Initial Environmental Examination

June 2022

Tajikistan: Road Network Sustainability Project (Additional Financing) (Bokhtar–Okmazor Section)

Prepared by Project Implementation Unit for Roads Rehabilitation under the Ministry of Transport of the Republic of Tajikistan for the Asian Development Bank.

ҶУМҲУРИИ ТОҶИКИСТОН
МАРКАЗИ ТАТБИҚИ ЛОИҲАҲОИ
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ЦЕНТР РЕАЛИЗАЦИИ ПРОЕКТОВ
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REPUBLIC OF TAJIKISTAN
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29 06 22 № 2/324

Ms. Shanny Campbell
Country Director
ADB Resident Mission in the
Republic of Tajikistan

TAJ: Road Network Sustainability Project (Bokhtar–Okmazor Section)
- Submission of final Initial Environmental Examination

Dear Ms. Shanny Campbell,

Thank you for your assistance and support in implementation of transport infrastructure projects of the Republic of Tajikistan.

We are pleased to submit you the final version of Initial Environmental Examination under the above mentioned project for your clearance and disclosure on ADB's website.

Sincerely,

Executive Director Arabzoda N.S.

CURRENCY EQUIVALENTS

(AS OF 1 JUNE 2022)
CURRENCY UNIT – SOMONI (TJS)
TJS 1.00 = $ 0.085
$1.00 = TJS 11.73

ABBREVIATIONS

AADT	-	Annual Average Daily Traffic
ADB	-	Asian Development Bank
Aids	-	Acquired immune deficiency syndrome
CAC	-	Center for Analytical Control
CAREC	-	Central Asia Regional Economic Cooperation
CSC		Construction Supervision Consultant
CEP	-	Committee for Environmental Protection under the Government of Tajikistan
EMP	-	Environmental Management Plan
GoT	-	Government of Tajikistan
GRM	-	Grievance Redress Mechanism
GRC	-	Grievance Redress Committee
HIV	-	Human Immune Deficiency Virus
IBAT	-	Integrated Biodiversity Assessment Tool
IEE	-	Initial Environmental Examination
IBA	-	Important Bird Area
IBAT	-	Integrated Biodiversity Assessment Tool
IUCN	-	International Union for Conservation
LAR	-	Land Acquisition and Resettlement
LARP	-	Land Acquisition and Resettlement Plan
MAC	-	Maximum Allowable Concentrations
MoT	-	Ministry of Transport
PAP	-	Project-Affected Person
PIURR	-	Project Implementation Unit for Road Rehabilitation (of MoT)
PIURR-ESE	-	PIURR Environmental Safeguards Expert
PRC	-	People's Republic of China
RAMS		Road Asset Management Unit
RAP	-	Resettlement Action Plan
RoW	-	Right-of-Way
SEE	-	State Ecological Expertise
SES	-	Socioeconomic Survey
SSEMP	-	Site Specific Environmental Management Plan
TOR	-	Terms of Reference

WEIGHTS AND MEASURES

°C (degree Celsius)	–	Measurement unit for temperature
dB (decibel)		Measurement unit for noise. The decibel is a relative unit of noise measurement. It is equal to one tenth of a bel (B).
h		hour
l		litre
m		metre
m²		square metre

m³	cubic metre
min	minute
mg (milligramme)	thousandth of one gramme
mSV (microsievert)	millionth of a sievert. Sievert is a unit for measuring radioactivity
km	kilometre

GLOSSARY

GOST	–	National Standards and Regulations
Hukumat		Administrative Unit of Tajikistan
Jamoat	–	Administrative Unit of Tajikistan
San PIN		Sanitary Protection Rules and Norms
SNiP		Technical Standards (Tajiki: СНИП) - a building code, a set of rules that specify the minimum standards for constructed objects such as buildings and nonbuilding structures
Raisi Mahala-		Head of the Village

NOTE

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

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I. EXECUTIVE SUMMARY

Road Network Sustainability Project,[1] approved by the Asian Development Bank (ADB) on 19 November 2020, will improve two national arterial roads, namely (i) Dangara-Okmazor and (ii) Hulbuk-Kangurt.The Ministry of Transport (MoT) of Tajikistan requested ADB to provide additional financing for the improvement of road section Bokhtar – Okmazor (km 0+000 to km 40+000).

Screening and categorization. ADB Safeguard Policy Statement (SPS) 2009 requires preparation of Initial Environmental Examination (IEE) for category B Projects. This IEE report covers Bokhtar-Okmazor road section. ADB Rapid Environmental Assessment Checklist was used to screen potential impacts as a basis for the categorization and scope of the IEE.

The implementation of the project will be governed by Government of Tajikistan applicable environmental acts, rules, regulations, and standards. Environmental safeguards will be followed in accordance with the ADB SPS. During construction and operation of the project, the borrower/client will apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's *Environment, Health and Safety Guidelines* (hereafter referred to as the *EHS Guidelines*).[2]

IEE and EMP. Field-based data gathering and consultations during preparation of this IEE (in May to August 2020) covered the Bokhtar-Okmazor-Dangara road section.[3]The corona virus disease 2019 (COVID-19) pandemic caused restrictions and limitations in visiting all locations thus limited environmental field surveys and community consultations were conducted. Therefore, in November 2021, additional field surveys and public consultation meetings were carried out. The IEE identified and analyzed all potential impacts; described their extent, duration, and severity; formulates the required mitigation and monitoring measures and presented them all in the form of an Environmental Management Plan (EMP) and Environmental Monitoring Plan (EMoP). The IEE also provided a detailed description of the direct and indirect environmental impacts associated with the Project during key periods of work, namely the design, pre-construction, construction, and operational phase.

This present IEE for Bokhtar – Okmazor is the updated version of an IEE which originally covered the whole section Bokhtar-Okmazor-Dangara and which due to financial constraints was divided into two sections:

1. Okmazor – Dangara road section (part of the original financing) and
2. Bokhtar – Okmazor road section (part of additional financing)

Project Description. The Bokhtar-Okmazor Project Road section is about 40 km long and part of the important roads of regional significance in the southern region of Tajikistan. The Project Road is in bad condition, like the rest of the project road sections. The deterioration has progressed over the years and numerous shortcomings and damages were identified on the road. Due to the poor technical condition of the road during the autumn and winter months, the villages

[1] 54005-001: Road Network Sustainability Project | Asian Development Bank (adb.org)

[2] *World Bank Group, Environmental, Health, and Safety Guidelines*, Washington, USA. Environmental, Health, and Safety Guidelines (ifc.org).

[3] The IEE for Dangara-Okmazor was cleared by ADB and disclosed on ADB web site <Road Network Sustainability Project: Dangara–Okmazor Section Initial Environment Examination | Asian Development Bank (adb.org)>since March 2021.

along the Project Road are disconnected from access to medical and educational facilities, state institutions, banks, and markets. Therefore, rehabilitation of the road is urgently needed.

The Project involves the reconstruction of the road over the whole length. The designed alignment is based on the existing alignment with minor adjustments made to improve geometric characteristics, wherever practical. No spatial alternatives or bypasses are foreseen under this Project. The Project will involve several associated activities such as utilization of borrow areas, operation of asphalt plants and aggregate crusher, establishment of contractor's worker camps and storage sites, etc.

Regarding the designed cross-section, the Project Road is split into two sections: (i) 4-lane section (9.7 km from Bokhtar) and (ii) 2-lane section (remaining 30.3 km).

Land use alongside the Project Road is rural and the terrain is mountainous. The Bokhtar-Okmazor road traverses four districts (Bokhtar, Kushoniyon, Levakand and Bakhsh district) by connecting five Jamoats (Bokhtar town, Bustonqala, Guliston, Vahdat and Mashal) to the district centres of Dangara and Bokhtar. In total, thirteen (13) villages are located alongside the Project Road. Based on the detailed design by Ronamo, socioeconomic surveys (SES) have been carried out to obtain the views, attitude and feedback of villagers alongside the Project Road. The villagers in the Project affected community were also informed about potential environmental impacts. The data collected during the SES consist of information on land use, income, household's assets, livestock, cropping pattern and other. For warranting objectivity and equal assessment of each Project-Affected Person (PAP), a questionnaire format was used in the survey. The questionnaire will be annexed to the Land Acquisition and Resettlement Plan (LARP). During the SES, face to face consultations were carried out with 154 persons within the time period from 23 June 2021 to 3 September 2021. Detailed information on the conducted consultations is provided in chapter VIII.

In addition, two public consultation meetings were carried out on 16 November 2021, one in Jamoat Bustonkala and one in Jamoat Guliston of Rayon Levakant. The public consultations were organized and attended by PIURR environmental safeguard experts (PIURR-ESE), Kocks Consult GmbH[4]national and international environmental and social experts.

Views and feedback of villagers alongside the Project Road are considered and incorporated in this IEE, particularly the Project EMP (Table 17) and EMoP(Table 18) as far as technically feasible.

No protected areas under national law are located within the Project Area of Influence.

Potential environmental impacts and mitigation measures. The Bokhtar-Okmazor road section involves the rehabilitation of an existing road. Cross section widening is foreseen on the section from 0 – 9.7 km from 2 to 4 lanes which will therefore result in physical loss and encroachment into existing structures within a 10 to 15 m wide strip to both sides of the existing road. For the remaining 30.3 km (Section 2), the existing two-lane cross section will remain and therefore the anticipated environmental impacts are spatially narrow and limited to a small strip paralleling the existing road corridor. Most of the environmental impacts are therefore generic and site specific and temporarily confined to construction phase. The impact on social and human assets are currently analyzed and quantified by the social survey team in the field. Due to the

[4] Kocks Consult GmbH is mobilized for ADB's ongoing Project: 49042-004: Central Asia Regional Economic Cooperation Corridors 2, 5, and 6 (Dushanbe–Kurgonteppa) Road Project | Asian Development Bank (adb.org)

widening from 2 to 4 lanes within km 0 to 9.7, the most substantial losses and encroachment lies within the lot 1. For lot 2 (km 9.7 to 40) only within a narrow strip alongside the Project Road interferences are expected. For managing these impacts, land acquisition will be carried out according to the LARP which will be cleared by ADB.

Construction activities will be confined to the selected sites and the interference with the general public and community around is minimal. In these works, the temporary negative impacts arise mainly from construction dust and noise, hauling of construction material, waste and equipment on local roads (traffic, dust, safety etc.), mining of construction material, occupational health and safety (OHS) aspects due to potential presence of hazardous materials such as fuels and oils.

After construction, during operation phase there will remain only low negative impacts as compared to the existing situation. This is because the road reconstruction scheme follows the existing alignment over most of its length. No valuable or protected natural habitats or other valuable environmental structures are significantly impacted after finalization of construction period, neither in their structure nor function. There are no archeologically sensitive areas identified within the project area. There will be mostly beneficial impacts.

Once the improved road section is operating, activities will only involve routine maintenance, which should not affect the environment.

Environmental management and monitoring. An EMP has been developed to provide mitigation measures to reduce all negative impacts to acceptable levels, along with the delegation of responsibility to appropriate entities. Various design related measures are already included in the project design. During construction, the EMP includes mitigation measures such as (i) proper planning of works to minimize the public inconvenience; (ii) barricading, dust suppression and control measures; (iii) traffic management measures for works along the roads and for hauling activities; (iv) analysis of existing materials on-site to assess potential health and safety risks; and (v) finding beneficial use of excavated materials to the extent possible to reduce the disposal quantity. EMP will guide the environmentally-sound construction of the project. EMP includes an EMoP to measure the effectiveness of EMP implementation and include observations on- and off-site, document checks, and interviews with workers and local people.

The EMoP will require the contractor/s to (i) establish the baseline site-specific environmental conditions, (ii) together with PIURR and the Construction Supervision Consultant (CSC), conduct consultations with communities adjacent to sites, if any; and (iii) prepare site-specific EMP (SSEMP) prior to commencement of civil works. The baseline results and consultation records will be reported as part of the Semi-Annual Environmental Monitoring Reports (SAEMR) and will be the basis to ensure no environmental degradation will happen and views/feedback of the communities near or adjacent to project sites are considered during project implementation. The EMP will be made binding on all contractors (including subcontractors) and will be included in the contractual clauses. Non-compliance with, or any deviation from, the conditions set out in this document will constitute a failure in compliance. A copy of the EMP and contractor's SSEMP will always be kept on-site during the construction period. The estimated cost for environmental management and monitoring measures is provided in Chapter VII.F.

This IEE, or update thereof, with the EMP will be included in the bid and contract documents to ensure compliance with the conditions set out in this document. The SSEMP will be submitted by the contractor for approval to PIURR and the CSC before the commencement of civil works. The SSEMP will include information on, among others: (i) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous

wastes; (ii) specific mitigation measures following the approved EMP; and (iii) site- and work-specific timebound environmental monitoring program. COVID-19 health and safety management plan and emergency response plan will also be prepared as part of the SSEMP. Works will not be allowed to commence prior to approval of SSEMP.

Safeguards implementation arrangements. The executing agency is the MoT, and the implementing agency is PIURR, wholly responsible for the implementation of ADB-financed projects, as agreed jointly between the borrower and ADB, and following the policies and procedures of the government and ADB. ADB staff is responsible for supporting implementation including compliance by MoT and PIURR of their obligations and responsibilities for project implementation in accordance with ADB's policies and procedures.

MoT will (i) provide overall project oversight; (ii) ensure compliance with all covenants of the financing agreement and ADB's policies, procedures, and guidelines; (iii) coordinate with all ministries and agencies involved in the project as appropriate; (iv) ensure that PIURR is adequately staffed and functional during the entire period of project implementation; (v) approve bidding documents, bid evaluation reports, contract variations, and suspension and termination of contracts; (vi) sign and act as the Employer for the contracts with consultants and contractors; (vii) timely resolve issues that would compromise quality, costs, or completion time of the project; (viii) conduct timely financial audits as per agreed timeframe and take recommended actions; (ix) collect and retain all supporting and reporting documents, including annual audit reports and financial statements; (x) involve beneficiaries and civil society representatives in all stages of project design and implementation as appropriate; (xi) regularly post on MoT website,[5] in consultation with ADB, the updated project information documents for public disclosure, including safeguards documents; and (xii) ensure project's post-implementation sustainability and report to ADB on the project impacts. The MoT will engage international and national consultants for the following services: (i) construction supervision, (ii) strengthening the Road Asset Management Unit (RAMS) Unit, and (iii) women empowerment. The MoT will ensure that the preparation, design, construction, implementation, operation and decommissioning of the project and all project facilities comply with (a) all applicable national laws and regulations relating to environment, health and safety; (b) ADB SPS; and (c) all measures, and requirements set forth in the IEE, and any corrective or preventive actions set forth in a Safeguards Monitoring Report.

PIURR will (i) coordinate the day-to-day project implementation activities; (ii) act as focal point for communication with ADB on project-related matters; (iii) procure works and goods and administer works and goods contracts; (iv) recruit consultants and administer consulting services contracts; (v) carry out environmental monitoring and public consultation during implementation to ensure the proper implementation of the project's SSEMPs and land acquisition and resettlement plans; (vi) monitor and promptly address complaints, and ensure their effective and adequate resolution; (vii) establish adequate financial management system and submit timely withdrawal applications to ADB; (viii) prepare periodic progress reports identifying issues and action plans, and ensure their timely submission to ADB; (ix) monitor and evaluate project activities and outputs, including periodic review and preparation of project completion report; (x) assist ADB's project review missions, as appropriate. PIURR will be assisted during project implementation by relevant departments of the MoT, the CSC, and relevant government agencies.

The CSC is tasked with specific responsibility to ensure environmental safeguards compliance of civil works, with emphasis on the monitoring of implementation of the EMP through the works contractor's SSEMP and related aspects of the project. The CSC will include an international environmental specialist (CSC-IES) and a national environmental specialist (CSC-NES), who will be responsible for supervising the contractor's environmental performance, coordinating the

[5] PIURR website at which the IEE and the SARMEs will be disclosed is https://www.mintrans.tj/.

public consultations and project grievance redress mechanism (GRM), and reporting to PIURR management for submission to MoT and ADB through the periodic project progress reports and SAEMRs. The CSC will also mobilize an ornithologist who conduct a fast-track ecological survey prior to construction.

The Works Contractor is required to appoint an Environment Safeguard Officer (ESO) rand Health and Safety Officer (HSO). The Works Contractor is responsible for preparing SSEMP that reflects its understanding and commitment to address environmental issues. The works contractor is always also responsible for the day-to-day implementation of the EMP and compliance with the requirements of both the IEE and EMP.

Consultation, Disclosure and Grievance Redress.

Public consultations were carried out in May to August 2020 in accordance with the newly adopted rules through applying the preventive measures elaborated regarding COVID-19 pandemic. Based on the detailed design by Ronamo, Kocks Consult GmbH (including an international and a national environment expert and social safeguards experts) and PIURR representatives carried out surveys within the villages alongside the Project Road. Villagers were informed about the social and environmental imapcs of the Project. In addition, the communities were informed by distribution of an information brochure regarding potential impacts and measures to avoid and mitigate these impacts, project's mechanism to address complaints/grievances, and focal persons in the event villagers are interested to know more about the project.

In addition, two public consultation meetings were carried out on 16 November 2021, one in Jamoat Bustonkala (Rayon Qushonion) and one in Jamoat Guliston (Rayon Levakant). The public consultation meetings were organized by PIURR under strict adherence to corona pandemic restrictions. Views and feedback of villagers alongside the Project road are considered and incorporated in this IEE, particularly in the Project EMP and EMoP as far as technically feasible.

The participants of the public meeting have been informed about the project's technical attributes, potential environmental impacts, design considerations and measures to avoid and mitigate impacts, project's GRM, implementation schedule, etc.

In addition, the IEE will be made available at public locations and will be disclosed to a wider audience via the ADB and MoT websites (footnote 5). The consultation process will be continued and expanded during project implementation to ensure that stakeholders are fully engaged in the project and can participate in its development, finalization, and implementation.

A grievance redress mechanism (GRM) is described within the IEE to ensure any public grievances are addressed quickly.

Monitoring and Reporting. PIURR with the support of the CSC will be responsible for monitoring and reporting. During construction, results from internal monitoring by the contractor will be reflected in construction site environmental monitoring reports (monthly EMP implementation reports) to PIURR. The CSC team will monitor the compliance of contractor, prepare a quarterly progress report, and submit to PIURR. PIURR will oversee the implementation and compliance and will prepare (with support of the CSC) SAEMR and submit to ADB. ADB will post the SAEMRs on its website. SAEMRs in Russian language[6]will also be posted on MoT website (footnote 5).

Conclusion. The project is unlikely to cause significant adverse impacts. The potential impacts

[6] Russian language is regarded in Tajikistan as the language of inter-ethnic communication which is specifically referred to in Article 2 of the National Constitution and it is widely used as a second language among the population. It is generally accepted that most of the Tajik citizens are familiar with the Ruassian language, in both oral and written forms. In case there are affected people who need information in Tajik language, PIURR staff will provide requested information in Tajik individually.

that are associated with construction and operation can be mitigated to acceptable levels without difficulty through incorporation or application of recommended mitigation measures and procedures. Based on the findings of the IEE, there are no significant impacts and the classification of the project as Category “B” is confirmed.

The successful implementation of the project will improve accessibility of 13 villages along the project road. Moreover, it will create short term employment opportunities.

Recommendations. The following are recommendations applicable to the project to ensure no significant impacts occur:

(i). Obtain all statutory clearances at the earliest time possible and ensure conditions/provisions are incorporated in the detailed design;
(ii). Include this IEE, or update thereof, with the EMP in bid and contract documents;
(iii). Prepare SSEMP based on site-specific conditions, contractors working methodology;
(iv). Update/revise the IEE/EMP if there are unanticipated impacts;
(v). Ensure that the existing materials to be demolished/dismantled are tested for hazardous contents and Spoils management plan and Waste Management Plan for handling, storage, transport, and disposal of the wastes is prepared by contractors as part of the SSEMP, approved by PIURR and the CSC, and strictly monitored during project implementation.
(vi). Ensure that wastes (solid and liquid) should be stored and disposed at designated site/facility (dumping on vacant lot is not allowed);
(vii). Conduct safeguards induction to the contractor upon award of contract;
(viii). Strictly supervise EMP implementation;
(ix). Ensure contractor appointed qualified ESO and HSO prior to start of works;
(x). Documentation and reporting on a regular basis as indicated in the IEE;
(xi). Continuous consultations with stakeholders;
(xii). Ensure consultations and focus group discussions are undertaken prior to start of works and incorporate measures to address relevant concerns in SSEMP;
(xiii). Timely disclosure of information and establishment of GRM in language and form understandable by stakeholders;
(xiv). Involvement of contractors, including subcontractors, in the first level GRM;
(xv). Commitment from PIURR, MoT, CSC, and contractors to protect the environment and the people from any impact during project implementation.

I. INTRODUCTION

A. Project Background and Purpose of the Report

1. The road network has a particular importance for the Republic of Tajikistan (herein referred to as Tajikistan). Due to its geographical location, specific mountainous conditions of the relief in the complete absence of sea and river routes, insufficient development of railways and airlines network, roads and motor transportations are the main type of transport services for the Republic.

2. The current level of condition of most roads (mainly regional and local roads) in Tajikistan has a low traffic capacity, not meeting the requirements of acting norms in the Republic. Most of the road network does not allow ensuring the safety of road users in accordance with modern requirements. In view of the unsatisfactory technical condition of many existing roads, the efficient operation of transportation is at a low level. The Project Road (40 km of Bokhtar - Okmazor section) is category III. The width of the existing carriage way is 9.0 to 11.0 m. The pavement of the carriageway is destroyed, visibility is not ensured, and the Project Road does not fit to the requirements of a category III road.

3. Therefore, improving Tajikistan's road network system remains a national priority and will remain so, as the main task of the MoT is to connect all regions of the country with a reliable network of relevant roads.

4. Road Network Sustainability Project (footnote 1), approved by the Asian Development Bank (ADB) on 19 November 2020, will improve two national arterial roads, namely (i) Dangara-Okmazor and (ii) Hulbuk-Kangurt. The Ministry of Transport (MoT) of Tajikistan requested ADB to provide additional financing for the improvement of road section Bokhtar – Okmazor (km 0+000 to km 40+000).The location of the 2 road sections (i) Dangara-Okmazor and (ii) Hulbuk-Kangurt,within Tajikistan is shown in Figure 1ниже. The Project Road section Bokhtar-Okmazor is shown in blue colour.

5. The Bokhtar-Okmazor Project Road section is 40 km long and forms one of the important roads of regional significance in the southern region of the republic. It provides important transport links, supply of agricultural products and industrial raw materials. The road is running through mountainous terrain with difficult relief and extreme weather conditions (heavy rainfall, mudflows and snowfalls). It passes through the territory of Bokhtar, Kushoniyon, Levakand and Bakhsh districts, where it serves a population of more than 283,200 people. (Table 1ниже)

6. Regarding the designed cross-section, the Project Road (Bokhtar-Okmazor) was split into two sections: (i) 4-lane section (9.7 km from Bokhtar) and (ii) 2-lane section (remaining 30.3 km). The Project alignment is expected to follow the existing road alignment. There are only limited realignments to improve geometric characteristics, elimination of safety hazards and to avoid areas subject to severe soil erosion or unstable slopes. The Project Road consist of one carriageway with two traffic lanes, width of 3.50 m, respectively 3.00 m, in each lane. There are no spatial alternatives or bypass options foreseen.

Figure 1 - Location of the 3 Road Sections of the Road Network Sustainability Project within Tajikistan (Project Road Bokhtar-Okmazor is shown in blue)

Table 1Districts, Jamoats and Villages alongside the Project Road

Districts	Jamoats	Villages along the project road
Bokhtar	Bokhtar town	Hoji Sharif
Kushoniyon	Bustonqala	СМП-540
		Ozodii Mehnat
		Niholparvar
		Abdullo Kurbon
		Hayoti nav
		Orzu
		Ergash
Levakand	Guliston	Guliston
		Eshonobod
	Vahdat	Sarband
		Tojikobod
Bakhsh	Mashal	Lolazor -2

1. Study Area and Project Categorization

7. Regarding the Project Area of Influence, it needs to be distinguished between the core impact area which is subject to direct physical encroachment and impacts and the wider zone of Project influence that is mostly subject to indirect and positive impacts such as better road connectivity.

8. An envelope of potentially 200 m wide on each side of the Bokhtar-Okmazor road over its entire length is identified as the core impact area. This core impact area is subject to direct physical encroachment which usually results in the physical loss of structures, such as human properties (kiosks, fences, crops etc.) or natural structures such as topsoil, trees, shrubs, and biotopes. Other impacts refer to negative interferences which do not cause the loss of structures but nevertheless cause the reduction of environmental quality. Examples are the negative effects of noise emissions, the effects of emissions of pollutants or the occurrence of increased erosion due to malfunctioning of culverts, lack of retention basins or other.

9. A detailed description of the impacts is given in the chapter on impacts and mitigation measures. Within road sections where sensitive receptors are present, such as schools, hospitals, or other places where people congregate particular attention will be given so that ample mitigation is formulated.

10. For road sections that cross rivers, the impact assessment may be expanded to cover the identified continuous extent of any ecologically important habitats / features along the Project Corridor. In addition, the core impact area needs to be widened at certain locations to consider all ancillary facilities occurring outside the 200 m corridor such as borrow pits and quarries.

11. In contrast the wider zone of influence includes the wider geographical area that is influenced by the project due to better access and more efficient transport connections. This wider zone of influence is subject to indirect and positive impacts.

12. The road will be reconstructed along the existing alignment. The existing road fall into technical road category III and consist of one carriageway with two traffic lanes width of 3.50 m, respectively 3.00 m, in each lane. Section 1 will be upgraded to category I, a highway of citywide significance. Section 1 starts at km 0+000 in Kochi Sharif Market and ends at km 9.7 at the Levakand turn. Section 2 comprises the remaining 30.3 km until Okmazor village. Section 2 will be rehabilitated to 2 lanes and will remain category III. Potentially the upgrading of road Projects to a higher Category might cause separation to communities due to higher vehicle speeds or implementation of required roadside barriers which may create obstacles for farmers and villagers in accessing their fields, etc. However, proper design and other mitigation measures allow avoiding or minimizing those impacts and improve road safety.

A. B. Purpose of the Initial Environmental Examination

13. **Screening and assessment of potential impacts**. ADB requires consideration of environmental issues in all aspects of the Bank's operations, and the requirements for Environmental Assessment are described in ADB SPS. The potential environmental impacts of the subproject have been assessed using ADB rapid environmental assessment (REA) checklist. The potential negative impacts were identified in relation to preconstruction, construction, and operation phases.

14. **Categorization**. Environmental assessment has been conducted for the road section based on (i) detailed design, and (ii) most likely environmentally sensitive components. The results of the assessment show that the project entails physical encroachment which involves the loss of structures (e.g., trees, shrubs, soil, habitats) and transformation of topography due to embankment cut and fill. Impact magnitude is medium within the first section due to the upgrade to category I and minor within Section 2. Within Section 1, the physical encroachment is confined to an approximately 15 m wide strip to both sides of the road. All impacts can be compensated by suitable mitigation measures and are therefore reversible. Hence the Project is not likely to have any significant adverse environmental impacts that are irreversible, diverse, or unprecedented. In addition to the loss of structures due to road widening in Section 1, additional potential impacts on environment result from construction dust and noise, hauling of construction material, waste and equipment on local roads (traffic, dust, safety etc.), mining of construction material, OHS aspects due to potential presence of hazardous materials such as fuels and oils. The potential impacts are site-specific, temporary in nature, short-duration, and can be mitigated to acceptable levels through proper engineering design and incorporation of recommended mitigation measures to be provided in the EMP. In most cases, mitigation measures can be designed with uncomplicated measures commonly used at construction sites and known to civil works contractors.

15. Reasons for the determination of the Project as category B are the following.

- In section 1 (km 0+000 – 9+700), the Project Road will be upgraded to category I. Hence a strip of approximately 15 m to both sides of the Project Road will be physically impacted and natural and human structures within this strip will be lost. During the carried-out surveys, no valuable ecological structures or habitats were identified within this strip which cannot be restored.
- In Section 2, the rehabilitation will be carried out on the already existing alignment and confined to the existing Right of way (RoW) as far as technically feasible. No spatial alternatives are foreseen. There might be only minor alignment shifts due to need for compliance with design parameters such as gradient or radius. Therefore, there is only little physical encroachment within this section and the anticipated environmental and social impacts are for the most generic and site specific and therefore such kind of impacts that occur in all types of road reconstruction Projects. They are mostly temporary limited to the construction phase.
- There are no protected areas under national law within the Project area of Influence.
- After Project implementation, during operational phase, there will be however only very low remaining impacts, mainly because the reconstruction follows the existing alignment and no valuable or protected natural habitats or other valuable environmental structures are significantly impacted after finalization of construction period, neither in their structure nor function. Therefore, the Project is proposed to be classified as environmentally category B.

16. The classification as category B is based on the conducted screening as demonstrated in the REA checklist. It is in line with ADB SPS in which a category B Project is defined as follows: "*A proposed project is classified as category B if its potential adverse environmental impacts are less adverse than those of category A projects. These impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. An initial environmental examination is required.*"

17. This IEE report covers Bokhtar-Okmazor road section, based on the detailed design documents and field-based data gathering and consultations which were carried out during

preparation of the IEE. The COVID-19 pandemic caused restrictions and limitations in visiting all locations thus limited environmental field surveys and community consultations were conducted. During the SES, all affected persons met were handed out an information booklet which is describing the Project, its impacts and benefits. The EMoP developed as part of the EMP will require the contractor/s to (i) together with PIURR and the CSC, conduct consultations with communities adjacent to sites, if any; and (iii) prepare SSEMP prior to commencement of civil works. The CSC is required to establish the baseline site-specific environmental conditions. The baseline results and consultation records will be reported as part of the SAEMRs and will be the basis to ensure no environmental degradation will happen and views/feedback of the communities near or adjacent to project sites are considered during project implementation.

18. This IEE identifies and analyses all significant impacts; describes their extent, duration, and severity; formulates the required mitigation and monitoring measures and presents it all in the form of an EMP and EMoP. The IEE also provides a detailed description of the direct and indirect environmental impacts associated with the Project during key periods of work, namely the design, pre-construction, construction, and operational phase.

19. Various design related measures are already included in the project design. During construction, the EMP includes mitigation measures such as (i) proper planning of works to minimize the public inconvenience; (ii) barricading, dust suppression and control measures; (iii) traffic management measures for works along the roads and for hauling activities; (iv) analysis of existing materials on-site to assess potential health and safety risks; and (v) finding beneficial use of excavated materials to the extent possible to reduce the disposal quantity. EMP will guide the environmentally sound construction of the subproject. EMP includes an EMoP to measure the effectiveness of EMP implementation and include observations on- and off-site, document checks, and interviews with workers and beneficiaries.

20. This IEE will be further updated if unanticipated environmental impacts become apparent. The updated IEE will supersede the earlier version of IEE and will be contractually applicable to the contractor.

21. The implementation of the project will be governed by Government of Tajikistan applicable environmental acts, rules, regulations, and standards. Environmental safeguards will be followed in accordance with ADB SPS. During construction and operation of the project, the borrower/client will apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as EHS Guidelines (footnote 2).

22. **Report Organization.** Work on the IEE started in March 2020. In a video call conference on 3 April 2021 joined by PIURR-ESE, PIURR Project coordinator and Kocks Consult GmbH national and international environmental experts, the methodological approach and the required working steps were in detail discussed. In compliance with ADB SPS requirements, this IEE has been structured and consists of 11 chapters including executive summary:

(i). EXECUTIVE SUMMARY
(ii). INTRODUCTION
(iii). Policy, Legal, and Administrative Framework
(iv). DESCRIPTION OF THE PROJECT
(v). Analysis of ALTERNATIVES
(vi). Description of the Environment (Baseline Data)
(vii). ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES
(viii). ENVIRONMENTAL MANAGEMENT PLAN
(ix). INFORMATION DISCLOSURE, CONSULTATION, AND PARTICIPATION
(x). Grievance Redress Mechanism
(xi). CONCLUSION AND RECOMMENDATIONS

23. The report is supported by 9 annexes.

1. Project Proponent and Main Institutional Responsibilities

24. The executing agency for the project is the MoT. The implementing agency is PIURR. Project office facilities are provided on the fourth floor of the MoT offices, 14 Aini Street, Dushanbe.

25. PIURR has appointed a PIURR-ESE who is responsible for coordinating and bringing forward all due diligence and safeguard documents required for the environmental and social permitting process on the national level and according to ADB SPS.

26. The preparation of the IEE was supported by Kocks Consult GmbH who is continuously supported and advised by PIURR and ADB. The National Design Consultant is Ronamo.

2. Methodology

27. The methodology used for the preparation of the IEE followed ADB SPS and the existing national Tajikistan environmental and social legislation.

28. In a video call conference on 3 April 2021 joined by PIURR-ESE, PIURR Project coordinator and Kocks Consult GmbH national and international environmental experts, the methodological approach and the required working steps were in detail discussed.

29. The first methodological step according to ADB SPS is the carrying out of the Rapid Environmental Assessment Checklist (REA). This needs to be done in order to establish and confirm the Project category. Based on the resulting categorization, relevant environmental assessment (i.e., Environmental Impact Assessment (EIA) for category A or Initial Environmental Examination (IEE) for category B) will need to be carried out according to ADB SPS.

30. The project road is following the existing road. In section 1 (km 0+000 – 9+700), the Project Road will be upgraded to category I. Hence a strip of approximately 15 m to both sides of the Project Road will be physically impacted and natural and human structures within this strip will be lost. During the carried-out surveys, no valuable ecological structures or habitats were identified within this strip which cannot be restored.

31. Remaining impacts are generic and site specific and of such kind which occur in all construction Projects. Therefore, the Project has been classified as B in terms of its environmental impacts.

32. Surveys, field verification and data gathering are conducted for purpose of collecting baseline information of the Project site and for identification of sensitive receptors.

33. The required field surveys were carried out by Kocks Consult GmbH national environmental expert. The field works consisted of walk over of the entire alignment of the road to describe the physical environment, including condition of the road base, vegetation along the road corridor, land use types along the corridor, existing infrastructure within and nearby the road corridor, parameters of the river crossings and environmental sensitive points (proximity of national parks or protected areas). All acquired field data were sent to the Kocks Consult GmbH international environmental expert for processing the data for IEE preparation in home office due to the travel restrictions due to COVID-19. During November 2021, the International Environmental Expert also could travel to

Tajikistan and visit the Project site for consolidating the findings. The findings and recommendations of the IEE are presented to PIURR.

34. For obtaining baseline information of air quality, water quality and noise, a qualified laboratory has been assigned for sampling and analysis. The identification of measurement points and sensitive receptors is carried out and coordinated by the Kocks Consult GmbH national and international environmental experts.

35. Project stakeholders and regulatory agencies that need to be involved have been identified and consulted in the course of IEE preparation. Follow up measures and responsibilities that need to be considered during Project implementation are incorporated in the EMP.

36. All statutory requirements are identified within scope of the legal framework description and duly considered in the IEE and EMP preparation.

37. The Project is categorized as B in terms of its environmental impacts and requires stakeholder engagement and consultation as a continuous process. In total, thirteen (13) villages are located alongside the Project Road. Based on the detailed design by Ronamo, SES was carried out in May to August 2020 to obtain the views, attitude and feedback of villagers alongside the Project Road. The villagers in the Project affected community were also informed about potential environmental impacts. An information brochure which contains a Project description, its impacts and benefits was handed over to the villagers and affected persons met during the SES.

38. In addition, two public consultation meetings were carried out on 16 November 2021, one in Jamoat Bustonkala, Rayon Qushonion and one in Jamoat Guliston, Rayon Levakant. The public consultation meetings were organized by PIURR under strict adherence to COVID-19 pandemic restrictions.

39. Views and feedback of villagers alongside the Project Road were considered and incorporated in this IEE, particularly the Project EMP and EMoP as far as technically feasible. After finalization, the IEE will become part of the bid documents.

II. Policy, Legal, and Administrative Framework

40. This section presents an overview of the policy/legislative framework as well as the environmental assessment guidelines of the Republic of Tajikistan that apply to the proposed project. The section also identifies relevant requirement under ADB SPS that will be applied in the project.

A. Environmental Clearance Requirements

41. According to ADB's Guidelines and Environmental Assessment Requirements of Infrastructure Projects, an IEE will be presented to both the Government of Republic of Tajikistan and ADB. According to initial environmental assessment, the Project has been classified as category "B".

1. Government Environmental Laws, Regulations and Guidelines

a) Legislation

42. Tajikistan has a well-developed environmental legal and regulatory framework. Current environmental legislation in Tajikistan includes statutory acts and laws on the following topics: (i) Protection of the environment; (ii) ecological audit and monitoring; (iii) protection of flora and fauna; (iv) environmental information and education; (v) soil, water and air quality; (vi) biological safety; (vii) human health and safety; and (viii) waste and chemicals management. These laws, along with the regulations approved by the Government of Tajikistan (GoT) create a favourable legal framework for environmental protection and for the use and protection of the country's natural resources. They also enforce the rights of any citizen for environmental safety, organic products, eco-friendly environment,

access to environmental information, possibility of investing (moral, material and financial) to improve the ecological situation in the country.

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

44. Environmental impact assessment (EIA) is the subject of the Law on Environmental Protection (2011), the Law on Ecological Expertise (2012), and the Law on Environmental Impact Assessment (updated in 2018). An environmental licensing system applies to hazardous waste management and mining. Environmental permitting systems regulate the use of natural resources, especially hunting or collecting certain species.

45. In Tajikistan, the organizations responsible for monitoring environmental and health and safety protection and their management are the Committee for Environmental Protection under the Government of Tajikistan (CEP), the Sanitary Inspectorate under the Ministry of Health (SES), the Industrial Safety Inspectorate; and the Field Development Inspectorate.

46. The Law on Environmental Protection (2011) contains articles that relate to the protection of the subsoil and the efficient use of land resources. The main environmental laws relevant to the Project are indicted in the following table.

Table 2 - Environmental, Labour and Health & Safety Laws of the Republic of Tajikistan

№	Name of the documents	When the document was approved
In the field of environmental protection		
1.	Law of RT[1)] "On Environmental Protection"	2 August 2011 as amended on 18 July 2017
2.	Law of RT “On Ecological Expertise”	16 April 2012
3.	Law of RT “On Environmental Impact Assessment”	1 November 2018
4.	Law of RT "On the protection of atmospheric air"	28 December 2012
5.	Law of RT "On production and consumption waste"	10 May 2002, amended in 2011
6,	Law of RT “On Environmental Audit”	26 December 2011
7.	Law of RT “On Specially Protected Natural Territories”	26 December 2011
8.	Law of RT “On Environmental Monitoring”	25 March 2011
9.	Law of RT “On Radiation Safety”	1 August 2003
10.	Law of RT “On the protection and use of flora”	17 May 2004
11.	Law of RT “On Biological Security”	1 March 2005
12.	Law of RT “On fauna”	5 January 2008
13.	Law of RT "On Soil Protection"	16 October 2009
14.	Law of RT “On hydrometeorological activity”	2 December 2002
15.	Law of RT “On the collection, conservation and rational use of genetic resources of cultivated plants”	1 August 2012
In the field of health, social protection and emergency situations		
1.	Law of RT “On protection of population and territories from emergency situations of natural and man-made character	15 July 2004
2.	Law of RT "On Fire Safety"	29 December 2010
3	Law of Republic of Tajikistan on Appeals of Individuals and Legal Entities	2016
4	Health Care code	2017
In the field of energy, industry and minerals		
1.	Law of RT “On Energy Saving”	10 May 2002
2.	Law of RT “On mineral resources”	20 July 1994

№	Name of the documents	When the document was approved
3.	Law of RT "On precious metals and precious stones"	12 May 2001
4.	Law of RT “On industrial safety of hazardous production facilities”	28 February 2004
In the field of water and land relationship, agriculture		
1.	Law of RT “On drinking water and drinking water supply”	29 December 2010
2.	Law of RT “On Land Reform”	5 March 1992
3.	Law of RT “On Land Valuation”	12 May 2001
4.	Law of RT "On Land Management"	5 January 2008, amended 2016
5.	Law of RT “On the production and safe handling of pesticides and agrochemicals”	22 April 2003
Codes		
1.	Land Code of the Republic of Tajikistan	13 December 1996, amended in 2016
2.	Water Code of the Republic of Tajikistan	20 October 2000
3.	Forest Code of the Republic of Tajikistan	2 August 2011
4.	Labour Code of the Republic of Tajikistan	2016

RT = Republic of Tajikistan

b) Environmental Assessment

47. 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 Expertise (2012) and the Law on Environmental Impact Assessment (2018). The Chapter V, Articles 35-39 of the Law on Environment Protection (2011) introduces the concept of state ecological review (literally, state ecological expertise[7] – SEE) that seeks to examine the compliance of proposed activities and projects with the requirements of environmental legislation and standards and ecological security of the society. The mentioned laws stipulate the mandatory cross-sectoral nature of SEE, which shall be scientifically justified, comprehensive, and objective and which shall lead to conclusions in accordance with the law. SEE precedes decision-making about activities that may have a negative impact on the environment. Financing of programs and projects is allowed only after a positive SEE finding, or conclusion, has been issued.

