the temporary bridge will be demolished. However, this temporary bridge is not part of the proposed project, nor is it covered under this ESIA.

51 The development of the feasibility study (FS) and the working documentation of this road commenced in 1975. In 1984 the Project was approved, and road construction began and continued up to 1992 when the construction activities were suspended due to political and financial reasons both at the Rogun HPP and on the bypass road. The new FS and the preliminary design of the long bridge under Package 3 have been undertaken by DONG MYEONG Engineering Consultants & Architecture Company Limited.

52 Asian Development Bank (ADB) provided financing for the conducting of ESIA for the whole 75km long road corridor including Packages 1 and 2 of the road project, which is being implemented with funding from ADB and the European Bank for Reconstruction and Development (EBRD) respectively. AIIB is providing funds to the Republic of Tajikistan to finance the construction of 920m long bridge under the Package 3. AIIB has assigned Project Category A to the proposed project (Package 3).

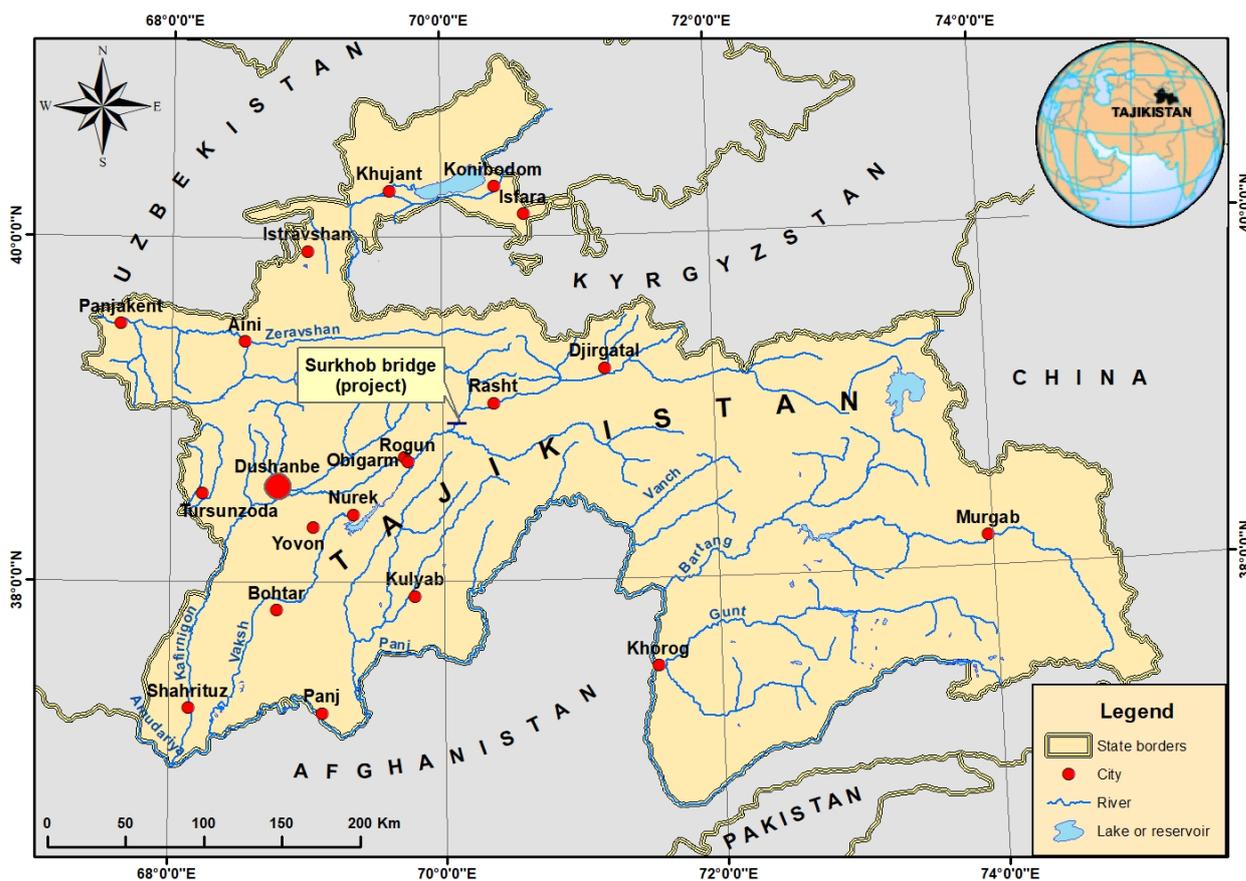


Figure 1. Location of the Project in the context of Central Asia

## 1.2 Project Overview

53 The proposed project will have the following three components:

- **Component 1: Construction of the Long Bridge and Its Approaches.** This is the major component of the Project which includes civil works for the construction bridge and its approach roads and construction supervision consultancy.
- **Component 2: Project Implementation Capacity Strengthening.** This component aims to enhance the capacity of the Project Implementation Unit for Roads Rehabilitation by furnishing it with necessary resources to timely deliver this complex Project in quality.
- **Component 3: Economic Empowerment for Women,** aiming to develop women’s entrepreneurship program in the project area.

54 More details on the project, its components and the key activities to be undertaken during its implementation are provided later in the document.

## 1.3 ESIA Study

55 ADB earlier appointed consultants to prepare an Environmental and Social Impact Assessment (ESIA) for the entire road corridor, which has been updated and disclosed recently by ADB and EBRD. However, the long bridge and its approaches under Package 3 have not been covered by that ESIA, as the bridge feasibility study, conceptual and preliminary designs were not available at the time of conducting that ESIA.

56 Given the fact that AIIB will provide financing for Package 3 comprising the long bridge with its approaches, AIIB’s Environmental and Social Framework (ESF) is applicable for this package/project. The project has been classified as Environmental Category A considering the nature of the project activities and the local environmental and social contexts in accordance

with the ESF. Hence, this ESIA for the proposed project has been prepared as an Addendum to the ESIA for the entire road corridor.

### 1.3.1 ESIA Objectives

57 The present ESIA Addendum has been prepared in compliance with requirements defined by the national regulations as well as AIIB ESF. The document is an Addendum to the EIA and SIA prepared under the financing of ADB for Central Asia Regional Economic Cooperation Corridors 2, 3, and 5 (Obigarm-Nurobod) Road Project in July 2019, as amended in 2020<sup>2</sup>.

58 AIIB ESF (2019) requires undertaking an environmental and social impact assessment of the Project and to develop the measures to manage and mitigate the identified risks and impacts associated with the Project implementation. Bank requires that:(i) environmental and social risks and impacts are identified and analyzed; (ii) actions to avoid, minimize, mitigate, or compensate for the potential adverse impacts are developed and implemented; and (iii) affected people are informed and consulted during project preparation and implementation.

59 The ESIA Addendum aims to identify and address the potentially adverse impacts of the proposed project (Section 3: 920m long bridge and its approaches) and its activities on the physical and biological environment as well as on socio-economic aspects – in order to make the project environmentally sustainable and socially acceptable.

60 The overall objective of the ESIA Addendum is to ensure that the adverse impacts of the project on the physical, biological, and human environment (including cultural heritage) are avoided where possible, minimized, mitigated, or compensated, and to integrate the environmental and social considerations into the project design so as to enhance the benefits of the project, equally for men, women, and any vulnerable groups.

61 The key objectives of this ESIA study include:

- Determining the current environmental and social baseline conditions of the area;
- Identifying important environmental and social components which may be impacted by the project;
- Assessing the potential environmental and social impacts, including any residual impacts of the proposed project;
- Identifying measures to avoid, minimize or mitigate the adverse impacts;
- Proposing Grievance Redress Mechanism for project-affected people and workers;
- Preparing an Environmental and Social Management Plan (ESMP) including an Environmental Monitoring Plan, in compliance with national and AIIB requirements.

### 1.3.2 Area of Influence (Aoi) and Study Area

62 Following the approach adopted for the whole road corridor (Packages1&2), based on the experience of similar projects and discussion with the AIIB Senior Environmental Specialist, and also the expectation that most of the environmental and social impacts are going to be localized, the project AOI is determined to extend 100 m from the edge of either side of the right of way (RoW) of the bridge and its approach roads. Given that RoW is 60 m wide, the Aoi is a 260 m wide corridor along the bridge and its approach roads (see **Figure 2**). Similarly, the AOI is determined to be within a radius of 100m around the proposed quarries, borrow areas, construction camps, and other Project facilities (location of such facilities is not known at this stage).

63 For the Surkhob River the area of influence has indicatively been determined as 100m downstream and 50m upstream the bridge location due to possible minor impacts during the project implementation period including piling and other construction activities.

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<sup>2</sup> <https://www.adb.org/projects/52042-001/main>



**Figure 2. Approximate area of the project influence**

### 1.3.3 ESIA Methodology

64 The ESIA study covers design, construction, operation and maintenance (O&M) phases of the proposed project. The methodology used for the preparation of this ESIA Addendum is based on the requirements of AIIB ESP 2019 and experience of the engaged specialists.

65 This assignment took as a starting point the ESIA already prepared and built on the studies already carried out for Package 2. The study was carried out through a combination of methods including desk reviews, field surveys, data collection, analysis and assessment and involved selective focus group discussion workshops, questionnaires, census surveys, and in-depth interviews

66 Baseline data and information on climate, topography, geology and soils, natural resources, flora and fauna, agriculture, and socio-economic data were obtained from published and unpublished sources and supplemented by field studies.

67 The International and National Environmental Specialists conducted several site visits during November and December 2022. The samples of the soil and water were taken and analyzed in the certified laboratory and the levels of noise were measured in the points closest to the potential sensitive receptors.

68 Discussions were held with a number of stakeholders in order to determine their perceptions of the level of impact from the Project. The selective socio-economics surveys with the use of the questionnaires were conducted in the surrounding communities. Data and information obtained have been included where appropriate in the ESIA Report.

69 The ESIA Consultant worked closely with the engineering design team so that the results of field surveys and the feedback from stakeholder consultations could be integrated into the options study and, eventually, the preliminary engineering design.

70 The preparation of the ESIA included the consequence of the steps described below and shown in **Figure 3**.

71 Step 1, Reviewing the Project Design: This task involved both understanding the linkages between package 3 and other sections of the road corridor and the proposed assessment of alternatives and design of package 3 focusing on the components that potentially have environmental and social impacts in the project area. For this purpose, the Environmental and Social (E&S) Safeguards documentation prepared for the Packages 1&2 has been

reviewed and analyzed.

72 Step 2, Scoping: The environmental and social components of the ESIA activities identified during scoping process, were summarized in the Scoping Report. Environmental and social experts assessed the impacts of the project activities. Then, the study team took into consideration ideas and suggestions of the representatives of the primary and secondary stakeholders and local authorities such as local authorities at the level of Jamoats. At this stage, the suggestions from the environmental and social experts, engineers as well as local residents were collected and taken into consideration.

73 Step 3, Review of Regulatory and Legislation Network. As part of this task, the national regulatory framework relevant to environmental and social assessment as well as involuntary resettlement was reviewed. In addition, the AIIB's ESF was reviewed and its relevance to the proposed project determined. Finally, a comparison of the two sets of requirements (i.e., national and AIIB requirements) was carried out and gaps between them identified.

74 Step 4, Baseline Environmental and Social Studies: The environmental and social baseline conditions of the proposed project area have been determined by collecting relevant data from primary and secondary sources. Under the ESIA study, available data on climate, geology, seismicity, water resources, land resources, soil properties, agriculture, ecology and socio-economic components have been collected from secondary sources. Reconnaissance field visit and instrument monitoring of environmental quality were also carried out to collect primary data in the key areas of terrestrial and aqua ecology, hydrology, industries and socioeconomics of the local community, physical and biological environment.

75 Step 5, Assessment of the Potential Impacts. Subsequent to the scoping, collection of baseline environmental and social conditions, the assessment of impacts on each environmental and social parameter was carried out. Once the potential impacts were identified, their significance was assessed. Subsequently, mitigations and enhancement measures were suggested to avoid, minimize and /or mitigate the potential E&S impacts. For this purpose, mitigation strategies adopted during earlier projects of similar nature were reviewed in addition to relying upon experts' judgment. Subsequently, residual impacts – impacts that are likely to take place even after the implementation of mitigation measures – and their significance were assessed.

76 Step 6, Assessment of the Associated Facilities. The step involved the identification of associated facilities of the Project and conducting due diligence on them. The temporary bridge with access road and Rogun HPP were analyzed to determine whether they meet the AIIB criteria for Associated Facilities. No associated facilities were identified under the project.

Step 7, Due Diligence on the Land Acquisition and Resettlement: This step followed the methodology adopted for the previous stages of ESIA and included the field visits, communication with the local authorities including responsible for land management, direct public communication activities with local communities that could include potentially affected people and thorough examination of the documentation related to this issue.

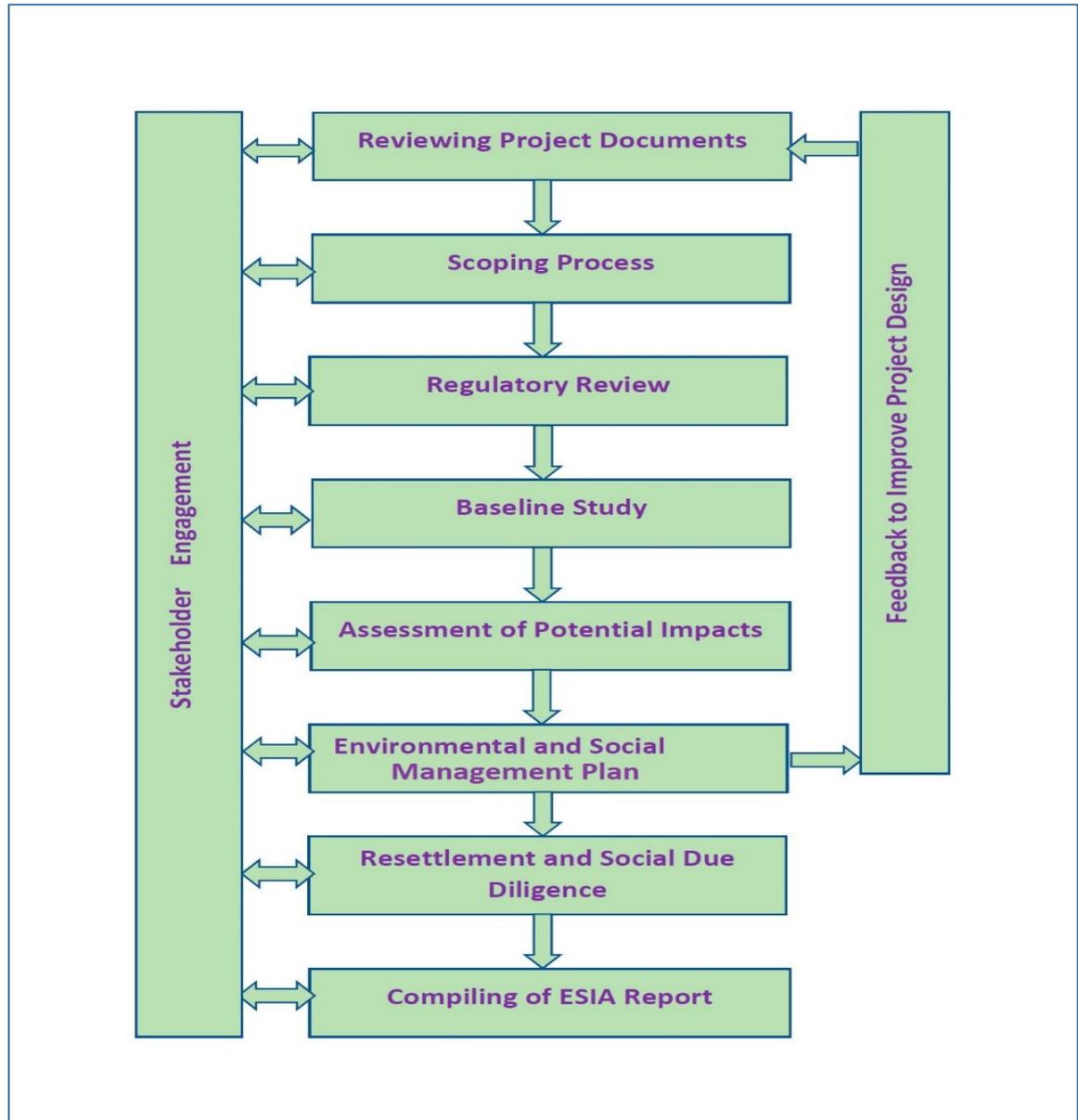
77 Step 8, Preparing of the Environmental and Social Management Plan: Once the impact assessment was completed and mitigation measures identified, an environmental and social management plan (ESMP) was prepared in close coordination with the PIURR. During the ESMP preparation, institutional arrangements for environmental and social management of the project were recommended, mitigation and monitoring plans were formulated, documentation and reporting protocols were defined, training needs were assessed, and cost of ESMP implementation estimated. ESMP will be included as part of Bidding Documents as an obligation for the contractors to implement. The ESMP provides provisions for a) implementing the mitigation measures identified earlier in the assignment, b) conducting monitoring and reporting and capacity building programs.

78 Step 9, Compiling of the ESIA report: Towards to end of present assignment, the ESIA report was prepared compiling the process and outcome of the steps described above.

79 Steps from 1 to 9, Stakeholder identification and engagement: Stakeholder engagement started from earlier stages when data and information on baseline conditions was collected from

the directly and indirectly impacted people. Their perceptions were considered in the selection of important environmental aspects through the scoping process.

80 Some formal consultations were carried out during the ESIA study. The ESIA team arranged a formal consultation meeting with potentially project affected people at Nurobod District. Along with this, the study team also communicated with local government authority to inform them and to learn their perception regarding this project. A participatory approach was followed during consultation meetings. A stand-alone Stakeholder Engagement Plan has also been prepared to guide the stakeholder engagement during project implementation.



**Figure 3. The main steps of ESIA process**

### 1.3.4 ESIA Team

81 ESIA was conducted by the research team represented by the following specialists:

- International Environmental Specialist
- National Environmental Specialist
- International Social and Resettlements Specialist
- National Social Safeguards Specialist

- International Occupational Health Safety
- Project Coordinator

## 1.4 Institutional Responsibilities

82 The Donor for the project's Package 3 is Asian Infrastructure Investment Bank (AIIB) a multilateral financial institution, whose purpose, as set out in its Articles of Agreement (Articles), is to: (a) foster sustainable economic development, create wealth and improve infrastructure connectivity in Asia, by investing in infrastructure and other productive sectors; and (b) promote regional cooperation and partnership in addressing development challenges by working in close collaboration with other multilateral and bilateral development institutions.

83 The overall responsibility for the project lies on the Government of Tajikistan GoT.

84 Ministry of Finance (MoF) is the responsible governmental body for the coordination with AIIB and other Institutions of the International Assistance.

85 The Ministry of Transport (MoT) is responsible for transport sector development and is the Executive Agency for the project. MoT has overall responsibility for planning, design, implementation, and monitoring of the project.

86 The Implementing Agency (IA) for the project is the Project Implementation Unit for Road Rehabilitation (PIURR) working under the Ministry of Transport (MoT) of Tajikistan. PIURR will carry out the responsibilities assigned to MoT. PIURR will oversee the works of the FS consultant, ESIA consultant, CSC and contractor, as well as implementation of the recommendation from ESIA reflected in the ESMP, and other safeguard requirements. PIURR office is located at the MOT building at 14 Aini, Dushanbe.

87 The DONG MYEONG Engineering Consultants & Architecture Co., LTD (thereafter, FS Consultant) is an internationally and competitively selected consulting firm awarded to "Consultancy Services for Options Study, Feasibility Study, Preliminary Design and Tender Documents for Output and Performance-Based Design, Build and Maintain Civil Works Contract.

88 Bars Consulting. Ltd is the Environmental and Social Impact Assessment (ESIA) Consultant engaged in the preparation of this ESIA Addendum.

## 1.5 ESIA Structure

89 This ESIA Addendum prepared for Package 3 of the Project has the following structure:

- **Executive Summary:** Concisely describes all aspects of ESIA report and provides a general summary of the ESIA contents and key findings.
- **Chapter 1. Introduction:** introduces the ESIA report describing its background, objectives, principles, process and methodology. The chapter also introduces the project proponents, the study team, and provide other relevant information;
- **Chapter 2. Legal Framework and Administrative Network and Gap Analysis:** presents a review of the national and provincial laws, regulations and standards relating to environmental and social assessment and management, any relevant international conventions and treaties. The chapter also identifies the legally mandated institutions associated with these legal instruments and their respective roles. The institutional arrangements include implementation and monitoring mechanisms that ensure inclusiveness and participation of all affected people, groups and communities. The chapter also describes the AIIB's Environmental and Social Policy and Standards and assesses how this applies in the specific case of the proposed Project. It presents in a tabular form the gaps between the AIIB Standards and the national legislations in Tajikistan and explains how the ESIA addresses the gaps;
- **Chapter 3. Description of Project:** This chapter provides a brief and simplified description of the project to place the ESIA in its relevant context. This includes a summary of the background to the project, its various components, construction activities, temporary

and permanent facilities to be established as part of the project, manpower requirements and labor camps, machinery and plant to be used for construction, requirements of various supplies including water and fuels, borrowing materials, and wastes streams generated. It also introduces the preliminary estimate of the cost and implementation schedule of the project. The Chapter covers all phases of the proposed project including design and engineering, construction, and operation and maintenance.

- **Chapter 4. Analysis of the Project Alternatives:** The chapter summarized and evaluates the project alternatives that are identified by the Feasibility Study consultant. Particular attention was given to the environmental and social consideration of each alternative with the summary of evaluation is presented in tabular form;
- **Chapter 5. Description of the Project Baseline Conditions:** This chapter of the ESIA presents findings of the literature review, environmental instrument monitoring, field surveys, social and economic surveys, and data collection conducted at the various proposed sites. The description covers the physical, biological, and socio-economic environment of the project area. This chapter will also include an estimated gender-disaggregated number and types of people likely to be affected to some or other by the project activities;
- **Chapter 6. Impact Assessment and Mitigation Measures:** This chapter presents the process and outcome of the scoping carried out and identifies which impacts are significant and the criteria used to make this judgment. This follows by describing the methodology and outcome of detailed impact assessment carried out during the assignment. The chapter presents the impact assessment during the design phase, construction phase and operation phases respectively, on physical, biological, social-economic environment and the climate. The analysis covers issues of the proposed project and associated on-site and off-site facilities (e.g., borrow pits, labor camps if any, transportation and storage of construction equipment and materials). Appropriate impact avoidance, minimization, mitigation, and/or compensatory measures are detailed for each impact. The potential impacts, their significance, and associated mitigation measures are presented in a tabular form. The Chapter to a significant extent covers the Occupational, Health and Safety Issues relating to the Project implementation. Analysis of the Associated Facilities is also covered under this Chapter.
- **Chapter 7. Environmental and Social Management Plan:** ESMP provides organizational setup from government department down to the implementation level, their respective responsibilities and staffing for environmental and social management. ESMP also includes mitigation and monitoring frameworks, training requirements and cost estimates.
- **Chapter 8: Land Acquisition and Resettlement:** Presents the findings of due diligence of land acquisition and resettlement based on principles outlined and agreed in the ESIA for Sections 1 and 2.
- **Chapter 9: Stakeholders Engagement:** This chapter presents the objective, process, and outcome of the stakeholder consultations carried out during the ESIA.

**ANNEXES:** To supplement the report eight Annexes are attached to the ESIA Addendum.

## 2. LEGAL AND ADMINISTRATIVE FRAMEWORK

90 This chapter presents a review of the Laws, Regulations and Standards of the Republic of Tajikistan related to the environmental and social management and occupational health and safety (OHS) issues including the relevant International Conventions and Treaties signed by the country. It also spells out AIIB ESP (2019) applicable to the Project and provides the analysis of differences between the national legal framework and AIIB standards. It also identifies the gaps in the national regulations, policies and standards related to environmental and social assessment for the bridge. In addition, the ESIA recommend ways and means to address any identified gaps.

### 2.1 Tajikistan Legislation and Regulations

#### 2.1.1 Tajikistan Legislation for Environment, Health and Safety

91 Tajikistan has a well-developed Environmental, Health and Safety (EHS) legal and regulatory framework. Current environmental legislation in Tajikistan includes statutory acts and laws on the following:

- Protection of the environment;
- Ecological audit and monitoring;
- Protection of flora and fauna;
- Environmental information and education;
- Soil, water, and air quality;
- Biological safety;
- Human health and safety; and
- Waste and chemicals management.

92 These laws, along with the regulations approved by the Government, create a favorable legal framework for environmental protection and for the use and protection of the country's natural resources. They also enforce the rights of citizens to environmental safety, organic products, eco-friendly environment, access to environmental information, and the possibility of investing (moral, material, and financial) to improve the ecological situation in the country.

93 Environmental legislation in the Tajik Republic includes the Constitution and codes and laws on air quality, noise, mineral resources, land management, forests, health and safety, and waste and chemicals management. The Tajikistan Framework Environment Law was adopted in 1993, enacted in 1994, and amended in 1996, 1997, 2002, 2004, and 2007, and replaced by a new law in 2011 amended in 2014, 2017 and in June 2022. The Water Code was enacted in 2000 and amended in 2008, 2009, 2011 and 2012. The Land Code was enacted in 1996 and amended in 1999, 2001, 2004, 2006, 2008, 2011, and 2012. The Forest Code was enacted in 1993 and amended in 1997 and 2008.

94 The important regal acts, laws and regulations relevant to environmental, social and safety aspects of the project are listed in **Table 1** below.

**Table 1: Relevant HSE Laws and Regulations in Tajikistan**

Law	Enacted and Amended	Responsible Agency	Brief Description
<i>Constitution of the Republic of Tajikistan</i>	Adopted on November 6, 1994, and amended on June 22, 1999, on June 22, 2003 and May 2014	The Government of the Republic of Tajikistan	According to the Constitution:  The State adopts measures for improvement of the environment. Cultural and spiritual treasures are protected by the State.

Law	Enacted and Amended	Responsible Agency	Brief Description
			According to Article 35 of the Constitution:  Every person has the right to work, choose their profession or job, and receive job protection. Wages for work cannot be lower than the minimum wage. Any restrictions in labour relations are prohibited. The same work must be paid equal wages. Forced labour is not allowed, except in cases specified by law. The use of women and child labor in heavy and underground work and in harmful conditions is prohibited.
<i>Law on Environment Protection</i>	No.760 enacted on August 2011 last amended in June 2022	CEP and its subdivisions at the district level	The Law defines the state principles of environmental protection and sustainable social and economic development, guarantees of human rights for healthy and friendly environment, law enforcement strengthening, prevention of negative impact of business and other operations on the environment, management of rational use of nature resource and securing environmental safety. Chapter 6 requires an Environmental Impact Assessment and Chapter 7 specifies requirements for the location, design, construction, reconstruction and commissioning of enterprises, buildings, and other facilities.
<i>Law on Environmental Impact Assessment</i>	No.1448 enacted on 18 July 2017	CEP and its subdivisions at the district level	The Law establishes the legal and organizational framework for assessing environmental impacts, relationship with state environmental expertise (SEE), and the procedures for registering and classifying environmental impacts on the environment.
Law on Environmental Monitoring	No. 707 enacted on 25 March 2011 last amended in 2014	CEP and its subdivisions at the district level	The Law defines the organizational, legal, economic and social bases for ensuring environmental monitoring in the Republic of Tajikistan and regulates relations between state authorities, self-government bodies of settlements and villages, public

Law	Enacted and Amended	Responsible Agency	Brief Description
			associations and citizens in this area.
Law on Environmental Information	No. 705 enacted on 25 March 2011	CEP and its subdivisions at the district level	The Law defines the legal, organizational, economic and social basis for providing environmental information in the Republic of Tajikistan, promotes the right of legal entities to receive complete, reliable and timely environmental information, and regulates relations in this area.
Law on the SEE	No. 818 enacted on 16 April 2012	CEP and its subdivisions at the district level	This Law defines the principles and procedure for conducting environmental expertise and is aimed at preventing the harmful impact of planned economic and other activities on the environment and related social, economic and other consequences of the implementation of the object of environmental expertise.
<i>Land Code of the Republic of Tajikistan</i>	No 326 enacted in 1996, last amended in July 2022	Committee on Land Management and Geodesy and its subdivisions at the district level	Land legislation governs the relations of land use and protection, land use and property relations, which arise from getting (acquisition) or conveying land use rights.
<i>Law about Highways and Road activities</i>	No 129 enacted on June 30, 2021	Ministry of transport	Regulates the aspects of the construction and operations of the Roads. Article 34 requires; (i) the environmental review by SEE for construction and reconstruction road projects, (ii) reinstatement of all damaged during the construction areas including planting of the trees and shrubs.
<i>Law on Special Protected Areas</i>	Enacted on 788 December 2011, last amended in 2014	State Institution on Specially Protected Natural Areas of Forestry Agency and its subdivisions in the districts	The Law defines the legal, organizational, and economic principles of specially protected natural areas and establishes the assignments, activity operations, and zoning.
<i>Law on Plant Quarantine and Protection</i>	No. 1567 enacted on 2 January 2019	CEP and its subdivisions at the districts; Ministry of Agriculture (MOA); Forestry	The Law defines the legal, organizational, and economic basis for plant quarantine and protection, conducting quarantine phytosanitary measures, handling plant

Law	Enacted and Amended	Responsible Agency	Brief Description
		Agency; Tajikistan Academy of Sciences (TAS)	protection products, and is aimed at preserving agricultural products, protecting the health of people, animals, and the environment
<i>Law on Protection and Use of Flora</i>	No 31 enacted on 17 May 2004, last amended in 2008	CEP and its subdivisions at the districts; MOA; and TAS	The Law establishes the state policy on the protection and efficient use of plants; defines legal, economic, and social principles governing the preservation and reproduction of plants.
<i>Forestry Code of the Republic of Tajikistan</i>	No 761 enacted on 2 August 2011	Forestry Agency; CEP and its subdivisions at the districts; MOA	The Law regulates the protection, possession, sustainable use, and reproduction of forests in Tajikistan. It defines prohibited activities in protected forest zones and their regimes and conditions when undertaking allowed activities in the utilization zone of forests and their regimes.
<i>Law on Conservation and Usage of Historical and Cultural Heritage</i>	No 178 enacted on 3 March 2006, last amended in 2017	Ministry of Culture; TAS; CEP; Forestry Agency	The Law provides the legal framework for conservation and use of historical and cultural heritage objects in Tajikistan as being national property of the Tajik people.
<i>Law on Subsoils</i>	No 983, enacted on 20 July 1994, last amended in 2013	Geology Head Office; CEP	The Law regulates the use and protection of subsoils for the interest of present and future generations.
<i>Law on Soil Conservation</i>	No 555, enacted on 16 October 2009	CEP; Committee on Land Management and Geodesy; MOA	The law defines main principles of state policy, legal framework of public authorities, individual and legal entities for the efficient and safe use of soils, preservation of quality, fertility and soil protection from negative impacts and regulates the variety of relationship related to soil protection.
<i>Water Code</i>	No 1688 enacted on 02 April 2000	CEP, Ministry of Energy and Water Resources, MOA; Geology Head Office; MOHSPP	The aims of the Water Code are: (i) protection of state water fund and state water fund lands for the improvement of the population's social condition and environment; (ii) water pollution control, impurity, depletion, prevention, and control of water adverse effects; (iii) enhancement and protection of water objects; (iv) strengthening legality and rights protection of individuals and legal entities in the water management field.

<b>Law</b>	<b>Enacted and Amended</b>	<b>Responsible Agency</b>	<b>Brief Description</b>
<i>Law on Protection of Atmospheric Air</i>	No 915 enacted on 28 December 2012	CEP; MOHSPP; Hydrometeorology Agency	The Law regulates the relations of individuals and legal entities, irrespective of ownership form, with the aim of conservation, rehabilitation of atmospheric air, and securing environmental safety
<i>Public Health Code</i>	No 1413 enacted on 30 May 2017, last amended in 2021	MOHSPP	The Code regulates public health relations and aims to implement constitutional rights and health protection of citizens. Chapter 17 of the Code secures sanitary and epidemiological safety.
<i>Law on Production and Consumption Waste</i>	No. 44 enacted on 10 May 2002, last amended in 2011	CEP; MOHSPP; State Unitary Enterprise on Municipal Housing and Utilities	The Law regulates the relations arising from the process of waste generation, collection, storage, utilization, transport, and deactivation and landfilling of wastes and state management, supervision and control of waste management. It aims to prevent the negative impact of production and consumption wastes on the environment and human health, and when handling these, their involvement in economic and production turnover as an additional stock source.
<i>Law on Inspection of Economic Entities</i>	No. 1269 enacted on 25 December 2015, last amended in 2020	State Inspection of Technical Supervision, CEP, MOLME	The Law establishes the legal basis for conducting inspections, the procedures or conducting them, the rights and obligations of business entities, officials of inspection bodies, and is aimed at protecting the health, legal rights, and interests of citizens, the environment, national security, and protection of the activities of the audited business entities, regardless of ownership forms.
<i>Protection of Population and Territories from Natural and Man-made Emergencies</i>	No 53, enacted on 15 July-2004	Committee for Emergency Situations and Civil Defense and its structural subdivisions	The Law defines the organizational and legal framework for the protection of the population and persons without citizenship in the territory of the Republic of Tajikistan, as well as the lands, interiors, water, airspace, animals and plants, and other natural resources of Tajikistan; objects of industrial and social purpose; and environment from natural and man-made emergencies. It regulates public relations on prevention, occurrence and development of

Law	Enacted and Amended	Responsible Agency	Brief Description
			emergencies, reduction of damages and losses, elimination of emergency situations and timely notification of populations in danger zones during natural and man-made emergencies.
<i>Law on Wildlife</i>	No 354, enacted on 5 January 2008	CEP; MOA; Academy of Sciences; Forestry Agency	The Law regulates public relations in the protection, restoration, and reasonable use of wildlife; and establishes the legal, economic, and social framework for the protection and restoration of wildlife resources
<b>The Laws and Regulations on the Occupational Health and Safety</b>			
<i>Labor Code of the Republic of Tajikistan</i>	No 1329 enacted on 23 July 2016, last amended in 2022	MOLME; Ministry of Health and Social Protection of the Population	The Code regulates labor and other relations and is directly aimed at the protection of the rights and freedoms of the parties in labor relations, securing minimal guarantees of labor rights and freedoms. The Labor Code prohibits forced labor, discrimination in employment and sets the minimum age at which a child can be employed as well as the conditions under which children can work. The Code also establishes rules for minimum wages, leave, overtime, and has provisions for pregnant women and caretakers for children. There must be a "labor protection service" if there are more than 50 employees.
<i>Law on Fire Safety</i>	No 363, enacted on 20 March 2008, last amended in 2010	Main Department of the State Fire Prevention Agency of the Ministry of Internal Affairs	The Law defines the general legal, economic, social, and organizational principles of fire prevention in Tajikistan; regulates the relations between state authorities, local authorities, organizations, other legal entities irrespective of organizational and legal forms as well as between public entities, officials, and citizens of the Republic of Tajikistan, foreign citizens, and persons without citizenship.
Law of the Republic of Tajikistan "On Trade Unions"	Adopted on August 2, 2011	MOLME. Ministry of Health and Social Protection of the Population	This law regulates the legal basis for trade unions, including their rights and guarantees, as well as the relationships between trade unions, state authorities, employers, public associations, individuals, and

Law	Enacted and Amended	Responsible Agency	Brief Description
			legal entities.
<i>Law of the Republic of Tajikistan "On Employment Promotion"</i>	Adopted on August 1, 2003 Amended 17.05. 2018 (No 1526.	Ministry of Labour, Migration and Employment (MOLME).	Regulates employment relations Establishes the legal, socio-economic and organizational foundations of state policy in relation to employment of the population Guarantees the implementation of the constitutional rights of citizens of the Republic of Tajikistan to work and social protection from unemployment in a market economy
Law of the Republic of Tajikistan "On Equality and Elimination of All Forms of Discrimination"	Adopted on September 13, 2022	MOLME. Ministry of Health and Social Protection of the Population	The Law aims to promote equality and eliminate all forms of discrimination in the country. The law applies to all individuals, organizations, and government bodies, and covers a wide range of areas including employment, education, and access to services. The law requires government bodies and employers to take affirmative action to promote equality and eliminate discrimination in their policies and practices
<i>Law of the Republic of Tajikistan "On State Social Insurance"</i>	Adopted on December 13, 1997 as amended No. 244 of 5 March 2007	Ministry of Health and Social Protection of the Population	The law establishes a mandatory state social insurance system, which requires employers to contribute a percentage of their employees' wages to the social insurance fund. The social insurance fund is used to provide benefits to workers and their families in case of certain events, such as illness, disability, or death. The law sets out the following types of benefits:  Sickness benefits: This includes payments to workers who are unable to work due to illness or injury.  Disability benefits: This includes payments to workers who are permanently unable to work due to disability.  Surviving dependents' benefits: This includes payments to the surviving dependents of workers

Law	Enacted and Amended	Responsible Agency	Brief Description
			<p>who die as a result of a work-related injury or illness.</p> <p>Maternity benefits: This includes payments to women who are unable to work due to pregnancy and childbirth.</p>
Law of the Republic of Tajikistan "On insurance and state pensions"	Adopted on January 12, 2010	Ministry of Health and Social Protection of the Population	The law establishes a mandatory state pension system, which requires all citizens to make contributions to the state pension and insurance fund. The state pension fund is used to provide benefits to citizens in case of certain events, such as retirement or death.
The Law on Occupational Safety in the Republic of Tajikistan	Adopted by the Governmental Resolution # on April 30, 2009 as amended in August 2012	MOLME	Establishes the legal basis of regulation of relations between employers and employees in the sphere of occupational safety. Cancels the previous Law on Occupational Safety of 1991. The Law outlines the measures and procedures to ensure the safety and health of workers in the workplace. It covers aspects such as workplace design, equipment and machinery safety, risk assessment, employee training and education, emergency preparedness and response, and reporting and investigating accidents. The law aims to prevent occupational injuries, illnesses, and fatalities by promoting safe and healthy working conditions in the country. The Law also covers the construction activities in Tajikistan.
The Law on Public Health in the Republic of Tajikistan	Adopted on May 15, 1997	Ministry of Health and Social Protection of the Population	The Law lays out the legal framework for ensuring and protecting the health of citizens in the country. The law addresses topics such as the organization of the healthcare system, the rights and obligations of healthcare providers and patients, and the role of the state in promoting public health and preventing and combating disease.
Law on Securing Sanitary and Epidemiological Safety of the	December 8, 2003, NO.49, last amended 2011	Ministry of Health and Social Protection of the Population	The law establishes the legal, organizational, and technical foundations for the implementation of measures to ensure the sanitary and

Law	Enacted and Amended	Responsible Agency	Brief Description
Population in Tajikistan			epidemiological well-being of the population. It aims to prevent the spread of diseases and improve public health by establishing the responsibilities of government bodies, organizations, and individuals in the sphere of sanitary and epidemiological safety, as well as the rights and duties of citizens in this regard. The law outlines the procedures for the prevention, elimination, and control of infectious diseases, quarantine measures, the provision of medical care and other measures to ensure sanitary and epidemiological safety.

### 2.1.2 Legislation of Tajikistan relating to EIA process

95 There are three laws in the country that stipulate all aspects of the Environmental Assessment: (a) Law on Environment Protection (2011); (b) Law on Ecological (Environmental) Expertise (2012) and the Law on Environmental Impact Assessment (2018).

96 The legal and administrative framework for the Procedure of The Environmental Impact Assessment is determined by Law of Environmental Impact Assessment passed on July 18, 2017.

97 According to the law, the planned activities are sub-divided into 4 categories (in Cyrillic A, Б, В, Г (I (High Risk), II (Medium Risk), III (Low Risk), IV (Minor Localized Risk)) by the scale and significance of the Environmental impacts. The government also issued a list of activities by the environmental category.

98 The category A has:

- a potential for high-scale negative impacts to the Environment and the Health of people.
- direct impacts on the Specially Protected Natural Areas.
- direct impacts on the Historical Heritage.
- trans-boundary impact.

99 Requirement for the conducting of the full EIA is clearly stated for the projects of the A category (Article 14). In accordance with the List of the activities by Category issued by the Government (Resolution No 253 from June 3, 2013 the construction n of the Motorways and Highways relates to A (high risk) category while (Б) (medium risk) category by Environmental Impacts.

100 Category B (Б in Cyrillic) has less scope and mainly predictable impacts. The categories III and IV projects may have only minor localized impacts and require only simplified Environmental documentation (such as a Statement of the Environmental Impacts). In accordance with the National EIA classification the Road Project including the construction of the long bridge falls under Category A as part of the road of international significance.

### 2.1.3 The Procedure of EIA in Tajikistan

101 The process of EIA in Tajikistan is not significantly differs from the Internationally accepted procedures for the projects classified under various Environmental categories. The law on EIA determines the following steps (see **Table 2**) in the EIA process (Article 11 of the

Law on EIA):

**Table 2. The Main EIA Steps in Tajikistan**

Stage	EIA Activity
1	Review and assessment of the baseline environmental status of project area
2	Preliminary Impact assessment conducted simultaneously with the Project feasibility study
3	Detailed Impact assessment with the preparation Environmental Management Plan (EMP). At this stage, the volumes of the emissions of pollutants to the atmosphere and discharges to the water from the project activities should be calculated and included into the report
4	Post-project analysis carried out in one year after the commissioning of the facility (beginning of economic or other activities) in order to confirm the safety for the Environment and adjust the environmental management plan (program).

102 The Law of Tajikistan on State Ecological Expertise (2012) provides provisions for obligatory Environmental review of planned activities but not requires the social impact assessment and LARP preparation and implementation. Review and activities have to be implemented by the relevant Governmental Authority. Currently that is Department of the State Ecological Expertise (SEE) of the Committee of Environmental Protection Review by CEP may last up to 60 days (Law on EIA, Article 13) for the Projects of Category A in the case of full EIA is prepared. For the Environmental documentation prepared for the project of Category B (B), the review and providing of approval take as a rule shorter period of time (in practice no more than 1-2 weeks). Waste management.

103 Environmental permits for activities associated with the turnover of waste are issued and monitored by the CEP or the hukumat regulatory authority (depending on the level of impact). The state regulatory authority is responsible for high-impact enterprises and the appropriate department at the hukumat level is responsible for middle- and low-impact enterprises. Regardless of ownership form, all companies that generate, store, and process waste in their territory have to obtain a license. Moreover, the enterprises have to agree on the volume of waste generation with state authorities and obtain the waste limit. Depending on the volume of waste generation, the limit is issued by the local environment protection authority if it is <20 tons (t) or by the CEP if >20 t. In accordance with the country's Law on Industrial and Household Wastes, household wastes are considered as hazardous, and following the Law on Licensing of Activities Related to Hazardous Waste Management, companies engaged in hazardous waste management activities are required to obtain a license.

104 Companies or organizations which generate waste, including municipalities, have to apply for permits: permits involving 20 cu m or more are obtained from relevant authorities. After submission of the application, the appropriate authority coordinates with the relevant Sanitary and Epidemiological Inspectorate and the Fire Prevention Agency and checks all relevant aspects of the application. Within one month of submission, an approval is issued, and the applicant is provided with a license; the technical requirements are listed in an annex to the license. The license fee goes directly to the state budget.

#### **2.1.4 Wastewater and sewerage management**

105 The basis for the regulations of management of sewage and wastewater is the established Maximal Allowed Concentrations of pollutants in the water. Tajikistan didn't issue specific uniform discharge standards for the sewage and wastewater; however, the potential polluters should apply for Discharge Permit and prepare the Discharge Project including mitigation measures and calculations justifying that the proposed discharges will not lead to the exceeding of the pollutants content above maximal permissible concentrations (MPC) in the receiving water body.

106 The Water Code regulates sets the requirements for the control of wastewater and sewage to prevent the contamination of water resources.

107 In accordance with the Chapter 25.4 the number of substances and microorganisms contained in wastewater discharges into water bodies should not exceed the established MAC for permissible impact on water bodies. Article 74.1 states that discharge of the sewage and other types of wastewaters can be conducted upon the obtaining of the special water use permit.

108 Private and state-owned enterprises engaged in the generation of wastewater/sewage are considered potential water polluters and are obliged to obtain special water use permits. Discharge of sewage/wastewater is allowed only in cases where it does not lead to an increase in the content of pollutants in the water body above the MPC. Municipal departments for environmental protection are authorized to levy certain environmental fees based on pollution emissions to air and water and solid waste generation. Income from the fees is used, in part, to fund local and central government administration and also for environmental protection.

### **2.1.5 Asbestos Regulation**

109 Tajikistan has not implemented a ban on the use of Asbestos-Containing Materials (ACMs). There are no laws or standards established for the application of ACMs, including in the construction sector. However, two key national regulations provide guidelines for the management of ACM:

110 The primary regulation for asbestos in Tajikistan is the multi-state agreement, Interstate Standard GOST 12871-93 “Chrysotile asbestos - Chrysotile. General specifications,” which was ratified by Tajikistan in 1996. This standard regulates the trade, transport, and handling of chrysotile asbestos. It classifies chrysotile as moderately hazardous for workers exposed to it. However, Asbestos-containing products are legally available. Pipes and corrugated roofing materials are being imported from Russia and China and the Dushanbe cement factory resumed production of corrugated asbestos-cement sheets in September 2013.

111 The Tajikistan Law “About generation and handling of waste” (#736 as amended in 2011) is another national law related to hazardous waste management that may be used in developing the ACM Management Plan. This law governs the handling, storage, use, transportation, and disposal of waste, including hazardous waste, to reduce negative impacts on the environment and human health.

### **2.1.6 International Standards for ACM**

112 The following International Standards relating to the ACMs are applicable to the project.

- Asbestos Convention (No. 162), of the International Labor Organization (ILO) in 1986. This convention was established to promote national laws and regulations for the “prevention and control of, and protection of workers against, health hazards due to occupational exposure to asbestos.” The convention outlines aspects of best practice: Scope and Definitions, General Principles, Protective and Preventive Measures, Surveillance of the Working Environment, and Workers’ Health.
- Good Practice Note: Asbestos: Occupational and Community Health Issues, World Bank, 2009.
- Environment & Social Framework (ESF), World Bank, 2018 and Environmental and Social Standard-3 (ESS-3) “Resource Efficiency and Pollution Prevention and Management” (GN17.2 and GN18)
- World Bank Group Environment Health and Safety (EHS) General Guidelines, 2007

113 The Resolution of the International Labor Organization (ILO) Conference in Geneva (31 May-16 June 2006) declared that the elimination of the future use of asbestos and the identification and proper management of asbestos currently in place are the most effective means to protect workers from asbestos exposure and to prevent future asbestos-related diseases and deaths. In Tajikistan, the Ministry of Education passed a special resolution prohibiting the use of asbestos and asbestos nets in chemical and physical labs of secondary schools, vocational-technical schools, and higher educational institutions 20 years ago.

### 2.1.7 Tajikistan Health and Safety Standards and Regulations

114 Worker health and safety standards are agreed among trade unions and employers' associations who are responsible for implementing the measures and the Ministry of Health and Social Protection of the Population of the Republic of Tajikistan, which is responsible for supervision and enforcement.

115 Other Tajikistan legislation that could apply to occupational health and safety during project-related activities is listed below:

116 Decree of the Government of the Republic of Tajikistan on the procedure for conducting a medical and social examination in Tajikistan dated April 26, 2022 No. 177. The purpose of the examination is to determine the ability to work, temporary and long-term disability, the group of disability and its causes, the duration of disability, and to determine the need for re-examination. The medical and social examination is conducted taking into account the overall assessment of the person's health, based on the analysis of clinical, functional, household, social, professional, labor and mental indicators of the person being examined. The results of the examination are used to determine the need for medical treatment, rehabilitation, or disability status.

- Decree of the Government of the Republic of Tajikistan **on part-time work and hourly wages of employees of enterprises of the Republic of Tajikistan**. It regulates the conditions of part-time work and hourly wages for employees of enterprises in the country. This legal act sets the guidelines for determining the terms and conditions of part-time employment, as well as the hourly wages for employees who work part-time. It outlines the rights and responsibilities of both the employer and employee in this type of work arrangement.
- Decree of the Government of the Republic of Tajikistan on the conditions for the payment of benefits **for temporary disability, pregnancy and childbirth and family benefits**. This legal act sets the guidelines and requirements for the payment of these benefits to eligible individuals in the country.
- Decree of the Presidium of the Council of the Trade Union Federation of the Republic of Tajikistan and Gosgortekhnadzor of Tajikistan dated February 9, 1993, No. 2412 establishes **regulations for investigating and registering workplace accidents in the country**. It outlines the reporting, investigation, and documentation procedures, as well as the responsibilities of employers, employees, and government agencies in maintaining occupational safety.
- Decree of the Council of Ministers of Tajikistan **on compensation by enterprises and government organizations of damage caused to employees by occupational accidents or diseases or any other work-related impairment of health** of March 20, 1994, No. 134 (with amendments and additions of April 17, 1998, NO.118, and March 11, 2000, NO.103)
- Decree of the Government of the Republic of Tajikistan on **the list of hazardous production facilities, workshops and trades where the workers are entitled to a short working day and extra annual leave** of December 31, 2002. NO.521.
- Law of the Republic of Tajikistan **on Road Traffic** dated May 17, 2018 No. 1533 regulates the use of roads, traffic safety, and the rights and responsibilities of road users in Tajikistan. It covers the rules for operating vehicles, road signs and signals, and the procedures for granting and revoking driver's licenses. The law also establishes the responsibilities of government agencies and local authorities for maintaining and improving the road network, and for ensuring the safety of road users.

117 The Law of the Republic of Tajikistan on Fire Safety dated July 21, 1994, NO.995 outlines the measures and regulations aimed at preventing and mitigating fires, as well as protecting people, property, and the environment from the harmful effects of fires. The law sets out the responsibilities of government agencies, local authorities, and citizens in ensuring fire safety, and establishes the procedures for fire prevention, fire-fighting, and fire evacuation. It also

defines the requirements for fire safety in buildings, industrial enterprises, and other facilities, and the procedures for conducting fire safety inspections and investigations.

118 The procedure for conducting a technical investigation of accidents, incidents, and cases of loss of civil explosives was established on April 7, 2014 by the Service for State Supervision of Safe Operations in Industry and Mining Supervision under the government of the Republic of Tajikistan. The procedure is outlined in document No. 10.

119 Tajikistan has ratified the following core labor standards of the International Labor Organization (ILO):

- ILO Convention No. 87 on Freedom of Association and Protection of the Right to Organize
- ILO Convention No. 98 on the Right to Organize and Collective Bargaining
- ILO Convention No. 29 on Forced Labor
- ILO Convention No. 111 on Discrimination in Employment and Occupation
- ILO Convention No. 100 on Equal Remuneration
- ILO Convention No. 138 on Minimum Age for Admission to Employment
- ILO Convention No. 182 on the Worst Forms of Child Labor
- ILO Convention No. 155 on Occupational Safety and Health.

### **2.1.8 Tajikistan Social and Resettlement Regulations**

120 **The Labor Code (2016)** prohibits forced labor and child labor. The Labor Code prohibits discrimination in employment and sets the minimum age at which a child can be employed as well as the conditions under which children can work. The minimum employment age is 15, however, in certain cases of vocational training, mild work may be allowed for 14-year-olds. In addition, there are some labor restrictions on what type of work can be done, and what hours of work are permissible by workers under the age of 18. The Code also establishes rules for minimum wages, leave, overtime, and has provisions for pregnant women and caretakers for children. It also sets the rules for settling disputes between workers and employers.

121 The Labor Code also sets requirements for occupational health and safety. It establishes the right of workers to work in places that are protected from exposure to dangerous and harmful factors. Employers are required to tell workers of risks and hazards of their jobs and requires employers to provide personal protective equipment. Employers are required to provide compulsory social insurance against accidents, disease, or injuries associated with their jobs. The law gives workers the right to refuse to undertake work that violates labor protection requirements. In addition, workers engaged in hazardous working conditions are entitled to free medical and preventative care, additional paid leave and other benefits and compensation. In case of disability or death, employers must provide compensation in multiples of average annual earnings. Employers must train workers in performing their work safety and must provide collective and personal protection for workers. Accidents must be investigated. Finally, there must be a “labor protection service” if there are more than 50 employees.

122 In addition, Tajikistan has ratified a number of core labor standards of the International Labor Organization, including the following:

- Forced Labor (C029) and Abolition of Forced Labor (C105)
- Minimum Age (C138) and Worst Forms of Child Labour (C182)
- Discrimination (C111) • Freedom of Association and the Right to Organize (C087) • Right to Organize and Collective Bargaining (C098) • Equal Remuneration (C100)

123 IFIs and the AIIB require that the risk of sexual abuse and exploitation should be assessed related to the project impacts. The Project risk of sexual exploitation and abuse and sexual harassment (SEA/SH) risk is assessed as low. The assessment is based on a review of national legislation and available information on SEAH aspects in the country. The civil works will be implemented away from residential areas. The majority of labor force is expected to be recruited from local communities or other parts of Country. During the civil works it will be strongly required from the Company that Prohibition of SEAH will be introduced in the Code of

Conduct to be acknowledged and signed by all workers. Training on SEAH issues and the available protocols for handling SEAH complaints in sensitive and confidential manner will be provided to all workers and communities in the project right of way (ROW). The protocol for handling SEAH grievances will involve referral mechanism to the appropriate specialized service providers identified with SEAH service provider mapping.

124 In order to combat human trafficking in Tajikistan, the Law on Counteracting Trafficking in Persons was in effect until July 2014. On 26 July 2014, the new Law on Counteracting Trafficking in Persons and Providing Support to Victims of Trafficking in Persons entered into force. The law establishes the organizational and legal framework for combating human trafficking and sets out a system of measures to protect victims of trafficking, provide them with assistance and rehabilitation. It also governs social relations in combating human trafficking and the provision of assistance to victims. A distinctive feature of the new act is that it stipulates comprehensive measures to assist victims of human trafficking.

125 The Ministry of Health and Social Protection of Population of the Republic of Tajikistan has developed the following guidelines and modules<sup>3</sup> to enhance the standards of services provided to victims of domestic violence.

126 This includes:

- Guideline on the local offices for social protection at home have been enhanced (Order of the Ministry of Health and Social Protection of Population No. 748 dated 12 September 2017) and put to practice since 1 January 2018 in the districts of Konibodom, Qabodiyon, Rudaki and Hamadoni, as well as the cities of Kulob and Khorugh;
- Guide on the response to domestic violence for employees of social protection institutions has been developed and published (Order of the Ministry of Health and Social Protection of Population No. 443 dated 11 May 2018);
- Model guideline on rooms of support for female victims of domestic violence in central clinical hospitals and maternity clinics of the Ministry of Health and Social Protection of Population have been enhanced and published (approved by Order of the Ministry of Health and Social Protection of Population No. 973 dated 20 October 2018);
- Model guideline on the organization and operation of shelters for victims of domestic violence have been developed and published (approved by Order of the Ministry of Health and Social Protection of Population No. 1176 dated 11 December 2018).

127 In accordance with paragraph 1 of the Action Plan of the State Programme for the Prevention of Domestic Violence in the Republic of Tajikistan for 2014–2023 and paragraph 6 of the National Action Plan to Implement the Recommendations Provided by the Member States of the UN Human Rights Council as part of the Universal Periodic Review (second cycle) for 2017–2020 approved by Order No. 901 of the President of the Republic of Tajikistan, dated 7 June 2017, in order to improve legislation to strengthen gender policies and protect women's rights, pursuant to the Instruction of the Head of the Executive Office of the President of the Republic of Tajikistan, dated 29 June 2017, a Working Group on Improvement of Legal Acts on Elimination of Gender Stereotypes, Protection of Women's Rights and Prevention of Domestic Violence was established.

128 The Criminal Code of the Republic of Tajikistan stipulates penalties for the following acts involving the use of violence against women:

- human trafficking (art. 130);
- rape (art. 138);

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<sup>3</sup> <https://evaw-global-database.unwomen.org/en/countries/asia/tajikistan/2017/working-group-on-improvement-of-legal-acts-on-prevention-of-domestic-violenc>

- sexual assault (art. 139);
- coercion to perform acts of a sexual nature (art. 140);
- sexual intercourse or other acts of a sexual nature with persons who have not reached the age of 16 (art. 141);
- sexual abuse/indecent assault (art. 142);
- unjustified refusal to hire or unjustified dismissal of a women who has a child under the age of 3 (art. 155);
- giving in marriage of a girl under marriageable age (art. 168);
- trafficking in minors (art. 167).

129 The legislation of the Republic of Tajikistan on the prevention of domestic violence (March 19, 2013) is based on the Constitution of the Republic Tajikistan and consists of this Law, other normative legal acts of the Republic of Tajikistan, as well as international legal acts recognized by Tajikistan. This Law applies to citizens of the Republic of Tajikistan, foreign citizens and persons without citizenship residing in the Republic of Tajikistan and married and members of their families, as well as persons jointly living with a common household.

130 Under the **Law on Public Associations (2007, last amended 2019)**, a public association may be formed in one of the following organizational and legal forms: public organization, public movement, or a body of public initiative. Article 4 of this law establishes the right of citizens to found associations for the protection of common interests and the achievement of common goals. It outlines the voluntary nature of associations and defines citizens' rights to restrain from joining and withdrawing from an organization. This legislation requires NGOs to notify the Ministry of Justice about all funds received from international sources prior to using the funds and to post financial information on their websites.

131 **The 2014 Law on Public Meetings, Demonstrations and Rallies (Article 10)** bans persons with a record of administrative offenses (i.e. non-criminal infractions) under Articles 106, 460, 479 and 480 of the Code for Administrative Offences from organizing gatherings. Article 12 of the law establishes that organizers must obtain permission fifteen days prior to organizing a mass gathering.

132 **The Law on Local Public Administration** provides the legal basis for local government. The former law assigns to Jamoats a broad range of competencies and the mandate to support community efforts to address local socioeconomic needs. The 2009 amendment aims to strengthen local self-governance and accountability by delegating budget authority to Jamoat councils and introducing a system of direct election for Jamoat councilors. The 2017 amendment allows Jamoat councils to retain non-tax revenues earned through the provision of administrative services and a percentage of local property taxes. The 2017 amendment suggests a seriousness on the part of national government to enact policies that empower Jamoat councils with authorities and resources needed to support local development and problem-solving.

133 The current **Land Code (1992, amended 2016)**. The Land Code regulates land relations and is aimed at rational "use and protection of land and soil fertility". Land is subject to rational use, and the Code allows local authorities to make decisions regarding "rational" land use.

134 **Land Management Act (2001)** The law requires authorities to perform mapping and monitoring of land quality, soil pollution, erosion and waterlogging.

Land categorization and the transfer of land from one category to another Land within the categories specified in Article 3<sup>4</sup> of the present Code and its transfer to another category shall be made in accordance with the procedure established by the Government of the Republic of Tajikistan. (In RT Law edition dated 28.02.2004 No.23)

Violation of provisions established by present Code and other normative legal acts on transferring lands from one category to another can be grounds for: (In RT Law edition dated 1.08.2012 No.891)

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<sup>4</sup> <http://ncz.tj/system/files/Legislation/2.ru...pdf>

- a) recognizing as invalid the resolutions of executive regional government bodies in the field of regulating land relations;
- b) refusing the issuance of documents certifying the right of land use and registration of the right to use a land plot.

135 According to Article 9. 1, the transfer of land from one type to another within the category of agricultural land and state reserve land. The decision to transfer arable land, land with perennial plantings, hayfields and grazing land with an agricultural purpose to a non-agricultural type of land and to transfer arable land and land with perennial plantings to hayfields and grazing land and to transfer all types of irrigated land to the category of dry land shall be made by the Government of the Republic of Tajikistan.

136 The decision to transfer hayfields and pastures and other types of land to arable land and land with perennial plantings regardless of land area, to transfer arable land to land with perennial plantings, to transfer land with perennial plantings to arable land, and to transfer all types of dry land to irrigated land shall be made by the local government of the district (city) (In RT Law edition dated 5.01.2008 No.357).

137 **Public Participation and Information Disclose: Article 12** of the Law on Environmental Protection stipulates the right of citizens to live in a favorable natural environment and to protect their health from adverse effects. Citizens also have the right to receive environmental information (Article 13), as well as the right to participate in and monitor the development, adoption and implementation of decisions related to the impact on the environment (Article 13). This right is ensured by the publication and public discussion of draft environmentally important decisions. The duty of the competent authorities is to take into account the suggestions and comments of citizens. On 17 July 2001, Tajikistan acceded to the Aarhus Convention on access to information, public participation in decision-making and access to justice in environmental matters. The provision of this Convention on the right to conduct public environmental impact assessment prevails over the provision of the national law.

138 According to the law, for any project subject to and EIA, the public has the right to initiate a public environmental assessment prior to or concurrently with the state environmental assessment. The outcome of the public assessment is of an advisory nature and has to be reviewed during the state environmental assessment. The EIA is carried out by an expert or an expert committee, as set out in the legislation. According to the EIA law, depending on the significance of environmental impacts, a project can be assigned a category "A", "B", "V" and "G". Review of the documents can take up to 60 days depending on the category of the project. As a result of the review, a positive or a negative conclusion is issued by the state institution. A positive conclusion is often supplemented by recommendations, for example, obtaining additional permits (emissions to air, wastewater discharge and waste) and activities to improve the surrounding environment. The conclusion is valid for the duration of the life cycle of the technology. If changes are made to the work processes or technologies which result in greater/smaller impact on the environment, a new assessment will have to be carried out.

139 The public has the right to request public hearings to be carried out. For category "A" and "B" projects state body should develop a stakeholder engagement plan with the possibility of conducting consultations and considering the opinions of citizens

140 **The Law on Environmental Information (2011)** is underpinned by Article 25 of the Constitution, which states that governmental agencies, social associations, and officials are required to provide each person with the possibility of receiving and becoming acquainted with documents that affect her or his rights with the possibility of receiving and becoming acquainted with documents that affect her or his rights and interests, except in cases anticipated by law. The Law defines the legal, organizational, economic, and social bases for providing environmental information and establishes the right of individuals and legal entities to receive complete, reliable, and timely environmental information. Article 4 provides 1 the right of access to environmental information and Article 8 defines the conditions for restricting access to environmental information.