48. The following activities and projects are subject to state ecological review:

- draft state programs, pre-planning, pre-project, and design documentation for economic development;
- regional and sectoral development programs;
- spatial and urban planning, development, and design;
- environmental programs and projects;
- construction and reconstruction of various types of facilities irrespective of their ownership;
- draft environmental quality standards and other normative, technology, and methodological documentation that regulates economic activities;
- existing enterprises and economic entities.

49. The laws stipulate that all types of economic and other activities shall be implemented in accordance with existing environmental standards and norms and shall have sufficient environmental protection and mitigation measures to prevent and avoid pollution and enhance environmental quality. The Environmental Assessment studies analysing the short- and long-term environmental, genetic, economic, and demographic impacts and consequences shall be evaluated prior to making decisions on the allocation, construction, or reconstruction of facilities, irrespective of their ownership. If these requirements are violated, construction will be terminated until necessary improvements are made, as prescribed by the GoT and/or other duly authorized control bodies, such as sanitary, geological, and public safety agencies.

[7] State Ecological Expertise means both the department (institution) within the Committee for Environmental Protection and the process of review as well.

50. An Environmental Impact Assessment (EIA) is a component of the SEE. Its procedure includes General guidelines, terms of reference, coordination and approval of design estimates, development of the EIA text, state approval, and feasibility documents. The EIA should follow the categorization of the proposed activities, which contains 180 types of activities, grouped according to four environmental impact categories: from A (in Cyrillic sounds A) "high risk" to Г (in Cyrillic sounds G, "local impact"). If the activity is not included in the list, then it is not required to pass either an EIA or a SEE. The EIA is the responsibility of the project proponent. The "Procedure on Environmental Impact Assessment" (2013) establishes general requirements for the contents of the EIA documentation. The SEE for all investment projects is the responsibility of the CEP and its regional offices. Furthermore, according to the Law on the SEE, all civil works, including rehabilitation, should be assessed for their environmental impacts and the proposed mitigation measures reviewed and monitored by the CEP. A detailed project description and the EIA study are the basis to go for the environmental permit and have to be submitted to the CEP. As a rule, the CEP prepares its conclusion within one month. The CEP provides three options of the conclusion: allowed, not allowed, and allowed on conditions (usually some additional requirements) to be followed by the company during the activity. If the CEP concludes that an environmental permit cannot be provided due to different circumstances, the company can change its design and resubmit the documents once again. It is not allowed to change the approved project to the detriment of environmental safety requirements.

c) Administrative Basis and Approval Procedure Specifically for the Project

51. The Law on Environment Protection (2011) determines that the state environmental review is conducted by an authorised state body of Tajikistan in the field of environmental protection, i.e., Committee on Environmental Protection (CEP). The CEP has a significant mandate, which includes environmental policy and inspection duties. The CEP has units at the regional, city and district levels, in the form of environmental protection departments.

52. A special unit under the CEP is charged with leading and managing the approval process of EIA and for issuing the SEE which is the official environmental approval on the National level.

53. The predecessor document of this IEE report (the IEE for the whole Bokhtar – Dangara road section) has already been submitted to the CEP on 10 November 2020 with official letter by PIURR (Annex 7 - MoT's Letter to the CEP on IEE Submission for the Bokhtar-Dangara Road). Then, on 16 November 2020, the submitted IEE was officially approved by the head of the committee and the SEE for the Project was issued (Annex 8 - CEP's Letter to MoT on SEE Conclusion for the Bokhtar-Dangara Road).The environmental permit for the Project that has been obtained on 16 November 2020 is still valid.

d) Public Participation

54. Article 12 of the Law on Environment Protection (2011) proclaims the right of citizens to live in a favourable environment and to be protected from negative environmental impacts. Citizens also have the right to environmental information (Article 13), as well as to participate in developing, adopting, and implementing decisions related to environmental impacts (Article 13). The latter is assured by public discussion of drafts of environmentally important decisions and public ecological reviews. Public representative bodies have an obligation to take into consideration citizen's comments and suggestions.

55. According to the law, for any project subject to the 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.

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

57. In Tajikistan, disagreements are resolved through Jamoats' (Hukumats') grievance mechanism or appeal to court. A GRM capable of receiving and facilitating the resolution of affected persons' concerns and grievances related to the project is required as a formalised way for PIURR to identify and resolve concerns and grievances.

e) Environmental Permits and Licenses

58. The Law on Environmental Protection (2011) set the legal, organizational and economic basis for the permits system: the list of activities that require a permit, the permitting procedure, and the types of permits and the competent state bodies authorised to issue them. The Law was one of the elements of the country's permit system reform that reduced the total number of types of permits (more than 600) to only 88. Eight types are issued by the CEP.

59. An indicative list of the permit types which may be required for the Project is provided in the following table.

Table 3 - Indicative List of Permits and Licenses Applicable to the Project

Description of Authorisation Document	Date of Issue	Issuing Authority and requirements for follow up.
Design Stage: Project Feasibility Study and Environmental Impact Assessment		
Conclusion of the SEE on the project to be issued by the CEP[1)]. Current Status as per September 2021: The predecessor document of this IEE[2)] report (the IEE[2)] for the whole Bokhtar – Dangara road section) has already been submitted to the CEP (State Committee for Environmental Protection of Tajikistan) on 10 November 2020 with official letter by PIURR[3)]. Then, on 16 November 2020 the submitted IEE[2)] was officially approved by the head of the committee and the SEE[6)] for the Project was issued (The documents are attached as Annex 7 and Annex 8 to the IEE[2)] report). The environmental permit for the Project that has been obtained on 16 November 2020 is considered to be still valid. For follow-up, this IEE[2)] of the Bokhtar-Okmazor road needs to be submitted again to the CEP[1)].	16 November 2020. Issuing of SEE[6)] for the IEE[2)] for the Bokhtar-Dangara road. (Annex 8 of this IEE[2)]).	Committee for Environmental Protection under the Government of Tajikistan (CEP RT). Requirements for follow up: Any updates and revisions of the IEE[2)] need to be submitted again to the CEP[1)] for renewal the permit. Therefore, this present IEE[2)] for the "Bokhtar-Okmazor" road will be submitted to the CEP[1)] for allowing follow up.
At the Construction Stage: Permits and Licences		
License to conduct the type of activity	Prior to construction	Ministry of Industry and New Technologies of Tajikistan
Permission for land use for the construction of the camp, asphalt and concrete plants and the development of quarries for the extraction of soil for the preparation of building materials (gravel,	Prior to construction	Local authorities (Hukumats)

Description of Authorisation Document	Date of Issue	Issuing Authority and requirements for follow up.
sand, crushed stone) and excavation for road pavement.		
Permission for special water use	Before and during construction	(CEP RT), Tajik geology (technical water), Ministry of Health and social defence of the population of Tajikistan (drinking water)
Permission to cut down trees and shrubs	At the construction stage	(CEP RT)
Permission for emissions of harmful substances into the atmosphere (MPE[4)]) from stationary and mobile sources	At the construction stage	(CEP RT)
Permission for discharge of hazardous substances into water bodies (MPD[5)])	At the construction stage	(CEP RT)
Permission for land acquisition for temporary storage of construction waste (substandard soil, old asphalt, dismantled concrete products, etc.)	At the construction stage	(CEP RT), Local authorities (Hukumats)
Permission to remove construction and household waste for storage in specially designated areas (disposal areas)	As required	Local authorities (Hukumats)

[1)]CEP Committee for Environmental Protection

[2)]IEE Initial Environmental Examination

[3)]PIURR Project Implementation Unit for Road Rehabilitation (of MoT)

[4)]MPE Maximum permissible emission

[5)]MPD Maximum permissible discharge

[6)]SEE State Ecological Expertise

f) Occupational Health and Safety (OHS) Legislation

60. There are several documents playing crucial role in labour health and safety decision-making process.

61. Under the Constitution of Tajikistan, everyone has the right to safe labour and health protection, which requires the state measures to improve the environment (Article 38)

62. *Labour Code of Tajikistan* contains main OHS principles including: a working environment that meets safety and health requirements; the responsibility of the employer for violation of OHS requirements; restrictions on work in harmful or hazardous labour condition; training and instruction of employees on OHS matters; development and introduction of instructions on OHS that are mandatory for the employees.

63. *The Law of Tajikistan on Occupational Safety (2007)* lays down the main provisions on ensuring the constitutional rights of citizens to occupational safety and guarantees the right to safe labour, sets down the main principles of occupational safety in the workplace and envisages economic mechanisms of ensuring occupational safety. The law applies to all the ministries, agencies, concerns, associations, enterprises, organizations, institutions, cooperatives, lease and other organizations regardless of the form of ownership and business activities.

64. *The Law of Tajikistan on inspections of business assets (2006)* sets an order of inspections, rights and obligations of business assets and officials of inspecting authorities and aims protection of this activity from unwarranted intervention. Inspection of business assets are performed by authorized state agencies, in particular: on protection of environment and forestry - by an authorized agency on protection of environment and forestry; on protection of labour during production process

- by an authorized agency on labour protection; on compliance with sanitary norms and rules - by an authorized agency, performing Sanitary and Epidemiological Surveillance.

65. *Health Care Code of Tajikistan, the Law No. 1413 as of May 30, 2017,* replaced Laws "On protection of public health (1997), "On ensuring sanitary-epidemiological safety of the population" (2003, amended in 2011) and "On counteraction to HIV/AIDs (2005).

g) State Environmental Program 2009-2019

66. The Program, approved in 2009, obligates ministries and offices, heads of administrations and mayors of cities to improve environmental conditions and ensure sustainable development of the country during the period of economic transition. It calls for adoption of modern environmental standards for water, air, soil, solid waste, toxic wastes, and noise control, based on maximum permissible amounts. Standards are to be supplemented by discharge permits. The Program is accompanied by broad ecological zoning, dividing the country into ten zones (Syr-Darya, Northern Turkestan, Zeravshan, Gissar, Vaksh, Dangarin, Khulbak – Kulyak - Tchube, Karategin - Baldzhuan - Shurobad, Garm – Muksu - Balandkiik, and Badakshan).

2. ADB Safeguards

67. The environmental and social assessment needs to comply with ADB SPS. Based on ADB SPS, a project is classified as one of the following four environmental categories:

- Category A: Projects with potential for significant adverse environmental impacts. An environmental impact assessment and a summary EIA (SEIA) are required to address significant impacts.
- Category B: Projects judged to have some adverse environmental impacts, but of lesser degree and/or significance than those for category A projects. An initial environmental examination and a summary IEE are required to determine whether or not significant environmental impacts warranting an EIA are likely. If an EIA is not needed, the IEE is regarded as the final environmental assessment report.
- Category C: Projects unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are still reviewed.
- Category FI: Projects are classified as category FI if they involve a credit line through a financial intermediary or an equity investment in a financial intermediary. The financial intermediary must apply an environmental management system, unless all subprojects will result in insignificant impacts.

68. As noted previously, the Bokhtar-Okmazor road has been classified as category "B" for Environment. The categorization was carried out based on ADB SPS by means of screening and scoping of the main Project related issues and impacts.

69. ADB SPS in addition to the required environmental assessment process emphasizes the requirements for public consultation and information disclosure. Consultation will be carried out in a manner commensurate with the Project impacts. The consultation process and its results are to be documented and reflected in the environmental assessment report.

3. International Treaties and Legal Commitments

70. Tajikistan is party to a number of international environmental treaties including:

- Vienna Convention for the Protection of the Ozone Layer, 1996 and updated by:
  - Protocol on Substances that Deplete the Ozone Layer (Montreal), 1998;
  - London Amendments to Montreal Protocol on Ozone Depleting Substances, 1998;
  - Copenhagen Amendments to Montreal Protocol on Ozone Depleting Substances, 2009;

- Montreal Amendments to Montreal Protocol on Ozone Depleting Substances, 2009;
- Beijing Amendments to Montreal Protocol on Ozone Depleting Substances, 2009.

- UN Convention to Combat Desertification (CCD), 1997.
- UN Convention on Biological Diversity (CBD), 1997; Related updates to CBD are:
  - Cartagena Protocol on Biosafety to the Convention on Biological Diversity, 2004.
  - 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.
- Ramsar Convention (joined 2000);
- Bonn Convention on the Conservation of Migratory Species of Wild Animals (joined 2001); A related update is:
  - Bukhara Deer Memorandum, 2002.
- UN Framework Convention on Climate Change, 1998; A related update is:
  - Kyoto Protocol, accessed on December 29, 2008, and entered into force on March 29, 2009.
- Stockholm Convention on Persistent Organic Pollutants (ratified 2007); Related updates:
  - 2009 amendments listing 9 new POPs, August 26, 2010;
  - 2011 amendment listing endosulfan, October 27, 2012; and
  - 2013 amendment listing HBCD, November 26, 2014.
- Aarhus Convention (joined 2001); A related update is:
  - Kiev Protocol on Pollutant Release and Transfer Registers to the Convention on Access to Information, on May 21, 2003.
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 2016.
- UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage (joined 1992).

B. Environmental Standards

71. Environmental quality standards in Tajikistan are based on GOST, SNiP and SanPiN. GOST (Tajiki: ГОСТ) refers to a set of technical standards maintained by the Euro-Asian Council for Standardization, Metrology and Certification (EASC), a regional standards organization operating under the auspices of the Commonwealth of Independent States (CIS). SNiP mean Technical Standards (Tajiki: СНИП) - a building code, a set of rules that specify the minimum standards for constructed objects such as buildings and nonbuilding structures. SanPiN (Tajiki: Коидахо ва меъёрхои санитари) are sanitary rules and norms (standards).

72. Environmental quality standards in Tajikistan ensure both maximum permissible concentration (**MPC**) (Tajiki: ПДК) and maximum permissible (or allowable) emissions (**MPE**) (Tajiki: ПДВ). The MPC is approved by law hygienic standard. Under MPC refers to a concentration of chemical elements and their compounds in the environment, which in everyday impact for a long time on the human body does not lead to pathological changes or diseases established modern research methods in any time of life of present and future generations. The MPE is standard of maximum permissible emissions of harmful substances (pollutants) into the air, which is set for a stationary source of air pollution in accordance with technical standards for emissions and background air pollution. It provides non-exceeding of the hygiene and environmental air quality standards, limits (critical) load on ecological systems and other environmental regulations requirements.

73. The following table gives an overview of the National Standards and regulations that are applicable to the Project.

Table 4 - National standards and regulations applicable to the Project

#	Title- National Standards - GOSTs
	31431—2011. Protection of nature. Air. Set of Maximum Permissible Emissions (MPE[1)]). 29 November 2011
	31434—2011 Protection of nature. Air. Determination of parameters of efficiency of dust collection systems. 29 November 2011
	IEC 61241-0—2011 Electrical equipment used at areas containing flammable dust. Part 0. General requirements. 29 November 2011
	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
	General provisions GOST 17.0.0.04-80 (1998) Protection of nature. Environmental passport (certificate) of industrial facility. General provisions
	GOST R ISO14001-98 Environmental management systems. Requirements and guidelines.
	GOST 17.0.0.02-79 (1980) Protection of nature. Provision of metrological control of air, surface water and soils pollution.
	GOST 17.1.1.01-77 (ST SEV 3544-82) Usage and protection of water. General terms and definitions.
	GOST 17.2.1.01- 76 Classification of emissions (content).
	GOST 12.1.014-84 (1996) SSBT. Air at workplace. Methodology of measuring of pollutants concentration using indication tubes.
	GOST 12.1.005-88 (1991) SSBT. General sanitary and hygiene requirements to air at workplace.
	GOST 17.2.2.05-97 Norms and methods of emissions measuring containing spent diesel gases, tractors and self-propelled agricultural machines.
	GOST 21393-75 Diesel motorcars. Exhaust gas opacity. Norms and methods of measurement.
	GOST 17.2.2.03-77 Concentration of carbon monoxide at exhaust gases of motorcars with gasoline engines. Norms and measurements methodology.
	GOST 17.2.2.03-87 Norms and methods of measurements of carbon monoxide at exhaust gases of motorcars with gasoline engines.
	GOST 17.4.2.01-81 Nomenclature of sanitary condition parameters
	GOST 17.4.1.02-83 Classification of chemical substances for monitoring of contamination.
	GOST 12.1.003-83 (1991) SSBT. Noise. General safety requirements
	GOST 12.1.023-80 (1996) SSBT. Noise. Methods of threshold noise levels for stationary machinery.
	GOST 12.1.029-80 (1996) SSBT. Means and methods of noise protection. Classification.
	GOST 12.1.036-81 (1996) SSBT. Noise. Allowable levels of noise within residential and public buildings.
	GOST 12.1.007-76 (1999) SSBT. Harmful substances. Classification and general safety requirements.
	GOST 12.4.119-82 SSBT. Means of respiratory PPE. Methods of protective features assessment for aerosols.
	GOST 12.4.125-83 (1985) SSBT. Means of collective protective equipment from mechanical factors. Classification.
Sanitary norms and regulations (SanPins)	
	SanPiN 2.1.4.559-96 Drinking water. Hygienic requirements to the quality of water from centralised systems of drinking water supply. Quality control
	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

1) MPE Maximum permissible emission

74. In the following tables, a synopsis is given on the specific standards for air quality, water, waste and noise emissions in Tajikistan. In addition, the standards are compared with international guidelines and standards. In general, it can be concluded that the Tadjik system of environmental standards is well developed and for the purpose of the present Project, it is in line with the requirements of international guidelines and standards. It was therefore decided to use the Tajik standards as the reference in the present Project.

Table 5 - Environmental Standards for Emissions to the Atmosphere

Topic	National Standards / Requirements	EHS Guidelines (footnote 2) (or IFC PS)	Adopted Project Standard	Rationale
Emissions of Ozone Depleting Substances	No relevant numeric standard	No relevant numeric standard (*Although 'no new systems or processes should be installed using CFCs, halons, 1,1,1-trichloroethane, carbon tetrachloride, methyl bromide or HBFCs'*).	Consistent with applicable international conventions apply the principle that there will be no utilisation of ozone depleting substances (halons, PCBs, CFCs, HCFCs) and IFC	Good practice
GHG emissions	No relevant numeric standard		Numeric standards do not apply. GHG will be quantified and reported annually if >25,000 tonnes CO_2 equivalent per year are expected (as per IFC PS3, 2012)	Most relevant

Table 6 - Environmental Standards for Ambient Air- Human population protection (at receptors)

National Standards / Requirements[8]	EHS Guidelines (footnote 2)	Adopted Project Standard (mg/m^3)	Rationale
mg/m^3: PM 0.15 NO 0.06 NO_2 0.04 SO_2 0.05 Ammonia 0.06 Benzopyrene 0.1 Benzene 0.1 Acetone 0.35 Petrol 1.5 V_2O_5 0.002 Vinyl acetate 0.15 HCl 0.2 HF 0.005 Fe_2O_3 0.04 HNO_3 0.4 H_2SO_4 0.1 Xylol 0.2 Manganese and its oxides 0.001 Copper oxides 0.002 Magnesia 0.05 Nickel oxide 0.001 Inorganic dust (SiO_2 70 %) 0.05 SiO_2 = 70 % - 20 % 0.1 SiO_2 is less than 20 % 0.15 Lead and its compounds 0.0003 Lead sulfur 0.001 Hydrogen sulfide, H_2S 0.008 Turpentine 1 Ethyl alcohol (ethanol) 5.0 Butyl alcohol (butanol) 0.1 Propane alcohol (propanol) 0.3 Methyl alcohol (methanol) 0.5 Styrene 0.003 Soot 0.05 CO 3.0 Phenol 0.01 Formaldehyde 0.003 Fluoride (HF, SiF4) 0/05	Where set, national air quality standards apply. If no national standards are set, then apply WHO standards WHO guidelines, μg/m^3: $PM_{2.5}$ 10 (1 yr.) $PM_{2.5}$ 25 (24 h) PM_{10} 20 (1 yr.) PM_{10} 50 (24 h) Ozone 100 (8 h) NO_2 40 (1 yr.) NO_2 200 (1 hr) SO_2 20 (24 h) SO_2 500 (10 min)	mg/m^3: PM 0.15 NO 0.06 NO_2 0.04 SO_2 0.05 CO 3.00 Ammonia 0.06 Benzopyrene 0.1 Benzene 0.1 Acetone 0.35 Petrol 1.5 V_2O_5 0.002 Vinyl acetate 0.15 HCl 0.2 HF 0.005 Fe_2O_3 0.04 HNO_3 0.4 H_2SO_4 0.1 Xylol 0.2 Manganese and its oxides 0.001 Copper oxides 0.002 Magnesia 0.05 Nickel oxide 0.001 Inorganic dust (SiO_2 70 %) 0.05 SiO_2 = 70 % - 20 % 0.1 SiO_2 is less than 20 % 0.15 Lead and its compounds 0.0003 Lead sulfur 0.001 Hydrogen sulfide, H_2S 0.008 Turpentine 1 Ethyl alcohol (ethanol) 5.0 Butyl alcohol (butanol) 0.1 Propane alcohol (propanol) 0.3 Methyl alcohol (methanol) 0.5 Styrene 0.003 Soot 0.05 Phenol 0.01 Formaldehyde 0.003 Fluoride (HF, SiF4) 0/05	Tajikistan and supplemented by WHO where necessary to achieve most comprehensive suite[9]

[8] Annex 3 to Procedure of Environmental Impact Assessment accepted by Resolution No 464 of the Government of the Republic of Tajikistan dated 3 October 2006
[9] The IFC cites WHO ambient air quality guidelines typically apply only in jurisdictions where there are no national standards in place.

National Standards / Requirements[8]	EHS Guidelines (footnote 2)	Adopted Project Standard (mg/m^3)	Rationale
Freon (all brands) 10 Chromium trioxide 0.0015 Chlorine 0.03 ZnO 0.05 Ethylene oxide 0.03		Freon (all brands) 10 Chromium trioxide 0.0015 Chlorine 0.03 ZnO 0.05 Ethylene oxide 0.03	

Table 7 - Environmental Standards for Surface Water Quality & Discharges to Water

Topic	National Standards / Requirements	EHS Guidelines (footnote 2)	Adopted Project Standard	Rationale
Discharge to surface water: Effluent water	List of MPC (Maximum Permission Compact) quality of water at surface water bodies (Requirements to water quality in fishery water bodies)[10] pH 6.5-8.5 Aluminium (Al) 0.04 Iron (Fe) 0.1 Cadmium (Cd) 0.005 Copper (Cu) 0.001 Nickel (Ni) 0.01 Lead (Pb) 0.006 Zinc (Zn) 0.01 Chromium (Cr^{+6}) 0.02 Chromium (Cr^{3+}) 0.07 Oil and petrochemicals 0.05 Arsenic (As) 0.05 Calcium (Ca) 180 Silicon (SiO_3^{2-}) 1.0	Temperature of wastewater prior to discharge does not result in an increase greater than 3°C of ambient temperature at the edge of a scientifically established mixing zone which takes into account ambient water quality, receiving water use and assimilative capacity among other considerations. For treated sanitary wastewater: pH 6-9 BOD 30 COD 125 Total nitrogen 10 Total Phosphorus 2 Oil and grease 10 TSS 50 Total coliform bacteria 400/100ml	pH 6.5-8.5 BOD 30 COD 125 Total Nitrogen 10 Total Phosphorus 2 TSS 50 Total Coliform bacteria 400/100 ml Aluminium (Al) 0.04 Iron (Fe) 0.1 Cadmium (Cd) 0.005 Copper (Cu) 0.001 Nickel (Ni) 0.01 Lead (Pb) 0.006 Zinc (Zn) 0.01 Chromium (Cr^{+6}) 0.02 Chromium (Cr^{3+}) 0.07 Oil and petrochemicals 0.05 Arsenic (As) 0.05 Calcium (Ca) 180 Silicon (SiO_3^{2-}) 1.0	Tajik MPC as most stringent standard supplemented by IFC where needed for comprehensive suite
Water quality - freshwater	List of MPC above (mg/l)	No numeric standards	Tajik MPC for surface water bodies	Tajik as only relevant

[10] Annex 3 to Procedure of Environmental Impact Assessment accepted by Resolution No 464 of the Government of the Republic of Tajikistan dated 3 October 2006.

Table 8 - Environmental Standards for Noise

Topic	National Standards / Requirements	EHS Guidelines (footnote 2)	Adopted Project Standard	Rationale
Nighttime noise limits for human protection	Noise emissions at the nighttime (23:00-07:00) should not exceed the following levels (SanPin 2.2.4/2.1.8.562-96, п.5.3.1.): • In residential and public buildings: – Hospitals, health centres with recreation areas: 25 dB(A); – Residential rooms: 30 dB(A); – Rooms in hotels and hostels; Territory directly surrounding hospital buildings and health centres, with their recreation areas: 35 dB(A); – Territory directly surrounding residential, clinics, rest homes, homes for the elderly and disabled, educational institutions, libraries; Recreation areas within the territory of residential, rest homes, houses for the elderly and disabled, children's playgrounds, schools and other educational institutions: 45 dB(A); – Halls of cafes, restaurants, eating rooms: 55 dB(A); – Shops trade halls, passenger halls in airports and stations, consumer services centres: 60 dB(A); Sound levels for the major types of work and workplaces are the same as for the daytime (see below).	Noise emissions should not exceed the following levels or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site: Residential; institutional, educational: Nighttime (22:00-07:00): 45 dB(A) Industrial, commercial. Nighttime (22:00-07:00): 70 dB(A)	Tajik standards apply with nighttime defined as 22:00 – 07:00 in line with IFC EHS General Guidelines.	Most stringent and provides more comprehensive measurement criteria
Day time noise limits for human protection	Noise emissions at the daytime (07:00-23:00) should not exceed in residential and public buildings: - 55 dB(A) and 45 dB(A) at night in office buildings – 60 dB(A), in production facilities – 80 dB(A) (Reference to Tajik standard should be given).	Noise emissions should not exceed the following levels or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site: Residential.; institutional., educational.: Daytime (07:00-22:00): 55 dB(A) Industrial, commercial: Nighttime (22:00-07:00): 70 dB(A).	Tajik standards with daytime defined as 07:00 – 22:00 in line with IFC EHS General guidelines.	Most stringent and provides more comprehensive measurement criteria

Vibration Standards

In Tajikistan, there are no state standards for vibration. However, vibration levels should be monitored during construction phase within settlements.

75. **ADB SPS International Best Practice Requirements**. ADB SPS requires that, during the design, construction, and operation of the project, the executing agency shall apply pollution prevention and control technologies and practices that are consistent with international good practice, as reflected in internationally recognized standards such as EHS Guidelines (footnote 2). These standards contain performance levels and measures that are normally acceptable and applicable to projects. When Government of Tajikistan regulations differ from these levels and measures, PIURR will apply the levels or measures whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, PIURR will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.

III. DESCRIPTION OF THE PROJECT

A. Overview

76. The Bokhtar-Okmazor Project Road section is 40 km long and forms one of the important roads of regional significance in the southern region of the Republic. The Project Road is part of the Bokhtar- Okamzor – Dangara - Guliston road, which is an important trunk road of international significance in Tajikistan. It provides important transport links, supply of agricultural products and industrial raw materials. The road is running partly through hilly terrain and the road alignment consist of small curves and steep gradients. The Bokhtar-Okmazor road traverses four districts (Bokhtar, Kushoniyon, Levakand and Bakhsh district) by connecting five Jamoats (Bokhtar town, Bustonqala, Guliston, Vahdat and Mashal) to the district centres of Dangara and Bokhtar.

77. The existing road falls into technical category III. The project road consists of one carriageway with two traffic lanes width of 3.50 m, in each lane. Traffic volumes indicates that the existing road category is not adequate from km 0 – km 9.5 for the anticipated future traffic volumes and improvement/upgrading of the road category to category I was therefore designed. From km 9.5 – km 40, the technical category III is adequate, and improvements of the alignment are envisaged where the geometrical parameters of the existing road deviate substantially from the minimum desired parameters for technical category III.

78. The Bokhtar- Okmazor Project Road provides important transport links, supply of agricultural products and industrial raw materials. With the further connection to Dangara and Guliston, the Bokhtar-Okmazor-section forms part of a significant transport connection through the People's Republic of China, Afghanistan and further south to Pakistan. The Bokhtar-Okmazor road section runs through arid country with steppe like vegetation. The relief is characterized by smooth low-lying mountains. Figure 2ниже provides an overview of the Project Road.

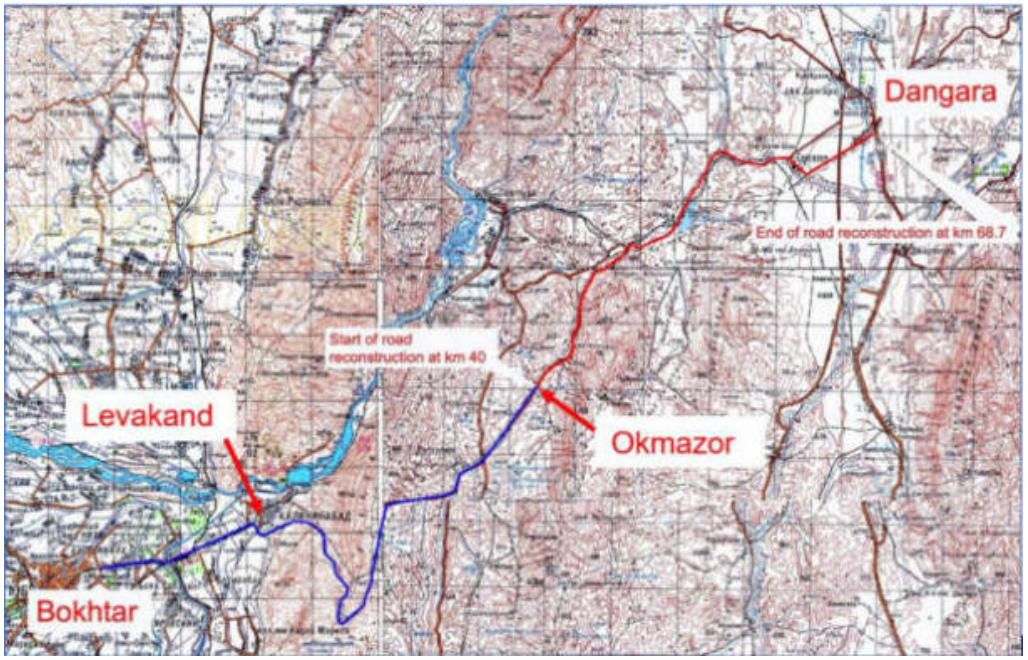


Figure 2 - Project Location Map of Bokhtar-Okmazor Road (Project Road in blue colour)

79. The Bokhtar-Okmazor road is divided into two different design sections. Design Section 1 will be upgraded to category I, a highway of citywide significance. Section 2 only needs to be rehabilitated.

80. Bokhtar – Okmazor road follows the existing alignment and remains within the existing RoW. No spatial alternatives, bypasses or other, are foreseen. There might be only minor adjustments due to compliance requirements with technical design parameters.

81. Section 1 starts at km 0 + 000 at the roundabout junction of the road Bokhtar - Levakand with the road Karabolo - Bokhtar city bus station. The end of Section 1 is at km 9 + 732 at the T-shaped junction of Bokhtar – Sarband - Dangara road. This is then start of Section 2 which ends in Okmazor village.

B. Type and Category of Project

82. The Project Road length is 40 km and forms one of the important roads of regional significance in the southern region of the republic.

83. The project road consists of one carriageway with two traffic lanes width of 3.50 m. The existing road category according to SNIP is category III. For the section from km 9.5 - km 40, no upgrade is required based on the traffic forecast. The typical cross section parameters are shown in the figures below.

Figure 3 - Typical cross section in urban area (2 lanes. Category III)

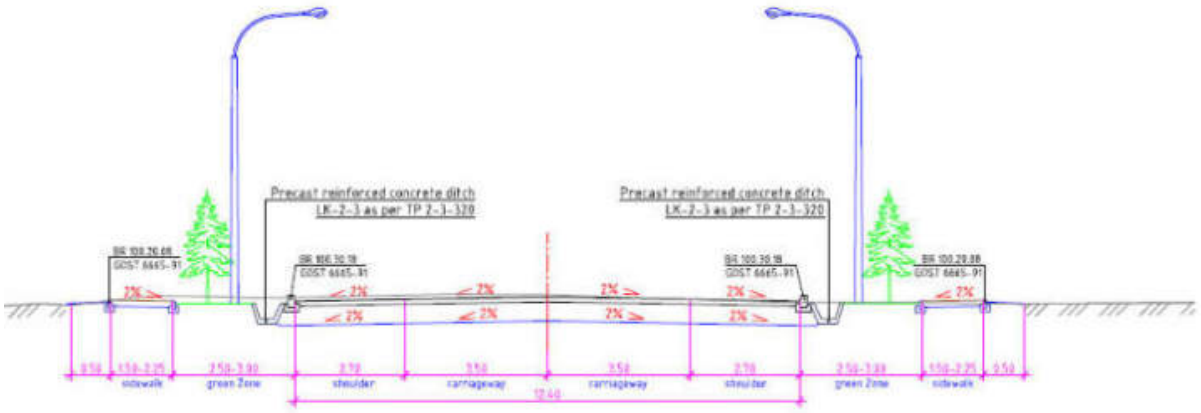
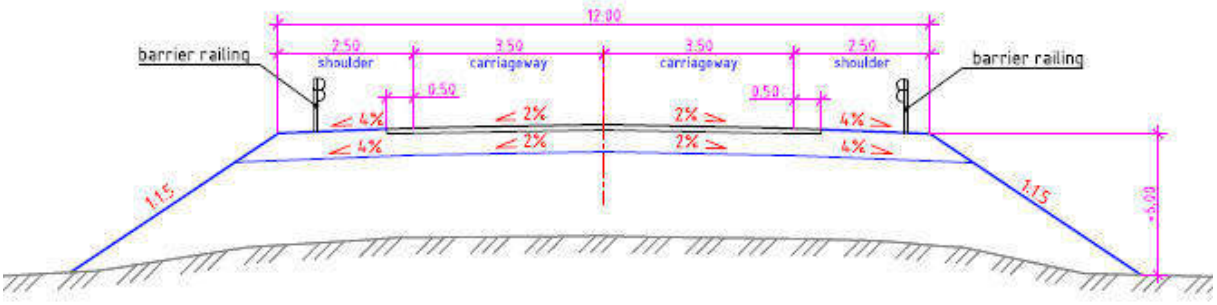
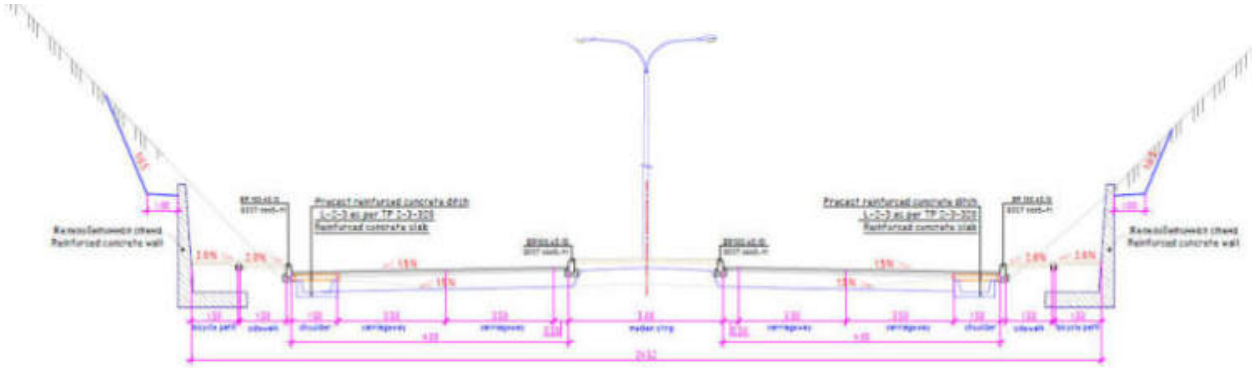


Figure 4 - Typical cross section in rural area (2 lanes. Category III)



84. From km 0 till km 9.5, traffic intensity requires a dual carriageway, 4-lane road with 3.5 m width of the traffic lane. The corresponding typical cross section is presented below.

Figure 5 - Typical cross section km 0 - km 9.5 (4-lanes. Category I)



85. In settled areas, the implementation of sidewalks, street lightening and green strips for improvement of road safety are considered in the design.

86. Cross-section parameters are related to traffic flows and will vary with the requirements of vehicular traffic. The road cross-section incorporates all elements between the road boundaries including carriageways, shoulders, verges, including cutting or embankment slopes. The cross-section elements serve several purposes and have a significant impact on construction costs, road operation and safety. The cross section in combination with the alignment will determine the earthwork quantities. Lane and shoulder width greatly impact traffic operations and safety therefore the road width should be kept to a minimum so as to reduce the costs of construction and maintenance whilst being sufficient to carry traffic loading efficiently and safely.

87. According to the intended classification of the road, the following design speeds are to be used for the Bokhtar-Okmazor Project Road:

Table 9 - Design Speeds by Terrain

Road Section	Design Speed in km/h		
	Level Terrain	Rolling Terrain	Mountainous Terrain
Km 0 – km 40	100	80	50

C. Need for Project

88. The Project Road has deteriorated over the years and is in currently bad condition with numerous shortcomings and damages. Due to the existing poor technical condition of the road, transport is getting unreliable and expensive. The asphalt concrete pavement has been destroyed. The base, consisting of coarse-grained soil, does not comply with GOST. In some places, the thickness of the base is 0.05 m only. There is no functioning drainage and numerous physical and geological processes are destroying the remaining intact roadbed. In some places, during heavy rainfall, the road is flooded. Therefore, rehabilitation of the Bokhtar – Okmazor road is urgently needed. The below two photos (Figure 6) provide an impression of the existing Project Road.

Figure 6 - Severely Damaged Road Pavement

D. Size or Magnitude of Operation

89. The Project involves the reconstruction of the existing Bokhtar - Okmazor road over the length of 40 km (km 0 – km 40), whereas the section from km 0 to km 9.5 will be designed for road category I and the section from km 9.5 to km 40 will be designed for road category III. The design alignment is mostly based on the existing alignment with minor adjustments made to improve geometric characteristics, wherever practical. No spatial alternatives or bypasses are foreseen under this Project. The Project will involve a number of associated activities such as utilization of borrow areas, operation of asphalt plants and aggregate crusher, establishment of contractor's worker camps and storage sites, etc.

90. The anticipated works for rehabilitation of the Bokhtar-Okmazor-Dangara Project Road comprise:

- Reconstruction and widening of road pavement

- Replacement of bridges
- Replacement of culverts and improvement of drainage system
- Construction of sidewalks in settled areas
- Installation of road lighting in settled areas
- Improvement of traffic safety due to proper road signing and marking and installation of guardrails
- Provision of bus stops with passenger shelters
- Construction of retaining walls.

91. The works will be procured in accordance with ADB procurement rules and guidelines for Open Competitive Bidding (OCB) and based on detailed design drawings.

E. Traffic Volume

92. Traffic growth forecasts have been calculated based on the existing traffic volumes on the project road. The existing traffic volumes were determined by carrying out traffic surveys. For determining the future traffic development. The anticipated national and regional economic development was considered.

93. Three homogenous road sections could be identified regarding the traffic characteristics. These are the Bokhtar – airport section, the airport - Levakand section and the Levakand - Okmazor section.

94. For the three identified homogenous road sections, the following Annual Average Daily Traffic (AADT) were calculated for the forecasted years 2022, 2027, 2032, 2037 and 2042.

Figure 7 - Future Traffic Development

Section	Bokhtar - Airport	Airport - Levakand	Levakand - Okmazor
AADT [1)] Year 2022	8,392	7,701	4,779
AADT [1)] Year 2027	10,931	9,376	5,819
AADT [1)] Year 2032	12,489	10,713	6,651
AADT [1)] Year 2037	13,995	12,006	7,454
AADT [1)] Year 2042	15,454	13,258	8,232

[1)]AADT Annual Average Daily Traffic

95. Growth rate of AADT is graphically shown in Figure 8ниже. Based on the calculated traffic forecasts, the Project Road category was determined and designed.

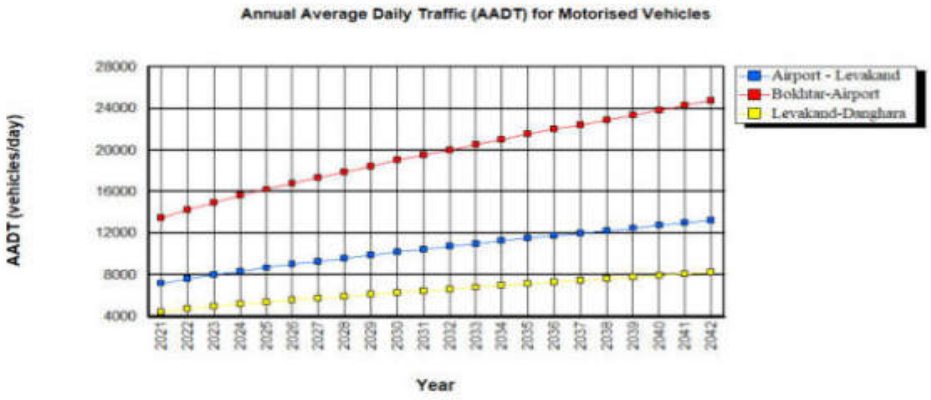


Figure 8 - AADT per each subsection

F. Proposed Schedule for Implementation

96. The procurement of the Works is planned to commence in June 2022. Considering 3 months for the procurement, the contract with the works contractor could be signed in September or October 2022. Commencement of works could start in October 2022. The overall construction time is estimated to be 18 months.

97. The SSEMP must be submitted within 30 days of the contract award and Preconstruction and Construction cannot commence until the SSEMP is approved by PIURR (MoT) and the CSC. Testing and commissioning are ongoing throughout construction period.

98. The construction duration of 18 months includes the winter season. A complete shut-down of the construction site in winter is not foreseen, despite the possibility that asphalt works might could not be carried out during winter season. The work schedule of the contractor should allow for limited works to be carried out during winter season.

G. Bridges

99. The Project involves the replacement of 5 bridges. The bridges most significant in terms of potential environmental impacts are the ones crossing natural watercourses. No natural water course is crossed by the Project Road. All surface waters crossed are irrigation channels.

Table 10 - Bridges of the Bokhtar – Okmazor Road Section

Bridge №	Bridge location, km	Nearest settlement	Crossing obstacle	Bridge length, m	Span arrangement, m	Total Width, m	Bridge Area, m^2	Design Solution
Br-1	2+340	vil. Sadvinkhoz	existing channel	6.5	1x6	43.5	242	New Bridge
Br-2	4+000	vil. Sadvinkhoz	existing channel	33.5	1x33	34.9	1,048	New Bridge
Br-3	7+585	vil. Shpalzavod	existing channel	6.5	1x6	42.2	235	New Bridge
Br-4	8+195	vil. Kirpichzavod	existing channel	6.5	1x6	40.3	224	New Bridge
Br-5	10+147	vil. Sarband	existing channel	16.59	1x15	14.4	216	New bridge
Total - 5 bridges				**69.59**			**1,965**	

vil. = village

H. Quantities

100. The quantities of aggregates required are spread over the construction period of 18 months and will only be sourced from local quarries and/or suppliers.

101. According to the BoQ, the following volumes of earthworks need to be managed in Section 1 of the Project (km 0+000 – km 9+732):

Table 11–Earthwork Volumes in Section 1 according to BoQ

Description	Unit	Estimated Quantity
Topsoil		
Stripping of topsoil and stockpile for re-use, including loading, transportation and storage for re-use, average thickness 0.20 m	m^3	4,085
Earthworks at Main Road		
Common excavation, soil group II - IV, to any depth in cut, load, transport, deposit, spread and compact in embankments at OMC (cut to fill).	m^3	103,120
Common excavation (soil group I-IV) of unsuitable and surplus material to any depth, load, transport, deposit and spread as directed (cut to waste).	m^3	57,446
Shape, level and compact formation level at OMC, as specified.	m^2	396,533
Earthworks at Junctions, Accesses and Entrances		
Common excavation, soil group II - IV, to any depth in cut, load, transport, deposit, spread and compact in embankments at OMC (cut to fill).	m^3	2,123
Common excavation (soil group I-IV) of unsuitable and surplus material to any depth, load, transport, deposit and spread as directed (cut to waste).	m^3	210

102. In Section 2 of the Project (km 9+732 – km 40+000), the quantities for cut and fill are the following:

Table 12 - Earthwork Volumes in Section 2 according to BoQ

Description	Unit	Estimated Quantity
Earthworks at Main Road		
Common excavation, soil group II - IV, to any depth in cut, load, transport, deposit, spread and compact in embankments at OMC (cut to fill).	m^3	148,648
Common excavation, soil group I - IV, of unsuitable and surplus material to any depth, load, transport, deposit and spread as directed (cut to waste).	m^3	1,135,214
Excavation in hard material, soil group V-VII, with suitable equipment (hydraulic hammer) including, load, transport, deposit and spread as directed (cut to waste).	m^3	616.441
Shape, level and compact formation level at OMC, as specified.	m^2	187,476
Earthworks for Junctions, Accesses and Entrances		
Common excavation, soil group II - IV, to any depth in cut, load, transport, deposit, spread and compact in embankments at OMC (cut to fill).	m^3	8,251
Common excavation, soil group I - IV, of unsuitable and surplus material to any depth, load, transport, deposit and spread as directed (cut to waste).	m^3	8,728
Shape, level and compact formation level at OMC, as specified.	m^2	8,771
Earthworks for Emergency Exits		
Common excavation, soil group II - IV, to any depth in cut, load, transport, deposit, spread and compact in embankments at OMC (cut to fill).	m^3	295
Excavation in hard material, soil group V-VII, with suitable equipment (hydraulic hammer) including, load, transport, deposit and spread as directed (cut to waste).	m^3	8,417

Provide and place suitable fill material for embankment construction, including, load transport, deposit, layered compaction (borrow to fill)	m^3	88,478

103. In the above shown tables, the volumes indicated as cut to fill will be reused in the Project. The volumes declared as cut to waste cannot be reused and need to be safely disposed. Hence in Section 1 (km 0+000 to km 9+732),57,665 m³ and in Section 2 (km 9+732 to km 40+000),1,768,800.00 m³ cannot be reused. This means that a total of 1,826,465.00 m³ of excavated material needs to be safely disposed. The proposed disposal sites are shown in Annex 6 - IDENTIFIED AREAS FOR SURPLUS MATERIAL DISPOSAL.

I. Borrow Areas

104. For the construction works, particularly for the embankment works, the production of asphalt concrete and concrete mixtures, construction aggregates are required which need to be extracted from suitable borrow areas.

105. For the Bokhtar-Okmazor road section, two borrow areas (Borrow Area #1 and Borrow Area #2) were examined and are proposed for use in the Project. In addition to these two borrow areas, also the three borrow areas (Borrow Area #3, Borrow Area #4, and Borrow Area #5) proposed for the Hulbuk- Temur Malik - Kangurt section could be used. All borrow areas are gravel pits within the floodplains of Vakhsh river, Surkhob river (реки Сурхоб) and Tairsu river (река Таирсу).

106. Borrow Area #1 is privately owned and operated by LLC “Ganji Bokhtar”, located in the Vakhsh river floodplain. The gravel deposits have a maximum grain size up to 400 mm. The borrow area is located on the territory of Kushoniyon district and the distance from the project road junction at Levakand is approximately 20.2 km. Due to the location of the borrow area in the floodplains of Vakhsh river, the area is flooded from March to June. Ground water level is at a depth of 3 m. Borrow Area #1 stretches about 1 km up- and downstream from the access point. Maximum grain size of the gravel is 500 mm.

107. Borrow Area #2 is also located in the floodplains of Vakhsh river and privately owned by LLC "Kurgontepa Sokhtmon". The area is located in the territory of Kushoniyon district and the distance from the road junction of Levakand to LLC "Kurgontepa Sokhtmon" is about 14.9 km. The company also owned an asphalt plant and concrete plant and procured also crushed stone material.

108. Borrow Area #3 is called “Shibanai”. It is located within the Surkhob river floodplain in the territory of Temurmalik district. Location of the borrow area is at km 39+260 of the Hulbuk-Temurmalik-Kangurt road at a distance of approximately 3.5 km from this Road. Access to the borrow area is via a 1.4 km asphalt road which is in currently bad condition and requires repair. The remaining stretch to the borrow pit is accessed via a dirt road running over the river floodplain. The borrow area is currently not operating. It was specifically identified for use in the Hulbuk – Temurmalik - Kangurt road rehabilitation. It is supposed that there is no official license currently existing for this borrow site. The borrow area is flooded from March to June. The thickness of the deposits suitable for quarrying is at least 3 m.

109. Borrow Area #4 is located in a village. Like Borrow Area #3, it is a gravel deposit within the Surkhob river floodplain. The depth of the deposits suitable for quarrying is 3.0 m. The deposits stretch at least 1 km up and downstream from the access point. The width of the deposit is about 700 m. Access to Borrow Area #4 is from the Hulbuk – Temurmalik - Kangurt Project Road at km 28+080. During construction phase, it is required to construct an access road of about 700 m length crossing the river floodplain. Like Borrow Area #3, the area is flooded from March to June. Currently there is a private crusher operating on the site.

110. Borrow Area #5 is a gravel deposit within the floodplain of the Tairsu River. Part of the area is privately owned. Access to Borrow Area #5 is from the Kangurt-Dangara road. There are 4 different access routes to the deposits of the Tairsu river floodplain. The length of the identified 4 possible access roads is 1,600m, 3,680m, 4,900m and 9,990m respectively. The borrow area stretches over a length of > 10,000 m at a width varying from 50 to 100 m. The useable thickness of the deposits is at least 3m. Material can be extracted only from the centre of the riverbed, where significant masses of pebbles are replenished by the regularly occurring floods. The riverbanks are extremely unstable and subject to collapse as a result of erosion. Work near the shoreline is potentially dangerous for residential buildings which are densely built along the river shore. It is therefore recommended that the banks be strengthened with gabions before starting borrow pit work at Borrow Area #5. Large boulders with a diameter of up to 1,500 mm will in addition complicate the extraction of material. The content of boulders more than 1000mm in diameter is up to 2% at certain locations. The Borrow Area #5 is flooded from March to June.

111. Impressions of the identified Borrow Area #4 and Borrow Area #5 are shown in the below figures.

Figure 9 - Proposed borrow area number 4 in Surkhob river floodplain

Figure 10 - Proposed borrow area number 5 in Tairsu river floodplain

IV. Analysis of ALTERNATIVES

112. No spatial alternatives or bypasses are foreseen for the Bokhtar –Okmazor road reconstruction. The general objective of the design was to follow the existing alignment with respect to minimizing the impact on properties, the environment and land. In order to minimize impacts, the road centreline will be adjusted as far as it is technically feasible. There will however be no departures from the standards.

113. There are minor design adjustments due to compliance requirements with technical design parameters and for improving traffic flow. This is at km 9.5 where a currently existing road junction will be converted to a roundabout in order to improve traffic flow. The planned roundabout at km 9.5 is shown in the below figure.

Figure 11 - Planned roundabout at km 9.5 where currently a regular cross-section exists

114. Other adjustments refer to required cross-section widenings, e.g., at sections where pedestrian walks are foreseen. All these adjustments do not require a new alignment, they only require cross-section widenings.

115. The “no Project” option would imply that the existing Bokhtar-Okmazor-Dangara road will not be improved, and that the road would be left in its present state as characterized by advanced deterioration of the asphalt layer, insufficient and lacking drainage, silted and destroyed culverts, lacking footpaths and lacking road lightning. These deficiencies pose numerous safety hazards to the road users and to the residential people alongside the road.

116. It is therefore obvious that the rehabilitation is urgently needed and that the “do nothing” option is not a real alternative.

V. Description of the Environment (Baseline Data)

117. In the following background information on Tajikistan, the Project and the environmental baseline conditions within the Project's area of influence are given.

118. Tajikistan is a landlocked, mountainous country with formidable geographic barriers that seriously constrain its ability to effectively participate in international trade. Its development efforts are further hampered by inadequate physical infrastructure, which is in need of investment and regular maintenance. Tajikistan is surrounded by the People's Republic of China, the Kyrgyz Republic, Uzbekistan and Afghanistan. The population of Tajikistan is 9.1 million (2019)[11]. Population density is 57.2 persons / km².

119. The road project (re-construction project) is located with-in the Tajik Depression. The research area is limited by coordinates: 38 ° 00'-38 ° 40 'N and 69 ° 00'-70 ° 00 'in. d. (from Greenwich). The administratively studied territory belongs to four districts: Bokhtar, Kushoniyon, Levakand and Vaksh.

120. The route of the road does not cross natural water barriers. The climate of the region is continental. The average annual rainfall is from 500 to 760 mm (the maximum falls in winter and spring, the minimum in late summer and autumn). The average annual air temperature is from +10 to + 16.4 ° C, the average monthly temperature in January is from –18.7 to –1.6 ° C, the average monthly temperature in July is from +21.5 to + 27.1 ° C.

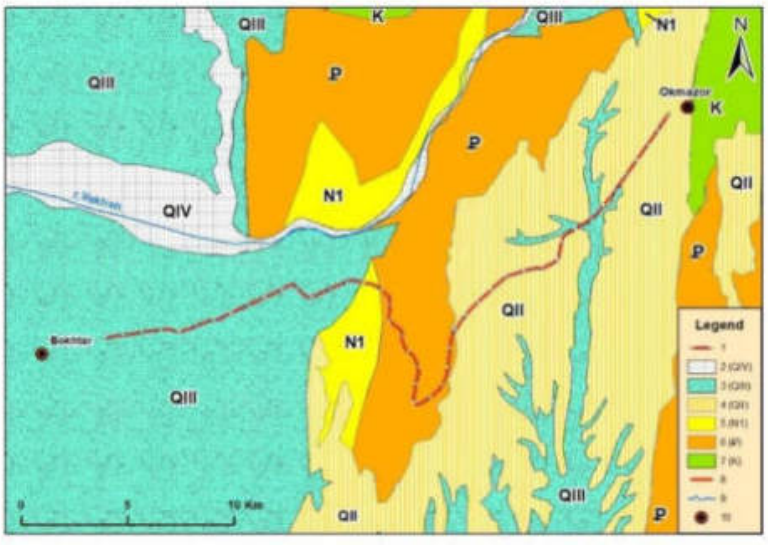
A. Physical Resources in Project Area

121. The study area is located within the Tajik Depression. Administratively, the territory belongs to the Bokhtar, Vaksh, Levakand and Kushoniyon districts of Khatlon region.

122. The relief of the area is slightly dissected. Typical morphological structures are ridges and sediment fans which diverge towards the south, southwest and southeast. In the same direction, their absolute elevations decrease (from 1000-1500 to 400 m). The inter-montane valleys in the north are narrow V-shaped, to the south they expand significantly, occupying large spaces. In the following, the physical characters of the Project Road corridor are described.

1. Geology

123. Geologically, the Bokhtar-Okmazor road is located in a large geological structure - the Tajik Depression. The consolidated base in the Tajik Depression is largely blocked by a thick cover of Mesozoic-Cenozoic deposits.



124. Figure 12ниже presents the geological formations along the project road section. The main types of soil are loess-like loams, pebbles, loesses, and sands, loams, pebbles.

[11] World Bank, 2020.Country Context. Available at: https://www.worldbank.org/en/country/tajikistan/overview (accessed on 28 July 2020).

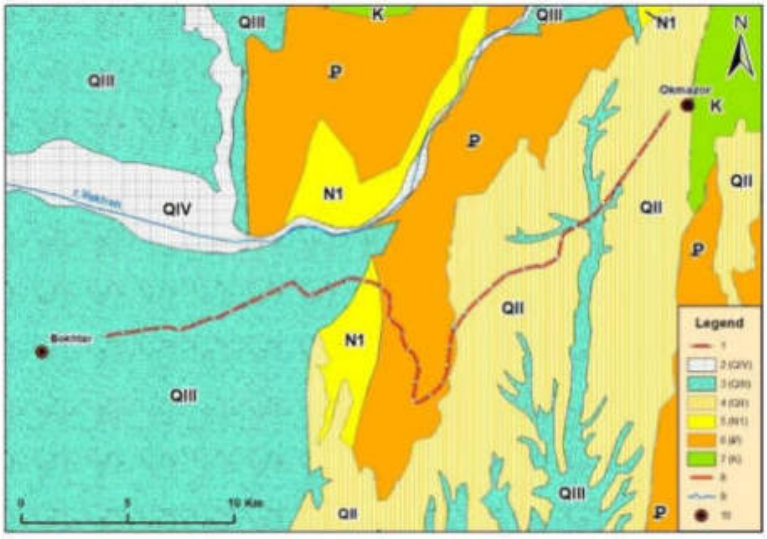


Figure 12 - Geology of the Bokhtar-Okmazor-Dangara road corridor

125. The legend of the above map of Geology of the road corridor uses the following abbreviations.

Figure 13 - Abbreviations

Signature	Description
1	Bokhtar-Okmazor-Dangara road
2 (QIV)	gravels, sands, loams, loamy sand
3 (QIII)	Sands, loams, pebbles
4 (QII)	Loess-like loams, pebbles, loesses
5 (QI)	Pebbles, conglomerates, sandstones, clays, loess-like loams
6 (N2)	Conglomerates, clays, siltstones, sandstones
7 (N1)	Sandstones, clays, siltstones
8 (P)	Clay, marl, limestone, gypsum, dolomite
9 (K)	Limestone, marls, clays, conglomerates
10 (J)	Sandstones, shales, gypsum, clay, rock, salt
11	Tectonic contact zone
12	River
13	Settlement

126. For the Bokhtar-Okmazor road, as well as for the entire Tajik depression, a characteristic feature of the relief is its structure, expressed by the alternation of large depressions and uplifts. The relief of the Project area was shaped by the two main exogenous factors of relief formation, denudation and accumulation. Hence the relief is divided into two main landform types: denudative and accumulative forms. The first type is localized in areas of recent uplifts, the second in areas of subsidence. Within each type, generic subtypes are distinguished according to the main relief-forming process.

127. The first includes low mountains ranging in height from 500-1,500 m. These mountains are represented by a system of ranges that are well defined in the relief and often complicated by ruptures of anticlinal folds and ridges. The latter are composed of Mesozoic-Cenozoic deposits and have a meridional strike, changing in the northern part of the basin to the north-eastern. The main orographic units of the region are the following groups of ranges: the Tabakchi Range and the Choltau Mountains.

128. Between the indicated uplifts there are hollows — synclinal zones, characterized by a wide development of alluvial and alluvial-proluvial plains.

129. Common features inherent in the study area include low-mountainousness and structural relief, the presence of crest-shaped and brachy anticline folds, salt domes, aridity of the climate and the transit nature of the main rivers, the absence of not only modern, but also traces of ancient glaciation and widespread loess development.

2. Seismicity

130. The studied section of the route is located within the South Tajik tectonic zone. In tectonic terms, the South Tajik fold zone represents a complex system of folds formed mainly in Mesozoic and Cenozoic deposits. There are no obvious, visible signs of tectonic activities along the road.

131. However, the most dangerous and unpredictable phenomenon for the Bokhtar-Okmazor highway is seismicity. The entire highway route runs in the zone of possible 7 points concussions (Figure 14ниже)[12]. In its northern part, the road enters an area capable of generating earthquakes with magnitudes up to 5.5.

[12] Babaev A.M., Koshlakov G.V., Mirzoev K.M. Seismic zoning of Tajikistan (explanatory note). Dushanbe: Donish, 1978, 68c.

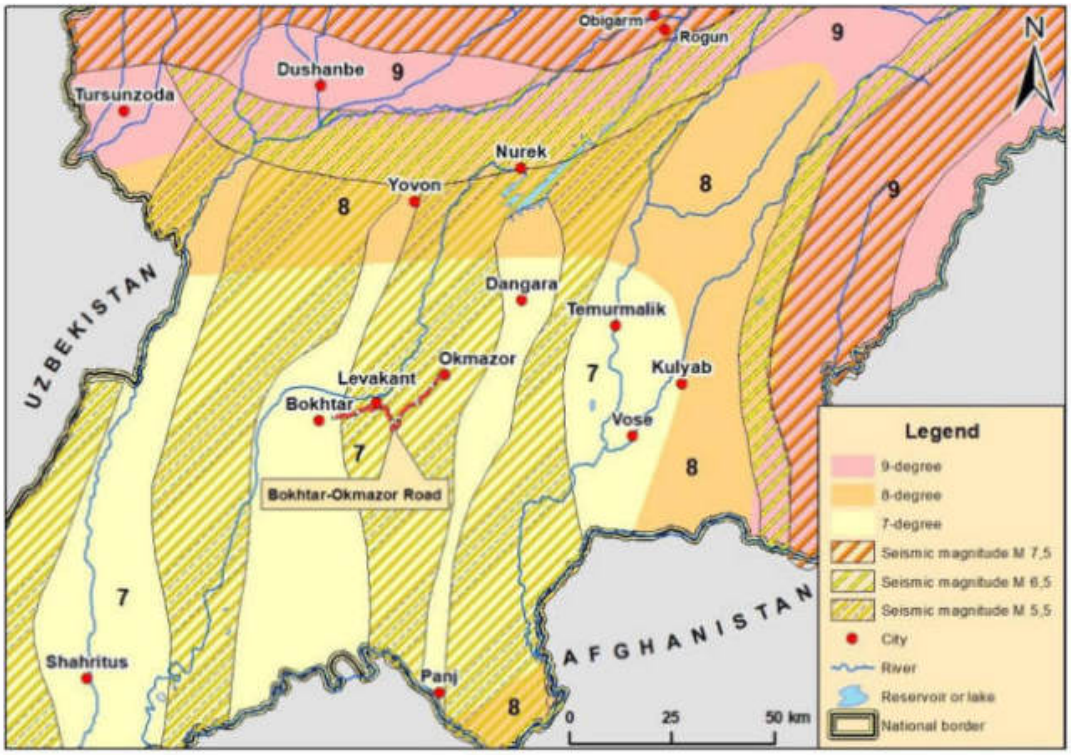


Figure 14 - Seismicity in the project road corridor and the wider vicinity

132. In accordance with the map of seismic zoning (SR-64), the territory of the region is assigned to the zone with seismic impact of 7 points.

3. Geomorphology and Natural Hazards

133. The main feature of the district relief is its youth and the predominance of accumulative forms, which is clearly visible on the geomorphological map. Among the surfaces formed by Quaternary deposits, the most important place belongs to alluvial and proluvial-alluvial formations. The youngest relief elements of this genesis include low floodplains and riverbeds, where clastic material is accumulated and washed over at present.

134. Of the superimposed secondary relief forms, rare karst funnels and dips should be noted. The manifestation of the karst relief is most associated with saline and gypsum-bearing rocks of the Jurassic period, which did not receive their development on the territory. To a lesser extent with carbonate rocks of the Upper Cretaceous Paleogene. Mostly karst forms are developed on the surface of the terraces of the Ilyak complex. Similar forms confined to the surface of the Dushanbe basement terrace. In all these cases, the manifestation of karst is associated with exits to the surface of gypsum-bearing and saline rocks of the Jurassic and partly of the Kulyab suite. Numerous suffusion funnels and de-pressions characterize terraces and terrace-like surfaces of the Ilyak complex, composed of loesses from the surface.

135. The superimposed relief forms are also cumulus and tuberous proluvial sands, which are developed in depressions (Lour). Here they form a system of differently oriented knolls several meters high. These forms strongly modify the primary plain relief of the surfaces of the Upper Quaternary and modern terraces, giving them a slightly wavy appearance. Proluvial and mudflow drift cones and loops often frame the base of the slopes of private uplifts.

136. A characteristic feature of the denudation relief of the region is the smoothness of the slopes, due to the relatively weak manifestations of recent uplifts, and, consequently, the weak erosion activity of the rivers, also associated with their low water availability. Here, during almost the entire newest stage of development, plane denudation of slopes predominated and only the last segment of geological history, starting from the Upper Quaternary, as a result of the general intensification of tectonic movements, a slight revival of the erosion activity of rivers that formed relatively shallow in all valleys (50-100 m). All the more ancient age-related generations of denudation relief within the region are represented by erosion-denudation surfaces, moderately and weakly dissected.

4. Soils

137. Soil erosion is a major environmental concern throughout the Tadjikiatan due to steep slopes, the fragility of the soils and human activities such as inappropriate livestock management, the removal of protective vegetative cover and poor water management practices.

138. The Bokhtar-Okmazor road is located within the realm of grey steppe soils. Soil zones in Tajikistan are shown in Figure 15ниже. Alongside the Project Road, three soil sections could be identified within the conducted surveys. These are described in the following chapters.

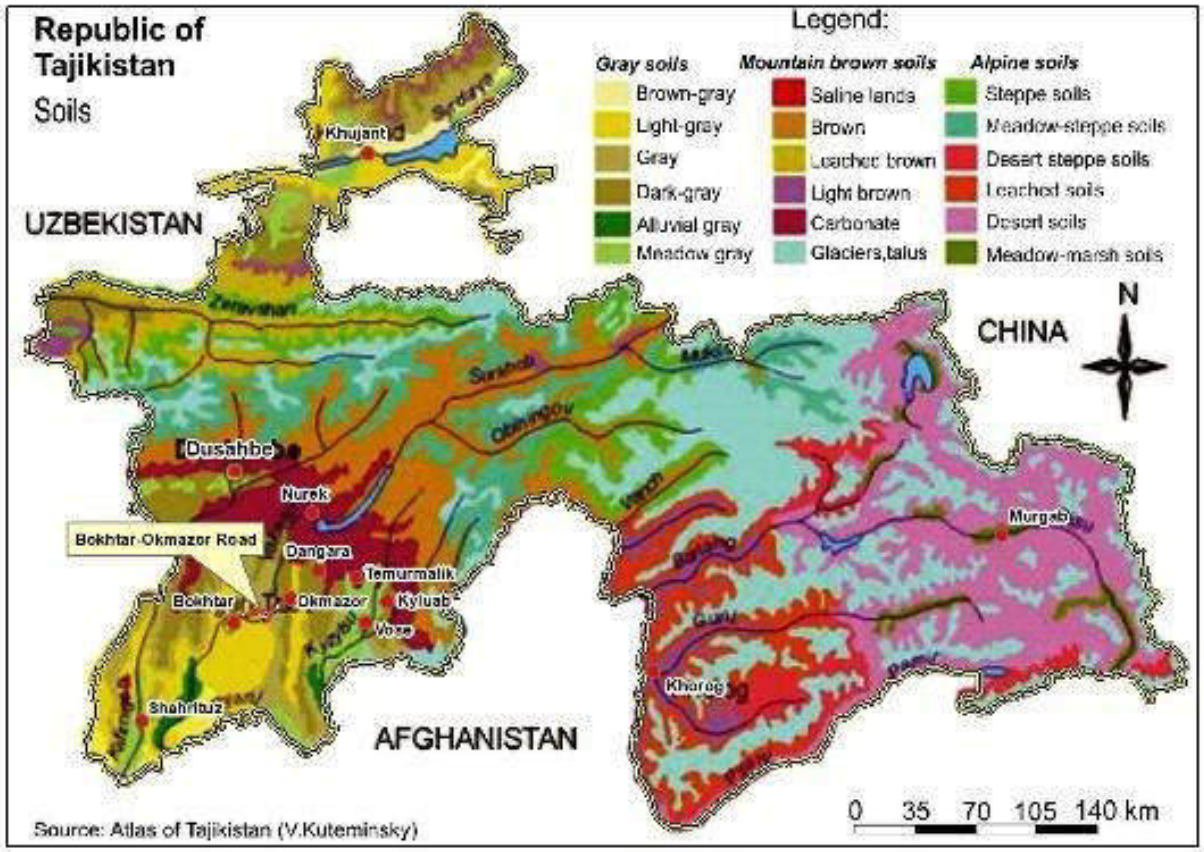


Figure 15 - Soil types in the Project Road corridor

a) Road section of Bokhtar-Levakand (13.4 km)

139. Soils in the road section from the city of Bokhtar to the district centre Levakand are represented by deposits of the Dushanbe and Termez complexes (Q3db + tr). The terrain is flat, slightly lowering towards the river Vaksh. The natural terrain is degraded by human land use. The drainage is provided by slopes and irrigation canals.

140. In the geological structure of the section of the road route, alluvial and proluvial soils are represented by pebbles, sandy loam and sand covered by loam. Indigenous rocks do not appear on the surface.

141. The distribution of groundwater is sporadic, the main accumulation occurs in the lenses and sand layers in clay deposits. Groundwater lies at a depth of 10 to 30 m. Groundwater is mainly fed by the absorption of floodwater and the infiltration of precipitation in the winter-spring period, additionally due to leaks from water-carrying communications.

142. The rocks of the Dushanbe complex comprise two floodplain terraces of the main river of the region: the fifth and fourth. Deposits of the fifth flood-plain terrace are not widespread. The lower part of the terrace is composed of brownish-gray pebbles, sprinkled with sand and sandy loam, sometimes with clay cement. The thickness of pebbles varies from 1 to 5 m. Its upper part is formed by greyish-brown and reddish-brown porous loess-like loams in places with the inclusion of small gravel in the form of lenses and interlayers. The total thickness of the deposits of the fifth terrace ranges from 35 to 55 m. The deposits of the fourth floodplain terrace are most widespread. The

terrace is composed mainly of loams and clay sediments. To the foothills, they are re-placed by gravel-pebble and sandy-sandy material in the lower part and loamy enriched with gravel in the upper part. Thickness of the sediments ranges is from 8 to 10.5 m.

Figure 16 - Road of Section Bokhtar-Levakand (blue line)

143. The rocks of the Termez complex compose the third floodplain terraces and associated extension cones. The terrace at the base is composed of pebbles (1.5-4 m), interbedded with coarse-grained sands. Pebbles consist of fragments of Paleozoic granites, diorites, effusive rocks and limestones. The upper part of the terrace section is formed by forest-like loam and sandy loam (10 m). The thickness of the sediments ranges from 6.5 to 20 m. In addition to alluvial sediments, among the precipitation of the Termez complex there are proluvial sediments that form drift cones. The drift cones of this age are extremely widespread, quite often they merge with each other, forming irregular loops. The cones of removal are composed of coarse-grained local material - crushed stone and boulders. In the peripheral parts of them contains a finer material: clay and sands. N. P. Kostenko conditionally classifies the deposits of the Termez complex to the tops of the upper part of the Quaternary system.

b) Road section of Tabakchi Range (22.7 km)

144. Tabakchi Ridge is a mid-mountain range, which is located on the left bank of the Vakhsh River and is part of two districts of the Khatlon region: Levakand and Dangarinsky. The array has clear boundaries. Rises to a height of 1293 m above sea level. It stretches from northeast to southwest for 10 km.

145. The massif is developed in Meso- and Cenozoic sediments. The Cenozoic deposits, which practically compose the entire section of the route, are composed of brick-red sandstones, clays, siltstones, gypsums of the Boljuana Formation (P3-N1) bl and various deposits of the Paleogene complex: clays, marls, limestones, gypsums, sandstones (bedrock, half-rock). Tectonic processes played an important role in the formation of the general morphological structure of the region. The modern relief is represented by steep and steep slopes more than a hundred meters high, developed in Neogene-Paleogene sediments.

146. The erosion-denudation western slope of the massif is relatively simple, and the eastern one, which was overcome to powerful landslide processes at different geological times, is more complicated.

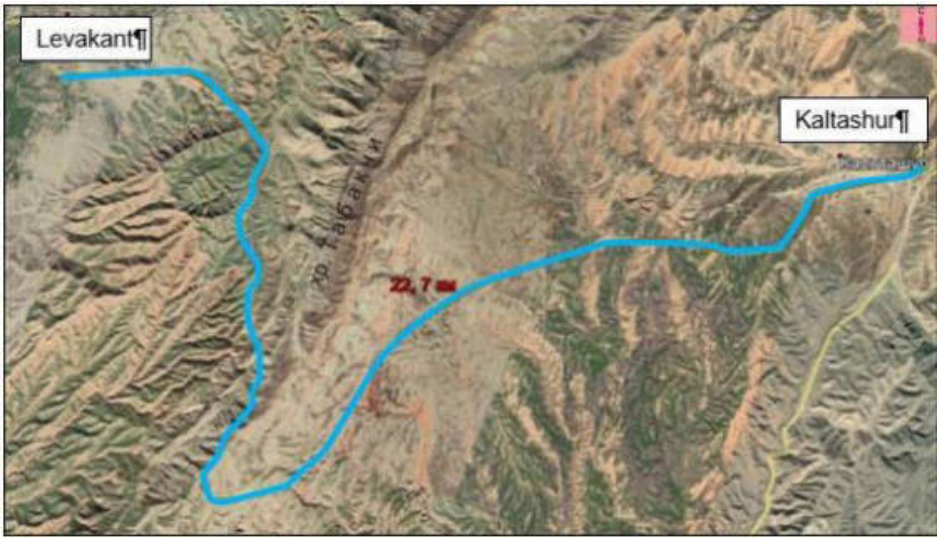


Figure 17 - Road Section through the Tabachi Range (blue line)

c) Road section through the tract Kaltashur (9.6 km)

147. The terrain of the road section is hilly with separate logs, uvulas, slightly lowering to the south. The drainage is provided by terrain slopes.

148. The Pleistocene loesses and loess-like loams, pebbles, gravel take part in the geological structure of the road section of the road. The bedrock is represented by limestones, marls, conglomerates, gypsums, siltstones and clays of the Upper Cretaceous sediments and brick-red sandstones, clays, siltstones, gypsums of the Boljuana Formation (P3-N1) bl. Deposits of the Boljuana Formation are overlapped according to the thick stratum of continental Neogene formations. They occupy about 30-35% of the total area of the site. In lithological terms, the thickness of the Neogene deposits is quite variegated. It is represented by conglomerates, sandstones, siltstones and sandy clays of gray, brownish-gray, brown, pinkish-gray, cream-brown and brown colour. A characteristic feature of these rocks is a rapid change in lithological composition, both in strike and in strike cross and change in colour and thickness of individual horizons.

149. The processes associated with the presence of landslides, karsts, screes, were not observed. There are areas where mudflows can occur during torrential rains. Groundwater lies at a considerable depth. There are exits of individual springs. The water is brackish.

Figure 18 - Road section through the tract Kaltashur (9.6 km)

5. Climate

150. Tajikistan's location in the middle of Eurasia, its remoteness from oceans and seas and vicinity to deserts predefine its climate which can be characterized as continental, with considerable seasonal and daily fluctuations in temperature and humidity. The country 's very complicated relief structure, with huge variations in elevation, creates unique local climates with great temperature differences.

151. In climatic terms, the area of the Bokhtar-Dangara road belongs to the Near-Asian region with a maximum of rainfall in the cold period. This is a dry climate zone with very warm summers, mild winters and moderately mild autumn (Fig. 13). The end of the road is in a cooler zone, with moderately mild winters and warm summers.

152. The average temperature of the hottest month - July exceeds 31 ° C, and the coldest - January - fluctuate between +2 and -2 ° C.

153. Figure 19ниже shows the climatic zones of Tajikistan and the location of the Bokhtar-Okmazor Project Road.

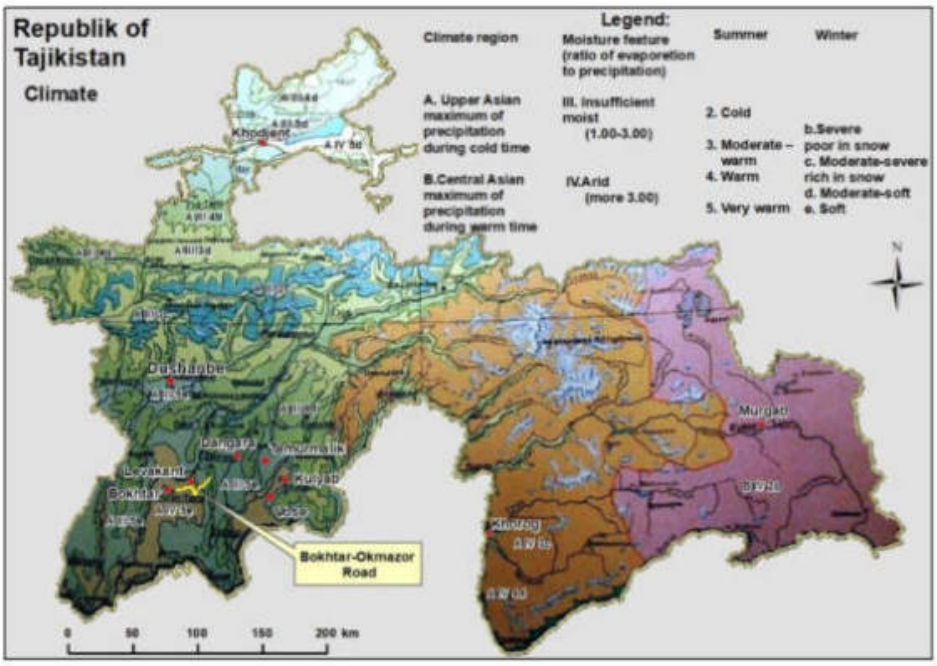


Figure 19 - Climate zones of Tajikistan and Project Road

6. Climate Change

154. A stand-alone document was prepared which assesses the effects of climate change with regard to the Project Road.

7. Surface Water Resources

155. The Bokhtar-Okmazor road begins in the zone of influence of the Vakhsh river. No natural water course is crossed by the Project Road. The Vakhsh river has a snow-rain type of food. The surface water system of the Vaksh River is shown in Figure 20ниже.

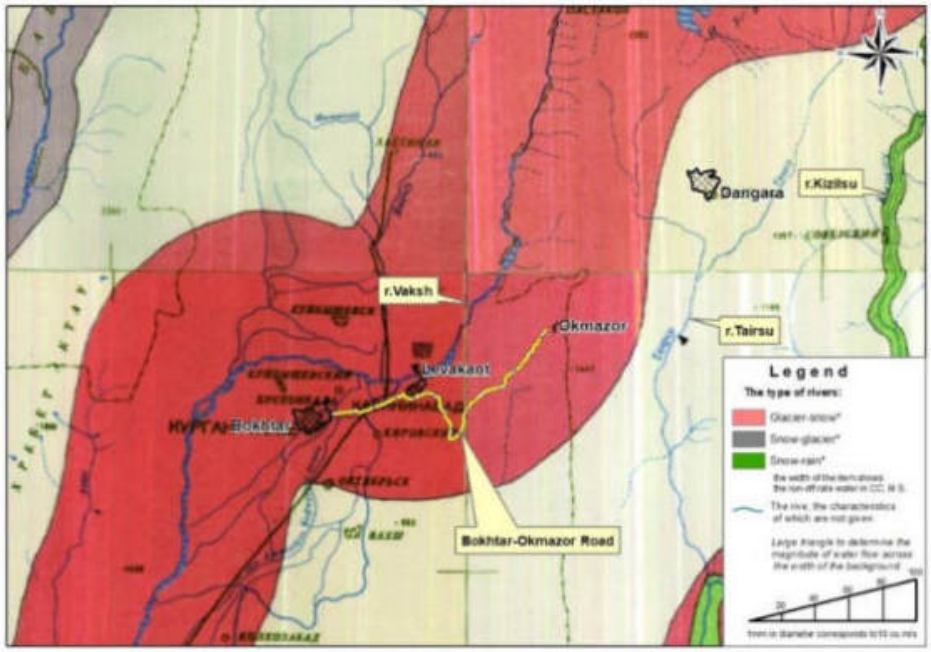


Figure 20 - Surface waters in the Project Road corridor

8. Ground Water

156. The Bokhtar-Okmazor highway runs in various aquiferous rock complexes [1]. The southern beginning of the route falls on the floodplain terrace of the Vakhsh River, represented by pebbles, sands, loams, sandworms of the upper Quaternary age (Figure 21ниже).

157. The depth of groundwater here varies between 1-5 m. Further, the road passes in rock complexes, where the sporadic waters of the Neogene-Pleistocene sediments are widespread and in the aquiferous complex of the Paleogene sediments. Going down to the valley, the road runs along the aquiferous complex of alluvial-proluvial sediments of the Middle Pleistocene-Holocene age. Further, the road passes again in the rock complexes, where the sporadic waters of the Neogene-Pleistocene sediments and in the aquiferous complex of the Paleogene sediments are widespread.

158. The route ends in the zone of the aquifer complex of alluvial deposits of the Upper Pleistocene-Holocene age. The depth of groundwater here varies between 10-20 m.

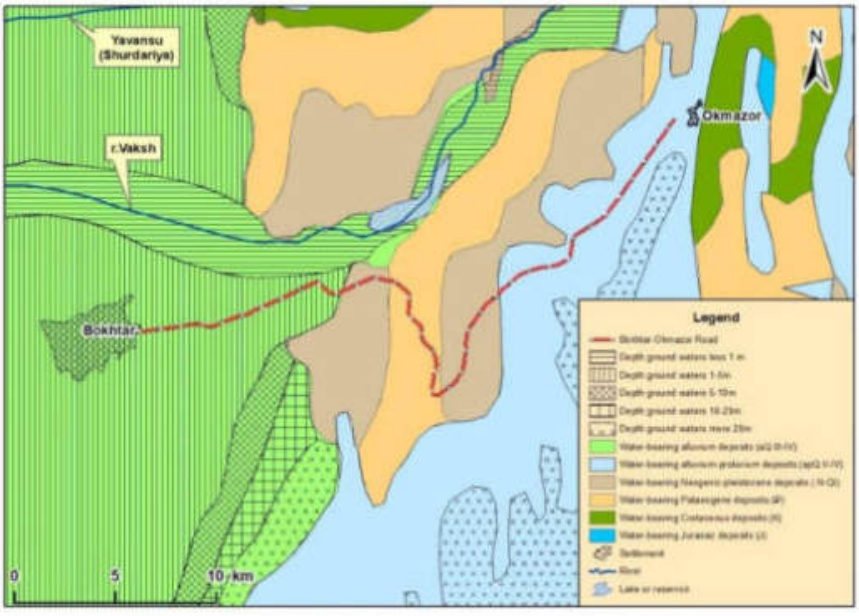


Figure 21 - Ground water resources Project Road corridor

B. Ecological Resources in the Project Area

159. Natural ecosystems are the single reliable source of environmental stability in the world. At the same time, the impact of anthropogenic activity on ecosystems is becoming the main reason for climate change, loss of biodiversity, and desertification/land degradation. Control of environmental risks requires a strong environmental policy, improved coordination of government structures, civil and business society representatives.