141 According to the **Law of the Republic of Tajikistan about the right to the information**

**access** (June 18, 2008) The legislation on the right to information access is based on the Constitution of the Republic of Tajikistan and consists of this Law, other normative and legal acts of the Republic of Tajikistan, and also the international legal acts recognized by Tajikistan.

142 Operation of this Law extends on:

- a) bodies and the organizations and their officials providing information;
- b) persons obtaining information - the right to access information and address for it in accordance with the established procedure.

Operation of this Law extends to the relations connected with information access, containing in official documents and not carried to information category of limited access.

The basic principles of providing the right to information access are:

- a) availability and openness of information;
- b) reliability and completeness of information;
- c) timeliness of provision of information;
- d) protection of the right to information access, including judicially;
- e) responsibility for violation of the right to information access;
- e) observance by provision of information of the rights and legitimate interests of the third parties;
- g) establishment of restriction of the right to information access with the law and only in that measure in what it is necessary for protection of bases of the constitutional system, ensuring defense of the country and safety of the state, the authority and impartiality of justice; morality, health, rights and legitimate interests of physical persons and legal entities.

**The Law on Environmental Expertise** provides for the rights of citizens to conduct Public Environmental Expertise (art. 7). Tajikistan is also party to the **1998 Aarhus Convention (July 17, 2001)** that contains provisions for public EE. The 2014 Procedure (Order) for Conducting an EIA also describes procedures for public participation. Public participation procedures are envisaged for all categories of projects, although in practice they are mainly applied to Category I projects. The Procedure (Order) for conducting the EIA of 2014 changed the focus and timing of public discussions. Compared to the 2006 version of the Procedure for preparing EIAs which provided the opportunity for public inputs during the scoping stage while drafting the technical task, the 2014 version of the Procedure provides space for public discussions only after the preparation of the EIA report.

143 In Tajikistan disagreements are solved through “Jamoats” grievance mechanism or appeal to court. A grievance redress mechanism (GRM) capable of receiving and facilitating the resolution of affected persons concerns and grievances related to the project is required as a formalized way for the PIU (Project implementation unit) to identify and resolve concerns and grievances.

144 **Law on Appeals of Individuals and Legal Entities of Republic of Tajikistan** contains legal provisions on established information channels for citizens to file their complaints, requests and grievances. Article 14 of the Law sets the timeframes for handling grievances, which is 15 days from the date of receipt that do not require additional study and research, and 30 days for the appeals that need additional study. These legal provisions will be taken into account by the project-specific Grievance Redress Mechanism.

145 The resettlement and internal migration in Tajikistan are regulated by the Resolution of the GoT about the **Procedure of the Internal Migration in the Republic of Tajikistan** (No 468 dated 1 October 2008), as amended by the Resolution No 532 dated August 7, 2014). The resettlement can be carried out only after receiving an official guarantee for the reception, provision of housing or allocation of a land plot for the construction of a residential house, provision of drinking water, medical care, electricity, and work for all members of the resettled families, guarantees of a favorable sanitary condition in accordance with the available

opportunities, the creation of social facilities. This guarantee is provided by local executive bodies of state administration of cities and regions.

### **Tajikistan Constitution, Law / Regulation on Land Acquisition, Resettlement and Compensation**

146 The Constitution of the Republic of Tajikistan is the main legal document which guarantees citizen's rights. Article 13 states that land, bowels of the earth, [i.e. mineral resources], water, airspace, animal and vegetable kingdoms, [i.e. flora and fauna], and other natural resources are owned by the state, and the state guarantees their effective use in the interests of the people. Furthermore, Article 12 states that the economy of Tajikistan is based on various forms of ownership and the state will guarantee freedom of economic activity, entrepreneurship, equality of rights, and the protection of all forms of ownership, including private ownership. The legal basis for state acquisition of private property for public works is outlined in article 12 which states the economy of Tajikistan is based on various forms of ownership and the state will guarantee freedom of economic activity, entrepreneurship, equality of rights, and the protection of all forms of ownership, including private ownership.

#### **Provisions regulated by the Land Code**

147 In August 2012 amendments to the Land Code that enable legal sales and lease transactions for land use rights were approved. The Land Code also includes changes to the provisions related to land acquisition. The revocation/allotment of lands and resettlement envisages compensation for losses incurred by land users or those with other registered rights to the land when the land plot is revoked for state and public needs. The state may revoke land plots for state and public needs from land users after:

- allocating a land plot of equal value;
- constructing housing and other buildings with the same purpose and value, in a new location for the natural persons and legal entities to whom the land plot had been allocated, in accordance with established procedures;
- fully compensating for all other losses, including lost profits, in accordance with the legislation of the Republic of Tajikistan.
- Upon the revocation of land plots for state and public needs, all losses shall be calculated according to the market price, which shall be defined by taking into consideration the location of the land plot, and compensation shall be paid to the persons/legal entity whose land has been taken away.

148 Termination of the right to use a land plot, for state and public needs, can be carried out after allocation of an equal land plot and compensation of other expenses is provided by part one of the present article. (L.C. Article 41; In the Republic of Tajikistan Law edition dated 1 August 2012, No. 891). The procedure for the compensation of losses to land users and losses arising from the removal of land from circulation is regulated by Article 43 of the Land Code edition dated 1 August 2012, No. 891:

- In the event of revocation of a land plot for state and public needs, compensation for losses to land users and others with registered rights to the land, and losses connected to the removal of land from circulation, shall be made by the natural/legal persons whose activity led to the revocation.
- In the event of withdrawal of a land plot for state and public needs, the procedure for compensation of losses to land users and others with registered rights to the land, and losses connected to the removal of land from circulation shall be defined by the Government of the Republic of Tajikistan (In RT Law edition dated 5 January 2008, No. 357).
- Upon termination of the rights to a property, the property will be assessed based on its market value (Article 265 Civil Code).

- Land users should be notified in writing about land revocation by the local executive government body no later than one year before the pending withdrawal of the land (Article 40. Land Code of the Republic of Tajikistan Law edition dated 1 August 2012 no. 891).
- In the event that international agreements recognized by the Republic of Tajikistan establish other rules than those contained in the Land Code of the Republic of Tajikistan, the rules of the international agreement shall be applied (Article 105, LC of the RT edition dated 28 February 2004 No. 23).

149 The Land Code of 1997 is the core legal document relating land acquisition. It has been updated a few times and most recently in August 2012. Article 2 of the Land Code states that Land is an exclusive ownership of the state ... [but]... the “state guarantees its effective use in the interests of citizens”. However, Articles 10-14, the Land Code outlines land title as being of long-term, short-term, and inherited land use entitlement. Article 14 of the LC of the RT also states that land users may lease land plots by agreement (In the Republic of Tajikistan Law addition dated 1 August 2012 No. 891).

### 2.1.9 Penalties for Environmental Violations

150 Tajikistan administrative regulations and criminal law include comprehensive system of penalties for the breach of the environmental legislation. The punishments vary from the relatively small fines (up to 300 of minimal units) to the 20 years imprisonment for the ones found by court guilty in ecocide. The inspectors may directly impose the fines and/or compensations for the damage to Environment and/or they may be inflicted by court through litigation.

### 2.1.10 Administrative Network for Environmental Management

151 The main governmental administrative body responsible for supervising of environmental issues is the Committee for Environmental Protection (CEP) under the Government of the Republic of Tajikistan. It comprises several Departments, Agency for Hydrometeorology of CEP under GoT is a Governmental agency assigned for the coordination of the Climate Change activities and the obligations to the country to the United Nation Framework Convention on Climate Change (UNFCCC). As fulfillment of its commitments under the UNFCCC the country developed four National Communications on climate change.

152 In 2019, GoT approved National Strategy for Adaptation to Climate Change of the Republic of Tajikistan up to 2030. This is a multisectoral policy document applicable to the assessment and management of climate change risk (natural disasters, flooding, droughts, avalanches, landslides) relevant to several priority sectors, including transport and transport infrastructure. The implementation of the National Strategy is imposed on the CEP which will serve as the coordination center for the integration of the Climate Change adaption policy to the relevant sectors.

153 **Table 3** below shows the main CEP Departments which may closely interact with the Project during the implementation.

**Table 3. The CEP Departments Roles and Responsibilities**

No	CEP Department of	Responsibility
1	<b>Monitoring and Environmental Policy</b>	Promotion of a unified state environmental policy, state environmental monitoring, rational use of natural resources and economic mechanisms of environmental management
2	<b>Administration (General, HR, Legal, Special Works and Economic Sectors)</b>	Registration, control, and export of documents, human resources, legal services, construction of facilities, and structures. Analysis of the compliance with the state policies and laws

No	CEP Department of	Responsibility
3	<b>Water Resources</b>	State control and protection of water resources
4	<b>Plant and Animal World</b>	State Control and protection of Biodiversity
5	<b>Protection of Atmospheric Air</b>	The promotion of state control over the regulation and harmonization of air emissions in accordance with the requirements of legislation and other regulations in this area.
6	<b>Land Protection and Waste Management</b>	Adoption of normative legal acts governing legal relations in the field of waste management and control over their implementation;  Determining the principles of organizing and conducting state control, conducting inspections in the field of waste management;
7	<b>International Relations</b>	Coordination of the cooperation of the Committee with international organizations and organizations, foreign missions, UN conventions in ensuring compliance with environmental standards and increasing the level of environmental protection.
8	<b>Specially Protected Natural Areas and National Parks</b>	Management of the protected areas to ensure the stability of the biological balance of nature, the protection of rare species of flora and fauna, specific natural ecosystems, biological monitoring, ecological tourism, mountaineering and research work on the analysis and assessment of processes affecting natural ecosystems
9	<b>Agency for Hydrometeorology</b>	Coordination of the activities at national level relating to Climate Change and the obligations to the country to the UN Framework Convention on Climate Change.

### 2.1.11 Environmental Standards

154 Standards are established for atmospheric and water pollution, noise, vibration, magnetic fields and other physical factors, as well as for the residual content of chemicals and biologically harmful microbes in food. Exceeding these levels leads to administrative actions, including financial sanctions. Some ministries, each in their area of responsibility, define environmental quality standards. For example, acceptable levels of noise, vibration, magnetic fields, and other physical factors are established by the Ministry of Health.

155 The environmental quality standards in Tajikistan are based on GOST, SNIIP and SanPiN. GOST (Tajik: GOST) refers to a set of technical standards that is supported by the Euro-Asian Council for standardization, Methodology and Certification (EASM), a regional standardization organization working under the auspices of the Commonwealth of Independent States (CIS). SNIIP means technical standards (in Tajik: SNIP) – it is a construction code, a set of rules that define minimum standards for constructed facilities, such as buildings and undeveloped buildings. SanPiN (in Tajik: Koidakho wameyorhoi sanitation) stands for sanitary rules and norms (standards).

156 Environmental quality standards in Tajikistan are provided by both MDK (in Tajik: MPC) and DVA (in Tajik: PDV). The maximum permissible concentration approved by the law on hygienic standards. By MDC is meant the concentration of chemical elements and their

composition in the environment, which, when exposed daily for a long time in the human body, will lead to pathological changes or diseases established by modern research methods at any time in the life of the present and future generation.

157 Maximum permissible (or allowed) emissions (MEL) are the standard maximum permissible emissions of harmful (polluting) substances into the atmospheric air, which are established for a permanent source of air pollution in accordance with technical standards for emissions and background air pollution. This ensures that standards for environmental air quality and hygiene are not exceeded, the most permissible (critical) loads on environmental systems and other requirements of environmental regulations.

158 **Table 4** presents an overview of the National Standards and Regulations that apply to the Project. Most of the currently valid environmental standards are Interstate standards accepted by EASM.

**Table 4. National and Interstate Standards Applicable to the Project**

No	Title of Standard
1	GOST 32847-2014 Requirements to environmental surveys for the road construction projects
2	VSN 8-89 Instruction on environment protection during road construction, repairs and maintenance
3	GOST 31431—2011. Protection of nature. Air. Set of Maximum Permissible Emissions (MPE <sup>1</sup> ). 29 November 2011
4	GOST 31434—2011 Protection of nature. Air. Determination of parameters of efficiency of dust collection systems. 29 November 2011
5	IEC 61241-0—2011 Electrical equipment used at areas containing flammable dust. Part 0. General requirements. 29 November 2011
6	GOST 17.0.0.01-76 (ST SEV 1364-78) (in edition of 1987) System of standards for environmental protection and improvement of natural resources usage. General provisions
7	General provisions GOST 17.0.0.04-80 (1998) Protection of nature. Environmental passport (certificate) of industrial facility. General provisions
8	GOST R ISO14001-98 Environmental management systems. Requirements and guidelines.
9	GOST 17.0.0.02-79 (1980) Protection of nature. Provision of metrological control of air, surface water and soils pollution.
10	GOST 17.1.1.01-77 (ST SEV 3544-82) Usage and protection of water. General terms and definitions.
11	GOST 17.2.1.01- 76 Classification of emissions (content).
12	GOST 12.1.014-84 (1996) SSBT. Air at workplace. Methodology of measuring of pollutants concentration using indication tubes.
13	GOST 12.1.005-88 (1991) SSBT. General sanitary and hygiene requirements to air at workplace.
14	GOST 17.2.2.05-97 Norms and methods of emissions measuring containing spent diesel gases, tractors and self-propelled agricultural machines.
15	GOST 21393-75 Diesel motorcars. Exhaust gas opacity. Norms and methods of measurement.
16	GOST 17.2.2.03-77 Concentration of carbon monoxide at exhaust gases of motorcars with gasoline engines. Norms and measurements methodology.
17	GOST 17.2.2.03-87 Norms and methods of measurements of carbon monoxide at exhaust gases of motorcars with gasoline engines.
18	GOST 17.4.2.01-81 Nomenclature of sanitary condition parameters

No	Title of Standard
19	GOST 17.4.1.02-83 Classification of chemical substances for monitoring of contamination.
20	GOST 12.1.003-83 (1991) SSBT. Noise. General safety requirements
21	GOST 12.1.023-80 (1996) SSBT. Noise. Methods of threshold noise levels for stationary machinery.
22	GOST 12.1.029-80 (1996) SSBT. Means and methods of noise protection. Classification.
23	GOST 12.1.036-81 (1996) SSBT. Noise. Allowable levels of noise within residential and public buildings.
24	GOST 12.1.007-76 (1999) SSBT. Harmful substances. Classification and general safety requirements.
25	GOST 12.4.119-82 SSBT. Means of respiratory PPE. Methods of protective features assessment for aerosols.
26	GOST 12.4.125-83 (1985) SSBT. Means of collective protective equipment from mechanical factors. Classification.
27	SanPiN 2.1.4.559-96 Drinking water. Hygienic requirements to the quality of water from centralised systems of drinking water supply. Quality control
28	CH 2.2.4/2.1.8.562-96 Noise at working places, indoors of residential and public buildings and the territories of residential areas

## 2.2 International Conventions and Treaties

159 Tajikistan joined and ratified several of International, convention and treaties relating to the Environmental Protection and Management. These treaties are summarized in **Table 5**.

**Table 5. The International Convention joined by Tajikistan**

No	Convention or Protocol	Approval Date
1	Vienna Convention for the Protection of the Ozone Layer	4/11/1995
2	Convention on Biological Diversity and to its Cartagena Protocol on Biosafety	15/05/1997
3	United Nation Framework Convention on Climate Change (UNFCCC)	13/12/1999
4	Convention to Combat Desertification	28/12/1998
5	Convention on Wetlands of International Importance Mainly as a Habitat for Waterfowl	24/10/2000
6	Convention on the Conservation of Migratory Species of Wild Animals	24/10/2000
7	Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters	9/06/2001
8	Stockholm Convention on Persistent Organic Pollutants	6/12/2006
9	Convention for the Protection of the World Cultural and Natural Heritage	1992
10	Convention on International Trade of Endangered Species of Flora and Fauna	2016

No	Convention or Protocol	Approval Date
11	Cartagena Protocol on Biosafety to the Convention on Biological Diversity	2004
12	Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity	signed in 2011 and ratified in 2013

160 The International treaties take precedence over national legislation, therefore the above-mentioned Conventions constitute also a legal basis in the relevant areas of environmental protection in the country

## 2.3 Environmental and Social Requirements of AIIB

161 Package 3 is funded by AIIB and project activities should be in line with the AIIB's E&S requirements stipulated in AIIB Environmental and Social Framework (ESF).

162 The AIIB Environmental and Social Framework (ESF) is a set of policies and standards created to support the Banks's clients in achieving environmentally and socially sustainable development projects. ESF is applicable to all AIIB-financed activities. One of the main objectives of ESF is to integrate the management of environmental and social risks and impacts into decision-making on, and preparation and implementation of, AIIB-financed projects.

163 The AIIB's ESF was initially approved in 2016 and amended at least every three years. AIIB ESP amended in February 2019 is applicable for this project. The document incorporates the Bank's policy addressing environmental and social impacts relating to all projects funded by the Bank.

### 2.3.1 Key elements of AIIB ESF

164 AIIB ESF includes the following main elements:

- a) **Environmental and Social Policy (ESP)**- The ESP mandatory environmental and social requirements for each Project including mandatory Environmental and Social Standards forth setting requirements in Environmental and Social Assessment and Management; Land Acquisition and Involuntary Resettlement; and Indigenous Peoples. ESP provides the detailed provisions for the Roles and Responsibilities of the Parties for the projects, screening and categorization of activities depending on the scope and magnitude of impacts and suggests appropriate ESIA instruments for required Scope of Analysis and Mitigation Hierarchy.
- b) **Exclusion List of activities which in no case will be funded by AIIB.**

### 2.3.2 Applicability of ESP Standards to the Project

165 The environmental and social standards (ESSs) provided detailed mandatory environmental and social requirements. ESSs include;

- a) **ESS-1 (Environmental and Social Impact Assessment)**: applies to the AIIB projects likely to have potential environmental and social impacts. It provides the detailed ESIA requirements to the Client's ESIA depending on the scope and magnitude of anticipated impacts.
- b) **ESS-2 (Land Acquisition and Involuntary Resettlement)**: applies to AIIB projects likely to involve Involuntary Resettlement. The Bank requires the Client to address, in accordance with ESS 2, any Involuntary Resettlement that was undertaken within three years prior to identification of the Project for possible Bank financing and which is directly linked to the Project.
- c) **ESS-3 (Indigenous People)**; applies if the Indigenous People are present in, or have a

collective attachment to, the proposed area of the Project, and are likely to be affected by the Project. In accordance with ESS-3 Indigenous people are defined as :”a distinct, vulnerable, social and cultural group possessing the following characteristics in varying degrees: (a) self-identification as members of a distinct indigenous cultural group and recognition of this identity by others; (b) collective attachment to geographically distinct habitats or ancestral territories in the Project area and to the natural resources in these habitats and territories; (c) customary cultural, economic, social or political institutions that are separate from those of the dominant society and culture; and (d) a distinct language, often different from the official language of the country or region. In considering these characteristics, national legislation, customary law and any international conventions to which the country is a party may be considered.”

166 The AIIB requires to manage the environmental and social risks and impacts associated with its project in a manner designed to meet the ESP and the applicable ESSs. **Table 6** shows applicability of the ESSs to the proposed Project.

**Table 6. Applicability of AIIB ESP Standards to the Project**

	<b>Standard</b>	<b>Applicability Conditions</b>	<b>Status</b>
<b>ESS-1</b>	Environmental and Social Impact Assessment and Management	Applicable, if the Project is likely to have adverse environmental risks and impacts or social risks and impacts (or both)	Yes, since the project is likely to have negative Environmental and Social Impacts.
<b>ESS-2</b>	<b>Involuntary Resettlement</b>	Applicable, if the Project is likely to cause involuntary resettlement impacts.	According to the all three alternatives design, the project will not impact on private owned or used land, but there can be temporary impacts of business or agricultural activities, as well as unforeseen land impacts identified on later stages of project preparation and implementation.
<b>ESS-3</b>	<b>Indigenous People</b>	Applicable, if the Indigenous people are present in the project area and likely to be affected by the Project	No. Indigenous People are not present in the Project area

167 ESF determines the Roles and Responsibilities of Parties and provisions for the Environmental and Social screening and categorization of funded activities. ESF includes Environmental and Social Policy (ESP), Environmental and Social Standards, and an Environmental and Social Exclusion List of funded activities.

168 The classification system developed by AIIB categorizes the projects by the scope and significance of the anticipated environmental Impacts. By significance of the potential Impacts ESF divides the projects into 4 categories including A, B, C, and FI with assigning of appropriate assessment tool for each category. The project has been assigned Category A in accordance with AIIB ESP (2019).

## **2.4 Comparison of national legislation with AIIB Policy on Environmental and Social aspects**

169 A comparison between the national legislation of Tajikistan discussed under Section 2.1 and AIIB ESP and ESS described under Section 2.3 is given in **Table 7**. The project will have to comply with both these requirements; in case of any conflict however, more stringent of the two sets of legislation/policy/standard will be applicable to the project.

170 **Table 8** to **Table 11** summarize the specific standards for air quality, water, waste and noise exposure in Tajikistan compared with WGB EHS Guidelines and WHO standards. In general, it can be concluded that the Tajik system in the field of environmental standards is well developed and that Tajik standards are generally broadly aligned with the standards of International Financial Institutions (IFIs).

**Table 7. Comparison of AIIB ESF and Environmental, Social and Resettlement Requirements of Tajikistan**

No	Aspect	AIIB	Tajikistan	Applicability to the Project
1	Environmental Policy and Regulations	Environmental and Social Policy including three Environmental and Social Standards ESS 1,2 and 3 (2019).	Environmental Legislation includes full set of the Environmental Laws and Regulations such as: Law on Environment Protection (2011); Law on the state Environmental Expertise (2012); Law on the Environmental Impact Assessment procedure and many of standards, norms and other regulative documents.	In most of the cases national requirements and standards for environment quality match with AIIB ESP and Standards.
2	Categorization	Project is categorized A if it is likely to have significant adverse environmental and social impacts that are irreversible, cumulative, diverse or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works and may be temporary or permanent in nature. The assessment tools are: ESIA with ESMP or ESMPF or similar documents	A project has an adverse and significant impacts on the environment, health conditions of the population, direct impacts on specially protected natural areas of national and International significance, historical and cultural heritage and trans-boundary impacts.  In addition, the types of the Project by Category listed under the Resolution No No257 issued by the GoT in 2013.  The assessment tool for A Category is EIA	AIIB determines the Project A Category “on the basis of the Project’s component presenting the highest environmental or social risk and potential impacts” <sup>5</sup> .  Tajikistan List of Activities falling under the High-Risk Category A includes motorways and speedy highways. Therefore, the assigning of High Risk (A) Category for the Project is in line both with AIIB and Tajikistan Requirements for the Project. The Project is assigned Category A.
3	ESIA Content	In accordance with ESP, the ESIA should include	The law on EIA procedure in Tajikistan determines that EIA requires to include:	The requirements of AIIB in conducting ESIA (to assess both Environmental and Social Impacts) The national law of Tajikistan does not require to assess social impacts and elaborate relevant mitigation measures, as well as preparation of
3.1		(a) description of the Project, including, as applicable, a map of the Project area;	Justification of the need in the project (Article 20).  a) details of the customer of economic and other activities; substantiation of the need to implement	

<sup>5</sup> ESP. V. Environmental and Social Screening. Categorization and Due Diligence by Bank. Categorization 17.1

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No	Aspect	AIIB	Tajikistan	Applicability to the Project
			economic and other planned activities, justification of investments, feasibility study of the project, as well as the approved part of the working draft and an explanatory note; goals and characteristics of the main indicators of the project as a whole and requirements for its placement in the area;	LARP. During the preparation of the present ESIA, the gap analyses of requirements/low were conducted and the national as well as AIIB requirements were fulfilled.
3.2		(b) policy, legal and administrative framework, including the international and national legal framework applicable to the Project;	(b) standards for emissions (discharges) of pollutants and waste disposal into the environment, as well as standards for the withdrawal of natural resources;	
3.3		(c) scoping, including stakeholder identification and consultation plan;	(c) the participation of public associations in the preparation and discussion of environmental impact assessment materials is provided by the Applicant as an integral part of the environmental impact assessment procedure (Law on IEA Article 4. (1))	
3.4		(d) analysis of alternatives, including the “without Project” alternative	(d) information on alternative options indicating the main reasons for choosing a design option	
3.5		(e) baseline environmental and social data;	(e) description of the state of the components of the environment existing before the implementation of the activity;	
3.6		f) evaluation of environmental and social risks and impacts including analysis of risks and impacts related to climate change	(f) evaluation of impacts of activities on abiotic (geology and relief conditions, climate, state of atmospheric air and water environment) and biotic (landscapes, soils, flora and fauna) components of the environment, public health and socio-economic conditions; ecosystems, human health, employment and education opportunities, state of infrastructure, sites of historical and cultural significance shall be assessed;	

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No	Aspect	AIIB	Tajikistan	Applicability to the Project
3.7		(h) public consultation and information disclosure;	(h) Materials on taking into account the opinions of citizens, drawn up in the form of protocols and containing their conclusions on the environmental aspects of the planned activity;	
3.8		(i) development of mitigation, monitoring and management measures and actions in the form of an ESMP or ESMPF or another Bank-approved document.	(i) description of the measures envisaged to prevent and reduce the impact on the environment, including proposals for environmental monitoring;  Tajikistan's Legislation doesn't require the preparing of the document in the ESMP format.	
3.9		(g) identifies the GRMs required for the Project;	(g) documented as minutes of meeting feedbacks of population and other stakeholders;	
4.	Public Consultations and Disclosure	The Borrower (Client) is responsible for conducting at least one meaningful consultation for all Categories A, B and C projects to discuss the issues to be addressed in the ESIA/ESMP or to discuss the draft non-technical summary (NTS) of the instruments. NTS in the local language(s) should be disclosed prior to consultations in the project areas and the Client's website.	Conducting of public consultation is not mandatory. It may be conducted, if required at the time of the EIA (second stage of EIA). Advertisement on conduction of public consultation have to be announced in the media.	Public consultations will be carried out with the stakeholders, affected people, NGOs, as part of the present ESIA, in line with the AIIB requirements. The feedback received from the Public Consultations has been used to finalize the present ESIA.
5	Preservation of Historic and Cultural Heritage	AIIB ESS1 requires development of Cultural Recourses field-based survey to conserve cultural resources and avoid destroying or damaging them under the Project	The Law of Tajikistan on Conservation and Usage of Historical and Cultural Heritage requires the prior coordination of any construction activities with the State Authority for the protection of Historical and Cultural heritage (Article 23).	The Academy of Sciences of the Republic of Tajikistan – Institute of History of Archaeology and Ethnography was contacted in June 2019, for information on the potential for cultural heritage locations to be present in the project area. The confirmation was provided that the sites of the cultural and historical heritage are absent in the project

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No	Aspect	AIIB	Tajikistan	Applicability to the Project
				area. However, the Chance Find procedures have been included into the ESIA
6	Occupational Health and Safety	<p>ESS-1. D." Working Conditions and Occupational Health and Safety" requires assessment of labor and working conditions of Project workers, as well as health and safety risks to Implement measures designed to ensure Project workers have safe and healthy working conditions, and put in place measures to prevent accidents, injuries, and disease caused by the Project.</p> <p>Apply the relevant occupational health and safety provisions of internationally recognized standards, such as the EHSGs and, as appropriate, industry-specific EHSGs, to the Project. Document and report on accidents, diseases and incidents.</p>	<p>Labor Code of Tajikistan and the Labor Protection Law requires providing of the safe work conditions with observation of sanitary requirements and norms. The Code requires the investigation of the work incidents installation of the prevention measures. The government issued a system of the National Safety Regulations for the various sectors including construction. The Government Body, - State Supervision of Safe Work in Industry and Mining Supervision Service under the Government of the Republic of Tajikistan</p>	<p>The OHS Regulations of Tajikistan in general in line with ESS-1 requirements.</p>
7	<p>Social aspects (community health and safety – SEAH/SH/GB V, transmittable diseases, safety issues, access to information/ GRM</p>	<p>Conduct social assessment relating to the risks and impacts, and design appropriate measures to avoid, minimize, mitigate, offset or compensate for them, all as required under ESP.</p> <p>Put in place preventive and emergency preparedness and response measures to avoid, or where avoidance is not possible, to minimize adverse risks and impacts of the Project on the health and safety of local communities.al communities in the area of the Project.</p>	<p>In accordance with the approval procedure the project proponent is obliged to receive detailed information about people affected by the proposed project from the relevant authority (at the Jamoat level) and adequately address the compensation issue, by obtaining of the signed letter of consent before the commencement of the proposed work.</p>	<p>The PAP policy of the AIIB (ESS1) – is generally in line with the Tajikistan's policy</p>

No	Aspect	AIIB	Tajikistan	Applicability to the Project
	<p>social inclusion/exclusion Gender) etc.</p>	<p>According to the all-proposed alternatives, the project will not impact on private owned or used land, but there can be temporary impacts of business or agricultural activities, as well as unforeseen land impacts which can be identified on later stages of project preparation and implementation.</p> <p>Construction activities may result in access roads traffic accidents between vehicles, pedestrians and vehicles and livestock and vehicles. There will also be short term impacts to noise and air quality, which may impact upon the health of the local population. Migrant workers may also increase community health and safety risks, for example, through the spread of sexually transmitted diseases.</p> <p>The GRM should be established and operated in compliance with the Tajikistan Regulations and AIIB Environmental and Social Policy requirements which requires the borrower/client to establish a mechanism that will receive and facilitate the resolution of affected persons' concerns and grievances about physical and economic displacement and other Project impacts, paying particular attention to vulnerable groups, gender, etc.</p> <p>Potential gender imbalance as single male workers, or those not accompanied by their families, are predominantly engaged in project construction works. This may create issues related to the observance of the law and public</p>		

No	Aspect	AIIB	Tajikistan	Applicability to the Project
		<p>order, and potentially social ills associated with consumption of alcohol and other substances, and a possible demand for commercial sex services;</p> <p>Accentuation of cultural and wealth differences between the host community and foreign workers/non-local migrants, which has the potential to lead to conflict within the community/project area.</p>		
Resettlement Issues				
8	Resettlement Compensation Eligibility	APs with legal rights receive compensation for land and non-land assets/improvements and provided with rehabilitation assistance	APs with legal /registered land use rights are eligible for compensation \ rehabilitation.	Same in principle and application.
		APs with legalizable rights are entitled to compensation for land and non-land assets/improvements and provided with rehabilitation assistance.	APs with legalizable rights receive compensation for the land and non-land assets.	Same in principle and application
		DPs with no legal rights on land that they occupy/use receive compensation for non-land assets/improvements and provided with rehabilitation assistance	Informal land users (without right to use land) are not entitled to any compensation (for land or non-land assets)	Informal land users will be entitled to compensation for non-land assets and improvements and for rehabilitation assistance
9	Livelihood Rehabilitation Standards	AIIB Policy requires improvement in the standards for AP livelihood	No such a provision exists in the national law	APs whose livelihood are affected will be supported to help restore their livelihood. be assisted to improve their standards of living to at least the national minimum standards.
10	Compensation	A. Loss of land Replacement land as the preferred option of the compensation for DPs whose livelihood is land- based. If land is not	Permanent loss of land. Replacement land but also cash compensation.	Replacement land will be sought as first option for whose livelihood is land- based.

No	Aspect	AIIB	Tajikistan	Applicability to the Project
		available, cash compensation at full market cost.		
		B. Loss of structures. Cash compensation for lost structures at full replacement cost irrespective of the legal status of land and free of depreciation, transaction costs and other deductions.	B. Loss of structures. Cash compensation for lost structures at market cost with depreciation or value of salvaged materials sometimes included in the calculation.	B. Structures will be compensated at full replacement cost without deduction of depreciation and value of salvaged materials.
		C. Loss of the business. Actual losses reimbursement plus business restart costs. Application based on tax declaration/similar documents for business stoppage period. Without tax declaration/similar documents, based on maximum non-taxable salary.	C. Business Losses. Compensation in cash at market value for legal businesses but the methodology is not specified. Non-registered businesses are not entitled to compensation.	C. Business losses will be compensated as per AIIB policy and procedures.
		D. Loss of trees. Irrespective of legal land occupancy status compensation at market cost based for application on tree type/ wood volume for wood trees and based on income lost (x tree type x market value of 1-year income x years to grow the tree to a full production.	D. Loss of trees. In general, private trees are not compensated although the wood cut is left to the APs.	D. Fruit bearing trees will be compensated based on the age category and market value of 1 year of income multiplied by the number of years needed to grow a tree of similar productivity. For wood trees, APs are allowed to keep the wood.
		E. Loss of crops. Cash compensation at market price for the gross crop value of an expected harvest.	E. Loss of crops. Cash compensation at market price for all incurred land preparation activities and expected gross crop value.	E. Same in principles and application.
		F. Loss of jobs. Indemnity of lost income so as to ensure AP rehabilitation. Specific arrangements to be agreed with borrowers for permanent impacts.	F. Loss of jobs. Severance pay provided by employer.	F. In case of affected workers, indemnity for lost income to be provided.
11	Procedural Mechanisms	A. Prior notification. Timely notice on land acquisition needed.	A. Prior notification. Written notification prior to withdrawal (acquisition) of land.	A. Same in principle and application.

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No	Aspect	AIIB	Tajikistan	Applicability to the Project
		B. Information disclosure. all relevant documents should be disclosed in a timely manner and in a language accessible to local population.	B. Information disclosure and decisions to be published in national media in Russian and Tajik within 5 days from approval.	B. All documents to be disclosed to the AHs as per AIIB policy and procedure.
		Public consultation. Meaningful public consultations are to be held with the APs. APs should be informed about their entitlements and options, as well as resettlement alternatives.	C. Public consultation. There are no requirements to inform directly the APs about their entitlements and resettlement options as such.	C. Consultations with AHs were conducted.
		GRM should be established for each project and information on GRM should be communication to APs.	D. GRM. No project specific GRM exists. Disagreements are resolved by through Hukumats' grievance mechanism or appeal to court.	D. Two-tier GRM procedure will be established for the project. All stakeholders to be notified.
12	Prior Acquisition	Property can be acquired only after full compensation is paid to the APs	Property can be acquired only after full compensation is paid to the APs	A. Same in principle and application.
13	Resettlement planning, assessment and valuation of project impacts	LARP Preparation: includes compensation entitlements, income / livelihood restoration strategy, monitoring plan, budget and implementation schedule, based on sound impact /valuation surveys as detailed below.	No requirements to prepare LARP or pursue measures to restore the livelihoods of APs to the pre-project level. A series of activities similar to those mandated by the SPS are however required as follows:	A. LARP has to be prepared following AIIB policy and procedures. The LARP has to be based on project impacts, if identified
		Detailed measurement survey (DMS). Measures quantitatively impacts for each affected property.	DMS. Measures all impacts in quantitative terms.	Same in principle and application. Valuation mechanisms need to be updated.
		AP Census (including review of legal status). Identifies all APs and establishes a list of legitimate Beneficiaries.	Census: AP Identification. Identifies all APs by residence or locality and establishes a list of legitimate beneficiaries based on land title and house ownership status.	Same in principle and application. Valuation mechanisms need to be updated.
		Socio-economic survey. Includes information on AP's disaggregated by age, sex, family size, education, occupation, income source.	Socio-economic survey. No comparable requirements exist	Socio-economic survey has been carried out following AIIB policy and procedures.

No	Aspect	AIIB	Tajikistan	Applicability to the Project
		Valuation survey	Valuation survey	Different
		Land: If land market exists based on a survey of recent land transactions. In absence of land market info, based on land productivity and income.	a) Land: Mechanisms for land valuation to be defined.	a) Application and valuation method to be developed and mainstreamed.  However, methodology for land valuation has been developed and being applied following AIIB policies and procedures.
		b) Buildings replacement cost of materials, labor and transport and special features of the building/ structure without discounting for depreciation, salvaged materials and transaction costs.	b) Buildings/structures: Market value materials, labor and transport and special building features but discounted for depreciation, salvage materials, and transaction costs.	b) Different in application. Application of the following the provision of replacement cost principle without discounting depreciation and transaction costs.
		c) Trees/crops. Based on the set methodology.	c) Trees/crops. Based on the set methodology.	c) Same in principle, but different in application. .
14	Special assistance to vulnerable severely affected and relocating APs	A. Vulnerable APs should be identified and special assistance should be provided to them so as to help their restoration or, improvement of pre-project level of livelihoods	A. Vulnerable APs: No special	A. Vulnerable APs should be identified and special assistance should be provided to them so as to help their restoration or, improvement of pre-project level of livelihoods
		consideration is required for vulnerable APs; no distinction is made between APs when		consideration is required for vulnerable APs; no distinction is made between APs when

**Table 8. Comparison of the Tajikistan's and International Air Quality Standards**

Aspect	National Standards / Requirements Standards of Tajikistan <sup>6</sup> ,	World Bank/IFC requirements based on the WHO recommendations <sup>7</sup>  Where a number of national air quality standards are applied. If no national standards are established, then WHO standards are applied	The applicable norms of the project (mg / m <sup>3</sup> /), additional standards are indicated	Justification
<b>Air quality - protection of the population (for receptors)</b>	mg / m <sup>3</sup> : TSP 0.15 NO 0.06 NO <sub>2</sub> 0.04 SO <sub>2</sub> 0.05 CO 3.0 U Ultrafine powder 0.0 Furaldehyde 0.003	WHO standards (µg/m <sup>3</sup> ) HO guidelines, µg/m <sup>3</sup> : PM <sub>2.5</sub> 10 (1 year) PM <sub>2.5</sub> 25 (24 hours) PM <sub>10</sub> 20 (1 year) PM <sub>10</sub> 50 (24 hours) Ozone 100 (8 hours) NO <sub>2</sub> 40 (1 year) NO <sub>2</sub> 200 (1 hour) No 20(24 hours) SO <sub>2</sub> 20 (24 hours) SO <sub>2</sub> 500 (10 minutes) CO (mg/m <sup>3</sup> )- 100 (15minutes) 35(one hour) 10(8 hours) 7 (24 hours)	mg/m <sup>3</sup> : TSP 0.15 PM <sub>2.5</sub> 25 (24 hours) PM <sub>10</sub> 50 (24 hours) NO <sub>2</sub> 0.025 (24 hours) SO <sub>2</sub> 0.02 (24 hours) CO 3.00 NO 0.06  nlimited dust (SiO <sub>2</sub> 70 %) 0.05 tyrene 0.00 Formaldehyde 0.0 Freon (all brands)	Tajikistan Environmental Standards are in line with other international standards <sup>8</sup> However, the WHO's SO standard for 24 hours equals 0.02 mg/m <sup>3</sup> , and WHO 2021 Air Quality Guidelines (AQGs) NO <sub>2</sub> guideline for 24 hours equals 0.025 mg/m <sup>3</sup> . Both are more stringent than Tajik standards and therefore are applied to the project.

<sup>6</sup> Annex 3 to the Environmental Impact Assessment Procedure, adopted by resolution of the Government of the Republic of Tajikistan No. 253 of 3 June 2013.

<sup>7</sup> <https://apps.who.int/iris/bitstream/handle/10665/345334/9789240034433-eng.pdf?s>

<sup>8</sup> The IFC cites the world Health Organization's guidelines for ambient air quality, generally applicable only in jurisdictions where there are no national standards.

**Table 9. Comparison of Tajikistan's and International Water Quality Standards**

Issue	National Standards / Requirements	IFC / World Bank Guidelines / Standards <sup>9</sup>	Accepted standards	Justification
	Tajikistan	IFC recommendations on environmental, safety and health issues		
<b>Discharge of harmful substances to the surface of the water:</b>  <b>Treated wastewater</b>	List of MPC water quality on the surface of water bodies (requirements to water quality of fishery water bodies) <sup>10</sup> TSS 75 pH 6.5-8.5 BOD 30 COD-300 Nitrites 1, (3,3 NO <sub>2</sub> ) Nitrates, 10.2 (45 NO <sub>2</sub> )-130 Fluorides-mg/l Iron (Fe) 0.1 Copper (Cu) 0.001 Chromium (Cr <sup>+6</sup> ) 0.02 Chromium (Cr <sup>3+</sup> ) 0.07 Oil and petrochemicals 0.05	For used domestic wastewater: pH 6-9 BOD 30 COD 125 General nitrogen 10 General phosphorus 2 Oil and fat 10 TSS 50	pH 6.5-8.5 BOD 30 COD 125 General nitrogen 10 General phosphorus 2 TSS 50 Iron (Fe) 0.1 Copper (Cu) 0.001 Chromium (Cr <sup>+6</sup> ) 0.02 Chromium (Cr <sup>3+</sup> ) 0.07 Oil and petrochemicals 0.05	Tajik MAC is the toughest standard supplemented by IFC, where it is needed for specific requirements

<sup>9</sup> <https://www.ifc.org/wps/wcm/connect/3d9a54ae-c44c-488d-9851-afeb368cb9f9/1-3%2BWastewater%2Band%2BAmbient%2BWater%2BQuality.pdf?MOD=AJPERES&CVID=nPtgvO>.

<sup>10</sup> CEP. The Resolution on the rules of protection of the surface and underground water in Tajikistan. Dushanbe 2017.

**Table 10. Comparison of Tajikistan's and International Standards for Waste Management**

Issue	Tajikistan Standards/Requirements	IFC recommendations on environmental, safety and health issues	Accepted Project Standards	Justification
<b>Waste treatment and disposal (Coastal part)</b>	No numeric standards are indicated in the source documents. All generated waste must be treated and disposed of in accordance with national legislation on production and consumption waste.	There is no corresponding numeric standard.	There is no corresponding numeric standard.	All generated waste must be treated and disposed of in accordance with national legislation on production and consumption waste.
<b>Secondary protective embankment (secondary containment) of liquid wastes</b>	No numeric standards are indicated in the source documents. No numerical standards are specified in the Tajik legislation.	A secondary containment (SC) is included where liquid waste is stored in volumes of more than 220 liters. The available volume of the SC must be at least 110% of the largest storage container, or 25% of the total storage capacity (but not less).	There is no corresponding numeric standard.	IFC Environmental, Health and Safety Recommendations A secondary containment (VO) is included where liquid waste is stored in volumes of more than 220 liters. The available volume of the VO must be at least 110% of the largest storage container, or 25% of the total storage capacity (but not less).

**Table 11. Comparison of Tajikistan's and International Standards for Noise Exposure**

Issue	National Standards/Requirements	International Regulations/Standards	Accepted Project Standards	Justification
	Tajikistan	IFC recommendations on environmental, safety and health issues <sup>11</sup>		
Restriction of noise at night time for the protection of human	<p>Noise exposure at night (23: 00-07: 00) should not exceed the following levels (SanPin 2.2.4 / 2.1.8.562-96):</p> <ul style="list-style-type: none"> <li>• In residential and public buildings:                             <ul style="list-style-type: none"> <li>- Hotel and motels, as well as business premises: 25 dB (A);</li> <li>- Living rooms in apartments, houses, dormitories, nursing homes and pensions, sleeping rooms in kindergartens and in boarding schools: 30 dB (A);</li> <li>- Rooms in hotels and hostels: 35 dB (A);</li> </ul> </li> <li>• In residential and other areas:                             <ul style="list-style-type: none"> <li>- Recreation areas, adjacent hospitals and medical centers: 35 dB (A)</li> <li>- Areas directly adjacent to residential buildings, clinics, dispensary, rest homes, homes for the elderly and disabled, kindergartens, schools and other educational institutions, libraries; 45 dB (A);</li> <li>- Areas immediately adjacent to hotel and hostel buildings: 50 dB (A)</li> </ul> </li> </ul>	<p>Noise exposure should not exceed the following levels or result in a maximum increase in background levels of 3 dB at the nearest site of the receptor outside the site:</p> <p>Institution, organization, educational: Night time (22: 00-07: 00): 45 dB (A)</p> <p>Industrial, commercial: Night time (22: 00-07: 00): 70 dB (A)</p>	<p>Tajik standards to be applied at night time is defined as from 22:00 – 07:00 in accordance with the IFC General Guidance</p> <p>Exception 1: The IFC Standard will be valid from 10 pm to 11 pm</p> <p>Exception 2: Territories, adjoining hotels and hostels where the IFC standard is more stringent 45 dB (A)</p>	The most stringent and provide comprehensive measures criteria

<sup>11</sup> <https://www.ifc.org/wps/wcm/connect/4a4db1c5-ee97-43ba-99dd-8b120b22ea32/1-7%2BNoise.pdf?MOD=AJPERES&CVID=nPtgwZY>

Issue	National Standards/Requirements	International Regulations/Standards	Accepted Project Standards	Justification
	Tajikistan	IFC recommendations on environmental, safety and health issues <sup>11</sup>		
Restriction of noise in daytime for the protection of human	<p>Daytime noise exposure (07: 00-23: 00) should not be exceeded in residential and public buildings (SanPin 2.2.4 / 2.1.8.562-96):</p> <ul style="list-style-type: none"> <li>• Inside residential and public buildings:                             <ul style="list-style-type: none"> <li>- wards in hospitals and sanatoriums and operating rooms: 35 dB (A);</li> <li>- Consultation rooms in clinics, clinics, dispensaries, hospitals and sanatoriums 35 dB (A).</li> <li>- Classrooms, teachers' general office, school and other conference rooms of other educational organizations, as well as 40 dB (A) public reading rooms.</li> <li>- Living quarters in apartments, rest houses, boarding houses, homes for the elderly and disabled, sleeping quarters in kindergartens, as well as residential schools: 40 dB (A);                                     <ul style="list-style-type: none"> <li>– Hotel and hostel rooms: 45 dB (A);</li> </ul> </li> <li>- Halls in cafeteria, restaurants, tables: 55 dB (A);</li> <li>- Shops trading halls, passenger halls at airports and train stations, consumer services centers: 60 dB (A);</li> </ul> </li> <li>• Inside residential and other areas:                             <ul style="list-style-type: none"> <li>- Recreation areas, directly adjacent hospital buildings and health centers: 45 dB (A)</li> <li>- Territories directly adjacent residential buildings, clinics, dispensary, rest homes, homes for the</li> </ul> </li> </ul>	<p>Noise exposure should not exceed the following levels or result in a maximum increase in background levels of 3 dB at the nearest receptor site outside the site:</p> <p>Institution, organization, educational: Daytime (07: 00-22: 00): 55 dB(A) Industrial, commercial: Night time (22:00-07: 00): 70 dB(a).</p>	Tajik standards to be applied at day time is defined as from 07:00 – 22:00 in accordance with the IFC General Guidance	The most stringent and provide comprehensive measures criteria

Issue	National Standards/Requirements	International Regulations/Standards	Accepted Project Standards	Justification
	Tajikistan	IFC recommendations on environmental, safety and health issues <sup>11</sup>		
	elderly and disabled, kindergartens, schools and other educational institutions, libraries: 55 dB (A); - Territories directly adjacent hotels and hostels: 60 dB (A); - Recreation areas on the territory of hospitals and sanatoriums 35 dB (A); - Recreation areas in the neighborhoods and residential areas, holiday homes, homes for the elderly and disabled, children's playgrounds in kindergartens, schools and other educational institutions: 45 dB (A).			

### 3. PROJECT DESCRIPTION

171 This Chapter provides a simplified description of the proposed project, its components and the key activities to be undertaken during its implementation.

#### 3.1. Obigarm- Nurobod Project Packages

172 The Obigarm- Nurobod Road project is divided into three packages:

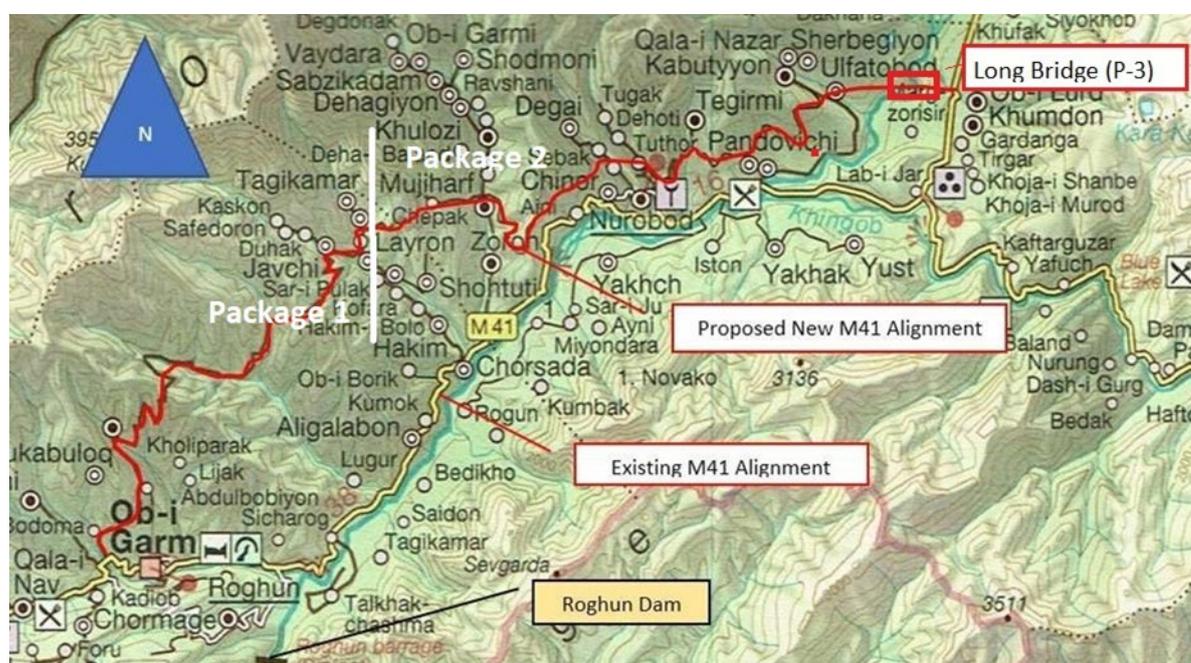
(i) Package 1: the Obigarm - Tagikamar road section is about 30km long. It includes two tunnels of 1.6 km and approximately 30km in length;

(ii) Package 2: the Tagikamar-Nurobod road section is about 44km long. It includes 1 tunnel of 2.6 km in length, six new bridges construction, one bridge rehabilitation, in addition to one long temporary bridge, and 40km long local access roads;

(iii) **Package 3 (the proposed project) includes a permanent bridge that is approximately 920 m long, and its approaches.**

173 The proposed project as Package 3 of the broader road corridor represents a pre-stressed Concrete Box Girder Bridge in length of about 920m and approaches roads from the sides in total length of about 480m. The bridge supports are supposed to be built on pile foundations. The bridge alignment will generally follow the same alignment that was studied and selected during the Soviet period.

174 The bridge will be built across the Surkhob river to connect the end of the Package 2 road section with the village of Darband, the center of the Nurobod district, which in the future will be located on the bank of the Rogun HPP reservoir. See **Figure 4** for the location of the three packages including Package 3 (the proposed project).



**Figure 4. Location of the proposed Long Bridge within the Project Activities**

#### 3.2. Project Components

175 **Scope.** The scope of the proposed project envisages the bridge construction including foundation, sub-structures, super-structures, road, environment, and ancillary works. The Project will also finance the construction of road approaches of about 600 meters from two sides of the bridge. Construction Supervision Consultant will be hired to supervise and administer the civil works contract (CWC). The Project will also finance Project Implementation Capacity Strengthening. A separate component will support women economic empowerment in the area

of the bridge construction.

176 **Component 1: Construction of the Long Bridge and Its Approaches.** This is the major component of the Project which includes the following sub-components:

177 *Sub-component 1a: Civil works for construction of long bridge and its road approaches.* It includes financing a Design, Build and Maintenance works contract for the bridge. According to the Bridge Options and Feasibility Study and the State Expertise Conclusion, the price estimation for the direct construction cost for this sub-component is USD56.92 million. This sub-component includes the works for auxiliary and landscape construction in the adjacent area to the bridge, as well as provisions for independent design review checker, insurance coverage during the construction; and contingencies for inflation and unforeseeable circumstances;

178 *Sub-component 1b: Construction supervision consultancy for the works contract.* This sub-component will finance the role of Engineer according to the FIDIC Yellow Book 2017 (2nd Edition), to supervise and administer the civil works contract, as well as monitor the contract's compliance to environmental, social, health and safety requirements.

179 **Component 2: Project Implementation Capacity Strengthening.** This component aims to enhance the capacity of the Project Implementation Unit for Roads Rehabilitation by furnishing it with necessary resources to timely deliver this complex Project in quality. Under the component, the following activities are proposed to be included:

180 *Sub-component 2a: Project implementation support,* which will be achieved through hiring experienced individual consultants with expertise in procurement & contract management, bridge engineering, project management, financial management, and environmental and social (E&S).

181 *Sub-component 2b: incremental operational expenses.* This sub-component is to cover the operational expenses related to project implementation.

182 **Component 3: Economic Empowerment for Women.** This component will (i) conduct the scoping study and skills needs assessment to identify potential business and livelihood opportunities for women living in the project-affected area of Section 3; (ii) develop women's entrepreneurship program, based on the skills needs assessment, and included possible list of participants and selection criteria; (iii) work together with ADB and with the National Committee of Women and Family Affairs, and local authorities on allocation of grants to support women entrepreneurs.

### 3.3. Implementation Arrangements

183 The Ministry of Transport will be the Executing Agency and its Project Implementation Unit for Roads Rehabilitation will be the Project Implementing Entity. PIURR will manage the project implementation from its inception to completion. The PIURR will be responsible for communication between AIIB, Government, and other relevant parties. The PIURR will also be responsible for coordinating the day-to-day project implementation activities through the dedicated PMT, supported by individual consultants.

184 PIURR has extensive experience in managing and delivering internationally financed projects. This includes projects funded by the ADB and EBRD, as well as successful implementation of AIIB co-financed project P000002: Dushanbe-Uzbekistan Border Road Improvement and S000609 PPSF Obigarm-Nurobod Road Grant Project. In addition to the dedicated Project Management Team (PMT) listed above, the PIURR maintains a separate Procurement Department, with experience in the procurement and contracting of major internationally financed works and services contracts.

185 However, PIURR is concurrently managing several projects with its existing human resources, leading to efficiency limitations during project implementation. To expedite the implementation of this technically complex bridge project and improve work quality, a dedicated full-time PMT will be hired. This PMT will consist of a blend of international high-caliber experts and skilled national professionals. The PMT team will be fully engaged and report directly to the Executive Director of PIURR.

### 3.4. Project Location

186 The project area is located at the edge of Nurobod District, in the center of Republican Subordination province (RRS) of the Republic of Tajikistan. See **Figure 5** for a Google Earth map of the bridge and its surroundings.

187 The Republic of Tajikistan is a land-locked mountainous country in Central Asia with an estimated 9.5 million inhabitants and an area of 141,400 km<sup>2</sup>. Administratively the country is subdivided into four regions which are (1) the province of Sughd, (2) the Region of Republican Subordination (RRS), (3) the province of Khatlon and (4) the autonomous province of Gorno-Badakhshan (GBO).



**Figure 5. The Location of Bridge on the Google Earth map**

188 The bridge area is located at the junction of the valleys of Surkhob (Vakhsh) and Obihingou Rivers and the adjoining valley of Sorbog River from the north, a major tributary of Surkhob River.

### 3.5. Project Design

189 Design works (i.e. feasibility study, engineering design and work design documents) for the Long bridge and its approaches take origin from 1975, within the framework of the "Taking the roads out from the Rogun HPP reservoir flooded zone".

190 The bridge design standards are based on the internationally accepted American Association of State Highway and Transportation Officials (AASHTO) LRFD 6 to 8th edition to 2017. However, in order to maintain the consistency of the live load of the national backbone road, the live load from GOST 33390-2015 will be cross-checked in conservative manner.

191 The Bridge will be designed for a design life of 100 years. Transient loads (i.e., earthquake, wind, fatigue, durability) calibrated for 75 years' service life at AASHTO will be recalculated by considering a return period for 100 years' service life.

### 3.6. Bridge Features

192 The design parameters for the bridge are based on the preliminary design analysis of the technical, financial and socio-economics factors for various alternatives and relate to the

selected Bridge Alternative.

193 The proposed 920 m Bridge will consist of two side spans of 85m in length and 5 main spans of 150m in length each supported by six piers. It will be a pre-stressed concrete (PCC) box girder structure designed as a beautiful aesthetic bridge in harmony with nature. The bridge will be inclined at 1%, from north down to the south. Considering the ground conditions, the piers and abutments foundations have been designed as bored piles. **Table 12** presents the key bridge parameters and **Figure 6** presents the drawings of the key bridge features.

**Table 12. Design Parameters for Project Bridge and Approaches**

Parameter	Unit	Definition
Type		Pre-stressed Concrete Box Girder Bridge
Construction Method		Free Cantilever Method (FCM)
Length	m	920
Total Number of Piers	no	6 plus 2 abutment piers
Average height of piers	m	67
Span Length	m	$85 + 5 \times 150 + 85 = 920$
Number of slabs	no	6
Width of the bridge	m	15.5 (Two lanes)

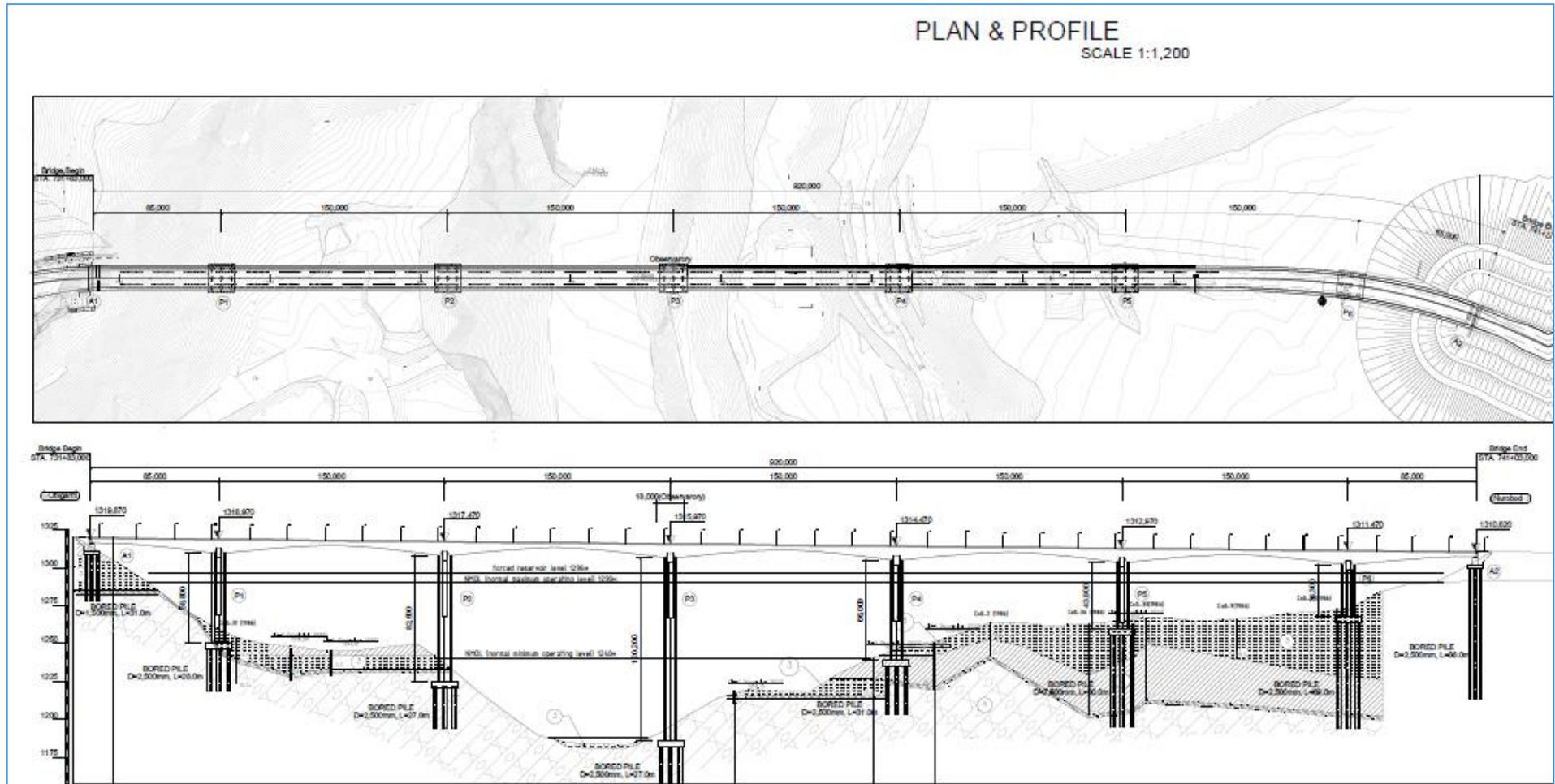
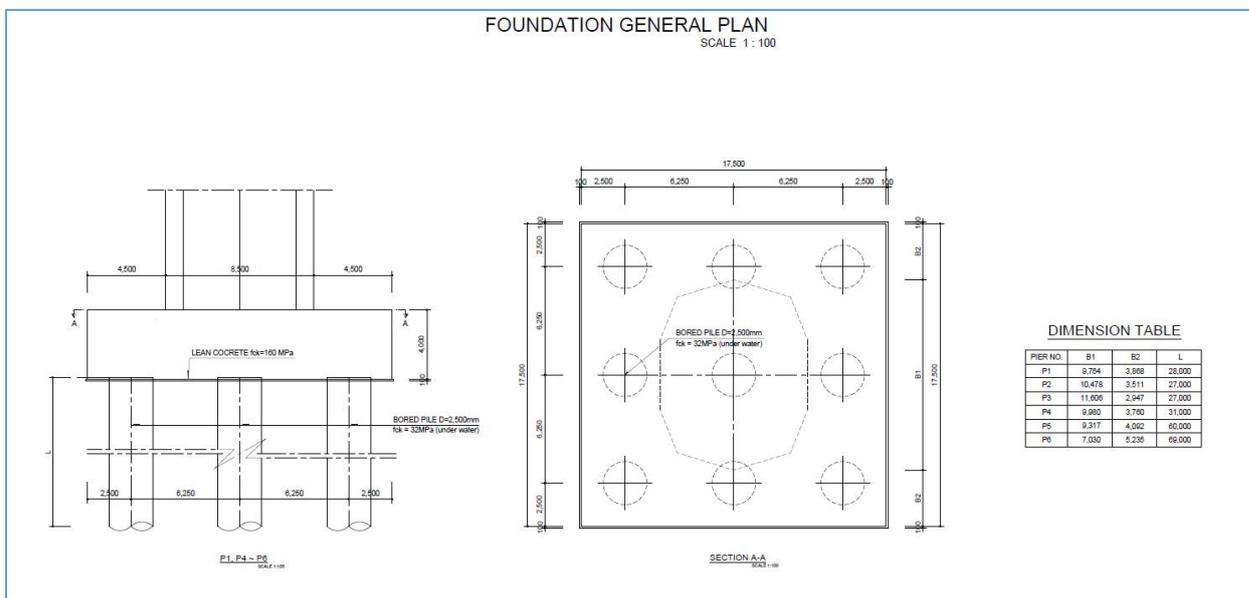


Figure 6. Plan and Profile drawings of the proposed Bridge

### 3.7. Foundations

194 Considering the ground conditions, foundations for the piers and abutments have been designed as bored piles. The square foundations with 17m length of side will be based on 9 piles with the depth of insertion calculated according to the results of additional ground investigation. See **Figure 7** for a typical foundation design.