160. Changeable mountain climatic conditions and hard natural historical processes promoted formation of a unique biological diversity in Tajikistan. The annual average sunshine level varies from 2,090 to 3,160 hours, the average air temperature varying from +17°C and higher in the south of the country to -7°C and lower in the Pamirs. The highest temperature is in July, while the lowest is in January. The most severe climate is observed in the Eastern Pamirs, where the annual average temperature is from -1 to -6ºC. The absolute minimum is at the Bulunkul Lake -63°C. In hot deserts of southern Tajikistan and in cold high-mountain deserts of the Eastern Pamirs, the annual average precipitation level varies from 70 to 160 mm, the maximum being in Central Tajikistan, sometimes exceeding 2000 mm a year. The mountain landscapes of Tajikistan contain 0.66% of the animal world and 1.8% – plant diversity, including wild relatives of domestic animals and cultivated plants.

Table 13 - Main Components of Biodiversity in Tajikistan

Component	Importance
Ecosystems	12 types
Types of vegetation	20 types
Flora	9,771 species
Wild relatives of cultivated plants	1,000 species
Endemic plants	1,132 species
Plants, listed in the Red Data Book of Tajikistan	226 species
Agricultural crops	500 varieties
Fauna	13,531 species
Endemic animals	800 species
Animals, listed in the Red Data Book of Tajikistan	162 species
Domestic animals	30 breeds

161. Forests only take up 3% (412,000 ha) of the land area of the country, however they still play an important role in the conservation of biodiversity and genetic resources as well as in atmospheric carbon absorption. In addition, the forests are a natural protection for human settlements against floods, avalanches, and soil erosion. They also regulate the water balance and microclimate.

162. Almost all forests in Tajikistan belong to the state and are considered to be Group 1 forests. Forest management activities are directed at conservation and the improvement of forest conditions. Primarily, there is an open juniper forest prevailing at 1,500-3,200 m. above sea level. Pistachio trees, well accustomed to the hot dry climate, are mostly found in southern Tajikistan at an elevation of 600-1,400 m. Walnut forests are characteristic of Central Tajikistan at 1,000-1,200 m. above sea level and are known by their specific requirements for soil and climatic conditions. Part of the forest belt consists in maple forests with fragmentary poplars, willows, birch trees, buckthorn, saxaul and various shrubs.

163. Field surveys in connection with the study of pertinent literature and consultation of institutes (e.g., forest department) are the methodological pillars that allow the description of the ecological baseline. Most of the vegetation alongside the Project Road has been converted to agricultural use in historical times. Information obtained on the flora and vegetation during the conducted site surveys in April – August 2020 and study of pertinent literature are described in the following.

1. Flora and vegetation

164. The beginning of the road passes in the zone of low-grass vegetation, represented by grass-mixed meadows (Figure 22). Further on the Project Road passes through vegetation type dominated by bluegrass and sedges (blue grass sedge ephemerals) and areas of higher altitude xerophytic woodland.

165. As can be seen from Figure 23, all nature protection zones are located far from the Bokhtar-Okmazor- road, as a result of which road rehabilitation does not threaten these zones.

166. As the road rehabilitation will be spatially confined to the existing RoW, nearly all tree plantations will remain. In case tree felling is required at certain spots these will be compensated by new tree plantings.

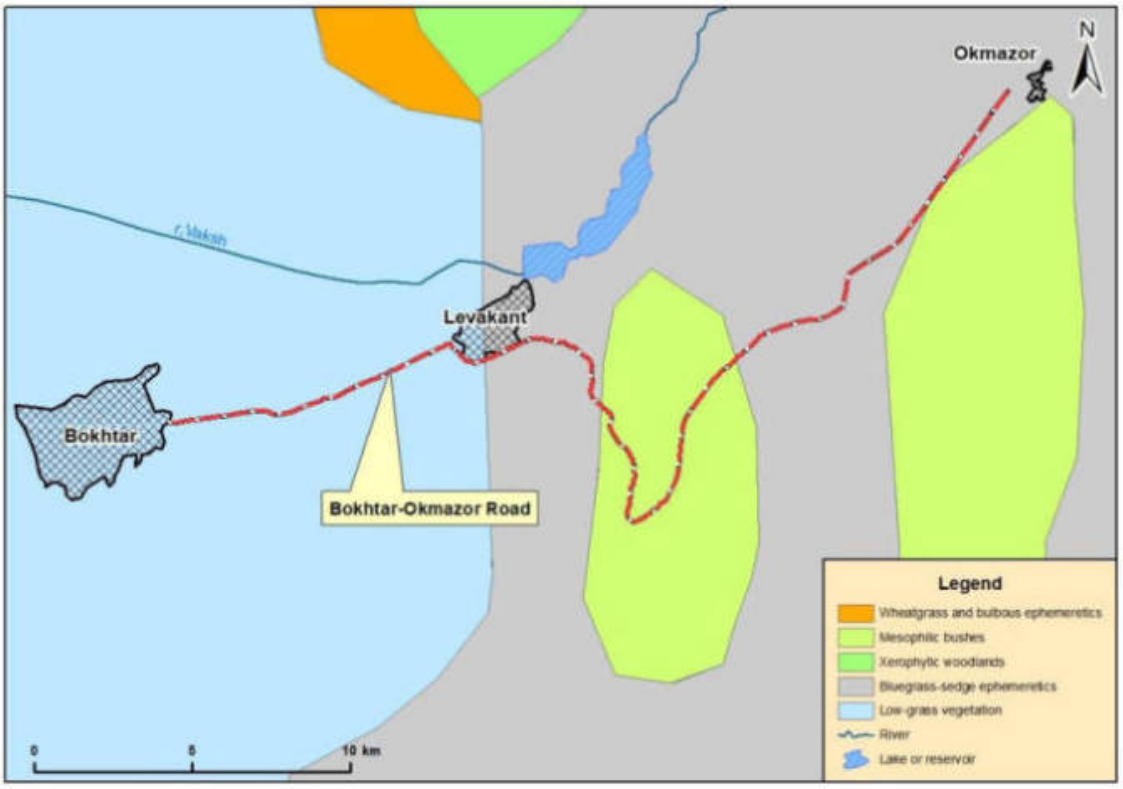


Figure 22 - Project Road and vegetation zones

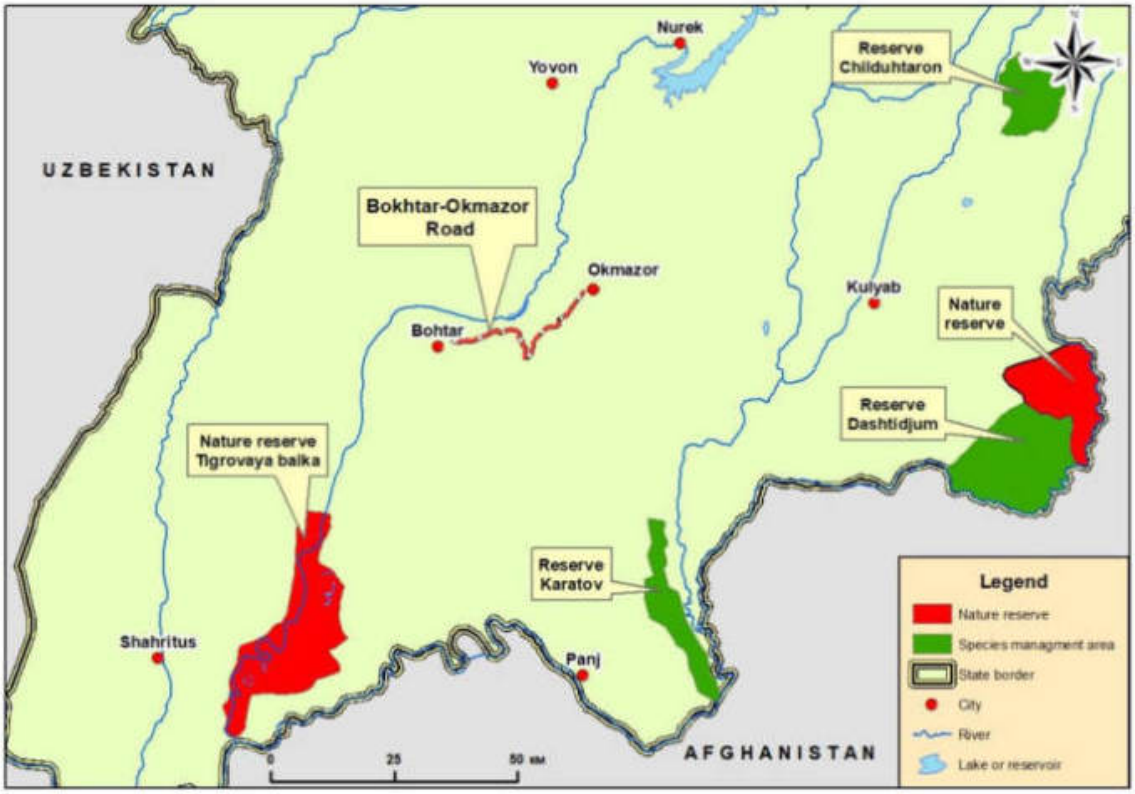


Figure 23 - Conservation zones and National Protecetd Areas along the project road

167. Figure 24 provides an overview of the forest areas in Tajikistan.

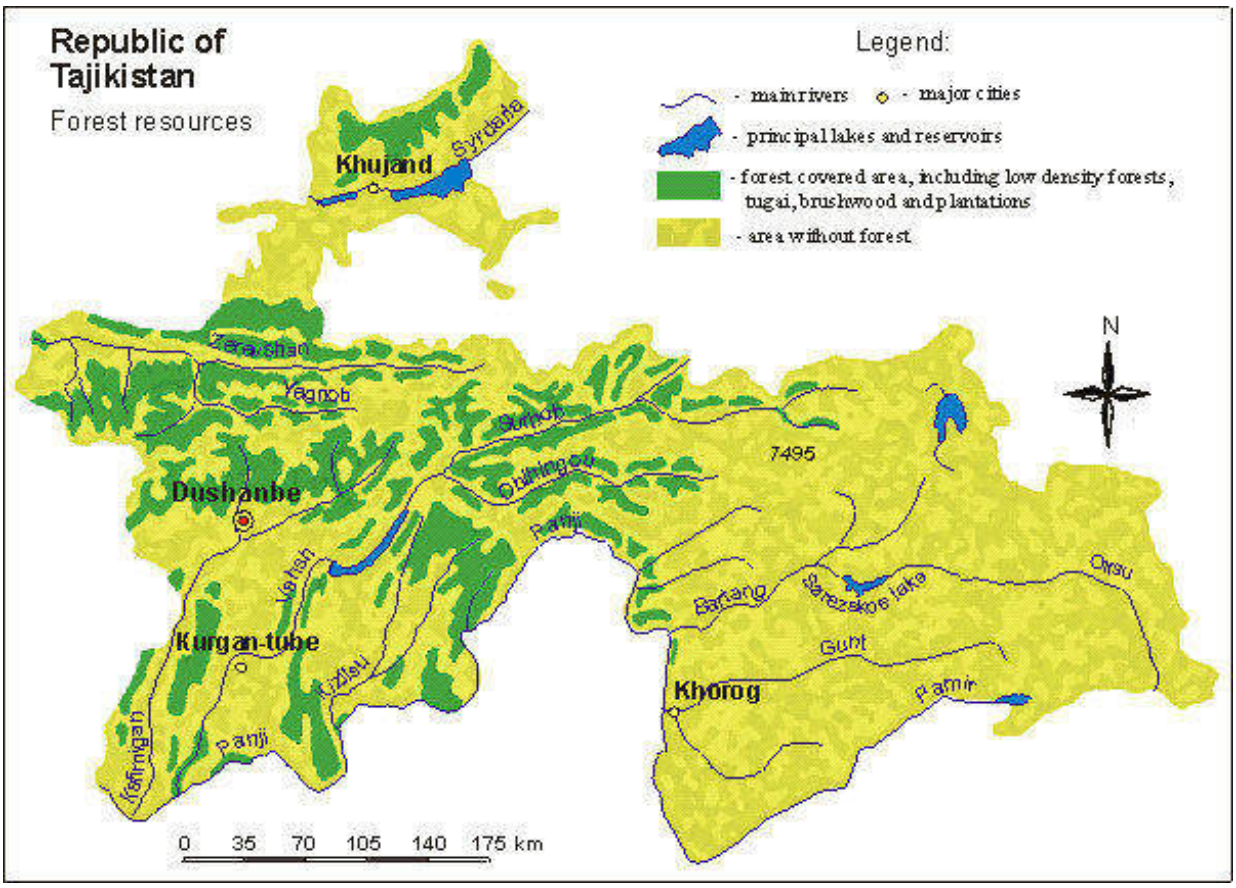


Figure 24 - Forest Resources in Tajikistan

2. Fauna

168. Tajik fauna is characterized by great genetic diversity. Mountain fauna is richer than that of the plain and contains a substantial number of European-Siberian and East-Asian elements. The fauna of the hot, lowland deserts contains plenty of Indo-Himalaya, Ethiopian, and Mediterranean species.

169. In terms of zoogeographic zoning, the entire length of the Project Road falls under the Tajik zoogeographical site. This site is characterized by an abundance of representatives of all classes of vertebrates. However, commonly the biodiversity alongside roads is reduced as compared to undisturbed areas. Project area is home to two species of amphibians, 40 species of reptiles, 186 species of birds and 45 species of mammals. The most common species here are:

Amphibians - Gray Toad (*Bufo bufo*) and Marsh Frog (*Rana ridibunda*);

Reptiles - Gecko, Turkestan and Steppe Agama, Viper, Cobra, East Boa (*Eryx miliaris*), Steppe Turtle, Glass-lizard (*Pseudopus apodus*) and Blindworm (*Anguis fragilis*); Rare and endangered species included in Red Data Book are cobra and steppe turtle.

Birds - Kestrel, Buzzard, Griffon Vulture, Rock Pigeon, Indian (*Acridotheres tristis*) and Pink (*Sturnus* or *Pastor roseus*) Starlings, Black-chest and Barn Sparrows, European Bee-eater, Roller, Crested Bird, Magpie, Black Check, Shrike, Long-tailed Shrike, and Barn Swallow; Rare birds such as Partridge, Shahin, Egyptian vulture, Golden Eagle, Saker and Pheasant are seen in this area. Due to their mobility, they rarely fall into the car accidents.

Mammals - Wolf, Fox, Porcupine (*Hystrix*), Tolai Hare (*Lepus tolai*), Turkestan Rat, Wood Mouse, Vole (*Microtus*), Gerbils (*Gerbillus*), Long-eared Bat, Horseshoe Bat, Pipistrelle (*Pipistrellus pipistrellus*), Long-eared Hedgehog and other rare and endangered species such as Porcupine, *Vormela peregusna*, Wild cat and Striped hyena may occasionally cross the road.

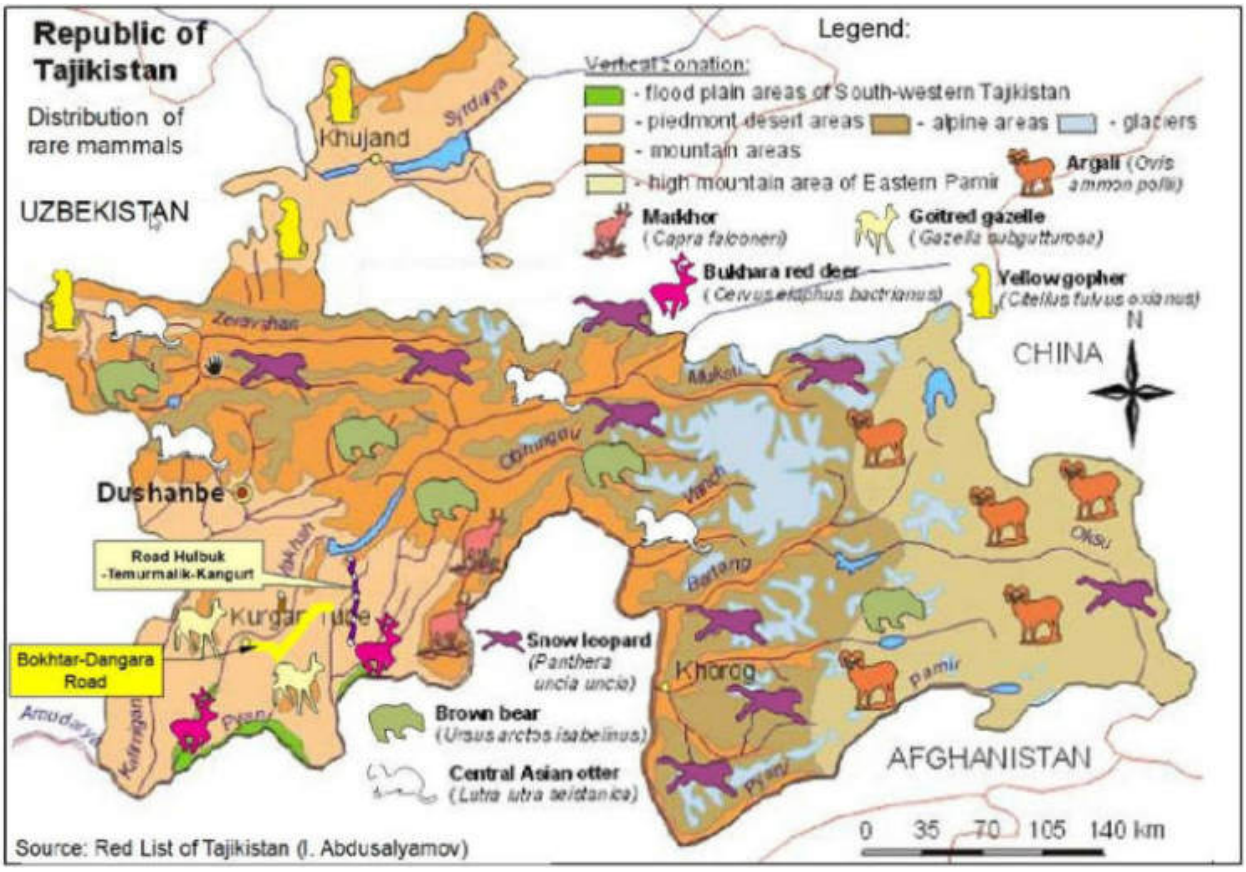


Figure 25 - Distribution of Rare Mammals in Tajikistan and Project Road

Fish - There are 52 species of fish in Tajikistan, including acclimatized and accidentally imported, and about 85% of them are inhabitants of the Aral Sea basin. The greatest number of species of fish belong to the carp family - Cyprinidae (23), the second largest number of species is Cobitidae, also known as the True loaches (11), the third - Sturgeons - Acipenseridae (5), and the rest of the family are represented each by one or two species. The most typical fish species in Tajikistan are: Amudarya trout, Marina, Turkestan catfish, carp, Aral and Turkestan barbel, catfish and others; weeds (non-target) species - gudgeon, mosquito fish, and numerous loaches.

Insects - Among rare and endangered insects which could theoretically be found in the vicinity of the road are the following: the arboreal mantis *Empusa pennicornis Pallas*, the beetle *Carabus tadzhikistanus* of the family *Carabidae* and *Nola elaeagni,* a deltoid moth of the family *Noctuidae (Lepidoptera, Butterflies)*.

a) Protected Areas and Biodiversity

170. As can be seen in Figure 23, there are no protected areas under national law within the Project Area of Influence. Consequently, there is no measurable impact on any of these reserves due to the Project Road rehabilitation.

171. In order to identify areas of international protection status including areas of key biodiversity, an online search was conducted by means of the Integrated Biodiversity Assessment Tool (IBAT)[13]. The search revealed that the Bokhtar - Okmazor road is more than 15 km to the International Bird Area (IBA) Dangara Massif. This is beyond project's area of influence thus works in the Bokhtar-

[13] IBAT is a multi-institutional programme of work involving Bird Life International, Conservation International, IUCN and UNEP-WCMC. IBAT provides a basic risk screening on biodiversity. It draws together information on globally recognized biodiversity information drawn from a number of IUCN's Knowledge Products: IUCN Red List of Threatened Species, Key Biodiversity Areas (priority sites for conservation) and Protected Planet/The World Database on Protected Areas (covering nationally and internationally recognized sites, including IUCN management categories I–VI, Ramsar Wetlands of International Importance and World Heritage sites).

Okmazor road section will not cause any direct or indirect impacts to the IBA. No further investigation in this regard is therefore required.

172. According to the site information provided by IBAT, the Dangara massif covers an area of 69,441 ha. It lies between the Vakhsh and Pyanj rivers and is situated between the Vakhsh range and Kizilsu river valley at an altitude of 550-570 m above sea level. The IBA is centred on Dangara mountain. Landscape is characterized by gentle hills, richly vegetated in spring. The natural vegetation is grassland. There are no forest ecosystems. Before development, the massif has been used as autumn-winter pastures. Since construction of the Nurec hydroelectric power station and Nurec water reservoir (about 70 km long and from 800-900 m to 3-4 km wide), there has been the possibility of irrigating the massif and now 20-25% of virgin and long-fallow land has been developed and converted to agricultural land.

173. The transformation of dry steppe vegetation to irrigated agricultural land has also significantly influenced the composition of the area's avifauna. According to the information provided by IBAT, birds adapted to dry land such as the bustards Otis tarda, Chlamydotis undulata and Tetrax tetrax, the stone curlew Burhinus oedicnemus and fowl-like birds such as Pterocles pterocles and Pterocles alchata significantly decreased in their populations or are even extinct now.

174. On the other side, the irrigation which created large plots of cereals, legumes, wetlands and artificial water surfaces such as the Selbursay water reservoir favoured the increase of water birds in the area. Large numbers of *Anseriformes, Gruiformes, Charadriiformes* and *Lariformes* were found within the IBA and particularly near Selbursay water reservoir.

175. There were more than 18,000 birds (Anser anser, Tadorna ferruginea, Anas penelope, Anas strepera, Anas platyrhynchos, Aythya ferina, Aythya fuligula, Mergus merganser, Grus grus and others) observed on the IBA bird census on 14-15 January 2006. Selbursay water reservoir, situated in the south-east of the Dangara massif, is one of the important ecological factors playing a key role in the wintering, migration and nesting of several hundreds of thousands of waterbirds, cranes, gulls, diurnal raptors and passerines.

176. For the IBA Dangara Massif, 13 trigger species[14] are identified. However, out of these 13 trigger species only the saker falcon (Falco cherrug) is classified as endangered (EN) according to the current IUCN Red List Category. All other species are categorized as least concern (LC).

177. Therefore, the biodiversity survey was conducted with focus on identification of habitats of the saker falcon (Falco cherrug). In addition, the study area was surveyed for identification of any other bird species that are potentially impacted by the Project Road construction.

178. In result, there is no risk identified for the saker falcon from the Project Road rehabilitation. There is however potential impact on bird species nesting in cliffs immediate abutting the Project Road. This refers to representatives of the roller family (Coraciidae) like the European roller (Coracius garullus), the family of bee-eater (Meropidae) (golden bee- eater), starlings (lane or Indian starling) and weaver family (Indian sparrow). In addition, these cliffs are habitats for wintering sheltering reptiles and amphibians.

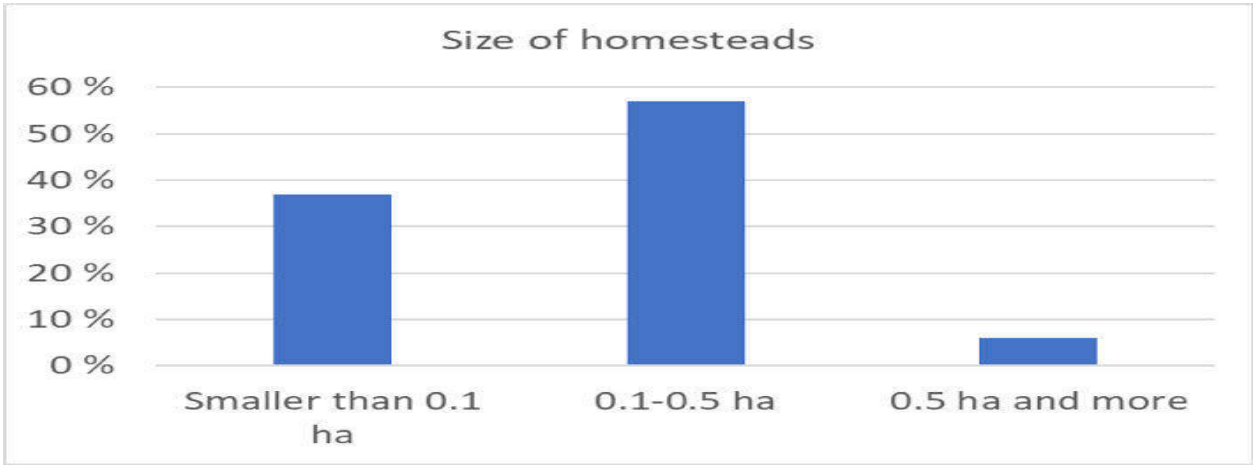
179. In result the conducted biodiversity survey comes to the conclusion that the potential impact of the project road rehabilitation on biodiversity is only minor, but mitigation measures must be taken to achieve this. The proposed mitigation measures are incorporated in the EMP.

b) Land use

180. According to socio-economic surveys 60% of the household respondents' land plots is the size from 0.1 to 0.5 ha in Bokhtar-Okmazor-Dangara. 38% of the respondent's land area is smaller than 0.1 hectares (Fig. 22). In these small land plots people usually grow tomato, cucumber, potatoes, carrots, peppers, corn and fruits.

[14]Trigger (or qualifying) bird species are those for which a site has been recognised as an IBA under any of the global (or, where appropriate, regional or sub-regional) criteria.

Figure 26 - Size of homesteads (left) (N=332) and peasant farms (right) in Bokhtar-Okmazor-Dangara area (N=107)



181. In 2005, under the Government's land reform, around 23,300 state agricultural enterprises from the Soviet era were reorganized into privately-owned dehkan farms in three categories: individual, family or collective dehkan associations. However, private ownership of land is still not permitted. Indeed, the Constitution states that all land "is in exclusive ownership of the state which guarantees its effective use in the interests of the people". Nevertheless, the dehkan farms have a land-use right in the form of lifelong inheritable holdings.[15]

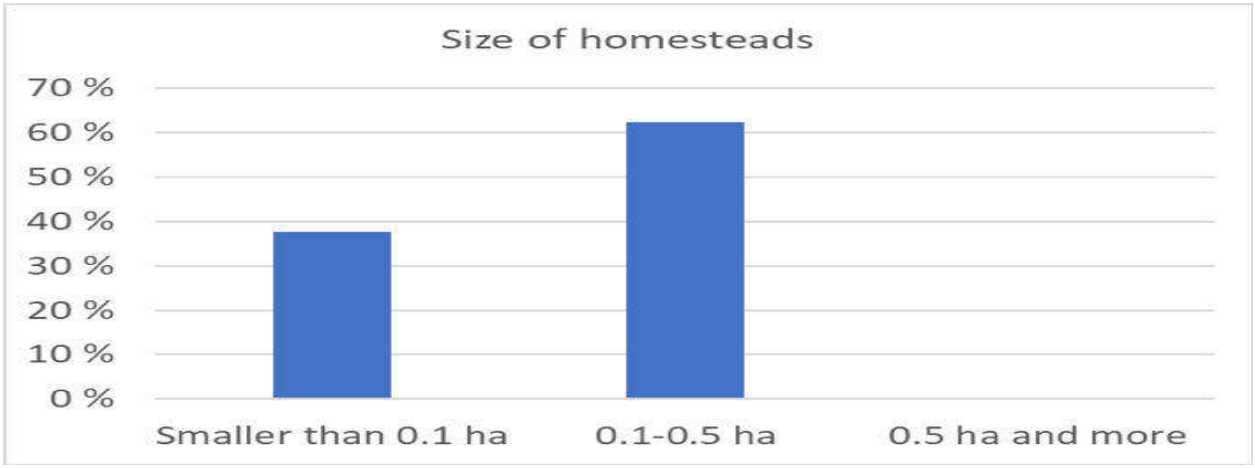


Figure 27- Size of homesteads in Bokhtar-Okmazor-Dangara area (N=107)

[15] FAO, 2020. Gender and Land Rights Database. Tajikistan. Available at: http://www.fao.org/gender-landrights-database/country-profiles/countries-list/general-introduction/en/?country_iso3=TJK (accessed on 31 July 2020).

C. Socioeconomic Environment

182. This Chapter presents the findings on the major socio-economic characteristics of the affected Project communities.

183. The project is located in the Khatlon Region of Tajikistan. Khatlon Region is one of the most populated of the four regions of Tajikistan. It is situated in the southwest of the country, between the Hisor (Gissarr) Range in the north and the Panj River in the south and borders of Afghanistan in the southeast and on Uzbekistan in the west. Khatlon has an area of 24,800 square kilometres and consists of 24 districts – 14 in Western Khatlon and 10 in Eastern Khatlon.[16] The total population of Khatlon in 2018 was 3,274,900[17].

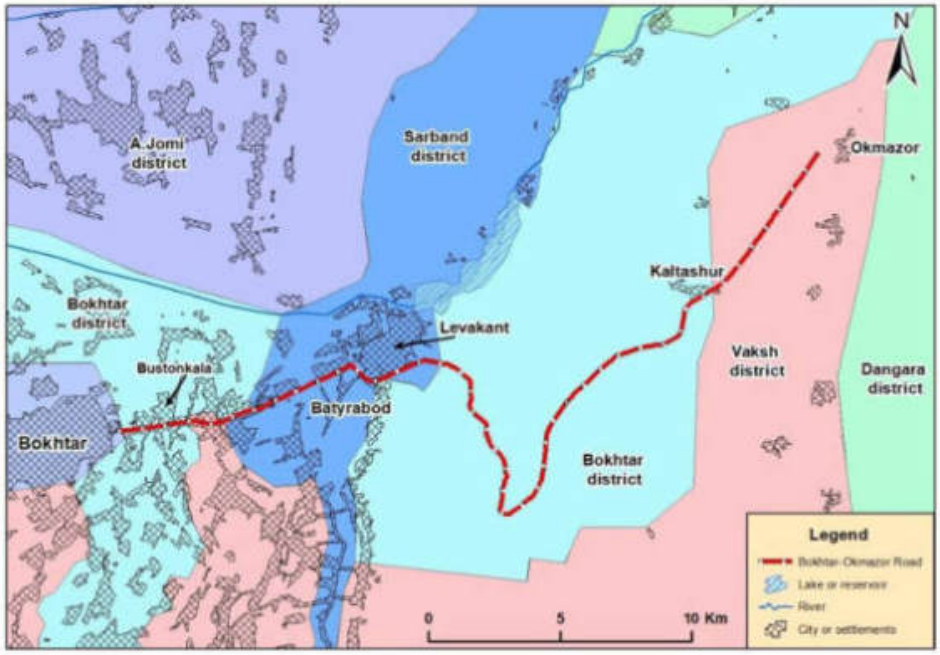


Figure 28 - Map of administrative units of the Bokhtar-Okmazor-Dangara road

1. Profile of the Project Area

184. The proposed road project is located mainly in five districts of Tajikistan: Bokhtar, Kushoniyon, Levakand and Vakshs districts of Khatlon Region. The above figures show the administrative units and settlements[18] alongside the Project Roads.

185. Khatlon Region is one of the most populated of the four regions of Tajikistan. It is situated in the southwest of the country, between the Hisor (Gissar) Range in the north and the Panj River in the south and borders on Afghanistan in the southeast and on Uzbekistan in the west.

186. Khatlon has an area of 24,800 square kilometres and consists of 24 districts – 14 in Western Khatlon and 10 in Eastern Khatlon. The total population of Khatlon in 2019 was 3,274,900 up from 2,677,251 in the 2010 population census. The population in Khatlon is mainly engaged in Agriculture.

187. The following table presents the demographic data for the Bokhtar-Okmazor-Dangara project districts, Jamoats, and villages.

[16] World Bank. 2013b. Tajikistan - Reinigorating growth in the Khatlon oblast (English). Washington DC; World Bank. Available at: http://documents.worldbank.org/curated/en/728911468119949897/Tajikistan-Reinvigorating-growth-in-the-Khatlon-oblast (accessed 28 June 2020)

[17] Agency on Statistics under the President of the Republic of Tajikistan. Available at: https://www.stat.tj/en/database-socio-demographic-sector (accessed 28 June 2020)

[18] The settlements are plotted from space images of 2015-2017

Table 14 - Demographic data (2020) of the Bokhtar-Okmazor-Dangara road project area

District	Jamoat	Villages along the road	Population	Men	Women	Number of HH
Bokhtar	Bokhtar city	Hoji Sharif	3,360	1,652	1,708	715
Kushoniyon	Bustonqal'a	SMP-540	1,010	504	506	127
		Ozodii Mehnat	1,800	902	898	270
		Niholparvar	1,074	536	538	132
		Abdullo Kurbon	116	57	59	16
		Hayoti Nav	1,601	800	801	235
		Orzu	2,005	1,001	1,004	390
		Ergash	734	367	367	107
Levakand	Guliston	Guliston	3,055	1,551	1,504	420
		Eshonobod	2,177	1,109	1,068	176
	Vahdat	Sarband	1,065	569	496	111
		Tajikobod	811	374	437	130
Vakhsh	Mash'al	Lolazor-2	1,224	639	585	136
Total:	**7**	**13**	**20,032**	**10,061**	**9,971**	**2,965**

2. Results of Socio-economic Assessment

188. Potential adverse Social and LARP impacts are addressed thorough mitigation measures prescribed in the LARP.

189. Main economic activities in the region are related to agriculture farming and horticulture. Some run small shops selling construction materials, consumer goods as well as local agricultural produce.

190. Rural and urban lifestyles differ in terms of main sources of income. In terms of job opportunities regional centres are in more advantageous position because there are more operating state institutions, such as education and health care facilities, as well as enterprises and private businesses.

191. Most households in the Project area keep some cattle and poultry. Some households also run private business or are employed locally and receive regular wages. Many households rely on pensions and earnings from selling surplus agricultural produce at the local market or to the wholesalers at the farm gate prices.

3. Cultural and Historical Sites

192. The Project Road traverses alongside 2 cemeteries and one grave. There is 1 cemetery in Kushoniyon district. Due to short distance the fences will be affected by the project and need to be reinstated. An additional cemetery is in Oksu village, at km 6+100 part of a Grave wall stretching along the road will be affected by the project. The wall will be reinstated. Photos of the cemetery in Kushoniyon and the grave site in Oksu village are shown in the below figures.

Figure 29 – Cemetery in Kushoniyon district

Figure 30 – Grave along the road in Oksu village

D. ALIGNMENT SHEETS

193. Alignment Sheets for providing an overview of environmental hotspots and sensitive receptors alongside the Project Road are attached in Annex 3 - ALIGNMENT SHEETS.

E. BASELINE MEASUREMENTS

194. Instrumental baseline measurements have been carried out at identified sensitive receptors on air quality, water quality and noise during the Months of June, and August 2020.

195. Annex 1 - REPORT ON WATER QUALITYprovides the report on water quality in the study area, Annex 2 - REPORT ON AIR QUALITY AND NOISE provides the report on air quality and noise in the study area. The main findings are described in the following chapters. Further details are provided in the laboratory reports.

1. Air Quality

196. Instrumental air quality measurements have been conducted in June 2020 according to Tajikistan standards for TSP, NO_2; SO_2; CO and NO. Measurements were carried out at 20 locations along the whole alignment sites. The measurements on water quality were carried out by Center for Analytical Control (CAC).

197. The selected measurement locations for air quality and noise are the following.

Table 15 - Selected Locations for Air Quality Measurements

№	Place	Width	Longitude
1	Km 0+00 Bokhtar-Okmazor-Dangara ring road	37^0 50. 434[1]	068^0 48. 483[1]
2	Near the entrance to the dehkan farm 'Buston'	37^0 50. 533[1]	068^0 49. 262[1]
3	Project Road, near the restaurant 'Orzu'	37^0 50. 627[1]	068^0 51. 210[1]
4	Gate of the Guliston village council	37^0 50. 050[1]	068^0 52. 529[1]
5	Road junction Levakand	37^0 51. 813[1]	068^0 54. 678[1]
6	Km 14 Navobod village	37^0 51. 699[1]	068^0 55. 896[1]
7	Km 33 project road, Ergashobod village	37^0 51. 232[1]	069^0 03. 721[1]
8	Km 42 project road, Gonchi village	37^0 56. 754[1]	069^0 33. 225[1]
9	Km 50 project road, Sangtuda junction village	37^0 00. 696[1]	069^0 07. 487[1]
10	Km 54 project road, entrance to Khushdilon village	38^0 01. 809[1]	069^0 10. 214[1]
11	Project Road, exit from Khushdilon village	38^0 02. 235[1]	069^0 12. 385[1]
12	Km 51 + 100 project road near the Free Economic Zone "Dangara"	38^0 03. 206[1]	069^0 13. 385[1]
13	Km 62 +200 entrance to the project road, Mehtar village	38^0 03. 723[1]	069^0 15. 921[1]
14	Km 63 + 00 middle of the project road, Mehtar village	37^0 03. 791[1]	069^0 16. 877[1]
15	Km 64 + 500 exit from the project road, Mehtar village	38^0 03. 923[1]	069^0 17. 981[1]
16	Km 66 +00 Bokhtar, Dangara and Kulyab road junction	38^0 03. 831[1]	069^0 19. 000[1]
17	Entrance to the project road, Armugon village	38^0 04. 151[1]	069^0 19. 643[1]
18	Near the gate of the Farm-Tex factory	38^0 04. 326[1]	069^0 20. 010[1]
19	Near the asphalt plant	38^0 03. 672[1]	069^0 35. 196[1]
20	Dangara - Bokhtar road junction at the end of the project road	38^0 04. 513[1]	069^0 20. 474[1]
21	Km 0+00 Bokhtar-Okmazor-Dangara ring road	37^0 50. 434[1]	068^0 48. 483[1]
22	Near the entrance to the dehkan farm 'Buston'	37^0 50. 533[1]	068^0 49. 262[1]
23	Project Road, near the restaurant 'Orzu'	37^0 50. 627[1]	068^0 51. 210[1]
24	Gate of the Guliston village council	37^0 50. 050[1]	068^0 52. 529[1]
25	Road junction Levakand	37^0 51. 813[1]	068^0 54. 678[1]

198. The underlying standards were the MAC of Tajikistan for pollutants in the atmosphere of populated areas. All standards were met. A detailed description of the conducted baseline measurement exercise is given in Annex 2 - REPORT ON AIR QUALITY AND NOISE. During construction phase regular monitoring measurements will be conducted as described in the EMoP.

2. Water Quality Measurements

199. Water quality measurements have been conducted on the parameters pH, temperature, suspended solids (mg/l), oil products (mg/l), mineralization (mg/l), BOD 5 (mg O_2/l), turbidity (mg/l) and electrical conductivity (Ohm/cm).

200. Water samples were taken for chemical analysis from the following identified 9 sensitive receptors in the study area.

1. Km 0+000 of the Project Road. Channel of the Vakhsh river
2. Near the entrance to the dehkan farm 'Buston', diversion canal
3. 50m above the bridge, Somin village, state farm, diversion canal
4. 50m below the bridge, Somin village, state farm, diversion canal
5. 50m above channel of Vakhsh river, along the project road near Orzu restaurant
6. 50m below channel of Vakhsh river, along the project road near Orzu restaurant
7. 50m above Tabakchi village, diversion canal
8. 50m below Tabakchi village, diversion canal
9. Bridge, km 10 + 500, discharge into canal

201. The purpose of the measurements is the establishment of baseline conditions on water quality prior to construction start. At the time of monitoring, significant anthropogenic and industrial impact in the project impact area was measured.

202. During construction phase of the Project, regular water quality measurements are foreseen as indicated in the EMoP. The measurement results will be presented in the SAEMRs.

3. Noise Measurements

203. Instrumental baseline measurements of noise were conducted in June 2020 by electronic sound level meter. The standards used are Tajikistan Standards (Sanitary Norms SN 2.2.4/2.1.8.562-96 – provided by Sanitary Epidemiological Surveillance Service of the Ministry of Health of Tajikistan).

204. The measurements were carried out within the villages traversed by the Project Road at the 20 locations shown in table below. The measurements provide a representative noise baseline for the whole Project Road. The identified 20 measurement locations are the same as for the air quality measurement.

205. The noise measurements revealed that the measured noise levels do not exceed the acceptable noise levels indicated in the sanitary norms SN 2.2.4 / 2.1.8.562-96 (provided by the sanitary and epidemiological surveillance service of the Ministry of Health of Tajikistan). At the time of monitoring, no significant anthropogenic impacts in the project area of influence were recorded. All details are described in the report in Annex 2 - REPORT ON AIR QUALITY AND NOISE.

206. During construction phase, noise monitoring will be carried out as prescribed in the EMoP.

Table 16 - Selected Locations for Noise Measurements

№	Locations where measurement made	Noise standards in decibels, (max) 10.00 -18.00	Baseline indicators, decibels (max)
1	Km 0+00 Bokhtar-Okmazor-Dangara ring road	55 - 45	54.3
2	Near the entrance to the dekhkan farm "Buston"	55 - 45	53.4
3	Project Road, near the restaurant "Orzu"	55 - 45	55.3

4	Gates of the Guliston village council	55 - 45	52.8
5	Levakand road junction	55 - 45	55.0
6	Km 14 Navobod village	55 - 45	50.4
7	Km 33 project road, Ergashobod village	55 - 45	45.7
8	Km 42 project road, Gonchi village	55 - 45	40.5
9	Km 50 project road, Sangtuda Junction village	55 - 45	47.0
10	Km 54 project road, entrance to Khushdilon village	55 - 45	45.0
11	Project Road, exit from Khushdilon village	55 - 45	40.3
12	Km 51 + 100 project road, near 'Dangara' Free Economic Zone	75 - 75	54.5
13	Km 62 +200 entrance to the project road, Mekhtar village	55 - 45	51.9
14	Km 63 + 00 middle of the project road, Mehtar village	55 - 45	42.8
15	Km 64 + 500 exit from the project road, Mekhtar village	55 - 45	54.8
16	Km 66 +00 Road junction Bokhtar, Dangara and Kulyab	55 - 45	44.3
17	Entrance to the project road, Armugon village	55 - 45	41.7
18	Near the gate of the 'Farm-Tex' factory	75 - 75	55.0
19	Near the asphalt plant	75 - 75	4.8
20	Junction of the Dangara-Bokhtar road at the end of the project road	55 - 45	53.2

VI. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

207. Based on the results of the conducted field surveys, desk top study and analysis of Project documents, the project's environmental impacts were identified and described, and suitable mitigation measures prepared.

208. The Project involves the rehabilitation of an existing road. Due to the traffic load and forecast the Project Road is divided into 2 sections which also differ in their environmental impact magnitude.

209. In section 1 (km 0+000 – 9+700), the Project Road will be upgraded to category I. Hence a strip of approximately 15 m to both sides of the Project Road will be physically impacted and natural and human structures within this strip will be lost. During the carried-out surveys, no valuable ecological structures or habitats were identified within this strip which cannot be restored.

210. In Section 2, the rehabilitation will be carried out on the already existing alignment and confined to the existing RoW as far as technically feasible. No spatial alternatives are foreseen. There might be only minor alignment shifts due to need for compliance with design parameters such as gradient or radius. Therefore, there is only little physical encroachment within this section and the anticipated environmental and social impacts are for the most generic and site specific and therefore such kind of impacts that occur in all types of road reconstruction Projects. They are mostly temporary limited to the construction phase.

211. For managing impacts on human assets, a LARPP has been prepared under this Project as a stand-alone document. After construction, during operation phase, there will remain only low negative impacts as compared to the existing situation. This is because the road reconstruction scheme follows the existing alignment over most of its length. No valuable or protected natural habitats or other valuable environmental structures are significantly impacted after finalization of construction period, neither in their structure nor function. Structures impacted by the Project can be physically restored within reasonable time. There will be many beneficial impacts.

212. For impact assessment, a corridor of maximum 200 m on each side of the project road over its entire length is identified as the core impact area. The Project Road traverses 13 villages. Sections where sensitive receptors are present, such as schools, hospitals or other places where people congregate are given particular attention so that adequate mitigation and monitoring measures are formulated. In addition, the core impact area needs to be widened at certain locations to consider all ancillary facilities occurring outside the 200 m corridor such as borrow pits and quarries.

213. Main impacts refer to the human environment because the Project Road is traversing densely populated rural area. In total thirteen villages are located along the proposed road project. SES for assessing encroachment into human assets and building structures has been carried out and incorporated in the LARP which will be cleared by ADB.

214. Encroachment into private parcels and loss of other valuable assets such as private residential and commercial land parcels, farmland, commercial facilities, trees and other cannot be prevented to a certain degree because of higher comfort requirements of the future road which within settlements also requires some more space for pedestrian lanes, street lighting and other safety facilities.

215. Other interferences are due to noise emissions, emissions of pollutants and vibrations within the traversed settlements especially when the Project Road runs close to sensitive receptors such as schools, hospitals, mosques, bazars or other.

216. In summary, main impact categories arise from the following activities: (i) construction works within or close to settlements result in loss of trees and other assets, noise impacts, emission of pollutants to air and vibration which is especially of concern when the Project Road comes close to sensitive receptors, (ii) site clearance activities result in loss of top soil and vegetation structures, (ii) aggregate sourcing, crushing of aggregates and asphalt plant operation may have severe impacts in case of unsuitable site selection or management. Additional impacts include iii) impacts from bridge rehabilitation, (v) potential impacts on surface waters and potential impacts on natural habitats and biodiversity.

217. The assessment of impact follows a risk matrix approach where the likelihood of an environmental, safety or social impact occurring is matched with the consequence (severity) of the impact occurring. The matrix ranks potential risks as low, medium, high or extreme. The assessment is provided for the post mitigation risk level to support the findings that the impacts are not-significant, short in duration, temporary and site-specific. All risks classified as medium or higher are considered significant and require mitigation. Figure 31 sets out the general risk matrix and assessment criteria.

Figure 31 – Risk Matrix

RISK RATING	LOW 0 to 3 ACCEPTABLE OK TO PROCEED	MEDIUM 3 to 6 UNDESIRABLE TAKE MITIGATION EFFORTS (good site practice)	HIGH 7 to 10 UNACCEPTABLE CLEARLY IDENTIFIED MITIGATION WILL BE REQUIRED IN ESMP	EXTREME 11 to 12 INTOLERABLE PLACE EVENT ON HOLD

			CONSEQUENCE / SEVERITY OF IMPACT			
			INSIGNIFICANT / MINOR • Easily handled within the normal course of operations with no additional costs	MODERATE • Immediate time / resource reallocation will be necessary with a moderate estimated cost	MAJOR • Environmental conditions disrupted but can be reversed. • Potential for serious injury / fatality • Significant disruption to community • Require significant resources to rectify	CRITICAL • Catastrophic environmental damage. Fines likely. • Potential for multiple fatalities • Significant irreversible disruption to community • Significant resources needed to rectify.
			>>>>>>>>>>>>>>>>>> Environmental / safety / social impact increasing in severity >>>>>>>>>>>>>>>>>>			
RISK / LIKELIHOOD OF IMPACT	IMPROBABLE • Environmental / safety / social impact is unlikely to occur (<20%)	<<<<<< Likelihood of impact increasing <<<<<<	LOW 1	MEDIUM 4	MEDIUM 6	HIGH 10
	POSSIBLE • Environmental / safety / social impact is likely to occur (20% to 90%)		LOW 2	MEDIUM 5	HIGH 8	EXTREME 11
	PROBABLE • Environmental / safety / social impact almost certain to occur (>90%)		MEDIUM 3	HIGH 7	HIGH 9	EXTREME 13

218. In the following chapters named “pre-construction phase”, “construction phase” and “operational phase”, the identified impacts and mitigation measures are described.

A. Pre-Construction (Design Phase)

1. Pre-works documentation and establishment of more recent baseline environmental conditions

Impacts

219. Possible obsolete information not capturing site-specific baseline and pre-works conditions. This is due to the span of time that passed between the establishment of the environmental baseline data and the actual construction start. During this time span certain baseline conditions may have changed.

Mitigation Measures

220. In order to establish more recent baseline environmental conditions as part of the preparation of the SSEMP, the contractor must, as part of the preparation of the SSEMP, undertake documentation, photographs (with GPS coordinates), environmental sampling and analyses (thru in-house or 3rd party authorized laboratory). This will be monitored by CSC and PIURR.

2. Road alignment within ecologically sensitive areas

Impacts

221. At locations where the Project Road is traversing alongside or cutting cliffs, particularly loess cliffs which bear potential nesting sites for cavity nesters, there is the impact of possible destruction of bird nesting sites. This refers to bird species representatives of the roller family (Coraciidae), particularly the European roller (Coracius garrulus), the family of bee-eater (Meropidae) (golden bee- eater Merops apiaster), starlings (lane or Indian starling) and weaver family (Indian sparrow). In addition, these cliffs are often habitats for wintering or sheltering reptiles and amphibians.

Mitigation Measures

222. At sections where the Project Road rehabilitation is traversing alongside cliffs, mainly formed by loess sediments which are suitable nesting sites for various birds such as the European roller Coracias garrulus (assessed as Least Concern by IUCN), bee-eater (Merops apiaster) evaluated as Least Concern or the Indian starling (Common Myna Acridotheres tristis)evaluated as Least Concern the design investigated the possibility of widening the cross section to the opposite site and avoid any impacts. Less mobile bird species colonizing clay cliffs along the roads cannot change nesting sites. Complete restoration takes 5-6 years, with possible adverse implications for species populations.

223. prior to construction start, a fast-track ecological survey will be conducted by CSC's ornithologist for purpose of (i) identification of nesting sites at cliffs in the construction corridor, and (ii) identification of additional mitigation and monitoring measures to minimize impacts on less mobile bird species. In case nesting sites are identified, then construction schedule will consider nesting season in order to avoid bird losses.

224. Also required tree felling and site clearance activities which involves the removal of vegetation must be outside nesting season (preferably between October and February). The first SAEMR will include the photo-documentation, GPS coordinates, and strip map of nesting sites.

Risk Assessment

RISK	RISK SEVERITY	RISK LIKELIHOOD	POST MITIGATION RISK LEVEL	SIGNIFICANT ?

Potential impact on ecologically sensitive sites, specifically loess cliffs with bird nesting sites and tree rows functioning as nesting sites for birds (all identified species are of IUCN conservation status Least Concern).	Moderate	Probable	**LOW**	**LOW**

3. Road alignment in areas of tree plantations

Impacts

225. There is a considerable number of tree losses involved. Based on the conducted surveys, 115 trees need to be felled in Section 2 and 1,705 in Section 1. Therefore, in total, 1,820 trees need to be felled. Main species are poplars, willows, birch trees, pistachio trees, walnut trees, buckthorn, and saxaul.

Mitigation Measures

226. Tree losses that cannot be prevented will be compensated by new tree plantings at the respective locations alongside the Project Road. The compensation ratio must be 1:2, meaning that for each felled tree 2 new trees must be planted. This means that 1,820 x 2 (3,640) trees are to be newly planted for compensation. A larger compensation ratio (1:3 or more) is not recommended because this would result in a too narrow space within the individual trees when they become older. The actual number and details of trees to be cut will be reported in the contractor's SSEMP and the first SAEMR.

227. Plantations will be executed after technical works have been completed. Plantations will be restricted to spring (March - April) and/or autumn (October). Locations for planting are within the new RoW at the locations where tree losses occurred. Therefore, no additional land acquisition for tree planting is required. However, the design will avoid tree losses as far as technically feasible by adjusting the roads centre line. Tree losses on private land are compensated as set out in the LARP. Suitable species for roadside planting are pines (Pinus spec.), cypresses (Juniperus spec.), mulberry (Morus nigra), pistachio (Pistacia vera), walnuts (Juglans regia) and planes (Platanus orientalis).From the bridge at km 2+340 to km 2+900 an irrigation channel is running alongside the road allowing the planting of species that require more moisture such as poplar (Populus alba), willow (Salix alba), maple (Acer spec.) and ash (Fraxinus spec.). Only native species will be planted from local genetic stocks.

228. In addition, 1,202 trees in Section 1 will be relocated.

Figure 32 – Irrigation Channel alongside Project Road

229. Additional mitigation of impacts to trees will be done through refraining from storing construction material and other heavy equipment which could compact the soil near the roots, using only organic material at the tree stem zone for potential fill up, or fencing the area around the trees during construction works near the trees.

Risk Assessment

RISK	RISK SEVERITY	RISK LIKELIHOOD	POST MITIGATION RISK LEVEL	SIGNIFICANT ?
Potential impact on trees and tree rows alongside the road. Risk of permanent tree losses if not compensated by new plantings.	Moderate	Probable	**LOW**	**LOW**

4. Embankment filling of the tree stem area

Impacts

230. Road alignment in areas of tree plantations bears the risk of embankment filling of the tree stem area. This may cause the loss of the respective tree because of compaction of soil above the roots of the tree, fill up of ground level at base of tree stem (filling up of more than 30 cm soil at base of tree stem damages the tree), covering the soil around the tree with impervious material, release of materials that are toxic to the trees or physical severance of the root system.

Mitigation Measures

231. In order to protect the trees only a maximum fill up of the tree stem area of 30 cm can be accepted. Fill up material in the tree stem area has to be organic soil. At locations where the bottom of the designed embankment comes close (less than 2 m) to trees or tree rows a vegetation protection fence during construction activities must be implemented.

Risk Assessment

RISK	RISK SEVERITY	RISK LIKELIHOOD	POST MITIGATION RISK LEVEL	SIGNIFICANT ?

Potential impact on trees and tree rows alongside the road embankment. Risk of permanent tree losses if not protected by suitable measures.	Moderate	Probable	**LOW**	**LOW**

5. Road alignment traversing cattle crossings

232. Alongside the project road, field cultivation is a prominent land use. Hence an important income source is from livestock breeding (mostly cattle and sheep). The Project Road will be rehabilitated along the existing alignment which does not feature an animal underpass. Hence there is no new disruption of any existing animal crossings and therefore no cattle crossing is designed for this road section. In accordance with the decision of the technical meeting of the Ministry of Transport bridge number 7 of the Okmazor-Dangara section was replaced by a cattle drive, since the bridge did not cross a water barrier. This new animal underpass allows the safe crossing of the Project Road for herders and their cattle as demanded during the carried-out consultation process.

6. Road alignment traversing towns and villages

Impacts

233. The Project Road is traversing 13 villages from Bokhtar to Okmazor. The rehabilitated Project Road will have higher traffic load in the future. Also, the rehabilitated road due to its improved design will allow higher speed. Potential impacts arising from this refer to potentially increased disruption of the traversed villages.

234. In addition, there is potential loss of building structures and assets (tree losses, masonry retaining wall, private yards, building structures).

Mitigation Measures

235. Suitable safety features and mitigation measures have been developed and integrated into the engineering design which will avoid or substantially minimize the impacts on settlements alongside the road. These design safety features consist of speed control signs, pedestrian crossings, livestock crossings, proper road markings, streetlights, and other visual means.

236. The chosen alignment and cross section will aim on reducing the loss of building structures as far as technically feasible. Loss of structures that cannot be prevented will be compensated according to the LARP. Crossing facilities within settlements consisting of zebra-crossings, traffic lights and ramps for disabled people will be provided.

Risk Assessment

RISK	RISK SEVERITY	RISK LIKELIHOOD	POST MITIGATION RISK LEVEL	SIGNIFICANT ?
Potential impact on road safety within traversed villages	Minor because road safety will improve through the Project	Improbable	**LOW**	**LOW**

7. Bridge/Culvert Rehabilitation

Impacts

237. The bridge works will have potential environmental impacts that need mitigation, but the impacts of culvert works can be considered as minimal.

238. Culvert replacement will contribute to sustainable functioning of the irrigation systems alongside the project road sections. Without replacement of the culverts the local irrigation system might be damaged.

239. Regarding the bridge rehabilitation, clear distinction needs to be made between impacts of bridges that are subject to only rehabilitation and bridges that require partial or total reconstruction. For example: (i) bridges needing only rehabilitation and are in fair condition; (ii) bridges needing widening or partial reconstruction but which have enough loadbearing capacity are in satisfactory to poor condition; and (iii) bridges which need reconstruction for lack of loadbearing capacity are in poor condition. Bridges for rehabilitation may require corrosion treatment for rusted reinforcement structures, which can cause severe water pollution.

240. Within the project road 5 bridges which are in such bad condition that replacement is required and construction of a new bridge (Chapter III. G). The new bridges may trigger water erosion processes at bridge and river embankments. This was considered in the pre-construction-/design-phase of the project.

Mitigation Measures

241. The lower parts of the bridge embankments have to be protected against erosion. This refers to all bridges that are crossing surface waters. Erosion protection is achieved by using natural stones which can in addition be embedded in concrete. The required protection measures were designed based on the hydraulic calculations.

242. In addition, in order to minimize impacts to the ecologically valuable surface waters, a solid drainage system will be designed. In principle, the infiltration of surface run-off water into the slopes and in grass ditches is aimed at. Surplus water is evacuated to the nearest natural waterway. Drainage installations are designed in a way to allow for easy maintenance and operation.

Risk Assessment

RISK	RISK SEVERITY	RISK LIKELIHOOD	POST MITIGATION RISK LEVEL	SIGNIFICANT ?
Potential impacts due to bridge/culvert rehabilitation	Minor	Improbable	**LOW**	**LOW**

B. Construction Phase

1. Impacts due to site clearance activities

Impact

243. Site preparation and clearance includes stripping and temporary storage of topsoil. If topsoil is not effectively managed, it can lead to erosion, siltation, obstruction of water courses and drainage, and loss of topsoil fertility. The associated impacts to site preparation and clearance activities are expected to be spatially limited to small strips alongside the already existing road. It includes the remove of vegetation within the construction corridor.

Mitigation Measures

244. The removed topsoil will be stored for re-use and long-term stockpiles of topsoil will be protected against erosion. This will be done for example through sowing fast growing vegetation such as grass on the stockpiles.

245. To ensure proper soil management, the contractor will prepare a spoils management plan as part of the SSEMP. This plan will include measures for minimizing water and wind erosion, measures to minimize loss of fertility in topsoil, timeframes, haul routes, final disposal sites and a re-cultivation plan. It will describe the mitigation measures to be taken from the beginning of the

project until final disposal of spoil materials. Upon completion of the project, the contractor will provide spoils stockpiles with grass cover.

Risk Assessment

RISK	RISK SEVERITY	RISK LIKELIHOOD	POST MITIGATION RISK LEVEL	SIGNIFICANT?
Potential impacts due to site clearance activities	Moderate	Probable	**LOW**	**LOW**

2. Break up of old pavement layers and asphalt

Impact

246. The breaking up of the old pavement and asphalt layer by excavator or milling machine will cause noise emissions, air emissions and vibrations. In addition, a significant amount of spoil will be generated which will be reused as much as possible for the subbase for the new pavement.

247. Air quality impacts, noise and vibration will mostly be temporary. Sources include construction machinery, dust generated from construction works, haul roads, exposed soils, and material stockpiles. Noise is temporary and results from operating construction machines. Vibration is caused by operating of construction machinery and hauling of materials.

248. In the traversed villages, many residential buildings are stretching alongside the road. During construction phase there will be noise and vibration monitoring.

Mitigation Measures

249. Within the traversed settlements, site- and work-specific timebound environmental monitoring program will be established for the construction phase. The parameters to be monitored are indicated in the EMoP (Table 18).

250. For the preservation of evidence, the contractor will document the condition of houses close to the road. Photographs of all residential houses nearby the road will be taken as a protection for possible complaints regarding damages in house walls etc. This is part of the contract.

251. In addition to avoid damages due to vibration, special construction techniques will be applied in areas where buildings and structures are located directly near the road. Such actions may include, alternative construction methods such as: (i) decrease of vibration emission from the particular equipment item; (ii) substitution of the particular equipment item at such location by other equipment capable of variable vibration control; (iii) use of smaller equipment; (iv) compaction without vibration rollers; (v) decreasing the thickness of material layers below the maximum thickness permissible under the specification; (vi) building wave barriers (trench or ditch) where appropriate; (vii) change the pavement type for example from flexible to rigid pavement, (viii) any other method of Contractor's choice that may be used while ensuring compliance with the specification for the material that is being compacted.

252. For purpose of spoil reduction, construction materials will be recycled. Recycled material from the existing pavement and special recycling techniques will be used in the reconstruction of the new pavement layers. The cost effectiveness of reconstruction measures could be enhanced greatly by the application of recycled pavement materials. Recycling options include hot mix recycling (HMR) with/without new materials and cold mixing recycling with/without new materials.

253. Recycled material will be used to the largest extent feasible to reduce the volume of spoils that needs to be disposed of.

254. Prior to commencing the activities, the contractor will prepare a waste management plan as part of the SSEMP, indicating detailed management of the waste produced in the project, including proper waste disposal sites.

Risk Assessment

RISK	RISK SEVERITY	RISK LIKELIHOOD	POST MITIGATION RISK LEVEL	SIGNIFICANT?
Potential impacts due to break up of old pavement layers and asphalt	Moderate	Possible	**LOW**	**LOW**

3. Impacts due to Earthworks

Impact

255. About 1,136,312m³ of unsuitable and surplus excavation material will be generated by the Project which needs to be safely disposed. In addition, there need to be storage locations for temporary disposal of aggregates and fill material.

Mitigation Measures

256. Temporary storage of surplus spoil will be close to the excavation area preferably on barren land without any wooden vegetation.

257. For final and temporary disposal of surplus spoil suitable sites have been identified which are shown in Annex 6 - IDENTIFIED AREAS FOR SURPLUS MATERIAL DISPOSAL. The identified sites need to be agreed upon with the respective authorities.

258. The contractor will dispose the surplus material within the identified sites by adhering to the following measures for impact mitigation and erosion protection: (i) Any stockpile of disposed surplus material will be allocated at least 100 m distance from any water course and no woody vegetation will be filled up or cut. Height of stockpiles will not exceed 3 m. For purpose of erosion protection fast growing vegetation, e.g., grass species, will be sawn for stabilizing the disposed material. (ii) The selected disposal sites are not expected to be a source of erosion as unsuitable material will fill up the existent gullies and depressions. However, the contractor is advised to compact end evenly distribute the surplus material by layers where possible, to minimize piling and impacts to landscape. The stockpiles will be sawn 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.

Risk Assessment

RISK	RISK SEVERITY	RISK LIKELIHOOD	POST MITIGATION RISK LEVEL	SIGNIFICANT?
Potential impacts due to disposal of surplus material	Moderate	Possible	**LOW**	**LOW**

4. Reconstruction of pavement inclusive widening of existing road

Impact

259. The 13 settlements traversed by the Project Road will be exposed to some degree to noise, air emissions and vibration during construction phase. Therefore, monitoring needs to be conducted during construction phase as stipulated in the EMoP.

260. The reconstruction activities cause air quality impacts, noise and vibration. The impacts are temporarily restricted to the construction phase. Impact sources include construction machinery, dust generated from construction works, haul roads, exposed soils, and material

stockpiles. Noise is temporary and results from operating construction machines. Vibration is caused by operating of construction machinery and hauling of materials.

261. The impacts on soil originate from the surface sealing due to the road widening, compaction of soil, site preparation and clearance, and improper storage of spoil material.

262. Compaction of soil on especially agricultural land can lead to degradation of its fertility. Agricultural lands are common along the whole length of the Project Road.

Mitigation Measures

263. To prevent soil compaction the contractor will limit the use of heavy machinery to the existing RoW especially in the vicinity of agricultural land.

264. The following mitigation measures will be implemented by the contractor to reduce emission levels of construction equipment: (i) maintenance of construction equipment in good condition and avoiding, as much as possible, idling of engines; (ii) banning of the use of machinery or equipment that cause excessive pollution (e.g., visible smoke); (iii) utilize construction machinery with low emission levels.

265. Negative effects of noise are mitigated by limiting construction work to 07.00 am - 06.00 pm within 500 m of settlements, and by limiting hauling traffic through settlements. In addition, the following measures need to be implemented: Noise control at source (using less noisier equipment, mufflers, dampeners, enclosures, proper maintenance of equipment, providing training to operators, etc), noise control at path (using natural structures with screening properties and acoustic barriers).

266. Construction phase monitoring is conducted for air quality, noise level and vibration.

Risk Assessment

RISK	RISK SEVERITY	RISK LIKELIHOOD	POST MITIGATION RISK LEVEL	SIGNIFICANT?
Potential impacts due to reconstruction of pavement inclusive widening of existing road	Moderate	Probable	**LOW**	**LOW**

5. Operation of borrow areas and quarries

Impact

267. The impacts related to establishment of borrow pits are largely dependent on the need for opening new pits. For the Bokhtar-Okmazor-Dangara, road section borrow areas were examined and are proposed for use in the Project. All borrow areas are gravel pits within the floodplains of Vakhsh river, Surkhob river (реки Сурхоб) and Tirso river (река Таирсу). The identified borrow sites are described in ChapterIII. I. “Borrow Areas” выше. Materials will be obtained exclusively from government licensed/authorized sources.

268. Impacts from river extraction activities refer to changes of riverbed morphology and increased erosion. Borrow Areas #1, #2, #3 and #5 are already operating and therefore environmental impacts concerning potential disfigurement of landscape, vegetation losses and damage to access roads are kept to a minimum because no new borrow site is opened.

269. Borrow Area #3 is called “Shibanai”. It is located within the Surkhob river floodplain in the territory of Temurmalik district. Location of the borrow area is at km 39+260 at a distance of approximately 3.5 km from the Project Road. The borrow area is currently not operating. It is supposed that there is no official license currently existing for this borrow site. The borrow area is flooded from March to June. The thickness of the deposits suitable for quarrying is at least 3 m.

270. Borrow Area #4 is located in a village. Material can be extracted only from the centre of the riverbed, where significant masses of pebbles are replenished by the regularly occurring floods. The riverbanks are extremely unstable and subject to collapse as a result of erosion. Work near the shoreline is potentially dangerous for residential buildings which are densely built along the river shore.

Mitigation Measures

271. The contractor will refrain from storing material near surface waters to prevent siltation or obstruction of water ways. This refers particularly to the floodplains of Vakhsh river, Surkhob river (реки Сурхоб) and Tairsu river.

272. The contractor will wet the unpaved routes which go next to settlements to suppress dust pollution when hauling material from borrow pits and provide covers for the load of all hauling vehicles to prevent dust pollution. Also wetting the aggregate load reduces potential dust emissions. The contractor will, as part of the SSEMP, prepare and implement air quality management plan, including transportation and post-closure rehabilitation of borrow sites. The access to the selected borrow areas is via the project road. The contractor must include mitigation measures for dust pollution by the settlements along the way.

273. The hauling traffic should be carried out only between 7:00 am and 6:00 pm.

274. In order to avoid any ground water pollution, the used machinery needs to be in good technical condition and properly maintained, so that no leakages of oil or any other pollutants occur. In addition, before starting material extraction the contractor will obtain the environmental permit from the CEP which may also include provisions for landscaping measures after finalization of the extraction activities.

275. After completion of construction and rehabilitation works, and after the use of borrow pits, the landscape will be restored to a standard that is of equal quality to its original condition.

Risk Assessment

RISK	RISK SEVERITY	RISK LIKELIHOOD	POST MITIGATION RISK LEVEL	SIGNIFICANT?
Potential impacts due aggregate extraction from borrow areas	Moderate	Probable	**LOW**	**LOW**

6. Operation of Asphalt Plant and Aggregate Crushers

Impact

276. Impacts from asphalt plants include pollutant and or emissions, possible water pollution from bitumen spills, and safety risks. The impacts can be minimized by acquiring the needed asphalt from an existing asphalt plant. In case a new asphalt plant must be set up, certain provision and mitigation measures have to be taken. In the Bokhtar - Okmazor project subsection, blasting operations are envisaged in 6 areas, which are located within the mountain section of the Project Road. Minimum distance to settlements is approximately 300 m based on the available information.

277. Air quality impacts are temporary. Impact sources include construction machinery, fugitive emissions from asphalt plants, aggregate crushers, and dust generated from construction works, haul roads, exposed soils, and material stockpiles. Noise is temporary and results from operating construction machines. Vibration is caused by operating of construction machinery and hauling of materials.

278. Aggregate crushers produce noise and dust emissions, and they require certain mitigation measures.

279. In road rehabilitation, the most severe possible water quality impact could come from spilled bitumen, or any petroleum products used in asphalt production. Bitumen is stored in drums which may leak, or which are often punctured during handling after long periods (more than 6 months in the elements) of storage.

Mitigation Measures

280. To ensure minimal impacts on settlements and productive land, the asphalt plants and aggregate crushers must be located downwind of settlements at a distance of 1,000 m or more.

281. Bitumen will not be allowed to enter either running or dry streambeds and nor can be disposed of in ditches or small waste disposal sites prepared by the contractor. Bitumen storage and mixing areas must be protected against spills and all contaminated soil must be properly handled. Storage areas should be lined with impermeable layer to mitigate impacts of potential spills. As a minimum, these areas must be designed so, that any spills can be immediately contained and cleaned up.

282. The contractor will have provisions for spill and fire protection equipment and will submit an emergency response plan (in case of spills, accidents, fires and the like) prior to operation of the plant, and asphalt plants will not be located close to plantations and productive land.

283. Bitumen storage and mixing areas will be protected against spills and all contaminated soil will be properly handled according to legal environmental requirements. Such storage areas will be contained so that any spills can be immediately contained and cleaned up.

284. Prior to commencing operation of the asphalt plant, the contractor must receive all relevant permissions and the site selection for the asphalt plant and aggregate crusher must be approved by CSC.

285. Both, asphalt plant and aggregate crusher are sources of emission of noise and air pollutants. Therefore, regular monitoring measurements will be conducted at these facilities as described in the monitoring table of the EMP.

Risk Assessment

RISK	RISK SEVERITY	RISK LIKELIHOOD	POST MITIGATION RISK LEVEL	SIGNIFICANT?
Potential impacts due to operation of asphalt plant and aggregate crusher	Moderate	Probable	**LOW**	**LOW**

7. Bridge and Culvert Reconstruction Works

Impact

286. Potential impacts include the generation of turbidity and siltation including change of surface hydrology in the water body by increased sediment load, and pollution of these water ways.

287. The impacts of stockpiling of topsoil and material are mitigated by storing the material at a safe distance from nearby surface waters and by providing for long term stockpiles a grass cover. These mitigation measures also prevent the impacts of increased sediment load on surface hydrology. Settlement ponds must be implemented to places where construction activities come near the natural water courses.

288. When construction activities are being carried out on or in the vicinity of watercourses improper handling and storage of materials (concrete, asphalt, lubricants, fuels, solvent) may pose the risk of water contamination. In addition, embankments and construction materials (fill, sand and gravel) are subject to wash out with rainwater. Oil and grease concentrations in surface waters will increase especially if oil leaks from engines are not properly controlled.

Mitigation Measures

289. Appropriate mitigation measures must be taken for ground and surface water protection, such as regular maintenance of the construction equipment to prevent oil leaks, in addition chemicals and oil will be stored in secure locations, impermeable, and bound area far away from surface waters.

290. Water quality monitoring will be conducted according to the EMoP.

291. Chemicals used for possible bridge corrosion treatment are especially hazardous for water ways and the treatment requires special provisions for preventing chemicals reaching the water. When carrying out corrosion treatment the contractor needs to present a method statement on this.

292. The bridge reconstruction debris will be removed in an environmentally safe manor and the costs of environmental measures have to be included in the unit costs of the contractor.

293. The contractor will submit a method statement or plan for the execution of bridge construction works including measures that will be undertaken to address adverse environmental impacts such as erosion of river embankment and siltation of watercourses that may result from such activities. The plan will be submitted to the Construction Supervision and PIURR.

294. Storage of any hazardous construction material will be on sealed surfaces only to prevent leakages into the groundwater.

Risk Assessment

RISK	RISK SEVERITY	RISK LIKELIHOOD	POST MITIGATION RISK LEVEL	SIGNIFICANT?
Potential impacts due to bridge and culvert reconstruction works	Moderate	Probable	**LOW**	**LOW**

8. Establishment and operation of contractor's yard

Impact

295. To mitigate the construction camp related impacts, the contractor will arrange the facilities, services, and water supply of the work camp so that it will not compete on the same resources with nearby communities. The contractor will also employ, to the largest extent feasible, people from the local communities to the workforce. Local communities will also be preferred, to largest extent feasible, when employing people for the tree planting works, drainage cleaning, and other suitable tasks.

296. Impacts produced by workers camps are manifold and include generation of solid and liquid waste, equipment maintenance related pollutants spills, potential spills from stored materials (chemicals, fuels, etc.), competition for water resources with local needs, and health and safety risks to workers and locals, including risk of HIV / AIDS and other STD's.

297. Construction worksites may place stresses on resources and infrastructure of nearby communities. This may lead to friction between local residents and the temporary workers.

298. In addition, construction camps are likely to have public health impacts. There will be a potential for diseases to be transmitted, exacerbated by inadequate health and safety practices. Therefore, the contractor will be required to recruit a qualified HSO to address such concerns in the work sites. The HSO will also liaise/work with the nearby communities when it is necessary for mitigation of health and safety concerns.

Mitigation Measures

299. The camp will not be set up on top of a ground water area, nor near any surface water areas.

300. Prior to commencing operation, the contractor will indicate proper sources of drinking and construction water which won't compete with local needs. This will be done together with local authorities.

301. For health and safety protection of workers and adjacent communities the following will be provided: (i) Adequate health care facilities (including first aid facilities) within construction sites; (ii) 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; (iii) Personal protective equipment (PPE) for workers, such as safety boots, helmets, gloves, protective clothing, goggles, and ear protection in accordance with legal legislation; (iv) Clean drinking water to all workers; (v) Adequate protection to the general public, including safety barriers and marking of hazardous areas; (vi) Safe access across the construction site to people whose settlements and access are temporarily severed by road construction; (vii) Adequate drainage throughout the camps so that stagnant water bodies and puddles do not form; (viii) Sanitary latrines and garbage bins in construction site, which will be periodically cleared by the contractors to prevent outbreak of diseases.

302. 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. This will be taken into consideration when deciding the place for the camp.

303. The contractor will hire a qualified HSO 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 will 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 will establish a short list of materials to be used (by quality and quantity) and provide a rough concept explaining the training / briefing that will be provided for the construction personnel.

304. The contractor will provide information to workers, encouraging changes in individual's personal behaviour and encouraging the use of preventive measures. The goal of the information is to reduce the risk of HIV / STD transmission among construction workers, camp support staff and local communities.

305. Contractors' conformity with contract procedures and specifications during construction will be carefully monitored. Contractors will be made to follow standard construction practices, monitored and supervised by CSC employed under the Project.

Risk Assessment

RISK	RISK SEVERITY	RISK LIKELIHOOD	POST MITIGATION RISK LEVEL	SIGNIFICANT?
Potential impacts due to operation of working camps	Moderate	Probable	**LOW**	**LOW**

9. Traffic impairment

Impact

306. Traffic impacts of the road rehabilitation project will include disturbance of traffic along the road sections.

307. Transport of potentially hazardous or toxic materials on the road poses a risk to the local population. Impacts in case of an accident which causes a spill may include pollution of surface water or ground water through leaching.

Mitigation Measures

308. Prior to commencing operations, the contractor will submit a traffic management plan to local traffic authorities and provide information to the public about the scope and schedule of construction activities and expected disruptions and access restrictions.

309. During the construction work the contractor will arrange for adequate traffic flow around construction areas.

310. The contractor will enhance traffic safety by providing adequate signalization, lighting, traffic safety signs, barriers, and flag persons for traffic control. Adequate training will be provided to the workers on traffic control prior to commencing operations.

311. The contractor will include action plan to mitigate impacts from transport of hazardous and toxic materials to the traffic emergency response plan for the operation phase of the road.

Risk Assessment

RISK	RISK SEVERITY	RISK LIKELIHOOD	POST MITIGATION RISK LEVEL	SIGNIFICANT?
Potential traffic impacts during road construction	Moderate	Probable	**LOW**	**LOW**

10. Archaeological chance finds

Impact

312. Potential damage to archaeological artefacts due to construction activities, particularly earthworks.

Mitigation Measures

313. In the event of the unexpected discovery of archaeological objects during construction operations, the contractor will immediately inform the CSC 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 give clearance for the continuation of the operations.

314. 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.

Risk Assessment

RISK	RISK SEVERITY	RISK LIKELIHOOD	POST MITIGATION RISK LEVEL	SIGNIFICANT?

11. Closure of construction sites

Impact

315. Potential impacts to landscape aesthetics occur if the camp site and construction associated facilities such as borrow areas are not properly cleaned and restored in the course of construction closure. Possible impacts which may arise are the disfigurement of landscape due to improper disposal of surplus material, spoils of waste (construction debris, metallic scrap etc.) if not properly disposed of.

Mitigation Measures

316. After completion of construction works the contractor will execute all works necessary to restore the sites to their original state (removal and proper disposal of all materials, wastes, installations, surface modelling if necessary, spreading and levelling of stored topsoil).

317. After completion of construction and rehabilitation works, and after the use of borrow pits, the landscape will be restored to a standard that is of equal quality to its original condition. Rehabilitation measures may not be necessary for borrow areas still in operation after road works have finished.

Risk Assessment

RISK	RISK SEVERITY	RISK LIKELIHOOD	POST MITIGATION RISK LEVEL	SIGNIFICANT?

C. Operational Phase

1. Impact on communities

Potential Impacts

318. *Settlement patterns.* No significant changes in settlement patterns are anticipated because of proposed road upgrading.

319. *Community impacts.* Potential community-level impacts can include economic enhancement, split communities, bypassed loss of roadside community business and social activities, impacts on current mode of transportation, impacts related to culture shock, and conversion to higher value land users.

Mitigation Measures

320. As the Project Road rehabilitation will be carried out within the existing road corridor no barriers or obstacles are created which could split communities. There is however widening of RoW required which entails encroachment into private assets within villages. Any Project affected people will be compensated for their loss by implementing the LARP.

Risk Assessment

RISK	RISK SEVERITY	RISK LIKELIHOOD	POST MITIGATION RISK LEVEL	SIGNIFICANT?
Potential impacts on population and communities in settlements alongside Project Road	Moderate	Possible	**LOW**	**LOW**

2. Increased risk of accidents with possible spills of harmful substances

Impact

321. Possible threats to people and communities living along the Project may occur in case of accidents and possible spills of harmful substances. However, due to the implemented safety features of the new road these risks are mitigated as compared to the status quo.

Mitigation Measures

322. PIURR will prepare and implement spill-contingency plan or emergency response plan which 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.

Risk Assessment

RISK	RISK SEVERITY	RISK LIKELIHOOD	POST MITIGATION RISK LEVEL	SIGNIFICANT?

3. Damaged drainage or uncontrolled erosion

323. Damaged drainage can result in damage to local irrigation systems, and erosion can have adverse effect on the road.

324. No particularly vulnerable areas regarding erosion were identified for Bokhtar-Okmazor section.

Mitigation Measures

325. Erosion damages will be mitigated by conducting routine monitoring of drainage and erosion at least twice a year. In case there are any damages identified these have to be repaired. Defects liability period from the side of the contractor is for 1 year. After this year maintenance and repair, if required have to be done by MoT.

Risk Assessment

RISK	RISK SEVERITY	RISK LIKELIHOOD	POST MITIGATION RISK LEVEL	SIGNIFICANT?
Potential damages due to erosion	Moderate	Improbable because issue is considered in the design	**LOW**	**LOW**

4. Positive Impacts

326. The proposed project will result in better road condition. The rehabilitation of the road which currently is in bad condition will, in combination with the implemented road safety features, allow safer driving in the future and better connecting the small villages along the Project Road to medical and educational facilities, state institutions, banks and markets.

327. In order to assess the potential noise impacts during the operational phase, baseline noise measurements were carried out alongside the Project Road in July 2020. The measurement results were compared with the valid standards of Tajikistan according to the sanitary norms SN 2.2.4/2.1.8.562-96 (provided by the sanitary-epidemiological supervision service of the Ministry of Health of Tajikistan). No exceedances of the standards were detected. The detailed results are shown in the expertise in Annex 2.

328. The new road will allow smoother traffic flow which results in potentially lower noise levels. In addition, also the implemented safety and speed control measures will have positive impacts on noise emitted by the vehicles. In conclusion no noise exceedances during operation phase are anticipated. The new road will therefore bring only beneficial impacts for the future traffic.

329. The Project will bring mostly positive impacts to the people living in the villages alongside the Project Road and beyond. The currently existing unacceptable bad road conditions which hinders economic development and access to essential infrastructure facilities like education, medical treatment and markets will significantly improve. This will bring great benefits to the people living in the villages alongside the Project corridor.

330. In addition, there will be better road safety conditions and smoother traffic flow which enhances driving comfort on the Project Road and also brings safety benefits to the people living alongside the Project Road.

5. Cumulative Impacts

331. Cumulative impacts can be described as the combined changes of environment that are the result, not only of a single project, but of all human activities, past, present and future (as far as it is foreseeable) in the study area. Hence cumulative impact assessment requires the assessment of the combined effects resulting from implementation of all sections of the Road Network Sustainability Project namely the

- Hulbuk – Temurmalik - Kangurt, approximately 59 km in length; and
- Bokhtar – Dangara - Guliston, approximately 125 km.

332. The cumulative impacts are mostly beneficial because the currently bad road network in the affected southern region of Tajikistan will be significantly improved allowing better transport links and access conditions for the population of Dangara, Baljuvan, Khovaling districts with Temurmalik and Vose districts. Supply of agricultural products and industrial raw materials for the population and enterprises of the cities of Dushanbe, Kulyab, Bohtar, Khorog and other regions of the Republic will improve. Also, in perspective trade with neighbouring countries, and transport connection to the international road corridors “Dushanbe – Dangara -Kulob – Khorog – Kulma-PRC” and “Dushanbe- Dangara –Guliston- Farkhor - Afgan Border “will significantly improve and bring better economic perspectives to the people living in the Project area.