**Figure 7. Drawing of the Foundation**

### 3.8. Piling

195 The foundations will be based on bored cast-in-situ piles in diameters of 2.5 and 1.5m. The piling comprises boring and construction of bored cast-in-place piles for the foundation of the bridge. Temporary steel casing pipe of required diameter shall be used at least for the upper 6m from the ground level during drilling to stabilize the hole. The casing pipe will be fabricated to the specified size and shape from mild steel.

### 3.9. Piers

196 The cross-section of the pier has been designed as polygonal with a constant width of 8.5m in the vertical direction. The upper 40m of the pier will be made of twin shafts to ensure ductility against earthquakes, and the lower part of the pier has been designed as a solid section. To increase consistency between the twin shafts and the lower part of the pier, the pier cross section has been designed in the form of a tuning fork

### 3.10. Superstructure Construction

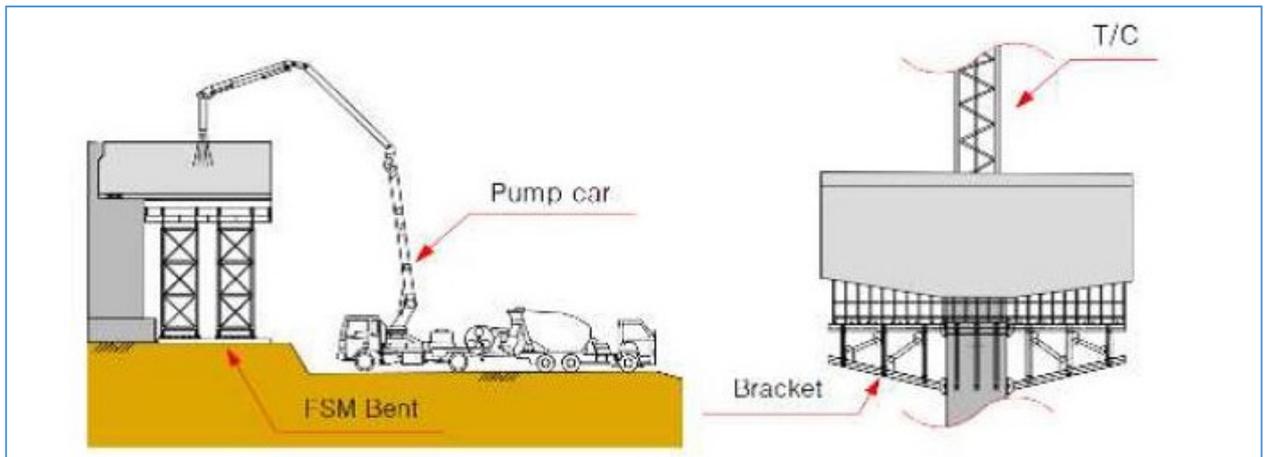
197 Superstructure construction consists of assembling formwork for the pier shaft, pier head segments, casting in situ head segments and then proceeding with-casting of cantilevered segments using travelling form and finally casting in situ stitch (closure concrete).

### 3.11. Construction of Girders

198 The girder of the long bridge has been designed as a 1-cell box girder with an open-type web and a 1:0.153 slope, and the lateral slope of the curved part is 4%.

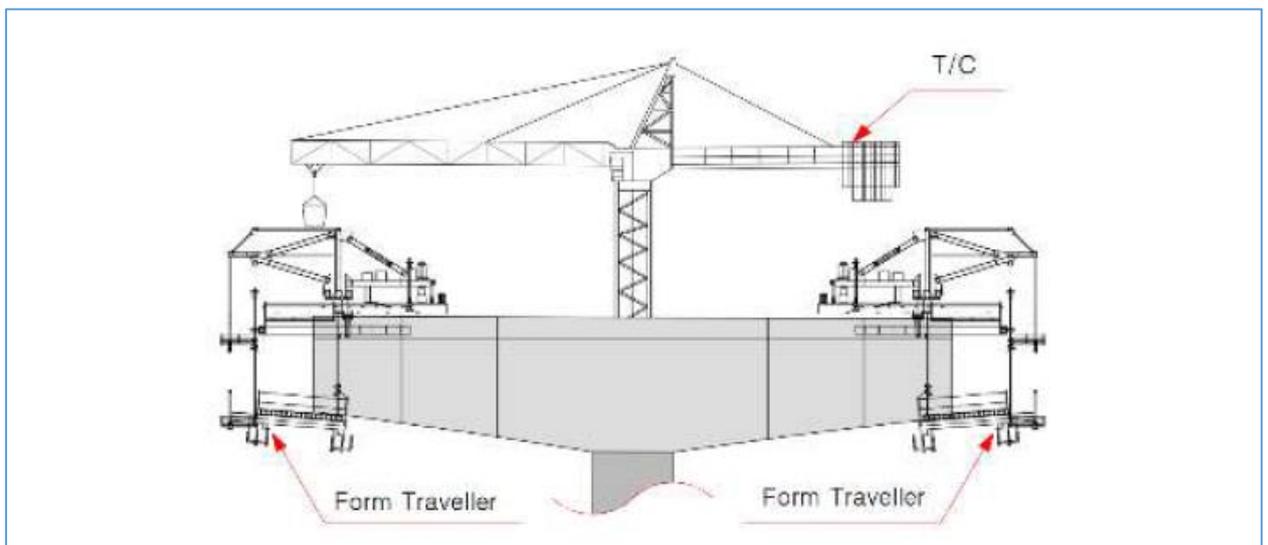
199 The girder will be constructed by applying the FCM (Free Cantilever Method), and the side span is constructed by the FSM (Full Staging Method) with a bent installed, and then closed with a key segment. FCM method for construction of superstructure bridge span which is based on a system of balanced cantilever erection about piers using form traveler to cast in-situ

segments of varying depth. See **Figure 8** for a typical construction methodology.



**Figure 8. Construction Steps for side span and pier table of the Box Girder Bridge**

200 The girder will be constructed using the Form Traveler and closure with key segment; see **Figure 9**.



**Figure 9. Girder Construction by the Form Traveler**

201 The girder of the long bridge has been designed as a 1-cell box girder with an open-type web and a 1:0.153 slope. The lateral slope of the normal part is 2% from the center to both ends, and the lateral slope of the curved part is 4%.

### 3.12. Bridge Deck

202 The bridge deck will consist of 2-lane roadways 3.75m wide each, and the 2m wide sidewalk on both sides. There is a pedestrian railing and drain spout at the end of the cantilever, and a concrete traffic barrier between the sidewalk and the roadway. The drain spouts will be installed from both sides of the bridge at approximately 3m intervals and will be equipped with the initial treatment system including replaceable filters to prevent direct release of the drain water, which could be contaminated due to traffic and possible accidents, to water. The thickness of the pavement will be 60mm. See **Figure 10** for the general cross section of the bridge deck.



Parameter	Meas. unit	Value	
Minimum seeing distance			
- for stoppage	m	75	85
- for oncoming vehicle		130	170
Cross fall	‰	20	
Super elevation	‰	40	
Earthwork (approximately):			
- excavation (cut)	m <sup>3</sup>	253 920	255 800
- embankment (fill)		513 950	515 300
Type of pavement		Permanent (Capital)	
Asphalt concrete pavement area	m <sup>2</sup>	8 179	8 227
Sidewalk area	m <sup>2</sup>	457	
Curbstone			
- БР100.60.20	m	340	
- БР100.20.08		340	
Barrier guardrails	m	115	
Breast railing	m	340	
Road signs (estimated)	pcs	8	
Road marking			
- horizontal, B-0,10	m	2910	
- vertical	m/m <sup>2</sup>	-	

205 Drainage of surface water will be through open ditches by discharge of water to the existing terrain. The construction of minor draining facilities or culverts on the approaches is not needed.

206 Structure of the road pavement is composed of:

- **Surface course:** Stone-mastic asphalt-concrete SMA-15 as per GOST 31015-2002, thickness 4 cm;
- **Binder course:** Dense hot laid asphalt-concrete of II class composed of macadam (gravel) mixture of type B, as per GOST 9128-2009, and bitumen of class BND/BN-60/90, thickness 5 cm;
- **Base:** Porous hot laid asphalt-concrete of II class composed of coarse-grained macadam (gravel) mixture, as per GOST 9128 – 2009, and bitumen of class BND/BN-60/90, thickness 6 cm;
- **Sub-base:** Macadam mixtures, thickness 15 cm;
- **Roadbed:** Macadam mixtures of continuous grading C3 – 120 mm (for bases) as per GOST 25607-2009, thickness 20 cm;
- **Strengthening of shoulders:** Macadam sandy gravel mixtures with average. thickness 15 cm.
- **Structure for sidewalks:** Pavement of dense hot laid asphalt-concrete composed of macadam (gravel) mixture and bitumen in thickness 6 cm;

### 3.14. Construction Activities

207 During the construction phase the following activities will be undertaken:

208 Site Clearing Works - The Works include the following site clearing works within or adjacent to the Road Project, in accordance with the drawings or instructions of the Engineer:

- **Clearing and grubbing.** Clearing is defined as removing and disposing of all unwanted surface material, such as trees, brush, grass, weeds, downed trees, and other materials. Grubbing is defined as removing and disposing of all unwanted vegetative matter from underground, such as stumps, roots, buried logs, and other debris.
- Removal of any other natural or artificial objects within the RoW.
- Removal and disposal of all vegetation and debris within the designated limits. All surface objects, including trees, logs, roots of downed trees, brush, residue grass, weeds, concrete, masonry, and other unwanted material, such as. lumber, trash, and loose debris shall be removed before the start of the construction.

209 Bridge Construction includes three main steps:

- **Step 1:** Piling and construction of foundations for bridge piers; Piling is defined as foundations that are driven or bored through the ground along a certain length of area to carry and transfer loads to soil considered to be weak in structure due to the soil conditions. Cast-in-situ foundations use concrete piles. Holes will be drilled into the ground, steel reinforcements will be placed inside and then the hole will be filled with concrete. This allows them to tailor the depth of the foundation as per the project's needs and use piles with a smaller diameter than the ones used for driven pile foundations.
- Construction of abatement and piers; Standard metal formwork will be used for walls, and a climbing system and crane will be used to continue concreting at height.
- **Step 2:** Construction of FCM (Piers 4,5, 6); involves the developing of bridge structure by individual parts, the so-called segments. Segments are concreted into formwork fixed to a special movable steel structure – form traveler.
- Construction of FCM (Abatement 1);
- Construction of Pier Table (Piers 1,2,3);
- **Step 3:** Construction of Key Segments Spans (Span 5,6,7); The same as for Step 2 Segments are concreted into formwork fixed to a special movable steel structure – form traveler.
- Construction of FCM (Pier 1,2,3);
- Construction of FSM (Abatement 1); The pre-cast full span method of construction (commonly known as FSM) is one of the fastest techniques used in construction of bridges and viaducts. The FSM involves casting the whole bridge span in the casting yard and transporting the whole span with a specially designed multi-axle Tyre Trolley to the bridge site. At the bridge site, an FSM purpose-built Launcher will be used to lift and place the whole span in the final position.
- Construction of Key Segment Spans (Span 1,2,3);
- Deck pavement including barriers hydro isolation, drainage, hand railing, and conduits for services.
- Approach slabs.
- Slope treatments in front and around the abutments.
- All necessary and incidental items required for a complete bridge.

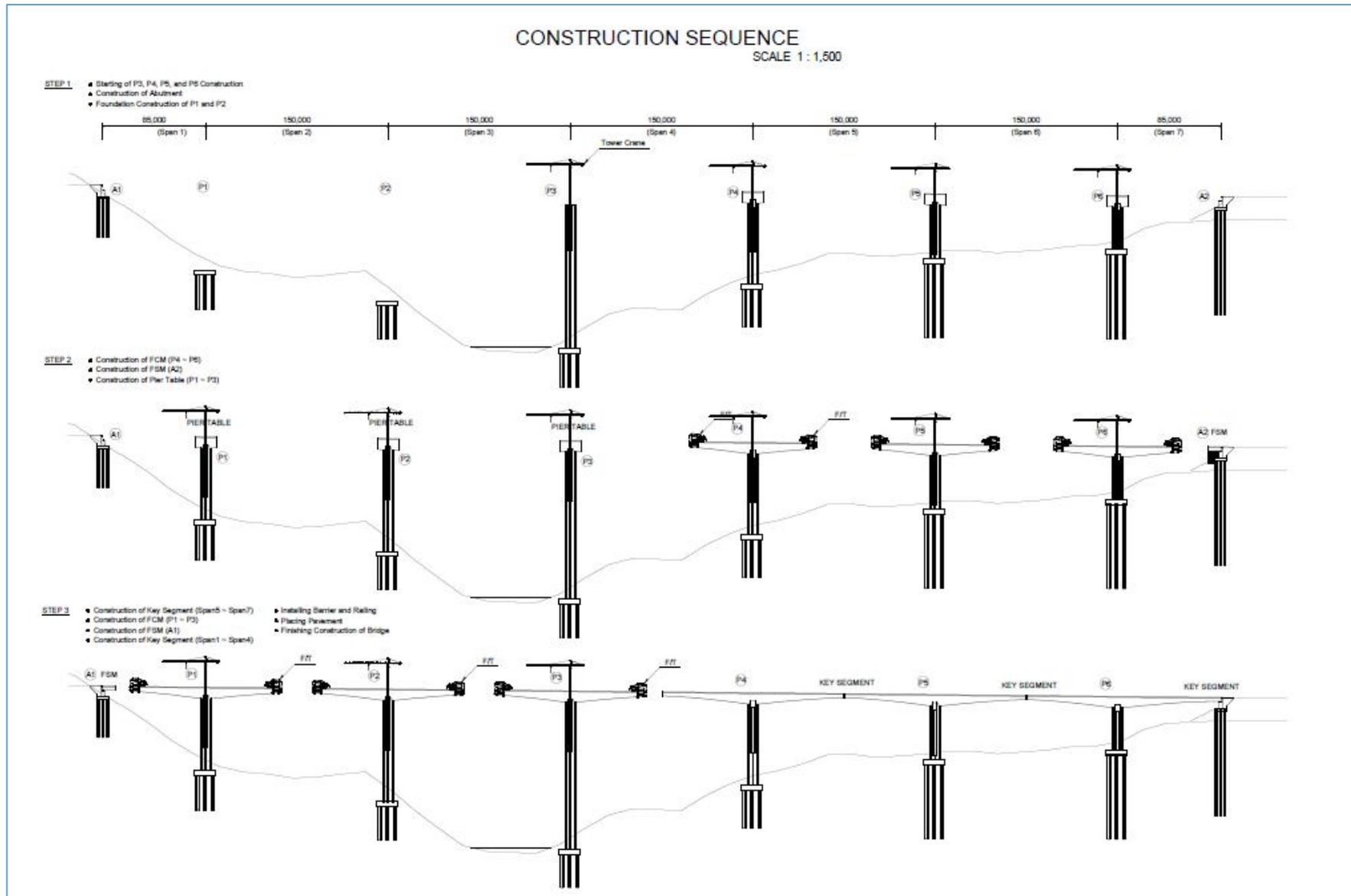
210 The following types of earthworks necessary for the construction of the Bridge, Approaches to the Bridge and all associated works:

- Removal of topsoil

- Construction of subgrade
- Removal and replacement of unsuitable materials, if any
- Structural excavation
- All backfilling necessary for the construction of bridge, retaining walls or other earth retaining structures and associated works, side drains and erosion protection work.
- Excavation, filling or backfilling necessary for the execution of any other incidental works.

211 **Figure 11** shows the planned bridge construction sequence.

212 The bridge construction sequence is significantly influenced by the schedule of the Rogun HPP impoundment. It is planned that all construction activities will be performed within the dry land environment and no construction of coffer dams for the diverting of water will be needed. The water will reach locations the piers closest to the river after the year 2027, while the impoundment of other piers locations is scheduled to start no earlier than 2030 (**Figure 12**). Therefore, the construction activities will start with the pier foundations nearest to the river. In case of significant delays, the construction methodology shall be re-designed.



**Figure 11. Sequence of the construction of the bridge**

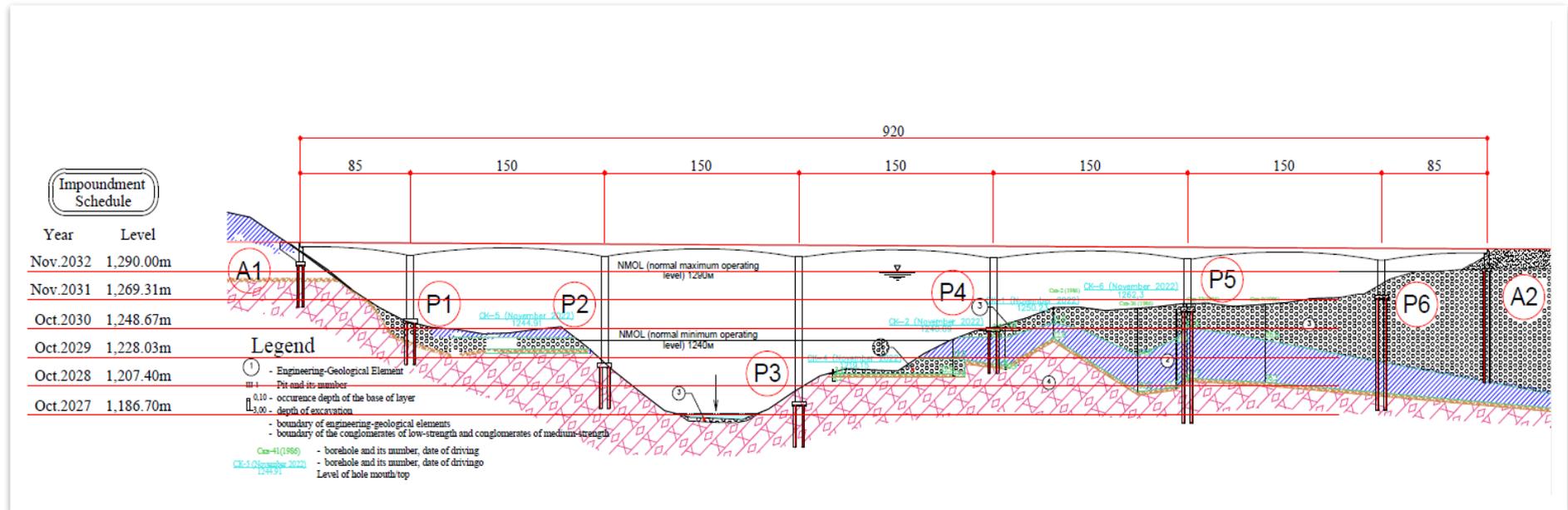


Figure 12. Scheduled levels of the impoundment against the height of the proposed bridge

### **3.15. Key Construction Equipment**

213 The construction of the bridge will require extensive application of various advanced machinery and equipment. The types and parameters of the equipment will be determined by the Contractor and subject to approval by the CSC and PIURR. Indicatively, the project implementation will require the following equipment:

- Aerial Lifts
- Air Compressor
- Backhoes
- Concrete and Asphalt Mixer Trucks
- Bulldozer with blade and ripper
- Climbing Form
- Dump Trucks
- Excavators
- Form Traveler
- Motor Grader
- Pumps
- Power generators
- Reverse Circulation Drilling Excavator
- Rollers
- Tower Crane
- Vertical Masts and Hydro platforms
- Welding machines
- Wheeled Loaders.

#### **Concrete Batching plant**

214 Due to the significant amount of high-quality concrete needed for the construction of the bridge, the installation of concrete batching of sufficient capacity will be required for the project implementation. A concrete batching plant is an equipment that combines various ingredients to form concrete. These inputs include water, air, admixtures, sand, aggregate (rocks, gravel, etc.), fly ash, silica fume, slag, and cement.

#### **Stone Crushing Plant**

215 The manufacturing of the concrete and construction of the road layers will require a significant quantity of rocky material of the determined size range and properties. To produce these aggregates from the excavated rocky material the crushing plant will be installed. Crushing plants may be either fixed or mobile. A crushing plant has different stations (primary, secondary, tertiary) where different crushing, selection, and transport cycles are done in order to obtain different stone sizes or the required granulometry.

### **3.16. Construction Manpower**

216 Construction work will require the involvement of over 300 staff including 20% of engineers and foremen, about 50% of high-skilled workers, and about 30% of low-skilled or unskilled workers. Priority will be given to the employment of the local people provided that the required qualification is available.

### 3.17. Construction Camps

217 Project implementation will require the establishment of a temporary construction camp. The camp location and layout will be identified by the contractor and local government subject to the CSC and PIURR approval. However, the selection should consider (i) the availability of sufficient areas for workers' accommodations, parking areas for machinery, and stores and workshops, (ii) access to communication and local markets, and (iii) an appropriate distance from the residential areas and other sensitive locations.

218 The area requirement for construction camps will depend upon the workforce deployed and the type and quantity of machinery mobilized. For example, the camp may include rock crushing plant and concrete batching facilities. In view of the area required, it will not be possible to locate camp sites within the RoW. The contractors will have to temporarily acquire land on lease from landowners. The construction camp will also have facilities for site offices, workshop and storage yard, and other related facilities including fuel storage.

219 The camp should have an autonomous water supply, sanitation with the use of septic tanks, and food and recreation facilities. Direct draining of wastewater into surface waters is prohibited. All wastewater from the latrines, kitchens, and bathrooms will be collected to the septic tanks installed in the locations approved by PIURR, the CSC, and local sanitary authorities. The sides and bottom of the septic tank will be lined with concrete to prevent the contamination of the aquifer. After the filling to the designed level, the content of the septic tanks will be pumped to the vacuum truck through the opening in the side wall equipped with the removable lid. Afterward, the content will be transported for disposal at the site agreed with the local environmental and sanitary authorities. The entire construction camp should be surrounded by a fence and have restricted access to ensure security. Currently, locations for labor camps, workshops, and borrow pits are not determined. However, it is anticipated that the unpopulated abandoned areas around the bridge site will be utilized for these purposes.

### 3.18. Resources required for the Project

220 A range of resources will be required for the construction of the bridge and approach roads. The extraction, processing and transport of these resources to the site can have impacts on the project area and can affect its regional availability depending on the scarcity of the resource.

221 **Rock and aggregates.** The project will require an estimated total amount of 29,000m<sup>3</sup> of aggregates. Rock and aggregates of sufficient quality are locally available. The exact location of borrow pits and quarries for production of gravel materials will be determined at the Detailed Design stage. The operating quarries for production of gravel material for the currently implemented Section 2 of the road corridor can be utilized for the project. Finer aggregates such as sand are not readily available and will need to be manufactured and crushed from coarse aggregates or transported from significant distances. While there is no shortage of suitable rock, the gaining and processing of the rock to design standards may incur potentially significant noise, dust, and water pollution impacts, that may require management.

222 **Cement and steel bars and bridge parts.** The estimated total amount of concrete needed for the project implementation is about 46,018m<sup>3</sup> which will require significant quantities of cement and steel bars. Cement will be transported to the site in bulk by heavy vehicles. Therefore, impacts would mostly be associated with transportation. Steel and bridge parts and other components will also be imported to the site from outside the region.

223 **Water.** Project implementation will require significant quantities of water. The main water uses include:

- Manufacturing of concrete;
- Curing of concrete;
- Compaction of the road layers;
- Suppression of the dust;
- Sanitary and hygiene;

- Drinking and cooking food.

224 It is expected that the Contractor will obtain water supplies from the river of Surkhob and tributaries. It is considered unlikely that rates of uptake will affect the flow rates of the rivers. However, the contractor should take care not to gain water from its tributaries or rivers with low flows. If feasible, by the agreement with relevant authorities, upon the obtaining of CSC and PIURR approval the contractor will drill a well for the water supply of the camp and other project needs. The contractor will need in particular to ensure that no adverse impacts are imposed on village water supplies or other water users. Potable water for cooking food and drinking will be purchased at the local market.

### **3.19. Storage Areas**

225 Temporary storage areas will be required for certain activities, such as the storage of cement, sand, gravel, and construction equipment. The storage areas may range from spots of about 100m<sup>2</sup> to more than 1 hectare. The locations for the storage areas will be selected by the Contractor subject to the CSC review and approval.

## 4. ANALYSIS OF ALTERNATIVES

226 This Chapter reviews all design alternatives that are identified by the FS Consultant with particular focus on the environmental and social aspects. Analysis of alternatives including the «without project» alternative is a required element of the environmental impact assessment for the projects funded by AIIB. During the project FS preparation, the various alternatives for bridge length, types, and alternatives for the type of bridge foundation were considered and evaluated.

227 The evaluation of alternatives in terms of environmental and social implications has been coordinated with the Design Consultants during the ESIA process. The environmental and social considerations of different alternatives are incorporated into the decision-making of the design.

### 4.1 Without Project Alternative

228 The Without Project Alternative is defined as the decision not to be undertaken for construction of the proposed bridge.

229 The rationale of the entire project is that a long bridge is part of the larger 75 km Road project, as described in **Section 1.1**, designed to replace the existing road section of M41 which will be submerged due construction of the Rogun HPP reservoir. The M41, known informally as the Pamir Highway is a road traversing the Pamir Mountains and connecting China, Afghanistan, Tajikistan, and Kyrgyzstan. For around two millennia, no other main supply route has been set up to connect Gorno-Badakhshan Autonomous Region (GBAO) with other region of Tajikistan due to the hazards that the difficult terrain of the mountains pose.

230 Only at the beginning of 21<sup>st</sup> century, the alternative road connecting the capital of Tajikistan with GBAO through the Khatlon Region was built, however, the significance of the M41 remains very high both for the local communities and ensuring International Connectivity through CAREC. The bypass road is currently under construction and this expensive project has little sense in the case that the long bridge is not constructed.

231 After the existing section of the M41 Highway will be submerged due to the filling up of the reservoir of Rogun HPP, a region with a population of over 80,000 can lose convenient connectivity to other areas of the country and within the region if a long bridge across Surkhob river is not constructed. Similarly, the international communication within this part of the CAREC corridor will be terminated which may lead to unprecedented social and economic consequences and adversely affect the country's further development, in case the bridge is not constructed.

232 For this project, the discussion of without project alternatives is of limited relevance, therefore the without project alternative is absolutely unacceptable under the existing situation.

### 4.2 Location and Bridge Alignment Alternatives

233 The proposed Bridge location follows the bridge alignment proposed during the Soviet period. It is the only feasible location to connect the Rogun bypass road with the Nurobod village due to the complex topography (mountainous) and geological conditions of the area. There are fixed tie-in points with Section 2 at either end.

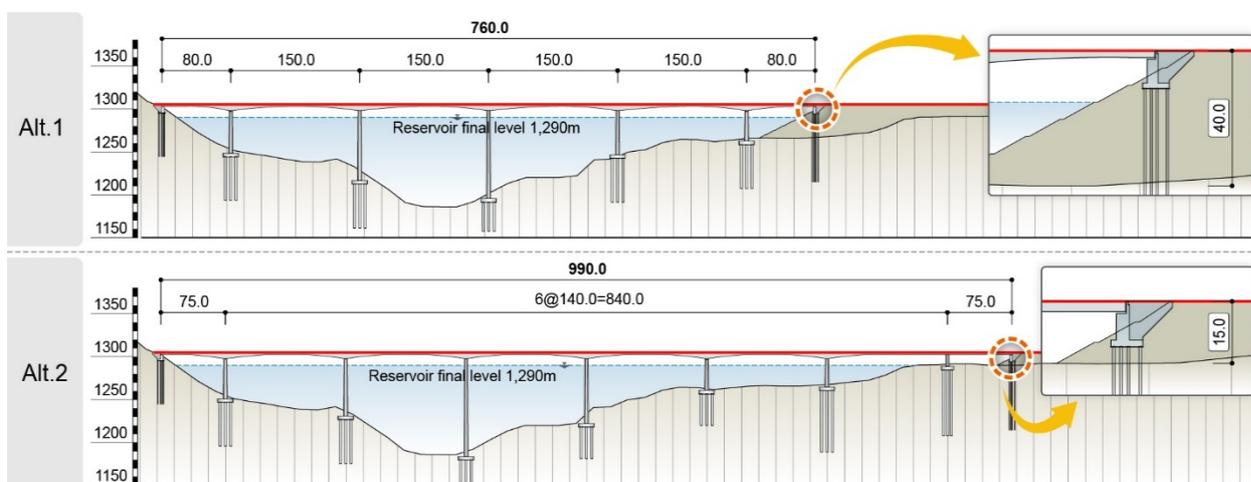
234 Therefore, the other alternatives for the location of the bridge which is a part of the Obigarm- Nurobod road are not considered.

### 4.3 Bridge Length Alternatives

235 Bridge Length Alternatives are shown in **Figure 13** and include:

(1) the 760m long bridge with abutment installed on a steep slope from right side, and the abutment installed on the 40 m high embankment secured by slope protection in the middle of reservoir on left bank; and

(2) the 920m long bridge with the left bank laid on the 15m high embankment. It will have better openness, and although it will increase construction cost, FS Consultant has provided more detailed economic and technical feasibility considerations for this option.



**Figure 13. The images of the different bridge alternatives (Source: Inception Reception of DMEC)**

236 The proposed bridge length alternatives for the project have different ending points which means that with the increase of the length of the bridge, the length of the approaches within the project will be reduced respectively. Therefore, the project AOI for both options and the consequent environmental and social impacts of the two length alternatives are not noticeably different.

237 The Construction of bridge length alternative 1 can utilize the old embankment left from the Soviet time and will require additional bank enforcement, meaning more interference to the water environment of the river.

238 The Alternative 2 increases the number of piers but reduces the volume of the embankment. The Alternative 2 embankment is designed to be located outside the water; therefore, the bridge construction will cause less disturbance to the water environment including both hydrological and possible biological aspects.

239 However, a 920m bridge length alternative can lead to the significant difference in cost. In accordance with the preliminary FS estimate, the application of bridge length Alternative 2 will increase the cost of the bridge by 30%.

240 Based upon better technical considerations, the Alternative 2 has been selected. The further assessment of the bridge type alternatives is based on this Alternative. .

## 4.4 Bridge Type Alternatives

241 Three alternatives for the type of bridge based on the allocated budget, availability of materials, scheduled construction period, the surrounding landscape and environment, possibility for water transportation and water tourism, and construction, and maintenance conditions have been recommended.

### 4.4.1 Alternative 1: Pre-stressed Concrete (PSC) box girder bridge

242 PSC box girder bridge, is a bridge in which the main beams comprise girders in the shape of a hollow box (see **Figure 14**). The box girder normally comprises pre-stressed concrete, structural steel, or a composite of steel and reinforced concrete. The box is typically rectangular or trapezoidal in cross-section. The construction cost for superstructure is lowest among the alternative but the cost for substructure will be increased due to the heavy weight of the superstructure. The construction period will be longer if we shall recycle the form traveler. The large number of piers is and the constructability of the pier can be poor due to the pier height.



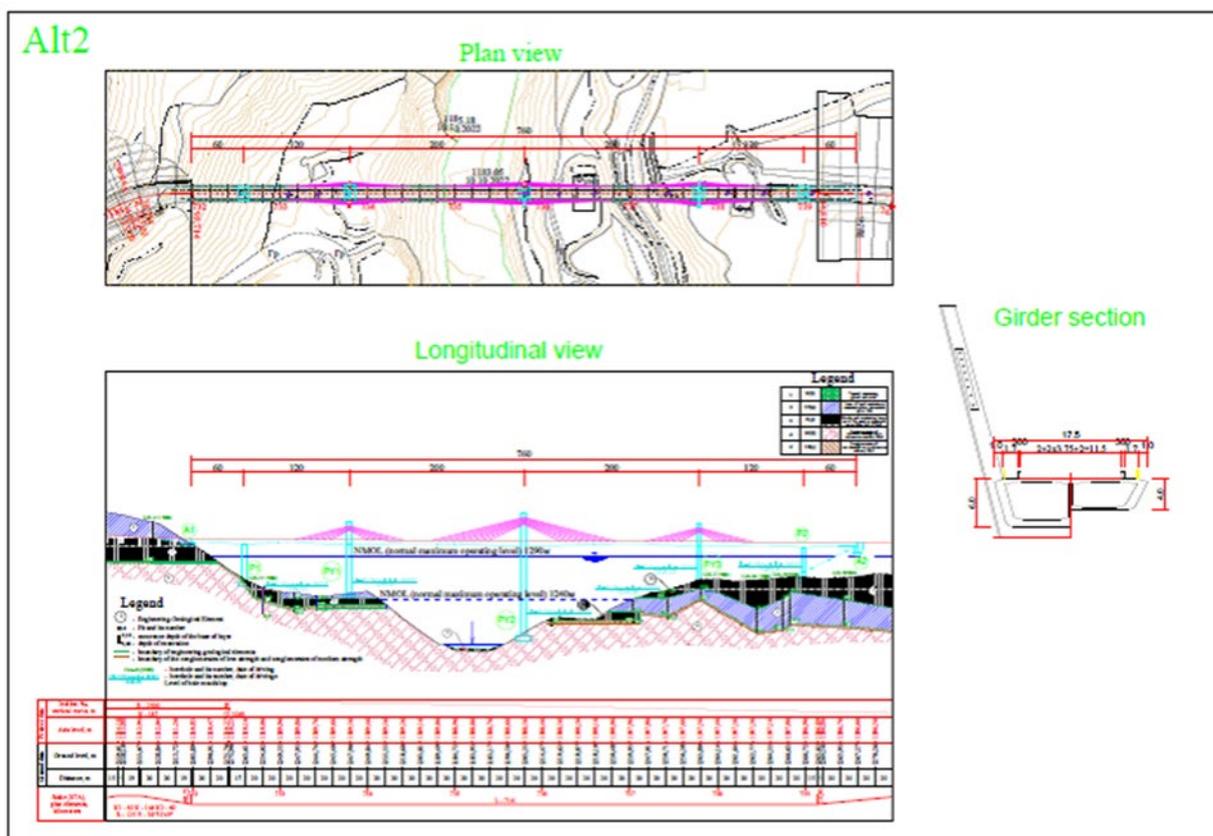


Figure 15. The drawings and sketch for extradosed bridge alternative

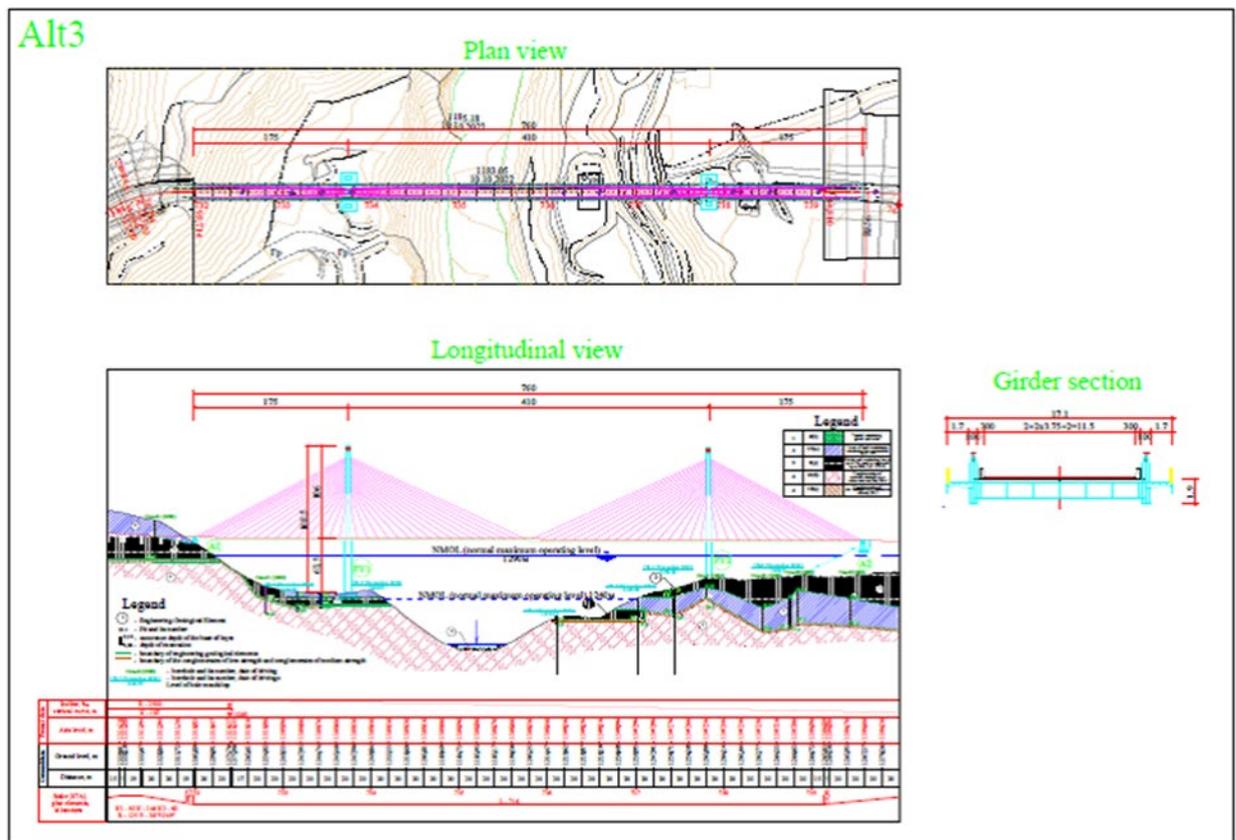
#### 4.4.3 Alternative 3: Cable-Stayed Bridge

246 A cable-stayed bridge has one or more towers (or pylons), from which cables support the bridge deck (see **Figure 16**). A distinctive feature are the cables or stays, which run directly from the tower to the deck, normally forming a fan-like pattern or a series of parallel lines. The construction cost for superstructure is definitely high but the cost for substructure is lower than other options. It requires minimal number of piers. The construction period will be shorter than Alternative 1 and Alternative. 2. Since seismic forces are concentrated, separate measures are required to disperse them.

247 The Project AOI is the same as for Alternatives 1 and 2, however the number of piles is significantly less therefore the disturbance to soil is much less.

248 **Table 14** provides a summary of the comparison for the bridge-type alternatives and

detects the small weighing of the environmental consequences in the selection of alternatives.



**Figure 16. drawing and sketch for the Cable-Stayed Bridge**

249 The assessed alternatives are located within the same alignment with similar embankment parameters and are anticipated to cause insignificant impacts within the same AOI. All alternatives will be based at the same volume of embankment and therefore require similar quantity of local geological resources; therefore, the type and level of impact will be similar for each structure. The alternative 3 needs significantly less of the piling works and therefore lower potential impacts to surface and underground water, soils, vegetation and other aspect as shown in **Table 14**. The difference in environmental consequences for assessed alternatives is negligible and hardly detectable compared to the technical and economic aspects which will play a dominant role in the final selection.

250 Occupational health and safety (OHS) considerations during the construction of cable-

stayed, extradosed, and girder bridges may vary depending on several factors, such as the design of the bridge, the construction method, and the site-specific conditions. At the moment, we can only provide a preliminary assessment of potential project alternatives in terms of safety during construction and further maintenance. It should be noted that overall, the list of hazards for workers during the construction of bridges of the selected types is the same. It includes working at height, working in confined spaces, lifting heavy loads, the possibility of electric shock, falling, drowning, working with hazardous materials, etc.

251 A factor that may affect the choice of alternative is the experience of implementing projects in the country. Based on the experience available in the country, the Girder concrete bridge will be the easiest to implement in terms of construction and further maintenance safety. Moreover, this type of bridge is the most efficient in terms of further technical maintenance and operation.

252 There is no experience in building Cable-Stayed bridges in Tajikistan. In general, cable-stayed bridges may be more vulnerable to the failure of one cable than extradosed or girder concrete bridges, which have greater redundancy of structural elements. Frequent technical maintenance is required as the structure ages to ensure its stability. This means that more frequent span checks should be carried out as the structure ages to ensure that it does not weaken over time.

253 Extradosed bridges are a relatively new and less common type of bridge, for the safe construction of which more specialized knowledge and experience may be required. Unlike a cable-stayed bridge system, in which all the load is borne by the cables, an Extradosed bridge uses a structure that combines the main elements of both beams and cables. Maintenance of such a bridge will be easier and safer than for a cable-stayed bridge due to the low height of the towers and cables. Alternative.2 has an improved landscape effect compared to Alternative.1 in the visual condition of having a low height in a wide lake due to protruding pylons and cables on the bridge saddles and anchorages. Considering the combination of economic feasibility and landscape, it is an alternative that can be chosen as a compromise between Alternative 1 and Alternative 3. Alternative.2 is a slightly more expensive bridge than Alternative.1 due to the addition of pylons, cables.

254 Based on the above discussion, Alternative 1 is a preferable option, with lower OHS risks during the construction. Proper safety training, equipment, and protocols should be implemented to protect workers and ensure a safe and successful construction process. See **Table 14** for a comparison of the three alternatives.

**Table 14. Comparison of Alternatives for type of bridge**

Parameter	Alternative 1	Alternative 2	Alternative 3
Type	PSC box girder bridge	Extradosed Bridge	Cable-stayed bridge
Sketch			
Length of span	Maximum span length is 150m	Maximum span length 200m	Maximum span length 410m
Number of piers.	6	5	2
Construction period (months)	49	54	48
AOI	130m from the centerline of the road and bridge		
Distance to the surrounding communities	The nearest residential houses located in over 500m from the start/end of the project sites both at the left and the right banks		
Access to communities	The safe access to the bridge crossing by the pedestrians and cattle could be provided by the proper design of the sidewalks for this type of the bridge.		
Community safety issues, unrest,	Construction activities may result in access road traffic accidents between vehicles, pedestrians and vehicles and livestock and vehicles. There will also be short term impacts to noise and air quality, which may impact upon the health of the local population. Migrant workers may also increase community health and safety risks, for example, through the spread of sexually transmitted diseases.		

Parameter	Alternative 1	Alternative 2	Alternative 3
Dependence on the flooding actions schedule	The type of the bridge depends on the flooding schedule to more extent as piles (supports) are located at the lower levels	The same as for Alternative 1	The Alternative to the least extent depends on the flooding schedule due to higher levels of the piles relative to the current water level.
Construction of approach roads and distance to connecting roads to the communities	There can be few areas where construction of access roads can temporarily block the access to various locations. In these cases, underpasses have been provided (some as a result of stakeholder consultations) or local roads to allow free movement of people and cattle around the construction area and along the access roads. Fencing has been adopted operational areas and will therefore not impact upon access.		
Impacts to landscape	<p>No adverse impact. The bridge is not a view deteriorating factor and sufficiently matches the landscape. The view of this type of bridge is familiar and acceptable for the people, however this bridge is much longer than any of the existing bridges in the country.</p> <p>Minimal visual impact related to the new infrastructure</p>	<p>The same as for Alternative 1. However, the bridge pylons make it look more unusual and more interesting and better match the reservoir and mountainous landscape compared to Alternative 1.</p> <p>Medium visual impact related to the new infrastructure</p>	The impact is beneficial as in accordance with FS due to symbolism and outstanding appearance it matches perfect to the surrounding mountainous landscape the bridge may become a regional landmark attracting visitors.
Seismic stability	<p>The bridge supports are based on concrete foundations which could be damaged during earthquakes due to soil liquefaction. Special mitigation measures are required to reduce this effect for example densification.</p> <p>Due to high seismic forces the deck needs adaptive design.</p>	This type of bridge applies both the cable system and concrete foundations therefore the weak points of the seismic resistance mainly relate to the vulnerability of the concrete supports due to soil liquefaction the same as for Alternative 1.	The lighter weight of the metallic slabs compared to PSC slabs in combination with the flexible cable stay system shall ensure the better seismic resilience of this type of bridge. Stays are the strongest part of the cable-stayed bridges during the earthquakes. <sup>12</sup> In accordance with FS the cable-stayed bridge has high seismic safety due to the effect of reducing the seismic force compared to heavy concrete girders by applying a steel composite girder cross-

<sup>12</sup> [https://theconstructor.org/structures/earthquake-cable-supporte d-bridges/16599/](https://theconstructor.org/structures/earthquake-cable-supporte-d-bridges/16599/)

Parameter	Alternative 1	Alternative 2	Alternative 3
			section with a small mass. By the results of modelling, it proved be more effective than other options by absorbing the seismic energy in a relatively long time.
Service life	100 years		
Resettlement risks and limited access for grazing lands	The alignment does not impact residential areas. No or negligible risk of resettlement. There are no cultural heritage sites in the direct impact zone. The project will not affect nearby businesses (restaurants, shops) and farming activities. The resettlement risks will be assessed during the land acquisition and resettlement due diligence to be implemented under Deliverable 3&4.		
Sensitive Locations	No sensitive locations are available within AOI		
Noise and Dust impact to communities.	Impacts related to nuisance caused by dust, emissions and noise/vibration during the construction period is low.		
Impact to vegetation and fauna	The AOI doesn't include sensitive ecosystem. The piling work can cause removal of bushes shrubs and disturbance to small fauna (insects, lizards, mice) in the zone of future flooding.		
Impacts to air quality	Some temporary impacts on air quality due to the work of machinery		
Impact to water quality	<p>The proposed plan of piers for this option doesn't indicate the need in the construction of cofferdams for the temporary diverting of water as the piles will be constructed outside of the existing river channel.</p> <p>However, the drilling fluids, water from concrete manufacturing, excavated soil and other pollutant can contaminate the water.</p> <p>The mitigation measure such as settling ponds will be developed and included into EMP. Other measure are installation and compaction of the protection barriers, prevention of the leaks.</p>		<p>Due to less quantity of piling work the anticipated worsening of water quality is less in scope. No work within the existing river channel is anticipated, provided that the working schedule will be observed.</p> <p>Prevention and mitigation measures are the same as for Alternative1 and 2.</p>

Parameter	Alternative 1	Alternative 2	Alternative 3
Construction cost Capital Expenditures (Capex)	USD 56,93 million	USD 65,00 million	USD 77,19 million
Operation and maintenance cost (apex)	USD 2,3 million	USD 2,9 million	USD 3,45 million a
Construction Method	<p>The girder is constructed by applying the FCM (Free Cantilever Method), and the side span is constructed by the FSM (Full Staging Method) with a bent installed, and then closed with a key segment.</p> <p>The piling for the piers could be conducted by cast in situ, steel pipe or open caisson method. The exact methodology will be determined during the detailed design. The environmental consequences are similar, however the cast in situ piling generate more noise and vibration and needs additional mitigation to avoid the water pollution.</p>	<p>By applying the same FCM as ALT.1, the side span is constructed with the FSM (Full Staging Method) with a bent installed, and closed with a key segment. Inside the main tower, saddles are installed to arrange external strands.</p> <p>The methods for construction of piers are the same as for Alternative 1</p>	<p>In the construction of the pylon of the bridge, it was planned to install and cast the pylon crossbeam by installing a bent. The girder is constructed by lifting the steel girder segments transported under the bridge from a derrick crane placed on the girder. Compared to other bridge alternatives, the bridge plan is disadvantageous due to more complicated construction process including such operations as cable tensioning, lifting decks, etc.</p> <p>The methods for the construction of piers are the same as for Alternatives 1 and 2</p>
OHS Risks	<p>The Girder concrete bridge will be the easiest to implement in terms of construction and further maintenance safety due to substantial experience. This type of bridge is the most efficient in terms of further technical maintenance and operation.</p>	<p>The bridge uses a structure that combines the main elements of both beams and cables. Maintenance of such a bridge will be easier and safer than for a cable-stayed bridge due to the low height of the towers and cables.</p>	<p>Cable-stayed bridges may be more vulnerable to the failure of one cable than extradosed or girder concrete bridges, which have greater redundancy of structural elements. Frequent technical maintenance is required as the structure ages to ensure its stability. There is no experience of the construction of such type of the bridges in Tajikistan.</p>

Parameter	Alternative 1	Alternative 2	Alternative 3
Soil erosion and landslide risks	The project area is prone to significant landslide risk due geological and topography settings, all bridge Alternatives are not expected to increase the risks of the landslides and soil erosion due to careful selection of the bridge location. provided that mitigation measures, such as proper planning of the earthworks, slope and bank protection measures will be applied		
Resilience to Climate change	The temperature changes can cause the expansion and contraction of the bridge Infrastructure leading to thermally induced stresses which can cause degradation. The increase in the wind load can affect the bridge's durability.	In general, the same as for Alternative 1 although the added cable elements improve the bridge resilience.	More resistant to lateral forces such as water pressure due to the pylon shape and wind load due to girder height.  The magnitude of static wind force is related to bridge deck height. So, it is advantage to alternative 3 bridge option.  The influence of the temperature increase is insignificant.
Impacts on Hydrology	Due to maximal number of the piers, there is a risk of upstream potential impediment to flow, decreased water velocity and increased depth, change in deposition regime upstream, caused by changes in flow and potential flood risk and changes to riffle/pools. Downstream potential increased water velocity and turbulence and as a consequence erosion. The influence of the bridge supports on the hydrological regime after the completion of the bridge is insignificant as the supports occupy negligible space compared to the volume of reservoir and in significant distance from each other. In accordance with the preliminary plans of the location of piers the diversion of the existing river channel for construction purpose is unlikely, provided that construction schedule will be observed.	The same as for Alternative 1	The influence of the bridge structure to the hydrology of reservoir is minimal if any due to minimizing of the number of piers. No diversion of the existing channel of the river is required for the construction purposes.
Socio-economic impact: proposed livelihood	During the Construction period: Workplace development for local population. During the	The same as for Alternative 1	In general, the same as for Alternatives 1 and 2, however, the Alternative 3 can attract more tourists due to the attractive

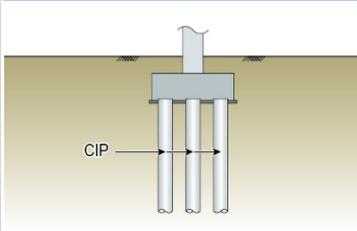
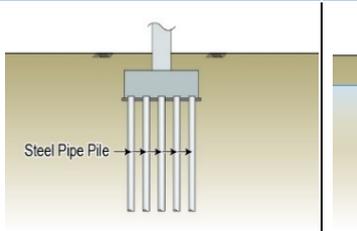
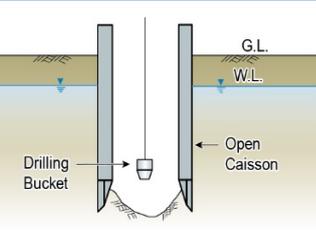
Parameter	Alternative 1	Alternative 2	Alternative 3
development facilities; contribution to tourism industry development; community benefits	operation the facilitating of the business relating on the tourism industry.		appearance and symbolism of the cable-stayed bridge.
Conclusion	<p>The social impacts are similar for all proposed options, all alternatives will provide employment opportunities for the local communities during the construction and operational phases. It is very important to ensure the design of safe and convenient access for the local communities, including pedestrians and livestock independent of what alternative will be chosen. All alternatives provide the similar seismic and climate change resilience.</p> <p>The anticipated impact on biodiversity is minimal for all alternatives due to the absence of valuable habitats and species in Project AOI. Although, the implementation of Alternative 3 needs less of the scope of physical works associated with the disturbance of the environmental components, such as soil and water due to fewer piers these advantages are eliminated by the fact that all this area will be filled with the Rogun reservoir water.</p> <p>Regarding the OHS issues the girder concrete bridge considered as Alternative 1 will be the easiest to implement in terms of construction and further maintenance safety due to substantial experience of construction of similar bridges (although of considerably smaller in size), while the country has no experience in the construction of cable-stayed bridges which considered as Alternative 3.</p> <p>It was concluded that design should focus on enhancing the stability of the abutment while alleviating concerns regarding slope stability due to high soil pressure in the left embankment of the project.</p> <p>Therefore, it was concluded that the Alternative 1 (Box Girder Bridge) in length of 920m is recommended as a preferable alternative for the further implementation steps.</p>		

## 4.5 Bridge Foundation Alternatives

255 Based on the preliminary studies the bridge foundations should be deep due to complex geological conditions of the site. As the rocky layers may be absent at the appropriate depth the friction type of foundation will be applied. The alternatives for the types of foundation under consideration are listed below and shown in **Table 15**.

- a. Cast in situ piles
- b. Steel Pipe Pile
- c. Open caisson

**Table 15. Comparison of the bridge foundation alternatives**

Item	Cast in situ Pile	Steel Pipe Pile	Open Caisson
<b>Foundation Type</b>			
<b>Quality control</b>	Require careful concrete quality management	Easy to manage quality due to a factory product	Require careful concrete quality management
<b>Construction method</b>	Necessary to install steel casing in water to protect concrete. However, for this project the casing maybe be unnecessary as no groundwater was encountered along the bridge alignment. No pile construction is planned within the existing river channel.	Easy to construct	Difficult to construct but no need in still casing
<b>Cost</b>	Low construction cost	High construction cost	The highest construction cost
<b>Friction resistance</b>	Advantageous	Disadvantageous	Advantageous
<b>Resistance to heavy load</b>	Good to resist heavy load	Good to resist small load	Advantageous to secure required bearing force due to large bottom area. Good to resist a heavy load
<b>Natural resources</b>	The local resources such as gravel, sand and water are needed for in situ fabrication	Less need in local resources as the prefabricated components will be brought to the project area.	The local resources such as gravel, sand and water are needed for concreting of the pier
<b>Vibration</b>	Significant during the piling	Significant during the piling	Insignificant, expected only during the compaction of concrete

<b>Noise</b>	The construction could be noisier due to piling	The noise impacts are during the knocking	
<b>Impact to Vegetation</b>	Low, within the piling site	Low, within the piling site	Within the construction site depending on the size of caisson, Could slightly higher than for piles
<b>Impact to Hydrology</b>	Low during the construction,	Low during the construction.	Low during the construction.

256 Each of the options has advantages and disadvantages. The most suitable type of the foundation will be selected based on the analyses of the soil characteristics.

257 The environmental footprint for the construction and further operation of foundation alternatives is approximately the same. Therefore, the final foundation alternative selection is based on the technical and economic benefits.

#### **4.6 Construction in water**

258 Despite the construction works planned to be completed at the dry terrain, the alternative for the construction of the foundation(s) in water was considered for the case of significant delay with the project due to force majeure circumstances. Dewatering measures such as constructing the cofferdams will be applied in this case. This will require an additional assessment of the environmental impacts with the development of appropriate mitigation measures.

#### **4.7 Alternatives for Pavement**

259 Asphalt-concrete and reinforcement concrete pavement types have been considered for the bridge and approaches. Priority was given to asphalt- concrete pavement which was earlier selected for the whole road corridor. This type of pavement has been chosen because there is:

- less noise during operation, compared to concrete (less noise nuisance for existing residents and wildlife);
- less vibration compared to concrete (many buildings along observed to be of mudbrick construction);
- better visibility of road markings on black asphalt (edge and lane markings -Road safety);
- better in winter snow/ice melt;
- re-cyclability of material.

## 5. ENVIRONMENTAL AND SOCIAL BASELINE

260 This chapter presents the description of baseline conditions for various components of physical, ecological, and socio-economic environment in regional aspect and within the Project AOI. The description is based on the previous studies for the whole road corridor, other regional projects and additional site-specific environmental studies which relate to the direct AOI of the project with the incorporation of the findings of site visits, and stakeholder consultations.

### 5.1 Physical Environment

261 Physical conditions include the topography, water resources, drainage pattern soils, geological and seismic conditions, land use, climate and weather ambient air quality, and level of noise in the project area. The description is based mainly on the literature review and analysis of the regional and site-specific information obtained during the previous and current ESIA studies.

#### 5.1.1 Overview

262 The project is located in a mountainous area within the approximately 3km wide valley of the Surkhob River between the Karategyn and Peter I mountainous ranges. Hydrologically, the future bridge is about 11km upstream from the confluence with the Obihingou River, which forms a Vakhsh River.

263 The AOI is characterized by widespread development of erosion processes and complex seismic conditions. The AOI mostly belongs to the inundation zone of the future Rogun HPP reservoir and the area surrounding or buffering this zone. The project site had already been subjected to construction activities before the suspension of the Rogun HPP project in 1993 due to financial restrictions following the collapse of the Soviet Union. One of the most prominent features within the project site is remains of the bridge embankment built during the previous construction activities.

#### 5.1.2 Topography

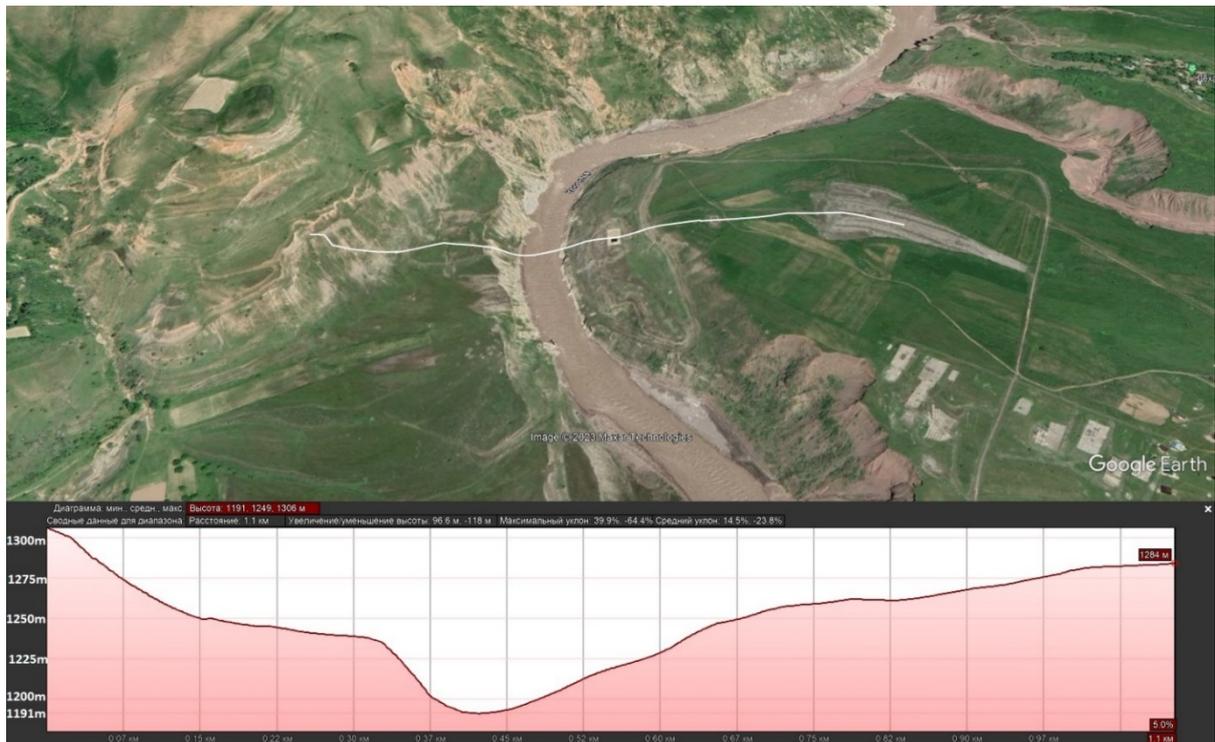
264 Mountains occupy 93% of the area of Tajikistan and comprise South Tyan-Shan and Pamir Mountain systems, with the Tajik Depression in the southwest and Fergana Valley in the northwest being the only lowlands in the entire country.

265 Geographically the project region relates to South Tyan-Shan system where combination of geological and hydrological features formed exclusively irregular, rugged terrain with alternation of rocky steep mountains and deep narrow valleys with prominent differences in true altitudes. The area of the Obigarm-Nurobad road belongs to the Hissar-Alai region. The relief of this region is typically mountainous, with access to the sub-Alpine and Alpine zones in the upper part of the ridge, with steep peaks and small glaciers. Almost every gorge has rough streams and rivers. On the steep slopes there are rocks and numerous stone scree deposits.

266 In regional content the project area is characteristic with ridges of latitudinal and sub-latitudinal strike, including the ridges of Zeravshan, Turkestan, Hissar and Karategin. The main orographic element is the mountain range of Karategin, and the route of Obigarm-Nurobad bypass road passes in the eastern ridges of it.