333. All road sections of the Road Network Sustainability Project will be rehabilitated within the existing road corridor. Therefore, no significant negative cumulative impacts are expected because for all three road sections the anticipated impacts are mostly site specific and generic and mostly confined to the construction phase.

VII. ENVIRONMENTAL MANAGEMENT PLAN

A. Implementation Arrangements

334. The overall responsibility for implementation of the Project lies at the GoT. The relevant organizational entity for the project implementation is PIURR, as Project implementation authority.

335. **PIURR** will be responsible for the overall implementation of the environmental mitigation, management and monitoring measures and requirements specified in this IEE. They will be required to oversee implementation of the SSEMP developed by the contractor to ensure it fulfils all identified environmental, health, safety and social requirements under the loan agreement for the Project. PIURR is responsible for assigning a PIURR-ESE who is dedicated to environmental safeguards and ensuring roles and responsibilities are clearly identified and allocated for environmental, health, safety and social, gender, both within PIURR itself, within the contractors' arrangements and for the handover to operations.

336. **MoF (Ministry of Finance)** is the responsible government body for coordination with ADB and other donors for foreign assistance.

337. **The State Ecological Review Committee and its regional offices** are responsible for environmental permitting and monitoring of Project implementation. Furthermore, according to the 2012 Law on SEE, all civil works, including rehabilitation ones, should be assessed for their environmental impacts and the proposed mitigation measures should be reviewed and monitored by **the CEP (Committee for Environmental Protection under the Government of Tajikistan)**.

338. **The CSC** will take over the responsibilities for the implementation of the environmental mitigation measures and monitoring measures during construction phase. Under the ongoing "Road Network Sustainability Project" (footnote 1), an international construction supervision consulting firm (the firm) has been recruited to supervise the civil works, and its contract was awarded in October 2021. It was agreed with the MoT to expand the construction supervision consultant's scope to cover the civil works under the proposed project, which will help save time for recruiting another consultant firm and allow the firm to harmonize its supervision strategy for the Dangara–Bokhtar section. The CSC will report to PIURR on a regular basis.

339. **The Contractor** will provide environmental monitoring reports as part of his monthly reporting obligations. The tender and contract documents will clearly set out the contractor's obligations to undertake environmental mitigation measures set out in the EMP.

340. **PIURR** will monitor and measure the progress of implementation of the EMP. In this regard SAEMRs during construction phase will be prepared by PIURR with the CSC's support and submitted to ADB and MoT within 1 month after the reporting period.

341. The executing agency is **MoT of Tajikistan**, and the implementing agency is **the Project Implementation Unit for Roads Rehabilitation (PIURR)**, wholly responsible for the implementation of ADB-financed projects, as agreed jointly between the borrower and ADB, and in accordance with the policies and procedures of the government and ADB. ADB staff is responsible for supporting implementation including compliance by MoT and PIURR of their obligations and responsibilities for project implementation in accordance with ADB SPS.

342. **The MoT** will (i) provide overall project oversight; (ii) ensure compliance with all covenants of the financing agreement and ADB's policies, procedures, and guidelines; (iii) coordinate with all ministries and agencies involved in the project as appropriate; (iv) ensure that PIURR is adequately staffed and functional during the entire period of project implementation; (v) approve bidding documents, bid evaluation reports, contract variations, and suspension and termination

of contracts; (vi) sign and act as the Employer for the contracts with consultants and contractors; (vii) timely resolve issues that would compromise quality, costs, or completion time of the project; (viii) conduct timely financial audits as per agreed timeframe and take recommended actions; (ix) collect and retain all supporting and reporting documents, including annual audit reports and financial statements; (x) involve beneficiaries and civil society representatives in all stages of project design and implementation as appropriate; (xi) regularly post on MoT website (footnote 5), in consultation with ADB, the updated project information documents for public disclosure, including safeguards documents (IEE and the SAEMRs); and (xii) ensure project's post-implementation sustainability and report to ADB on the project impacts. The MoT will engage international and national consultants for the following services: (i) construction supervision, (ii) strengthening the RAMS Unit, and (iii) women empowerment. On 31 December 2020, the Road and Transport Digitization Unit was established. This is part of the RAMS. The purpose of the system is to develop data inventories of the country's arterial highway networks. At present, there is no comprehensive inventory in the MoT, making it difficult to estimate maintenance needs and plan the optimal use of available resources against the needs. For developing the RAMS database, the Road and Transport Digitization Unit will be supported by international consultancy firm.

343. **The MoT** will ensure that the preparation, design, construction, implementation, operation and decommissioning of the project and all project facilities comply with (a) all applicable national laws and regulations relating to environment, health and safety; (b) the Environmental Safeguards; and (c) all measures and requirements set forth in the IEE, and any corrective or preventive actions set forth in a Safeguards Monitoring Report.

344. **PIURR** will (i) coordinate the day-to-day project implementation activities; (ii) act as focal point for communication with ADB on project-related matters; (iii) procure works and goods and administer works and goods contracts; (iv) recruit consultants and administer consulting services contracts; (v) carry out environmental monitoring and public consultation during implementation to ensure the proper implementation of the project's SSEMPs and LARP; (vi) monitor and promptly address complaints, and ensure their effective and adequate resolution; (vii) establish adequate financial management system and submit timely withdrawal applications to ADB; (viii) prepare periodic progress reports identifying issues and action plans, and ensure their timely submission to ADB; (ix) monitor and evaluate project activities and outputs, including periodic review and preparation of project completion report; (x) assist ADB's project review missions, as appropriate. PIURR will be assisted during project implementation by relevant departments of the MoT, the CSC, and relevant government agencies. PIURR-ESE with the support of CSC-NES and CSC-IES will have responsibility for regular (weekly at least) supervision of the EMP implementation, and provision of required reports. The specific responsibilities of the EMS include: (i) liaise with the Works Contractor, CSC, and MoT to ensure adherence to the IEE and EMP and adequate implementation of related activities; (ii) undertake internal supervision of the EMP implementation and report regularly to PIURR on progress made and envisaged action plans; and (iii) conduct consultation meetings with local stakeholders as required, informing them of imminent construction works, updating them on the latest project development activities, GRM, etc.

345. **The CSC** is tasked with specific responsibility to ensure environmental safeguards compliance of civil works, with particular emphasis on the monitoring of implementation of the EMP through the works contractor's SSEMP and related aspects of the project. The CSC will include CSC-NES and CSC-IES who will be responsible for supervising the contractor's environmental performance, coordinating the public consultations and project GRM, and reporting to PIURR management for submission to MoT and ADB through the periodic project progress

reports and SAEMRs. The CSC will also mobilize an ornithologist who conducts a fast-track ecological survey prior to construction.

346. **The Works Contractor** is required to appoint an ESO and HSO. The Works Contractor is responsible for preparing a SSEMP that reflects its understanding and commitment to address environmental issues. The works contractor is also responsible for the day-to-day implementation of the EMP and compliance at all times with the requirements of both the IEE and EMP. The EMP included in this IEE together with the SSEMP that need to be prepared by the contractor provide the overall Project environmental management framework.

347. The SSEMP must be submitted within 30 days of the contract award and Preconstruction and Construction cannot commence until the SSEMP is approved by PIURR and the CSC.

348. The Bid Documents for the potential Contractor(s) will contain two sections relating to environmental issues, firstly a basic clause indicating that the Contractor will be responsible for following the requirements of this IEE including the EMP and that he should prepare his own SSEMP for the Project. Secondly, EMP of the IEE will be repeated in its entirety as an Annex to the Bid Documents so as the bidder is aware of his environmental requirements under the Project (both Pre-construction, Detailed Design, Construction and operation during the liability period) and help him put costs to his proposal (such as costs for noise monitoring, etc).

349. The Contract Documents should follow a broadly similar pattern to the Bid Documents. It is not considered necessary to repeat the mitigation measures. The Contract should specify that the Contractor(s) is responsible for implementation of the EMP via his SSEMP. Again, the EMP should be included at an Annex to the Contract so the Contractor(s) is liable for any non-conformance with the EMP, and thereby this IEE.

350. The Contractor(s) will be responsible for the preparation of the Construction EMP/ SSEMP. The preparation of the Construction EMP/SSEMP requires a qualified environmental person. The work will need to be fully compliant with the EMP and will need to be prepared within 30 days of Contract award.

351. During the Construction phase, the Contractor must retain the expertise of an ESO and an HSO to prepare and update SSEMP and to oversee and report on the operation throughout the contract period. The ESO and HSO should be full-time member of contractor's staff over the 18 months construction time.

352. The CSC team will include CSC-NES and CSC-IES, and a national ornithologist to ensure that the Contractor is compliant with his environmental obligations. The CSC-NES will be engaged on a full-time basis to undertake day to day monitoring of the contractor's activities. The CSC-NES will be assisted by the CSC-IES who will provide intermittent inputs.

B. Environmental Management Plan

353. The EMP describes the various measures proposed under this Project, which were designed to avoid, mitigate, or compensate the adverse environmental impacts that may result from the Project. As such the EMP considers all phases of the Project cycle, namely the detailed design, construction and operational phases of the Project.

354. To ensure that the proposed mitigation measures will be carried out by the contractors during the construction stage, the design consultant will clearly set out in the tender and contract documents the contractor's obligation to undertake the respective environmental mitigation measures.

355. Table 17 summarizes the environmental mitigation measures, and Table 18describes the environmental monitoring requirements.

Table 17 - Summary of Environmental Mitigation Measures

Activity / Location	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
DETAILED DESIGN PHASE – PRE-CONSTRUCTION PHASE				
Pre-works documentation and establishment of more recent baseline environmental conditions	Possible obsolete information not capturing site-specific baseline and pre-works conditions	1. As part of preparation of SSEMP, undertake documentation, photographs (with GPS coordinates), environmental sampling and analyses (thru in-house or 3rd party authorized laboratory).	Contractor	CSC, PIURR
Road alignment within ecologically sensitive areas	Possible destruction of bird nesting sites and their offspring. Possibly affected bird species are the bee eater (*Merops apiaster*), the European roller (*Coracius garrulous*), starlings (lane or Indian starling) and birds of the weaver family, e.g., the Indian sparrow.	2. At sections where the Project Road rehabilitation is traversing alongside cliffs, mainly formed by loess sediments which are suitable nesting sites for various birds such as the European roller (Coracias garrulus), the bee-eater (Merops apiaster) or the Indian starling (Common Myna Acridotheres tristis) the design investigated the possibility of widening the cross section to the opposite site and by doing this avoiding any impacts. 3. In addition, prior to construction, a fast-track ecological survey will be conducted for purpose of (i) identification of nesting sites at cliffs in the construction corridor, and (ii) identification of additional mitigation and monitoring measures to minimize impacts on less mobile bird species. 4. In case nesting sites are identified, then construction schedule will consider nesting season in order to avoid bird losses.	CSC's Ornithologist	CSC, PIURR
		5. Required tree felling and site clearance activities which involves the remove of vegetation will be outside nesting season (preferably between October and February).	Contractor	CSC, PIURR
Road alignment in areas of tree plantations.	Tree losses that cannot be prevented. Main species are poplars, willows, birch trees, pistachio trees, walnut trees, buckthorn, and saxaul.	6. Any tree losses are to be compensated by new plantations at a ratio of 1:2. This means that 1,820 x 2 (3,640) trees are to be newly planted for compensation. 7. Species to be planted are pines, cypresses, mulberry, pistachio, walnuts and planes. 8. From the bridge at km 2+340 to km 2+900 an irrigation channel is running alongside the road allowing the planting of species that require more moisture such as poplar (Populus alba), willow	Contractor	PIURR

Activity / Location	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
	Based on the conducted surveys 1820 trees need to be felled.	(Salix alba), maple (Acer spec.) and ash (Fraxinus spec.). Only native species will be planted from local genetic stocks. 9. Plantings will be conducted after technical works have been completed. Planting time will be restricted to spring (March till April) and/or autumn (September till October). Trees to be planted will have the following parameters: 1.5 – 2 m height, age 5 – 6 years. 10. Locations for tree plantings are within the existing RoW at the locations where tree losses occur. 11. Distance in between individual trees will be 6 – 8 m. 12. In addition, 1,202 trees in section 1 (Bokhtar-Levakand) will be relocated.		
Embankment filling of the tree stem area	Tree losses due to embankment fill.	13. A maximum fill up of the tree stem area of 30 cm can be accepted. Fill up material in the tree stem area has to be organic soil. 14. A filling up of more than 30 cm will damage the tree. In this case cutting can't be prevented and a new tree is to be planted as a compensation measure at the respective location within the existing RoW.	Contractor	PIURR with support of CSC
	Potential damaging of trees lying very close to the road (less than 2m).	15. Implementation of a temporary vegetation protection fence during construction activities.	Contractor	PIURR with support of CSC
Road alignment traversing towns and villages	Potential loss of building structures and assets. (Tree losses, masonry retaining wall, private yards, building structures).	16. The chosen alignment and cross section will aim on reducing the loss of building structures as far as technically feasible. 17. Loss of structures that cannot be prevented will be compensated according to the LARP. 18. Crossing facilities within settlements consisting of zebra-crossings, traffic lights and ramps for disabled people will be provided.	EA thru PIURR	PIURR
Bridge/Culvert Rehabilitation	Potential damage to local irrigation system if new culverts should not be sufficiently dimensioned or in	19. In the course of the road rehabilitation all existing culverts will be replaced. All culverts are sufficiently dimensioned in order to prevent any damages or blockages to the existing local irrigation systems.	Design Consultant	PIURR

Activity / Location	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
	case that not all existing culverts should be rehabilitated in the course of the road rehabilitation.			
	Potential water erosion processes at bridge and river embankments.	20. Design of erosion protection measures at lower parts of bridge embankments. Erosion protection is achieved by using natural stones which can in addition be embedded in concrete. 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.	Design Consultant	PIURR
Consultations with the project affected villages	Compensation claims	21. Access to Information/ Public Relations 22. Convene a public consultation meeting (including the Contractor) prior to contractor's mobilization to provide basic project information and construction scheduling, establish and explain the grievance redress mechanism including proactive arrangements for keeping the public informed of road reconstruction activities.	PIURR with support of at least CSC's team leader, deputy team leader, safeguards and design engineers	PIURR
Complaints/grievances	Compensation claims	23. Establishment of grievance redress mechanism (GRM) by Resettlement Specialist to ensure that PAPs have information on the procedure to submit a complaint, in case they have one.	EA thru PIURR	PIURR
Within settlements disproportionate encroachment on poor people's assets.	Loss of wealth and property of poor people. Poor and vulnerable households might be affected.	24. Resettlement Specialist will issue LARP covering assessment of loss and compensation procedure.	EA thru PIURR	PIURR with support of CSC
CONSTRUCTION PHASE				

Activity / Location	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
Impacts due to site clearance activities	Loss of topsoil.	25. Implement the spoils management plan prepared as part of the SSEMP. 26. Removing of topsoil occurring within site clearing corridor. Topsoil will be removed and stored for reuse. 27. Long-term stockpiles of topsoil will immediately be protected to prevent erosion or loss of fertility. 28. For erosion protection it will be sawn with a fast-growing vegetation, e. g. grass	Contractor	PIURR with support of CSC
Break up of old pavement layers and asphalt	A significant amount of spoil will be generated which will be reused as much as possible for the subbase for the new pavement	29. Document the condition of houses close to the road. Photographs of all residential houses nearby the road will be taken as a protection for possible complaints regarding damages in house walls etc. This is part of the contract. 30. Special construction techniques will be applied in areas where buildings and structures are located directly near the road. Such actions may include, alternative construction methods such as: (i) decrease of vibration emission from the particular equipment item; (ii) substitution of the particular equipment item at such location by other equipment capable of variable vibration control; (iii) use of smaller equipment; (iv) compaction without vibration rollers; (v) decreasing the thickness of material layers below the maximum thickness permissible under the specification; (vi) building wave barriers (trench or ditch) where appropriate; (vii) change the pavement type for example from flexible to rigid pavement, (viii) any other method of Contractor's choice that may be used while ensuring compliance with the specification for the material that is being compacted. 31. Recycled material will be used to the largest extent feasible to reduce the volume of spoils that needs to be disposed of. 32. Special recycling techniques will be used in the rehabilitation of the new pavement layers. 33. Implement the waste management plan prepared as part of the SSEMP.	Contractor	PIURR with support of CSC
Impacts due to Earthworks	Selected disposal sites for cut material. Potential disfigurement of	34. Compact and evenly distribute the surplus material by layers where possible, to minimize piling and impacts to landscape. 35. The stockpiles will be sawn with fast growing grass to avoid erosion by the root system.	Contractor	PIURR with support of CSC

Activity / Location	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
	landscape. Potential wind and water erosion.	36. During dry and windy periods, water will be spread on the disposed material to avoid dusting.		
	Loss of topsoil Water erosion	37. Implement the spoils management plan which provides 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. 38. Topsoil will be removed and reused to cover areas where excess materials will be dumped and on road embankments. 39. As erosion protection measure at riverbanks, natural stone fillings will be used as additional measures if required.	Contractor	PIURR with support of CSC
	Siltation of surface waters and/or impact on soils due to improper disposal of excess materials	40. Excavated material will be reused as far as technically feasible. In addition, the reclaimed asphalt pavement will be recycled for the construction of new pavement as far as technically feasible. Thus, potential impacts due to the need for disposal of excess material will be kept to a minimum. 41. Extracted soil material that cannot be reused is approximately 1,136,312 m³.and needs to be disposed at the areas shown in Annex 6.	Contractor	PIURR with support of CSC
	Competition for water resources	42. Conduct consultation with local authorities to identify sources of water (for spraying and other construction requirements) that will not compete with the local population.	Contractor	PIURR with support of CSC
	Air pollution due to exhaust emission from the operation of construction machinery	43. Maintain construction equipment to good standard and avoid, as much as possible, idling of engines. 44. Banning of the use of machinery or equipment that cause excessive pollution (e.g., visible smoke).	Contractor	PIURR with support of CSC
	Disturbance of adjacent settlements due to elevated noise levels	45. Restrict work between 7:00 am and 6:00 pm within 500m of the settlements. 46. A limit of 70 dBA will be set in the vicinity of the construction site and strictly followed. 47. Noise control at source (using less noisier equipment, mufflers, dampeners, enclosures, proper maintenance of equipment, providing training to operators, etc.), noise control at path (using	Contractor	PIURR with support of CSC

Activity / Location	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
		natural structures with screening properties and acoustic barriers).		
	Soil compaction due to operation of heavy equipment	48. Confine operation of heavy equipment within the corridor that is absolutely necessary for the road construction to avoid soil compaction and encroachment into agricultural used land close to the road.	Contractor	PIURR with support of CSC
Reconstruction of pavement inclusive widening of existing road	Dislocation or involuntary resettlement of people (Within settlements, encroachment into private and residential land).	49. Implement LARP covering assessment of loss and compensation procedure.	EA through PIURR	PIURR with support of CSC social safeguards team
	Loss of businesses and income of people operating their business within the existing RoW	50. Implement LARP covering assessment of loss and compensation procedure. 51. Inform all residents and businesses about the nature and duration of work well in advance so that they can make necessary preparations. 52. Limit dust by removing waste and soil quickly; by covering and watering stockpiles, and covering soil with tarpaulins when carried on trucks 53. Increase workforce and use appropriate equipment to complete the work in minimum time in the important areas. 54. Avoid construction work in sensitive times like festivals near religious places. 55. Contractors (and sub-contractors) need to be informed that they are not allowed to hunt/poach in the project area of influence.	EA through PIURR	PIURR with support of CSC social safeguards team
	Damage to infrastructure, supply cuts of infrastructure services such as water supply pipes and other facilities, wastewater discharge	56. Measures will be ensured in engineering designing to avoid any disturbance to the existing infrastructure. 57. Prior to construction start the respective service agencies will be informed about the construction work. 58. Coordinate with respective agencies and provide prior information to the public in case of any required disruption in services during construction	Contractor	PIURR with support of CSC

Activity / Location	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
	facilities, electricity lines etc.	59. Consult with the affected people using project implementation. 60. Make the project contractors aware of any significant issues resulting from loss of electricity. 61. Inform people in advance of any power cuts and the duration of the cut will be made clear in order that they can plan around the lack of power.	Contractor	PIURR with support of CSC
	Possible damage to properties and community facilities. Construction sites.	62. Immediately repair and/or compensate for any damage caused by construction works and activities to existing communities and their property and facilities 63. Maintain access roads used for transport of construction materials and other construction related activities are maintained to ensure that they remain in at least in their pre-project condition for the duration of the project.	Contractor	PIURR with support of CSC
	Noise exceeding applicable noise standards. Vibrations may result in damage to local infrastructure, including private property and local (haulage) roads.	64. Limit the use of heavy machinery to the existing RoW especially in the vicinity of agricultural land. 65. maintenance of construction equipment in good condition and avoiding, as much as possible, idling of engines. 66. banning of the use of machinery or equipment that cause excessive pollution (e.g., visible smoke). 67. Utilize construction machinery with low emission levels. 68. limiting construction work to 7:00 am – 6:00 pm within 500 m of settlements, and by limiting hauling traffic through settlements. 69. Within the traversed 13 villages applicable noise standards will be complied with as far as technically feasible by means of noise measurements as indicated in the EMoP and in case of exceed of standards, ascribe of time restrictions for construction activities between 7:00 am and 6:00 pm. 70. Noise control at source (using less noisier equipment, mufflers, dampeners, enclosures, proper maintenance of equipment, providing training to operators, etc), noise control at path (using natural structures with screening properties and acoustic barriers). 71. 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 CSC.	Contractor	PIURR with support of CSC

Activity / Location	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
		72. Put in place grievance redress procedures to facilitate communication between the contractor and potentially affected people. In addition, haul routes and construction site access roads should be discussed and jointly approved between the contractor and local officials to minimize the risk of conflicts.	PIURR with support of CSC	PIURR with support of CSC
	Construction activities close to building structures, particularly within villages. Aggregate extraction. Haulage of aggregates and construction equipment.	73. Advise the community members on road safety with the key messages reinforced with communities throughout construction. 74. Place clear signs 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. 75. Heavy machinery will not be used after day light and all such equipment will be returned to its overnight storage area/position before night. 76. All sites including storage areas will be made secure, prohibiting access by members of the public by fencing when appropriate. 77. Install barriers to keep pedestrians away from hazardous areas such as constructions sites and excavation sites. 78. Install signage at the periphery of the construction site advising road users that construction is in progress. 79. 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. 80. Provide security personnel in hazardous areas to restrict public access. 81. If necessary, provide safe passageways for pedestrians crossing the construction site and for people whose access has been disrupted due to construction woks.	Contractor	PIURR with support of CSC
Operation of borrow areas and quarries	Potential disfigurement of landscape, vegetation losses and damage to access roads Increased dust emission	82. Refrain from storing material near surface waters to prevent siltation or obstruction of water ways. This refers particularly to the floodplains of Vakhsh river, Surkhob river (реки Сурхоб) and Tairsu river. 83. Wet the unpaved routes which go next to settlements to suppress dust pollution when hauling material from borrow pits and provide covers for the load of all hauling vehicles to prevent	Contractor	PIURR with support of CSC

Activity / Location	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
	Siltation and obstruction of surface waters	dust pollution. Also wetting the aggregate load reduces potential dust emissions. 84. Implement air quality management plan, including transportation and post-closure rehabilitation of borrow sites. 85. The hauling traffic should be carried out only between 7:00 am and 6:00 pm. 86. Used machinery needs to be in good technical condition and properly maintained, so that no leakages of oil or any other pollutants occur. 87. Before starting material extraction, the contractor will obtain the environmental permit from the CEP which may also include provisions for landscaping measures after finalization of the extraction activities. 88. Before starting extraction activities, it needs to be confirmed that there is a valid license for the quarrying activities issued by the responsible authorities/agencies. 89. Implement material management plan which indicates the location of the proposed extraction site as well as rehabilitation measures and implementation schedule for the borrow areas and access roads. The plan needs to address the sensitive issues of avoidance of transportation through residential areas as far as technically feasible and closure rehabilitation.		
	Loss of valuable ecological structures if the selected disposal sites are not carefully selected.	90. No agricultural area or river floodplain will be selected as disposal site. Minimum distance to any watercourses must be at least 100 m. 91. Disposal sites will be preferably on barren land without any wooden vegetation.	Contractor	PIURR with support of CSC
Operation of Asphalt Plant and Aggregate Crushers	Increased dust emission and noise emission	92. Careful site selection of aggregate crusher in order not to interfere with any sensitive receptor. Distance to next settlement and residential houses at least 1,000 m downwind. Site selection for aggregate crusher has to be approved by PIURR.	Contractor	PIURR with support of CSC
	Odour emission and safety risks	93. Asphalt plants will be 1,000 m downwind from any settlements and residential houses. 94. Provide spill and fire protection equipment and submit an emergency response plan (in case of spills, accidents, fires and	Contractor	PIURR with support of CSC

Activity / Location	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
		the like) to the authority in responsibility prior to operation of the plant. 95. Secure official approval for installation and operation of asphalt plants from MoT.		
	Water pollution due to spilled bitumen	96. Receive all relevant permissions prior to commencing operation of the asphalt plant. 97. Obtain the CSC's approval on the site selection for the asphalt plant and aggregate crusher. 98. Bitumen will not be allowed to enter either running or dry streambeds nor will it be disposed of in ditches or small waste disposal sites prepared by the contractor. 99. Storage areas should be lined with impermeable layer to mitigate impacts of potential spills. As a minimum, these areas must be designed so, that any spills can be immediately contained and cleaned up. 100. Bitumen storage and mixing areas must be protected against spills and all contaminated soil must be properly handled according to legal environmental requirements. Such storage areas must be contained so that any spills can be immediately contained and cleaned up. 101. Provide spill and fire protection equipment. 102. Implement an emergency response plan (in case of spills, accidents, fires and the like) prepared as part of the SSEMP prior to operation of the plant. 103. Asphalt plants will not be located close to plantations and productive land. 104. Bitumen storage and mixing areas will be protected against spills. 105. All contaminated soil will be properly handled according to legal environmental requirements. Such storage areas will be contained so that any spills can be immediately contained and cleaned up. 106. Contaminated storm water and process wastewater should be captured and recycled by a system with the following specifications:	Contractor	PIURR with support of CSC

Activity / Location	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
		a. The system's storage capacity must be sufficient to store the runoff from the bunded areas generated by 20 mm of rain. b. Water captured by the bunds should be diverted to a collection pit and then pumped to a storage tank for recycling. c. An outlet (overflow drain) in the bund, 1 m upstream of the collection pit, should divert excess rainwater from the bunded area when the pit fills due to heavy rain (more than 20 mm of rain over 24 hours). d. Collection pits should contain a sloping sludge interceptor, to separate water and sediments. The sloping surface enables easy removal of sludge and sediments. e. Wastewater should be pumped from the collection pit to a recycling tank. The pit should have a primary pump triggered by a float switch and a backup pump which automatically activates if the primary fails. 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.		
Bridge and Culvert Reconstruction Works	Possible alteration of surface water hydrology resulting in increased sediment by increased soil erosion at construction site	107. Store the material at a safe distance from nearby surface waters. 108. Provide long term stockpiles a grass cover. 109. Implementation of settlement ponds at locations where construction site comes close to natural watercourses to retain sediments and mitigate possible impacts on water hydrology. 110. Implement the waste management plan which considers sensitive receptors (rivers and their floodplains). 111. Conduct regular maintenance of the construction equipment to prevent oil leaks. 112. Chemicals and oil will be stored in secure locations, impermeable, and bound area far away from surface waters.	Contractor	PIURR with support of CSC

Activity / Location	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
		113. When carrying out corrosion treatment, the contractor needs to present a method statement on this. 114. The bridge reconstruction debris will be removed in an environmentally safe manner. 115. Prepare a method statement or plan for the execution of bridge construction works including measures that will be undertaken to address adverse environmental impacts such as erosion of river embankment and siltation of watercourses that may result from such activities. 116. Storage of any hazardous construction material will be on sealed surfaces only to prevent leakages into the groundwater.		
Establishment and operation of contractor's yard	Potential soil and water pollution	117. Implement the Construction camp management plan prepared as part of the SSEMP in reference to World Bank Group's Workers' Accommodation: Processes and Standards.[19] The plan will indicate: • Site location, surface area required and layout of the work camp. The layout plan will also contain details of the proposed measures to address adverse environmental impacts resulting from its installation. • Sewage management plan for provision of sanitary latrines and proper sewage collection and disposal system to prevent pollution of watercourses; • 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; • 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.	Contractor	PIURR with support of CSC

[19] A guidance note by IFC and the EBRD Workers' Accommodation: Processes and Standards (August 2009)

Activity / Location	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
		118. Prior to the commencement of works the site installations will be inspected for approval. 119. The selected site will not be on top of ground water area or near surface waters.		
	Competition for water resources	Prior to establishment of the work camps; 120. Indicate proper sources of drinking and construction water which won't compete with local needs. 121. Conduct consultations with local authorities to identify sources of water that will not compete with the local population.	Contractor	PIURR with support of CSC
	Health and safety risks to workers and adjacent communities	122. Implement the waste management plan prepared as part of the SSEMP. 123. Provide sanitary latrines and garbage bins at construction site. 124. Periodically clear the sanitary latrines and garbage bins. 125. Do not allow open burning of waste i. For health and safety protection of workers and adjacent communities, the following will be provided: ii. adequate health care facilities (including first aid facilities) within construction sites; iii. 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; iv. personal protective equipment for workers, such as safety boots, helmets, gloves, protective clothing, goggles, and ear protection in accordance with legal legislation; v. clean drinking water to all workers; vi. adequate protection to the general public, including safety barriers and marking of hazardous areas; vii. safe access across the construction site to people whose settlements and access are temporarily severed by road construction; viii. adequate drainage throughout the camps so that stagnant water bodies and puddles do not form; ix. 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	Contractor/ HSO	PIURR with support of CSC

Activity / Location	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
		work sites into existing waste collection systems and disposal facilities of nearby communities;		
	Worker's health and soil / water pollution in and around equipment maintenance and fuel storage areas	126. The contractor will hire a qualified HSO 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 will 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 will establish a short list of materials to be used (by quality and quantity) and provide a rough concept explaining the training / briefing that will be provided for the construction personnel. 127. Locate storage facilities for fuels and chemicals away from watercourses. 128. Management and storage of fuel, waste oil, hazardous waste will be planned in accordance with the IFC EHS General Guidelines on Hazardous Materials Management. This includes the use of appropriate secondary containment structures capable of containing the larger of 110 percent of the largest tank or 25% percent of the combined tank volumes in areas with above-ground tanks with a total storage volume equal or greater than 1,000 litres. 129. Store and dispose waste/used oil consistent with environmental legal requirements.	Contractor	PIURR with support of CSC
	Road 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 work camps by supporting the spread of STD and HIV/AIDS. In addition, the transport	130. Providing information to workers, encouraging changes in individual's personal behaviour and encouraging the use of preventive measures. The goal of the information is to reduce the risk of HIV / STD transmission among construction workers, camp support staff and local communities. 131. To avoid risk of spread of the corona virus the FIDIC guidance memorandum "FIDIC COVID-19: On-site working and project team organization" will be adhered to construction site. 132. Implement the COVID-19 Health and Safety Management Plan and emergency response plan prepared in accordance with the relevant government regulations and guidelines on	Contractor	PIURR with support of CSC

Activity / Location	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
	sector itself actually helps the epidemic, as infrastructure and associated transport services give people and infections mobility. Possible risks on construction sites also arise regarding the possible spread of the corona virus.	COVID-19 prevention and control or, where relevant, with international good practice guidelines20 133. If a suspected incidence of COVID-19 is reported of any member of the project team during implementation of the project-related activity (including consultation and public participation), the activity will stop immediately for a review of the adequacy of the safety system of work and a corrective action will be implemented to address any identified gaps in the safety system of work prior to recommencement of the activities. All such incidence will be reported to ADB immediately for review.		
	Social conflict between the workers and local people	134. Arrange the facilities, services, and water supply of the work camp so that it will not compete on the same resources with nearby communities. 135. Employ, to the largest extent feasible, people from the local communities to the workforce. Local communities will also be preferred, to largest extent feasible, when employing people for the tree planting works, drainage cleaning, and other suitable tasks.	Contractor	PIURR with support of CSC
Traffic impairment	Traffic impairment	136. Submit the traffic management plan to local traffic authorities prior to mobilization. The plan will include action plan to mitigate impacts from transport of hazardous and toxic materials to the traffic emergency response plan for the operation phase of the road. 137. Provide information to the public about the scope and schedule of construction activities and expected disruptions and access restrictions 138. Allow for adequate traffic flow around construction areas. 139. Provide adequate signalization, appropriate lighting, well - designed traffic safety signs, barriers and flag persons for traffic control.	Contractor	PIURR with support of CSC

[20] World Health Organization, Considerations for public health and social measures in the workplace in the context of COVID-19. Geneva. Available here: https://www.who.int/publications-detail/considerations-for-public-health-and-social-measures-in-the-workplace-in-the-context-of-covid-19

Activity / Location	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
	Potential Impact on Community Health and Safety	140. Implement a traffic management plan that will set out how access along the project road will be maintained safely during construction. 141. 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. 142. Ensure access in areas to be closed temporarily by providing temporary/alternative access. 143. Provide adequate training to the workers on traffic control prior to commencing operations.	Contractor	PIURR with support of CSC
Archaeological chance finds	Potential damage to archaeological artefacts due to construction activities, particularly earthworks	144. In the event of the unexpected discovery of archaeological objects during construction operations, the contractor will immediately inform the CSC 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 give clearance for the continuation of the operations. 145. 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.	PIURR, CSC and Contractor	PIURR with support of CSC and in coordination with Institute of Archaeology / Ministry of Culture
Closure of construction sites	Potential impacts to landscape aesthetics occur if the camp site and construction associated facilities such as borrow areas are not properly cleaned and restored in the course of construction closure. Possible impacts which may arise are the disfigurement of landscape due to improper disposal of	146. After completion of construction works the contractor will execute all works necessary to restore the sites to their original state (removal and proper disposal of all materials, wastes, installations, surface modelling if necessary, spreading and levelling of stored topsoil). 147. After completion of construction and rehabilitation works, and after the use of borrow pits, the landscape will be restored to a standard that is of equal quality to its original condition. Rehabilitation measures may not be necessary for borrow areas still in operation after road works have finished.	Contractor	PIURR with support of CSC

Activity / Location	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
	surplus material, spoils of waste (construction debris, metallic scrap etc.) if not properly disposed of.			
OPERATION PHASE				
Impact on communities	Economic enhancement, split communities, bypassed loss of roadside community business and social activities, impacts on current mode of transportation, impacts related to culture shock, and conversion to higher value land users.	148. Any Project affected people will be compensated for their loss by implementing the LARP.	PIURR	PIURR
Increased risk of accidents with possible spills of harmful substances	Community safety risk	149. Prepare and implement spill-contingency plan or emergency response plan which 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.	PIURR	PIURR
Damaged drainage or uncontrolled erosion	Harmful environmental impacts resulting from damaged drainage or uncontrolled erosion.	150. Routine monitoring of drainage and erosion control at least twice a year. 151. In case there are any damages identified, these have to be repaired.	PIURR	PIURR

CSC = Construction Supervision Consultant, EA = Executive Agency, EMP = Environmental Management Plan, PIURR = Project Implementation Unit for Road Rehabilitation (of MoT)

356. Prior to construction works, the contractor will provide a comprehensive SSEMP covering the following aspects:

(i) Construction site standard operating procedures (SOP)
(ii) Material management Plan detailing measures for construction material management and storage in order to avoid environmental pollution and any safety hazards to workers and nearby communities. Identification and designation of special storage sites, e.g., for bitumen barrels, prefabricated concrete elements (e.g., culverts) and metallic structures.
(iii) Spoils Management Plan detailing measures to be undertaken to minimize effects of wind and water erosion on stockpiles of topsoil and excess materials, measures to minimize loss of fertility of topsoil, timeframes, haul routes and disposal sites for excess materials.
(iv) Water quality management plan which must include site specific protection measures for ground and surface water inclusive water quality monitoring at rivers, creeks and irrigation channels crossed by the Project Road. 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
(v) Sewage management plan including provision of sanitary latrines and proper sewage collection and disposal system to prevent pollution of watercourses
(vi) Waste management plan covering provision of garbage bins, 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
(vii) Hazardous waste management plan for ensuring that hazardous waste is properly stored, collected and safely disposed to an official landfill.
(viii) Air quality management plan which must include air quality monitoring at sensitive receptors including asphalt plant, aggregate crusher and concrete plan. Monitoring results need to be incorporated in construction site environmental monitoring reports. Air quality management plan will include schedule for spraying on hauling and access roads to construction site and details of the equipment to be used
(ix) Noise and vibration management plan which must include noise and vibration monitoring at sensitive receptors. Monitoring results need to be incorporated in construction site environmental monitoring reports
(x) Asphalt Plant and Borrow pit/Quarry Management plan. In case a new borrow area is opened by the contractor the restoration of the area also needs to be incorporated.
(xi) Traffic management plan for ensuring traffic safety and avoiding congestion to the degree technically possible during construction phase.
(xii) Emergency response plan (in case of spills, accidents, fires and the like) prior to operation of the asphalt plant
(xiii) Construction camp management plan in reference to World Bank Group's Workers' Accommodation: Processes and Standards.[21] The plan will include layout of the work camp and details of the proposed measures to address adverse environmental impacts resulting from its installation.
(xiv) Health and Safety Management Plan
(xv) COVID-19 health and safety management plan and emergency response plan prepared in accordance with the relevant government regulations and guidelines on COVID-19 prevention and control or, where relevant, with international good practice guidelines[22]
(xvi) Chance find procedure needs to be in place for avoiding any damage to archaeological artefacts (if any) due to earthworks. The mitigation measures to be followed are described. In

[21] A guidance note by IFC and the EBRD Workers' Accommodation: Processes and Standards (August 2009)
[22] World Health Organization, Considerations for public health and social measures in the workplace in the context of COVID-19. Geneva. Available here: https://www.who.int/publications-detail/considerations-for-public-health-and-social-measures-in-the-workplace-in-the-context-of-covid-19

case of unexpected discovery of archaeological objects during construction operations contractor must immediately inform CSC.

(xvii) Post-construction plan for ensuring that camp site and associated facilities such as borrow areas are left clean and without any landscape deformation and safety hazards (e.g., steep slopes).

(xviii) As part of the SSEMP, the contractor is required to document pre-work conditions and include restoration as part of work.

(xix) Method statement or plan for the execution of bridge construction works including measures that will be undertaken to address adverse environmental impacts such as erosion of river embankment and siltation of watercourses that may result from such activities.

357. The SSEMP will be submitted by the contractor for approval to the CSC and PIURR before the commencement of civil works. Works will not be allowed to commence prior to approval of SSEMP.

C. Environmental Monitoring Plan

358. Environmental monitoring is an important aspect of environmental management during construction and operation stages of the project to safeguard the protection of environment. The parameters to be monitored are outlined in Table 18. PIURR will supervise the road project regularly, and submit quarterly reports based on the monitoring data and laboratory analysis report.

Table 18 - Environmental Monitoring Plan

Issue	What parameter is to be monitored?	Where is the parameter to be monitored	How Is the parameter to be monitored?[23]	When is the parameter to be monitored? Frequency	Institutional responsibility
Pre-Construction					
A. Pre-works conditions and environmental baseline	Site conditions	This should be on project sites, alignments, and project area of influence as defined in this IEE.	Photo-documentation with GPS coordinates for all sites and detailed report	During preparation of the SSEMP. If works will be conducted chainage/section-wise, the SSEMP should provide justification and detailed action plan on undertaking the pre-works documentation and baseline monitoring.	Contractor To be confirmed by PIURR with support of CSC
B. Ecological baseline	Bird nesting sites.	fast-track ecological survey will be conducted for purpose of identification of nesting sites at cliffs in the construction corridor.	Photo documentation with geographical coordinates or alternatively specification of road chainage.	Once before construction starts.	CSC's ornithologist
Construction stage					
C. Water quality in surface waters (irrigation channels, no rivers crossed by Project Road).[24]	pH, temperature, suspended solids (mg/l), oil products (mg/l), mineralization (mg/l), BOD 5 (mg O_2/l), turbidity (mg/l) and electrical conductivity (Ohm/cm)	At surface waters traversed by the Project Road. (9 locations listed under para. 200)	Measurement either directly in surface water with a suitable measurement device or sample taking and measurement in a certified laboratory according to the methodology of the water baseline measurement report (Annex 1 - REPORT ON WATER QUALITY)	During construction activities water measurements will be carried out on a quarterly basis and results must be documented in the environmental monitoring reports.	CSC

[23]For environmental parameters, follow requirements per local standards and EHS Guidelines, whichever is more stringent.
[24]Baseline measurements have been conducted. Results are shown in the water baseline measurement report (Annex 1 - REPORT ON WATER QUALITY).

Issue	What parameter is to be monitored?	Where is the parameter to be monitored	How Is the parameter to be monitored?[23]	When is the parameter to be monitored? Frequency	Institutional responsibility
D. Noise and Vibration	Noise level and vibration	20 locations listed in Table 16[25]	By means of portable noise / vibration measurement device	Monitoring measurements twice per Month during construction phase. Monitoring results must be documented in the environmental monitoring reports,	CSC
E. Air quality deterioration due to road construction works	TSP, NO_2; SO_2; CO and NO	25 locations listed in Table 15 and near the asphalt plant and the aggregate crusher.	By means of suitable portable measurement device	Monitoring measurements will be carried out on a quarterly basis during construction phase.	CSC
F. Potential tree losses because tree stem area is subject to embankment filling.	Trees located within the newly designed embankment.	At respective tree locations.	Inspections; observation. An embankment fills of up to 30 cm at the bottom of the tree stem area can be accepted. A filling up of more than 30 cm will damage the tree and cutting will be necessary. Decision is to be made by the CSC.	During construction phase.	PIURR with CSC's support
G. Topsoil preservation	Stockpiling and means of protection	Job site	Inspections; observation	Upon preparation of the construction site, after stockpiling and after completion of works on shoulders	PIURR with CSC's support
H. Equipment servicing and fuelling	Prevention of spilling of oil and fuel	Contractor's yard	Inspections; observations	Unannounced inspections during construction	PIURR with CSC's support

[25] Rehabilitation works within the 13 villages that are traversed by the Project Road, particularly at locations where the Project Road runs close to sensitive receptors such as schools, hospitals, mosques, bazars or other sensitive socioeconomic infrastructure.

Issue	What parameter is to be monitored?	Where is the parameter to be monitored	How Is the parameter to be monitored?[23]	When is the parameter to be monitored? Frequency	Institutional responsibility
I. Worker's **safety and health**	Official approval for worker's camp; Availability of appropriate personal protective equipment; Organization of traffic on the construction site Provision of safety training to the staff according to the requirements of the individual workplace	Job site and worker's camp	Inspection; interviews; comparisons with the Contractor's method statement	Weekly site visits by the contractor's HSO. Unannounced inspections during construction and upon complaint.	PIURR with CSC's support
J. Worker's **education on AIDS and STD**	Has relevant education been provided?	To be determined by assigned Construction Supervision	To be determined by assigned Construction Supervision	After beginning of works and at appropriate intervals throughout construction	PIURR with CSC's support
K. Material **supply** Asphalt plant	Possession of official approval or valid operation license	Asphalt plant	Inspection	Before work begins	PIURR with CSC's support
L. Borrow areas	Possession of official approval or valid operation license	Sand and gravel borrow pit and / or quarry	Inspection	Before work begins	PIURR with CSC's support
M. Material **transport** Asphalt	Are the truck loads covered or wetted? Compliance with the Contractor's method statement (restricted working hours; haul routes) dust suppression methods where required	Job site / haul routes	Supervision	Unannounced inspections during work	PIURR with CSC's support
N. Stone		Job site / haul routes	Supervision spot checks	Unannounced inspections during work	PIURR with CSC's support
O. **Sand and** gravel		Job site / haul routes	Supervision	Unannounced inspections during work	PIURR with CSC's support
P. Surface water protection	Contractor's compliance with his approved method statement	Bridges and Culverts	Inspection	Unannounced inspections during bridge and culvert works	PIURR with CSC's support
Air pollution from improper maintenance of equipment Q. Asphalt plant and Machinery	Exhaust fumes, dust	At site	Measurement at asphalt and crushing plants. Regular check certificate of vehicles and equipment	Unannounced inspections during construction works	PIURR with CSC's support

Issue	What parameter is to be monitored?	Where is the parameter to be monitored	How Is the parameter to be monitored?[23]	When is the parameter to be monitored? Frequency	Institutional responsibility
R. Planting of new roadside trees	Regular monitoring and control of successful growth of new planted trees	At locations of new planted trees	Replanting of trees that have died	Monitoring to be conducted in autumn so as to allow for replacement of failures	Contractor for 1st year or until defects liability period / PIURR in the subsequent year(s)
S. Ecological status	Bird nesting sites and bird species population	Along the new road	Photo documentation with geographical coordinates	Semi-Annually	PIURR with CSC's support
Operational stage					
T. Increased road kills of animals due to higher traffic loads **and vehicle speeds**	Road kills of animals	Along the new road	Keep records of accidents. In the case that accident hot spots with large mammals are identified, appropriate protective measures will be elaborated (e.g., reflectors / local fencing, warning signs, speed reductions etc.)	Throughout the Year	MoT
U. 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	MoT
V. Damaged drainage or uncontrolled erosion	Leakages in drainage system and damages due to erosion	Culverts and drainage facilities	Documentation	Throughout the Year	MoT[6)]
W. Ecological status	Bird nesting sites and bird species population	Along the new road	Photo documentation with geographical coordinates	Annually	MoT

CSC = Construction Supervision Consultant, EHS = Environment, Health and Safety, IEE = Initial Environmental Examination, MoT = Ministry of Transport, PIURR = Project Implementation Unit for Road Rehabilitation (of MoT), SSEMP = Site Specific Environmental Management Plan

D. Capacity building and development

359. Executing and implementing agencies need to have a sustained capacity to manage and monitor compliance with ADB SPS and government requirements. PIURR will be supported by the CSC-NES and CSC-IES. However, it is necessary to mainstream safeguards in day-to-day working thus PIURR require capacity building measures for (i) a better understanding of the project-related environmental issues; and (ii) to strengthen their role in preparation of IEE, implementation of mitigation measures, and subsequent monitoring. Trainings and awareness workshops are included in the project with the primary focus of enabling PIURR staff to understand impact assessments and carry out environmental monitoring and implement EMP. After participating in such activities, the participants will be able to review environmental assessments, conduct monitoring of EMPs/SSEMPs implementation, understand government and ADB requirements for environmental assessment, management, and monitoring (short- and long-term), and incorporate environmental features into future project designs, specifications, and tender documents and carry out necessary checks and balances during project implementation.

360. CSC-NES and CSC-IES will assess the capabilities of the target participants, customize the training modules accordingly and provide the detailed cost.

361. Typical modules would be as follows: (i) sensitization; (ii) introduction to environment and environmental considerations in water supply and wastewater projects; (iii) review of IEEs and integration into the project detailed design; (iv) improved coordination within nodal departments; and (v) monitoring and reporting system. Specific modules customized for the available skill set will be devised after assessing the capabilities of the target participants and the requirements of the project. The contractors will be required to conduct environmental awareness and orientation of workers prior to deployment to work sites. The proposed training project, along with the frequency of sessions, is presented in Table below.

Table 19 - Suggested Capacity Building Program on EMP Implementation

	Description	Target Participants and Venue	Timing	Resource person	Cost and Source of Funds
1	Introduction and Sensitization to Environmental Issues (1 day) • ADB Safeguard Policy Statement (2009) • Government of Tajikistan applicable safeguard laws, regulations and policies including but not limited to core labor standards, OH&S, etc. • incorporation of EMP into the project design and contracts • monitoring, reporting and corrective action planning	All staff and consultants involved in the project (at PIURR office)	Once prior to the commencement of civil works	Safeguard specialist of CSC (IES together with NES).	PIURR cost
2.	EMP implementation (2 days) • Roles and responsibilities • OH&S planning and implementation • Wastes management (water, hazardous, solid, excess construction materials, spoils, etc.) • Working in congested areas, • Public relations • Consultations • Grievance redress • Monitoring and corrective action planning • Reporting and disclosure • Post-construction planning	All staff and consultants involved in the project All contractors before start of construction works	Once prior to the commencement of civil works	Safeguard specialist of CSC (IES together with NES).	PIURR cost
3.	Plans and Protocols (1 day) SSEMP including • Construction site standard operating procedures (SOP) • Material management plan • Spoils management plan • Water quality management plan • Sewage management plan • Waste management plan • Hazardous Waste Management Plan • Air quality management plan • Noise and vibration management plan • Asphalt Plant and Borrow pit/Quarry Management plan • Traffic management plan • Emergency response plan (in case of spills, accidents, fires and the like) • Construction camp management plan • Health and Safety Management Plan • COVID-19 health and safety management plan and emergency response plan)	All staff and consultants involved in the project All contractors before start of construction works or during mobilization stage.	Once prior to the commencement of civil works	Safeguard specialist of CSC (IES together with NES).	PIURR cost Contractors cost as compliance to contract provisions on EMP implementation

	Description	Target Participants and Venue	Timing	Resource person	Cost and Source of Funds
	• Chance find protocol • O&M plans • Post-construction plan				
4.	Experiences and best practices sharing • Experiences on SSEMP implementation • Issues and challenges • Best practices followed	All staff and consultants involved in the project	Quarterly (6 times during construction)	Safeguard specialist of CSC (IES together with NES).	PIURR cost
5.	Guidance and orientation to Workers on EMP implementation (OHS, core labor laws, hazardous waste management plan, spoils management, etc.)	All workers (including manual laborers) of the contractor prior to dispatch to worksite	Quarterly (6 times during construction)	Safeguard specialist of CSC (IES together with NES).	Contractors cost as compliance to contract provisions on EMP implementation

EMP = Environmental Management Plan, OHS = occupational health and safety, PIURR = Project Implementation Unit for Road Rehabilitation (of MoT)

E. Monitoring and reporting

362. During construction, the ESO and the HSO of contractors are responsible for the preparation of weekly environmental checklists and environmental section of the contractor's monthly progress reports. The reports should comprehensively address all relevant aspects of environmental requirements and, in particular, all environmental audits undertaken during the period covered by the report. The monthly reports will be reviewed and endorsed by the contractor's project manager and then submitted to the CSC and PIURR for review. PIURR and the CSC will review and advise on corrective actions if necessary.

363. The CSC will prepare and submit to PIURR Quarterly Progress Reports which includes the information on the implementation and compliance with the EMP and the SSEMPs, including information on oil spills, accidents, grievance received, if any, and actions taken against them.

364. Based on the contractor's monthly environmental reports and the CSC's Quarterly Progress Reports, PIURR will, assisted by the CSC-NES and CSC-IES, prepare SAEMRs and submit to ADB for disclosure. The first SAEMR will include the photo-documentation, GPS coordinates, and strip map of nesting sites (para. 222) and actual number and details of trees to be cut (para. 226). ADB's monitoring and supervision activities are carried out on an ongoing basis until ADB's project completion report (PCR) is issued. Thus, SAEMR, which may cover O&M of completed packages, will be submitted to ADB until PCR is issued.

365. Within three months after completion of all civil works, a report on the project's environmental compliance performance (including lessons learned that may help MoT and PIURR in their environmental monitoring of future projects) will also be prepared. This report will be part of the input to the overall PCR.

366. During the operation phase, PIURR will be responsible for environmental management and will continue to prepare SAEMRs.

367. The SAEMRs will be disclosed on ADB website. The relevant information of the reports in Russian language (see footnote 6) will also be disclosed to the affected people by posting on MoT website (footnote 5).

368. In addition to the above-mentioned reports, in case of any accident related to occupational and community health and safety, PIURR is expected to (i) report to ADB within 72 hours, and (ii) prepare and submit an incident report with action plan within 7 days of the occurrence.

369. CSC will support PIURR in preparing such reports. In case the CSC's liability period ends before ADB's PCR issuance, PIURR-ESE will prepare the SAEMRs without the CSC's support.

370. ADB will review project performance against the project commitments as agreed in the legal documents. The extent of ADB's monitoring and supervision activities will be commensurate with the project's risks and impacts. Monitoring and supervising of social and environmental safeguards will be integrated into the project performance management system.

F. Implementation cost

371. Most of the mitigation measures require the contractors to adopt good site practice, which are part of their normal procedures. Mitigation that is the responsibility of PIURR will be provided as part of their management of the project. Cost for the capacity building program is included as part of the project. Cost of environmental management are given in Tables below.

Table 20 - Cost Estimate for Contractor's Environmental Management

Description	Unit	Quantity	Rate $	Amount $
Protection of Environment				
Planting, maintenance and watering (during construction stage) of trees on the roadside as explained in the EMP[1)].	Pieces	3,640	15	54,600
Protection of trees during the construction activities.	lumpsum			5,000

Description	Unit	Quantity	Rate $	Amount $
Preparation of site-specific EMP[1)]	Lumpsum			10,000
Clearing of Construction Corridor.	lumpsum			Included in civil engineering works
Removal and Storage of Topsoil.	lumpsum			Same as above
Protection of Water Resources.	lumpsum			Same as above
Management of Solid Waste and Sewage Waste from the Construction Camp.	lumpsum			Same as above
Potential restoration of Work and Storage Sites, Quarries and Borrow Pits, Construction Site Roads.	lumpsum			Same as above
Securing of Storage and Equipment Maintenance Areas.	lumpsum			Same as above
Dust suppression measures during dry period (water spraying)	Lumpsum	Daily during dry summer periods (2 periods)	15,000	30,000
ESO	month	18	2,000	36,000
HSO	month	18	2,000	36,000
Medical seminar on worker's health protection covering protection against HIV / Aids and Covid-19	Quarterly	6	1,500	9,000
Subtotal				**180,600**
Contingencies 10%				18,060
Total				**198,660**

EMP = Environmental Management Plan

Table 21 - Cost Estimate for CSC's Environmental Management

Description	Unit	Quantity[26]	Rate ($)	Amount ($)
CSC-NES	month	18 (includes 1 month training)	3,000	54,000
CSC-IES	month	6	20,000	120,000
CSC national ornithologist[27]	month	1	3,000	3,000
Training of PIURR Safeguard Department	Lumpsum			15,000
Consultations in project affected villages	Lumpsum			16,000
Total				**208,000**

CSC = construction supervision consultant, EMP = Environmental Management Plan, GRM = Grievance Redressal Mechanism, PIURR = Project Implementation Unit

Table 22 - Cost Estimate for Instrumental Monitoring (CSC)

Description	Unit	Quantity	Rate $	Amount $
Water Quality Monitoring (Quarterly)	Number of Measurements	54 (at 9 locations every 3 months during 18 months of construction phase)	200	10,800
Noise Monitoring (Twice per month)	Number of Measurements	720 (20 locations twice per month during construction)	100	72,000
Vibration Monitoring (Twice per month)	Number of Measurements	Same as above	100	72,000
Air quality monitoring (Quarterly)	Number of Measurements	180 (at 25+5 locations every 3 months during 18 months of construction phase)	150	27,000
Subtotal Monitoring				**181,800**
Contingencies (10%)				18,180
Total Monitoring				**199,980**

[26] Person-months of the CSC of ongoing original Project<54005-001: Road Network Sustainability Project | Asian Development Bank (adb.org)>will be increased. A national ornithologist will be mobilized unde the CSC for this Additional Financing.

[27] The ornithologist will conduct survey for identification of bird nesting sites in cliffs which will be cut by Project Road.

VIII. INFORMATION DISCLOSURE, CONSULTATION, AND PARTICIPATION

A. General approaches

372. The objective of public information is to involve public and other relevant stakeholders from the earliest stages with the aim to consider the concerns and suggestions of stakeholders regarding likely impacts of the project during the pre-, and construction phases. The main objectives of the public information are as follows:

- Familiarize possible affected people with proposed project;
- Ensure cooperation and participation of the public in Project planning and implementation phases; and
- Establish accessible and effective grievance redress procedures.

B. Identification of Main Stakeholders

373. The primary stakeholders identified are as follows:

- Project Implementation Unit for Road Rehabilitation (PIURR) of the MoT
- Committee for Environmental Protection under the Government of Tajikistan (CEP)
- Hukumats, Jamoats and villages along the project road

C. Meaningful Consultations

374. Meaningful consultation activities should include the following elements:

- **Begins early and is carried out on an ongoing basis throughout the project cycle**. Methods for consultation and participation, and response to comments received during project preparation should be documented in the EIA/IEE. Throughout the life of the project, the borrower/client is encouraged to build upon established channels of communication and engagement with affected communities to disclose information and receive feedback on the effectiveness of mitigation measures, and affected communities' ongoing interests and concerns about the project;
- **Provides timely disclosure of relevant information**. Affected people and stakeholders should have access to relevant project information prior to any decision-making that will affect them. Relevant information includes key aspects of the assessment such as project activities and locations, identified impacts, mitigation measures, compensatory methods and amounts, and consultation and grievance mechanisms. Information should be provided in a form and language that are understandable and readily accessible to affected people;
- **Is free of intimidation or coercion**. Consultation occurs freely and voluntarily, without any external manipulation, interference, or threat of retribution, and is conducted in an atmosphere of transparency;
- **Is gender-inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups**. Consultation should be inclusive of various segments of the affected community, including both women and men, and accessible to the disadvantaged and vulnerable groups within the community. In highly stratified communities or societies, lower ranking socioeconomic groups, ethnic groups, or castes may normally have little voice in public forums, community consultations, and formal meetings with project and/or borrower/client officials. Similarly, women in some communities are censored or shamed into silence in such forums and may be spoken for by their husbands or other male relatives. These barriers to participation need to be positively addressed in a culturally sensitive manner. Ensuring consultation with and participation of women may require a separate women's consultation process and hiring female professionals to engage female stakeholders. For other excluded low -ranking

groups, separate consultations without the presence of higher ranked groups are usually needed to obtain a full picture of the needs of the poor and vulnerable, and specialists in the participation of the poor and vulnerable may be required; and

- **Requires the incorporation of relevant views of affected people and other stakeholders into project design and decision-making, including the development of mitigation and compensation measures.** It also involves communicating to affected people and other stakeholders the measures taken to address their concerns. It facilitates the sharing of development benefits and opportunities.

D. Minimum topics required during consultation meetings

375. The types and level of consultation need to be commensurate with the impacts on affected communities. However, as minimum requirement, the following topics to be included in all consultation meetings:

- **Overview of the project** – Explain relevant info about the project, including information on associated project or previous phase/s of the project, if any; schedule of implementation; etc.
- **Specific design of the project such as capacity, number of beneficiary end users, exact locations, layouts, footprints that will be utilized, etc.** – Discuss the design and components of the project in a way that can be understood by non-technical people.
- **Construction methods and labor requirements** – Discuss the design preferring local labor, if required skills are available.
- **Operational processes during operation stage of the project** – Discuss how the project will operate once it is constructed.
- **Environmental impacts expected from the project and the mitigation measures to be implemented** – Discuss all environmental impacts expected from the construction phase and operation phase of the project and enumerate the measures to be undertaken to mitigate these impacts. The presentation on this topic should provide comfort to consultees that their issues are as relevant/important and could be solved through these measures.
- **Grievance redress mechanism** – Discuss and emphasize the grievance redress process that is available under the project to facilitate any issues or complaints about the implementation, including the availability of line of communication between affected persons and project implementers (the GRM chart could be used in this case). Discuss and emphasize the access of all affected persons to information about developments on the project (e.g., contact details of contractors, CSC, executing agency, implementing agency).

1. Consultation Process in the Bokhtar - Okmazor Road Section

376. The IEE process for the Bokhtar-Okmazor road rehabilitation project includes stakeholder participation and consultation to help MoT to achieve public acceptance of the project. The purpose of the Public Consultation is 1) inform people about the project, 2) receive feedback, 3) incorporate all relevant views of affected people and other stakeholders into decision making, such as project design, mitigation measures, etc. According to ADB SPS, the Public Consultation begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle".

377. In the light of the Corvid-19 crisis, the consultation process needed to adapt to the required precautions and extra care in order to protect the consulted people, stakeholders and also the Project team against any potential spreading of the corona virus. This put a significant challenge to the consultation.

378. Although no large -scale public gathering or traditional public consultation meetings were organized for the sake of health safety reasons caused by the threat of pandemic, the final objective could be achieved, and persons directly affected by road project as well as population within project influence area have been informed on the possible social and environmental impacts and benefits of the Bokhtar-Okmazor road's rehabilitation project.

379. Based on the detailed design by Ronamo, socioeconomic surveys (SES) have been carried out to obtain the views, attitude and feedback of villagers alongside the Project Road. The villagers in the Project affected community were also informed about potential environmental impacts. The data collected during the SES consist of information on land use, income, household's assets, livestock, cropping pattern and other. For warranting objectivity and equal assessment of each affected person and household, a questionnaire format was used in the survey. The questionnaire will be annexed to the LARP. During the SES, face to face consultations were carried out with 154 persons within the time period from 23 June 2021 to 3 September 2021.

380. During the carried -out consultations, Kocks Consult GmbH national environmental expert together with PIURR and Designer's Engineer individually met with at least one mature member of each project affected household. Similarly, the owners and renters of business facilities and management of project affected legal entities, as well as other project stakeholders including Jamoat representatives, raisi mahalan (head of the village), and relevant local authorities. Public Information booklets were distributed to each and every consulted Affected Person. Instead of public gatherings, the preference was given to individual, face-to-face communication with project affected households and business owners, as well as renters and sub-renters.

381. All located Affected Persons including vulnerable and severely affected persons were individually consulted and provided with full information on project goals and objectives, expected benefits and environmental, social and LAR impacts to their land and assets. The Affected Persons learned about their rights and eligibility to compensation, compensation entitlements in accordance with ADB SPS and country legislation, GRM procedures and benefits, importance of PAPs participatory involvement if project planning and DMS, census, SES, inventory of affected assets.

382. The exercised face-to-face interaction has been proved to be a rather efficient instrument and source for sharing Project information with Affected Persons, for understanding their concerns and for answering their questions. This approach allows all Affected Persons/Affected Households to be fully informed on the project schedule, expected environmental, social and LAR impacts, benefits of GRM, eligibility to compensation and compensation entitlements. In total 154 persons were consulted within the time period from 23 June 2021 to 3 September 2021. The provided information booklet is attached in Annex 9. In addition, oral information was provided to the consulted persons about the technical properties of the Project, its social and environmental impacts and foreseen mitigation and management measures. The below table provide an overview of concerns/questions raised and answers provided.

Table 23 – Summary of questions/concerns raised during public consultation and provided answers (May to August 2020)

Concerns / questions raised	Responses provided by PIURR
When will construction start?	Construction will start after all preparatory works including all required safeguard documents are finalized and approved. After this there will be procurement. Construction start will be next year (2022).
Will there be job opportunities for the local population and villagers?	It is part of the policy of the Project's financier and of PIURR to include local people and villagers and also recruit local work force to the degree possible. However, most of the recruitments will probably be confined to unskilled work because the construction contract will be subject to international bidding and therefore companies will bring with them their own skilled workforce. The road construction is expected to also generate indirect benefits to the local job market (e.g., retail, food selling) because of the increased spending capacity brought in by foreign workforce.

Concerns / questions raised	Responses provided by PIURR
Will all affected persons be compensated for their losses? What is the amount of compensation?	All affected persons will be compensated for their loss. In this initial phase of the Project, no prices are yet fixed. Compensation will be based on the carried-out valuation and ADB principles and guidelines.
Will there be measures to protect against noise and dust emissions?	Yes. Suitable protection measures are incorporated in the Environmental Management Plan. There will also be instrumental monitoring of noise and dust during the construction phase.
Will there be measures to protect against damages from vibration?	Yes, this is also part of the Project's Environmental Management Plan.

383. In addition to the already conducted small scale consultations of affected people and households by means of face-to-face interviews, two official public consultation meetings were carried out on 16 November 2021, one in Jamoat Bustonkala and one in Jamoat Guliston of Rayon Levakant. During the meetings the participants were informed about the results of the IEE by means of a presentation. In the following question-answer session the participants had the opportunity to ask questions and raise their concerns.

384. The main concern of Project Affected People aimed on reducing the social impacts (encroachment into private assets), particularly within section 1 of the Project Road where there is an upgrade to category I (4-lane cross section). The raised concerns are taken into consideration and the design of section 1 will be adjusted to further mitigate and avoid loss of private structures by keeping the designed cross section. The below table provide an overview of concerns/questions raised and answers provided. The minutes of public consultations, photos, the list of attendees will be attached to LARP and IEE (Annex 5).

Table 24 – Summary table showing questions/concerns of affected persons and provided answers (16 November 2021)

Concerns / questions raised by affected persons	Responses provided by PIURR-ESE, engineer and Kocks Consult GmbH national environmental expert
There are many structures along the existing road which may be affected by road project, what is the category of road I-A or I-B? Do you plan to adjust road parameters to minimize project impact?	We are working to find feasible technical solutions to minimize road project impact on commercial facilities and residential dwellings as well, specifically along the section from km 0.00 to km 9.72.
When will road construction start?	Tentatively in the year of 2022.
Consideration of pedestrian underpass in the road design would have been good for better accessibility and safety of pedestrian passengers.	Your proposal will be discussed with road designer and engineers. Best to our knowledge, the road design considers underground passage.[28]
According to your design, my land parcels will be impacted by your road by 6 m in width. What will happen if that happens?	Project affected residential, commercial and agricultural land will be cash compensated for the loss of land use rights.
How will be evaluated project affected structures and fruit trees?	You all supposed to remember when together with you or adult member of your family, we conducted inventory of project affected assets, including structures and fruit bearing trees. This data is submitted for valuation to State Unitary Enterprise (SUE)to determine the amounts of compensation for your project affected assets that will allow you to purchase or construct new

[28] The design was reviewed again after the consultation. The final design does not include underpasses. It was decided to implement crossing facilities within settlements consisting of zebra-crossings, traffic lights and ramps for disabled people. In terms of pedestrian safety, the designed crossings rank is equal to underground passes.

Concerns / questions raised by affected persons	Responses provided by PIURR-ESE, engineer and Kocks Consult GmbH national environmental expert
	structure of similar size and designation. In addition, each and every fruit bearing tree is evaluated according to yield capacity, market price of specific fruit multiplied to the number of years to grow to the current productive age and added with amount sufficient to purchase sapling. Besides, you are eligible to keep the trees standing on your land parcel, once Contractor felled these trees.
Some families may not have relevant legal documents on their residential house; what happens if such house is project affected?	In such cases, you need to apply to your Jamoat for obtainment official document verifying that you are the owner of the property.
Is any cash compensation considered for land of Dehkan farm and fruit trees?	Certainly, Dehkan farms will receive cash compensation for project affected land, annual crops and fruit bearing perennials, and if any other affected assets and /or improvements are identified. In addition, a onetime allowance to cover the cost of certificate renewal will be issued as well.
Are there any culverts included in the road design? For instance, in Levakant in vicinity of the Road Asset Management office?	Drainage system is included in the road design. After double check with the engineer and review of drawings, it is confirmed that all required drainage standards are met by the design. Within section Bokhtar-Levakand, there will be three culverts implemented. The Road Asset Management Office is located at PK 417+20 and at PK 417+55 where there is a 2.0x2.0 m culvert. In our project, we reconstruct this pipe - extend it from the inlet side.
Is there any U-turn included in the road design?	Certainly, U-turns are included in the road design in compliance with Road Safety requirements and in coordination with the State Auto Inspection Agency.
It is clear that some non-fruit bearing trees (mostly “Platan”, locally called Chinar) will be affected during road works. What mitigation measures will be applied?	Replacement deciduous trees will be planted along the edges of new road as mitigation measures considered under IEE.
Can we please offer to consider underground or overground passage for passengers at three locations: a. railway station, b. Chemical Factory in Jamoat Guliston, c. in the village Eshonobod.	Within settlements the preference is often given to Traffic lights and Zebra crossings. However, your suggestion will be delivered to Management of Project Executing Agency, Engineer and Design Company to review, assess and in compliance with established standards offer the best and most efficient approach. The selected design solution for the Bokhtar-Levakant project provides one underground pedestrian crossing and two overground pedestrian crossings in the following places: - PK 0+30 – underground pedestrian crossing; - PK 20+05 - overground pedestrian crossing; - PK43+20 - overground pedestrian crossing.
Is there any water supply project aside to Road project in this area?	We cannot provide any answer to your questions, as we are only involved in Road Network

Concerns / questions raised by affected persons	Responses provided by PIURR-ESE, engineer and Kocks Consult GmbH national environmental expert
	Sustainability Project in the Republic of Tajikistan.
I am representing one of the project affected fuel stations. Is there any possibility to narrow the width of the road, amend some technical parameters to eliminate project impact from road side businesses and more importantly partially affected fuel stations, where some other operating businesses, such as shops, car repair and car wash facilities remain outside of ROW, after the main business element-fuel stations is going to be demolished and there is no space left to build a new fuel station and restore the "chain" of business we currently keep operating.	We are aware of such cases and understand the sensitivity and severity of impact. We will reassess every single case with similar impact conditions and if confirmed that remaining assets will lose economic value in coordination with affected person, the decision may be made to compensate residual land and assets in addition to assets directly affected by the given road project.

2. Future Consultations

385. Further consultations will be held prior to start of works and during project implementation by PIURR and the CSC.

3. Reporting on Consultations

386. The consultation process during the Project implementation and its results will be documented in the SAEMRs.

387. Key information that should be reported includes:

- relevant Tajikistan laws, rules and regulations;
- methodologies/means used to inform and involve the affected people and other stakeholders in the environmental assessment process;
- discussion of issues raised by various stakeholders;
- response to affected people on how the project will address concerns raised during consultation;
- continuous consultation measures to be and/or already established for the environmental management program; and
- documentation of public meetings and interviews, including dates, names, topics, summary details of discussion, and important outcomes.

E. Information Disclosure

388. ADB SPS requires the borrower to provide relevant environmental information, including IEE, SAEMRs and corrective action plan, in a timely manner, in an accessible place and in a form and language(s) understandable to affected people and other stakeholders. MoT will make the environmental assessment and other environment-related documents available in accordance with Tajikistan's and ADB requirements for disclosure. All environmental safeguards documents are subject to public disclosure, and therefore will be made available to the public.

- PIURR is responsible for ensuring that all environmental assessment documentation, including the IEE and environmental monitoring reports, are properly and systematically kept as part of PIURR project specific record;
- all environmental documents (IEE and environmental monitoring reports) are subject to local public disclosure, and will therefore be made available to public through publication on MoT website (footnote 5) and posting notices of availability of hard copy to be provided by PIURR on request in affected village communities;
- PIURR will translate the IEE into Russian and its summary into Tajik language and post them on MoT website with the full report (in English) within two weeks after ADB's clearance of the document. The website at which the IEE and the SAEMRs will be

disclosed is https://www.mintrans.tj/. The IEE will be disclosed in Russian and in English Language. The report summary will be also disclosed in Tajik language. Hardcopies of the IEE (full report in Russian and summary in Tajik) will be made available in the respective villages alongside the Project Road if requested by the affected community (see footnote 6).

- the IEE and SAEMRs have to be disclosed on ADB's website upon receipt, any update to the IEE during project implementation will be subject to ADB review and clearance before disclosure;
- PIURR will ensure that meaningful public consultations, particularly with project affected persons, are undertaken throughout preparation and implementation of the project
- PIURR will ensure relevant information and project reports are disclosed in language and form understandable by stakeholders, workers, and local communities

IX. Grievance Redress Mechanism (GRM)

A. General

389. PIURR will apply existing GRM [29] which has been effectively operating for years on infrastructure projects including those funded by the ADB. The GRM has been enforced through the Grievance Redress Committee(s) (GRCs). Considering the nature and scales of the proposed road project, three (3) GRCs (in Bokhtar, Levakant and Kushoniyon) have been legitimately established under the official letter No. 359-360 dated 6 April 2020 issued by PIURR, meaning that all processes, procedures and decisions made by GRCs are valid as equipped with relevant legal force. The composition of each GRC, the names, positions and contact phone numbers are provided below in Chapter IX. F. "Composition of Project level GRCs" on page 118.

390. However, the application of GRM in no circumstances impede any aggrieved person to access the Country's judicial or administrative remedies or ADB Accountability Mechanism.

391. Application of GRM during the entire project cycle requires several steps and instruments described below.

B. Roles and responsibilities of Focal Points

392. The Focal Point with relevant knowledge and experience has been appointed at PIURR to support smooth operation of all three project Level GRCs from the early phase of project, preparation phase.

393. The major tasks of PIURR Focal Point are not limited to the assignments listed below:

- Ensure that the relevant PIURR personnel and Project Level GRC members receive adequate training;
- Conduct/facilitate consultations with project communities and other stakeholders, as and when needed;
- All projects managed by PIURR will benefit from the input of Focal Point into development of the project communication material, such as Project Information Booklet providing information of benefits of application of GRM in case of complaints, claims or even queries.

394. Once the project becomes effective, PIURR and the CSC will conduct training for members of three Project Level GRCs. PIURR will ensure to increase the accessibility of PAPs, local communities and other project stakeholders to the remedies of GRM.

395. In order to straight forward the process of receiving and registering complaints to enable PAPs to convey their concerns to MoT and PIURR directly, or through third parties, the following instruments will be applied:

396. CSC's Social Safeguards Specialist and CSC-NES are in charge to act as Focal Point in collecting verbal/written complaints from field at any time, record and provide information and materials, if any to PIURR Focal Point. Contractor will also appoint Focal Point at the camp site. Head of communities *Raisi Mahala* appointed by Jamoats will also act as local Focal Points[30] for increased accessibility of PAPs and local communities to GRM.

397. PIURR Focal Point provides relevant instructions to other Focal Points and introduce them to the procedures required for registration of grievances.

398. Multiple intake points for grievances will be organized; PIURR will ensure installation of sufficient number of Grievance Boxes in project affected settlements and one (1) in PIURR office.

[29] Grievance Redress Mechanism (GRM) is a system based on the principles, guidelines and methodology used for resolving problems, issues, disagreements and disputes encountered under the project.

[30] The practical experience confirmed that, in rural areas, the people used to present all their complaints to the head of the community (*raisi mahala*) appointed by Jamoats or directly to the local government representative (the Jamoat). Therefore, involvement of local government in the GRM process at community level as a focal point for receiving complaints is essential.

The Grievance Boxes[31]will be regularly opened by PIURR Focal Point accompanied by CSC's Focal Point (Social Safeguards Specialist and CSC-NES). All complaints collected from multiple intake points are cumulated with PIURR Focal Point to be entered in the Grievance Log and further simple screening purposes. PIURR Focal Point will carry out simple screening to validate, assess eligibility of complaint and determine if a complaint is qualified for the GRM. All grievances found qualified (eligible) will subject to GRC review and redress procedures.

399. PIURR Focal Point will follow up to ensure:

- Planning grievance redress through organizing relevant GRCs for review and processing complaints found eligible.
- Undertake procedures for acknowledging receipt of a complaint and informing an aggrieved person about the expected timeframe for the complaint review.
- Preparation materials for GRC review and redress, calling for GRC review and communicating a complainant on the GRC decision.
- Process and update records into the main Grievance Log on progress and status of complaints redress and closures.

C. Grievance Redress Procedures

400. The GRM covers environmental and social safeguard issues.

401. In some case, especially during the construction phase, some complaints may be simple and easy to be resolved at the spot, without the need for GRC involvement. In such cases, the CSC's Social Safeguards Specialist and CSC-NES acting as project level Focal Point will register the complaint and resolution status in the grievance in its grievance tracking record. The same information will be provided to PIURR Focal Point to be entered in the main Grievance Log. This log maintained by PIURR Focal Point will contain all complaints, claims and queries together with all reported cases dealt by the GRCs.

402. Overall, during construction phase, the CSC's national Social Safeguard Specialist and CSC-NES (if needed backed up by the international specialists) will carry out the tasks necessary for processing the grievances and complaints. This information will also be reflected in SAEMRs.

403. In case the complaint may or cannot be resolved on spot and is eligible for GRC review, Team composed by PIURR Focal Point and assigned PIURR staff and project level Focal Points[32]will collect relevant information, prepare package of documents (filled out Grievance Form, photos, legal /official documents as needed) and present the documented grievance package to the GRC members for review and redress.

404. All grievances related to the Project will be addressed by Project Level GRC with the participation of this Team composed by the individuals appointed on the following positions:

- Chief Engineer, Deputy Executive Director, under PIURR
- PIURR's Social safeguard specialist
- PIURR-ESE
- CSC's Social Safeguards Specialist and CSC-NES
- Contractor's project level Focal Point
- MoT lawyer, other specialists invited as necessary
- Representatives of the local authorities (Deputy Chairman of the city/district, Chief Architect, Representative of the Land Development Committee, representative of jamoat, raisi mahalla, etc.)

[31]Grievances are collected from multiple intake points twice per month (collection form Grievance Boxes, and immediate communication if filed through multiple Focal Points in Jamoats.

[32]As described above, the PIURR Focal Point and assigned PIURR staff often require engagement of CSC and Contractor during recoding and addressing lodged grievances related to the Project.

405. GRC is the officially authorized unit to review complaints/grievances found by PIURR Focal Point as eligible to be reviewed by relevant GRC through GRM.

D. Roles and Responsibilities

406. The three (3) GRCs will function for the duration of the project implementation. PIURR and the CSC will conduct training for members of three GRCs. These three GRCs are established in compliance with the country legislation and under the PIURR letter No. 359-360, issued on 6 April 2020 and authorized to function for the entire project implementation cycle.

407. PIURR is in charge to provide the full contact details of Project Level GRC members to project affected Jamoats so that any aggrieved person can reach out the GRC in case of project related questions, concerns or complaints on environmental and social safeguard issues.

408. Grievances can be lodged with at the Jamoat through the Focal Point appointed by local government. The Jamoat's Focal Point, in consultations with PIURR Focal Point will screen the grievance for eligibility. If eligible, he/she (local Focal Point) in coordination with PIURR's Social safeguard specialist, PIURR-ESE, the CSC and Contractor will prepare relevant information (documents, photo materials, any assessment reports, if available) and provide to project Level GRC through PIURR Focal Point for review and organizing GRC meeting for complaint review and redress.

409. The complaint registered through GRM should be reviewed, addressed and a decision made on its relevancy to the Project within 14 calendar days after the lodgement. 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.

410. All supporting documents such as photographs, related certificates and legal and technical expert opinions, if required, should be prepared, reviewed and assessed by the relevant GRC.

411. Once the complaint is resolved, the GRC will organize a complaint closure meeting, where the complainant confirms the closure of the complaint. PIURR representative will oversee the resolution of the complaint.

E. Grievance Resolution Process by Project Level GRCs

Steps	Process
Step 1	– The complaint obtained from multiple intake places are provided to the PIURR Focal Point at the intake place. – Complaint subject to simple screenings and recorded in the Grievance Log. – Complaint is reviewed, site visited, resolved on spot and closed. – Relevant information of complaint is recorded in local grievance tracking record and same information is provided to PIURR Focal Point, who enters the data into the main Grievance Log. – If the complaint is not resolved on spot, the next step actions are required
Step 2	– PIURR Focal Point evaluates the complaint to determine eligibility to GRM and enters relevant record in the main Grievance Log. – Meanwhile: – If the complaint is not eligible to GRM application relevant notification is provided to the complainant; – If the complaint is found eligible to GRM application, PIURR Focal Point in coordination with local Focal Point first recoding the complaint and together with PIURR's Social safeguard specialist, PIURR-ESE, CSC's Social Safeguards Specialist, CSC-NES, and other Focal Points from relevant local government plans the site visit, meets with the complainants and collects all available and necessary information and prepares the package of documents on complaint to be provided to GRC for review and redress.

Steps	Process
	– PIURR Focal Point in coordination with PIURR's Social safeguard specialist and PIURR-ESE obtain the GRC complaint review date and ensures complainant is informed to participate, if needed. – The GRC will prepare decision on complaint redress status within 14 calendar days since the lodgment date. – If the case is complicated, the GRC may request more days (up to 30 days) and involves extra experts, as needed. In such cases, PIURR Focal Point provides relevant notification to complainant with expected date of GRC decision. – Once the complaint is resolved, the complaint closure documentation is prepared and processed. The statement signed by the complainant is enclosed and the files are saved with PIURR. Relevant record is entered in the main Grievance Log.

412. All efforts will be made to settle issues at GRC. However, regardless the established GRM 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.

413. In addition, an aggrieved person may bring a grievance to ADB Accountability Mechanism for consideration. If PAPs want to register a complaint with the ADB, Focal Points of the GRCs will inform the complainants that they can refer their complaints through the ADB Tajikistan Resident Mission for proper coordination with the responsible project officer and relevant staff. Alternatively, the complainants may access the ADB Accountability Mechanism through its Complaint Receiving Officer (CRO) which will then forward it to either the Office of the Special Project Facilitator (OSPF) for facilitation of complaint resolution, or to the Office of the Compliance Review (OCRP) in case of allegation of ADB's violation to its operational policies and procedures. The Focal Point will provide the complainants the following contact information:

Resident Mission of Asian Development Bank in Republic of Tajikistan
45 Sovetskaya Street, Dushanbe, Tajikistan
Tel: 992 372 210558/271895/271897
Complaint Receiving Officer (CRO), Accountability Mechanism
Asian Development Bank
ADB Headquarters, 6 ADB Avenue, Mandaluyong City 1550, Metro Manila, Philippines
Tel. +63 2 4444 loc. 70309, Fax + 63 2 636 2086, E-mail: amcro@adb.org

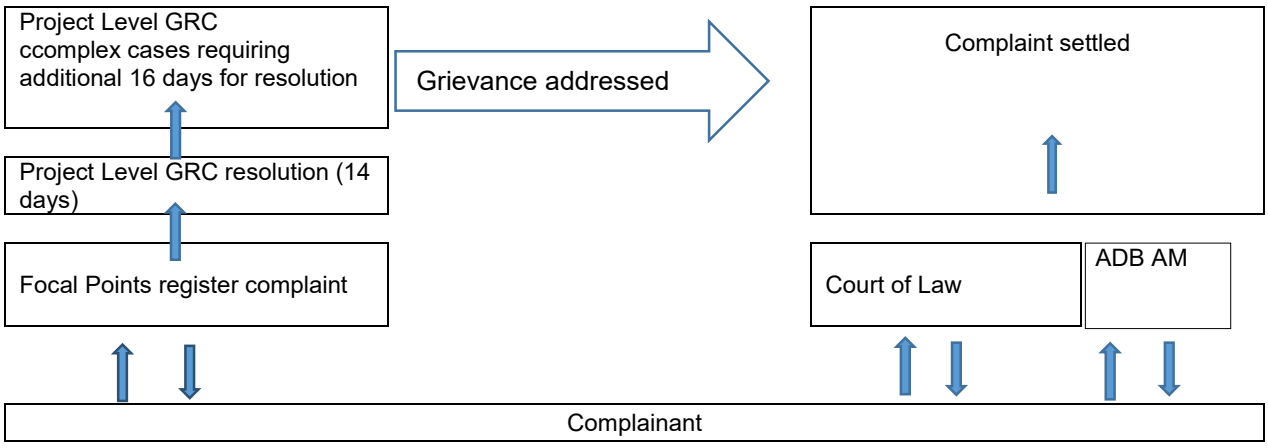


Figure 33 – Grievance Resolution Process

F. Composition of Project level GRCs

414. Three GRCs will be operating through the entire project cycle. The composition of the three GRCs is provided below. The number of GRC may be odd or even. The complaint is either upheld or dismissed based on the decision of the GRC based on the findings of a complaints review by the GRC. The individual names of GRC members are specified according to those appointed on that specific position for the moment of grievance review. In addition, the above members of the GRC are involved depending on the nature of the complaint and the scope of the complaint.