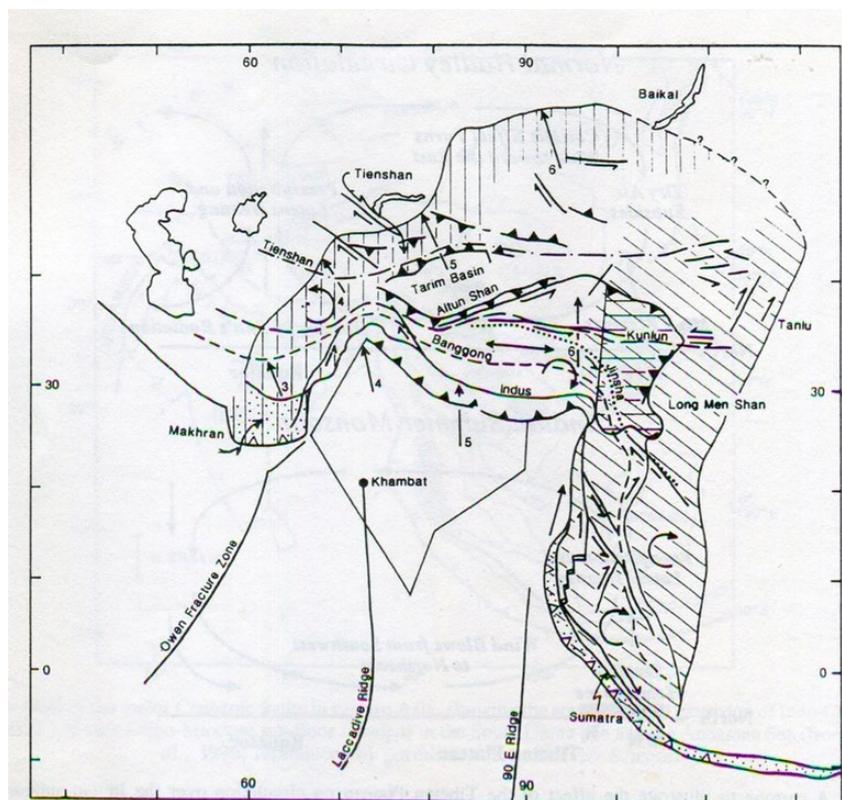
267 Highly dissected terrain is due to the effect of various factors: a well-developed hydrographic network, the existence of tectonic zones and the development of physical and geological processes.

268 The project area is a slightly asymmetrical valley of the river Surkhob with visual terrace benches on both sides as shown at **Figure 17**. The average slope is 14 % with the maximal slope ranging from 64% on the right bank to 39% on the left bank. The vertical difference between the highest and lowest points is about 120m.



**Figure 17. The terrain cross-section profile along the bridge alignment**  
**5.1.3 Geology and Geotechnical Conditions**

269 Tajikistan has a complex geology due to deformation of Central Asia south of Tibet caused by the India-Asia collision. Tajikistan is located within the suture zone of colliding continental tectonic plates.



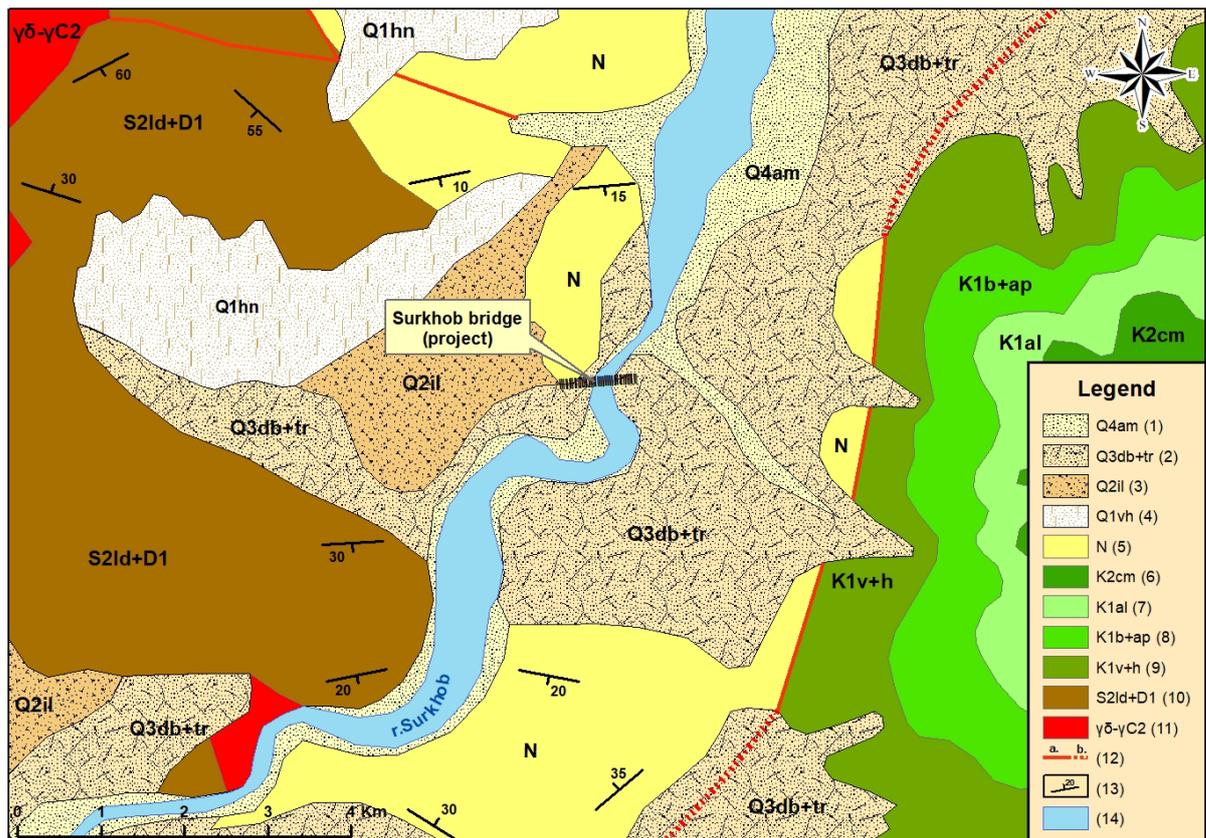
**Figure 18. Map of tectonic zones of India-Eurasian convergent plate boundary complex<sup>13</sup>**

270 The rocks covering the country were formed from the Archean-Proterozoic to the

<sup>13</sup> Brian F. Windly. The Evolving Continents. 3<sup>rd</sup>. Edition. John Wiley and Son.

Quaternary period and are mainly represented by rocks formed through volcanic activity and rock the geological structure of the country is divided into Karamazar (Northern Tajikistan), Central Tajikistan (Hissar – Alai), Pamir (with Darvaz), Tajik depression and Fergana depression. The project is located in the Hissar-Alai region of sedimentary origin which is a northern part of Tajik depression, - the foreland basin created by India –Asian collision but sited on the earlier formed basement (see **Figure 18**).

271 Geological structure of the bridge construction area comprises a consolidated basement overlaid with various types of Quaternary sediments (see **Figure 19**). The basement is represented by a thick layer of cemented/consolidated boulder-pebble conglomerates of lower Neogene age of alluvial origin and dislocated in a monocline fold with the fall of strata to the South and Southeast.



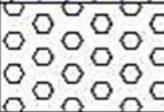
**Legend Description:**

Quaternary system: 1-modern department. Amudarya complex. Pebbles, sands, loams, sandy loam, crushed stone, glacial deposits. 2-upper department. The Dyushambinsky and Termez complexes are united. Sands, pebbles, siltstones, loams, crushed stone. 3-middle department. The Ilyaksky complex. Pebbles, sands, glacial deposits. 4-lower department. Vakhsh complex. Pebbles, conglomerates, sandstones, calcareous tuffs. Neogene system: 5-undifferentiated deposits. Conglomerates, sandstones, gravelites. Chalk system: 6-upper section. Cenomanian tier. Clays, sandstones, conglomerates, dolomites, limestones, gypsum. The lower section 7 is the Albian tier. Sandstones and clays with interlayers of marls, conglomerates, limestones. 8-The Barremian and Aptian tiers are combined. Sandstones, clays, gravelites. 9-Valanginsky and Goterivsky tiers combined. 10-Ludlovsky tier of the Silurian system and the lower division of the Devonian system combined. Limestones, flints. 11-Medium-carboniferous porphyritic plagioclase granites, granodiorites. 12-the line of tectonic contact: a-reliable, b-assumed. 13-inclined occurrence of layers. 14-river.

**Figure 19. Geological Map of the Project area** (Source: Fig. Fragment of the map J-42-11 scale 1:200 000 series Alai-Hissarskaya. Authors: A.V.Burmakin, D.A.Starshinin. Moscow, VSEGEI, 1965)

272 The conglomerate outcrops are recorded on the edges of the Surkhob river, the conglomerates are encountered in a number of geotechnical boreholes during the survey. Conglomerates are composed of pebbles and boulders of igneous rocks of granitoid composition.

273 A bundle of alluvial deposits of the upper Neogene-early -Quaternary age is laying on the eroded surface of the lower Neogene conglomerates. The deposits are represented by alluvial cross-bedded lensing sand, pebbles, and gravel. The top of the section is dominated by pebbles and boulders (see **Figure 20**). Within the elevated terrace at left bank of the Surkhob river in the project soils primarily consist of sediments eroded from the mountains and comprise alternating layers of gravels, sands, silts and clays lying on the eroded surface of lake-alluvial loams (see Figure 4). They make up almost the entire left bank of the Surkhob river from the Labijar ridge to the Sharab mud-flow Adjacent to the mountains, the sediments are dominated by coarse deposits such as gravels and pebbles, deposited by the runoff water from the mountains. Further, away from the mountains, the deposits would be expected to become increasingly dominated by finer sediments such as fine sands/silts.

1	9(δ)		Topsoil containing gravel and roots
2	35(θ)		Clay loam, loamy sand of hard consistency, containing lime concretion up to 10%.
3	6(θ)		Pebblestone or breakstone soil, containing oversize up to 5% and including boulders more than 30%. Aggregate is sand.
4	18(δ)		Conglomerates of medium-strength on a calcareous (lime) cement, 5B-6
5	18(α)		Conglomerates of low-strength on a calcareous (lime) cement, 5B-5
6	6(θ)		Pebblestone (breakstone) containing boulders up to 10% 3B,P-3 (revealed in the pits driven on the approach roads)
7	6(α)		Pebblestone (breakstone) containing boulders up to 30% 3B,P-4 (revealed in the pits driven on the approach roads)

**Figure 20. Geological consequence in the geotechnical borehole**

274 **Table 16** shows the types of the unconsolidated deposits identified in the Project area

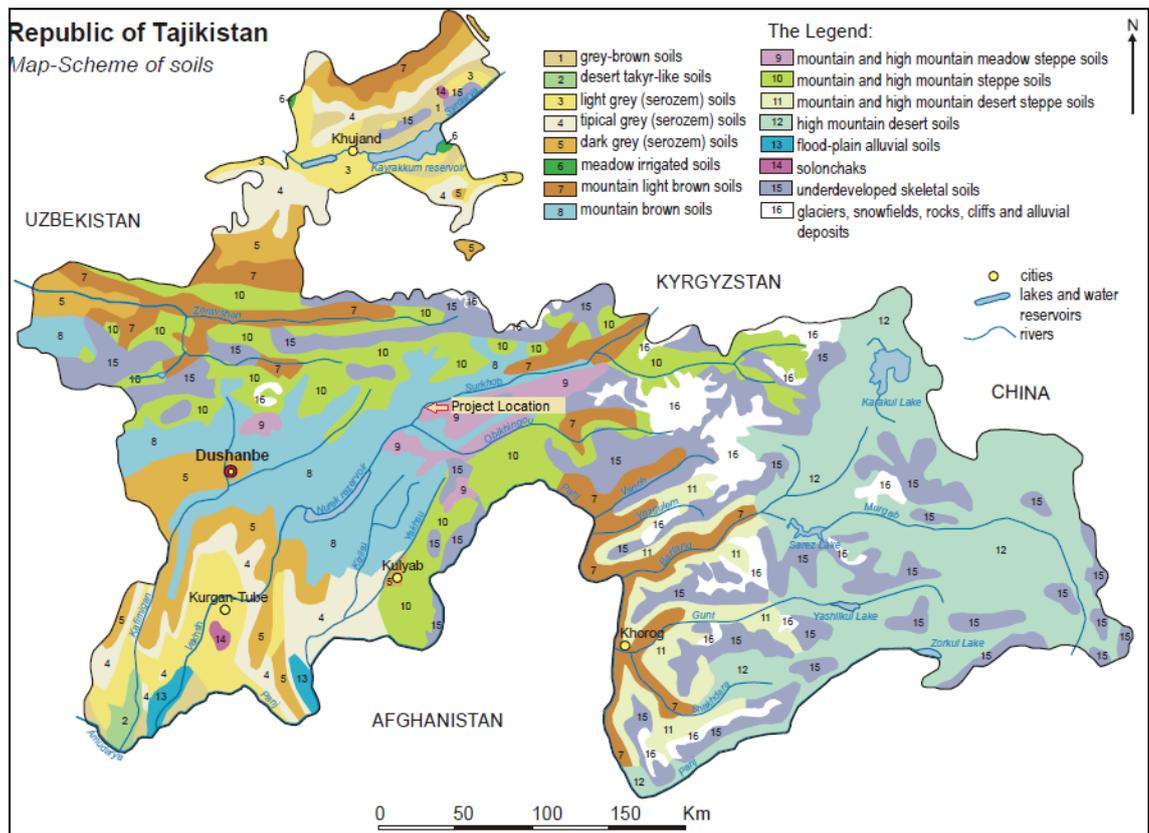
**Table 16. Types of unconsolidated deposits identified in the Project area**

No	Description of sediments (soils)
1	Alluvial sediments of modern watercourses. Pebble, gravel, sand.
2	Sediments of the first elevated terrace. Pebble with boulders, gravel, sand.
3	Upper Quaternary and modern alluvial fans sediments. Gray sandy loam with break stone and angular fragments
4	Glacial (morainal) terraced deposits. Sandy silts with coarse material.

No	Description of sediments (soils)
5	Deposits of high terrace elevated by (40-60 m) of the Surkhob river, divided by geomorphological characteristics. Bouldery pebble, gravel, sand, sandy loam and loamy sand with anemoclast.
7	Outliers of high (80-100 m) terraces of the Surkhob – Vakhsh rivers. Pebble.
8	Alluvial fan-and-talus sediments. Limestone breccia cemented with loamy sand and loam.
9	Glacial (morainal) sediments. Gray sandy silts and loam with bulk of ungraded coarse material.
11	Proluvial-and-dealluvial sediments. Sandy loam, loamy sand with angular homeland debris.
12	Conglomerates of different types of pebbles up to boulders.
13	Gray and dark-gray, crumbling/fissured dolomite limestone.
14	Tectonic fault, surmised under the quaternary sediments.

#### 5.1.4 Soils and Soil Erosion

275 According to Tajikistan's classification agricultural soils in the road corridor belong to mountainous brown soils (see **Figure 21**). The zone of the spreading of mountainous brown soils comprises foothills and slopes of the mountain ranges in the range of altitudes from 900 to 1600m above mean sea level (amsl), sometimes up to 2800m amsl. These soils are developed in the area with semi-savanna vegetation type with the domination of shrubs and high grasses. They are featured with high humus content, thick humus layer, and distinct grainy texture. During the baseline studies the soil samples were taken from various locations within the Project AOI and analyzed in the certified laboratory in Dushanbe. A total of 12 parameters were analyzed, namely pH, dry residue, potassium chloride, nitrates, manganese, hydro-carbonates, sulfates, iron, copper, zinc, fluorine and oil products (details are provided in **Annex 1**).



**Figure 21. Map of soils of Tajikistan (Source; NSAP on preservation of Biodiversity)**

276 The soil is classified as clean with all measured parameters within the tolerance limits. However, the Project AOI does not contain well-developed agricultural soils, due to intense erosion processes and past construction activities (see **Figure 22**).



**Figure 22. Eroded slope of terrace at the left bank of Surkhob river downstream from the bridge location**

277 Soil erosion is a key problem for Tajikistan. Erosion is a widespread natural phenomenon due to the country's topography and climate, but is exacerbated by weak management practices such as: grazing on steep mountain slopes, over-felling of forests and shrubs, forest

degradation, overgrazing and inadequate irrigation. Soil erosion in the Project area has had a notable impact on the parts of the road that were constructed in the soviet era. The two main factors causing soil degradation in the project area are wind and water flowing over slopes, creating gullies that accelerate the erosion process. Figure 6 shows an example of the bank erosion on the left bank of Surkhob River 500m downstream from the Project site.

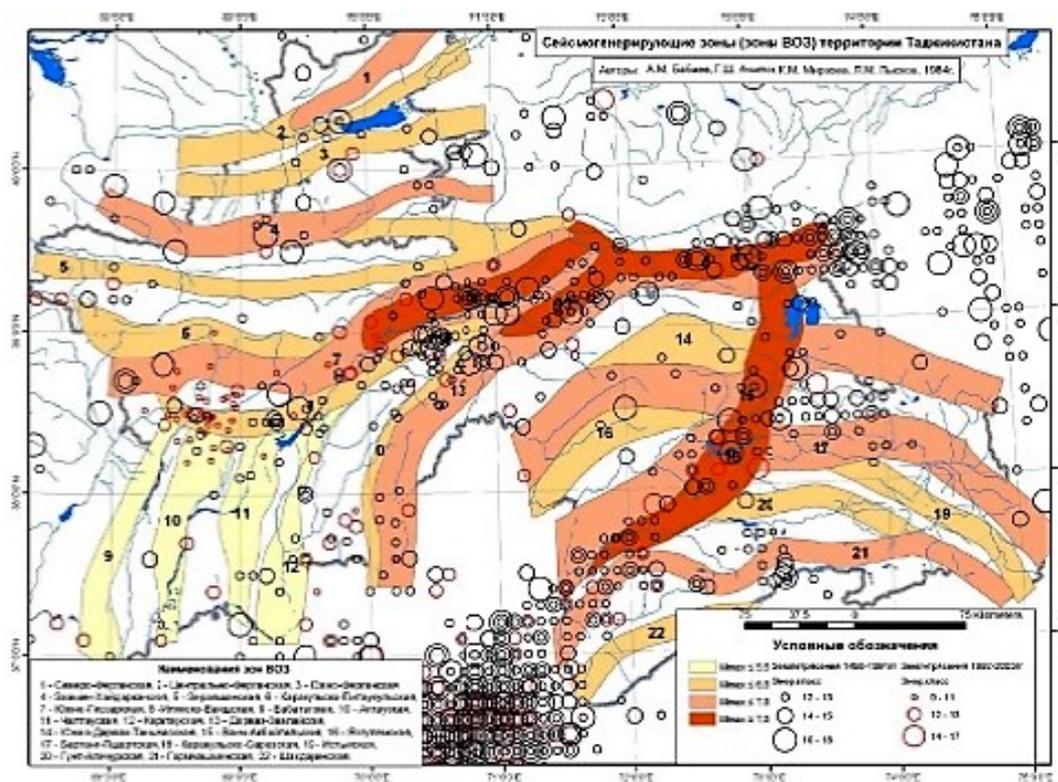
278 Anthropogenic factors have accelerated this erosion through intensive agricultural development on road slopes and unsustainable crop cultivation practices.

### 5.1.5 Seismic Hazards

279 Tajikistan generally has a relatively high seismic potential due to the very active tectonic structure and its location within the thrusting tectonic border between Hindustan and Eurasian plates. **Figure 22** shows the locations of the main seismic zones in Tajikistan. As a result, it is the only part of continental Asia, which has earthquakes that originates deep below the earth's crust, as well as crustal earthquakes.

280 In accordance with seismic zoning, the regions of Tajikistan are divided into three seismic zones. The seismic zones are based on the high risk of earthquakes ranging from 7 to 9 points at the Medvedev-Sponheuer-Karnik scale (MSK-64).

281 The project area relates to "9 points earthquake zone" by MSK-64 scale which is the zone of the high risk of earthquakes of highest intensity in Tajikistan.



**Figure 23. Seismogenic zones of Tajikistan. Source. Institute of seismology and seismic construction**

### 5.1.6 Hydrogeology

282 The hydrological studies conducted for Packages 1 and 2 indicate that the rock formations of the region are characterized by steep incidence angles and large fractures, which means that resisted water-bearing strata along the area are absent. Underground waters, by the nature of their spread, are in trenches, fissure-pore and pore. They are confined mainly to alluvial deposits, and on the surface occur as springs. The formation and accumulation of groundwater in this area is associated with atmospheric precipitation, falling in the form of rain and snow. The high degree of fracturing of intrusive rocks and the complex tectonic structure of the area in general, contributes to the intensive absorption of atmospheric precipitation and snow melt,

which are the main source of recharge of groundwater resources.

283 The rocks existing in the area are characterized by steep angles of incidence and large fractures, that's why there are no aquifers that are sustained in area.

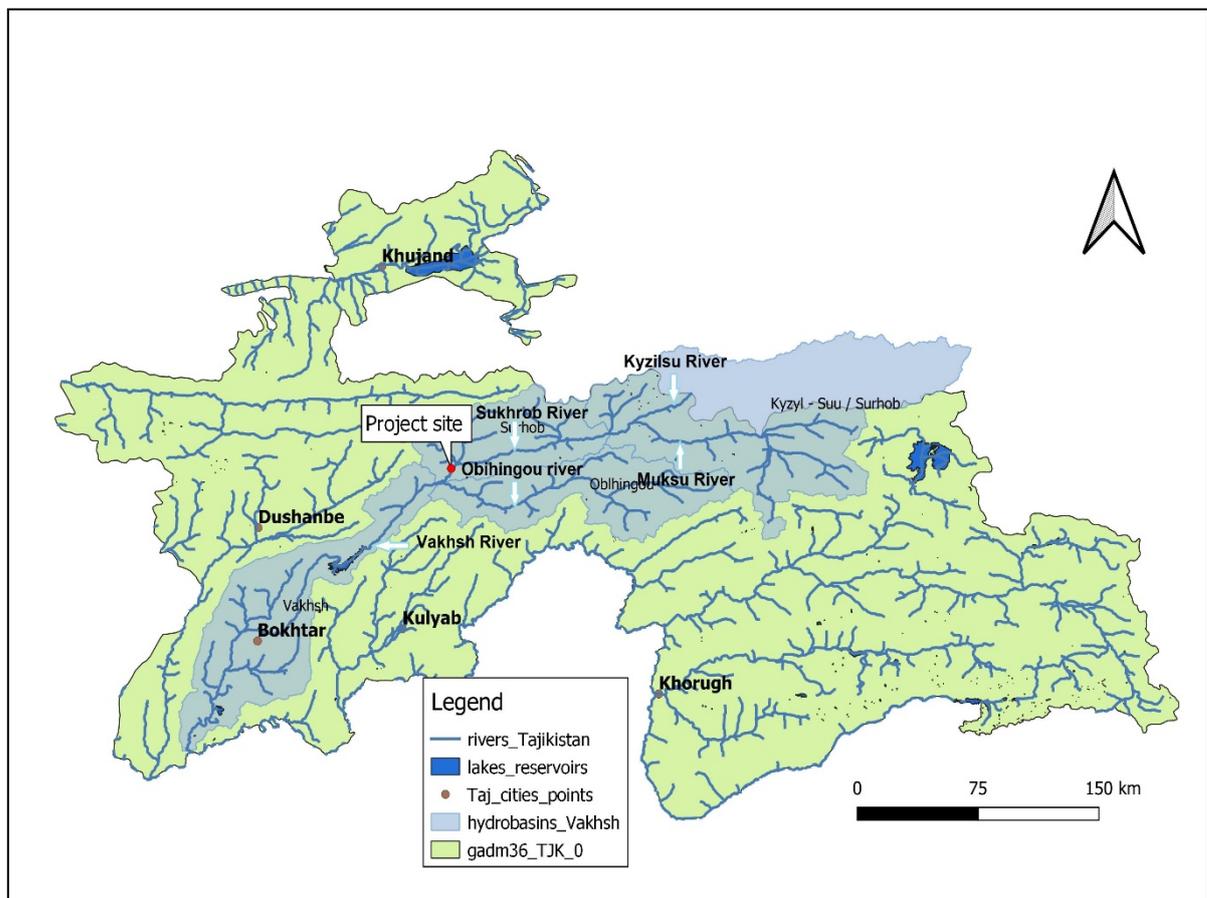
284 During the previous surveys conducted for the road corridors, groundwater was identified in 13 locations dug along the road Project at depths of between 1.0 and 8.0m.

285 Within Package 3 AOI, no area-aligned aquifer was detected. The geotechnical boreholes that were drilled in depths up to 58m within Project AOI during FS did not reveal any aquifer or stable water tables although periodically encountered water at various depths.

286 Only the localized lenses of ground water characterized by seasonal variations occur. The outlet of spring water and wetlands exist on the entrance to the bridge crossing (before the start of approach roads).

### 5.1.7 Hydrological Conditions

287 The entire river network in Tajikistan belongs to two basins: the Amu Darya and the Syr Darya. The road project region, including the AOI of the proposed project, belongs to the first basin – Amu Darya. The confluence of the rivers Kyzylsu (in the northern part), originating in the Alai valley of Kyrgyzstan, and the Muksu, originating in the center of the Pamirs Fedchenko glacier forms the Surkhob river which in turn merges with the river Obihingou forming the river of Vakhsh. **Figure 8** shows the location of the Vakhsh River basin within hydrological network of Tajikistan.



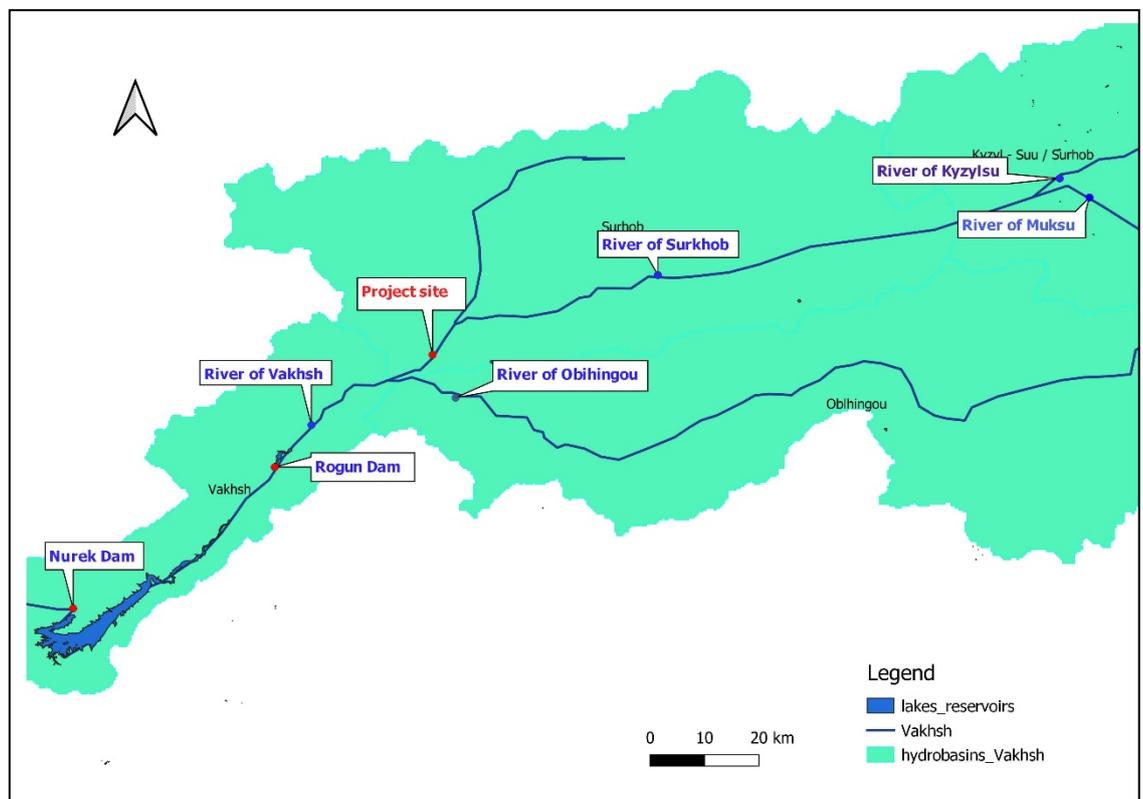
**Figure 24. The Basin of Vakhsh river within Tajikistan's hydrological network (Hydromet)**

288 The 524 km long Vakhsh river (Including Surkhob section) is the region's main water artery which, downstream of the project area, after joining the Pyanj river forms the Amu Darya river, which ultimately flows into the Aral Sea. Along the road corridor, the Vakhsh river is fed by many tributaries, including Obi-kabud, Obi-Yasman, Kamarob, Mirzosharipov, Dasht Gorgan, Kalakan, Thermi, Lugur, Hakimi, and Mujikharf. All these rivers are of a snow-glacial origin and therefore their greatest flows occur at the end of June-July.

289 The tributaries of these rivers are mainly temporary and the perennial flow on individual tributaries in the summer period is due to springs located in their basins. In all the rivers, two periods are clearly distinguished in the annual flow: spring –summer high water and autumn-winter low water with the difference in the regime of the rivers being the predominance of the feed source. The high-water flows in the rivers, depending on the altitude, begins in February - March, and ends due to snow cover in July and August. The length of the period of high-water flow is approximately from 100 to 200 days, although this also depends on the catchment area. During this time, the majority of the annual runoff flows down the rivers.

290 The Project Bridge is crossing the Surkhob River approximately 10km upstream where it joins Obihingou forming the Vakhsh River. In turn, Surkhob River is formed by the confluence of two rivers: Kyzylsu and Muksu. The total catchment area of these rivers is 15,390 km<sup>2</sup> or about 39.4 % of the catchment area of Vakhsh River (39,100 km<sup>2</sup>).

291 The full length of Vakhsh River before its confluence with Panj River is 786 km. From a hydrological point of view the sections of Vakhsh, Surkhob, and Obihingou rivers between the Rogun dam and the proposed long bridge (area of road corridor) are considered as a single water body (see **Figure 25**).



**Figure 25. Hydrographic Layout of the Project area (prepared with QGIS)**

292 The upper reaches of Surkhob River originate from the largest in Central Asia glaciation center. The main component of Surkhob River is Kizilsu River starting on the western slopes of the Taumurun watershed in the eastern end of the vast Alai Valley.

293 Surkhob (Vakhsh) River is a glacier-snow-fed river (according to V. L. Shchultz classification) with a corresponding intra-annual flow distribution. The river flow regime is determined by both climatic and physical-geographical conditions of the basin with the considerable height of the catchment area due to which eternal snows and glaciers are widespread here, with high atmospheric precipitation, as well as high specific and absolute water content.

294 The southern position of the catchment area and thick snow cover even in lower belts of mountains causes, taking into account the height of catchment area, early beginning of floods falling on average in Garm township in early April. Liquid precipitation also plays a relatively large role in feeding the river, creating a series of rainfall peaks in the spring that overlap the

main flooding period. The flooding period lasts for up to 180 days and ends, on average, at the end of the first decade of October. The beginning and the end of the period of high-water flows fluctuate significantly, mainly as a result of changes in intensity of snow and glacier melting in the mountains.

295 The highest mean monthly discharges are in July and August, and the discharges in September are well below those in August and slightly below those in June. After the high-water period, there is a long and steady low water period in autumn and winter, with low water discharge on average in February. The average discharge of the Surkhob in Garm is 333 m<sup>3</sup>/sec. The annual flow of Surkhob River is stable and varies from 263 m<sup>3</sup>/sec (1962) to 456 m<sup>3</sup>/sec (1933).

296 Surkhob River is mainly fed by meltwater, and thus the maximum flow rate in the river is associated with the flood phase. Since rainwater plays an insignificant role in the total flow of Surkhob River, the maximum flow of water in the river is entirely formed by meltwater. The average date of the flood peak is 24 July, with the earliest date on 24 June 1934 and the latest date on 16 August 1950.

297 The highest maximum discharge in Surkhob River in Garm for the period of observations (1933-1970) was 2,690 m<sup>3</sup>/sec (15 July 1958). The next highest discharge was recorded in July 1952 and was equal to 2,170 m<sup>3</sup>/sec. The average value of maximum streamflow in Garm was 1,490 m<sup>3</sup>/sec, and the lowest maximum streamflow (915 m<sup>3</sup>/sec) was observed on 3 August 1951. The lowest low-water flow was recorded at 94.7 m<sup>3</sup>/sec on average, with the highest of 113 m<sup>3</sup>/sec in 1955 and the lowest of 40.3 m<sup>3</sup>/sec.

### 5.1.8 Quality of Surface Water

298 The previous studies conducted for the road corridor proved the good water quality in Vakhsh and Surkhob rivers, the number of tributaries crossing the roads and springs located in the vicinity of the road corridor. The concentration of many parameters is an order of magnitude lower than the maximum permissible concentration (MPC).

299 In the water sample from the Vakhsh river taken from the bridge of Sicharog, the contaminant concentrations were relatively lower than in the sample taken after the confluence of the Surkhob and Obihingou (the beginning of the Vakhsh river). This is due to the fact that the water tributaries of the Vakhsh river (Safecase, Mujiharf, Mirzosharipov, Hakimi, Lugur, Dasht Gorgan, Thermi, batters, etc.) are much cleaner than the Vakhsh river and its main tributaries, the Surkhob and Obihingou, and because of the dilution of concentration of contaminants in the center of the Jamoat Sicharog, is relatively lower than after the confluence of Surkhob and Khingob.

300 Sampling and laboratory tests also included the Surkhob river location approximately 500m downstream of the temporary bridge which is currently under construction. Except a turbidity, no exceeding of the MPC were detected.

301 During the current ESIA studies the selected water quality parameters in Project AOI were tested for water samples taken 500m upstream and 500m downstream from the proposed bridge location. The parameters measured were temperature, pH, odor, transparency, turbidity, nitrites, nitrates, total suspended solids (TSS), biological oxygen demand (BOD), chemical oxygen demand (COD), fluorides, dissolved oxygen, oil products, iron, copper, and chromium.

302 The samples showed an exceedance for two parameters -turbidity and TSS content over water quality sanitary standards both for surface water and fisheries. As an example, the TSS values made up 187 mg/l for an upstream sample and 192 mg/l for the downstream sample with MPC for surface water and for fisheries 75mg/l. This confirms the high sedimentation load of the river caused by natural reasons. **Table 17** shows the results of the water quality analysis compared to the National Standards.

**Table 17. The baseline water quality testing results**

№	Parameter	MPC			Downstream the bridge location	Upstream the bridge location
		Sanitary standards	Fishery water standards	Drinking water		
1	Temperature, °C	-			4	4
2	pH	6,5-8,5		6,0-9,0	7,24	7.21
3	Odor	none			none	none
4	Transparency (cm)		—		1,6	1,6
5	Turbidity (mg/L)				254,1	254,6
6	Nitrites, (mg/L)	1,0 (3,3 -NO <sub>2</sub> )	0,2	—	0,004	0,002
7	Nitrates, (mg/L)	10,2 (45 on NO <sub>3</sub> )	9,1	10,2 (45 on NO <sub>3</sub> )	1,43	1,21
8	Suspended solids, (mg/L)	25	75	25	187	192
9	BOD <sub>5</sub> , (mg O <sub>2</sub> /L)	3	3,0	3	1,8	1,7
10	COD, (mg/L)	—	30,0	—	4,6	4,6
11	Fluorides	1,5	0,75	1,5	0,002	0,002
12	Dissolved oxygen (mg O <sub>2</sub> /L)	Not < 4.0			6,2	
13	Oil products, (mg/L)	0,3	0,05	—	0,048	0,046
14	Iron (mg/L)	0,5	0,005	0,3	0,002	0,002
15	Copper (mg/L)	1,0	0,001	1,0	0,00	0,00
16	Chromium 6 valence (mg/L)	0,05	0,001	0,05	0,00	0,00

303 The other measured parameters were significantly lower than the MPC or even below the detectability level. **Annex 1** of this ESIA includes a detailed report on instrumental measurements of the environmental components, including the water quality in Project AOI.

### 5.1.9 Ambient Air Quality

304 The project AOI is part of the larger road corridor that crosses a mountainous landscape, with small villages along the road and does not have industrial sources of pollution. Therefore, the main source of air pollution in the region is the burning of fossil fuels for heating and cooking. Other sources are emissions of exhaust gases from motor vehicles and dust raised by motor vehicles. The current road construction activities also affect the ambient air quality along the road corridor, however in accordance with the Environmental Monitoring Reports (EMR)<sup>14</sup> issued by the PIURR the air quality is monitored on a monthly basis and due to proper mitigation remains below MPC.

<sup>14</sup> Semi-Annual EMR for Central Asia Regional Economic Cooperation Corridors 2, 3, and 5 (Obigarm-Nurobod) Road Project. January-June 2022. Accessed from: [https://www.adb.org/sites/default/files/project-documents/52042/52042-001-emr-en\\_0.pdf](https://www.adb.org/sites/default/files/project-documents/52042/52042-001-emr-en_0.pdf)

305 Despite the absence of noticeable artificial sources of air pollution within the project AOI the additional baseline air quality measurements were conducted at the start and end points of the project in the locations closest to the residential houses in Darband and Safedchashma Jamoats concurrently with the noise measurements. The parameters measured included: Total Suspended Particles (TSP), CO, CO<sub>2</sub>, NO, NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>2.5</sub>, PM<sub>10</sub>. **Table 18** shows the results of monitoring compared with the National Standards.

**Table 18. Summary of air quality testing compares with National MPC**

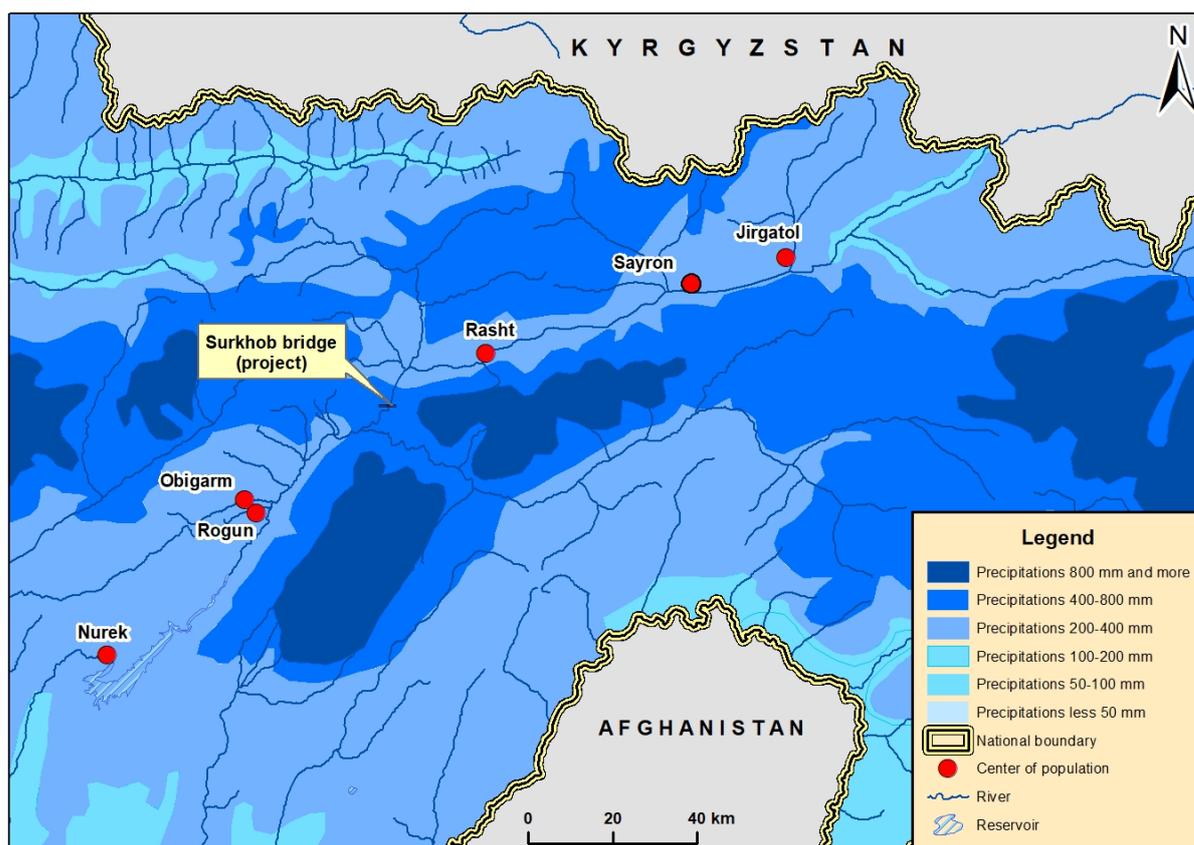
No	Name of Ingredients	MPC	A1 Darband town,	A2 Safedchashma village
1	PM <sub>2.5</sub> , mg/m <sup>3</sup>	25	18	21
2	PM <sub>10</sub> , mg/m <sup>3</sup>	50	35	41
3	TSP, mg/m <sup>3</sup>	0,15	0,0065	0,0082
4	CO, mg/m <sup>3</sup>	5	0,287	0,351
5	CO <sub>2</sub> , mg/m <sup>3</sup>	3900	620	673
6	NO	0,4	0,00437	0,00391
7	NO <sub>2</sub>	0,2	0,00152	0,00121
8	SO <sub>2</sub>	0,5	0,0273	0,0082

306 All measured parameters are below MPC that confirms good quality of the ambient air in the project AOI.

#### 5.1.10 Climate Characteristics

307 Tajikistan is characteristic of continental climate, influenced by its location in Central Asia at the border between the subtropical and temperate climatic zones. The main features of Tajikistan's climate are: high solar radiation, low cloudiness, long sunshine hours, rapid changes of daily and seasonal air temperatures, uneven distribution of precipitation during a year, and high dust content in the air. In the mountain regions of Tajikistan there are glaciers covering a total area of 8,400 km<sup>2</sup> (which is ca 6% of the country's area).

308 During the cold part of a year there is a polar front over Tajikistan. The weather is affected by dry and cold air masses moving from the Siberian anticyclone and meeting the damp warm air from the Atlantic Ocean in the form of cyclones.



**Figure 26. Precipitation Map of the Project area (Source Hydromet of Tajikistan)**

309 Annual mean temperature in the south is +17°C, in the Pamirs it reaches -6°C. Maximum air temperature can reach +47°C on the south; the lowest temperature can reach - 63°C in the Eastern Pamirs. Precipitation is distributed unevenly both temporally and spatially as shown on **Figure 26**. Annual rainfall is 400-1,200 mm in the west of Tajikistan. The highest totals are measured at the Fedchenko Glacier (more than 2,000 mm per year). Areas up to 1,000 m amsl are characterized by a warm summer with an average temperature of 30°C, and in the months of June–September there is little precipitation. For the mountain ridges of Central Tajikistan and the Western Pamirs, a mild climate is typical: the summer is cooler, winter is cold, and there is high precipitation during the winter season.

310 Mean annual wind speed can vary between 0.8 to 6.0 m/sec. Wind direction and speed greatly depends on the atmospheric circulation and landscape. The strongest winds blow in highland areas (e.g. Fedchenko Glacier in the Central Pamirs) and in the areas where landscape results in the convergence of air flows (Khujand, Fayzabad). Mean annual wind speed in these areas can reach 5-6 m/sec.

311 In the area of Nurabod, winds of the northern and north-eastern directions prevail. The probability of maximum wind speeds is presented in **Table 19**.

**Table 19. Nurobod weather station wind speed data (Tajikhydromet)**

Wind speed (m/s) recurrence once in				
1 year	5 years	10 years	15 years	20 years
18	22	24	25	28

312 Additionally, frontal sandstorms that accompany cold-wave intrusions, rush upwards along the valleys of Kafirnigan and Vakhsh. At the same time a strong wind (18-20 m/sec) along with sandstorm blow for several hours. The biggest number of days with sandstorms is observed in the south of the country and reaches 14 days a year.

313 The climatic characteristics in the area of the Rogun reservoir and in particular the bridge crossing is given by the nearest Meteorological Stations Obigarm, Nurobod and Rasht.

314 Weather data for Nurabad was provided by Agency for Hydrometeorology under the Committee on Environmental Protection (Tajik Meteorological Service). Temperature, precipitation, humidity and wind data are presented in **Table 20**.

**Table 20. Nurobod weather station average climate data by month (Tajikhydromet)**

Month	1	2	3	4	5	6	7	8	9	10	11	12	Yearly
Average air temp °C	-3	-1.7	4.6	12.2	16.1	21.1	24.4	24.6	20	13	6.8	0.9	11.2
Average precipitation mm	90.1	113.2	165.2	133.8	112.6	30.9	17.5	5.9	8.5	58.4	57.7	90.4	884.2
Average Relative Humidity %	68.1	68.4	64.3	61.3	56.6	43.4	38.5	39.4	42.2	51.4	59.1	64.9	54.7
Average speed of wind m/sec	6,5	6,5	7.6	8.6	7.6	7.9	8.3	8.3	7.9	8.5	6.8	6.1	7.4

315 Absolute minimum temperatures are in January and range from -30°C at the Nurobod Station to -32°C at the Rasht Station. The absolute maximum temperature in August is 40°C in Obigarm, Rasht and 41°C at the Nurobod Station. The average multi-year amplitude of air temperature fluctuations within a year is about 30°C.

316 The frost-free period averages 226 days, with the average first cold spell occurring in the first decade of November and the last - in late March and early April. The soil surface temperature, like air temperature, is determined by the radiation and circulation regime. The surface temperature of the soil also depends on the mechanical composition and type of soil, its moisture content, surface condition, etc. The average monthly temperature of the soil surface in the winter months does not differ much from the air temperature, while in the summer months the difference reaches 5-7°C.

317 According to meteorological stations, the frost-free period on the soil surface lasts up to 183 days a year. The average date of the first cold spell is in the first decade of October and the last - in the second half of April. Noteworthy is the uneven distribution of precipitation both on a multi-year and annual basis.

318 The precipitation maximum amount is observed in the winter-spring period and its almost complete absence - in August-September. The total annual precipitation is up to 936 mm (in the Nurobod Meteorological Station). According to published data, the maximum daily rainfall at the Rasht Meteorological Station on 12 January 1962 was recorded at 81 mm.

319 The number of days with snow cover reaches up to 85 days in a year. The earliest date of snow cover occurrence is on 27 October and the latest on 1 January. The earliest date of snow cover melt is on 26 February and the latest on 16 April.

320 The average ten-day snow cover thickness ranging from 2 cm in December to 52 cm in February. The maximum height of snow cover recorded at the Obigarm Meteorological Station is 114 cm.

321 Air humidity can be judged by the value of water vapor elasticity, relative humidity, as well as by the lack of air saturation and water vapor. The elasticity of water vapor in the air varies annually as does the air temperature.

322 It reaches its lowest value in winter - in January (3.4 mb). The maximum absolute air humidity is reached in the period of intensive evaporation (May-July) and amounts to 12 mb. Mean annual relative humidity is 59 % on average.

323 During the year, the lowest relative humidity values at 35-38 % are observed in August and September and the highest at 67-77 % in December and March. From the above it can be

concluded that the highest humidity is observed in winter and the lowest - in the summer-autumn period.

324 Accordingly, the highest humidity deficit occurs in the warm period of the year and the lowest - in the cold period. The average annual saturation deficit ranges from 7.7 mb (the Obigarm Station) to 8.9 mb (the Nurobod Station).

325 The terrain orography has a great influence on the processes of ice formation. The intensity and recurrence, as well as the duration of ice and drizzle formation depend on a complex set of factors such as terrain elevation, topography, slope exposition, etc. Ice and drizzle events in the bridge crossing design area are rare, and observations are of a visual nature. Ice occurs less frequently in the area under consideration than drizzle. **Table 21** shows the average number of days with ice and drizzle per month and per year.

**Table 21. Maximal percentage of days with drizzle**

Month	I	II	III	XII	Year
<b>Nurobod</b>	0.1	0	0.05	0	0.2
<b>Rasht</b>	1	0.5	0.2	0.2	2

326 The maximum number of days with drizzle occur in January and with ice - in March.

### 5.1.11 Noise and Vibration

327 The whole project road alignment crosses a mountainous landscape, with small villages along the alignment. The Package 1&2 project corridor does not have industrial sources of noise pollution, vehicle movements are rare and the noise environment is quiet, typical of a sparsely inhabited, rural upland area.

328 Villages on the alignment contain, residential buildings, schools and places of worship (mosques) that are particularly sensitive to noise pollution.

329 No significant unnatural sources of the noise or vibration are available within the Project AOI. Base-line noise levels were measured at the sensitive locations along the road corridor implemented under Package 1 and 2. In addition the noise modelling covering the Project AOI was conducted with use of the Sound Scan software.

330 The current construction activities within the Packages 1 and 2 result in increase of the levels of the noise compared to baseline values. However, the levels of the noise are monitored and mitigations measures included in the relevant environmental and social management plan (ESMP) are implemented. The Contractors conduct the measurements of the noise on the Monthly basis and submit the Quarterly Environmental Monitoring Reports to PIURR.

331 Although Project AOI does not contain any sensitive receptors for the noise the additional baseline noise measurements were conducted at the start and end points of the project in the locations closest to the residential houses in Darband and Safedchashma Jamoats. Due to the absence of the any artificial sources of noise the natural levels of the noise were measured. The maximal levels of the noise didn't exceed 46.2 dBA with the accepted average hourly level for daytime of 55 dBA (see **Table 22**).

**Table 22. Noise monitoring results**

No	Name of parameter	National standard	N1 Darband town,	N2 Safedchashma village
1	Noise, dB	55	46,0	46,2

332 **Annex 1** provides the details of the conducted noise measuring activities in the Project AOI.

## 5.2 Biological Environment

333 The sub-section presents a summary of the baseline information already documented within the preparation of EIA for Pacakges1&2 and a supplementary Update Biodiversity Report

prepared by WSP<sup>15</sup> which cover in detail the status of the regional Biological Environment along the road corridor. These data are supplemented by the literature review and field visit to the Package 3 AOI including the sit walkover with the participation of a Biodiversity Specialist.

### 5.2.1 Natural Protected Areas

334 No natural protected areas are located within the AOI and adjacent areas. The nearest natural protected areas are Romit Biospheric Reserve located about 60km west from the proposed bridge location and Sarihasor National Park which is not included in International List of the Protected Areas or Key Biodiversity Areas (KBO) located in 25km south (see Figure 27).



**Figure 27. Natural Protected Areas of Tajikistan in relation to the Project Bridge**

### 5.2.2 Habitats

335 The habitats along the road corridor are affected by the anthropogenic activities, to significant extents. Due to long-term overgrazing and tree cutting a short grass sward, interspersed with herbs have been formed. Tree removal has also resulted in soil destabilization and subsequent erosion.

336 Package 3 AOI habitats have been completely changed by the previous construction activities, regular grazing and sporadic agricultural activities. AOI includes the riparian zone of Surkhob river which lacks vegetation due to regular flooding at the left bank and the steepness of the eroded right bank.

337 The additional screening of the habitats in the area of the road corridor which includes the Project AOI was carried out during the preparing of the Biodiversity Update Report funded by

<sup>15</sup> <https://www.wsp.com/en-gl>

EBRD16. The study conducted by WSP in May 2019 includes detailed analysis of the habitats based on the criteria for triggering of the Critical Habitat (CH). In accordance with EBRD performance criteria (PR-6) the CH is triggered by the following conditions:

- i. Highly threatened or unique ecosystems;
- ii. Habitats of significant importance to endangered or critically endangered species;
- iii. Habitats of significant importance to endemic or geographically restricted species;
- iv. Habitats supporting globally significant migratory or congregatory species;
- v. Ecological functions that are vital to maintaining the viability of biodiversity features

338 The CH assessment methodology included the literature review, consultations with national biodiversity specialists and site walkover. The study concludes that there is no evidence that the project road corridor area plays a significant role in supporting any species and meets any of the above described criteria.

339 Integrated Biodiversity Assessment Tool (IBAT) was also applied for the preliminary screening on the presence of Key Biodiversity Areas (KBA) within 50 km from the Project location. No KBAs were identified. The IUCN Red Lists screening within 25km did not identify any species relating to threatened categories.

340 . Ecologically, the AOI is located within the belt of the Alpine meadow-steppe ecosystem and can support mammals, birds, insects, and meadow plant communities. However, the area is severely modified by human activities and has already been in the role of a construction site for the long bridge during the Soviet period. The Biodiversity of the AOI is poor and presented mainly by the grass and shrubs species adjusted to the grazing activities.

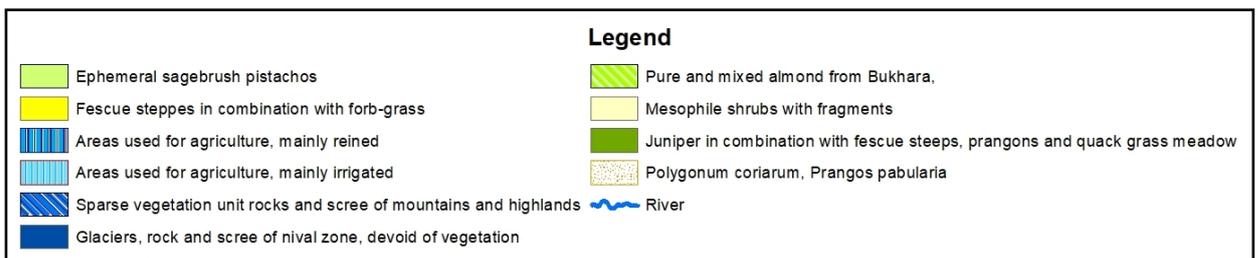
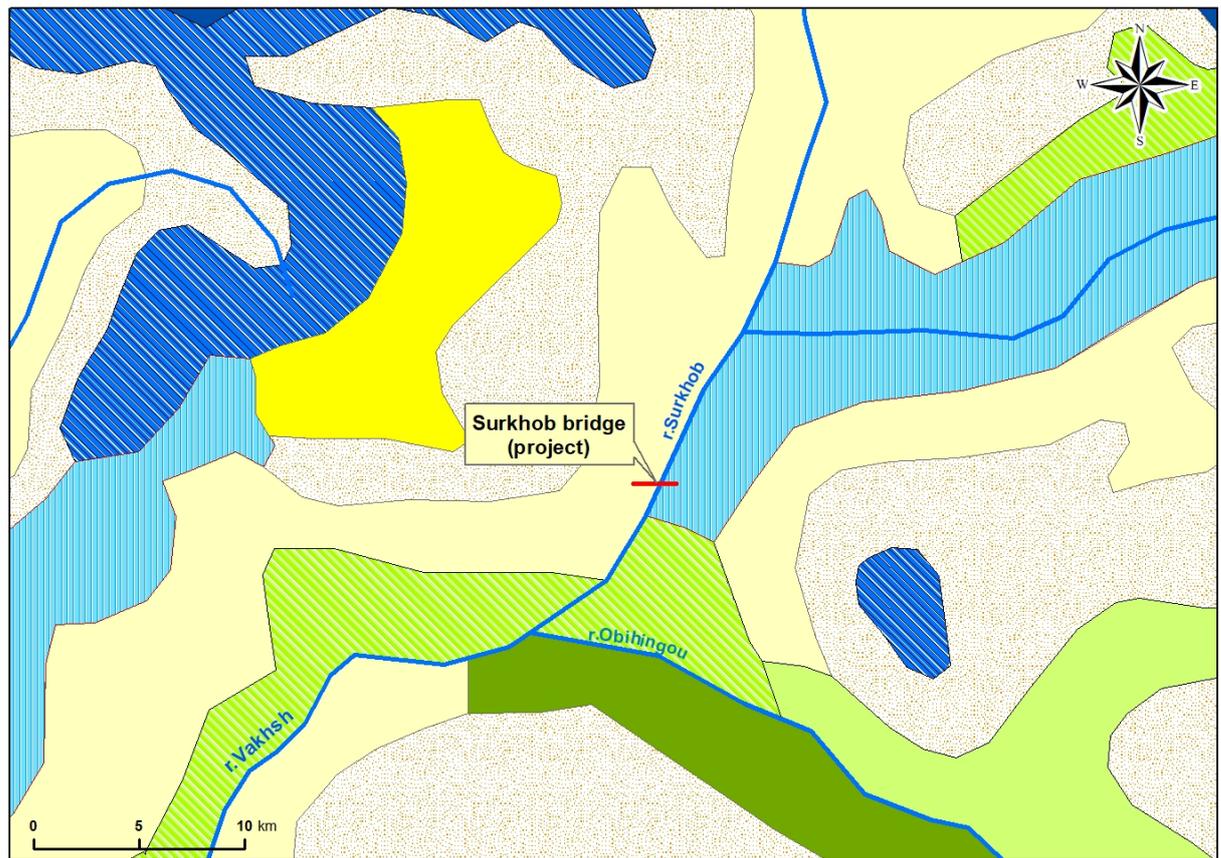
### 5.2.3 Flora

341 Due to vertical zoning, scattered relief, diversity of climatic zones and soil cover in the country, there are more than 5000 plant species, and 7 geobotanical regions, in Tajikistan. All of them are confined to the absolute heights of the terrain, climate, orography of soil cover. In general, they coincide with the natural zoning of the country (Atlas of the Tajik SSR, 1968).

342 The project road corridor is located within the warm lowlands area, with broad-leaf grass-bearing wheatgrasses dominating the vegetation cover. At higher altitudes, this gives way to tree-shrub vegetation, which consists of almonds (*Amygdalus bucharica*), hawthorn (*Crataegus pontica*), small-leaved maple (*Acer regelii*), carcass (*Celtis caucasica*), and chilon (*Zuziphus jujuba*). Grassy cover is completely dominated by wheatgrass (*Elytrigia trichofora*), barley (*Hordeum bulbosum*), viviparous bluegrass (*Poa bulbosa*), palate (*Cynodon dactylon*), bearded (*Bortriochloa ischaemum*). At lower levels (i.e. in the gorges and floodplains) walnut, apple, poplar and willow are common. **Figure 28** shows the main vegetation zones in the Project area.

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<sup>16</sup> EBRD. Biodiversity Update. Rogun Bypass Road. 2019.  
<https://www.ebrd.com/documents/environment/496505.zip?blobnocache=true>



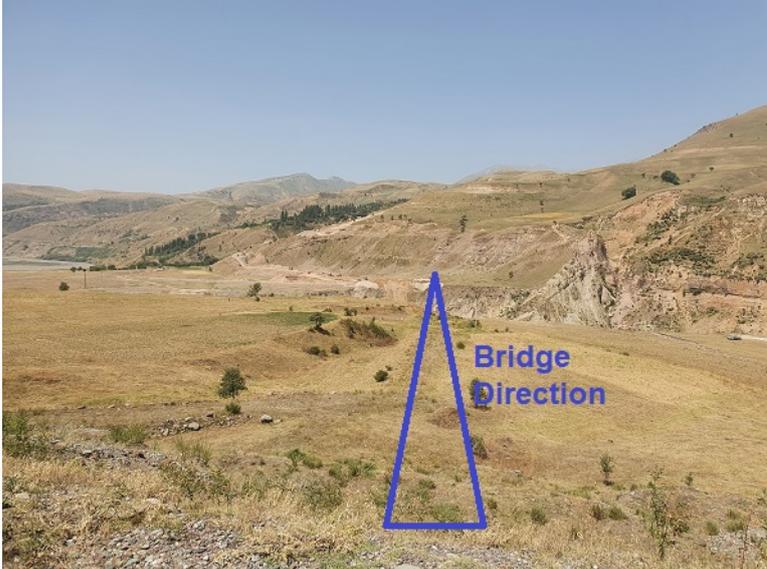
**Figure 28. Types of the Vegetation in the project area (Tajik Institute of Botanic)**

343 Within the Bridge project AOI, especially on the slopes and on the foot of the abandoned embankment, the spots of the herbs and shrubs are observed. Species such as wild rose (*Rosa kokanica*) and hawthorn (likely *Cretaeagus pontica*) were noticed.

344 On the mountainous territory surrounding the project AOI many herbs of medicinal importance grow. Some of them are harvested, both by local residents and forestry workers. These herbs are milfoil (*Alhhaca armeniaca*), *Althaea officinalis* (*Alhhaca officinalis*), wormwood (*Artemisia absinthium*), shepherd's purse (*Capsela bursa-pastoris*), caraway (*Carum carvi*), *Adonis turkestanica* and many others.

345 **Table 23** presents the main habitats within the Project AOI and **Figure 29** shows the plant species representing these habitats.

**Table 23. Main features of the habitats within the Project AOI**

Image of the habitat within the AOI	Description
	<p>The abandoned embankment is the most prominent feature within the Project AOI (view from the south). It was expected to form the bridge approach road at the left bank of Surkhob river. Construction was stopped in the beginning of 1990-s. The embankment length is about 360m, with the current width ranging from 20m at the end point of to the project to over 160m. Visually the height of the embankment above at the ground level is about 30m. The upper part and slopes is partially covered by the grasses and low shrubs.</p>
	<p>The view downslope from the top edge of the embankment. The area on the photo represents partially ploughed grass land which is mainly used for occasional grazing. The area will contain bridge supports and abatement and will be under water after filling up of the Rogun HPP reservoir.</p>
	<p>The gravel material in the AOI of the project which apparently stockpiled nearby the embankment during the previous period of construction. Currently, the location is covered with sparse grass and shrubs and is used by the local communities for the grazing of domestic cattle.</p>



The end point of the embankment closest to the Nurobod village (in about 500m from the nearest buildings) is used for the grazing of the domestic cattle,



***The hawthorn (Cretaeagus pontica) fruits seen nearby the abandoned embankment***

346 No species included in the RBT or IUCN were encountered during the field studies.



Cousinia (on the left) and Achillea millefolium (on the right),



Poplar sprouts and shrubs of *Rosa canina* at the stony slopes of the embankment

**Figure 29. Representatives of the common flora within the Project AOI**

#### 5.2.4 Terrestrial Fauna

347 Faunal diversity along the road corridor is diverse, with numerous animal groups represented. The presence of key faunal species (i.e. those of increased conservation concern) will vary throughout the year depending upon prevailing weather conditions, prey availability, as well as other influences such as local livestock movement.

348 Large carnivores are considered to be very infrequent visitors to road corridor area, with snow leopard *Panthera uncia*, wolf *Canis lupus*, and brown bear *Ursus arctos* only potentially present during periods of prolonged snow cover at higher altitudes (i.e. when they are forced to forage at lower altitudes).

349 No wild fauna except the small common bird species and insects have been observed during the walkover in AOI. The presence of the large fauna within the AOI is unlikely due to its closeness to the area's construction activities.

350 However, the presence of small fauna, including reptiles, and amphibians probably having habitats in the project surroundings is proved by the studies for the road corridor.

351 **Mammals** - There are 84 species of them in Tajikistan, and in accordance with the previous studies many of the live in the area of the road corridor. The habitats in Project AOI are heavily modified by the previous activities, however given in general a similar environment as Package1 and Package 2 may probably still be occasionally used by the some following small species:

352 Turkestan rat (*Rattus turkestanicus*), forest dormouse (*Dryomys nitedula*), grey hamster (*Cricetulus migratorius*), juniper vole (*Microtus juldaschi*), forest mouse (*Apodemus uralensis*). None of them have any Red Book of Tajikistan (RBT) protection status. Grey hamster, juniper vole and forest mouse included to IUCN Red Least under the LC category. However, their presence in Project AOI was not confirmed. There is no indication that the Project AOI performs any significant role in supporting these species or any other species included in the IUCN list under the Categories of critically endangered (CR) or endangered (EN) species.

353 **Bats** - There are eight bat species present in Tajikistan, and many of these will likely be present within the project area at times. Roosting opportunities exist within built structures and cliff/rock cavities, while an ample foraging resource is also present. No evidence about the presence of bats in the Project AOI is available.

354 **Avia fauna**- In accordance with EIA prepared by ADB (2020) for the road corridor, 150 of almost 400 bird species living in Tajikistan can be found in the project area. The characteristic nesting birds here are chukar partridge (*Alectoris kakelik*), blue-rock thrush (*Monticola saxatilis*), mountain swallow, (*Ptyonoprogne rupestris*), rock nuthatch (*Sitta neumayer*), rock dove (*Columba rupestris*), and alpine swift (*Apus affinis*).

355 In the scree slopes, the colonially nesting pink starling (*Sturnus roseus*) can occur. In places where shrubs and trees are more common, blackbird (*Turdus merula*), daraba (*Turdus viscivorus*), Oriental turtle dove (*Streptopelia orientalis*), magpie (*Pica pica*), paradise flycatcher (*Terpsiphone paradisi*), the yellow-browed warbler (*Phylloscopus inornatus*), red-backed shrike (*Lanius collurio*), grey-headed goldfinch (*Carduelis caniceps*), streaked laughing thrush (*Trochalopteron lineatum*, Cetti's warbler (*Cettia cetti*), golden oriole (*Oriolus oriolus*) and many others are all present.

356 **Predatory birds** present within the road corridor include golden eagle (*Aquila chrysaetos*), Egyptian vulture (*Neophron percnopterus*), lesser kestrel (*Falco naumanni*), sparrowhawk (*Accipiter nisus*), hobby (*Falco subbuteo*), peregrine (*Falco peregrinus*), booted eagle (*Hieraaetus pennatus*). Additionally, during a cattle drive, species such as griffon vulture (*Gyps fulvus fulvus*), black vulture (*Aegypius monachus*) and sometimes bearded vulture (*Gypaetus barbatu*) will be present.

357 However, currently there are very limited nesting and forage opportunities within the Project AOI for the above described bird species, due to lack of the natural shelters and disturbance caused by the construction of the temporary road and bridge.

358 **Migratory birds:** The road corridor lies within two global migratory bird flyways: The Central Asian Flyway (CAF) and the East Asian-East African Flyway (EAEAF) (also known as the West Asian-East African Flyway). During the migratory seasons hundreds and thousands of birds move through the project region.

359 The migratory birds which can be observed along the road corridor during the appropriate season include: black swift – *Apus apus*, shrike – *Lanius schach*, swallow – *Hirundo daurica*, *Hirundo rustica*, rose-colored starling – *Pastor roseus*, neophron – *Neophron perenopterus*, saker falcon – *Falco cherrug*.

360 The migratory water birds were not observed directly within Project AOI however it is anticipated they will be attracted by the stopover and forage opportunities after the inundation of the Rogun water reservoir.

361 The project AOI occupies a small portion of the Obigarm-Nurobod road corridor. No important, rare, endangered, or protected bird species or habitats known to exist in the project AOI. **Table 24** indicates the fauna species which are reported from the project AOI.

**Table 24. Faunal species that possibly can be encountered in the Project AOI**

No	Scientific name	Common name	Protection Status	
			IUCN	RBT <sup>17</sup>
	<b>Amphibians</b>			
1	<i>Bufo viridis</i>	European green toad	LC*	
	<b>Reptiles</b>			
2	<i>Testudo (Agrionemys) horsfieldii</i>	Central Asian tortoise	VU**	
3	<i>Cyrtopodion fedtschenkoi</i>	Fedtschenko's bent-toed Gecko		
4	<i>Agama lehmani</i>	Turkmenian Agama		
5	<i>Coluber ravergieri</i>	Spotted Whip Snake		
6	<i>Elaphe Dione</i>	Dione Rat Snake		

<sup>17</sup> Red Book of Tajikistan, 2<sup>nd</sup> Edition;  
<http://tajnature.tj/upload/iblock/647/llrvmfwg38j7602qck54ifjzmzpeplv4x.pdf>

No	Scientific name	Common name	Protection Status	
			IUCN	RBT <sup>17</sup>
	<b><u>Aves</u></b>			
1	<i>Myophonus caeruleus</i>	Blue whistling thrush	LC	VU
2	<i>Chaimarrornis leucocephala vigors</i>	White-crown water robin		VU
3	<i>Garrulax bilkevitchi</i>	Babbler		VU
4	<i>Myiarchus validus</i>	Rufous-tailed flycatcher	LC	VU

\*LC- Least Concern, \*\*VU-Vulnerable, \*\*\*EN-Endangered

### 5.2.5 Aquatic Biodiversity

362 Like most of the watercourses in the project area, the river of Surkhob is very dynamic, with the steep overall gradient in the region resulting in high discharge levels and constant movement of the substrate through the system. This reduces suitability for a wide range of aquatic flora and fauna, mainly as a result of very little aquatic plant life being able to survive in the relatively harsh conditions, and subsequently reducing opportunities for associated fauna. Overall this is reflected in the low numbers of fish present (3-4 species as likely being present). Regardless of this, the protection of the aquatic environment during the construction is necessary.

363 ESIA funded by WB and conducted in 2014 by «Pöyry Energy Ltd» for Rogun HPP included studies of the baseline state of the water fauna of the Vakhsh river upstream from Nurek Dam and throughout the whole length of the Rogun reservoir (See **Figure 30**). The description of the water fauna is based on this survey as the section Surkhob river crossed by the project Bridge is part both of the project AOI and future Rogun Reservoir. The data from this survey are the latest available data on the water biodiversity, and the ESIA for the Rogun HPP funded by the World Bank including the water biodiversity studies is currently in the state of update. **Table 25** shows the fish species likely inhabiting the Project Area identified during the ESIA studies. During field work benthic organisms were selected and identified in addition to fish; these organisms are important as they serve as the main food for river fish species.

**Table 25. Fish species in the project area (source: ESIA for Rogun HPP)<sup>18</sup>**

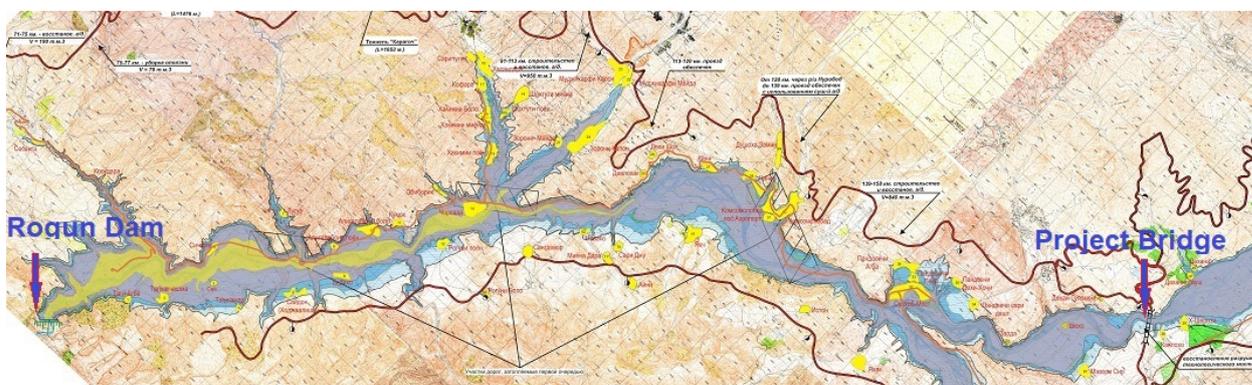
No	Scientific name	Common name	IUCN	RBT	Status in the project area
1	<i>Salmo trutta oxianus</i>	Amudarya trout		VU*	Confirmed
2	<i>S. truttafario</i>	Brown trout	LC**		Expected to inhabit
3	<i>Oncorhynchus mykiss</i> ( <i>S. irideus</i> )	Rainbow trout			Expected to inhabit
4	<i>Schizothorax intermedius</i>	Common marinka			Confirmed

<sup>18</sup> Extracted from: OSHPC “Barki Tojik” Republic of Tajikistan Rogun HPP ESIA. Environmental and Social Impact Assessment. Prepared by PÖYRY ENERGY LTD, 2014 Table 12’  
<https://www.worldbank.org/content/dam/Worldbank/Event/ECA/central-asia/ESIA%20Rogun%20Vol%20I%20eng.pdf>

No	Scientific name	Common name	IUCN	RBT	Status in the project area
5	<i>Nemacheil usstoliczkai</i>	Tibetan loach			Expected to inhabit
6	<i>N. malapteruruslongicauda</i>	Eastern crested loach			Expected to inhabit
7	<i>Glyptosternum reticulatum</i>	Small tukestan sheatfish		VU	Confirmed
8	<i>Salmo trutta aralensis</i>	Aral bulltrout		EN***	Confirmed in Nurek reservoir.

\*VU-Vulnerable, \*\*LC-Least Concern, \*\*\*EN-Endangered

364 Around 50 years ago, the Nurek Dam was constructed about 70 km downstream from the construction site of Rogun HPP. This dam had a significant impact on the integrity of the Vakhsh River ecosystem. One of the consequences was the complete halt of long-distance fish migration in the river. This migration was already impeded by the river's exceptionally high sediment content, which can reach up to 4000 g/m<sup>3</sup>. t



**Figure 30. Map of the future Rogun HPP reservoir between the Rogun Dam and Project Bridge**

365 **Table 26** presents information on the important benthic organisms identified and the frequency of their consumption by fish caught in the area:

**Table 26. Benthic organisms found in the stomach of fish in the Project area**

No	Type of benthic organism	Number of Species	Consuming by fish species (was found in the stomach)	Percentage of the caught fish (%)
1	Bristle worms ( <i>Polychaetes</i> )	2	Common Marinka ( <i>Schizothoraxintermedius</i> )	40
2	Caddisfly ( <i>Trichoptera</i> )	2	Common Marinka ( <i>Schizothoraxintermedius</i> ) Turkestan catfish ( <i>Glyptosternon reticulatum</i> )	100
3	Lavrae of mayflies ( <i>Ephemeropera</i> )	6	Common Marinka ( <i>Schizothoraxintermedius</i> ) Turkestan catfish ( <i>Glyptosternon reticulatum</i> )	100
4	Nonbiting midges larvae ( <i>Chironomidae</i> )	12	Turkestan catfish ( <i>Glyptosternon reticulatum</i> )	30

No	Type of benthic organism	Number of Species	Consuming by fish species (was found in the stomach)	Percentage of the caught fish (%)
5	Mollusca	1	All caught fish species	5
6	Algae incrusting rocks in water environment ( <i>Aufwuchs</i> )		All caught fish species	100

366 The Rogun HPP ESIA aqua-biodiversity studies result in the following conclusions:

- *The fish migration over long distances in the Vakhsh River is absent. If earlier such migrations took place, they were certainly interrupted by the construction of the Nurek dam and later of the Rogun dam. Given the fact, the Vakhsh River, including its section that will be directly affected by the dam of the Rogun HPP reservoir, is considered a heavily modified natural habitat.*
- *The aquatic-fauna is very poor, both in terms of species and in terms of the number of individuals. The fish has no economic value for the local population (see Table 18).*
- *The river of Surkhob in the project area, as well as Obihingou which joining with Surkhob form the Vakhsh river due to their very high sediment load, are not very suitable for fish*

367 The fish species found in the river system upstream of the Nurek and Rogun dams still can migrate short distances, for example between the Surkhob River and its tributaries while migration of the fish along the Vakhsh river was severely stopped over 50 years ago after the construction of Nurek HPP dam and Reservoir. The Rogun HPP will further fragmentize the possibly existing migration patterns of the fish.

### 5.3 Socio-Economic Baseline Conditions

368 The socioeconomic data were collected from public statistical and other sources. The socio-economic data was also obtained during the consultation with local authorities and population living along the road corridor affected by the Project

369 As of 2020 data, the regions of Tajikistan are subdivided into 47 districts not including 4 districts belonging to the capital city Dushanbe, and 18 cities and districts of republican (direct) subordination (including Dushanbe, regional cities). The districts are further subdivided into rural administrative units called Jamoats which in turn are further subdivided into villages (deha or qyshloq).

370 The socioeconomic data were collected from official statistical and other sources (dated as of March 4, 2023). Data was also obtained during the consultations conducted on November 11, 2022 and March 1-7, 2023 by local social expert with local authorities and population living along the alignment affected by the Project.

371 This section discusses issues related to demography, economy, employment and unemployment, infrastructure, land and water resources, social services, and cultural heritage. Data was analyzed on district and Jamoat levels.

#### 5.3.1 Overview

372 The project site is located in the Nurobod district of the Republican Subordination. It is adjacent to the Darband township- the center of the Nurobod District from the south and Gulmon village of the Safedchashma Jamoat on the west. The Darband township was built as a new district center to replace Komsomolobod, which is planned to be inundated by the Rogun Reservoir. This townships is distinguished by proper urban planning with asphalt paved streets and has administrative and cultural buildings, and numerous small businesses. The Gulmon village is a small rural settlement with several houses, and the local population is mainly involved in agricultural production. There are no major industries present in the project area.

373 Although these villages are outside of Project AOI, they are located relatively close to the project site. Therefore, they are of particular concern as the Project can indirectly affect them. Therefore, the socio-economic review conducted for the project includes the details for the broader area comprising the jamoats along the Obigarm-Nurobod road, which are primary Project beneficiaries.

### 5.3.2 Land Use of AOI

374 The project AOI is an uninhabited area with no agricultural, industrial, or other business activities observed. The small groups of domestic cattle (sheep and goats) owned by residents of surrounding settlements from time to time enter Project AOI for occasional grazing. However, the local authorities have already provided alternative areas for grazing outside Project AOI. **Figure 31** shows that nearest settlements are the village of Gulonob on the right bank and the Darband township on the left bank of Surkhob river, located over 500m from the start/end points of the proposed project. The lands adjacent to the bridge were acquired by the state for the purpose of the bridge construction in the early 1980s.

375 After the suspension of the construction activities due to political reasons the lands were transferred to the Nurobod District authority as reserve lands and never been formally made available for any kind of use by the local communities.



**Figure 31. Plan of the Project Surroundings (based on the Google Earth image)**

#### General Description of Nurobod District

376 Nurobod District is a district of Republican Subordination. (DRS) It lies east of the city of Rogun, south of the city of Vahdat and Rasht District, and west of Sangvor District. Its southern border is with the Khatlon Region.

377 Nurobod district was established in 1936 as Darband District and underwent several renaming in its history until its current name in 2003 by the Governmental Resolution 390. The former District center located in the area of the future flooding by the Rogun HPP reservoir was relocated from the village of Komsomolobad in 1993 to the township especially built for this purpose at its present location. The Nurobod district is located about 135 km east of the capital

city of Dushanbe, the administrative center is the township of Darband. The territory of the Nurobod district is 7128.7 km<sup>2</sup>, it includes eight jamoats (sub-districts) and a peri-urban settlement ( township).

378 The project is likely to impact the Nurobod district, particularly the town of Darband and jamoat Safedchashma because of their proximity to the project AOI. Population in the Nurobod district is 75,733 people. The largest town in the broader Project area is Darband with population of 3,128 people.

### 5.3.3 Demographic Data

379 The State Statistic Committee reports that in 2021 the share of women and men in Tajikistan constituted 49.3% and 50.7%, respectively, with the similar trend observed in Districts of Republican Subordination (DRS) (50.8% and 49.2%). However, in Nurobod District the share of women and men constitute 51.3% and 48.7%, in Jamoat Safedchashma 50,2% and 49,8%, respectively This is maybe due to higher rates of migration for men.

380 For example, in the labor migration there are only 17 women compared to 263 men. That is why some households are headed by women; and women are taking care for children, doing housework, and are also working. **Tables 27** and **28** show the demographic data for Nurobod District.

**Table 27. Number of migrants by gender**

Location	Population (as of 2022)		
	Total	Male	Female
Nurobod District	75,733	37,351	38,851
<b>Jamoat type</b>			
• Urban	3,128	1,523	1,605
• Rural	72,495	35,306	37,189

**Table 28. Demography of Nurobod District and Jamoats**

No	Jamoats (January1, 2022 data)	Number Settlements	Households	Existing Population	Migrated to Other Country (Temporary)	Total
1	<a href="#">Mehrobod</a>	19	1733	12,930	716	13,646
2	Mujiharf	25	1842	15,254	986	16,240
3	Hakimi	24	1854	13,425	596	14,021
4	Khumdon	20	1615	9,890	1,585	11,475
5	Izzatullo Halimov	16	1202	8,500	314	8,814
6	Safedchashma	9	946	7,876	423	8,299
7	Rural Population (Total)	113	9192	67,875	4,620	72,495
8	Darband (town)	14	533	3,065	173	3,128
<b>9</b>	<b>Total</b>	<b>127</b>	<b>9,725</b>	<b>70,940</b>	<b>4,793</b>	<b>75,623</b>

### 5.3.4 Ethnicity, Religion and Language

381 Ethnic groups present in Tajikistan are Tajik 84.3% (includes Pamiri and Yagnobi), Uzbek 13.8%, and other 2% (includes Kyrgyz, Russian, Turkmen, Tatar, Arab). **Table 29** shows the ethnicity distribution in the Nurobod district:

**Table 29. Ethnical composition in Nurobod district**

Ethnicity	Percentage
Tajik	99.85
Other (Uzbek, Kyrgyz, Russian, etc.)	0.15
Total	100

382 Tajikistan considers itself a secular state with a constitution providing for freedom of religion. Sunni Islam of the Hanafi school has been officially recognized by the government since 2009. The government has declared two Islamic holidays, Eid ul-Fitr and Eid al-Adha, as state holidays. The population of Tajikistan is 98% Muslim.

383 According to the 1994 Constitution, Tajik is the state language and Russian is a language of international communication with post-Soviet countries. Tajik is the language most widely used in the country, although Russian continues to be used, mainly in urban areas. In the Project area, Tajik is the main language, and many people do not speak Russian, particularly women in the small villages.

### 5.3.5 Vulnerable Groups

384 **Table 30** shows the vulnerable categories in the broader project area. These vulnerable people can be negatively impacted by the project and the intensity of impacts on them can potentially be higher than the other people because of their vulnerability.

**Table 30. Vulnerable People by Category**

Vulnerable Category (Per Person)	Area of Impact	
	Darband (City)	Safedchashma
Pensioners	136	627
Disabled Persons	30	57
Under the poverty line (Poor)	156	275
Homeless Female	N/A	10
Homeless Male	N/A	6
Widows	28	129

### 5.3.6 Household Organization

385 The social organization in the Project affected areas follows a very traditional, patriarchal and male dominated model. For the most part, men earn the household income, the majority of them employed in Russia or other neighboring countries (see migration data above). Separation of work is gender based, and women are expected to perform domestic chores as well as field labor. When decision-making processes are considered, during the meetings with local population it was indicated that women are consulted and take part in the decision-making processes in all major family activities, also they are employed in public sector as civil servants, and teachers.

### 5.3.7 Employment and Unemployment Levels

386 As per the official statistics, the unemployment rate has reduced and it was 2,4 % in 2022, compared to 4,6% in 2015. However, most of the employed population work in public sector and agriculture farming. The number of self-employed people is high. Most of the self-employed people in district are busy in agriculture activities. **Table 31** shows the historical employment data of Nurobod district (Source: National Statistics Office of Tajikistan and Passport of the District as of 2022).

**Table 31. Employment rate in Nurobod district**

Category	Nurobod District		
	2015	2020	2022
Active population, total	42,700	43,600	41,567

Category	Nurobod District		
	2015	2020	2022
Employed in Public sector and Agriculture	19,700	21,600	22,100
Hired	4,100	4,390	4,640
Self-employed	210	230	264
Officially Unemployed	1,964	1,744	9,97
Unemployment rate, %	4.6	4.0	2.4

387 Most Tajiks continue to live in rural villages. Such settlements usually consist of 200 to 700 single-family houses built along an irrigation canal or the banks of a river. Traditionally, mud fences surround the houses and flat roofs cover them, and each house is closely connected with an adjacent garden, orchard or vineyard. In the mountains the villages are located in narrow valleys, form smaller settlements, usually 15 to 20 households. On the steep slopes the flat roof of one house often serves as the yard for the house above it.

### 5.3.8 Land Use and Agriculture

388 Nurobod is an agricultural region, the total land size is about 92,797 ha. A large proportion of the production of Nurobod district is represented by agricultural products. The total size of agricultural land is about 3,062 ha. The following branches of agriculture are well developed: annual crop growing (including potato and other vegetables), cattle-breeding (30,074 cattle and 91,925 sheep), and poultry-raising (83,581). Fruit growing is also a well-developed branch: From 379 ha garden land 74 ha is for mulberry production and 2 ha is under the vineyards. About 63,330 ha of land is under the pastures.

389 In Tajikistan less than 7% of the land area is arable and cotton is the predominant crop. Other significant agricultural products include grain, fruits, grapes, vegetables, cattle, sheep and goats. The main activity of local population is farming, the distribution of land resources is presented in **Table 32** below.

**Table 32. Land Use in Road Project Corridor**

Category of land	Size of Land (Ha)
Arable	3062
From Arable Irrigated	1513
Perennial Plants	455
From Perennials Orchards	379
Mulberry	74
Vineyards	2
Land of under the personal subsidiary plots	889
Land for the passage of livestock	8882
Meadows	828
Land for yards total	2727
Land for yards irrigated	864
Land for Yards under the houses and structures	637
Forest land	1801

Category of land	Size of Land (Ha)
Underwater lands	1394
Pastures	63330
Other lands	16366

390 **Figures 32** and **33** present photos from rural areas under the project impact.



**Figure 32. View from the old embankment to the east**



**Figure 33. View from the top of old embankment to the north**

### 5.3.9 Education System in Tajikistan and Nurobod District

391 Education in Tajikistan consists of four years of primary school followed by two stages of secondary school (lasting five and two years, respectively). Attendance at school is mandatory from age seven to seventeen. In accordance with the Law on Higher Education and Professional Postgraduate The country provides for the following levels of higher education:

- Specialist degree (darajai mutakhassis), with studies lasting five years. Five-year university degree is equivalent to bachelor (four years) and master degree (one year).

- Bachelor degree (darajai bakalavr), with studies lasting not less than four years except for medicine (no less than five years);
- Master degree (darajai magistr), with studies lasting minimum of one year.

392 Some higher education institutions still apply an old system by providing specialist degree where upon graduation a specialist diploma is awarded, which is equivalently recognized as a master degree by Higher Education and Professional Postgraduate Education System of Tajikistan. On the other hand, some higher education institutions award Bachelor degrees after four years of studying. Thus, those which do not have a Bachelor degree in a specialty cannot start a Master degree. Tajik is the main language of instruction through secondary school, but in 2003 Russian was restored as a mandatory second language.

393 The Human Rights Measurement Initiative (HRMI)<sup>19</sup> finds that Tajikistan is fulfilling 98.9% of what it should be fulfilling for the right to education based on the country's level of income. HRMI breaks down the right to education by looking at the rights to both primary education and secondary education. While taking into consideration Tajikistan's income level, the nation is achieving 97.9% of what should be possible based on its resources (income) for primary education and 100 % for secondary education.

394 The infrastructure for education porpoises is quite well developed in the district: there are two kindergarten and 85 schools in the area – 23 primary schools, 19 basic, 43 middle schools and two Vocational Colleges. Currently, the number of school students in the district is 16,870 and the number of Kindergarten students is 75. The total number of school teachers is 928.

395 There are eight schools in Safedchashma and two schools in the town of Darband. A majority of schools lack proper sanitation and water facilities. In cases where the piped water is not available, the spring water is used.

### **5.3.10 Healthcare and Social Wellbeing**

396 The system of medical care in Tajikistan does not adequately protect public health in a time when environmental pollution has become a major problem because of the careless application of pesticides and chemicals in agriculture. Both the inhospitable environment and the low general standard of living have led to infant and maternal mortality rates exceeding those of any other Central Asian republic, and the rates throughout Central Asia far exceed those recorded in the West. Amenities such as paved roads, modern communications, potable running water, indoor toilets, and modern indoor heating and electrification are still confined to urban areas. Conditions in most rural areas remain primitive, though the state is working to improve housing and community services.

397 The Ministry of Health is responsible for national health policy, but has no control over the overall health budget, and directly manages only health facilities at the national level. Local authorities are responsible for most social services, including health and education.

398 According to the 2017 Tajikistan Demographic and Health Survey, there has been a steady decline in under-five mortality from 43 deaths per 1,000 live births in 2012 to 33 deaths per 1,000 live births in 2017. During the same period, infant mortality fell from 19 to 13 per 1,000 births. While this reflects a positive trend, the current pace remains slow and requires urgent attention.

399 Insufficient sanitation and hygiene poor water supply systems, old practices still used in hospitals, and poor condition of health care facilities remain among the leading contributors to high neonatal and infant mortality. These deficiencies not only hinder health-seeking and service uptake, but also create challenges for effective infection prevention and control, and hygiene promotion for mothers and service providers. Water supply, hygiene and sanitation have a significant impact on the survival of mothers and children.

400 Lack of proper nutrition continues to be a major health problem, causing preventable deaths and delaying the physical and cognitive development of children in Tajikistan. About 21% of children under the age of five are stunted (due to chronic malnutrition). Many women and

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<sup>19</sup> <https://rightstracker.org/country/TJK>

children also suffer from micronutrient deficiencies, as evidenced by high rates of anemia and iodine deficiency.

401 In Tajikistan, more than 4 out of 10 children are anemic. Only 36 percent of mothers in Tajikistan breastfeed exclusively for the first six months. Nearly half of them start giving their babies complementary foods between four and six months, and one in ten mothers introduce complementary foods even earlier. Thirty-seven percent of children suffer from vitamin A deficiency and 12 percent from vitamin D deficiency.

402 Only 40 percent of children aged 6-23 months receive optimal food variety and frequency of meals. Malnutrition also contributes to poor maternal health. About 41% percent of women of childbearing age are anemic. Poor maternal nutrition before conception and during pregnancy and in the first two years of life threatens the chances of a safe birth and the health of children and can cause growing delays.

403 As a national facilitator in Country of “Scale Up Nutrition” since 2013, UNICEF has been supporting the improvement of coordination mechanisms by building technical capacity to monitor, analyze, plan and develop sustainable mechanisms for proper nutrition interventions at the national and regional levels.

404 UNICEF operates with the World Food Program and the World Health Organization assists the Ministry of Health and Social Protection in the implementation of the National Protocol for the Integrated Management of Acute Malnutrition (IMAM protocol) to increase access to acute malnutrition for children suffering from acute malnutrition and, ultimately to further reduce depletion. This collaboration is followed by capacity building activities for partners across the country. UNICEF is collaborating with other development partners to ensure the availability of vitamin A, iron-folic acid, water-spraying sources and therapeutic nutrition in health facilities.

405 According to a 2016 World Bank report<sup>20</sup>, only 38% of the general population of Tajikistan has access to a safely managed drinking water system. About 78% of the population use basic drinking water services and only 53% have access to basic sanitation. The situation is even worse in rural areas.

406 Inappropriate water supply, sanitation and hygiene (WASH) in maternity hospitals and in medical facilities is one of the leading contributors to high neonatal and infant mortality. The lack of WASH facilities not only hinders the search for and use of services by pregnant women, but also complicates effective infection control and hygiene by newborn mothers. Out of 73 of maternity hospitals in Tajikistan, where more than 80% of births take place, 65 (89%) do not meet the minimum required WASH standards. Evidence is growing that unhygienic conditions during labor and delivery, at home or in health care facilities, and poor hygiene after childbirth are responsible for 8% of maternal deaths worldwide and approximately 10-15% of maternal deaths occur in developing countries.

407 A WB study showed<sup>21</sup> that 80 % of infant deaths in hospitals in Tajikistan are registered within the first month after the birth of a child. About 70% of these deaths occur in the first week of life and almost 70 % in the first six days of life.

408 Also, the situation in schools in Tajikistan is not sufficient. Only 55 % of schools have access to safe water; the lack of safe drinking water is a critical factor for the 25% of school students who do not attend or drop out of school; only 48 % of schools have access to functioning water systems; 86% of schools have separate toilets for boys and girls; and 84% of school toilets are simple pit latrines.

409 UNICEF focuses on rehabilitating or building infrastructure in schools and health facilities and promoting safe hygiene behaviors for health workers and schoolchildren. It is working closely with the Ministry of Health and Social Protection of the Population, the Ministry of

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<sup>20</sup> <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/430241498807578979/tajikistan-health-services-improvement-project-audit-report-for-the-year-ended-december-31-2016>

<sup>21</sup> Ibid

Education and Science, other development partners, and the Ministry of Water Resources and Energy to map health and educational institutions, improve infrastructure and develop standards for schools and medical institutions, and guidelines and messages to enable schoolchildren and healthcare workers to change their hygiene behaviors. In its work in Tajikistan, UNICEF uses the best international practices, including information on the promotion of menstrual hygiene. To save newborn lives, UNICEF is working to improve WASH conditions in maternity wards and to promote hygiene.

410 There are 45 medical facilities in the Nurobod District with 245 beds and 10 pharmacies. The number of medical personnel is 251; 45 are doctors among them.

### 5.3.11 Transport Facilities and Telecommunication

411 Public transport in the area is intermittent and is based on independent operators/ taxi drivers using either small vans, minibuses or jeeps. **Table 33** shows the main types of the transport present in Project area. There is no fixed schedule, and transport departs when full (from market places and other areas of congregation). There are no visible bus stations/ stops with amenities along the road.

**Table 33. Number of vehicles by type (source: Passport of Nurobod District, 2022),**

Total Number of Vehicles	2930
State owned	78
Car	2695
Trucks	201
Buses and small buses	12
Private Vehicle	2848
Private Cars	2635
Trucks	201

412 Total length of the motor roads in the district is about 165 km, the length of secondary roads is about 70 km and length of the internal roads is about 91 km.

413 A digital fixed-line telephone network is developed throughout the country. Mobile telephone service is available in all major urban areas and in Nurobod District. There is only one internet service provider, which is managed by the state-run company Tajiktelecom.

### 5.3.12 Energy, Water Supply and Other Public Amenities

414 Electricity is available in all Project villages; however, energy supply is intermittent, especially in the winter period when water levels that feed water reservoirs for hydropower stations are low. Only Darband town has piped water, the total length of water supply system is 26 km.

415 The majority of population in rural areas use spring water. There are 11 electricity and water supply stations in the district. **Table 34** shows the main public facilities available in the Nurobod district.

**Table 34. Enterprises in Nurobod District (Source: official passport of Nurobod District, 2023)**

Public Facility	Number
Catering enterprises	18
Trade point	323
Industrial enterprise	4
Club	4
Library	22
Museum	2
Farm	913
Mosque (Darband and Safedchashma)	8
Special Public Place for praying (Darband and Safedchashma)	6

Cultural centre/ Chaihana (Darband and Safedchashma)	7
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416 Darband and Safedchashma have a mosque and a chaikhona (tea house) where village men meet each other. In these villages there are small shops and businesses along the central village road. Other services such as larger markets and administrative services are available only in the town of Darband and administrative center.

### 5.3.13 Annual Income

417 Regular wages, pension subsidies, agriculture, and wage employment are major contributors to the income of households living in nearby communities. The main sources of income are wages from the public and private sectors. After comes income from agriculture, temporary works, private business, and pension/state allowances/ remittances. The highest number of households have income from pensions, state allowances, and remittances.

418 The income for most households in the region is low to very low and is divided in three categories: 300-1,000 Tajik Somani (TJS) (10.57%), 1,100-2,000 TJS (49.63%) and 2,100-3,000 (24.45%) per month. Only 15,35 % of households fall under fourth and fifth categories: 3,000- 5,000 and 5,000 and more. The average monthly expenditure for the surveyed households is 1,985 TJS, most of this money is used (54.45%) for food.

### 5.3.14 Formal and Informal Economic Activities

419 The major economic activities in the Project villages are agriculture and animal husbandry. Wheat is the major crop in the area. Almost every household has some land and livestock. Animals raised in the area include cattle, sheep, goats and horses. **Table 35** shows the distribution of number of livestock (30074 Heads) in Nurobod District.

**Table 35. The livestock in Nurobod District**

Domestic Animals	Number (Heads/Families)
Cows	21924
Sheep and rams	91925
Poultry	83581
Bee Families	10516

### 5.3.15 Cultural Heritage and Historical Assets

420 There are no known historical or cultural sites within the project Aol or its immediate surroundings. Other important sites and places in the broader project area are listed in **Table 36**.

**Table 36. Important Cultural and Religious Assets in the vicinity of the project area**

#	Location	Mosque	Cemetery
1.	Darband	7	7
2.	Safedchashma	1	1

### 5.3.16 Gender Analysis

421 Since 2015, the Government of the Republic of Tajikistan has made the following significant achievements in the implementation of the Beijing Declaration and Platform for Action:

- I. Improved the legal framework for achieving gender equality in the Republic of Tajikistan;
- II. Included issues related to reduction of gender inequality as a cross-cutting theme in the 2030 National Development Strategy (NDS 2030) and in the Mid-Term Development Programme 2016–2020 (MtDP 2016–2020) and adopted new gender-sensitive programmes;

- III. Built the capacity to introduce the main institutional mechanism for the advancement of women, the coordination of actions for the implementation of gender policies, and the implementation of interim measures;
- IV. Created mechanisms for the implementation of policies to prevent domestic violence.

422 Despite all efforts, women in Tajikistan are not reaching their full human development potential due to gender inequalities across three dimensions: i) reproductive health, ii) empowerment (measured by educational attainment and political participation), and iii) labor market participation. The country has Gender Inequality Index value of 0.285, ranking it 68 out of 170 countries in 2021. However, gender inequalities in Tajikistan are resulting in a smaller loss to female human development than in 1995 thanks to a decrease in maternal deaths, more women in parliament, and a higher share of women with at least some secondary education. Women's labor force participation did not change significantly while men increased their participation by 4.3 percentage points during the same period.<sup>22</sup>

### 5.3.17 Baseline Information of Nearest Settlements of Project Area

423 The nearest residential houses are located about 700m away from the start point of the project at the left bank and about 500m away from the right bank. In the town of Darband, the nearest settlement to the bridge is the 7th mahala with population of 421 people, including 201 women. The number of households is 93.

424 In the Jamoat "Safedchashma", the nearest settlement to the proposed bridge is the village of Dikhi-Gulmon. As many as 146 persons live in Dikhi-Gulmon, including 75 men and 71 women.

### 5.3.18 Main Gender Differences in Project Area

425 AIIB ESP and ESS1 clearly state that any adverse gender-based risks and impacts should be identified and mitigation measures should be developed to reduce these risks and impacts; equal opportunities and women's socio-economic empowerment should be promoted by optimizing project design. By referring to the analysis dimensions of gender differences by international financial institutions such as the World Bank and the Asian Development Bank (ADB), and in combination with the actual situation of the project, three dimensions of participation in decision-making, economic participation and development capacity are selected to analyze gender differences.

426 Female headed households in the project area are of lower economic status than male headed households. The income of households in the project area is still mainly supported by men. During the individual meetings, it was mentioned that the decision-making power of the family was mainly in the hands of men, and women were limited by lower educational level, household activities and duties on taking care of the elderly and children, which limited women to work outside due to many objective factors, resulting in that women's contribution to family economic activities was lower than that of men, and their family economic status was lower than that of men.

427 Available data<sup>23</sup> for the Project Jamoats shows that 1,076 live in registered poor households. Data for villages was not available or was not systematically recorded. The Project Jamoats have a poor household rate of between 9.68% in Darband and 25.61% in Safedcheshma, where the poor household rate is highest. The villagers claim that the number of poor people is much higher because many people do not proceed with the procedure for registering as a poor household due to the complexity of the procedure.

428 Jamoats' data shows that 773 (**see Table 37**) households are headed by a woman. The woman-headed households rate ranges from 5.76% in Muchiharf to 17.01% in Komsolobod Jamoat. These are single- woman households, where women are mostly widows or, less

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<sup>22</sup> <https://hdr.undp.org/data-center/specific-country-data#/countries/TJK>, 2021 data

<sup>23</sup> Gender Impact Assessment Report prepared by ADB for the Obigarm- Nurobod Road Project. (December 2018)

commonly, divorced. The poverty rate for the women-headed households is much higher than the general poverty rate in the Project villages. In female-headed households, the poverty rate ranges from 25% in Darband to 64.42% in Muchiharf Jamoat.

**Table 37. Indicators of women's roles by the Jamoats of Nurobod District**

District	Jamoat	No of HH	No of poor HH	% of poor HH	Woman head of HH	% of women-head of HH	Woman-headed poor HH	% of poor woman-headed HH	No of women on decision-making position
Nurobod	Hakimi	1,753	190	10.84	261	14.89	76	29.11	20
	Muchiharf	1,806	384	21.26	104	5.76	67	64.42	21
	Komsomolobod	1,846	235	12.73	314	17.01	95	30.25	171
	Safedcheshma	937	240	25.61	78	8.32	46	58.97	48
	Darband	310	30	9.68	16	5.16	4	25.00	165
Total		6,652	1,076	80.12	773	51.14	288	207.25	425

429 A Social and Gender Impact Assessment was conducted by ADB for the whole road corridor in 2018. According to the information obtained during the community and individual meetings, women have less access to employment opportunities and limited vocational skills than men. Rural women in the project area suffer from higher employment difficulties in the labor market than men, such as lower access to employment information, thus reducing their opportunities to participate in income-generating activities (e.g. creation of microenterprises or participation in cooperative organizations). In addition, the everyday household activities also make women less time to participate in various employment opportunities and skills training activities than men. The assessment findings were incorporated in the design of project activities on women economic empowerment and development under Packages 1&2 and will be expanded to women beneficiaries in Package 3.

## 6. IMPACT ASSESSMENT AND MITIGATION MEASURES

430 This section details the potential direct and indirect impacts and risks in both short-term and long terms resulting both from construction and operation phases of the Project. It also proposes mitigation measures to limit any negative impacts identified. Based on the adopted Impact Assessment methodology, steps and procedure it discusses the types, phases and magnitude of the impacts and their potential environmental and social consequences that may arise due to the Project implementation and suggests measures to mitigate them.

### 6.1 Impact Assessment Methodology

431 The significance of potential impacts has been assessed using the risk assessment methodology that considers impact magnitude and sensitivity of receptors, described below.

#### 6.1.1 Types of Impacts

432 The types of impacts that may arise during Project works can be classified as follows:

- i. Direct Impacts - i.e., direct impacts due to the Project itself such as the impacts to air quality resulting from construction activities, equipment and vehicles. Direct impacts also include the impact of construction expenditures in the local economy.
- ii. Indirect Impacts - i.e., those resulting from activities prompted by the Project, but not directly attributable to it. The use of rock and other construction materials, for example, has an indirect impact of increasing the demand for these materials.
- iii. Cumulative Impacts - i.e., impacts in conjunction with other activities. A single bridge construction may not exert a significant environmental impact, but if other projects are developed in the same area, the cumulative or additive effect could be more significant.
- iv. Compliance Impacts – i.e., impacts that would occur if correct compliance mechanisms were not enforced.

433 These impact categories may be either:

- a. Short-term – i.e., impacts which occur during construction and affect land use, air quality and other factors. Many of these impacts, however, will be short-lived and without long-lasting effects. Even the effects of some relatively significant impacts such as borrow pits, for example, may be eventually erased if appropriate mitigation actions are taken. Many potential short-term negative impacts can be avoided or otherwise mitigated through proper engineering designs and by requiring Contractors to apply environmentally appropriate construction methods. or;
- b. Long-term – i.e., construction impacts that could, for example, affect regional; affect regional hydrology and flooding if poor design practices are used.

434 Both short-term and long-term impacts may be either beneficial or adverse. Short-term positive impacts will include, for example, the generation of employment opportunities during construction period. Long-term benefits will include enhanced development opportunities, improved transport services, easier access to commercial and service facilities; faster communications and commodity transport; improved access to markets and growth centers and increased services and commercial facilities.

#### 6.1.2 Impact Magnitude

435 The potential impacts of the project have been categorized as major, moderate, minor or nominal based on consideration of the parameters such as: i) duration of the impact; ii) spatial extent of the impact; iii) reversibility; iv) likelihood; and v) legal standards and established professional criteria. The magnitude categories are defined in **Table 38**.

**Table 38. Parameters of Determining of Magnitude**

Parameter	Major	Medium	Minor	Nominal
Duration of potential impact	Long term (more than 35 years)	Medium Term Lifespan of the project (5 to 15 years)	Limited to construction period	Temporary with no detectable potential impact
Spatial extent of the potential impact	Widespread far beyond project boundaries	Beyond immediate project components, site boundaries or local area	Within project boundary	Specific location within project component or site boundaries with no detectable potential impact
Reversibility of potential impacts	Potential impact is effectively permanent, requiring considerable intervention to return to baseline	Baseline requires a year or so with some interventions to return to baseline	Baseline returns naturally or with limited intervention within a few months	Baseline remains constant
Legal standards and established professional criteria	Breaches national standards and or international guidelines/obligations	Complies with limits given in national standards but breaches international lender guidelines in one or more parameters	Meets minimum national standard limits or international guidelines	Not applicable
Likelihood of potential impacts occurring	Occurs under typical operating or construction conditions (Certain)	Occurs under worst case (negative impact) or best case (positive impact) operating conditions (Likely)	Occurs under abnormal, exceptional or emergency conditions (occasional)	Unlikely to occur

### 6.1.3 Sensitivity of Receptors

436 The sensitivity of a receptor has been determined based on review of the population (including proximity / numbers / vulnerability) and presence of features on the site or the surrounding area. Criteria for determining receptor sensitivity of the Project's potential impacts are outlined in **Table 39**.

**Table 39. Criteria for Determining Sensitivity**

Sensitivity Determination	Definition
Very Severe	Vulnerable receptor with little or no capacity to absorb proposed changes or minimal opportunities for mitigation.

Sensitivity Determination	Definition
Severe	Vulnerable receptor with little capacity to absorb proposed changes or limited opportunities for mitigation.
Mild	Vulnerable receptor with some capacity to absorb proposed changes or moderate opportunities for mitigation
Low	Vulnerable receptor with good capacity to absorb proposed changes or/and good opportunities for mitigation

437 Within the determined zone of the direct Project influence, most of the identified Receptors have Low significance in accordance with above criteria. The only Receptor of the mild sensitivity is the surface water of Surkhob river and the future Rogun HPP reservoir.

#### 6.1.4 Impact Significance

438 Following the determination of impact magnitude and sensitivity of the receiving environment or potential receptors, the significance of each potential impact has been established using the impact significance matrix shown below in **Table 40**.

**Table 40. Matrix for Defining of Impact Significance**

Magnitude of Impact	Sensitivity of Receptors			
	Very Severe	Severe	Mild	Low
Major	Critical	High	Moderate	Minimal
Medium	High	High	Moderate	Minimal
Minor	Moderate	Moderate	Low	Minimal
Nominal	Minimal	Minimal	Minimal	Minimal

#### 6.1.5 Mitigation Approach

439 AIIB ESP (2019) requires that all potential environmental impacts and risks of a project be investigated and where necessary effectively managed. Mitigation measures developed for the project follow mitigation hierarchy consisting of three levels including:

- **Avoidance** is an approach normally called Design Mitigation. When applied during the design stage, it allows for the assessment process to influence and inform the design of the project and results in complete avoidance of the potential impact. This is a first priority mitigation.
- **Minimizing** of the impacts which could not be avoided during the design stage.
- **Mitigating** the minimized or reduced impacts with the help of appropriate measures (mitigation measures)
- **Compensation/offset** of the impact which cannot be reduced to the acceptable level.

## 6.2 Summary of the Anticipated Impacts

440 The project's potential environmental and social impacts have been assessed with the help of methodology described in **Section 6.1** above. These impacts and their significance are summarized in **Table 41** and discussed in the subsequent sections.

**Table 41. Summary of the E&S and OHS Risks**

Potential Impacts	Duration of Impact	Spatial Extent	Reversible or not	Likelihood	Magnitude	Sensitivity	Significance Prior to Mitigation	Significance after Mitigation
Improved Transport System	Long-term	Local	Yes	Certain	Major	N/A	High Positive	
<b>Design Phase Impacts and Risks</b>								
Land acquisition and resettlement including temporary land requirements for camps and other project facilities	N/A	N/A	N/A	Unlikely	Minor	Low	Low	Minimal
Loss of farmlands and income	N/A	N/A	N/A	Unlikely	Minor	Low	Low	Minimal
<b>Environment impacts during construction phase</b>								
Dust and Air pollution	Short term	Widespread	Yes	Certain	Medium	Mild	Moderate	Low
Landscape and Topography	Mostly long-term	Local	Mostly no	Certain	Medium to major	Mild	Moderate	Low
Soil and land use changes	Short term	Within project boundary	Yes	Certain	Medium	Mild	Moderate	Minimal
Impacts of borrow areas	Short term	Local	Yes	Certain	Medium	Mild	Moderate	Low
Water Quality	Short term	Local	Yes	Certain	Medium	Mild	Moderate	Low
Groundwater	Short-term	Local	Yes	Uncertain	Minor	Mild	Low	Minimal
Hydrology	Short-term	local	yes	Uncertain	Minor	Mild	Low	Minimal
Wastes (including spoil, domestic and hazardous)	Short term	Local	Yes	Certain	Medium	Severe	High	Low
Geological Resources	Short term	Local	Yes	Certain	Medium	Mild	Low	Minimal
Noise and vibration	Short term	Local	Yes	Certain	Medium	Mild	Moderate	Low
Impacts on cultural resources	Short term	Local	Yes	Unlikely	Minor	Mild	Low	Minimal
Impacts of batching plant and crushing plant	Short term	Local	Yes	likely	Medium	Mild	Moderate	Low
Impacts on Biodiversity and Habitats including loss of trees	Long-term	Local	No	Unlikely	Minor	Mild	Low	Minimal

Potential Impacts	Duration of Impact	Spatial Extent	Reversible or not	Likelihood	Magnitude	Sensitivity	Significance Prior to Mitigation	Significance after Mitigation
Impact of Camps	Short -term	Local	Yes	Likely	Medium	Mild	Moderate	Minimal
Occupational health and safety	Short term	Local	Yes	Certain	Medium	Severe	High	Low
<b>Social impacts during construction phase</b>								
Community health and safety including Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH)	Short term	Mostly local	Yes	Likely	Medium	Mild	Moderate	Low
Disturbance to the traffic	Short term	Local	Yes	Certain	Medium	Mild	Moderate	Minimal
Influx of workers and labor issues	Short term	Local	Yes	Likely	Medium	Mild	Moderate	Low
<b>Environmental impacts during O&amp;M</b>								
Accidents with the spills of the harmful substances	Short term	Local	No	Occasional	Medium	Severe	High	Low
Generation of wastes including hazardous materials	Long term	Local	Yes	Certain	Major	Mild	Moderate	Low
Air pollution	Long term	Widespread	Yes	Certain	Medium	Mild	Moderate	Low
Noise and vibration	Long term	Local	Yes	Certain	Medium	Severe	Moderate	Low
Water pollution	Long term	Widespread	Yes	Certain	Major	Mild	Moderate	Low
Occupational health and safety	Short term	Local	Yes	Likely	Medium	Severe	High	Low
Climate Change	Long term	Widespread	No	Likely	Medium	Mild	Moderate	Low
<b>Social impacts during O&amp;M</b>								
Emergency situations	Short term	Local	Yes	Occasional	Medium	Severe	High	Low

## **6.3 Design Phase Impacts and Mitigation**

441 The Project Design involves certain physical activities that can cause environmental and social impacts, especially during field studies. For example, the geotechnical studies may require drilling of the boreholes and the development of exploration pits. They may need the construction of temporary access roads which lead to the removal of the vegetation cover.

442 However, as a rule, design phase activities do not cause notable physical or social disturbance to the project due to negligible extent of such activities especially compared to the construction phase of the project. With the observance of the established work procedure and best practices such impacts can be avoided or minimized.

443 The more serious pre-construction impacts may be caused by design flaws and improper planning of the works when the environmental and social consequences are not properly considered and integrated. Consultants have reviewed the works carried out during the Soviet era and concluded that modification was needed to bring the bridge design up to current standards.

### **Mitigation**

444 The Bidding Documents for the Detailed Design Contractor will include a set of E&S documentation, including this ESIA that will provide them with proper guidance on the E&S issues of the Project.

## **6.4 Physical Resources**

### **6.4.1 Air Quality**

445 Adverse air quality impacts can occur due to: emission of inorganic dust from digging /loading works; emission of harmful substances; emissions from combustion of diesel used by generators, transportation vehicles and construction machinery (crushers /asphalt/ concrete batching plants); as well as smoke arising from road construction works during asphalt works. Welding works cause welding aerosol and manganese monoxide emissions.

446 Air pollution is known to cause a variety of health risks to both the workers and the public general. Emissions from crushers and quarry sites can cause health impacts ranging from coughing, influenza, respiratory ailments, to irritation in eyes and reduction in visibility. Children are at particular risk for such negative impacts which, however, are most of the time temporary and localized.

### **Construction Phase**

447 Air pollution is likely to occur in this Project during the construction phase, originating from a variety of sources:

- Workshops, crushing plants and concrete batching plants;
- Exhaust emission from construction machinery, vehicles and diesel generators;
- Dust emissions from crushing plant, excavations
- Dust and exhaust emissions from batching plant
- Open burning of waste material
- Dust generated from haul roads, unpaved roads, exposed soils, material stock-piles, etc.

448 Fugitive emissions will be emitted on a longer-term basis from stationary sources such as quarries, borrow pits, concrete batching plants and rock crushing plant. Haulage routes may potentially cause traffic congestion and dust emissions if the routes are unpaved. The impacts may be summarized as follows:

- (i) Exhaust emissions from the operation of construction machinery (e.g., Nitrogen Oxides (NO<sub>x</sub>), Sulphur Oxides (SO<sub>x</sub>) and Carbon Monoxide (CO));
- (ii) Open burning of waste materials; and

- (iii) Dust (Particulate Matter (PM)) generated from quarries, borrow pits, haulage roads, unpaved roads, exposed soils and material stockpiles.

### **Operation and Maintenance Impacts**

449 The air quality impacts during the operation phase are mainly associated with the anticipated significant increase in traffic. However, the air quality modeling conducted during the previous ESIA stage through the use of the software RLU 2012 for the forecasted traffic of 5,000 vehicles per day detected that the concentration of the seven air pollutants on the road will be far below the IFC Guideline Values<sup>24</sup>.

### **Mitigation measures for design phase**

450 The selection and placing of facilities that can be a potential source of fugitive emissions in an area where they can cause the least impact on human and ecologic receptors. It relates to quarries, borrow pits, concrete batching plants and rock crushing plant.

451 During the design phase the preliminary locations of borrow pits are proposed in Nurobod district. Locations for quarry sites, borrow pits, rock-crushing and concrete batching plants will require approval from the CSC and PIURR during the Construction phase. Efforts will be made to ensure that these facilities are as near to the Project location as practical to avoid unnecessary journeys and potential dust issues from vehicle movements during construction works.

452 Sensitive receptors, other than the Project workers are absent within the Project AOI, however during the transportation of the materials extracted from the quarries and borrow pits the haulage routes can pass through the settlements.

### **Mitigation measures for the construction phase**

453 To limit air pollution during the construction phase, the Contractor will take the following measures:

- (i) No furnaces, boilers or other similar plant or equipment using any fuel that may produce air pollutants will be installed without prior written consent of the CSC. Construction equipment will be maintained to a good standard and fitted with pollution control devices regularly monitored by the Contractor and CSC.
- (ii) No burning of debris or other materials will occur on the Site without permission of the CSC.
- (iii) The Contractor will ensure that material stockpiles are located in enclosed areas and be covered with tarpaulins or other such suitable covering to prevent material becoming airborne.
- (iv) All trucks used for transporting materials to and from the site will be covered with canvas tarpaulins, or other acceptable type cover (which will be properly secured) to prevent debris and/or materials from falling from or being blown off the vehicle(s).
- (v) Hard surfaces will be required in construction areas with regular movements of vehicles. Effective use of water sprays will be implemented (e.g., all roads within the construction areas of the Site will be sprayed at least twice each day, and more, if necessary, to control dust to the satisfaction of the CSC).
- (vi) Liaison with the community will be maintained where relevant.
- (vii) No quarry, rock crushing plant or concrete batching plant will be located in vicinity of any urban area or sensitive receptor. The locations of these facilities will be identified by the Contractor and detailed location plan presented to CSC for review and approval.
- (viii) Crushing plant and batching plant will be equipped with dust suppression mechanism (such as wet scrubbers).
- (ix) Dust generation will be controlled by the spraying water with the water tanks.
- (x) The contractor will maintain construction equipment to good standard and avoid, as much as possible, idling of engines.

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<sup>24</sup> P:\Abt743\98620\Bearbeitung\\_RaUmw\Text\Review April 2020\98620\_Air\_Emissions\_Rogun\_Bypass\_20200429.docx

454 Air quality monitoring will also be undertaken by the Contractor before the starting of the civil works and its results included in Environmental and Social Monitoring Reports of the Contractor.

### **Residual Impacts**

455 With the implementation of the above mitigation measures, the potential impacts associated with air quality deterioration are likely to be adequately addressed and hence the significance of residual impact is likely to be Minimal.

## **6.4.2 Impacts to Landscape and Topography**

456 The Rogun HPP impoundment will completely change the landscape in the Project area by creating a vast water surface within the beautiful mountainous valley. It is obvious that the new bridge may become a part of the scenery which is going to be one of the best tourist attractions in the country.

### **Pre-construction Phase**

457 The aesthetic value of the Project could be compromised, if the importance of the landscape during the Design Phase is underestimated.

### **Mitigation**

- The aesthetic design approach adopted during the FS will be further developed during the Detailed Design and Construction stage. The bridge design and layout must be aesthetically pleasing and in harmony with the existing environment.
- Design of erosion protection measures at lower parts of bridge embankments. Prefabricated concrete protection plates prevent erosion processes at the lower and lateral parts of bridge and river embankments. Detailed design of the respective protection measure is drafted in the technical design documentation for the respective bridges.

### **Construction Phase**

458 During the construction phase alteration of landscape and topography is anticipated due to extraction of material. However, the bulk earthworks carried out during the soviet period resulted in the formation of abandoned embankment which also can serve as a source of material, reducing the need for the development of off-site borrow areas from quarries and borrow pits.

459 It is estimated that the concrete works for the bridge construction will require approximately 12,000m<sup>3</sup> of fine aggregates and about 18,000m<sup>3</sup> of coarse aggregate. The exact locations of the sources of material will be determined by the contractor based on the quality requirements and other criteria. It is most likely that material will be extracted from the area subject to inundation. However, it is possible that these borrow areas may cause a number of adverse impacts, including loss of fertile soil, damage to cultivation fields, soil erosion, devaluation of land value, and safety hazards.

460 The construction work will also include excavation at the site for construction of foundation, abatements and approaches. However, the amount of spoil material generated by the construction work is anticipated to be negligible as the construction of the piers is based on the piles.

### **Mitigation**

- After completion of construction works and the use of borrow pits, the landscape shall be restored to a standard of equal quality to its original condition.
- Proper landscaping will be conducted to restore the campsites, facilities, and borrow pits area, including removing debris, excess soil, and backfilling where feasible.
- All spoil material will be removed and disposed appropriately.

### **Residual Impacts**

461 After the completion of restoration as described above, the residual impacts of the project on landscape and topography are anticipated to be Minimal.

#### **6.4.3 Impacts to Soil**

462 Potential impacts of the project activities on soil may include:

- (i) Contamination due to spills or hazardous materials - soil contamination is a possibility resulting from poorly managed fuels, oils, pest control substances and other hazardous liquids used during the project works especially in the construction camp and equipment maintenance area. Accidental spills during the operation of bridge and maintenance of approach roads can also cause soil contamination.
- (ii) Erosion – It is possible, that without adequate protection measures soil erosion could occur on the approach road embankments. Disturbance of soils during construction including (and particularly) from movement of vehicles may lead to destruction of the integrity of upper soil layers. Damaged soil is more readily eroded and washed into water courses during rainfall events and can also form dust during dry periods. It is also possible that soil located close to surface waters could infiltrate the water courses during heavy rainfall and cause siltation of the river.
- (iii) Topsoil – The defined project AOI does not contain any valuable topsoil which is worth preservation for further use. However, impacts to topsoil may occur during the construction activities outside the currently defined Project AOI (e.g. excavation of borrow pits or setting up of construction camp). These impacts can include: compaction of topsoil; loss of topsoil by wind and water erosion and covering of topsoil by project works.

### **Mitigation Measures**

463 Mitigation related to the potential soil-related impacts is as follows:

- (i) Erosion - During construction, the Contractor will be responsible for ensuring material that is less susceptible to erosion will be selected for placement around bridges and culverts. In addition, the contractor will ensure re-vegetation of exposed areas including; (i) selection of fast growing and grazing resistant species of local grasses and shrubs; (ii) re-vegetation of all slopes and embankments at the first spring after the work or as appropriate; (iii) placement of fiber mats to encourage vegetation growth.
- (ii) The CSC and the Contractor will both be responsible for ensuring that embankments are monitored continuously during construction for signs of erosion, with the use of specially developed check-lists.
- (iii) As an erosion protection measure at riverbanks, natural stone fillings shall be used as additional measures if required.
- (iv) Topsoil – To reduce impacts to topsoil, the following measures will be employed by the Contractor; locate topsoil stockpiles outside drainage lines and protect stockpiles from erosion; construct diversion channels and silt fences around the topsoil stockpiles to prevent erosion and loss of topsoil; rip ground surface prior to the spreading of topsoil; limit equipment and vehicular movements to within the construction zones; remove unwanted materials from topsoil such as roots of trees, rubble and waste etc.
- (v) Long-term stockpiles of topsoil will immediately be protected to prevent erosion or loss of fertility. For erosion protection stockpiles will be covered with fast-growing vegetation, e.g. grass. Topsoil will be removed and reused to cover areas where excess materials are dumped and on road embankments.
- (vi) Contamination Due to Spills or Hazardous Materials. The Contractor, with oversight from the CSC, will ensure that:
  - All fuel and chemical storage (if any) will be sited on an impervious base within a bund and secured by fencing. The storage area will be located away from any watercourse or wetlands. The base and bund walls will be impermeable and of sufficient capacity to contain 110 % of the volume of tank (or one tank if more than one tank is located in the bund).

- The construction camp maintenance yard will be constructed on impervious hard standing with adequate drainage with the settling pond to collect spills, there will be no vehicle maintenance activities on open ground.
- Filling and refueling will be strictly controlled and subject to formal procedures. Drip pans will be placed under all filling and fueling areas. Waste oils will be stored and disposed of by a licensed contractor.
- All valves and trigger guns will be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.
- The contents of any tank or drum will be clearly marked. Measures will be taken to ensure that no contaminated discharges enter any soils.
- For the treatment of effluents to be discharged from the construction operations, sedimentation ponds will be provided to allow sediment to settle for periodic removal for disposal in designated site spoil areas. Water being discharged from these ponds will be regulated to ensure they are within turbidity limits.
- Spillage treatment kits will be arranged at site. Contaminated soil will be removed and treated separately.

### **Mitigation Measures Relating to Borrow Pits and Disposal sites**

- Excavation of borrow pits will be avoided where possible by reuse of existing spoil in construction, and locations will be selected in a manner that aims to minimize visual impacts.
- Borrow areas shall not be selected inside cultivation fields, and will be kept up to one meter deep. Borrow pits will be restored to minimize safety hazards, blockage of routes, or devaluation of land.
- Transportation of construction materials will be carried out strictly along the designated routes, in order to minimize the possibility impacts on receptors;
- Borrow pits will be returned to the state as reasonably possible close to the initial. In long-term prospects the rehabilitated road will significantly improve the landscape view along the road.
- Excavated unsuitable material will be timely removed from the sites of excavation and disposed in the designated sites. The contractor will identify suitable sites for temporary storage of wastes from construction sites in consultation with communities and government authorities. The waste shall be transported for disposal in a timely manner.
- If the Contractor intends to use any existing borrow pits, then a due diligence review should be carried out by the CSC to confirm that these new sites identified for use by the Contractor are indeed operating or operable in an appropriate manner. This will include review of the borrow pits operational license and its potential environmental impacts, such as its proximity to sensitive receptors. A copy of the agreement between the operator and the Contractor should also be provided to the CSC.
- For any new borrow pit to be opened and operated by the Contractor, the Contractor will be responsible for the preparation of a Borrow Pit Action Plan as part of SSESMP. The Borrow Pit Action Plan will be submitted to the CSC prior to the start of construction. The plan will identify the locations of all proposed borrow pits which will also be approved by both the CSC, CEP and representatives of the Ministry of Transport (executing agency). The plan will also indicate rehabilitation measures and implementation schedule for the borrow areas and access roads and address the sensitive issues of avoidance of transportation through residential areas as far as technically feasible and closure rehabilitation. The plan should ensure that:
  - Pit restoration will follow the completion of works in full compliance with all applicable standards and specifications.
  - Arrangements for opening and using material borrow pits will contain enforceable provisions.

- The excavation and restoration of the borrow areas and their surroundings, in an environmentally sound manner to the satisfaction of the CSC will be required before final acceptance and payment under the terms of contracts.
- Additional borrow pits will not be opened without the restoration of those areas no longer in use. Wet aggregates and/or provide cover on haul trucks to minimize dust emission and material spillage. In addition, watering of unpaved access roads for reduction of dust emission.
- The hauling traffic should be carried out only between 8 am and 6 pm. Locate stockpiles away from surface waters.

#### **6.4.4 Impacts on Surface Water Quality**

464 Impacts on quality of surface water could occur through improper operation of construction camps and associated manufacturing areas including crushing and grading, concrete and, asphalt production. Poor construction management around bridge and close to surface watercourses could also lead to pollution incidents. Similarly, any soil contamination caused by the project and discussed earlier has a potential to contaminate the water bodies in the area.

465 The project will require significant quantity of water for concrete works and other construction needs that may cause the conflict with the local population.

#### **Construction Phase**

466 Potential impacts on surface water in the construction phase can be from the bridge construction and improper management of the camps and facilities. They can include:

- Run-off from excavation, crushed and ground rock material from drilling, earth moving and spoil handling, concrete batching;
- Oil and chemical spills; washing of vehicles and other machinery;
- Piling activities;
- Waste effluents from camps;
- All other activities causing soil contamination discussed earlier can also cause water contamination.

467 The PMU has committed to ensuring construction within the river itself takes place only within the dry season, when there is no flowing water. Further to that, the headwaters of the Rogun dam are not expected to reach the project area until 2028, well after construction has completed. However, if bridge construction activities are to take place in water this may increase the silt load in the river and may also result in accidental spillage of concrete and liquid waste into the river. This may impact the ecology of rivers including fish species. In such a case, the ESIA would be subject to material change and revision would be required before any construction can continue.

#### **Mitigation Measures**

468 Potential adverse impacts in the Project Area will be avoided or otherwise minimized by ensuring the Contractor complies with the following:

- (i) The Contractor will consult with CEP to comply with the national legislation for waste water discharges in to the water bodies and will ensure that all required permits have been gathered prior to the excavation of any borehole.
- (ii) Good site practices should be followed at all times, ensuring chemicals are stored in properly bunded containers and that an emergency response plan is established in the event of spillage
- (iii) Construction within the river bed itself will only take place during the dry season (i.e. construction of foundations) and prior to the headwaters of the Rogun dam reaching the project site.

- (iv) Construction in close proximity to the river should follow proper on-site practices, include sand bags and WWTP's to ensure no sediment laden surface run off enters nearby water courses.
- (v) Carry out bridge construction works without interrupting the traffic on the temporary bypass passing through the Project AOI
- (vi) Contractor will be required to take appropriate measures to avoid and contain any spillage and pollution of the water, provide silt fences, sediment barriers or other devices to prevent migration of silt during construction within streams.
- (vii) All areas intended for storage of hazardous materials to be provided with adequate facilities to combat emergency situations complying all the applicable statutory stipulation;

For the treatment of effluent to be discharged, sedimentation ponds will be provided to allow sediment to settle for periodic removal for disposal in designated site spoil areas. Water being discharged from these ponds will be regulated to ensure they are within turbidity limits.

- (viii) Workers camps will be located at the safe distance from water bodies; Sewage from the toilets will go into lined septic tanks. Sewage disposal trucks will be used to periodically remove the sludge/sewage from the site and camps/ Ensure no waste materials are dumped in the river, including reinforced concrete debris.
- (ix) Ensure no waste materials are dumped in the river, including reinforced concrete debris.
- (x) The contractor will conduct consultation with local authorities to identify sources of water (for spraying and other construction requirements) that will not compete with the local population. Water use shall be minimized by recycling and reuse. Technical wastewater which will be generated as a result of cleaning and washing equipment, trucks and Batching Plant shall be used for dust suppression measures after treatment, as far as technically possible.

### **Operational Phase**

469 Drainage of run-off from the bridge decks, including accidental spillage, could flow directly to the river water and to the future impoundment if correct drainage is not installed on the bridge. This could be a problem if the bridge has accumulated oils and grease during dry periods and they are suddenly washed out during heavy rainfall. There is also increased risk of accidents with possible spills of harmful substances.

#### **Mitigation Measures for Operation Phase**

470 The bridge deck will be carefully cleaned from the oil and grease accumulated during the dry season before the start of the rainfall period.

471 The bridge drainage system will include the drain spouts will be installed from both sides of the bridge at approximately 3-m intervals and will be equipped with the initial treatment system including replaceable filters to prevent direct release of the drain water, which could be contaminated due to traffic and possible accidents.

472 A spill-contingency plan and emergency response plan will be prepared for the O&M phase of the Bridge and the entire road corridor. It is a set of procedures to be followed to minimize the effects of an abnormal event on the Project roads, such as a spill of oil, fuel or other substances that may harm drinking water resources or have adverse effects on the natural balance of sensitive areas. Additional measures to mitigate risk of accidents and spill of harmful substances are speed control and weighing stations. Appropriate budget should be allocated by MOT during the O&M phase of the Bridge (and the entire road corridor).

#### **Residual Impacts:**

473 After implementation of the above mitigation measures, the impacts of the project on the water resources will be adequately mitigated. Therefore, the significance of residual impacts will be Minimal.

#### **6.4.5 Impact to Groundwater Quality**

474 No groundwater table was detected in the area of the proposed Bridge as described in **Chapter 5** earlier, therefore no impacts on the groundwater are anticipated from the construction works. However, there will be significant use of fuel and lubricant outside the construction site e.g. at construction camps, workshops, quarries where groundwater table maybe available. Without a standardized material handling and storage protocol in place, contamination of nearby waters through surface runoff is likely. Other impacts on groundwater could occur from the washing out of concrete mixers onto bare soils, lack of oil and grease interceptor tanks in drainage systems.

##### **Mitigation Measures for Construction Phase**

475 The mitigation measures outlined for Hydrology – Surface water, will prevent impacts to groundwater as well as surface water. For example, the conditions relating to accidental spills will also prevent impacts to groundwater (and also to soils). Regarding extraction of groundwater; it is unlikely that groundwater will be required for construction activities. However, if boreholes are required, the Contractor will be responsible for obtaining all necessary permits for the drilling and operating of a borehole during the construction period. The CSC will ensure that all appropriate permits are in place before excavation of boreholes can begin. No toilets or septic tanks will be located closer than 500 m from any public water, bore hole or well used for drinking water supply.

476 Technical water in Project area can be sourced from Surkhob river without impacting on existing inhabitants. Although temporary deterioration is possible during the construction, the prevention and mitigation measures will be developed and integrated into design. No refueling of vehicles or equipment to take place within river beds or within 25 meters of the edge of the water course.

##### **Residual Impacts:**

477 After the implementation of the above-described mitigation measures, no residual impacts are anticipated.

#### **6.4.6 Alteration to Hydrology**

478 The construction of Rogun HPP dam will result in the significant alteration of the Hydrology of the river of Surkhob including the conversion of its section flowing through the Project AOI to the water reservoir. However, the Bridge construction will not cause any alteration of Surkhob River as the construction of the bridge piers will be completed before the inundation of the area and will not require the construction of any coffer dam. In fact no construction works will be carried out in the water.

479 Despite the fact that hydrology of the area will be completely altered due to the construction of Rogun Dam, the input of the proposed Project in this process is minimal if any and restricted to the foundations.

##### **Mitigation**

- Construction activities will be properly planned to ensure the completion of bridge piers before inundation.

##### **Residual Impact**

480 No residual impacts are anticipated if the mitigation measures are implemented.

#### **6.4.7 Waste Management**

481 Various types of wastes will be generated by different construction activities of this project, including excavated materials, construction spoils, domestic wastes and other construction wastes including hazardous wastes. They are discussed below.

482 Excavation for the bridge piers, abatements and approaches will generate excess spoils. If the excavated materials are not disposed properly, they may cause water and soil

contamination. Disposal of this spoil in cultivation fields will affect the crops and irrigation. Similarly, spoil disposal in built-up area will cause hinderance and traffic congestion. The spoils will also act as a source of dust.

483 The construction works generate large quantities of excess materials from construction sites (aggregate, sand, concrete, discarded material, vegetation, scrap material, packing material), wastes from construction yards, including garbage, recyclable waste, food waste, and other debris. The construction process will take about 5 years and as a result, the construction camps will take a semi-permanent appearance. The majority of waste generated from construction camps will include papers, plastic containers, residues of food, fruits and liquid waste: from kitchen and bathroom. A large part of such wastes is recyclable and biodegradable.

484 Small quantities of hazardous waste will also be generated mainly from the vehicle maintenance activities (bitumen, liquid fuels; lubricants, hydraulic oils; chemicals, such as anti-freeze; contaminated soil; spillage control materials used to absorb oil and chemical spillages; machine/engine filter cartridges; oily rags, spent filters, contaminated soil, medical waste and others). If these wastes are not responsibly disposed, it can cause adverse environmental, human health and aesthetic impacts.

### **Mitigation**

485 The following mitigation measures will be implemented:

- Spoil generation will be minimized by recycling the excavated soil to the maximum extent possible by using it as filling material in the road section.
- The excess spoils will be stored in the lands provided by local communities or in the areas approved by the project management/local authorities.
- Minimize the production of waste materials by 3R (Reduce, Recycle and Reuse) approach. Segregate and reuse or recycle all the wastes, wherever practical. Provide reuse containers at each worksite.
- The non-hazardous waste will be disposed through the city or district services if available. The hazardous wastes will be disposed by agreement with local organizations for the disposal of solid and hazardous wastes.
- The contractor is advised to compact and evenly distribute the surplus material by layers where possible, to minimize piling and impacts to landscape. The stockpiles shall be sown with fast growing grass to avoid erosion by the root system. During dry and windy periods, water should be spread on the disposed material to avoid dusting
- The dismantled asphalt will be recycled and reused for approach road or other constructions.
- The contractor will identify suitable sites for temporary storage of wastes from construction sites and demolished wastes in consultation with communities and government authorities. The wastes shall be transported for disposal in a timely manner;
- the waste disposal site will be away from settlements, water streams and or any archaeological and historical monuments while barren lands are preferable for this purpose.
- The contractor will identify suitable sites for disposal of hazardous and nonhazardous waste. The selection will be carried out in consultation with the local government authorities.
- No dumping on private property is carried out without written consent of the owner.
- Vehicles transporting solid waste shall be covered with tarps or nets to prevent spilling waste along the route.
- Train and instruct all personnel in waste disposal practices and procedures as a component of the environmental induction process.

- Provide absorbent and containment material (e.g., absorbent matting) where hazardous material is used and stored and personnel trained of the correct use.
- Make sure all containers, drums, and tanks that are used for storage are in good condition and are labeled with expiry date. Any container, drum, or tank that is dented, cracked, or rusted might eventually leak. Check for leakage regularly to identify potential problems before they occur.
- Prohibit burning of solid waste.
- Request suppliers to minimize packaging where practicable.
- Avoid the use of material with greater potential for contamination by substituting them with more environmentally friendly materials.
- Maintain all construction sites in a cleaner, tidy and safe condition and provide and maintain appropriate facilities as temporary storage of all wastes before transportation and final disposal.
- No agricultural area or river floodplain shall be selected as disposal site. Minimum distance to any watercourses must be at least 100 m. Disposal sites shall be preferably on barren land without any wooden vegetation.
- The contractor is advised to compact and evenly distribute the surplus material by layers where possible, to minimize piling and impacts to landscape. The stockpiles shall be vegetated with fast growing grass to avoid erosion by the root system. During dry and windy periods, water should be sprayed on the disposed material to avoid dust emissions.
- If during the construction activities any material suspected to contain asbestos is encountered, the Contractor will immediately suspend the work and communicate with the expert from the contracted waste management organization and representative of the CSC.
- The contractor cannot resume the civil works around asbestos-cement pipes unless (i) the Contractor prepares a separate method statement for the safe excavation, handling and disposal of the asbestos containing waste material, and (ii) the method statement is reviewed and approved by the CSC.

### **Residual Impacts**

486 With the help of the above mitigation measures, the potential impacts associated with waste generation are likely to be adequately addressed and hence the residual impact is likely to be Low in significance.

#### **6.4.8 Geological Resources and Seismic Impact**

487 The project will require significant amount of geological resources such as gravel and sand to be extracted from the quarries and borrow pits. However, these resources are abundant in the project area and quarry operation will not result in any kind of depletion of geological resources.

488 The project is located in a seismically active area and project design is compliant with the relevant seismic standards. No project activity is expected to cause any seismic consequences.

### **Mitigation Measures**

489 Impact on geological resources will be further reduced by the proper planning of the excavation and re-use of the excavated material wherever feasible.

490 During the structural design, the regional and site-specific seismic conditions were studied and taken into consideration for the selection of the final bridge alternative and further preliminary design steps. The most stringent national standards relating to seismic construction and best international practices were applied.

## **Residual Impacts**

491 The residual impacts on geological resources assessed as Minimal provided that the mitigation measures are implemented.

### **6.4.9 Noise and Vibration**

492 Various construction activities will cause noise and vibration. During construction, noise is likely to be generated from site clearing, excavation, concrete mixing, crushers, piling in bridge construction. Noise from vehicles and construction equipment will also affect receptors near the construction sites and along the transportation routes. The vibration may affect the stability of nearby structures. Noise will be generated during construction from construction activities and operation of heavy equipment and machinery and during operation mainly from the plying of traffic on the road.

493 Although the noise is of temporary nature, construction activities can create noise levels sufficient to cause community annoyance and interfere with daily activities. Similarly, construction activities can cause vibration levels that may result in structural damage which leads for the community annoyance or interference with construction activities.

494 Most construction noise originates from internal combustion engines. A large part of the noise emitted is due to the air intake and exhaust cycle. **Table 42** presents the A-weighted sound pressure level at 10 m for the anticipated generic construction equipment.

**Table 42: Typical Noise Levels Emitted by Construction Equipment**

<b>Equipment Description</b>	<b>Sound Pressure Level (dB), 10 m</b>
Concrete Mixer Tank	79
Concrete Pump	80
Compactor	80
Crane	76
Diesel Power Generator	66
Bulldozer	75
Drilling Rig	83
Excavator	80
Grader	83
Hydraulic Hammers	90
Crushing Plant	82
Truck	79
Water Tank	79
Wheeled Loader	76
Vibrating Roller	83

495 The summary noise emission levels for major construction activities based on the combination of noise levels from the individual construction equipment were calculated during the previous ESIA studies. **Table 43** shows the noise levels calculated for the bridge construction activities:

**Table 43. Noise Generation for bridge works**

<b>Equipment Type</b>	<b>Noise Level at 10m L<sub>Aeq</sub> (dB)</b>	<b>Duration of Activity as</b>	<b>Correction to L<sub>Aeq</sub> (dB)</b>	<b>Activity Noise Level L<sub>Aeq</sub>(10) (dB)</b>

		percentage of 10h		
Excavator	80	80	-1.0	79
Drilling Rig	83	80	-1.0	82
Concrete Mixer Truck	79	80	-1.0	78
Concrete Pump	80	80	-1.0	79
Truck	79	60	-2.2	76.8
Crane	76	60	-2.2	73.8
Poker Vibrator	69	80	-1.0	68
Diesel Generator	66	100	0.0	66

496 The noise modeling conducted during the preparation of EIA for Packages 1&2 indicated that noise impacts will reduce to the IFC guideline allowable noise level at a residential property (55 dB(A) for a day) at the distances shown in **Table 44**.

**Table 44. The main types of work and distance where noise level reduces to 55 dBA**

Construction Activities	Distance from the source of noise (m)
Site Clearance	312
Earthworks	410
Bridge/Structure Works	385
Road Pavement Works	290

497 No sensitive receptors other than the project workers are identified within the project AOI. The nearest residential areas are located over 500m from the construction site and are outside of the area where construction noise can exceed IFC and National tolerance limits as shown in **Table 44**. However, the residents of the Darband and Gulonom villages can be occasionally affected during the transportation of materials if the haulage routes pass the villages. Villages can be occasionally affected during the transportation of materials if the haulage routes pass the villages.

498 **Vibration** caused by construction can cause disturbance to residents close to the works and damage to property. The effects of vibration on structures depend on the construction machinery and equipment used (emission source) and on the structural conditions of the potentially affected building structures (receptors). The construction activity that typically generates the most severe vibrations is pile driving. The calculations made during the previous stages indicated that the fragile buildings located less than 7.5 meters from the bridge can be vulnerable to damage. Due to the significant distance between the project activities and the nearest residential buildings, the risk of the damage caused by vibration is assessed as very low.

### Mitigation

- All construction equipment will be fitted with suitable engine mufflers with tight fitting engine enclosures and panels. All mobile equipment will be maintained in good mechanical condition. Route heavily loaded trucks away from the residential streets, if possible, select streets with fewest homes, if no alternatives are available. Horns will not be used while driving through the communities to the extent possible.
- No plant and equipment shall be left running if not required for immediate use. Where this is not practicable, equipment shall be set to idle in the quietest manner to minimize noise emissions. The sanitary (OHS) standards for noise level and vibration control will be strictly observed.
- Avoid nighttime activities. People are more aware of vibration in their homes during the nighttime hours. The noisy construction activities will be conducted between 7:00 A.M and 11:00 P.M. The construction contractor would be required to monitor construction noise levels at sensitive locations during construction activities to confirm that compliance with the noise criteria is achieved and that additional noise attenuation measures are not required for construction equipment, vehicles or activities.

- Personal protective equipment (PPE) will be used by the construction workers including ear muffs where necessary.
- For potential damages to local infrastructure, including private property and local (haulage) roads, compensation procedures will have to be established prior to the beginning of construction and approved by the engineer.
- Grievance redress procedures will be put in place to facilitate communication between the contractor and potentially affected people.
- Haul routes and construction site access roads will be discussed and jointly approved between the contractor and local officials to minimize the risk of conflicts.

### **Residual Impacts**

499 After implementing the above-listed mitigation measures, the residual impacts of noise and vibration caused by the project activities will be Minimal.

### **Mitigation**

#### **6.4.10 Impacts to Physical Cultural Heritage**

500 No sites of historical, cultural or archeological value are known to exist within AOI. However, during the construction activities such as excavation, discovery of any object or site having cultural, historical or archaeological value is possible.

### **Mitigation**

- Chance Finds Procedure (**Annex 7**) will be used in case of any historical, cultural or religious sites or artefacts are discovered during the construction phase. Training will be provided to excavator operators and supervisors/site managers for this purpose. .
- In the event of the unexpected discovery of archaeological objects during construction operations, the work at that particular location will be stopped, and the contractor/CSC will immediately inform the residential engineer who will notify the Institute of Archaeology / Ministry of Culture and PIURR for further instructions. In this case the construction works at the localized site will remain suspended until Institute of Archaeology gives clearance for the continuation of the operations.
- Works will resume only after appropriate measures have been taken as instructed by the Institute of Ministry of Culture and confirmation has been received that works may continue.

### **Residual Impacts**

501 The residual risk has been assessed as Minimal provided the Chance Find Procedure is appropriately applied.

#### **6.4.11 Impacts of Construction Camp and other Site Facilities**

502 Camps will contain offices and accommodation for works staff, maintenance areas and crushing plant and asphalt and concrete batch plant and storage areas. Impacts include noise from maintenance areas and any crushing plant, dusty works (from vehicle movements and operation of equipment, rock crushers and concrete batching plant) and potential for adverse water impact due to runoff from unmade roads, oily runoff, from storage areas and sewerage discharges from poorly maintained septic tanks / waste water treatment facilities.

503 The in-migration of construction workers into the Project-affected area, can subsequently lead to increased health risk to the local community (i.e. the potential for transfer of communicable or infectious diseases, such as hepatitis, polio, influenza, HIV/AIDS, malaria, etc.), crime levels, instances of alcoholism and drug use amongst others. Poor quality of housing and hygiene standards can result in injury or sickness.

### **Mitigation**

The Contractor will ensure the following conditions are met:

- Contractor to appoint camp manager who will be responsible for ensuring standards of accommodation meet basic requirements and are safe and hygienic
- First aid facilities will be made available at the work sites and in the camps. The contractors will engage qualified medical staff. Location and telephone numbers of the nearest hospital will be displayed at appropriate places at work sites and in construction camps. Firefighting equipment will be made available as required at camp sites and particularly near the fuel storage.
- No construction camp should be located within populated area and at least 50 m from any surface water course, this will help reduce noise, water and air quality impacts. The CSC will approve the locations of the construction camps prior to the establishment of the camp. In addition, the Contractor will
- The camps will have autonomous water supply, sanitation with the use of septic tanks, food and recreation facilities. Direct draining of wastewater into surface waters is prohibited. All wastewater from the latrines, kitchens and bathrooms will be collected to the septic tanks installed in the locations approved by PIURR CSC and local sanitary authorities. The sides and bottom of the septic tank will be lined by concrete to prevent the contamination of aquifer. After the filling to the designed level, the content of the septic tanks will be pumped to the vacuum truck through the opening in the side wall equipped with the removable lid. Afterwards, the content will be transported for disposal to the site agreed with the local environmental and sanitary authorities.
- Rain-water run-off arising on the site will be collected, removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance. The drainage system should be fitted with oil and grease interceptors.
- Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies should be prohibited.
- Liquid material storage containment areas should not drain directly to surface water.
- Wastewater from vehicle washing bays should be free of pollutants if the wash bay has been constructed correctly.
- Lubricating and fuel oil spills should be cleaned up immediately and spill clean-up materials should be maintained at the storage area.
- Discharge of sediment-laden construction water directly into surface watercourses will be forbidden. Sediment laden construction water will be discharged into settling lagoons or tanks prior to final discharge.
- Description and layout of equipment maintenance areas and lubricant and fuel storage facilities including distance from water sources and irrigation facilities. Storage facilities for fuels and chemicals will be located away from watercourses. Such facilities will be bounded and provided with impermeable lining to contain spillage and prevent soil and water contamination.
- Washing out concrete trucks at construction sites should be prohibited unless specific concrete washout areas are provided for this purpose at the construction site (e.g., a bridge site). The washouts should be impermeable and emptied when 75% full.
- Spill cleanup equipment will be maintained on site (including at the site maintenance yard and vehicle fueling areas. The following conditions to avoid adverse impacts due to improper fuel and chemical storage:
  - Fueling operations should occur only within containment areas.
  - All fuel and chemical storage (if any) should be sited on an impervious base within a bund and secured by fencing. The storage area should be located away from any watercourse or wetlands. The base and bund walls should be impermeable and of sufficient capacity to contain 110 % of the volume of tanks.
  - Filling and refueling should be strictly controlled and subject to formal procedures and will take place within areas surrounded by bunds to contain spills / leaks of potentially contaminating liquids.

- All valves and trigger guns should be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.
- The contents of any tank or drum should be clearly marked. Measures should be taken to ensure that no contaminated discharges enter any drain or watercourses.
- Disposal of lubricating oil and other potentially hazardous liquids onto the ground or water bodies will be prohibited.
- Should any accidental spills occur, immediate cleanup will be undertaken, and all cleanup materials stored in a secure area for disposal to a site authorized to dispose of hazardous waste.
- The Contractor should provide necessary cleaning facilities on site and ensure that no water or debris from such cleaning operations is deposited off-site.
- The Contractor should also be responsible to maintain and cleanup campsites and respect the rights of local landowners. If located outside the AOI, written agreements with local and owners for temporary use of the property will be required and sites must be restored to a level acceptable to the owner within a predetermined time period.

### **Residual Impacts**

504 After the implementation of mitigation measure as described above, the residual impacts associated with the establishment and operation of the camps and other site facilities are expected to be Minimal.

#### **6.4.12 Impacts of Concrete Batching Plant**

505 Concrete Batching Plant can be a source of air, water and soil pollution if not appropriately sited and managed.

### **Mitigation**

506 The following measures will be followed to limit the potential for pollution from batching plants:

- Batching plants will be located downwind of residential areas
- The entire batching area traversed by vehicles – including driveways leading into and out of the area – will be paved with a hard, impervious material.
- Sand and aggregates will be delivered in a dampened state, using covered trucks. If the materials have dried out during transit, they will be re-wetted before being dumped into the storage bunker.
- Sand and aggregates will be stored in a hopper or bunker which shields the materials from winds. The bunker should enclose the stockpile on three sides. The walls will extend 1 m above the height of the maximum quantity of raw material kept on site and extend 2 m beyond the front of the stockpile.
- The hopper or bunker will be fitted with water sprays which keep the stored material damp at all times. Monitor the water content of the stockpile to ensure it is maintained in a damp condition.
- Overhead storage bins will be totally enclosed. The swivel chute area and transfer point from the conveyor will also be enclosed.
- Rubber curtain seals may be needed to protect the opening of the overhead bin from winds.
- Conveyor belts which are exposed to the wind and used for raw material transfer will be effectively enclosed, to ensure dust is not blown off the conveyor during transit. Conveyor transfer points and hopper discharge areas should be fully enclosed.
- Conveyor belts will be fitted with belt cleaners on the return side of the belt.
- Weigh hoppers at front end loader plants will be roofed and have weigh hoppers shrouded on three sides, to protect the contents from the wind. The raw materials

transferred by the front-end loader will be damp, as they are taken from a dampened stockpile.

- Store cement in sealed, dust-tight storage silos. All hatches, inspection points and duct work will be dust tight.
- Silos will be equipped with a high-level sensor alarm and an automatic delivery shut-down switch to prevent overfilling.
- Cement dust emissions from the silo during filling operations must be minimized. The minimum acceptable performance is obtained using a fabric filter dust collector.
- Totally enclose the cement weigh hopper, to ensure that dust cannot escape to the atmosphere.
- An inspection of all dust control components will be performed routinely – for example, at least weekly.
- All contaminated storm water and process wastewater will be collected and retained on site.
- All sources of wastewater will be paved and bunded. The specific areas that will be paved and bunded include; the agitator washout area, the truck washing area, the concrete batching area, and any other area that may generate storm water contaminated with cement dust or residues.
- Contaminated storm water and process wastewater will be captured and recycled by a system with the following specifications:
  - The system's storage capacity must be sufficient to store the runoff from the bunded areas generated by 20 mm of rain. Water captured by the bunds will be diverted to a collection pit and then pumped to a storage tank for recycling.
  - An outlet (overflow drain) in the bund, 1 m upstream of the collection pit, will divert excess rainwater from the bunded area when the pit fills due to heavy rain (more than 20 mm of rain over 24 hours).
  - Collection pits will contain a sloping sludge interceptor, to separate water and sediments. The sloping surface enables easy removal of sludge and sediments.
  - Wastewater will be pumped from the collection pit to a recycling tank. The pit will have a primary pump triggered by a float switch and a backup pump which automatically activates if the primary fails.
  - Wastewater stored in the recycling tank needs to be reused at the earliest possible opportunity. This will restore the system's storage capacity, ready to deal with wastewater generated by the next rainfall event. Uses for recycling tank water include concrete batching, spraying over stockpiles for dust control and washing out agitators.

### **Residual Impacts**

507 After the implementation of mitigation measure as described above, the residual impacts associated with the establishment and operation of batching plant are expected to be Minimal.

#### **6.4.13 Impacts of the stone crusher operation**

508 Operation of the stone crushing equipment can lead to the increased dust and noise emissions.

#### **Mitigation**

- Careful site selection of aggregate crusher in order not to interfere with any sensitive receptor.
- Distance to next settlement and residential houses at least 1000 m downwind.
- Site selection for aggregate crusher has to be approved by the CSC after prior approval

of PIURR.

- Water spraying will be carried out to suppress dust emissions where possible/appropriate.

#### **6.4.14 Climate Change Risks Impacts**

509 The transport infrastructure in Tajikistan is directly vulnerable to the impacts of climate change. An initial physical climate risk screening of the project carried out using the “AWARE” web-based tool indicated a high climate risk rating. As such, a detailed Climate Risk and Adaptation Assessment (CRA) for the project as per AIIB’s Paris Alignment methodology was conducted. In the CRA, we assessed the climate risks to the project components and identified adaptation measures to be integrated into the project design to address the risks. We also estimated the climate finance of the adaptation measures and examined the potential inconsistency of the project with Tajikistan’s key national policies on climate resilience. Details can be found in the CRA report in Annex 2.

510 **Mitigation:** Measures to mitigate these risks have been incorporated into the design documents. The following assessments associated with potential climate changes will be undertaken by the design consultants during the detailed design stage of the Project:

- Corrosion of steel reinforcements in concrete structures – Assess if the use of advanced concrete materials and structures will help improve the durability of concrete infrastructure and their adaptation to climate change.
- Damage to the access road and bridge drainage system due to heavy precipitation – Assessment of 1/100 year flood return period for all bridges. Increase capacity of side and cross drains to accommodate more intense floods.
- Increase in scouring of the approach road, bridges, and support structures – Assess designs of piers, abutments and embankments to determine if protection methods (e.g., riprap) are required to cope with additional water volumes and increased flow intensity.

#### **6.4.15 Occupational Health and Safety Risks**

511 The construction of a bridge and roads is a complex and demanding project that requires a comprehensive approach to occupational health and safety (OHS). Construction activities such as site preparation, excavation, installation of formwork, concreting, operation of construction machinery and equipment, vehicular traffic, and the use of temporary workers’ accommodation pose potential risks to the health, safety, and therefore well-being of construction workers. In addition to the standard safety risks from construction, there are additional hazards created by working at heights and over water. Health and safety issues associated with the use of temporary accommodation sites include those relating to sanitation, disease, fire, cultural alienation, sleeping space, quality and quantity of food, personal safety and security, temperature control, and recreation, amongst others.

512 The OHS risks that may arise at construction are exposure to physical hazards from working on heights, working over/near water, lifting and hoisting, scaffolding, use of heavy equipment including cranes; trip and fall hazards; exposure to dust, noise, and vibrations; falling objects; exposure to hazardous materials; and exposure to electrical hazards from the use of tools and machinery. Not properly maintained access and egress arrangements can lead to unauthorized entry into hazardous work areas and, as a consequence falls into bridge openings, and into water. That can result in injury or fatality of workers due to insufficient controls on work activities and processes.

#### **Mitigation**

513 The mitigation measures to address the project impacts on workers’ health and safety are listed below:

- Contractor will develop and implement a health and safety system, including incident and near miss reporting. The contractor will prepare and implement an Occupational Health and Safety (OHS) Management Plan that will also cover communities’ health

and safety aspect. A sample of OHS Management Plan is provided in **Annex 5**.

Regular trainings will be provided to the workers on OHS aspects.

- OHS risk matrix will be prepared for the entire project before the construction starts. This matrix will be reviewed and revised as and when necessary.
- Job hazard analysis will be carried out for each type of construction activities.
- Contractors will have dedicated and qualified OHS staff for ensuring compliance with the OHS Plan.
- Regular training will be provided to the workers on OHS aspects.
- Awareness raising material will be used including posters, signage, booklets, and others.
- All site personnel will be screened for communicable diseases including sexually transmitted infections.
- Use of appropriate personal protective equipment (PPE) will be mandatory. No worker (or even visitor) will be allowed on the site without the required PPE (such as hard hat, safety shoes).
- Firefighting equipment will be made available as required at construction sites, camp sites, and particularly near the fuel storage.
- The project drivers will be trained in defensive driving. They will maintain low speed while driving through / near the communities.
- Suitable scaffolds from the ground shall be provided for the work force, who are working at elevated heights, if a ladder is used a proper foot holds and hand holds shall be provided on the ladder.
- Persons having to operate electrical equipment will be fully instructed as to any possible danger of the equipment concerned.
- All the electrical equipment will be inspected before it is taken into use to ensure that it is suitable for its purpose.
- The transport tanks, storage tanks and dispensing container will be designed, used, cleaned and disinfected at suitable intervals in a manner approved by the competent authority.
- Safety provisions shall be brought to the notice of all concerned by displaying or notice board at a prominent place at the work locations.
- The contractor shall be responsible for observance, by his sub-contractors, of the foregoing provisions.
- At every workplace, there shall be maintained in readily accessible place first aid appliances including an adequate supply of sterilized dressing and cotton wool as prescribed in the factory rules.
- The contractor will take adequate measures for the control of infectious diseases and their vectors.
- Forced and child labor is forbidden.
- Complete record of accidents and near-misses will be maintained.
- First aid facilities will be made available at the work sites and in the camps. The contractors will engage qualified first aider(s).
- 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 the government rules and regulation.
- Location and telephone numbers of the nearest hospital will be displayed at appropriate places at work sites and in construction camps. If necessary, the contractor will have an ambulance available at the site.
- Adequate housing, safe and reliable water supply for all workers.
- Accommodation for taking meals and for shelters during interruption of work due to adverse weather conditions.
- Hygienic sanitary facilities and sewerage system. The toilets and domestic waste water will be collected through a common sewerage. Provide separate latrines and bathing places for males and females with total isolation by wall or by location. The minimum number of toilet facilities required is one toilet for every ten persons.

- Provide in-house community/common entertainment facilities. Dependence of local entertainment outlets by the construction camps to be discouraged/prohibited to the extent possible.
- Provide adequate health care facilities and first aid facility round the clock within construction sites. Maintain stock of medicines in the facility and appoint fulltime designated first aider or nurse.
- Train all construction workers in basic sanitation and health care issues and safety matters, and on the specific hazards of their work. □ Provide appropriate security personnel (police/home guard or private security guards) and enclosures to prevent unauthorized entry in to the camp area.
- The contractor will educate the work force about HIV/AIDS and launch awareness campaign among the work force.
- There will be proper enforcement of the labor laws at the work place.
- A system will be in place to document and report incidents and accidents at site.
- First Aid. The contractor will be responsible for ensuring that first aid, including the provision of trained personnel, is available. Arrangements will be made for ensuring the removal for medical attention of workers who have suffered an accident or sudden illness. The manner in which first aid facilities and personnel are to be provided will be prescribed by national laws or regulations, and drawn up after consulting the competent health authority and the representative organizations of employers and workers concerned:
- First-aid kits or boxes, as appropriate, will be provided at the workplaces, including isolated locations and the motor vehicles used for construction like dumpers and tippers.
- First-aid kits and boxes will not contain anything besides material for first aid emergencies.
- First- aid kits and boxes will simple with clear instructions to be followed, be kept under the charge of a responsible person qualified to render first aid and be regularly inspected and kept properly stocked not running short of medicines.
- Firefighting: There will be firefighting facility at construction locations. The staff will face any emergency situations without many problems. There will be adequate measures as listed below:
- Secure storage areas will be provided for flammable liquids, solids and gases such as liquefied petroleum gas cylinder, paints and other such materials in order to deter trespassers.
- Smoking will be strictly prohibited and no smoking notices be predominantly displayed in all places containing readily combustible or flammable materials.
- Only suitably protected electrical installations and equipment, including portable lamps, will be used.
- Oil rags, waste and clothes or other substances liable to spontaneous ignition will be removed without delay to a safe place.
- Adequate ventilation will be provided.
- Combustible materials such as packing materials sawdust, greasy/oily waste and scrap wood or plastic will not be allowed to accumulate in work places but will be kept in closed metal containers in a safe place.
- Regular inspections will be made to places where there are fire risks. These include the vicinity of heating appliance, electrical installation, and conductors, stores of flammable and combustible material, hot welding and cutting operations
- Places where workers are employed will, if necessary, to prevent the danger of fire, be provide suitable and sufficient fire-extinguishing equipment, which will be easily visible

and accessible an adequate water supply at ample pressure.

- Fire-extinguishing equipment will be properly maintained and inspected at suitable intervals by a competent person. Where appropriate, suitable visual signs will be provided to indicate clearly the direction of escape routes in case of fire. The escape routes will be kept clear at all times.
- Safety Training Program. A Safety Training Program is required and should consist of:
  - Initial Safety Induction Course. All workmen should be required to attend a safety induction course within their first week on Site. The induction trainings are mandatory for new staff and visitors.
  - It is essential that all individuals present on the site, including employees, contractors, and site visitors, are thoroughly briefed on the site's emergency response procedures and made aware of any potential health or safety hazards associated with on-site activities.
  - Periodic Safety Training Courses. Period safety course should be conducted not less than once every six months. All Subcontractor employees will be required to participate in relevant training courses appropriate to the nature, scale and duration of the subcontract works. Training courses for all workmen on the Site and at all levels of supervision and management.
  - Safety Meetings. Regular safety meetings will be conducted on a monthly basis and should require attendance by the safety representatives of Subcontractors unless otherwise agreed by the CSC. The CSC will be notified of all safety meetings in advance. The CSC may attend in person or by representative at his discretion. The minutes of all safety meetings will be taken and sent to the CSC within seven days of the meeting.
  - Safety Inspections. The Contractor should regularly inspect, test and maintain all safety equipment, scaffolds, guardrails, working platforms, hoists, ladders and other means of access, lifting, lighting, signing and guarding equipment. Lights and signs should be kept clear of obstructions and legible to read. Equipment, which is damaged, dirty, incorrectly positioned or not in working order, should be repaired or replaced immediately.
- Personal Protective Equipment (PPE). Workers should be provided (before they start work) with of appropriate personnel safety equipment suitable for electrical work such as safety boots, helmets, gloves, protective clothes, goggles, and ear protection at no cost to the workers. Site agents/foremen will follow up to see that the safety equipment is used and not sold on. In addition, life vests should be provided to Contractors staff working on the bridge piling works.
- Clean drinking water should be provided to all workers;
- Adequate protection to the general public, including safety metal fence and marking of hazardous areas should be provided;
- Risk assessment of workplaces prior to any construction activities. Before new activities are commenced, risk assessment should be conducted including a thorough examination of working site to identify situations, processes, etc. that may cause harm, particularly to people. After identification is made, the probability and severity of the risks should be analyzed and evaluated. Based on the evaluation, actions necessary to eliminate the hazard, or control the risk using the hierarchy of risk control methods should be identified.
- All contractors and subcontractors will be required to appoint an CSO who should be available on the Site throughout the operational period of the respective contract unless the Engineer approval to the contrary is given in writing. In the event of the CSC's approval being given, the CSC, without prejudice to their other duties and responsibilities, should ensure, as far as is practically possible, that employees of

subcontractors of all tiers are conversant with appropriate parts of the SSESMP.

- Contractor should subcontract with an Approved Service Provider to provide an HIV Awareness Program to the Contractor's Personnel and the Local Community as soon as practicable after the Contractor's Personnel arrive at the Site but in any case, within two weeks after the Contractor's Personnel arrive at Site and to repeat the HIV Awareness Program at intervals not exceeding four months.
- Zones with noise level above 80 dBA must be marked with safety signs and appropriate PPE must be worn by workers.

### **OHS risks which may be specific to female workers**

514 Tajikistan's Labor Code (Article 216) prohibits women's employment in: underground jobs, difficult jobs, jobs in harmful conditions, or jobs linked to manual lifting and moving of heavy loads. The list of specific sectors and professions where female employment was not allowed was established by the Government Resolution No. 179 of 4 April 2017 at the national level. The Resolution largely mimicked the Soviet Ordinance by preserving the archaic nature of job restrictions. According to the Resolution, women are excluded from numerous professions and tasks that are perceived to be harmful or difficult in around 27 sectors of the national economy.

515 During the implementation and operation of the Project, the proportion of male workers is higher than that of female workers, and male workers are more likely to be skilled workers. In case of improper management, harmful behaviors such as gender-based violence, sexual exploitation and abuse, and sexual harassment may occur, which may have a negative impact on the physical and mental health of female workers on the construction site. Separate washrooms, toilets, locker rooms and sleeping areas will be provided for women at the site, if needed and as appropriate.

### **Residual Risk**

516 With the help of the above-listed measures, the OHS risks will be adequately addressed and the significance of the residual impacts has been assessed to be Low.

## **6.5 Impacts on Ecological Resources**

### **6.5.1 Impacts on Habitats and Ecosystem**

517 The potential impact of the project on biodiversity is relatively low, due to fact that the bridge and approaches will be constructed within an already disturbed habitat, and situated within a degraded environment that has been subject to anthropogenic pressures for many ears (in particular livestock grazing). Ecosystems have been substantially transformed since the previous construction activities were undertaken in the Soviet era, and already carry a significant anthropogenic footprint. Although no valuable and ecosystem are available within the Project AOI, some trees of shrubs can be damaged by the project activities.

518 During construction, the main impacts will comprise direct habitat loss in the immediate vicinity of the project AOI and within the construction working areas adjacent to the bridge alignment. There will also be disturbance associated with construction activities, mainly noise and vibration impacts.

519 As described in **Chapter 5**, habitat loss will generally impact areas of relatively low biodiversity value. No protected plant species included in the IUCN or Red Book List was revealed. Very scarce flora including the common grasses and shrubs grow within the Project construction footprint. About ten dispersed hawthorn trees grow within Project AOI, however, no tree has definitely been determined as subject to removal for construction purposes as they are located outside of RoW. It is estimated that from 1 to 5 small hawthorn trees could be removed or accidentally damaged by the project activities.

520 At present it is not considered that the scale of this impact will trigger any significant effects on biodiversity, especially taking into account that most of the Project AOI will be under the water of Rogun Reservoir in the near future and transform to a completely different ecosystem type.

521 The proposed bridge is not anticipated to affect the fragmentation of water ecosystem caused by the dams even during the construction phase. The piers will be erected outside the river. These piers are planned to be impounded by water only after the completion of the bridge construction activities. Hence, no coffer dams will be needed.

522 Furthermore, upon completion, the built bridges are the most ecologically friendly hydrological structures compared to the dams and impede the natural flow and as consequence migration of biota to a minimal extent.

523 The bridge construction is not anticipated to have a significant impact on the aquatic biodiversity and migratory fish in the Surkhob river and within the whole hydrological basin of Vahsh upstream of Rogun HPP.

524 Disturbance impacts may affect fauna making use of features for sheltering purposes, foraging, or undertaking other activities, within disturbance distance of the construction activities. Most notably this will include nesting birds and hibernating/sheltering reptiles and amphibians, all of which are sensitive to such disturbance while using these features. It is possible that some of this fauna will include Red Book species, although most likely at very low levels, due to the high levels of disturbance that are already present.

525 Road traffic accidents will affect all fauna, but have the potential to affect Red Book (and otherwise rare) large carnivores such as snow leopard, wolf and brown bear, which will occasionally roam across the project area for foraging purposes (i.e. especially when snow levels at higher altitudes make foraging there difficult). Given the level of presence of such species, together with the traffic volumes and prevailing speeds, it is considered unlikely that a significant effect will result.

### **Mitigation**

526 The damage to natural vegetation will be minimized. In the case of the removal of trees the compensatory planting will be conducted in the ratio of 5 (five) planted seedlings for 1 (one) removed tree. Plant species that are native to the project area shall be used. The following species mix will be planted: Pines (*Pinus spec.*), cypresses(*archa*) (*Juniperus spec.*), maples (*Acer platanoides*), poplars (*Populus alba*), willows (*Salix alba*), walnuts (*Juglans regia*), ashes (*Fraxinus angustifolia*) and platanes (*Platanus orientalis*). Planting time should be restricted to spring (March and April) and/or autumn (September and October). Contractor will maintain trees during the Defects Liability Period and conduct periodic pruning

527 Biodiversity awareness training will be included in the contractor's site induction. This will include: the clarification of roles and responsibilities; the identification of all critically endangered, endangered, and protected species wildlife species; worker's behavior including bans on hunting, foraging, trapping and keeping dogs; national regulatory requirements; activities that will be observed in specific sections or periods/months (e.g. bird nesting period, bird migratory period) to avoid or minimize the risk of disturbance, injury, or death of critically endangered and endangered, and protected wildlife species, and the reporting and protection activities during chance encounter with specific mammals, bird and reptile species.

528 Speed restrictions in and around settlements to reduce the likelihood of traffic collisions, particularly with mammals, including limits of 50km/h in urban and residential areas.

529 Improved water flow management via the construction of reinforced concrete drainage channels to manage water movement and reduce runoff into adjacent habitat.

530 No agricultural area or river floodplain shall be selected as disposal site. Minimum distance to any watercourses must be at least 100 m. Disposal sites shall be preferably on barren land without any wooden vegetation.

531 Before commencement of physical works, the contractor will examine if the small animals including the birds and reptilians are available nearby the construction site and will make an effort to let them a chance to leave the area timely.

532 Lastly, the Biodiversity Action Plan's which formed part of the Section 1 and Section 2 ESIA's, of which this project forms an addendum, will be included in the tender documents of

this project to ensure that the contractors to ensure contractors and operators follow correct processes should there by any chance find of protected species.

### **Residual Impact**

533 After implementing the above mitigation measures, the residual impacts on Biodiversity, Habitats, and Ecosystems are assessed as Minimal.

## **6.6 Socio Economics and Cultural Impacts**

### **6.6.1 Community Health and Safety (CHS)**

534 No communities are located within Project AOI, which reduces significantly possible CHS risks and impacts of the construction activities. The nearest residential houses of the villages Gulonom and Darband which can be assessed as sensitive receptors are located as it was mentioned earlier about 500m from the edge of the Project AOI.

535 However, CHS risks particularly for women and children still exist and may include safety risks associated with construction activities and operation of heavy construction machinery as well as movement of construction vehicles, worsening of the air and water quality, the increase of vibration and noise levels, exposure to SEA/SH and Sexually Transmitted Diseases (STD), and other communicable diseases, social conflict and road safety risk, loss of access and disturbance of public utilities.

536 Other disturbance and impacts on community may include:

- Traffic congestion and detours;
- Disrupted access to residences and businesses;
- Presence of construction workers, equipment, materials and staging areas including potential concrete batch;
- Noise and vibrations from construction equipment and vehicles;
- Airborne dust and possible mud on road
- Improper waste management.

### **Mitigation**

- Community health and safety management plan will be prepared and implemented. Hazardous substances will be handled and stored according to the standards; The project drivers will be trained in safe driving. They will maintain low speed while driving through / near the communities.
- The project will establish its own grievance redress mechanism (GRM) to address community grievances related to health and safety aspects of the Project based on the experience of GRM established for Packages 1 and 2.
- Contractor will provide clear signs to guide road users and advise them on changes to road priorities in order to make their journey as smooth as possible and to ensure road safety as unanticipated changes e.g. change of lane, will be avoided.
- Access to construction sites to be closed temporarily while providing temporary/alternative access routes where needed in consultation with the community.
- The community members will be advised on road safety with the key messages reinforced with communities throughout construction. Clear signs will be placed at construction sites including borrow pits, in view of the public, warning people of potential dangers such as moving vehicles, hazardous materials and excavation and raising awareness on safety issues. Heavy machinery will not be used after day light and all such equipment will be returned to its overnight storage area/position before night.
- All sites including storage areas will be made secure, prohibiting access by members of the public by fencing when appropriate. Install metal fence to keep pedestrians away

from hazardous areas such as constructions sites and excavation sites.

- Install signage at the periphery of the construction site advising road users and local community that construction is in progress.
- Strictly impose speed limits on construction vehicles along residential areas and where other sensitive receptors such as schools, medical places and other populated areas located.
- Provide security personnel in hazardous areas to restrict public access. If necessary, provide safe passageways for pedestrians crossing the construction site and for people whose access has been disrupted due to construction works.
- Provide information to the public about the scope and schedule of construction activities and expected disruptions and access restrictions,
- Allow for adequate traffic flow around construction areas.
- Provide adequate signalization, appropriate lighting, well-designed traffic safety signs, metal fence and flag persons for traffic control; and
- Access roads should be maintained during the construction phase and rehabilitated at the end of construction by the contractor to the satisfaction of the local authorities and in compliance with the contract.

### **Residual Impacts**

537 With the help of the above-listed measures, the CHS risks will be adequately addressed and the significance of the residual impacts has been assessed to be Low.

### **6.6.2 Livelihood of Local Communities**

538 Livelihood impacts of the proposed project on the surrounding population are anticipated to be generally positive, providing improved access to jobs and services. The project will create limited job opportunities for the local population (both men and women), during the construction, operation /maintenance phases. Additionally, there may be commercial opportunities during the construction phase and also associated with improved access to markets, either due to easier transportation of goods and people or through trading activities in the vicinity to the bridge.

539 The project will improve the reliability, safety, and speed of passengers and goods transportation which otherwise would be interrupted after the inundation of the location by the Rogun Dam, and will provide International connection. Construction Period: The temporary loss of income due to disturbance of commercial activities and/or acquisition of property is unlikely due to absence of the commercial activities and property within AOI which was verified by the public communication.

540 Operation & Maintenance: The O&M activities can provide some job opportunities for the locals and business opportunities due to the better connectivity.

### **Mitigation**

541 The completion of the bridge is expected to boost the commercial activities in the nearby communities due to increase of the number of visitors. The possible negative impacts during the construction will be addressed through the GRM. The contractor will be encouraged to maximize jobs to the local population.

### **Residual Impact**

542 The livelihood impacts during the O&M period are expected to be highly positive due to improved access and new commercial opportunities.

### **6.6.3 Impacts on Women**

### **Positive impacts**

543 During the construction of the Project, a certain number of temporary jobs will be

provided for women, such as labor workers, cleaners, traffic maintenance personnel, and cooks who cook for construction teams with low technical requirements during construction. These nearby temporary jobs can be provided for young and middle-aged women and low-income groups so that local women and low-income groups can increase non-agricultural economic income. The implementation of the Project will also promote the sale of local agricultural products and the development of local tourism, which will positively promote the income increase of women's families in the project area.

544 Participation of women and promotion their own development will be encouraged and supported. AIIB projects have always supported women's participation and paid attention to the protection of women's rights and interests. In the process of project construction and implementation, jamoats local authorities can be used to promote women's participation in relevant public affairs and encourage women to participate in project discussions and consultations. More women are informed of and involved in the project, giving them a full voice, addressing their own needs and seeking more opportunities for development. At the same time, the provision of safety awareness training and employment training for women is conducive to raising their awareness of participation, improving their comprehensive quality, and promoting their long-term development.

545 It is important to provide a more comfortable and convenient travel environment for women. The implementation of project reduces women's travel and time for travel, shopping, and work in the project area, and improve the transfer and accommodation experience.

546 As part of the proposed project (Component 3), the following activities will be carried out to directly benefit the women of the area: (i) conduct the scoping study and skills needs assessment to identify potential business and livelihood opportunities for women living in the project-affected area of Section 3; (ii) develop women's entrepreneurship program, based on the skills needs assessment, and included possible list of participants and selection criteria; (iii) work together with ADB and with the National Committee of Women and Family Affairs, and local authorities on allocation of grants to support women entrepreneurs.

### **Negative impacts**

547 The potential SEA/SH risks during the project implementation is moderate due to the presence of male-dominated manpower during the construction period. However, any harmful behavior against the will of individuals based on gender differences can happen. It may include acts causing physical, sexual, or mental harm or suffering, threats to such acts, coercion, and other deprivation of liberty. These behaviors may occur in public or in private. During the implementation and operation of the Project, the proportion of male workers is higher than that of female workers, and male workers are more likely to be skilled workers. In case of improper management, harmful behaviors such as gender-based violence, sexual exploitation and abuse, and sexual harassment may occur, which may have a negative impact on the physical and mental health of female workers on the construction site and female community members in the surrounding communities.

### **Mitigation**

548 The Gender Action Plan given below provides mitigation measures while other aspects such as SEA/SH are addressed later in the Chapter.

### **Gender Action Plan**

549 In order to address above mentioned female related impacts, the environmental and social assessment team, based individual and small group meetings and consultations, sorted out some needs of local female groups from project surroundings. In response to these needs, also based on experience gained from Packages 1 and 2 implementation, the gender action plan for component 3 has been prepared. The plan will be implemented by different responsible agencies: PIURR, CSC, Project Contractor, Women's organizations from nearby Jamoats and others. The Gender Action plan is provided in **Table 45** below.

**Table 45. Gender Action Plan**

Specific measures or actions		Monitoring index	Implemented by	Target population
Increasing employment opportunities for women	During the construction and operation of the project, priority will be give providing unskilled and semi-skilled jobs for women from Jamoats in the project area.	Priority will be given to providing project employment opportunities	Project Contractor	Female employees from jamoats around the project area jamoats around the project area
	For jobs with low physical requirements, the requirements, the employment age range should be appropriately relaxed, and women aged 40 to 50 who find it difficult to find non-agricultural employment opportunities or are vulnerable, or from Female Headed HH will be preferred, such as cleaning, cooking, management and care.	During Construction Period		
Empowering of women	Improve women's skills knowledge and knowledge lectures, skills knowledge training courses and employment and entrepreneurship seminars. level, personal needs and other factors, and appropriate training time shall be set up to further ensure that women have the same opportunity to improve their skills as men.	Proportion of women women's rights and interests publicity and education, employment skills training, etc.	Women's organizations from nearby Jamoats; IA	All women in project area
Design and implement a women's entrepreneurship program	Women's entrepreneurship program developed, based on the skills needs assessment, and included possible list of	Proportion of women women's rights and interests publicity and education,	Women's organizations from nearby Jamoats; IA	All interested women from project area

Specific measures or actions		Monitoring index	Implemented by	Target population
	participants and selection criteria At least 50 women trained, and 25 women gained and reported knowledge and skills on business development in relevant areas such as handicrafts, farming, and catering, guesthouse management and hosting, etc.	employment skills training, etc.		
Facilitate access of women entrepreneurs to governmental grants	At least 10 women entrepreneurs submitted grants applicants to the program selection committee. At least 3 women from the project area received government grant for women entrepreneurs	Proportion of interested women	Women's organizations from nearby Jamoats; Ministry of Transport, National Committee of Women and Family Affairs	All interested women from project area
Conduct training on SEA/SH issues and inform about the available protocols for handling SEA/SH complaints in sensitive and confidential manner	Number of project workers to be trained. Number of community members to be informed	Before and during civil works	PIURR and (sub-) Contractors	Project workers and community members
Introduce protocol for handling SEA/SH grievances, including referral mechanism to the appropriate specialized service providers identified with SEA/SH service provider mapping.	SEA/SH service providers mapping is complete. Protocol for handling SEA/SH is prepared.	Before the civil works start	PIURR	Project stakeholders

#### **6.6.4 Sexual Exploitation and Abuse and Sexual Harassment (SEA/SH) Risks and Mitigations Measures**

550 The Government of Tajikistan introduced the Law on the Prevention of Domestic Violence in 2013 and the State Program for the Prevention of Domestic Violence for 2014-2023 to reduce the incidence of domestic violence and encourage victims to seek support. However, Tajikistan does not have legislation on sexual harassment in employment along with the applicable remedies, inhibiting women's voice and agency in the workplace.

551 The Project risk of sexual exploitation and abuse and sexual harassment (SEA/SH) can be assessed as moderate. The assessment is based on a review of available information on SEA/SH aspects in the country. The project works will be implemented away from residential areas. The part of labor force is expected to be recruited from local communities or other parts of Country. Prohibition of SEA/SH will be introduced in the Code of Conduct to be acknowledged and signed by all workers. Training on SEA/SH issues and the available protocols for handling SEA/SH complaints in sensitive and confidential manner will be provided to all workers and target communities. The protocol for handling SEA/SH grievances will involve referral mechanism to the appropriate specialized service providers identified with SEA/SH service provider mapping.

552 In terms of protecting female employees from sexual harassment in the workplace, employers are required to take effective measures to prevent and stop female employees from being sexually harassed in the workplace in combination with their own work and production characteristics. If female employees are sexually harassed in the workplace and other behaviors endangering the personal safety of employees are reported or complained to the Employer, the Employer shall deal with them in a timely manner and protect the personal privacy of female employees according to law. At the same time, female employees shall be encouraged to resolutely defend their individual rights, The contractor has to set up display boards, legal knowledge competition, door-to-door publicity, distribution of prevention and legal publicity materials, etc., in order to publicize the knowledge of preventing and eliminating gender-based violence and relevant laws and regulations to the general public, eliminate gender-based violence, and maintain healthy, civilized and harmonious social development.

553 The Grievance redress mechanism will be established during the construction and operation phases to cover the SEA/SH issues. The Contractor's Social specialist will be dedicated to be contacted in case of SEA/SH; The female claimants will have possibility to contact the Social specialist directly in case of SEA/SH, and she will make sure to follow all procedures for SEA/SH grievance resolution. The confidentiality of claimant is respected unless otherwise requested by the claimant. The SEA/SH cases will be also included in the grievance log (anonymously).

554 Every employer (contractor, supervision consultant, etc.) will adopt a protocol for safe, confidential, and survivor-centered approach to handling of sensitive complaints such as those related to SEA/SH. Such protocols will ensure safe and confidential referral of SEA/SH survivors to adequate services upon their choice. For this purpose, a Code of Conduct (CoC) will be prepared that will be signed by all site personnel at the time of their employment/appointment at the site. Sample CoC is provided in **Annex 6**.

#### **Non-Discrimination**

555 Discrimination is prohibited in employment and even during the pre-contractual relations, including cases when a job application is published and further at the selection stage. This applies to discrimination based on race, skin color, language, ethnic and social background, nationality, origin, level of social welfare, place of residence, age, sex, sexual orientation, due to disability, religious, social, political or other affiliation, including professional union, affiliation, marital status, political or other views or other grounds.

556 The Constitution of the Republic of Tajikistan recognizes international law as a component of the national legal system, and Tajikistan is a State Party to the Convention on the elimination of All Forms of Discrimination Against Women (CEDAW). The Law of the

Republic of Tajikistan «On State Guarantees of Equal Rights of Men and Women and Equal Opportunities for their Implementation» from March 1, 2005, Decree of the President of the Republic of Tajikistan of December 3, 1999 «On Measures to Enhance the Role of Women in Society», the State Program on «Main directions of the state policy to ensure equal rights and opportunities for men and women in the Republic of Tajikistan for 2001 - 2010 », and the National Strategy “On Enhancing the Role of Women in the Republic of Tajikistan for 2011-2020” are the main documents regulating the role of women in society.

557 Tajikistan’s legal framework does, to some extent, prevent women from participating equally in labor market. Women have equal physical mobility to men (such as obtaining a passport and foreign and domestic travel), mothers receive 140 days of maternity leave with full pay,<sup>54</sup> the law mandates equal remuneration for equal work, discrimination based on gender during hiring is illegal, and the legal procedures for registering a business are the same for women as they are for men, including the average duration of registration. Tajikistan’s labor law prohibits women from working in mines, in jobs associated with unhealthy work conditions and heavy lifting, at night (with some exceptions), and overtime (for pregnant women and mothers of children under three years old). Overtime includes weekends, holidays, and business trips.

558 In terms of the protection of the reproductive rights of female employees, the employer shall not agree with female employees on restricting their legitimate rights and interests such as marriage and childbirth in the labor (employment) contract. It is not allowed to reduce the wages and welfare benefits of female employees due to their marriage, pregnancy, maternity leave, breastfeeding, and other reasons, restrict their promotion, appraisal, and employment of professional and technical positions, dismiss female employees and unilaterally terminate the labor (employment) contract. All these laws have been misused by some employers to close some positions to women.

### **6.6.5 Impacts of Labor Influx**

559 The construction process will take several years, with a significant part of the employees/workers during construction phase are likely to be employed from outside the project area. The people and the changes they bring can have significant impacts on the local communities and social structures. Substantial numbers of workers will inhabit the area in temporary camps loading local infrastructure and causing ambient social influence. The influx of a large number of workers from other parts of the Country and even from abroad can potentially cause conflict between the project personnel and the local community. This could be because of differences in culture, religion, social norms, acceptable social behavior, and even dress code. In addition, the construction activities can potentially affect the women economic activities. Any such impact can be detrimental to the project since it can potentially cause tension between the project and local communities and even disruption of construction works

560 The influx of laborers from other regions may cause social tensions due to competition for workplaces with the residents and lead to SEA/SH issues.

#### **Mitigation**

- Construction camps will be established outside of communities, with the approval of PIURR and local authorities;
- The contractor will prepare and implement a CoC (see **Annex 6**) for all site personnel, in consultation and coordination with the local community. All site personnel will be required to sign the CoC and its adequate implementation will be regularly monitored and included in progress reports;
- CoC will be translated in local language(s) and displayed at key locations within the site;
- All site personnel will be provided orientation and training on Code of Conduct. Awareness raising materials such as posters and signage will be used as appropriate;
- All site personnel will be provided awareness and training to prevent communicable diseases, sexually transmitted infections, Human immunodeficiency virus (HIV) infections / Acquired Immune Deficiency Syndrome (AIDS);

- Privacy of women will be respected; routes and places used by them will be avoided as far as possible;
- Entry of the site personnel in the local communities will be minimized to the extent possible/appropriate.
- No child labor or forced labor will be engaged by the contractor.
- GRM for workers will be established by the civil works contractor and will also address community grievances related to social conflict.
- Liaison with the community will be maintained.
- Provide training to the project workers which will include sessions on social norms and cultural awareness.
- The following shall be prioritized: (i) employ local people as much as possible, (ii) ensure equal opportunities for women and men, (iii) pay equal wages for work of equal value, and to pay women's wages directly to them; and (iv) not employ child or forced labor.

### **Residual Impact**

561 With the help of the above-listed mitigation measures, the impacts associated with influx of labor will be adequately addressed and the significance of residual impacts has thus been assessed as Low.

#### **6.6.6 Possible Resettlement Impacts and Land Use**

562 During the field visit conducted on November 11, 2022 by local social consultant and desk study provided by International social consultant, it was considered whether the proposed project will have an influence on private or privately owned/used land, business or farming activities of any kind of ownership, if there are grazing areas used by local community and if the income from cattle-breeding is the main source of income for locals.

563 Finding of the above assessment is that the Bridge Construction will have no impact on private, legalizable, and State-owned land plots. During the small group meetings and public consultations, the data regarding the land ownership and usage were double-checked and verified.

564 In order to avoid any kind of negative impact on land use and farming, a due diligence report was prepared (see **Annex 3**) and local community and other stakeholders' consultations were held during the ESIA preparation process (see **Annex 4**). If during the construction or operation period there are any kind of unforeseen or temporary impact on land ownership, usage, farming or other activities, the relevant Resettlement Plan has to be developed, disclosed and implemented, based on entitlement matrix elaborated in due diligence report, as well as AIIB Policy and AIIB Environmental and Social Framework, national legislation and consultations which has to be conducted with impacted parties. Further details are provided later in the document as a separate chapter.

### **6.7 ANALYSIS OF ASSOCIATED FACILITIES**

565 AIIB defines the Associated Facilities as activities that are not included in the description of the Project set out in the agreement governing the Project, but directly or materially related to the Project.

566 The Consultant discussed the identification of associated facilities with PIURR and AIIB E&S staff. Preliminarily, the road sections to be connected to the bridge and the temporary bridge over the Surkhob River and its approach roads which will be demolished after the long bridge is open to service were recognized as Associated Facilities (AF). However, the review of the E&S documents relating to the road corridor clarified that these facilities are a part of the single project which includes Package 3, and therefore do not fall under the definition of Associated Facilities. See **Table 46** for the assessment.

**Table 46. Identifying of Associated Facilities by the AIB Criteria**

No	Activity of Facility	Criteria			Conclusion
		a) directly and materially related to the Project;	b) carried out, or planned to be carried out, contemporaneously with the Project;	c) necessary for the Project to be viable and would not be constructed or expanded if the Project did not exist	
1	Construction of Rogun HPP	Yes, the proposed project relates to the future reservoir of Rogun HPP.	Yes. The reservoir planned to be filled up when the bridge will be ready,	No. HPP can be constructed even if the Project did not exist .	In accordance with AF criteria the construction of Rogun HPP is not an associated facility of the long Bridge Project.

## **7. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN**

567 This Chapter presents the implementation arrangements for the mitigation measures discussed in **Chapter 6**. Also included in this Chapter are institutional arrangements, monitoring, documentation, reporting and training requirements to ensure that the mitigation measures are effectively implemented.

### **7.1 Objectives, Structure and Content**

568 The objectives of the Environmental and Social Management Plan (ESMP) are:

- to propose implementation arrangements to ensure that the mitigation measures and all other actions described in this ESIA are regularly implemented;
- To ensure the effective implementation of mitigation measures discussed in **Chapter 6**.
- To monitor and measure the success and effectiveness of proposed mitigation measures in minimizing potential environmental, health, safety and social impacts;
- To ensure the project construction is conducted in compliance with the national laws and regulations as well as the requirements of the Asian Infrastructure Investment Bank (AIIB) (the Lender);
- To continuously control the changes to baseline environmental, health, safety and social conditions during pre-construction, construction and operation activities;
- To facilitate a continual review of activities based on performance data and consultation feedback; and
- To implement corrective actions or new adaptive management programs, as required.

### **7.2 Institutional Arrangements**

#### **7.2.1 PIURR**

569 PIURR will be responsible for overall project implementation and ensuring the compliance with all relevant national and international environmental, health, safety and social policies, guidelines and performance requirements of both the Republic of Tajikistan and AIIB.

570 PIURR will be responsible for the overall implementation of this ESMP and other actions described within this ESIA. They will supervise and guide construction supervision consultants (CSC) (discussed later in this Section) in performing their duties at the site.

571 PIURR will also be responsible for the implementation and conformance of the grievance redress mechanism (GRM) (discussed later in the document) to ensure that all grievances and/or objections (if any raised by the local community and/or workers or any other stakeholders) are received, acknowledged and addressed as per the grievance procedure presented later in the document.

572 PIURR will engage the following environmental and social personnel:

- I. Environmental Specialist
- II. Social Specialist
- III. OHS specialist.

#### **7.2.2 Construction Supervision Consultants**

573 Monitoring of environmental and social performance and of the implementation of mitigation measures will be performed by CSC. CSC will be responsible for supervising the Contractor to ensure that requirements, as set out in this ESMP and other documentation are effectively applied. They will be responsible for continuous monitoring of processes and activities undertaken by the Contractor, and specifying measures to be implemented by the Contractor, to address any areas of non-compliance as well as environmental instrumental monitoring such as air quality monitoring, noise and water.

574 CSC will recruit and retain an International Environmental Specialist (IES), a National Environmental Specialist (NES) and a National Social Specialist (NSS), to ensure that regular monitoring and supervision is carried out for all activities, actions and facilities established by the Contractor and the Contractor remains compliant with his environmental and social obligations.

575 In addition, CSC will engage a Senior International Occupational Health and Safety Specialist will be employed for 4 months during the project construction phase and a fulltime National Occupational Health and Safety Specialist during the implementation of the project.

576 CSC IES, with the support of the national EHS specialists of the CSC NES-NSS, will be responsible for supervising the contractor's environmental and social performance, coordinating the public consultations, implementation of project GRM, and assisting PIURR to prepare periodic environmental and social monitoring reports (ESMRs).

577 During the pre-construction stage, CSC IES will prepare a detailed action plan including environmental and social monitoring checklists to be completed by the CSC-NES to ensure that the ESMP is implemented, maintained and will monitor its performance. S/he will also take care of all environmental and social issues during construction works.

578 S/he will also conduct environmental training and briefings to provide environmental and social awareness on AIIB and the environmental safeguards policies, requirements and standard operating procedures in conformity with the government's regulations and international practice; ensure baseline and periodic monitoring and reporting of Contractor's compliance with contractual environmental mitigation measures during the construction stage. She/he will also help with the development of the Contractor's Site Specific ESMP (SSESM), discussed later in the Chapter. The detailed tasks of this position are listed below.

- (i) Assist PIURR and the CSC's team leader in managing and implementing the project and ensuring compliance with AIIB ESP (2019) requirements, and ESIA and ESMP of the project;
- (ii) Review ESIA Amendment including ESMP, to understand the project's environmental E&S requirement, and assist PIURR in updating ESIA in case of unanticipated impacts;
- (iii) Conduct trainings, workshops, and other knowledge sharing sessions good practices on E&S and OHS aspects to the PIURR staff and contractor's staff (especially the contractor's E&S officer, the contractor's health and safety officer), and build capacity of relevant staff to undertake their tasks in ESMP implementation and monitoring. One of the trainings will be conducted prior to the start of construction to develop the knowledge and understanding of the environmental, health and safety aspects of the project. Ensure that all the E&S mitigation measures required to be implemented are incorporated into the contract documents;
- (iv) Assist PIURR in reviewing the SSEMPs prepared by contractor(s) and provide clearance;
- (v) Ensure that the contractors (and its subcontractors, if any) comply with the relevant measures and requirements set forth in ESIA, ESMP and any corrective or preventative actions set out in periodic EMSRs;
- (vi) Assist PIURR in supervising and monitoring ESMP/ SSESMs implementation and in preparation of periodic EMSRs for further submission to AIIB;
- (vii) Support PIURR in resolving project-related complaints/grievances;
- (viii) Assist PIURR in organizing and conducting consultations and awareness-raising activities;
- (ix) Contribute inputs to the CSC's monthly compliance reports, highlighting potential and actual issues and/or problems related to ESMP/SSESMs and recommending corrective measures for PIURR's actions;
- (x) Upon completion of the civil works, prepare a report on the project's E&S compliance performance; including lessons learned that may help PIURR in their

E&S monitoring of future projects. This report will be part of the input to the overall Project Completion Report.

579 *Time Period:* CSC-IES and ISS will be engaged on a part-time basis for a period of five months spread over the duration of the construction period (48 months). The specific on-site inputs will be determined by CSC and PIU.

### 7.2.3 Construction Contractor

580 The Contractor will be responsible for implementing ESMP in line with AIIB Requirements. The Contractor is also responsible for implementing any environmental, health, safety and social measures identified in the National EIA, that PIURR has developed for submission to the Committee for Environmental Protection (CEP).

581 The Contractor must ensure EMP is implemented by competent individuals, using approved methods of monitoring, and calibrated equipment (field testers and handheld equipment) where appropriate. Calibration must be done regularly. All calibration records and monitoring results, along with the copies of the site records, certificates, permits and documents shall be submitted and kept by the Project Implementation Unit Road Rehabilitation (PIURR).

582 The Contractor shall appoint a dedicated Environmental and Safety Officer (ESO) and Deputy Environmental and Safety Officer (DESO) responsible for undertaking health, safety and environmental management tasks as set out in ESMP and Contract and lead the monitoring team. These personnel will be supported by additional personnel with specific EHS responsibilities. The Environmental and Safety team will report directly to the Contractor's Project Management.

583 The responsibilities of ESO will include:

- Ensuring that the contractor implements the environmental and social protection and management specifications set out in the Contract, ESMP and SSESMP;
- Undertaking day-to-day environmental, social and safety management tasks as required for the Project and weekly environmental audits;
- Maintaining a daily Site Diary recording all relevant matters concerning E&S and safety management on the Site including protections and controls, audits, inspections, and related incidents. Making the Site Diary available for inspection by the Engineer upon request;
- Participating in joint inspections to be undertaken by PIURR, AIIB and other Environmental organizations and Contractor's Environmental and Social Team.
- Preparing and submitting the reports as required by the Contract and SSESMP.
- The Contractor shall also appoint a dedicated person with responsibilities for managing the requirements of the Contract and SSESMP related to social and gender matters.

## 7.3 Mitigation Plan

584 The Mitigation Plan (**Table 47**) provides the overall Project environmental and social management framework. It provides summary information of the types of impacts, which are described in detail in **Chapter 6**. It also provides detailed information about the required mitigation and monitoring measures.

**Table 47. Mitigation Plan**

Subject	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
<b>Pre-construction project activities</b>				
Site selection, site preparation and operation of contractor's camp	E&S noncompliance with activities due to improper planning	<p>The contractor will prepare an SSESMP and obtain its approval from the CSC and PIURR. The SSESMP will include:</p> <ul style="list-style-type: none"> <li>– Site location, surface area required and layout of the construction camps. The layout plan will also contain details of the proposed measures to address adverse environmental impacts resulting from its installation.</li> <li>– Sewage management plan for provision of sanitary latrines and proper sewage collection and disposal system to prevent pollution of watercourses;</li> <li>– Waste management plan covering provision of garbage tons, regular collection and disposal in a hygienic manner, as well as proposed disposal sites for various types of wastes (e.g., domestic waste, used tires, etc.) consistent with appropriate regulations;</li> <li>– Description and layout of equipment maintenance areas and lubricant and fuel storage facilities including distance from water sources and irrigation facilities. Storage facilities for fuels and chemicals will be located away from watercourses. Such facilities will be bounded and provided with impermeable lining to contain spillage and prevent soil and water contamination.</li> </ul> <p>All Project sub-contractors will be supplied with copies of the SSESMP. Provisions will be incorporated into all sub-contracts to ensure the compliance with the SSESMP at all tiers of the sub-contracting.</p> <p>Prior to the commencement of works the site installations will be inspected for approval. The selected site will not be on top of ground water area or near surface waters.</p> <p>Prior to establishment of construction camps, conduct consultations with local authorities to identify sources of water that will not compete with the local population.</p>	Contractor	CSC and PIURR
	Health and safety risks to workers and adjacent communities	<p>For health and safety protection of workers and adjacent communities the following will be provided:</p> <ul style="list-style-type: none"> <li>– adequate health care facilities (including first aid facilities) within construction sites;</li> <li>– training of all construction workers in basic sanitation and health care issues, general health and safety matters, and on the specific hazards of their work;</li> <li>– PPE for workers, such as safety boots, helmets, gloves, protective clothing, goggles, and ear protection in accordance with legal legislation;</li> <li>– clean drinking water to all workers;</li> <li>– adequate protection to the general public, including safety metal fence and marking of hazardous areas;</li> <li>– safe access across the construction site to people whose settlements and access are temporarily severed by road construction;</li> </ul>	Contractor	CSC and PIURR

Subject	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
		<ul style="list-style-type: none"> <li>- adequate drainage throughout the camps so that stagnant water bodies and puddles do not form;</li> <li>- toolbox training and safety courses must be cascaded down to all sub-contractors</li> <li>- sanitary latrines and garbage bins in construction site, which will be periodically cleared by the contractors to prevent outbreak of diseases. Where feasible the contractor will arrange the temporary integration of waste collection from work sites into existing waste collection systems and disposal facilities of nearby communities;</li> </ul> <p>Contractor will prepare and implement Integrated Pest Management Procedure as part of the SSESMP. In implementation of pest control activities, avoid the use of hazardous materials subject to international bans or phase-outs. Purchase, use, and manage substances based on integrated pest management approaches and reduce reliance on synthetic chemical pesticides.</p>		
Detailed design	<p>Elevated levels of gaseous and noise emissions due to increased traffic during operation.</p> <p>In addition, increased pedestrian vs. vehicle accidents due to traffic volume and higher speed as a result of improved road design.</p>	<p>Integrate in the engineering design safety features such as speed control signs, proper road markings, streetlights, pedestrian crossing, livestock crossing and other visual means.</p> <p>To prevent suicides among communities during O&amp;M phase, it is important that a structural measure secures all parts of a bridge that allow lethal jumps, and it seems less important which kind of structural measure (high safety net versus barriers) is chosen.</p>	Design Consultant	MOT, PIURR
Ecological Resources	Impact on Ecological Resources and Habitat fragmentation.	<p>The following measures will be included as part of the design of the Proposed Project and avoid or reduce impacts to features of ecological value:</p> <ul style="list-style-type: none"> <li>- Speed restrictions in and around settlements to reduce the likelihood of traffic collisions, particularly with mammals, including limits of 50km/h in urban and residential areas.</li> <li>- Improved water flow management via the construction of reinforced concrete drainage channels to manage water movement and reduce runoff into adjacent habitat.</li> </ul>	Design Consultant	PIURR

Subject	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
Road Safety	Traffic accident during the operation phase.	<p>The following traffic safety issues will be accounted for during the design phase of the Project:</p> <ol style="list-style-type: none"> <li>Safety metal fence;</li> <li>Traffic signs;</li> <li>Road Crossings;</li> <li>Speed Bumps;</li> <li>Speed limits;</li> <li>Temporary access/bridges to houses;</li> <li>and Street lighting</li> </ol> <p>Consider additional traffic safety measures close to schools, including reduced speed limits (maximum 50 km/hr.) and traffic calming measures such as speed bumps.</p>	Design Consultant	PIURR
Several trees are located in the Project AOI	In some cases, tree losses cannot be prevented.	<p>Trees will be replanted at a ratio of 1:5. The number of the lost trees will be replaced by the new trees in the locations approved by the relevant Authorities and CSC. Plantations will be conducted after technical works have been completed. Planting time will be restricted to spring (March and April) and/or autumn (September and October).</p> <p>Trees to be planted will have the following parameters: 1.5 – 2 m height, age 5 – 6 years. Distance in between individual trees will be 10 – 12 m.</p> <p>The following species mix will be planted: Species: Pines (Pinus spec.), cypresses(archa) (Juniperus spec.), maples (Acer platanoides), poplars (Populus alba), willows (Salix alba), walnuts (Juglans regia), ashes (Fraxinus angustifolia) and platanes (Platanus orientalis).</p>	Contractor	PIURR, CSC
Design of bridge	Potential water contamination and erosion processes at bridge and river embankments.	<p>A new bridge will be designed for the life expectancy of 100 years. The design loading and design of all structural components must conform to the bridge design standards provided in the Employer's Special Requirements. Bridge designs will ensure that drainage from bridge decks over 50 m does not discharge directly to the water beneath the bridge. If possible, the discharge waters will lead to a filter pond adjacent to the bridge in order to trap oil and grease run-off. Finally, the bridge design and layout must be aesthetically pleasing and in harmony with the existing environment.</p> <p>Design of erosion protection measures at lower parts of bridge embankments. Prefabricated concrete protection plates prevent erosion processes at the lower and lateral parts of bridge and river embankments. Detailed design of the respective protection measure is drafted in the technical design documentation for the bridge.</p>	Design Consultant	PIURR
Chance archaeological find during the excavation	Destruction of artefacts	The Procedure of the chance archaeological and historical find will be developed by the Contractor.	Contractor	Archaeological Institute Dushanbe, CSC

Subject	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
Potential Climate Change	Change in temperature and precipitation level	<p>The following assessments associated with potential climate changes will be undertaken by the design consultants during the design stage of the Project:</p> <p>Corrosion of steel reinforcements in concrete structures – Assess if the use of advanced concrete materials and structures will help improve the durability of concrete infrastructure and their adaptation to climate change.</p> <p>Damage to the access road and drainage system due to flooding – Assessment of 1/100 year flood return period for all bridges. Increase capacity of side and cross drains to accommodate more intense floods.</p> <p>Increase in scouring of roads, bridges, and support structures – Assess designs of piers, abutments and embankments to determine if protection methods (e.g., riprap) are required to cope with additional water volumes and increased flow intensity.</p>	Design Consultant and ESIA Consultant	PIURR
<b>CONSTRUCTION PHASE</b>				
Air Quality	Construction Impacts	<p>To adequately manage air quality impacts, the Contractor will be responsible for the preparation and implementation of Air Quality and Dust Management Plan as part of the SSESMP. The plan will detail the action to be taken to minimize dust generation (e.g., spraying un-surfaced roads with water, covering stockpiles, etc.) and will identify the type, age and standard of equipment to be used and will also provide details of the air quality monitoring program for baseline and routine monitoring. The Plan will also include contingencies for the accidental release of toxic air pollutants (or will refer to the Emergency Response Plan).</p> <p>To limit air pollution during the construction phase, the Contractor will take measures to ensure the following conditions are met:</p> <ul style="list-style-type: none"> <li>(i) Exhaust emissions - No furnaces, boilers or other similar plant or equipment using any fuel that may produce air pollutants will be installed without prior written consent of the CSC. Construction equipment will be maintained to a good standard and fitted with pollution control devices regularly monitored by the Contractor and CSC.</li> <li>(i) Open burning of waste materials - No burning of debris or other materials will occur on the Site without permission of the CSC.</li> <li>(ii) Dust generated from haul roads, unpaved roads, material stockpiles, etc. - The Contractor will ensure and that material stockpiles will be located in sheltered areas and be covered with tarpaulins or other such suitable covering to prevent material becoming airborne. All trucks used for transporting materials to and from the site will be covered with canvas tarpaulins, or other acceptable type cover (which will be properly secured) to prevent debris and/or materials from falling from or being blown off the vehicle(s). Hard surfaces will be required in construction areas with regular movements of vehicles. Effective use of water sprays will be implemented (e.g., all</li> </ul>	Contractor	CSC and PIURR

Subject	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
		<p>roads within the construction areas of the Site will be sprayed at least twice each day, and more, if necessary, to control dust to the satisfaction of the CSC).</p> <p>During the design phase the preliminary locations of borrow pits were proposed in Nurobod district. Locations for quarry sites, borrow pits, rock-crushing and concrete batching plants will require approval from the CSC and PIURR during the Construction phase. Efforts will be made to ensure that these facilities are as near to the Project road as practical to avoid unnecessary journeys and potential dust issues from vehicle movements during construction works.</p> <p>No quarry, rock crushing plant or concrete batching plant will be located within 500 m of any urban area or sensitive receptor. The locations of these facilities will be indicated within the SSESMP. Baseline air quality monitoring will also be undertaken.</p>		
	Air pollution due to exhaust emission from the operation of construction machinery	The contractor will maintain construction equipment to good standard and avoid, as much as possible, idling of engines. Banning of the use of machinery or equipment that cause excessive pollution (e.g., visible smoke).	Contractor	CSC and PIURR
Impacts to landscape and topography	Sand and gravel will be sourced from the designated quarries and borrow pits	Excavated unsuitable material will be timely removed from the sites of excavation and disposed in the designated sites. Borrow pits will be returned to the state as reasonably possible close to the initial. In long-term prospects the rehabilitated road will significantly improve the landscape view along the road.	Contractor	CSC and PIURR
Impacts to soil	Contamination Due to Spills or Hazardous Materials, erosion, loss of topsoil	<p>Erosion - During construction, the Contractor will be responsible for ensuring material that is less susceptible to erosion will be selected for placement around bridges and culverts. In addition, the contractor will ensure re-vegetation of exposed areas including; (i) selection of fast growing and grazing resistant species of local grasses and shrubs; (ii) immediate re-vegetation of all slopes and embankments; (iii) placement of fiber mats to encourage vegetation growth. The CSC and the Contractor will both be responsible for ensuring that embankments are monitored continuously during construction for signs of erosion. Contractor will prepare the Erosion Control Plan as part of SSESMP where the erosion control measure will be described in detail for all construction activity.</p> <p>Topsoil – To reduce impacts to topsoil, the following measures will be employed by Contractor; locate topsoil stockpiles outside drainage lines and protect stockpiles from erosion; construct diversion channels and silt fences around the topsoil stockpiles to prevent erosion and loss of topsoil; rip ground surface prior to the spreading of topsoil; limit equipment and vehicular movements to within the construction zones; remove unwanted materials from topsoil such as roots of trees, rubble and waste etc. Removing of topsoil will occur within site clearing corridor. Topsoil will be removed and stored for reuse. Long-term stockpiles of topsoil will immediately be protected to prevent erosion or loss of fertility. For erosion protection, stockpiles will be sown by seeds of fast-growing vegetation, e.g., grass.</p>	Contractor	CSC and PIURR

Subject	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
		<p>Conversion of agricultural Soils Due to Indirect/Induced Impacts. Although the EMP contains provisions controlling direct impacts of land takings for both the road and ancillary functions (batching plants, construction camps, etc.), control of the induced impacts is largely beyond the scope of the Project.</p> <p>Contamination Due to Spills or Hazardous Materials. The Contractor, with oversight from the CSC, will ensure that:</p> <ul style="list-style-type: none"> <li>- All fuel and chemical storage (if any) will be sited on an impervious base within a bund and secured by fencing. The storage area will be located away from any watercourse or wetlands. The base and bund walls will be impermeable and of sufficient capacity to contain 110 % of the volume of tank (or one tank if more than one tank is located in the bund).</li> <li>- The construction camp maintenance yard will be constructed on impervious hard standing with adequate drainage to collect spills, there will be no vehicle maintenance activities on open ground.</li> <li>- Filling and refueling will be strictly controlled and subject to formal procedures. Drip pans will be placed under all filling and fueling areas. Waste oils will be stored and disposed of by a licensed contractor.</li> <li>- All valves and trigger guns will be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.</li> <li>- The contents of any tank or drum will be clearly marked. Measures will be taken to ensure that no contaminated discharges enter any soils.</li> </ul>		
	Loss of topsoil	Topsoil shall be removed and reused to cover areas where excess materials will be dumped and on road embankments. In addition, a soil management plan shall be provided detailing measures to be undertaken to minimize effects of wind and water erosion on stockpiles, measures to minimize loss of fertility of topsoil, timeframes, haul routes and disposal sites.	Contractor	CSC and PIURR
	Water erosion in river	As erosion protection measures at riverbanks natural stone fillings shall be used as additional measures if required.		
Hydrology (surface water and groundwater)	Bridge construction activities may increase silt load in the river during construction at bridge sites and may result in accidental spillage of concrete and liquid waste into the river. This may impact upon the ecology	<p>Contractor will prepare Water Quality Management Plan as part of SSESMP with detailed description of measures for protection of water quality. The Plan will identify the sources of potential water pollution and develop measures for avoidance or otherwise minimizing the impacts to water quality. The plan will include the details for instrumental monitoring of the potentially affected water bodies and other sources of water. The instrumental water quality monitoring will be conducted down- and upstream where the Project Road crosses the river of Surkhob.</p> <p>Water Use - The Contractor will ensure that all required permits have been gathered prior to the excavation of any borehole. No toilets or septic tanks will be located closer than 500 m from any public water, bore hole or well used for drinking water supply.</p>	Contractor	CSC and PIURR

Subject	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
	of rivers including fish species.	<p>Bridge Construction – There will be no construction within the river or streams themselves as all construction within the river will take place during dry season. Construction directly in the river when there is flow will result in material change to this ESIA and detailed water quality impact assessment will be required.</p> <p>Nonetheless, it is accepted that construction will take place in close proximity to the river and on and near the steep river banks. Therefore, the Contractor will consult with CEP to establish the fish spawning period in relation to the bridge construction works. The Contractor will ensure that all works are undertaken in periods least likely to affect the fish spawning period. In addition, concerning bridge construction works, the Contractor will prepare Erosion Control Plan as part of SSESMP to consider the following:</p> <ul style="list-style-type: none"> <li>• Ensure adequate draining facilities and good site practices are followed to ensure no sediment laden surface runoff</li> <li>• Carry out bridge construction works without interrupting the traffic on the temporary bypass passing through the Project AOI</li> <li>• Ensure no waste materials are dumped in the river, including reinforced concrete debris.</li> <li>• Ensuring good site practice and housekeeping throughout</li> </ul>		
	Siltation of surface waters and/or impact on soils due to improper disposal of excess materials	Mostly all excavated material will be reused. In addition, the reclaimed asphalt pavement will be recycled for the construction of new pavement. Thus, potential impacts due to the need for disposal of excess material will be kept to a minimum.	Contractor	CSC and PIURR
	Possible alteration of surface water hydrology resulting in increased sediment by increased soil erosion nearby surface waters.	Implementation of settlement ponds at locations where construction site comes close to natural watercourses to retain sediments and mitigate possible impacts on water hydrology. Oil and solid waste management need to be described in the SSESMP and consider these sensitive receptors (rivers and their floodplains). No campsite is allowed near river floodplains.	Contractor	CSC and PIURR
Ecological Resources	Impact on Ecological Resources	Biodiversity awareness training will be included in the contractor's site induction. This will include: the clarification of roles and responsibilities; the identification of all critically endangered, endangered, and protected species wildlife species; worker's behavior including bans on hunting, foraging, trapping and keeping dogs; national regulatory requirements; activities that will be observed in specific sections or periods/months (e.g. bird nesting period, bird migratory period) to avoid or minimize the risk of disturbance, injury, or death of critically endangered and endangered, and protected wildlife species, and the reporting and protection activities during chance encounter with specific mammals, bird and reptile species.	CSC and PIURR	the Committee for Roads (executing agency) and PIURR

Subject	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
		<p>Construction sites will be sited and designed to reduce the risk of construction impacts such as fuel spills, oil spills, and waste disposal.</p> <p>Before commencement of physical works, the contractor will examine if the small animals including the birds and reptilians are available nearby the construction site and will make an effort to let them a chance to leave the area timely.</p> <p>The Contractor shall reviewed the Biodiversity Management Plan included within the Sections 1 and 2 ESIA and ensure applicable provisions are followed in the Project.</p>		
Vibration	Damages to buildings	<p>The Contractor will prepare and implement Noise and Vibration Management Plan as part of SSESMP.</p> <p>Special construction techniques will be applied in areas where buildings and structures are close to the road.</p> <p>To avoid damages due to vibration, special construction techniques will be applied in areas where buildings and structures are close to the construction site and where the vibration monitoring shows that the specified construction vibration limit is reached at a particular location. The Contractor will be directed by the Engineer to suspend the construction activities that generate the excessive vibration at such location, and with the approval of the CSC, take mitigative actions necessary to keep the construction vibration within the limits prescribed in Tajikistan Sanitary Standards</p> <ul style="list-style-type: none"> <li>• decrease of vibration emission from the particular equipment item</li> <li>• substitution of the particular equipment item at such location by other equipment capable of variable vibration control</li> <li>• use of smaller equipment</li> <li>• compaction without vibration rollers</li> <li>• decreasing the thickness of material layers below the maximum thickness permissible under the specification</li> <li>• building wave barriers (trench or ditch) where appropriate</li> <li>• change the pavement type for example from flexible to rigid pavement</li> <li>• any other method of Contractor's choice that may be used while ensuring compliance with the specification for the material that is being compacted. During construction phase, vibration levels will be monitored as indicated in the EMoP.</li> <li>• For potential damages to local infrastructure, including private property and local (haulage) roads, compensation procedures will have to be established prior to the beginning of construction and approved by the engineer.</li> <li>• Grievance redress procedures will be put in place to facilitate communication between the contractor and potentially affected people.</li> </ul> <p>Haul routes and construction site access roads will be discussed and jointly approved between the contractor and local officials to minimize the risk of conflicts.</p>	Contractor	CSC and PIURR

Subject	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
Noise	Construction noise	<p>Restrict work between 8 am and 6 pm. In addition, a limit of 70 dBA will be set in the vicinity of the construction site and strictly followed.</p> <p>For sensitive receptors of public interest such as schools and hospitals and also for residential houses alongside the Project road applicable noise standards will be complied with as far as technically feasible by means of noise measurements.</p> <p>Contractor will be responsible for ensuring the use of:</p> <ol style="list-style-type: none"> <li>a. Source Controls, i.e., requirements that all exhaust systems will be maintained in good working order; properly designed engine enclosures and intake silencers will be employed; and regular equipment maintenance will be undertaken.</li> <li>b. Site Controls, i.e., requirements that stationary equipment will be placed as far from sensitive land uses as practical; selected to minimize objectionable noise impacts; and provided with shielding mechanisms where possible. Work near Sensitive Receptors will be limited to short term activities. No concrete batching plants, rock crushing plants or any long-term generators of significant noise will be allowed within 500 m of sensitive receptors;</li> <li>c. Time and Activity Constraints, i.e., operations will be scheduled to coincide with periods when people would least likely be affected; hours and workdays will be limited to less noise-sensitive times. Hours of-work will be approved by the site CSC having due regard for possible noise disturbance to the local residents or other activities. Construction activities will be strictly prohibited between 6 pm and 8 am.;</li> <li>d. Community Awareness, i.e., public notification of construction operations will incorporate noise considerations; methods to handle complaints will be specified. Sensitive receptors will be avoided as possible (i.e., aggregate crushers, operators, etc.). Disposal sites and haul routes will be coordinated with PIURR.</li> </ol> <ol style="list-style-type: none"> <li>1. To avoid excessive noise levels near sensitive receptors particularly the villages the following mitigation measures will be implemented. <ul style="list-style-type: none"> <li>• All construction equipment will be fitted with suitable engine mufflers.</li> <li>• All mobile equipment will be maintained in good mechanical condition.</li> <li>• No plant and equipment shall be left running if not required for immediate use. Where this is not practicable, equipment will be set to idle in the quietest manner to minimize noise emissions.</li> <li>• Where feasible, equipment modifications will be considered, such as dampening of metal surfaces, which is effective in reducing noise due to vibration.</li> <li>• Temporary acoustic barrier will be utilized for those areas where sensitive receptors are significantly affected during construction. Temporary acoustic barrier is typically constructed from plywood and will be of sufficient height to screen acoustic line-of-sight between the receiver and the noise source.</li> </ul> </li> </ol>	Contractor	CSC and PIURR

Subject	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
		<ul style="list-style-type: none"> <li>Acoustic barriers will be implemented if effective and practicable. This will be decided on a case-by-case basis.</li> </ul>		
Exposure to diseases	Infrastructure construction projects bear a high potential risk to affect local communities and the health and well-being of those that live in or near to the temporary construction camps by supporting the spread of STD, HIV/AIDS.	<p>Prepare and implement Health and Safety Plan including the information and education campaign in the form of awareness raising seminars and meetings in collaboration with Ministry of Health, Women's Committee of Tajikistan (regional branches) on sexually transmitted diseases and HIV/AIDS.</p> <p>The contractor will disseminate relevant gender-sensitive publications and distribute materials.</p> <p>Providing information to workers, encouraging changes in individual's personal behavior and encouraging the use of preventive measures. The goal of the information is to reduce the risk of STD, HIV/AIDS transmission among construction workers, camp support staff and local communities.</p>	Contractor	CSC, PIURR and Ministry of Health
Social Conflict	social tensions and potential conflicts	<p>Provide training to the project workers which will include sessions on social norms and cultural awareness.</p> <p>The following shall be prioritized: (i) employ local people as much as possible, (ii) ensure equal opportunities for women and men, (iii) pay equal wages for work of equal value, and to pay women's wages directly to them; and (iv) not employ child or forced labor.</p>	Contractor	CSC and PIURR
	Traffic Management.	<p>Implement a traffic management plan and access road plan that will set out how access along the project road will be maintained safely during construction.</p> <p>Provide clear signs to guide road users and advise them on changes to road priorities in order to make their journey as smooth as possible and to ensure road safety as unanticipated changes e.g. change of lane, will be avoided.</p> <p>Ensure access in areas to be closed temporarily by providing temporary/alternative access.</p>	Contractor	CSC and PIURR
	Construction activities close to building structures, particularly within settlements. Aggregate extraction. Haulage of aggregates and construction equipment.	<p>The community members will be advised on road safety with the key messages reinforced with communities throughout construction.</p> <p>Clear signs will be placed at construction sites including borrow pits, in view of the public, warning people of potential dangers such as moving vehicles, hazardous materials and excavation and raising awareness on safety issues.</p> <p>Heavy machinery will not be used after day light and all such equipment will be returned to its overnight storage area/position before night.</p> <p>All sites including storage areas will be made secure, prohibiting access by members of the public by fencing when appropriate.</p> <p>Install metal fence to keep pedestrians away from hazardous areas such as constructions sites and excavation sites.</p> <p>Install signage at the periphery of the construction site advising road users that construction is in progress.</p>	Contractor	CSC and PIURR

Subject	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
		<p>Strictly impose speed limits on construction vehicles along residential areas and where other sensitive receptors such as schools, medical places and other populated areas located.</p> <p>Provide security personnel in hazardous areas to restrict public access.</p> <p>If necessary, provide safe passageways for pedestrians crossing the construction site and for people whose access has been disrupted due to construction works.</p>		
Loss of Access	Traffic impairment	<p>The Contractor will:</p> <p>Submit a Traffic Management Plan and an Access Road Plan to local traffic authorities prior to mobilization and include the plan as part of the SSESMP;</p> <p>Provide information to the public about the scope and schedule of construction activities and expected disruptions and access restrictions;</p> <p>Allow for adequate traffic flow around construction areas;</p> <p>Provide adequate signalization, appropriate lighting, well-designed traffic safety signs, metal fence and flag persons for traffic control; and</p> <p>Provide temporary access where accessibility is temporarily restricted due to civil works.</p> <p>Access roads will be maintained during the construction phase and rehabilitated at the end of construction by the contractor to the satisfaction of the local authorities and in compliance with the contract.</p>	Contractor	CSC and PIURR
Waste generation)		<ul style="list-style-type: none"> <li>• Preparation and implementation of Waste Management Plan</li> <li>• Spoil generation will be minimized by recycling the excavated soil to the maximum extent possible by using it as filling material in the road section.</li> <li>• The excess spoils will be stored in the lands provided by local communities or in the areas approved by the project management/local authorities.</li> <li>• Minimize the production of waste materials by 3R (Reduce, Recycle and Reuse) approach. Segregate and reuse or recycle all the wastes, wherever practical. Provide reuse containers at each worksite.</li> <li>• The non-hazardous waste will be disposed through the city or district services if available. The hazardous wastes will be disposed by agreement with local organizations for the disposal of solid and hazardous wastes.</li> <li>• The contractor is advised to compact and evenly distribute the surplus material by layers where possible, to minimize piling and impacts to landscape. The stockpiles shall be sown with fast growing grass to avoid erosion by the root system. During dry and windy periods, water should be spread on the disposed material to avoid dusting</li> <li>• The dismantled asphalt will be recycled and reused for approach road or other constructions.</li> </ul>	Contractor	CSC and PIURR

Subject	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
		<ul style="list-style-type: none"> <li>The contractor will identify suitable sites for temporary storage of wastes from construction sites and demolished wastes in consultation with communities and government authorities. The wastes shall be transported for disposal in a timely manner;</li> <li>the waste disposal site will be away from settlements, water streams and or any archaeological and historical monuments while barren lands are preferable for this purpose.</li> <li>The contractor will identify suitable sites for disposal of hazardous and nonhazardous waste. The selection will be carried out in consultation with the local government authorities.</li> <li>No dumping on private property is carried out without written consent of the owner.</li> <li>Vehicles transporting solid waste shall be covered with tarps or nets to prevent spilling waste along the route.</li> <li>Train and instruct all personnel in waste disposal practices and procedures as a component of the environmental induction process.</li> <li>Provide absorbent and containment material (e.g., absorbent matting) where hazardous material is used and stored and personnel trained of the correct use.</li> <li>Make sure all containers, drums, and tanks that are used for storage are in good condition and are labeled with expiry date. Any container, drum, or tank that is dented, cracked, or rusted might eventually leak. Check for leakage regularly to identify potential problems before they occur.</li> <li>Prohibit burning of solid waste.</li> <li>Request suppliers to minimize packaging where practicable.</li> <li>Avoid the use of material with greater potential for contamination by substituting them with more environmentally friendly materials.</li> <li>Maintain all construction sites in a cleaner, tidy and safe condition and provide and maintain appropriate facilities as temporary storage of all wastes before transportation and final disposal.</li> </ul>		
	Loss of valuable ecological structures if the disposal sites are not carefully selected.	No agricultural area or river floodplain shall be selected as disposal site. Minimum distance to any watercourses must be at least 100 m. Disposal sites shall be preferably on barren land without any wooden vegetation.	Contractor	CSC and PIURR
	Potential wind and water erosion at disposal sites for cut material	The contractor is advised to compact and evenly distribute the surplus material by layers where possible, to minimize piling and impacts to landscape. The stockpiles shall be sawn	Contractor	CSC and PIURR

Subject	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
		with fast growing grass to avoid erosion by the root system. During dry and windy periods, water will be spread on the disposed material to avoid dusting.		
	Impacts to human health and environment due to improper treatment of asbestos containing waste	<p>If during the construction activities any material suspected to contain asbestos will be encountered, the Contractor will immediately suspend the work and communicate with the expert from the contracted waste management organization and representative of the CSC.</p> <p>The Contractor cannot resume the civil works around asbestos-cement pipes unless (i) the Contractor prepares a separate method statement for the safe excavation, handling and disposal of the asbestos containing waste material, and (ii) the method statement is reviewed and approved by the CSC.</p>	Contractor	CSC and PIURR
Construction Camps	Construction Camps: Improper siting and design can have negative impacts to hydrology through inappropriate disposal of liquid waste and spills of hazardous liquids.	<p>No construction camp will be located within urban area and at least 50 m from any surface water course, this will help reduce noise, water and air quality impacts. The CSC will approve the locations of the construction camps prior to the establishment of the camp. In addition, the Contractor will be responsible for the preparation of a Construction Camp Site Plan which will form part of the SSESMP. The Plan will indicate the system proposed and the locations of related facilities in the site, including latrines, holding areas, etc.</p> <p>The camps will have autonomous water supply, sanitation with the use of septic tanks, food and recreation facilities. Direct draining of wastewater into surface waters is prohibited. All wastewater from the latrines, kitchens and bathrooms will be collected to the septic tanks installed in the locations approved by PIURR CSC and local sanitary authorities. The sides and bottom of the septic tank will be lined by concrete to prevent the contamination of aquifer. After the filling to the designed level, the content of the septic tanks will be pumped to the vacuum truck through the opening in the side wall equipped with the removable lid. Afterwards, the content will be transported for disposal to the site agreed with the local environmental and sanitary authorities.</p> <p>The Contractor will ensure the following conditions are met within the Construction Camp Site Plan:</p> <p>(i) <i>Rain-water run-off arising on the site will be collected, removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance. The drainage system will be fitted with oil and grease interceptors.</i></p> <p>(ii) <i>Construction and work sites will be equipped with sanitary latrines that do not pollute surface waters and are connected to septic tanks, or wastewater treatment facilities.</i></p> <p>(iii) <i>There will be no direct discharge of sanitary or wash water to surface water. Septic tanks will be provided at construction camps for sewage water. Licensed contractors</i></p>	Contractor	CSC and PIURR

		<p><i>will be required to collect and disposal of liquid waste from the septic tanks on regular basis.</i></p> <p>(iv) <i>Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies will be prohibited.</i></p> <p>(v) <i>Liquid material storage containment areas will not drain directly to surface water.</i></p> <p>(vi) <i>Wastewater from vehicle washing bays will be free of pollutants if the wash bay has been constructed correctly.</i></p> <p>(vii) <i>Lubricating and fuel oil spills will be cleaned up immediately and spill clean-up materials will be maintained at the storage area.</i></p> <p>(i) Discharge of sediment-laden construction water directly into surface watercourses will be forbidden. Sediment laden construction water will be discharged into settling lagoons or tanks prior to final discharge.</p> <p>(ii) Description and layout of equipment maintenance areas and lubricant and fuel storage facilities including distance from water sources and irrigation facilities. Storage facilities for fuels and chemicals will be located away from watercourses. Such facilities will be bounded and provided with impermeable lining to contain spillage and prevent soil and water contamination.</p> <p>(iii) Washing out concrete trucks at construction sites will be prohibited unless specific concrete washout areas are provided for this purpose at the construction site (e.g., a bridge site). The washouts will be impermeable and emptied when 75% full.</p> <p>(iv) Spill cleanup equipment will be maintained on site (including at the site maintenance yard and vehicle fueling areas. The following conditions to avoid adverse impacts due to improper fuel and chemical storage:</p> <p>a) Fueling operations will occur only within containment areas.</p> <p>b) All fuel and chemical storage (if any) will be sited on an impervious base within a bund and secured by fencing. The storage area will be located away from any watercourse or wetlands. The base and bund walls will be impermeable and of sufficient capacity to contain 110 % of the volume of tanks.</p> <p>c) Filling and refueling will be strictly controlled and subject to formal procedures and will take place within areas surrounded by bunds to contain spills / leaks of potentially contaminating liquids.</p> <p>d) All valves and trigger guns will be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.</p> <p>e) The contents of any tank or drum will be clearly marked. Measures will be taken to ensure that no contaminated discharges enter any drain or watercourses.</p> <p>f) Disposal of lubricating oil and other potentially hazardous liquids onto the ground or water bodies will be prohibited.</p>		
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Subject	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
		<p>g) Will any accidental spills occur, immediate cleanup will be undertaken, and all cleanup materials stored in a secure area for disposal to a site authorized to dispose of hazardous waste.</p> <p>Site plans will ensure that, insofar as possible, all construction camps are located at least 50 m away from a watercourse, stream, or canal. If determined warranted by the CSC, the Contractor will provide a wash pit or a wheel washing and/or vehicle cleaning facility at the exits from the sites. If so requested, the Contractor will ensure that all vehicles are properly cleaned (bodies and tires are free of sand and mud) prior to leaving the site areas.</p> <p>The Contractor will provide necessary cleaning facilities on site and ensure that no water or debris from such cleaning operations is deposited off-site. The CSC will undertake regular monitoring of the construction camps to ensure compliance with the Construction Camp Site Plan.</p> <p>The Contractor will also be responsible to maintain and cleanup campsites and respect the rights of local landowners. If located outside the RoW, written agreements with local and owners for temporary use of the property will be required and sites must be restored to a level acceptable to the owner within a predetermined time period.</p>		
	Concrete Batching Plant: Potential pollutants in batching plant wastewater include cement, sand, aggregates and petroleum products.	<p>The following measures will be followed to limit the potential for pollution from batching plants:</p> <p>(i) To limit impacts from dust, the following conditions will apply:</p> <p>a. Batching plants will be located downwind of residential areas</p> <p>b. The entire batching area traversed by vehicles – including driveways leading into and out of the area – will be paved with a hard, impervious material.</p> <p>c. Sand and aggregates will be delivered in a dampened state, using covered trucks. If the materials have dried out during transit, they will be re-wetted before being dumped into the storage bunker.</p> <p>d. Sand and aggregates will be stored in a hopper or bunker which shields the materials from winds. The bunker will enclose the stockpile on three sides. The walls will extend 1 m above the height of the maximum quantity of raw material kept on site and extend 2 m beyond the front of the stockpile.</p> <p>e. The hopper or bunker will be fitted with water sprays which keep the stored material damp at all times. Monitor the water content of the stockpile to ensure it is maintained in a damp condition.</p> <p>f. Overhead storage bins will be totally enclosed. The swivel chute area and transfer point from the conveyor will also be enclosed.</p> <p>g. Rubber curtain seals may be needed to protect the opening of the overhead bin from winds.</p>	Contractor	CSC and PIURR

Subject	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
		<p>h. Conveyor belts which are exposed to the wind and used for raw material transfer will be effectively enclosed, to ensure dust is not blown off the conveyor during transit. Conveyor transfer points and hopper discharge areas will be fully enclosed.</p> <p>i. Conveyor belts will be fitted with belt cleaners on the return side of the belt.</p> <p>j. Weigh hoppers at front end loader plants will be roofed and have weigh hoppers shrouded on three sides, to protect the contents from the wind. The raw materials transferred by the front-end loader will be damp, as they are taken from a dampened stockpile.</p> <p>k. Store cement in sealed, dust-tight storage silos. All hatches, inspection points and duct work will be dust tight.</p> <p>l. Silos will be equipped with a high-level sensor alarm and an automatic delivery shut-down switch to prevent overfilling.</p> <p>m. Cement dust emissions from the silo during filling operations must be minimized. The minimum acceptable performance is obtained using a fabric filter dust collector.</p> <p>n. Totally enclose the cement weigh hopper, to ensure that dust cannot escape to the atmosphere.</p> <p>o. An inspection of all dust control components will be performed routinely – for example, at least weekly.</p> <p>(ii) All contaminated storm water and process wastewater will be collected and retained on site.</p> <p>(iii) All sources of wastewater will be paved and banded. The specific areas that will be paved and banded include; the agitator washout area, the truck washing area, the concrete batching area, and any other area that may generate storm water contaminated with cement dust or residues.</p> <p>(iv) Contaminated storm water and process wastewater will be captured and recycled by a system with the following specifications:</p> <p>a. The system's storage capacity must be sufficient to store the runoff from the banded areas generated by 20 mm of rain.</p> <p>b. Water captured by the bunds will be diverted to a collection pit and then pumped to a storage tank for recycling.</p> <p>c. An outlet (overflow drain) in the bund, 1 m upstream of the collection pit, will divert excess rainwater from the banded area when the pit fills due to heavy rain (more than 20 mm of rain over 24 hours).</p>		

Subject	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
		<p>d. Collection pits will contain a sloping sludge interceptor, to separate water and sediments. The sloping surface enables easy removal of sludge and sediments.</p> <p>e. Wastewater will be pumped from the collection pit to a recycling tank. The pit will have a primary pump triggered by a float switch and a backup pump which automatically activates if the primary fails.</p> <p>f. Wastewater stored in the recycling tank needs to be reused at the earliest possible opportunity. This will restore the system's storage capacity, ready to deal with wastewater generated by the next rainfall event. Uses for recycling tank water include concrete batching, spraying over stockpiles for dust control and washing out agitators.</p>		
	Work site operation / Operation of equipment maintenance and fuel storage areas	<p>The contractor will hire a qualified CSO who will provide safety training to the staff according to the requirements of the individual workplace. Prior to the commencement of works, the work site personnel shall be instructed about safety rules for the handling and storage of hazardous substances (fuel, oil, lubricants, bitumen, paint etc.) and also the cleaning of the equipment. In preparation of this the contractor shall establish a short list of materials to be used (by quality and quantity) and provide a rough concept explaining the training / briefing that shall be provided for the construction personnel.</p> <p>Locate storage facilities for fuels and chemicals away from watercourses. Such facilities will be bounded and provided with impermeable lining to contain spillage and prevent soil and water contamination.</p> <p>Store and dispose waste/used oil consistent with environmental legal requirements.</p> <p>Work site restoration: After completion of construction works the contractor shall execute all works necessary to restore the sites to their original state (removal and proper disposal of all materials, wastes, installations, surface modeling if necessary, spreading and leveling of stored topsoil).</p>	Contractor	CSC and PIURR
Operation of borrow areas and quarries	<p>Potential disfigurement of landscape, vegetation losses and damage to access roads</p> <p>Increased dust emission</p> <p>Siltation and obstruction of surface waters</p>	<p>If the Contractor intends to use any existing borrow pits, then a due diligence review will be carried out by the CSC to confirm that these new sites identified for use by the Contractor are indeed operating or operable in an appropriate manner. This will include review of the borrow pits operational license and its potential environmental impacts, such as its proximity to sensitive receptors. A copy of the agreement between the operator and the Contractor will also be provided to the CSC.</p> <p>For any new borrow pit to be opened and operated by the Contractor, the Contractor will be responsible for the preparation of a Borrow Pit Action Plan as part of SSESMP. The Borrow Pit Action Plan will be submitted to the CSC prior to the start of construction. The plan will identify the locations of all proposed borrow pits which will also be approved by both the CSC, CEP and representatives of the Ministry of Transport (executing agency). The plan will also indicate rehabilitation measures and implementation schedule for the borrow areas and access roads and address the sensitive issues of avoidance of</p>	Contractor	CSC and PIURR

Subject	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
		<p>transportation through residential areas as far as technically feasible and closure rehabilitation. The plan will ensure that:</p> <p>Pit restoration will follow the completion of works in full compliance with all applicable standards and specifications.</p> <p>b) Arrangements for opening and using material borrow pits will contain enforceable provisions.</p> <p>c) The excavation and restoration of the borrow areas and their surroundings, in an environmentally sound manner to the satisfaction of the CSC will be required before final acceptance and payment under the terms of contracts.</p> <p>d) Additional borrow pits will not be opened without the restoration of those areas no longer in use.</p> <p>Wet aggregates and/or provide cover on haul trucks to minimize dust emission and material spillage. In addition, watering of unpaved access roads for reduction of dust emission.</p> <p>The hauling traffic will be carried out only between 8 am and 6 pm.</p> <p>Locate stockpiles away from surface waters.</p>		
	Increased dust emission and noise emission caused by the operation of aggregate crusher	Careful site selection of aggregate crusher in order not to interfere with any sensitive receptor. Distance to next settlement and residential houses at least 1000 m downwind. Site selection for aggregate crusher has to be approved by the CSC after prior approval of PIURR.	Contractor	CSC and PIURR
Occupational Health and Safety	Accident	<p>Contractor will develop and implement a health and safety system, including incident and near miss reporting. The contractor will prepare and implement an Occupational Health and Safety (OHS) Management Plan that will also cover communities' health and safety aspect. Regular trainings will be provided to the workers on OHS aspects. The OHS Plan requirements will be escalated to subcontractors and Contractor will ensure their compliance. PIURR and Contractor will ensure that OHS requirements are cascaded down into EPC and sub-contractors' scope of work through inclusion into tender documentation, contracts and their policy and procedures during construction and operation.</p> <p>The mitigation measures to address the project impacts on workers' health and safety are listed below:</p> <ul style="list-style-type: none"> <li>OHS risk matrix will be prepared for the entire project before the construction starts. This matrix will be reviewed and revised as and when necessary.</li> <li>Job hazard analysis will be carried out for each type of construction activities.</li> <li>Contractors will have dedicated and qualified OHS staff for ensuring compliance with the OHS Plan.</li> </ul>	Contractor	CSC and PIURR

Subject	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
		<ul style="list-style-type: none"> <li>• Regular training will be provided to the workers on OHS aspects.</li> <li>• Awareness raising material will be used including posters, signage, booklets, and others.</li> <li>• All site personnel will be screened for communicable diseases including sexually transmitted infections.</li> <li>• Use of appropriate personal protective equipment (PPE) will be mandatory. No worker (or even visitor) will be allowed on the site without the required PPE (such as hard hat, safety shoes).</li> <li>• Firefighting equipment will be made available as required at construction sites, camp sites, and particularly near the fuel storage.</li> <li>• The project drivers will be trained in defensive driving. They will maintain low speed while driving through / near the communities.</li> <li>• Suitable scaffolds from the ground shall be provided for the work force, who are working at elevated heights, if a ladder is used a proper foot holds and hand holds shall be provided on the ladder.</li> <li>• Persons having to operate electrical equipment will be fully instructed as to any possible danger of the equipment concerned.</li> <li>• All the electrical equipment will be inspected before it is taken into use to ensure that it is suitable for its purpose.</li> <li>• The transport tanks, storage tanks and dispensing container will be designed, used, cleaned and disinfected at suitable intervals in a manner approved by the competent authority.</li> <li>• Safety provisions shall be brought to the notice of all concerned by displaying or notice board at a prominent place at the work locations.</li> <li>• The contractor shall be responsible for observance, by his sub-contractors, of the foregoing provisions.</li> <li>• At every workplace, there shall be maintained in readily accessible place first aid appliances including an adequate supply of sterilized dressing and cotton wool as prescribed in the factory rules.</li> </ul> <p>The contractor will take adequate measures for the control of infectious diseases and their vectors.</p> <ul style="list-style-type: none"> <li>• Forced and child labor is forbidden.</li> <li>• Complete record of accidents and near-misses will be maintained.</li> <li>• First aid facilities will be made available at the work sites and in the camps. The contractors will engage qualified first aider(s).</li> </ul>		

Subject	Potential Impact	Mitigation measures	Institutional Responsibility	
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		<ul style="list-style-type: none"> <li>• 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 the government rules and regulation.</li> <li>• Location and telephone numbers of the nearest hospital will be displayed at appropriate places at work sites and in construction camps. If necessary, the contractor will have an ambulance available at the site.</li> <li>• Adequate housing, safe and reliable water supply for all workers.</li> <li>• Accommodation for taking meals and for shelters during interruption of work due to adverse weather conditions.</li> <li>• Hygienic sanitary facilities and sewerage system. The toilets and domestic wastewater will be collected through a common sewerage. Provide separate latrines and bathing places for males and females with total isolation by wall or by location. The minimum number of toilet facilities required is one toilet for every ten persons.</li> <li>• Provide in-house community/common entertainment facilities. Dependence of local entertainment outlets by the construction camps to be discouraged/prohibited to the extent possible.</li> <li>• Provide adequate health care facilities and first aid facility round the clock within construction sites. Maintain stock of medicines in the facility and appoint fulltime designated first aider or nurse.</li> <li>• Train all construction workers in basic sanitation and health care issues and safety matters, and on the specific hazards of their work. • Provide appropriate security personnel (police/home guard or private security guards) and enclosures to prevent unauthorized entry into the camp area.</li> <li>• The contractor will educate the work force about HIV/AIDS and launch awareness campaign among the work force.</li> <li>• There will be proper enforcement of the labor laws at the workplace.</li> <li>• A system will be in place to document and report incidents and accidents at site.</li> </ul> <p>First Aid. The contractor will be responsible for ensuring that first aid, including the provision of trained personnel, is available. Arrangements will be made for ensuring the removal for medical attention of workers who have suffered an accident or sudden illness. The manner in which first aid facilities and personnel are to be provided will be prescribed by national laws or regulations, and drawn up after consulting the competent health authority and the representative organizations of employers and workers concerned:</p> <ul style="list-style-type: none"> <li>• First-aid kits or boxes, as appropriate, will be provided at the workplaces, including isolated locations and the motor vehicles used for construction like dumpers and tippers.</li> </ul>		

Subject	Potential Impact	Mitigation measures	Institutional Responsibility	
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		<ul style="list-style-type: none"> <li>• First-aid kits and boxes will not contain anything besides material for first aid emergencies.</li> <li>• First-aid kits and boxes will simple with clear instructions to be followed, be kept under the charge of a responsible person qualified to render first aid and be regularly inspected and kept properly stocked not running short of medicines.</li> </ul> <p>162 Firefighting: There will be firefighting facility at construction locations. The staff will face any emergency situations without many problems. There will be adequate measures as listed below:</p> <ul style="list-style-type: none"> <li>• Secure storage areas will be provided for flammable liquids, solids and gases such as liquefied petroleum gas cylinder, paints and other such materials in order to deter trespassers.</li> <li>• Smoking will be strictly prohibited and no smoking notices be predominantly displayed in all places containing readily combustible or flammable materials.</li> <li>• Only suitably protected electrical installations and equipment, including portable lamps, will be used.</li> <li>• Oil rags, waste and clothes or other substances liable to spontaneous ignition will be removed without delay to a safe place.</li> <li>• Adequate ventilation will be provided.</li> <li>• Combustible materials such as packing materials sawdust, greasy/oily waste and scrap wood or plastic will not be allowed to accumulate in work places but will be kept in closed metal containers in a safe place.</li> <li>• Regular inspections will be made to places where there are fire risks. These include the vicinity of heating appliance, electrical installation, and conductors, stores of flammable and combustible material, hot welding and cutting operations</li> <li>• Places where workers are employed will, if necessary, to prevent the danger of fire, be provide suitable and sufficient fire-extinguishing equipment, which will be easily visible and accessible an adequate water supply at ample pressure.</li> <li>• Fire-extinguishing equipment will be properly maintained and inspected at suitable intervals by a competent person. Where appropriate, suitable visual signs will be provided to indicate clearly the direction of escape</li> </ul> <p>adequate health care facilities (including first aid facilities) within construction sites</p> <p>2. Safety Training Program. A Safety Training Program is required and will consist of:</p> <ol style="list-style-type: none"> <li>a. Initial Safety Induction Course. All workmen will be required to attend a safety induction course within their first week on Site. The induction trainings are mandatory for new staff and visitors.</li> </ol>		

Subject	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
		<p>b. Periodic Safety Training Courses. Period safety course will be conducted not less than once every six months. All Subcontractor employees will be required to participate in relevant training courses appropriate to the nature, scale and duration of the subcontract works. Training courses for all workmen on the Site and at all levels of supervision and management.</p> <p>Safety Meetings. Regular safety meetings will be conducted on a monthly basis and will require attendance by the safety representatives of Subcontractors unless otherwise agreed by the CSC. The CSC will be notified of all safety meetings in advance. The CSC may attend in person or by representative at his discretion. The minutes of all safety meetings will be taken and sent to the CSC within seven days of the meeting.</p> <p>Safety Inspections. The Contractor will regularly inspect, test and maintain all safety equipment, scaffolds, guardrails, working platforms, hoists, ladders and other means of access, lifting, lighting, signing and guarding equipment. Lights and signs will be kept clear of obstructions and legible to read. Equipment, which is damaged, dirty, incorrectly positioned or not in working order, will be repaired or replaced immediately.</p> <p>Personal Protective Equipment (PPE). Workers will be provided (before they start work) with appropriate personnel safety equipment suitable for electrical work such as safety boots, helmets, gloves, protective clothes, goggles, and ear protection at no cost to the workers. Site agents/foremen will follow up to see that the safety equipment is used and not sold on. In addition, life vests will be provided to Contractors staff working on the bridge piling works.</p> <p>Clean drinking water will be provided to all workers;</p> <p>Adequate protection to the general public, including safety metal fence and marking of hazardous areas will be provided;</p> <p>Risk assessment of workplaces prior to any construction activities. Before new activities are commenced, risk assessment will be conducted including a thorough examination of working site to identify situations, processes, etc. that may cause harm, particularly to people. After identification is made, the probability and severity of the risks will be analyzed and evaluated. Based on the evaluation, actions necessary to eliminate the hazard, or control the risk using the hierarchy of risk control methods will be identified.</p> <p>All contractors and subcontractors will be required to appoint an CSO who will be available on the Site throughout the operational period of the respective contract unless the Engineer approval to the contrary is given in writing. In the event of the CSC's approval being given, the CSC, without prejudice to their other duties and responsibilities, will ensure, as far as is practically possible, that employees of subcontractors of all tiers are conversant with appropriate parts of the SSESMP.</p> <p>Contractor will subcontract with an Approved Service Provider to provide an HIV Awareness Program to the Contractor's Personnel and the Local Community as soon as</p>		

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		practicable after the Contractor's Personnel arrive at the Site but in any case, within two weeks after the Contractor's Personnel arrive at Site and to repeat the HIV Awareness Program at intervals not exceeding four months.  Zones with noise level above 80 dBA must be marked with safety signs and appropriate PPE must be worn by workers.		
OHS of female workers	Particular Risks relating to women	<ul style="list-style-type: none"> <li>• The contractor and subcontractors will provide all necessary Personal Protective Equipment (PPE) to female site workers free of charge, taking into account any particular needs of women.</li> <li>• Separate accommodations with the locked rooms will be provided to ensure the privacy</li> <li>• Separate sanitary facilities will be provided for female workers at the site.</li> </ul>	(Sub)-Contractors	
Emergency Response Planning	Risks of Emergency Situation	The Contractor will be responsible for preparation of an Emergency Response Plan (ERP) as part of the SSESMP and which will include sections relating to: <ol style="list-style-type: none"> <li>1) Containment of hazardous materials;</li> <li>2) Oil and fuel spills;</li> <li>3) Fire and explosions;</li> <li>4) Work-site accidents;</li> <li>5) Earthquake hazards</li> </ol> The ERP will detail the process for handling, and subsequently reporting, emergencies, and specify the organizational structure (including responsibilities of nominated personnel). Implementation of the plan will be monitored by the CSC. Any emergencies, and how they were handled, will be reported in monthly progress reports by the Contractor to the CSC. The CSC will also provide periodic monitoring of the Contractors works throughout construction to ensure the ERP is implemented effectively.	Contractor	CSC and PIURR
Community Health and Safety	Sexual Exploitation and Abuse and Sexual Harassment (SEA/SH) Risks	<ul style="list-style-type: none"> <li>• Community health and safety management plan will be prepared and implemented. PIURR and Contractor will ensure CHS requirements are cascaded down into EPC and sub-contractors' scope of work through inclusion into tender documentation, contracts and their policy and procedures during construction and operation.</li> <li>• Hazardous substances will be handled and stored according to the standards; The project drivers will be trained in safe driving. They will maintain low speed while driving through / near the communities.</li> <li>• The project will establish its own grievance redress mechanism (GRM) to address community grievances related to health and safety aspects of the Project based on the experience of GRM established for Packages 1 and 2.</li> <li>• Contractor will provide clear signs to guide road users and advise them on changes</li> </ul>	Contractor, CSC and PIURR	CSC, PIURR

Subject	Potential Impact	Mitigation measures	Institutional Responsibility	
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		<p>to road priorities in order to make their journey as smooth as possible and to ensure road safety as unanticipated changes e.g. change of lane, will be avoided.</p> <ul style="list-style-type: none"> <li>• Access to construction sites to be closed temporarily while providing temporary/alternative access routes where needed in consultation with the community.</li> <li>• The community members will be advised on road safety with the key messages reinforced with communities throughout construction. Clear signs will be placed at construction sites including borrow pits, in view of the public, warning people of potential dangers such as moving vehicles, hazardous materials and excavation and raising awareness on safety issues. Heavy machinery will not be used after day light and all such equipment will be returned to its overnight storage area/position before night.</li> <li>• All sites including storage areas will be made secure, prohibiting access by members of the public by fencing when appropriate. Install metal fence to keep pedestrians away from hazardous areas such as constructions sites and excavation sites.</li> <li>• Install signage at the periphery of the construction site advising road users and local community that construction is in progress.</li> <li>• Strictly impose speed limits on construction vehicles along residential areas and where other sensitive receptors such as schools, medical places and other populated areas located.</li> <li>• Provide security personnel in hazardous areas to restrict public access. If necessary, provide safe passageways for pedestrians crossing the construction site and for people whose access has been disrupted due to construction works.</li> <li>• Provide information to the public about the scope and schedule of construction activities and expected disruptions and access restrictions;</li> <li>• Allow for adequate traffic flow around construction areas;</li> <li>• Provide adequate signalization, appropriate lighting, well-designed traffic safety signs, metal fence and flag persons for traffic control; and</li> <li>• Access roads should be maintained during the construction phase and rehabilitated at the end of construction by the contractor to the satisfaction of the local authorities and in compliance with the contract.</li> <li>• Prohibition of SEA/SH will be introduced in the Code of Conduct to be acknowledged and signed by all workers.</li> <li>• Training on SEA/SH issues and the available protocols for handling SEA/SH</li> </ul>		

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			Implement	Monitor
		<p>complaints in sensitive and confidential manner will be provided to all workers and communities in the project corridor.</p> <ul style="list-style-type: none"> <li>• The protocol for handling SEA/SH grievances will involve referral mechanism to the appropriate specialized service providers identified with SEA/SH service provider mapping.</li> <li>• In terms of protecting female employees from sexual harassment in the workplace, employers are required to take effective measures to prevent and stop female employees from being sexually harassed in the workplace in combination with their own work and production characteristics.</li> <li>• If female employees are sexually harassed in the workplace and other behaviors endangering the personal safety of employees are reported or complained to the Employer, the Employer shall deal with them in a timely manner and protect the personal privacy of female employees according to law.</li> <li>• At the same time, female employees shall be encouraged to resolutely defend their individual rights,</li> <li>• The contractor has to set up display boards, legal knowledge competition, door-to-door publicity, distribution of prevention and legal publicity materials, etc., in order to publicize the knowledge of preventing and eliminating gender-based violence and relevant laws and regulations to the general public, eliminate gender-based violence, and maintain healthy, civilized and harmonious social development.</li> <li>• The Grievance redress mechanism will be established during the construction and operation phases to cover the SEA/SH issues. The Contractor's Social specialist will be dedicated to be contacted in case of SEA/SH.</li> <li>• The female claimants will have possibility to contact the PIURR Social Specialist directly in case of SEA/SH, and she will make sure to follow all procedures for SEA/SH grievance resolution.</li> <li>• The confidentiality of claimant is respected unless otherwise requested by the claimant. The SEA/SH cases will be also included in the grievance log (anonymously).</li> </ul>		
Community Road Safety	Interruption of Access and Road Safety	<ul style="list-style-type: none"> <li>• Contractor will provide clear signs to guide road users and advise them on changes to road priorities in order to make their journey as smooth as possible and to ensure road safety as unanticipated changes e.g. change of lane, will be avoided.</li> <li>• Access in areas to be closed temporarily by providing temporary/alternative access will be ensured.</li> </ul>	Contractor, CSC and PIURR	CSC, PIURR

Subject	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
		<ul style="list-style-type: none"> <li>• The community members will be advised on road safety with the key messages reinforced with communities throughout construction. Clear signs will be placed at construction sites including borrow pits, in view of the public, warning people of potential dangers such as moving vehicles, hazardous materials and excavation and raising awareness on safety issues. Heavy machinery will not be used after daylight and all such equipment will be returned to its overnight storage area/position before night.</li> <li>• All sites including storage areas will be made secure, prohibiting access by members of the public by fencing when appropriate. Install metal fences to keep pedestrians away from hazardous areas such as constructions sites and excavation sites.</li> <li>• Install signage at the periphery of the construction site advising road users that construction is in progress.</li> <li>• Strictly impose speed limits on construction vehicles along residential areas and where other sensitive receptors such as schools, medical places and other populated areas located.</li> <li>• Provide security personnel in hazardous areas to restrict public access. If necessary, provide safe passageways for pedestrians crossing the construction site and for people whose access has been disrupted due to construction works.</li> <li>• Provide information to the public about the scope and schedule of construction activities and expected disruptions and access restrictions;</li> <li>• Allow for adequate traffic flow around construction areas;</li> <li>• Provide adequate signalization, appropriate lighting, well-designed traffic safety signs, metal fence and flag persons for traffic control; and</li> <li>• Provide temporary access where accessibility is temporarily restricted due to civil works.</li> <li>• Access roads will be maintained during the construction phase and rehabilitated at the end of construction by the contractor to the satisfaction of the local authorities and in compliance with the contract.</li> </ul>		
	Spread of vector-borne diseases	To control a spread of vector borne diseases the Contractor will prepare and implement Integrated Pest Management Procedure as part of the SSESMP. In implementation of pest control activities, avoid the use of hazardous materials subject to international bans or phase-outs. Purchase, use, and manage substances based on integrated pest management approaches and reduce reliance on synthetic chemical pesticides.	Contractor, CSC and PIURR	CSC, PIURR
Impacts on Women		Gender Action Plan that has been prepared for the proposed project will be implemented	Contractor, CSC and PIURR	CSC, PIURR

Subject	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
Livelihood impacts	Generally positive impacts with more employment opportunities for local population	Contractors will give preference to the local population for the site jobs.	Contractor, CSC and PIURR	CSC, PIURR
Influx of labor	Social conflict, resistance to labor from other places, SEA/SH risks	<ul style="list-style-type: none"> <li>• Construction camps will be established outside of communities, with the approval of PIURR and local authorities;</li> <li>• The contractor will prepare and implement a CoC for all site personnel, in consultation and coordination with the local community. All site personnel will be required to sign the CoC and its adequate implementation will be regularly monitored and included in progress reports;</li> <li>• CoC will be translated in local language(s) and displayed at key locations within the site;</li> <li>• All site personnel will be provided orientation and training on Code of Conduct. Awareness raising materials such as posters and signage will be used as appropriate;</li> <li>• All site personnel will be provided awareness and training to prevent communicable diseases, sexually transmitted infections, Human immunodeficiency virus (HIV) infections / Acquired Immune Deficiency Syndrome (AIDS);</li> <li>• Privacy of women will be respected; routes and places used by them will be avoided as far as possible;</li> <li>• Entry of the site personnel in the local communities will be minimized to the extent possible/appropriate.</li> <li>• No child labor or forced labor will be engaged by the contractor.</li> <li>• GRM for workers will be established by the civil works contractor and will also address community grievances related to social conflict.</li> <li>• Liaison with the community will be maintained.</li> <li>• Provide training for the project workers which will include sessions on social norms and cultural awareness.</li> <li>• The following shall be prioritized: (i) employ local people as much as possible, (ii) ensure equal opportunities for women and men, (iii) pay equal wages for work of equal value, and to pay women's wages directly to them; and (iv) not employ child or forced labor.</li> </ul>	Contractor, CSC and PIURR	CSC, PIURR

Subject	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
Physical Cultural Resources	Potential damage to archaeological artefacts due to construction activities, particularly earthworks	<p>In the event of the unexpected discovery of archaeological objects during construction operations the contractor shall immediately inform the residential engineer who will notify the Institute of Archaeology / Ministry of Culture and PIURR for further instructions. In this case the construction works at the localized site would be stopped until Institute of Archaeology gives clearance for the continuation of the operations.</p> <p>Works will resume only after appropriate measures have been taken as requested by the Institute of Ministry of Culture and confirmation has been received that works may continue.</p> <p>In the event of any chance finds during the construction works, procedures will apply that are governed by national legislation and guidelines. Contractors will take the following precautions to avoid disturbance of any yet undiscovered archaeologically valuable artefacts:</p> <ul style="list-style-type: none"> <li>(i) Workers (both contractor and the CSC) will be instructed to keep a watching brief for relics in excavations.</li> <li>(ii) Will any potential items be located, Archaeological Institute Dushanbe will immediately be contacted, and work will be temporarily stopped in that area.</li> <li>(iii) If the item is of potential significance, an officer from Archaeological Institute Dushanbe will be invited to inspect the site and work will be stopped to allow time for inspection.</li> <li>(iv) Work will not re-commence in this location until agreement has been reached between Archaeological Institute Dushanbe, the CSC and PIURR as to any required mitigation measures, which may include structured excavation.</li> </ul>	Contractor, CSC and PIURR	CSC, PIURR and Archaeological Institute Dushanbe
<b>OPERATION PHASE</b>				
Increased traffic volumes and higher vehicle speeds	Increased risk of accidents with possible spills of harmful substances	A spill-contingency plan and emergency response plan is a set of procedures to be followed to minimize the effects of an abnormal event on the Project roads, such as a spill of oil, fuel or other substances that may harm drinking water resources or have adverse effects on the natural balance of sensitive areas. Additional measures to mitigate risk of accidents and spill of harmful substances are speed control and weight stations. The appropriate budget will be allocated by the MOT (executing agency).	MoT (executing agency) and PIURR	PIURR
Damaged drainage or uncontrolled erosion	Harmful environmental impacts resulting from damaged drainage or uncontrolled erosion.	Routine monitoring of drainage and erosion control on the regular basis. Oil interceptors, which are regularly checked and maintained, will be installed on all drainage systems on the bridge.	Local Road Maintenance Unit under Ministry of Transport	PIURR
Maintenance of the trees planted	Trees planted as mitigation measures may not grow well. Planting tall-growing trees under or	Maintain the trees after the defect's liability period. Conduct periodic pruning	local Khukumat	PIURR

Subject	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
	near overhead utility lines eventually requires pruning them to maintain safe clearance from the wires. This pruning may result in the tree having an unnatural appearance.			
Accidents and spills	Soil and water contamination	<ul style="list-style-type: none"> <li>The bridge deck will be carefully cleaned from the oil and grease accumulated during the dry season before the start of the rainfall period.</li> <li>The bridge drainage system will include the drain spouts will be installed from both sides of the bridge at approximately 3-m intervals and will be equipped with the initial treatment system including replaceable filters to prevent direct release of the drain water, which could be contaminated due to traffic and possible accidents.</li> <li>A spill-contingency plan and emergency response plan will be prepared for the O&amp;M phase of the Bridge and the entire road corridor. It is a set of procedures to be followed to minimize the effects of an abnormal event on the Project roads, such as a spill of oil, fuel or other substances that may harm drinking water resources or have adverse effects on the natural balance of sensitive areas. Additional measures to mitigate risk of accidents and spill of harmful substances are speed control and weighing stations. Appropriate budget should be allocated by MOT during the O&amp;M phase of the Bridge (and the entire road corridor).</li> <li>The roads drainage system will contain oil interceptors that will be regularly checked, cleaned and replaced by the operators maintenance staff, especially after rain events.</li> </ul>		
Waste generation	Soil and water contamination	<ul style="list-style-type: none"> <li>MOT will make arrangement for collection of wastes and their appropriate disposal during the O&amp;M phase of the Bridge (along with the road).</li> </ul>	PIU	MOT
OHS/CHS	Risks to O&M workers and communities caused by vehicular traffic on the Bridge (and road corridor)	MOT will prepare and implement a road safety system for the entire road corridor.	PIU	MOT
Emergency situations	Risks to human life and property; soil, water and air contamination	An Emergency Response Plan will also be prepared to address natural or man-caused emergencies such as floods and fires). The Emergency Response Plan will also cover pollution related events such as oil spills and chemical accidents and the measures to put in place to ensure spillages are contained and do not spread into the natural environment, especially surrounding water courses.	PIU	MOT

### 7.3.1 Site-Specific Environmental and Social Management Plans

585 SSESMPs are the documents that the Contractor will prepare (with the assistance of the CSC-IES) outlining how s/he intends to implement the ESMP and ensure that all of the mitigation and monitoring is completed according to the implementation arrangements specified in this ESMP.

586 SSESMP will describe the precise location and methodology of the required mitigation /monitoring, the persons responsible for the mitigation / monitoring, the schedule and reporting methodology. SSESMP will be submitted to PIURR for approval at least 10 days before taking possession of any work site. No access to the site will be allowed until SSEMPs are approved by PIURR and CSC.

587 SSESMP will describe how ESMP will be implemented in the conditions of particular construction site and ensure compliance with the requirements for mitigation and monitoring. SSESMPs will include the following:

- (a) Environmental management staff organizational structure, which will identify the personnel to be engaged environmental protection and the responsibilities of the participants;
- (b) Criteria for appointment of principal staff;
- (c) Proposed interaction and communication procedures between the contractor's construction personnel, Contractor's Environmental Officer (CEO) and CSO, including proposals for communication facilities.

588 SSESMP will contain specific Annexes (Management Plans), relating to the following aspects<sup>25</sup>:

- a) **Air Quality and Dust Management Plan:** This plan will detail the action to be taken to minimize dust generation (e.g., spraying un-surfaced roads with water, the source of water and the volume they will need for spraying, covering stockpiles, etc.) and will identify the type, and standard of equipment to be used and will also provide details of the air quality monitoring program, including the locations, frequencies and parameters measured for baseline and routine monitoring. The Plan will also include contingencies for the accidental release of toxic air pollutants (or will refer to the Emergency Response Plan).
- b) **Water Quality Management Plan:** This Plan will identify the sources of the potential water pollution and develop the measures for avoidance or otherwise minimizing the impacts to water quality. The plan will include the details for instrumental monitoring of the potentially affected water bodies and other sources of water. The instrumental water quality monitoring will be conducted down- and upstream where the Project road crosses the river of Surkhob. Four monitoring points were selected at the Detailed Design stage where baseline studies have been conducted. Contractor will prepare Water Quality Management Plan as part of SSESMP with detailed description of measures for protection of water quality.
- c) **Noise and Vibration Management Plan:** This Plan will describe the measures to minimize and manage the potential impacts of increased levels of noise & vibration causing health and property risks like nuisances, hearing impairment which can impact both construction workers and the nearby leaving residents.
- d) **Waste Management Plan:** This Plan will include items relating to the safe handling and management of domestic, construction, and hazardous waste. The Plan will cover waste disposal, recycling and reuse, and storage of hazardous waste.
- e) **Construction Camp Management Plan:** This Plan will include the camp layout, details of various facilities including supplies, storage, and disposal of hazardous waste, the operational impacts and mitigation measures to address these impacts.

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<sup>25</sup> This is a typical list; additional plans may need to be prepared as part of SSESMP.

- f) **Fuel and Hazardous Substances Management Plan** will be prepared by the contractor in accordance with the present ESMP, standard operating procedures and other relevant guidelines, and where applicable, material safety data sheets (MSDS). The Plan will include the procedures for handling the oils and chemical spills.
- g) **Borrow Pit Management Plan** will provide the details for the implementation of measures to manage the impacts of the construction activities on the quarries, borrow pits and haul roads that may be required for the project including the provision for re-instatement.
- a) **Health and Safety Plan:** This Plan will also cover communities' health and safety aspect, road safety, noise and air quality control. Communication with surrounding communities within the O&M stage.
- a) **Emergency Response Plan:** This Plan aims to document the approach of the Contractor for the transportation, handling, use, storage, and disposal of chemicals and in the implementation of measures in the event of spills or accidental releases of hazardous materials and any other likely incident or accidents that may rise during construction works. The implementation of the measures Plan will allow reducing the risk of any impacts up to an acceptable level.
- b) **Traffic Management Plan:** This Plan will contain acceptable strategies for the movement of materials and personnel within and outside the construction site, including the transportation of non-standard loads. The plan will include information on the organization of traffic between points, access routes, and main existing roads, as well as planned upgrade works. A well-designed TMP is a crucial aspect of the SSESMP plan for any Infrastructure project. However, it is essential to regularly review and update the TMP as the project progresses and conditions evolve.
- c) **Reinstatement & Landscape Management Plan:** The purpose of this plan is to document the implementation of site cleaning and restoration including restoration, landscaping, and revegetation.
- d) **Erosion Control Plan:** This Plan will describe in detail the erosion control measure or all construction activity.
- e) **Pest Control:** In implementation of pest control activities, avoid the use of hazardous materials subject to international bans or phase-outs. Purchase, use, and manage substances based on integrated pest management approaches and reduce reliance on synthetic chemical pesticides.
- f) **Communication Plan:** Formulates a detailed communication plan that delineates the designated channels, protocols, and mechanisms for disseminating of E&S information to workers and stakeholders.

589 SSESMP will define: (i) Frequency, coverage and intent of environmental management meetings together with the rationale for attendance; (ii) Frequency, coverage and intent of regular environmental reports; (iii) Methods of promoting an awareness of environmental protection and amongst all persons directly or indirectly associated with the Works.

590 The powers vested in the environmental management staff which would enable them to take urgent, appropriate and direct action to prevent and/or correct disruption to the environment. The means by which environmental management matters and requirements will be communicated to Subcontractors of all tiers.

591 The means by which environmental management systems will be supervised, monitored and audited to ensure due compliance with the principles and objectives of the ESMP at all levels of construction.

592 Proposals to ensure that construction methods do not compromise the Contractor's commitment to environmental management.

593 All locations (including but not limited, construction areas, sites areas, plant and equipment areas and Contractor staff office and accommodations) that are directly or indirectly associated with the Contract will be regularly inspected for compliance with environmental requirements. Specific issues include but not be necessary limited to:

- (a) dust control;
- (b) waste handling and disposal;
- (c) oil and diesel handling and storage;
- (d) prevention of materials encroaching outside the RoW;
- (e) temporary drainage;
- (f) water quality.

## 7.4 Environmental and Social Monitoring

594 For the proposed project, two types of monitoring have been proposed: compliance monitoring and effects monitoring. Compliance monitoring will focus on the monitoring the compliance of various labor and environment, health and safety (EHS) requirements and implementation of mitigation measures identified in ESMP and SSESMP. The Effects monitoring or Environmental Quality Monitoring will be carried out during project construction phase.

595 For the environmental quality monitoring, parameters like water contamination, air pollution and noise will be monitored by the contractor under the supervision of CSC. The party responsible for monitoring in accordance with **Table 48** will be obliged to report to PIURR. During the operation period (until the issuance of AIB's Project Completion Report), such monitoring will be conducted by the Ministry of Transport (executing agency). **Table 48** provides the monitoring actions required during the pre-construction, construction and operation phase of the Project. This can be revised as necessary during the construction phase.

**Table 48. Effects Monitoring Plan**

Item	Parameter	Location	Method	Timing	responsibility
<b>Pre-Construction Stage</b>					
Surface Water quality (surface waters including rivers streams and irrigation channels)	pH, BOD, COD, dissolved oxygen, oil products, turbidity, total suspended solids, conductivity, temperature, lead	Down- and upstream where the Project road crosses the river. channels.	Measurement either directly in river water with a suitable measurement device or sample taking and measurement in a certified laboratory.	Baseline measurements before construction activities commence.	Contractor
Noise and Vibration	noise and vibration level	Within the settlements close to settlements. In addition, near the Concrete batching plant and the aggregate crusher.	By means of portable noise / vibration measurement device	Prior to construction (to establish baseline conditions)	Contractor
Air quality	Dust, noise, SO <sub>2</sub> , NO <sub>x</sub> , CO	Same as above. In addition, near the Concrete batching plant and the aggregate crusher.	By means of suitable portable measurement device	Prior to construction (to establish baseline conditions)	Contractor

Item	Parameter	Location	Method	Timing	responsibility
Number of Trees to be cut	Trees located within the newly designed embankment.	At respective tree locations.	Inspections; observation.	Prior to construction (to establish baseline conditions)	Contractor and CSC
<b>Construction stage</b>					
Surface Water quality	Same as above.	Same as above.	By means of suitable portable measurement device	Quarterly basis during construction stage. Upon receiving relevant complaint, as necessary.	Contractor
Noise and Vibration	Same as above.	At locations where the Project AOI is close affected settlements) Other locations will be included in the case of need.	Same as above.	Quarterly basis during construction stage. Upon receiving relevant complaint, as necessary.	Contractor
Air quality	Same as above.	Same as above. Other locations will be included in the case of need	Same as above.	Quarterly basis during construction stage. Upon receiving relevant complaint, as necessary.	Contractor
<b>Operational stage</b>					
Increased traffic volumes may increase possible spills of harmful substances	Accidents that cause spills of harmful substances	Along the new road	Counting of accidents	Throughout the Year	Ministry of Transport
Damaged drainage or uncontrolled erosion	Leakages in drainage system and damages due to erosion	Culverts and drainage facilities	Documentation	Throughout the Year	Ministry of Transport

Item	Parameter	Location	Method	Timing	responsibility
Noise	Noise level	At all sensitive receptors which noise level may exceeds standards, and other sensitive receptors in the vicinity	By means of portable noise measurement device <sup>26</sup>	In the opening year (right after the civil works completion, and 3 months, 6 months, 12 months, and 24 months after the civil works completion) and in subsequent years until 2040 one measurement per year.	Contractor and the CSC (during 2 years after the civil works completion) the Ministry of Transport (after the contractor and the CSC are demobilized)
Post construction site inspection	Performance checked against the management plans submitted before construction for specific aspects (Occupational and Community Health and Safety Plan).	All construction sites	Visual inspection	Twice: two weeks before completion of construction activities and once after completion	CSC, AIIB

## 7.5 E&S Documentation and Reporting

596 The following environmental and social documentation and reports will be produced by the parties involved during the project implementation:

- a. **Monthly Progress Report** prepared by the Contractor will include EHS section covering environmental and social monitoring, OHS compliance, OHS incidents and accidents, trainings conducted, GRM and any other salient activities carried out during the reporting period. The report will be submitted to CSC.
- b. **Quarterly Environmental and Social Monitoring Reports** will be submitted by the Contractor to the Supervising Engineer, for subsequent approval by the Supervising Engineer, PIURR and/or the Committee for Environmental Protection (CEP), as appropriate.
- c. **Environmental, Social, Health and Safety sections in Quarterly Project Progress Reports:** the CSC will prepare quarterly Project Progress Report. The Environmental, Social and OSH Specialists of CSC will provide inputs to the Project Progress Reports covering various ES and HS issues that include monitoring and results, compliance, incidents and accidents, ESHS training, grievances. The reports will be submitted to PIURR and then submitted to AIIB by PIURR.
- d. **Semi-annual Environmental and Social Monitoring Report** will be prepared by CSC. The environmental and social monitoring reports will include environmental and social mitigation measures undertaken, environmental and social monitoring activities undertaken, progress of resettlement, payment of compensation and assistance, details of monitoring data collected, analysis of monitoring results particularly the non-

<sup>26</sup> The devices of the contractor and the CSC will be handed over to the Ministry of Transport, when the contractor and the CSC are demobilized.

compliances, recommended mitigation and corrective measures, training conducted, regulatory violations observed, status of GRM and its implementation, and grievance received and resolved. The environmental and social monitoring reports will be submitted semi-annually during the construction period and annually for three years after completion of construction. The reports will be submitted by PIURR to AIIB.

e. **Accident reports**

f. **Project Completion Environmental and Social Monitoring Report:** One year after completion of construction, the PIU will submit a Project Completion Environmental and Social Monitoring Report, which will summarize the overall environmental and social management of the project

597 Documentation required to ensure E&S compliance will also include:

- **Minutes of Meetings-** notes that are recorded during a meeting. They highlight the key issues that are discussed, motions proposed or voted on, and activities to be undertaken.
- **Noncompliance Report (NCR)** will be prepared whenever inspectors determine that the Contractor has failed to meet one or more ESMP requirements, explaining the nature of the regulatory action
- **Corrective Actions Plan (CAP)** will be documenting non-compliance issues, identifying their root causes, and capturing measurable, achievable solutions and realistic deadlines.

## 7.6 E&S Training

598 The training program as an important part of project capacity-building will cover all E&S and OHS aspects necessary for the project implementation. The staff of the PIURR and the Contractor will receive training in environmental and social risk management, environmental monitoring and supervision, mitigation planning, emergency response, public consultation and use of the GRM, occupational and community health and safety, and other environmental and social management topics. The tentative summary of the training schedule is presented in **Table 49**.

**Table 49. Tentative Environmental and Social Trainings Program**

Topic of Training	Duration	Receiver	Organizer
Comparison of AIIB and Tajikistan's Environmental and Social Requirements. ESIA and ESMP E&S and OHS documentation at required at the project's level	1 day during the first month after the project starting	MoT and PIURR Staff involved in the Project	PIURR
Development and implementation of SSESMP, site inspections, monitoring and reporting, and GRMs	Before the civil works 3 days	EHS staff of the Contractor	CSC
Health & Safety, Handling and disposal of hazardous materials	Before starting respective works 1 day	EHS staff of the Contractor	CSC
Code of conduct; gender issues; SEA/SH and other social issues	Periodically during the construction	Contractor's staff	Contractor with assistance of CSC
Driving safety	Periodically during the construction	Contractor's staff	Contractor with assistance of CSC
Camp management	Periodically during the construction	Contractor's staff	Contractor with assistance of CSC

## 7.7 Cost Estimate

599 Most costs associated with the implementation of environmental and social provisions of ESMP are imbedded in the civil works cost. The installation of septic systems at construction camps, for example, is an environmental necessity, but not generally considered an “environmental cost. **Table 50** lists the proposed mitigation measures to be taken by contractor and indicates where they would be “included in the project budget” as part of a bid document and where additional costs are a likely “environmental cost” beyond what would normally be included in a project budget. **Table 51** indicates general Environmental Management Costs while **Table 52** provides indicative cost for environmental monitoring. It is expected that the monthly expenses for the Environmental Management can reach to \$12,000 per month or about \$580,000 for the whole project period. It is close to the total estimate provided below (\$554,000). Approximately the same amount will be spent on covering of OHS issues including PPE, other safety equipment, and trainings. CSC expenses for E&S management will be around \$375,100 (see **Table 52**).

**Table 50. Indicative Cost Estimate for Contractor’s Environmental and Social Management activities**

Description	Unit	Quantity	Rate	Amount	Notes
Protection of trees during the construction activities.	lumpsum			\$8,000	
Preparation of SSESMP	lumpsum			\$10,000	Included in Contractor’s Cost
Clearing of Construction Corridor.	lumpsum			\$10,000	Included in Contractor’s Cost
Removal and Storage of Topsoil.	lumpsum			\$8,000	Included in Contractor’s Cost
Protection of Water Resources.	lumpsum			\$12,000	Included in Contractor’s Cost
Management of Solid Waste and Sewage Waste from the Construction Camp.	lumpsum			\$30,000	Included in Contractor’s Cost
Potential restoration of Work and Storage Sites, Quarries and Borrow Pits, Construction Site Roads.	lumpsum			\$50,000	Included in Contractor’s Cost
Securing of Storage and Equipment Maintenance Areas.	lumpsum			\$18,000	Included in Contractor’s Cost
Temporary physical barriers to protect vegetation	lumpsum			\$12,500	Included in Contractor’s Cost
Installation of the settling ponds and septic tanks	lumpsum			\$52,000	Included in Contractor’s Cost
Dust suppression measures during dry period (water spraying)	lumpsum	Daily during dry summer period (4 periods)	\$10,000	\$40,000	Included in Contractor’s Cost

Description	Unit	Quantity	Rate	Amount	Notes
Contractor's Environmental and Social Officer	month			\$96,000	Included in Contractor's Cost
Contractor's Safety Officer	month			\$96,000	Included in Contractor's Cost
HIV / AIDS Seminar	Every 6 months during construction	8	\$2,000	\$16,000	
EHS Trainings		10	\$2,000	\$20,000	
<b>Sub-Total</b>				\$478,500	
Contingencies (10%)				\$47,850	
<b>Total:</b>				<b>\$526,350</b>	

**Table 51. Cost Estimate for the Contractor's Environmental and Social Monitoring**

Description	Unit	Quantity	Rate	Amount
Water Quality	Before and during construction	32 (16 times in 2 locations)	\$250	\$8,000
Noise Level	Same as above.	32 (16 times in 2 locations)	\$200	\$6,400
Vibration Level	Same as above	32 (16 times in 2 locations)	\$200	\$6,400
Air Quality	Same as above.	32 (8 times in 10 locations)	\$180	\$5,760
<b>Sub-Total</b>				<b>\$25,560</b>
Contingencies (10%)				\$2,560
<b>Total</b>				<b>\$28,120</b>

**Table 52. Cost Estimate for CSC Environmental and Social Staff**

Description	Unit	Quantity	Rate	Amount
International Environmental Specialist (CSC-IES)	month	8	\$15,000	\$120,000
National Environmental Specialist (CSC-NES)	month	48	\$3,000	\$144,000
National Social Specialist	lumpsum	24	\$3,000	\$72,000
Training of PIURR staff	lumpsum			\$5,000
<b>Sub-Total</b>				<b>\$341,000</b>
Contingencies (10%)				\$34,100
<b>Total</b>				<b>\$375,100</b>

## 8. LAND ACQUISITION AND RESETTLEMENT

600 This Chapter provides a summary of due diligence carried out for the potential resettlement impacts of the proposed project.

### 8.1 Overview

601 Within the ESIA process, the ESIA Consultants jointly with PIURR conducted due diligence to confirm if there are any land acquisition and resettlement impacts as per the AIIB ESP requirements. The task was conducted by the social specialists of the ESIA Consultants and involved stakeholder consultations since the start of the ESIA activities.

602 To determine if any additional land acquisition is needed for the project, the ESIA and PIURR specialists reviewed the documents related to land acquisition and resettlement through a desk review and also had discussions with AIIB E&S specialists. In addition, a survey was also carried out of potential project-affected persons (PAPs). The Due Diligence findings are summarized below while details are provided in **Annex 4**.

### 8.2 Social and Resettlement Due Diligence Summary

603 During the field visit conducted on November 11, 2022 by local social consultant and desk study conducted by international social consultant, it was considered if project will have any impact on private or privately used land, business or farming activities of any kind of ownership, if there are grazing areas used by local community and if the income from cattle-breeding is the main source of income for locals.

604 The preliminary stakeholder meetings revealed that the lands within the project AOI relate to the state reserve land fund and therefore no land acquisition would be needed for the project and also that the project would not directly affect any persons or households since the land under AOI is free of any structure or cultivation as described in **Chapter 5**. This was further verified through communication with relevant government authorities and local communities.

605 The findings of the above study were that Bridge construction will have no impact on private, legalizable, and State-owned land plots. During the small group meetings and public consultations, the data regarding the land ownership and usage were double-checked and verified.

606 However, if during the construction or operation period, there is any kind of unforeseen or temporary impact on land ownership, usage, farming or other activities, a Resettlement Plan will be prepared based on entitlement matrix (**Table 53**), as well as AIIB Policy and AIIB Environmental and social framework, national legislation and consultations which has to be conducted with impacted parties. Subsequently, the Resettlement Plan will be disclosed and implemented.

607 The final design of Package 3 will be reviewed by resettlement specialists and their recommendations considered in the final design, including the impact caused by temporary facilities locations, such as camps, and storage areas.

**Table 53. Indicative Entitlement Matrix**

No.	Asset	Affected Person/ Affected Entity	Compensation Entitlements
<b>Permanent Loss</b>			
		Individual land-use rights holders	Cash allowance for loss of land use rights equal to net income in the last 5 years generated from the affected land area, at market rate, at the time of taking; or Provision of alternative land plot of equal value/productivity to the lost plot. If the remaining portion of the plot to be taken is too

No.	Asset	Affected Person/ Affected Entity	Compensation Entitlements
1	Agricultural land (all losses irrespective of severity)		small to use, the whole plot is compensated or exchanged.
		Cooperative land-use rights holders (dehkan farms – entities)	Cash allowance for loss of land use rights equal to net income for the last 5 years generated from the affected land area at market rate at time of revocation; or Provision of alternative land plot of equal value/productivity to the lost plot. If the remaining part of the plot to be taken is too small to use, the whole plot is compensated or exchanged.
		Renters/ leaseholders (informal users, if any)	Rental allowance in accordance with the conditions of the rent agreement, but not less than the cost of rent for 3 months; or Continuation of rental agreement on alternative land plot or cash allowance for the lost income equivalent to 1 year of average crop productivity. Provision of opportunity to lease a plot on state land. Relocation allowances, if applicable.
2	Residential and commercial land	Owners	Cash allowance for loss of land use rights in cash equal to current annual land lease rates at the time of acquisition multiplied by 25; or Provision of alternative land plot of equal value/productivity (similar conditions and facilities) to plot lost. If the residual portion of the plot to be taken is too small to use, the whole plot is compensated or exchanged, in agreement with the owner.
		Renters	Rental allowance in accordance with the conditions of the rental agreement, but no less than the cost of rent for 3 months, or continuation of the rental agreement on an alternative land plot.
		Informal users (if any)	Cash compensation, at replacement cost, for the improvements (fence, trees, sheds) on the affected land. Provision of opportunity to lease a plot on state land. Relocation allowance if applicable.
3	State land (used by PAPs)	Informal users (ROW occupiers - people who extend their fences towards the road and make some improvements such as	The improvements made by APs are compensated in cash at replacement cost in accordance with the relevant category under this EM.

No.	Asset	Affected Person/ Affected Entity	Compensation Entitlements
		auxiliary structures, trees, sheds)	
4	Buildings and structures	Owners of structures including "informal"	<p>Cash compensation at replacement rate for affected structure/other fixed assets (without deduction of depreciation, taxes, costs for salvageable materials and other transaction costs). All buildings and structures will be compensated in their entirety; or According to the owner's choice, if feasible, a building for building/structure for structure exchange.</p> <p>No project affected structure (residential, commercial, auxiliary) will be demolished until AP has fully vacated the building, collected salvaged materials and signed receive-delivery act with IA.</p>
		Renters	Rental allowance in accordance with the conditions of the rental agreement, but not less than cost of rent for 3 months; or Continuation of the rental agreement for an alternative building/structure.
5	Crops	All APs, including "informal" users	Cash compensation equal to gross income generated on the affected land area for 1 year at market rate at time of revocation. No compensation for land will be paid.
6	Fruit trees	All APs, including "informal" owners of trees cultivated in state land	<p>Compensation reflecting income replacement.</p> <p>Cash compensation for productive trees based on the net market value of 1 year of income multiplied by the number of years needed to grow a tree to a similar level of productivity, plus purchase of saplings and starting materials.</p>
	Non-fruit trees		<p>Cash compensation based on wood volume x market value of wood.</p> <p>APs will be eligible to take cut timber, and dispose logged trees themselves. Construction company ensures free logging.</p>

No.	Asset	Affected Person/ Affected Entity	Compensation Entitlements
7	Business and employment (temporary and permanent)	Permanently affected Business Owner	<p>Cash compensation equal to 1 year's net income (lost profits) plus cost of lost certificates/licenses/patents.</p> <p>The income is calculated based on the official tax declaration, or (if tax declaration is unavailable) it is accepted as the official monthly average wage defined by GoT.</p> <p>An average monthly salary defined by GOT by the period of impact multiplied by 12.</p> <p>loss of main structure-building used for commercial activities is qualified as permanent impact to business with 12 months expected stoppage of business.</p>
		Temporarily Affected Business Owner	<p>The income is calculated based on the official tax declaration, or (if tax declaration is unavailable) it is accepted as the official monthly average wage defined by GoT.</p>
<b>Temporary Loss</b>			
8	Temporary impacts	All relevant APs	<p>For unforeseen and temporary impacts other than stated above, AIB policy general principles and objectives will be used as the minimum benchmarks, and appropriate impact mitigation measures will be sought to meet them.</p> <p>The payment for rented land during the construction, will be based on the market price under negotiated agreement. After discontinuation of land use, the land must be restored to the original status, or as per the agreement with the land rights holder.</p>

## **9. STAKEHOLDER ENGAGEMENT**

608 This Chapter describes the process and outcome of stakeholder engagement particularly consultations. Also described in the Chapter is the grievance redress mechanism (GRM).

### **9.1 Stakeholder Consultations**

#### **9.1.1 Public Consultation International Requirements**

609 According to the AIIB ESF (2019), the transparency and meaningful consultation is essential for the design and implementation of a Project and works closely with its Clients to achieve this objective. Meaningful consultation is a process that begins early and is ongoing throughout the Project. It is inclusive, accessible, timely and undertaken in an open manner. It conveys adequate information that is understandable and readily accessible to stakeholders in a culturally appropriate manner and in turn, enables the consideration of stakeholders' views as part of decision-making. Stakeholder engagement is conducted in a manner commensurate with the risks to, and impacts on, those affected by the Project. Meaningful consultation is a process that:

- (i) Begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle;
- (ii) Provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people;
- (iii) Is undertaken in an atmosphere free of intimidation or coercion;
- (iv) Is gender inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups; and
- (v) Enables the incorporation of all relevant views of affected people and other stakeholders into decision making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues. Consultation will be carried out in a manner commensurate with the impacts on affected communities. The consultation process and its results are to be documented and reflected in the environmental assessment report."

610 AIIB's Environmental and Social Framework covers environmental and social sustainability; and AIIB's role in meeting the challenge of sustainable development in Asia. The Environmental and Social Policy (ESP) (2019) comprises mandatory environmental and social requirements for each Project and Environmental and Social Standards.

611 According to the AIIB requirements, consultations should take place associated with ESIA development and implementation. Consultation should be meaningful and welcoming of communities and non-government organizations where applicable. This process should take into consideration anyone classed as vulnerable and put in place additional measures to ensure there is a means for open participation from all stakeholder groups.

#### **9.1.2 Stakeholder Engagement Activities - General Principles**

612 Stakeholder engagement has been undertaken throughout the development of the Project, with the view to determining and responding to the views of interested parties and parties potentially affected by the Project, ensuring open and transparent, two-way communication between Project proponent, the PIU and stakeholders. The approach to engagement seeks to meet both national and international requirements.

613 The following general principles have governed stakeholder engagement activities:

- The content of documents for public comment provides accessible and adequate information on the Project, and not create undue fears (regarding potential negative impacts) or expectations (regarding potential positive impacts such as job creation, etc.);

- Written information is accompanied by visual illustrations and explanations as needed to build understanding of the project and its ESIA;
- The information is disclosed in the two languages where needed and in a manner that is accessible and culturally appropriate, taking into account any vulnerable people;
- Efforts were made to explain not only the proposed project and ESIA process, but also applicable national laws and legislations, international principles and standards and how the PIU will address compliance.

614 AIIB requires that clients conduct stakeholder engagement on the basis of providing local communities that are directly affected by the project and other relevant stakeholders with access to timely, relevant, understandable and accessible information, in a culturally appropriate manner, and free of manipulation, interference, coercion and intimidation.

615 The ESIA consultants have developed the Stakeholder Engagement Plan (SEP) to ensure effective communication and engagement with stakeholders throughout the project implementation. SEP aims at summarizing the methods, procedures, policies and activities that will be implemented by the Ministry of Transport (MoT) Project Implementation Unit for Road Rehabilitation (PIURR) supported by the Project Management Team.

616 The purpose is to inform stakeholders about the potential impacts of the Project and engage them in an inclusive and timely manner. The public and interested parties will be able to access and view SEP at the Ministry of Transport building, 14 Aini Street, Dushanbe city. Hard copies of SEP will be available at MoT and in the identified villages (jamoats). In addition, prior to commencement of civil works, MoT PIURR will distribute an information brochure on the project, which will be developed by the environmental and social consultant (Bars Consulting) covering the key points of the Project.

617 Stakeholder Engagement and Consultation aim to inform and improve the decision-making process for the Project and enhance mutual understanding through the active involvement of individuals, groups and organizations with an interest in the Project. It helps to:

- Identify and involve all potentially affected groups and individuals;
- Generate a good understanding of the Project amongst those that will be affected or have a vested interest;
- Identify issues early in the Project cycle that may pose a risk to the Project or its stakeholders;
- Ensure that mitigation measures are appropriate (implementable, effective, and efficient); Establish a system for long-term communications between the Project developer and communities that is of benefit to all parties.

618 The Government of Tajikistan's requirements on public consultation are set forth in the Law on Environmental Protection (Articles 12-13). In accordance with this Law, citizens have the right to environmental information and participation in the development, adoption and implementation of decisions regarding environmental impact. The requirements are presented in **Chapter 2**.

619 From the October 2022 to the March 2023, several stakeholder engagement events have been held by ESIA consultants. More events will be organized by PIU with support from consulting firm. Meetings have included public meetings, focus group discussions and one-on-one meetings with potentially affected individuals, communities, and experts.

620 The aim of consultations was to involve the stakeholders in the decision-making process, especially the people who are either directly benefiting from, or affected by the Project. Communications was conducted mostly in the Tajiki and Russian languages. The consultations started at an early stage of ESIA preparation and will continue during the Project implementation.

621 During the site visits the ESIA consultants conducted individual and group consultations with the local population, farm owners and governmental authorities. Consultations covered a number of meetings in February 2023 and in July 18, 2023. A summary of these discussions is provided in **Table 54**.

**Table 54. Summary of Questions and Responses during Consultations**

No.	Question	Responses
<b>Darband community</b>		
1	When does construction start, will there be given preferences in hiring of workers from local residents?	Regarding the timing of the start of construction, the population will be informed as soon as the work related to the preliminary design and organization of a tender for hiring a contractor for the construction of the bridge is completed. When hiring workers, yes, preference will be given to local residents, especially by profession welders, concrete workers, drivers of construction equipment etc.
2	Who will be responsible for quality control during construction?	During the construction works, the quality and timing will be controlled by consulting engineers.
3	If we have any complaints about the Contractor, to whom can we complain?	Grievance Redress Committee has been set up at the jamoat level to which you can file grievances. There will also be a construction supervision consultant company that can handle complaints.
4	Will there be any opportunities for women to work as cooks, bakers, cleaners, etc. during the construction of the bridge?	Yes. People will be informed about the positions that the contractor will require.
5	If the bridge is built, it will certainly make life easier for us, primarily due to the fact that the travel time to the village of Safedchashma will be reduced, there will be additional opportunities for the organization of trade and, in general, earnings.	The bridge will be built, as already noted, it should be noted that this project is large-scale and the bridge that will be built will be the largest in the country.
<b>Safedchashma Community</b>		
1	We are looking forward to the construction of the bridge, we think that everything will be better when it is completed. Almost all of us have relatives and friends living in the Darband Jamoat, and given that the regional center is located there, we very often travel there, covering a long distance, which is also costly considering the cost of fuel and lubricants	Indeed, the bridge will significantly reduce the travel time to the district center and, as a result, save money on transport. When hiring workers, yes, preference will be given to local residents, especially by profession welders, concrete workers, drivers of construction equipment.
2	Who will be responsible for quality control during construction?	During the construction works, the quality and timing will be controlled by consulting engineers.
3	When will the bridge construction start?	Regarding the timing of the start of construction, the population will be informed as soon as the work related to the preliminary design and organization of a tender for hiring a contractor for the construction of the bridge is completed.
4	How will environmental standards be observed during construction in order to prevent environmental pollution during construction?	During the construction of the bridge, in accordance with the requirements of national legislation and the standards of the Asian Infrastructure Bank, which is very strict in monitoring environmental compliance, the contractor, as well as the project supervision consultant, will be strictly monitored to ensure the reduction of environmental impact during construction.

622 Following the disclosure of ESIA, the PIURR will conduct a series of public consultations tentatively in the Q4 of 2023 to enable those potentially affected by the project to share their views and concerns regarding the environmental and social impacts of the bridge and approach roads construction. The meetings will be held in:

- Jamoat Safedchashma
- Jamoat Darband

## **9.2 Information Disclosure**

623 ESIA once finalized will be disclosed by PIURR at the local and national level. ESIA Executive Summary will be translated in local languages for the disclosure purposes. AIIB will also disclose ESIA on its website. PIURR will disclose relevant information about the investment work under Package 3 as appropriate throughout the Project. At this stage, the following documents will be disclosed for effective stakeholder communication:

- ESIA
- Non-technical summary (NTS)
- Stakeholder Engagement Plan (SEP)
- Environmental and Social Management Plan (ESMP)
- Brochures/leaflets that should include a summary of project activities, including the timing of expected access restrictions, as well as the main risks associated with them.

624 All documents will be available in Russian and English languages, additionally SEP and NTS will be available in the Tajik language.

625 The above information will be available to the public, including affected communities, throughout the life of the project. Hard copies of the relevant documents will be available at the MoT offices on the fifth floor at the address: Dushanbe, street Aini, 14, and online at: <http://www.mintrans.tj/>.

626 Information about the project, including potential employment opportunities, will be advertised on bulletin boards in community centers and in local media. In addition to advertisements placed in jamoats, local newspapers will also be used to advertise the Project and potential employment opportunities. Brochures/flyers/postcards with key information about the project and contact details will also be published to inform the public about the progress and stages of the project. Hard copies must be provided at the start of the disclosure period.

## **9.3 Grievance Redress Mechanism**

### **9.3.1 Overview**

627 Grievance Redress Mechanisms (GRMs) are locally based, formalized way to accept, assess, and resolve community feedback or complaints. They provide predictable, transparent, and credible processes to all parties, resulting in outcomes that are relatively low cost, fair, and effective. They build on trust as an integral component and facilitate corrective action and preemptive engagement. GRMs also set out a timeframe in the resolution of complaints.

628 The Project GRM will serve as a venue for receiving and addressing project-affected peoples' concerns and grievances about environment related impacts. It will address concerns promptly through an understandable and transparent process that is accessible to all members of the community, gender responsive and culturally appropriate. The overall approach of GRM is to deal with grievances at a local level first in an efficient manner and escalate to the next level or higher level of authority if grievance cannot be resolved.

629 AIIB requires the Client to establish, in accordance with ESP and applicable ESSs, a suitable grievance mechanism to receive and facilitate resolution of the concerns or complaints of people who believe they have been adversely affected by the Project's environmental or social impacts, and to inform Project affected people of its availability. The grievance mechanism is scaled to the risks and impacts of the Project. The grievance mechanism may utilize existing formal or informal grievance mechanisms, provided that they are properly designed and implemented, and deemed by the Bank to be suitable for the Project; these may be supplemented, as needed, with Project specific arrangements.

630 The mechanism is designed to address affected people's concerns and complaints promptly, using an understandable and transparent process that is gender sensitive, culturally appropriate and readily accessible to all affected people. The grievance mechanism includes provisions to protect complainants from retaliation and to remain anonymous, if requested. The mechanism provides for maintenance of a publicly accessible case register, and reports on grievance redress and outcomes, which are disclosed in accordance with the applicable ESS. If the Project is a private-sector Project, the Bank also requires the Client to establish a grievance mechanism for workers to address workplace concerns.

### **9.3.2 Project-specific GRM**

631 This ESIA includes in its scope the devising a responsive, readily accessible and culturally appropriate Grievance Redress Mechanism (GRM) capable of receiving and facilitating the resolution of affected persons' (or any other stakeholder's) concerns and grievances related to the project. An established grievance redress mechanism allows a PAP (or any other stakeholder) to appeal any decision, practice or activity arising from land or other assets compensation that they disagree with. The scope of GRM is to address issues related to potential involuntary resettlement, social and environmental performance, and information disclosure.

632 PAPs will have the right to file complaints and/or queries on any aspect of the project, including environmental issues and other social aspects such as dust, noise, land acquisition and resettlement. Under the already adopted for Packages 1 and 2 grievance mechanisms, PAPs may appeal any decision, practice or activity related to the project. All possible avenues will be made available to PAPs to voice their grievances. GRM is available for those who live or work in the areas falling under the impact of the Project activities under the Package 3 too. Anyone who has experienced impact and is concerned by the Project activity has the right to participate in GRM, to have an easy access to it and receive assistance in its use. The proposed GRM does not replace the public mechanisms for resolving grievances and conflicts, provided by the legal system of the Republic of Tajikistan, but tries to minimize its use as much as possible.

633 It should be noted that although multiple methods for raising grievances are highlighted below, all grievances will be addressed in the same way and the process will be consistent across the alignment.

634 Overall responsibility for the timely implementation of GRM rests with PIURR. Relevant Hukumats and Jamoats, authorized by the law to carry out tasks, related to the complaints, and mediators / non-governmental organizations (NGOs) that are involved in promoting the amicable resolution of complaints, are also included in GRM.

635 MoT require the creation and development of grievance redress committee (GRC) at the Jamoat level.

636 At the first stage, an attempt will be made to resolve grievances through the GRM at the jamoat level using the following steps:

- Grievances can be lodged with the Focal Person (FP) at the jamoat GRC. The jamoat FP, in consultations with the PIURR social safeguards specialist, will screen the grievance for eligibility. If eligible, FP will organize a meeting of the Grievance Redress Committee (GRC). The PIURR representatives will be informed and invited to the meeting.
- The option to submit grievances anonymously will be available to complainants using the public grievance form. It should be made clear to complainants submitting anonymous complaints that it will not be possible to provide a response.
- The complaint registered with GRM will be reviewed (with a letter of receipt/acknowledgment to complainant), the date should be recorded on the complaints log. The complaint will be assigned to a responsible person, addressed and a decision made on its relevancy to the Project within 14 calendar days of lodgment. If the case is complex or requires more detailed investigation (e.g.

inspection by technical experts or legal opinion from the state or certified private entities) the complaint review period may be extended to 30 calendar days or more, if necessary. In such cases, written notification should be sent to the complainant explaining the reasons for extension, describing the process and indicating the expected dates for the delivery of the results of the revision.

- All supporting documents such as, photographs, related certificates and legal and technical expert opinions, if required, will be prepared, reviewed and assessed. Once the complaint is resolved, the GRC will organize a complaint closure meeting, where the complainant confirms the closure of the complaint. The PIURR representative will oversee the resolution of the complaint.
- All efforts will be made to settle issues at the Jamoat/Project level. All complaints and resolutions will be properly documented by the PIURR and made available for review, monitoring and evaluation purposes. Social Safeguard Specialist of PIURR keeps in regular contact with the FP of the GRCs and will have a database for the whole Project's grievances cases, including the status of grievances. This report will be regularly included in monthly Project progress reports.
- Regardless of the set grievance mechanism and procedures, PAPs will have the right to submit their cases to a court of law at any point in time of the grievance redress process. All efforts will be made to settle the issues at the Project level through community consultation with affected person. If not possible, attempts will be made to resolve the issues at the PIURR level to avoid/minimize litigation as much as possible.
- In addition, the complainant can appeal the decision and bring the case to the lender's Accountability Mechanism (AM) or Project Complaint Mechanism (PCM). The GRM at the Project level does not in any way impede the PAPs' access to the lender's AMs. If PAPs want to register a complaint, the PIURR Focal Person will provide the complainants with the relevant contact information for each section.
- AIIB policy on the Project-affected people's mechanism can be accessed via <https://www.aiib.org/en/policies-strategies/operational-policies/policy-on-theproject-affected-mechanism.html>
- Complaints can also be filed directly with the contractor using the Contractor GRM process: Once a link to the contractor's GRM process is known, it will be added to SEP, including the 24-hour hotline. The handling of a complaint should be consistent regardless of how the complaint is made, so contractors' GRM should be based on the one contained in this document.
- The grievance redress mechanism may require one or more meetings on each complaint and on-site investigations by specific technical or evaluator experts. Cases involving complaints by several applicants may be treated as a single case.
- For appeals filed directly with the MoT, the responsible person of the PIURR will review the case together with the relevant GRC at the Jamoat level and try to find a solution together with the victim.
- GRC will be assisted, as needed, in the form of professional capacity needed to handle specific cases.
- In each GRC there is one woman and one representative of the affected person.

637 **Figure 34** shows the flowchart for the GRM procedure.

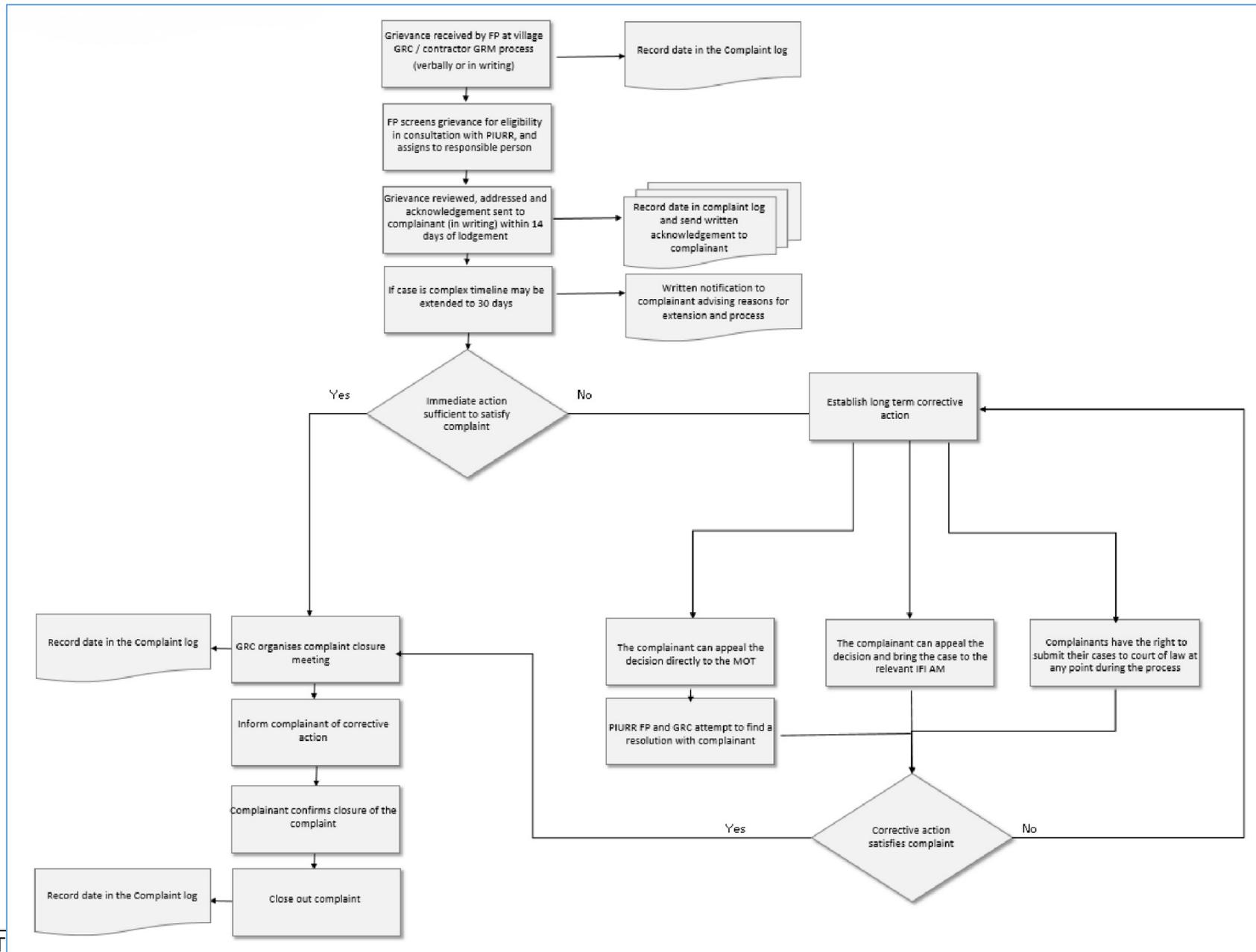


Figure 34. Flowchart of GRM Procedure

## Grievance Procedures

638 The Jamoats and the Social Safeguards Specialist of PIURR will monitor the communication channels, one to- one meetings and periodic meetings and will provide feedback as appropriate. Grievance logbook will be available for stakeholders participating in public consultation meetings and will be available at the Jamoat offices to record comments both anonymously and with the option to provide contact details.

639 This book will be presented in an obvious area of the exhibition but in an area, that will not be directly monitored by host staff (e.g. by the exit). The Hukumats and Jamoats will record this information so that a response and feedback can be provided for those stakeholders that provide contact details. It should be made clear to those recording comments that a response cannot be provided to anonymous comments.

640 According to the Tajikistan legal and administrative structure disagreements are resolved through Hukumats'/Jamoats' grievance mechanism or appeal to court. The intended officials were appointed to these positions to assist in submission and resolution of grievances or complaints, received from the Affected persons and the public complaint procedures related to the Project, are to ensure efficient and systematic The mechanism for the Project to answer questions, to provide feedback against complaints from those whose interests are affected, other stakeholders and the public.

641 **Tables 55 and 56** list persons at the villages level are responsible for project-related inquiries and grievances. Names in bold and italics are contact points for women.

**Table 55. Grievance Redress Committee, Jamoat Safedchashma, Nurobod District**

No	Name	Position	Address	Telephone
1	Mahmadoy Saidashraf	Jamoat Chairman	Dehi tag	988 41 51 51
2	Safarov Vaskho	Head of Dehi Tag village	Dehi tag	918 27 62 82
3	Shukurov Teshabek	Head of Kabutiyon village	Kabutiyon	918 39 32 06
4	<u>Zukhaylov Abdukholik</u>	Resident of Kalanga village	<u>Kalnazar</u>	98 573 36 39
5	Shoev Inoyat	Head of Sherbegiyon	Sherbegiyon	98 769 70 19
6	Mirzoev Saidkhoja	Resident of Ulfatobod village	Ulfatobod	918 90 80 44
7	Nabiev Jonmahmad	Head of Dehi Gulmon village	Dehi Gulmon	918 38 90 11
<b>8</b>	<b><i>Obidova Nakhliston</i></b>	<b><i>Resident of the jamoat</i></b>	<b><i>Safedchashma</i></b>	<b><i>985 52 61 45</i></b>

**Table 56. Complaints Committee of the 7th Microdistrict, Jamoat Darband, Nurobod district**

No	Name	Position	Address	Telephone
<b>1</b>	<b><i>Shamsieva Narzigul</i></b>	<b><i>Jamoat Chairman</i></b>	<b><i>Jamoat Darband</i></b>	<b><i>985425284</i></b>
2	Askarov Ismoil	Jamoat Secretary	Jamoat Darband	918 56 66 80
3	Barotov Rahmonali	Head of the village	Jamoat Darband	989 03 71 62
4	Ibronsho Nuronsho	Resident of the village	Jamoat Darband	918 31 11 53
5	<u>Nosirov Mahmadsarif</u>	Resident of the village	Jamoat Darband	<u>988 72 92 24</u>
6	<u>Bayonov Zokirjon</u>	Resident of the village	Jamoat Darband	<u>988 49 13 49</u>

642 **Technical Experts:** When requested by the PIURR to provide technical expertise for the assessment of an impact claimed by the complainant, the relevant expert will:

- i) study cases, conduct appropriate checks or investigations;
- ii) prepare a summary report based on the results of the audit;
- iii) recommend if additional legal opinion or expertise is required to reach a decision on the merits of the case.

643 **GRC Complaint Register, Records and Documentation:** PIURR will maintain the complaints register. This will include a record of all complaints for regular monitoring of

grievances and results of services performed by the GRCs for periodic review by AIIB.

644 **Coordination on complaints:** The affected individuals and other interested parties may visit, call and send a letter to the contacts at the PIURR shown in **Table 57**.

**Table 57. Grievances Contact Information**

Address and e-mail	Position
Aini street 14, 4th floor, Dushanbe. Tajikistan  Tel: Email:pirrr@tojikiston.com	Social Safeguard Specialist of PIURR

645 **Grievance Log:** **Table 58** shows a template that will assist in recording comments, complaints and grievances for monitoring purposes. See sample of the Grievance Registration Form in **Annex 8**.

**Table 58. Grievance Log Template**

Name/Contact details	Date received	Details of complaint/comment	Responsibility	Actions taken	Date resolved

## 10. CONCLUSIONS

646 This ESIA has been prepared for the construction of the long Bridge project that is Package 3 of the CAREC Corridors 2,3, and 5 (Obigarm-Nurobod) Road Project to comply with AIIB ESP (2019) and the relevant legislation of the Republic Tajikistan requirements in E&S assessment and management.

647 The document summarizes baseline studies conducted within the ESIA process, including the analysis of the environmental and social legislation relevant to the project, a review of the environmental and social aspects of the bridge-type alternatives, studies of the baseline physical, biological, and socio-economic environment, assessment of the project impacts and risks and mitigation measures developed to prevent or otherwise minimize the project implementation.

648 ESIA also reviewed the Climate Change Project Implications and proposed the adapting measures to be integrated into the design.

649 The long permanent bridge is a component of a larger road corridor that has already undergone a comprehensive ESIA process and is currently in the active construction phase.

650 The key environmental impacts with high significance include waste generation, occupational health and safety risks, community health and safety (CHS) risks, and accidents as well as emergency situations. Appropriate mitigation and control measures have been proposed in this ESIA to address these potential impacts and to bring down the significance of the residual impacts to an acceptable level (Low or Minimal). All of the residual impacts are of Low or Minimal significance, meaning that the project implementation will not cause any significant impact on environment and people.

651 The possible negative social implications of the project are moderate, provided that effective management and mitigation measures are implemented as proposed in this ESIA. No resettlement issues were identified.

652 The basis of environmental, social and OHS legislation in Tajikistan is sufficient and is not in conflict with the AIIB ESP (2019) and safeguard regulations of the other International Financial Institutions. Based on the comparison of the National and International standards and regulations the most stringent standards were accepted for the project implementation.

653 The project area is prone to erosion, landslides and other natural hazards which might be aggravated by the seismic conditions and climate change. Therefore, special attention should be given to the development of protection measures to ensure the durability of the bridge and reducing the risks of hazardous phenomena.

654 The study reveals that the local vegetation represented by the common species having no special protective status both by UICN and RBT lists. No fauna except the small birds and insects were observed during the field studies. The most prominent feature within AOI is an old embankment built on the left bank to serve as a foundation for the future approach road and bridge abutment. The surface of the embankment looks like an artificial hill and is already overgrown with rather sparse vegetation cover.

655 No sensitive receivers that require the implementation of the special protective measures have been identified during the studies of the baseline environment and social conditions. It was confirmed that the habitats within the project AOI are heavily modified and represent the bridge construction site abandoned in early 1990-s surrounded by the spots of the stony soils used for the grazing and sporadic rein-fed agriculture activities.

656 The environmental and social analysis have revealed that the project can be implemented according to the proposed design and configuration in the proposed site and location. The environmental and social impacts are of limited nature, whereas the benefits of the project are many.

657 It is expected that the operation phase of the project will not have any significant adverse impact on the natural and social environment, which may cause long-term and irreversible effects. However, the project will positively impact the area's economic development by improving transport systems and creating employment opportunities. Additionally, the project Bridge is expected to become a notable landmark, enhancing tourism.