Table 25 -Composition of Project Level GRC operating in Bokhtar

Full Name	Position	E-mail	Phone
Muhammadjonzoda D.	Deputy Chairmen of Bokhtar City-Chairman of the Committee	N/A	2-40-7 2-40-76
Yatimzoda B.	Head of the Department of Architecture and Urban Planning Committee Secretary	N/A	905-35-919
Komilzoda A.	Chairman of City Land Management Committee	N/A	2-29-55
Khalilzoda Sh.	Head of the Department of Environmental Protection of the city	N/A	2-8654 559-82-09-09
Sharifzoda I.	Head of city electric networks	N/A	93-585-07-07
Abdulloev N.	Chief Engineer of the city gas supply department	N/A	2-24-74
Vatanzoda H.	Head of the state subsidiary «Registration of immovable property	N/A	900-10-40-00
Yarov A.	Head of KDF City Water Supply and Sewerage	N/A	N/A

Table 26 -Composition of Project Level GRC operating in Kushoniyon

Full Name	Position	E-mail	Phone
Safarzoda Sh.	Deputy Chairmen of Kushoniyon City	N/A	901-00-50-11
Yusupov E.	Head of the Department of Architecture and Urban Planning of Kushoniyon district-Committee Secretary	N/A	93-315-44-44
Alizoda A.	Chairman of Kushoniyon District Land Management Committee	N/A	915-79-44-44 918-50-43-44
Ergashev N.	Head of the District Department of Environmental Protection	N/A	93-506-39-39
Kasirov N.	Head of city electric networks	N/A	987-28-00-65
Sindbody A.	Head of the state subsidiary «Registration of immovable property	N/A	918-61-99-84
Imomov B.	Head of the Department for land improvement and irrigation	N/A	93-424-27-67
Ravshanzoda A.	Haed of City Water Supply and Sewerage Department	N/A	882-00-00-10 918-27-00-27
Satorov J.	Head of village drinking water department	N/A	N/A

Table 27-Composition of Project Level GRC operating in Levakant

Full Name	Position	E-mail	Phone
Kabirzoda N.	First Deputy of Mayer of t. Levakant	N/A	904-43-21-87
Faizgulzoda A.	Chairman of land management committee	N/A	904-57-10-01
Iusufov M.	Head of the Architecture and Urban Planning Department o t. Levakant	N/A	907-12-54-44
Abosov Sh.	Head of Environmental Department of t. Levakant	N/A	909-79-80-44
Khalimzoda S.	Chairman of Jamoat Guliston	N/A	908-89-31-89
Sultonov F.	Chairman of Jamoat Vakhdat	N/A	905-01-31-81

Table 28 - Representatives of PIURR

Khabibuloev Dilovar	**Temurzoda Sherali**	**Shakirova Sharis**
- Project Manager of Bokhtar-Dangara road project - 14 Ayni Street, 4th Floor, Dushanbe. Tajikistan - Tel: +992 90 788 30 98 - Email: dilovar_khabib@mail.ru	- Lead Resettlement specialist of PIURR - 14 Ayni Street, 4th Floor, Dushanbe. Tajikistan - Tel: +992 (37) 222 20 78 - +992 900 53 44 44 - +992 933 09 40 03 - Email: sherali@piu.tj	- Main specialist on Environmental issues (PIURR-ESE) - 14 Ayni Street, 4th Floor, Dushanbe. Tajikistan - Tel: +992 (37) 222 20 78 - +992 110 003 151 - Email: Sharis_piurr@mail.ru

G. GRC at higher level

415. Within the framework of the project, there might be issues of wider scope, beyond the project related complaints of environmental and social safeguards. Such issues are reviewed and resolved on the higher level and through the commission called on the level of MoT supported by the representatives of relevant state agencies engaged according to the nature of the issue, request of complaint. The Commission is usually complied with individuals by then appointed to the following positions in PIURR:

A. Project Manager - PIURR Focal Point
B. Deputy Executive Director of PIURR
C. PIURR-ESE
D. PIURR Social Safeguards Specialist
E. Invited member of Project Level GRC (as needed)
F. Invited technical experts of CSC and contractor (as needed)
G. Representatives of relevant National/local state agencies (as needed)

416. When requested by PIURR to provide technical expertise for the assessment of an impact claimed by the complainant, the relevant expert will: (a) examine the case, perform relevant tests or an investigation; (b) prepare a short report based on the results of the examination completed; and (c) recommend if further or additional legal opinion or expertise is needed to make a judgement on the substance of the case.

H. GRC Complaint Register, Records and Documentation

417. PIURR Focal Point will maintain the Grievance Log. This will include a record of all complaints, either eligible or ineligible, both resolved on spot or those resolved through GRC involvement, for regular monitoring of grievances and results of services performed by the GRCs. The summary will be reported to ADB through SAEMRs.

X. CONCLUSION AND RECOMMENDATIONS

418. This is the Initial Environmental Examination (IEE) report for the reconstruction of the Bokhtar-Okmazor road section.

419. In terms of its environmental impacts the Project is ranked as category B. It involves the reconstruction of an existing road. Based on the traffic load and traffic forecast, the road has been divided into two sections which also differ in terms of the magnitude of impacts.

420. In section 2 (km 0+000 – 9+700), the Project Road will be upgraded to category I. Hence a strip of approximately 15 m to both sides of the Project Road will be physically impacted and natural and human structures within this strip will be lost. During the carried -out surveys, no valuable ecological structures or habitats were identified within this strip which cannot be restored.

421. In Section 2, the rehabilitation will be carried out on the already existing alignment and confined to the existing RoW as far as technically feasible. No spatial alternatives are foreseen. There might be only minor alignment shifts due to need for compliance with design parameters such as gradient or radius. Therefore, there is only little physical encroachment within this section and the anticipated environmental and social impacts are for the most generic and site specific and therefore such kind of impacts that occur in all types of road reconstruction Projects. They are mostly temporary limited to the construction phase.

422. After construction, during operation phase, there will remain only low negative impacts as compared to the existing situation. This is because the road reconstruction scheme follows the existing alignment over most of its length. No valuable or protected natural habitats or other valuable environmental structures are significantly impacted after finalization of construction period, neither in their structure nor function. There will be mostly beneficial impacts.

423. The positive impacts therefore by far outweigh the likely environmental and social risks as the Project will bring mostly positive impacts to the people living in the villages alongside the Project Road and beyond. The currently existing unacceptable bad road conditions which hinders economic development and access to essential infrastructure facilities like education, medical treatment and markets will significantly improve. This will bring great benefits to the people living in the villages alongside the Project corridor. In addition, there will be better road safety conditions and smoother traffic flow which enhances driving comfort on the Project Road and also brings safety benefits to the people living alongside the Project Road.

424. In the light of the Corvid-19 crisis, the consultation process needed to adapt to the required precautions and extra care in order to protect the consulted people, stakeholders and also the Project team against any potential spreading of COVID-19. This put a significant challenge to the consultation. Although no large-scale public gathering or traditional public consultation meetings were organized in May-August 2020 for the sake of health safety reasons caused by the threat of pandemic, the final objective can be achieved, and persons directly affected by road project as well as population within project influence area are being informed on the possible social and environmental impacts and benefits of the Bokhtar-Okmazor road's rehabilitation project. Project affected persons and stakeholder met during the SES are handed out a brochure which informs about the Project, its impacts and benefits.

425. In addition, two public consultation meetings were carried out on 16 November 2021, one in Jamoat Bustonkala and one in Jamoat Guliston of Rayon Levakant. During the meetings the participants were informed about the results of the IEE and took the opportunity to ask questions and raise concerns. The main concern of Project Affected People was on reducing the social impacts (encroachment into private assets), particularly within section of the Project Road where there is an upgrade to category I (4-lane cross section). The raised concerns are taken into consideration and the design of the relevant section will be adjusted to further mitigate and avoid loss of private structures by keeping the designed cross section.

426. The IEE contains an EMP and an EMoP which need to be carried out during pre-construction, construction and operation phases. In addition, the contractor is required to prepare SSEMPs. In order to warrant duly implementation of the prescribed measures, a competent environmental and social supervision during the construction phase is strongly recommended.

427. SSEMPs need to be prepared by the contractor's ESO and HSO based on the stipulations of the EMP in this IEE. The CSC's team will be strengthened by CSC-NES, CSC-IES, and an ornithologist who will closely work together with PIURR to warrant implementation of EMP and EMoP. For quality assurance, PIURR safeguard team need to be offered training and seminars as required. This is reflected in the cost estimate for the Project implementation.

A. Conclusion

428. The project is unlikely to cause significant adverse impacts. The potential impacts that are associated with design, construction and operation can be mitigated to acceptable levels without difficulty through proper engineering design and the incorporation or application of recommended mitigation measures and procedures. Based on the findings of the IEE, there are no significant impacts and the classification of the project as Category "B" is confirmed.

B. Recommendations

429. The following are recommendations applicable to the project to ensure no significant impacts:

(i). Obtain all statutory clearances at the earliest time possible and ensure conditions/provisions are incorporated in the detailed design;
(ii). Include this IEE, or update thereof, with the EMP in bid and contract documents;
(iii). Prepare SSEMP based on site-specific conditions, contractors working methodology;
(iv). Update/revise the IEE/EMP if there are unanticipated impacts;
(v). Ensure that the existing materials to be demolished/dismantled are tested for hazardous contents and Spoils management plan and Waste Management Plan for handling, storage, transport, and disposal of the wastes is prepared by contractors as part of the SSEMP, approved by PIURR and the CSC, and strictly monitored during project implementation.
(vi). Ensure that wastes (solid and liquid) should be stored and disposed at designated site/facility (dumping on vacant lot is not allowed);
(vii). Conduct safeguards induction to the contractor upon award of contract;
(viii). Strictly supervise EMP implementation;
(ix). Ensure contractor appointed qualified ESO and HSO prior to start of works;
(x). Documentation and reporting on a regular basis as indicated in the IEE;
(xi). Continuous consultations with stakeholders;
(xii). Ensure consultations and focus group discussions are undertaken prior to start of works and incorporate measures to address relevant concerns in SSEMP;
(xiii). Timely disclosure of information and establishment of GRM in language and form understandable by stakeholders;
(xiv). Involvement of contractors, including subcontractors, in the first level GRM;
(xv). Commitment from PIURR, MoT, CSC, and contractors to protect the environment and the people from any impact during project implementation.

Annex 1 - REPORT ON WATER QUALITY

Rehabilitation of 70 km Bokhtar-Okmazor-Dangara road[33]

Prepared by: Rustamov Egamberdi
Khudoyorov I., Odinabekov T.

Instrumental baseline report on environmental impact, water quality monitoring, GPS testing

Dushanbe – 2020

[33] Note: The expertise on water quality covers the road segment Bokhtar- Okmazor- Dangara. This is because initially Bokhtar-Okmazor-Dangara was one Project. Later it was splitted into two Projects, Bokhtar-Okmazor and Okmazor-Dangara.

LIST OF ABBREVIATIONS

CEP RT – Committee for Environmental Protection under the Government of Tajikistan

IEM – Initial Environmental Monitoring

EMP – Environmental Management Plan

MPC – Maximum permissible concentration

FIP – Fish industry purposes

BOD – Biological oxygen demand

MPL - Maximum permissible level

AMC - Analytical Monitoring Center

Figure 34 - basic laboratory of the CAC

Environmental monitoring of water resources was carried out in accordance with the legal framework of the Law on Environmental Protection of Tajikistan and the Water Code of Tajikistan

Criteria for assessing the quality of water ecosystems

- Criteria for quality assessment are any set of quantitative indicators characterizing the properties of the objects under study and used for their classification or ranking. Quality assessment of freshwater reservoirs is carried out on three main aspects, including the following sets of indicators:
- factors related to the physical-geographical and hydrological description of the reservoir as an integral natural or water management facility;
- monitoring indicators of the composition and properties of the water environment that provide a formalized assessment of quality of water and its compliance with existing regulations;
- a set of criteria that assess the specifics of the structural and functional organization of hydrobionts and the dynamics of the development of water biocenoses.
- The main water object in the project area is the Vakhsh River, the main tributary of the Amudarya River.

A. **INTRODUCTION**

This report covers the element of Initial environmental monitoring (IEM) of the environment in the area of impact by the Bokhtar-Okmazor-Dangara road rehabilitation Project.

B. **MONITORING OBJECTIVES**

- Water quality analysis;
- GPS testing;

Assessment and documentation of the results of the initial environmental survey in the area of influence and construction of the new Dangara–Okmazor-Bokhtar road.

The work was carried out from 20th to 25th June 2020.

C. **SCOPE OF THE STUDY AS PART OF THE INITIAL ENVIRONMENTAL MONITORING**

Quality of water

21 water samples were collected for chemical analysis to obtain baseline data:

1.Km 0+00 Dangara–Okmazor-Bokhtar ring road. The channel of the Vakhsh river

2.Near the entrance to the dehkan farm 'Buston', diversion canal

3.50m above the bridge, Somin village, state farm, diversion canal

4.50m below the bridge, Somin village, state farm, diversion canal

5.50m above channel of Vakhsh river, along the project road near Orzu restaurant

6.50m below channel of Vakhsh river, along the project road near Orzu restaurant

7.50m above Tabakchi village, diversion canal

8.50m below Tabakchi village, diversion canal

9.Bridge, km 10 + 500, discharge into canal

10. 50m above the project road, km 59 + 500, small river

11. 50m below the project road, km 59 + 500, small river

12. Km 59+500, spring

13. Km 64 + 500, exit from Mekhtor village, irrigation inlet

14. Km 65 + 600, project road, discharge, dehkan farm S. Gulmurodov.

15. Cooperative farm 'Mukhsindzhon', irrigation inlet canal

16. 50m above diversion canal, near a pump station

17. 50m below diversion canal, near a pump station

18. Irrigation canal, near Form-Tex factory, on the right side of the road

19. Irrigation canal, discharge, near Form-Tex factory, on the left side of the road

20. Irrigation canal, near 'Arabzade' asphalt plant

21. Irrigation canal, road junction A-385.

D. ENVIRONMENTAL LAWS OF THE REPUBLIC OF TAJIKISTAN

Table 29 - ENVIRONMENTAL LAWS

№ п/п	Title of the document	When a document is approved
1.	Law of the Republic of Tajikistan “On Environmental Protection”	August 2, 2011
2.	Law of the Republic of Tajikistan “On Environmental Expertise”	April 16, 2012
3.	Law of the Republic of Tajikistan “On Air Protection”	December 28, 2012
4.	Law of the Republic of Tajikistan “On Environmental Monitoring”	March 25, 2011
5.	Water Code of RT	October 20, 2000
6.	Law of the Republic of Tajikistan “On Drinking Water and Drinking Water Supply”	December 29, 2010

E. ENVIRONMENTAL MONITORING

1. Water quality monitoring

Tajikistan builds its policy in the field of water relations based on the need for sustainable development of the country's economy, environmental security, compliance with the principles of international law and enhancement of cooperation.

Priorities in rational use and protection of water resources are defined in the "Concept for rational use and protection of water resources in Tajikistan", approved by the Government of Tajikistan (2001).

The chemical composition of water in Vakhsh river remains constant, with a hydro carbonate class of the calcium group. According to the concentration of dissolved substances, Vakhsh river belongs to the freshwater group.

Figure 35 - Water sampling, Bokhtar, diversion canal.

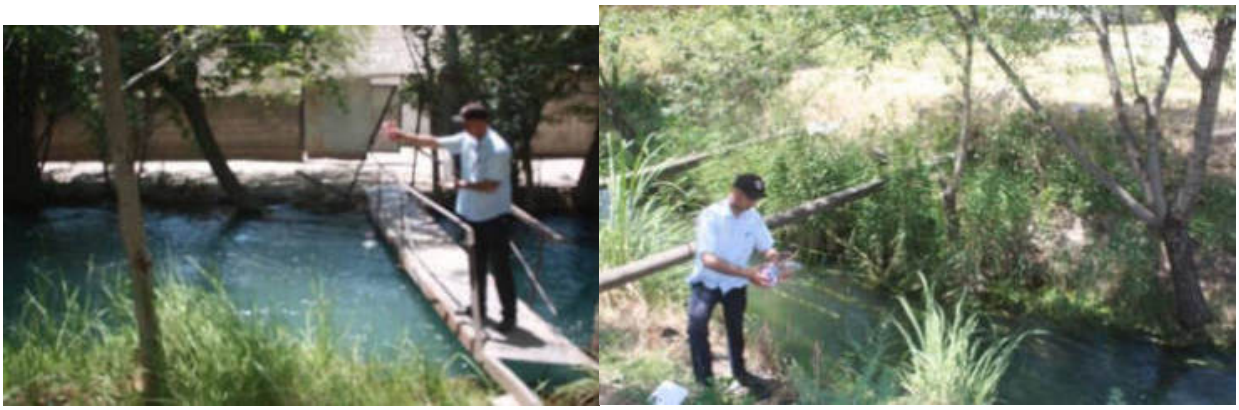


Figure 36 - Conducting a chemical analysis of water in the laboratory.

This report is a survey of the environment prior to the construction and rehabilitation phase of 73 km of the Dangara–Okmazor-Bokhtar highway to obtain baseline data.

Figure 37 - Certificate of accreditation


СИСТЕМАИ МИЛЛИИ АККРЕДИТАТСИЯИ
ҶУМҲУРИИ ТОҶИКИСТОН
МУАССИСАИ ДАВЛАТИИ
«МАРКАЗИ МИЛЛИИ ОИДА АККРЕДИТАТСИЯ»
АТТЕСТАТИ
АККРЕДИТАТСИЯИ ОЗМОИШГОХ
№ TJ 762.37100.02.061-2019
Маркази назорати тахлили Кумитаи хифзи мухити зисти назди Хукумати Ҷумҳурии Тоҷикистон
шахри Душанбе, кучаи Шамсй-5/1,
Директор
Ҷумазода Б. Х.

2. Equipment

Figure 38 - Conductivity meter, Bathometer, Titrometer, pH – meter, Spectrophotometer.

3. Analysis methodology

Water samples taken at approved locations were delivered to the laboratory of the Analytical Control Center of the Committee for Environmental Protection under the Government of Tajikistan in Dushanbe for analysis.

The samples were analyzed using standardized chemical and physical-chemical methods:

- Drinking water. GOST – 2874-82.
- Drinking water, field methods of analysis. GOST – 1030-81.
- Unified methods of water quality research, Part 1.
- Methods of chemical analysis of water, volume 1, Moscow, - 1987.
- Unified methods of water quality research, Part 2.
- Methods of chemical analysis of water, volume 2, Moscow, - 1983.
- Monitoring parameters:
- Mineralization
- Electrical conductivity
- BOD 5
- Petroleum products
- Data on equipment and calibration
- pH – potentiometric methods on a pH meter of grade pH Level-1
- Suspended substances, dry residue, oil products were determined by weight (gravimetric) method: based on the weight of Japanese production (Shimadzu).
- BOD 5 – by the tetra metric method
- Conductivity - by a conductometer manufactured in India
- Nitrates, nitrites, ammonium, chlorine - by a spectrophotometer.

F. Conclusion

Based on the results of the chemical analysis of water samples in the project impact area, we came to the following conclusion:

- At the time of monitoring of significant anthropogenic and industrial impact in the project impact area.
- Chemical analysis of the water quality of the canals, the river "Posyolok" meets the requirements of GOST 2874-84, established for drinking needs.
- The results of the analysis showed that some indicators exceed the norms of drinking water and fishery standards at the maximum permissible concentration. On mineralization, samples No.10 - 1.3 and No. 11 -1.3 times, on BOD 5 (biological oxygen demand) samples No.10 - 2.8 times, samples No. 11 - 2.5 times, samples No. 15 - 1.4; on turbidity, samples No.10 - 800.9, samples No.11 - 800.6, samples No.15 - 29.8, samples No.16 - 15.0 and samples No.17 - 14.7 times the norms of drinking water. On suspended solids, samples No. 10 - 1130.6, samples No.11 - 1159.6, samples No.14 - 8.8, samples No.15 - 8.5. Samples No.16 - 5.4 samples No.17 - 5.3 times higher than fishery standards.
- Long-term observations show that the small river is in trouble at 59 + 500, the suspended matter concentration and turbidity in its tributaries are seasonal, especially in the flood period, and the location of the small river is clayey. Excess of the maximum allowable concentration in terms of mineralization is background contamination.

  Pollution in water basin

- The main sources of pollution in the water basin are wastewater from washing plants containing suspended solids and oil products, wastewater from industrial sites containing heavy metals, acids, alkalis, paint, and solvents.

Table 30 - The result of water quality analysis

№	Sampling location	Latitude	Longitude	Name of ingredients	Standard of Tajikistan (MPC)		Actual
					Domestic sanitary	Fishery	
1	Km 0+00 Dangara–Okmazor-Bokhtar ring road. Canal	$37^{0}50.434^{1}$	$0{,}68^{0}.48.483^{1}$	pH	6.5 – 8.5		7.1
				Temperature^{0}C		7.4	13.3
				Suspended substances, mg / l	0.25	0.75	0.41
				Petroleum products, mg / l	0.05	550	
				Mineralization, mg / l	1000	-	610,0
				BOD_5, mg O / l	3.0	3.0	1.8
				Turbidity, mg / l	1.5	-	3.8
				Electricalconductivity, O / cm		720	480
2	Near the entrance to the dehkan farm ‘Buston’, diversion canal.	$37^{0}.50.533^{1}$	$068^{0}49.262^{1}$	pH	6.5 – 8.5		7.2
				Temperature^{0}C			14.2
				Suspendedsubstances, mg / l	0.25	0.75	0.35
				Petroleum products, mg / l	0.05	0.05	
				Mineralization, mg / l	1000	1000	614.0
				BOD_5, mg O / l	3.0	3.0	1.6
				Turbidity, mg / l	1.5	-	3.7
				Electrical conductivity, O / cm	-	-	540
3	50m above the bridge, Somin village, state farm, diversion canal	$37^{0}.50.669^{1}$	$068^{0}.50.446^{1}$	pH	6.5 – 8.5		8.2
				Temperature^{0}C			13.2
				Suspended substances, mg / l	0.25	0.75	2.4
				Petroleum products, mg / l	0.05	0.05	0.01
				Mineralization, mg / l	1000	1000	890
				BOD_5, mg O / l	3.0	3.0	3.4
				Turbidity, mg / l	1.5	-	8.2
				Electrical conductivity, O / cm	-	-	840
4	50m below the bridge, Somin village, state farm, diversion canal	$37^{0}.50.620^{1}$	$068^{0}.50.044^{1}$	pH	6.5 – 8.5		8.1
				Temperature^{0}C			13.0
				Suspended substances, mg / l	0.25	0.75	2.6
				Petroleum products, mg / l	0.05	0.05	0.01
				Mineralization, mg / l	1000	1000	890
				BOD_5, mg O / l	3.0	3.0	3.1
				Turbidity, mg / l	1,5	-	7.9
				Electrical conductivity, O / cm	-	-	560
5	50m above channel of Vakhsh river, along the project road			pH	6.5 – 8.5		7,1
				Temperature^{0}C			12.4
				Suspended substances, mg / l	0.25	0.75	1.2
				Petroleum products, mg / l	0.05	0.05	
				Mineralization, mg / l	1000	1000	570

		$37^0.50.665^1$	$068^0.51.216^1$	BOD_5, mg O / l	3.0	3.0	2.4
				Turbidity, mg / l	1,5	-	1.2
				Electrical conductivity, O / cm	-	-	255
6	50m below channel of Vakhsh river, along the project road near Orzu restaurant	$37^0.50.627^1$	$068^0.51.210^1$	pH	6.5 – 8.5		7.81
				Temperature^{0}C			12.4
				Suspended substances, mg / l	0.25	0.75	1.3
				Petroleum products, mg / l	0.05	0.05	
				Mineralization, mg / l	1000	1000	570
				BOD_5, mg O / l	3.0	3.0	2.1
				Turbidity, mg / l	1.5	-	1.4
				Electricalconductivity, O / cm	-	-	315
7	50m above Tabakchi village, diversion canal	$37^0.51.502^1$	$068^0.53.731^1$	pH	6.5 – 8.5		7.4
				Temperature^{0}C			13.2
				Suspendedsubstances, mg / l	0.25	0.75	1.6
				Petroleum products, mg / l	0.05	0.05	
				Mineralization, mg / l	1000	1000	420
				BOD_5, mg O / l	3.0	3.0	2.7
				Turbidity, mg / l	1.5	-	3.8
				Electricalconductivity, O / cm	-	-	280
8	50m below Tabakchi village, diversion canal	$37^0.51.626^1$	$068^0.54.939^1$	pH	6.5 – 8.5		7.3
				Temperature^{0}C			14.0
				Suspendedsubstances, mg / l	0.25	0.75	8.1
				Petroleum products, mg / l	0.05	0.05	
				Mineralization, mg / l	1000	1000	440
				BOD_5, mg O / l	3.0	3.0	2.8
				Turbidity, mg / l	1.5	-	4.3
				Electrical conductivity, O / cm	-	-	320
9	Bridge, km 10 + 500, discharge into canal	$37^0.51.606^1$	$068^0.54.872^1$	pH	6.5 – 8.5		7.1
				Temperature^{0}C			13.7
				Suspended substances, mg / l	0.25	0.75	6.1
				Petroleum products, mg / l	0.05	0.05	
				Mineralization, mg / l	1000	1000	380
				BOD_5, mg O / l	3.0	3.0	2.6
				Turbidity, mg / l	1.5	-	9.4
				Electrical conductivity, O / cm	-	-	280
10	50m above the project road, km 59 + 500, small river	$38^0.03.990^1$	$069^0.14.188^1$	pH	6.5 – 8.5		8.3
				Temperature^{0}C			15.7
				Suspended substances, mg / l	0.25	0.75	848.0
				Petroleum products, mg / l	0.05	0.05	0.035

				Mineralization, mg / l	1000	1000	1320
				BOD_5, mg O / l	3.0	3.0	8.4
				Turbidity, mg / l	1.5	-	1200
				Electrical conductivity, O / cm	-	-	920
11	50m below the project road, km 59 + 500, small river	$38^0.03.968^1$	$069^0.14.240^1$	pH	6.5 – 8.5		8.4
				Temperature^{0}C			13.2
				Suspended substances, mg / l	0.25	0.75	869.7
				Petroleum products, mg / l	0.05	0,05	0.035
				Mineralization, mg / l	1000	1000	1310
				BOD_5, mg O / l	3.0	3.0	8.1
				Turbidity, mg / l	1.5	-	1195
				Electrical conductivity, O / cm	-	-	925
12	Km 59+500, spring	$38^0.03.983^1$	$069^0.14.248^1$	pH	6.5 – 8.5		6.8
				Temperature^{0}C			18.7
				Suspended substances, mg / l	0.25	0.75	0,7
				Petroleum products, mg / l	0.05	0.05	
				Mineralization, mg / l	1000	1000	140
				BOD_5, mg O / l	3.0	3.0	1.6
				Turbidity, mg / l	1.5	-	1.6
				Electricalconductivity, O / cm	-	-	318
13	Km 64 + 500, exit from Mekhtorvillage, irrigation inlet	$38^0.03.891^1$	$069^0.17.154^1$	pH	6.5 – 8.5		7.6
				Temperature^{0}C			12.1
				Suspendedsubstances, mg / l	0.25	0.75	1,6
				Petroleum products, mg / l	0.05	0.05	
				Mineralization, mg / l	1000	1000	240
				BOD_5, mg O / l	3.0	3.0	2.8
				Turbidity, mg / l	1.5	-	76.4
				Electricalconductivity, O / cm	-	-	380
14	Km 65 + 600, project road, discharge, dehkan farm S. Gulmurodov	$38^0.03.923^1$	$069^0.17.981^1$	pH	6.5 – 8.5		7.11
				Temperature^{0}C			19.1
				Suspendedsubstances, mg / l	0.25	0.75	7.4
				Petroleum products, mg / l	0.05	0.05	
				Mineralization, mg / l	1000	1000	340
				BOD_5, mg O / l	3.0	3.0	2.9
				Turbidity, mg / l	1.5	-	79.1
				Electrical conductivity, O / cm	-	-	287
15	Cooperative farm ‘Mukhsindzhon’, irrigation inlet canal	$38^0.03.865^1$	$069^0.18.400^1$	pH	6.5 – 8.5		7.6
				Temperature^{0}C			15.2
				Suspended substances, mg / l	0.25	0.75	6.4
				Petroleum products, mg / l	0.05	0.05	0.018
				Mineralization, mg / l	1000	1000	290
				BOD_5, mg O / l	3.0	3.0	3.4
				Turbidity, mg / l	1.5	-	44.8

				Electrical conductivity, O / cm	-	-	380
16	50m above diversion canal, near a pump station	$38^0.03.818^1$	$069^0.18.807^1$	pH	6.5 – 8.5		7.7
				Temperature^{0}C			13.2
				Suspended substances, mg / l	0.25	0.75	4.2
				Petroleum products, mg / l	0.05	0.05	
				Mineralization, mg / l	1000	1000	320
				BOD_5, mg O / l	3.0	3.0	2.8
				Turbidity, mg / l	1.5	-	22.6
				Electrical conductivity, O / cm	-	-	420
17	50m below diversion canal, near a pump station	$38^0.03.883^1$	$069^0.18.996^1$	pH	6.5 – 8.5		7.8
				Temperature^{0}C			13.1
				Suspended substances, mg / l	0.25	0.75	4.1
				Petroleum products, mg / l	0.05	0.05	
				Mineralization, mg / l	1000	1000	310
				BOD_5, mg O / l	3.0	3.0	2.6
				Turbidity, mg / l	1.5	-	21.8
				Electrical conductivity, O / cm	-	-	410
18	Irrigation canal, near Form-Tex factory, on the right side of the road	$38^0.03.831^1$	$069^0.19.000^1$	pH	6.5 – 8.5		7.11
				Temperature^{0}C			16.2
				Suspended substances, mg / l	0.25	0.75	0.49
				Petroleum products, mg / l	0.05	0.05	
				Mineralization, mg / l	1000	1000	260
				BOD_5, mg O / l	3.0	3.0	2.4
				Turbidity, mg / l	1.5	-	1,8
				Electrical conductivity, O / cm	-	-	345
19	Irrigation canal, discharge, near Form-Tex factory, on the left side of the road	$38^0.03.891^1$	$069^0.17.154^1$	pH	6.5 – 8.5		8.1
				Temperature^{0}C			16.1
				Suspended substances, mg / l	0.25	0.75	0.81
				Petroleum products, mg / l	0.05	0.05	0.013
				Mineralization, mg / l	1000	1000	420
				BOD_5, mg O / l	3.0	3.0	2.9
				Turbidity, mg / l	1.5	-	8.8
				Electrical conductivity, O / cm	-	-	560
20	Irrigation canal, near ‘Arabzade’ asphalt plant	$38^0.04.538^1$	$069^0.20.474^1$	pH	6.5 – 8.5		7.8
				Temperature^{0}C			13.1
				Suspended substances, mg / l	0.25	0.75	1.6
				Petroleum products, mg / l	0.05	0.05	0.026
				Mineralization, mg / l	1000	1000	360
				BOD_5, mg O / l	3.0	3.0	3.4
				Turbidity, mg / l	1.5	-	2.8
				Electrical conductivity, O / cm	-	-	480
21	Irrigation canal, road junction A-385.			pH	6.5 – 8.5		7.4
				Temperature^{0}C			13.9

		$58^0.04.571^1$	$069^0.20.542^1$				
				Suspended substances, mg / l	0.25	0.75	1.2
				Petroleum products, mg / l	0.05	0,05	
				Mineralization, mg / l	1000	1000	240
				BOD_5, mg O / l	3.0	3.0	2.4
				Turbidity, mg / l	1.5	-	1.6
				Electrical conductivity, O / cm	-	-	360

Notes:

Maximum permissible concentration (MPC) in the water of a reservoir of economic and domestic water use (MPC в) - the concentration of a harmful substance in water, which should not have a direct or indirect effect on the human body throughout his life and on the health of subsequent generations and should not worsen the hygienic conditions of water use.

MPC in water of a reservoir used for fisheries purposes (MPC) - the concentration of a harmful substance in water, which should not have a harmful effect on fish populations, primarily commercial ones.

Maximum permissible discharge (MPD) - the mass of substances in wastewater, the maximum allowed for discharge with the established regime at this point of the water facility per unit of time to ensure water quality standards in a monitoring point.

Annex 2 - REPORT ON AIR QUALITY AND NOISE

Rehabilitation of 70 km Bokhtar-Okmazor-Dangara road

Executor: Rustamov Egamberdi
Odinabekov Tillokhon.

Instrumental baseline report on environmental impact, air quality inspection, noise measurement, GPS testing

Dushanbe – 2020

LIST OF ABBREVIATIONS

CEP RT – Committee for Environmental Protection under the Government of Tajikistan

IEM – Initial Environmental Monitoring

EMP – Environmental Management Plan

MPC – Maximum permissible concentration

CO – Carbon monoxide

NO2 – Nitrogen dioxide

TSS – Total suspended solids

MPL -Maximum permissible level

AMC -Analytical Monitoring Center

SPZ – Sanitary Protection Zone

A. MONITORING OF ATMOSPHERIC AIR QUALITY

Protection of the atmosphere is one of the main tasks of nature protection. The Law on Environmental Protection precisely outlines the problem of anthropogenic air pollution and sets priorities for air protection. The Law on Air Protection establishes the main principles of air protection and rational use in the country, economic mechanisms and responsibilities, as well as directions for activities of state bodies

Tajikistan's standards are stricter than international standards, but more general. For example, Western countries have different size standards for particulate matter (PM-10, PM-2.5), while Tajikistan uses the concept of dust, which is closer to the total amount of suspended particulates (TSP). Also, many international standards for air pollutants differ in terms of the time of external exposure, while Tajikistan's standards are based on average.

Table 31 - Maximum allowable concentration in air (MAC)

Pollutants	Standards, mg / m^3
(RSP)– PM_{10}/ $PM_{2.5}$	0.150
Nitrogen dioxide (NO_2)	0.085
Carbon oxide (CO)	5.0
Sulphur dioxide (SO_2)	0.50
Nitric oxide (NO)	0.4

Departmental control over the protection of atmospheric air, including compliance with the standards of maximum permissible emissions of pollutants into the air and harmful physical effects on it, is carried out by nature users. In this case, it is carried out by the contractor. Instrumental measurements were carried out in period of June 20 – 21, 2020 in the daytime 10.00 - 18.00 h.

B. CHARACTERISTICS OF THE MEASURING RANGE OF THE DEVICE

Table 32 - Range Characteristic

№	Substances	Ingredients	Range of measurements, mg/m^3
1	PM_{10} и $PM_{2.5}$		0.05 – 1.0
2	Nitrogen dioxide	NO_2	0.03-2.5
3	Sulfur dioxide	SO_2	0.025-5
4	Carbon monoxide	CO	1.5-10
5	Nitric oxide	NO	0.03 – 2.50

C. INSTRUMENTAL MEASUREMENTS WERE MADE AT 20 POINTS 3 TIMES IN THE FOLLOWING AREAS

1) Km 0+00 Bokhtar-Okmazor-Dangara ring road
2) Near the entrance to the dekhkan farm "Buston"
3) Project Road, near the restaurant "Orzu"
4) Gates of the Guliston village council
5) Levakant road junction
6) Km 14 Navobod village
7) Km 33 project road, Ergashobod village
8) Km 42 project road, Gonchi village
9) Km 50 project road, Sangtuda Junction village
10) Km 54 project road, entrance to Khushdilon village
11) Project Road, exit from Khushdilon village
12) Km 51 + 100 project road, near 'Dangara' Free Economic Zone
13) Km 62 +200 entrance to the project road, Mekhtar village
14) Km 63 + 00 middle of the project road, Mehtar village
15) Km 64 + 500 exit from the project road, Mekhtar village
16) Km 66 +00 Road junction Bokhtar, Dangara and Kulyab

17) Entrance to the project road, Armugon village
18) Near the gate of the 'Farm-Tex' factory
19) Near the asphalt plant
20) Junction of the Dangara-Bokhtar road at the end of the project road.

D. **GPS TESTING AT 20 POINTS FOR ATMOSPHERIC AIR AND NOISE TESTING**

Table 33 - Atmospheric Air

№	Location	Latitude	Longitude
1	Km 0+00 Bokhtar-Okmazor-Dangara ring road	37^0 50. 434^1	068^0 48. 483^1
2	Near the entrance to the dehkan farm 'Buston'	37^0 50. 533^1	068^0 49. 262^1
3	Project Road, near the restaurant 'Orzu'	37^0 50. 627^1	068^0 51. 210^1
4	Gate of the Guliston village council	37^0 50. 050^1	068^0 52. 529^1
5	Road junction Levakand	37^0 51. 813^1	068^0 54. 678^1
6	Km 14 Navobod village	37^0 51. 699^1	068^0 55. 896^1
7	Km 33 project road, Ergashobod village	37^0 51. 232^1	069^0 03. 721^1
8	Km 42 project road, Gonchi village	37^0 56. 754^1	069^0 33. 225^1
9	Km 50 project road, Sangtuda junction village	37^0 00. 696^1	069^0 07. 487^1
10	Km 54 project road, entrance to Khushdilon village	38^0 01. 809^1	069^0 10. 214^1
11	Project Road, exit from Khushdilon village	38^0 02. 235^1	069^0 12. 385^1
12	Km 51 + 100 project road near the Free Economic Zone "Dangara"	38^0 03. 206^1	069^0 13. 385^1
13	Km 62 +200 entrance to the project road, Mehtar village	38^0 03. 723^1	069^0 15. 921^1
14	Km 63 + 00 middle of the project road, Mehtar village	37^0 03. 791^1	069^0 16. 877^1
15	Km 64 + 500 exit from the project road, Mehtar village	38^0 03. 923^1	069^0 17. 981^1
16	Km 66 +00 Bokhtar, Dangara and Kulyab road junction	38^0 03. 831^1	069^0 19. 000^1
17	Entrance to the project road, Armugon village	38^0 04. 151^1	069^0 19. 643^1
18	Near the gate of the Farm-Tex factory	38^0 04. 326^1	069^0 20. 010^1
19	Near the asphalt plant	38^0 03. 672^1	069^0 35. 196^1
20	Dangara - Bokhtar road junction at the end of the project road	38^0 04. 513^1	069^0 20. 474^1

Figure 39 - GPS Testing

Note: Instrumental measurement of atmospheric air and noise was carried out at a pressure of 716 mmHg, wind speed from 3 – 4 m/sec, humidity – 30% and temperature – 37^0C.

Location 1. Km 0+00 Bokhtar-Okmazor-Dangara ring road

	Types of particles	Maximum permissible standards	Actual Measurement			Average
№	Parameter	Standard of Tajikistan, mg/m³	№ 1	№2	№3	
1	PM_{10} и $PM_{2.5}$	0.15	0.019	0.020	0.021	0.020
2	NO_2	0.085	0.0016	0.0016	0.0015	0.00156
3	SO_2	0.50	0.0014	0.0013	0.0012	0.0013
4	CO	5.0	0.25	0.24	0.23	0.24
5	NO	0.4	0.0033	0.0034	0.0019	0.0028

Location 2. Near the entrance to the dekhkan farm “Buston”

	Types of particles	Maximum permissible standards	Actual Measurement			Average Parameter
№	Parameter	Standard of Tajikistan, mg/m³	№ 1	№2	№	
1	PM_{10} и $PM_{2.5}$	0.15	0.023	0.023	0.022	0.023
2	NO_2	0.085	0.0015	0.0013	0.0013	0.0014
3	SO_2	0.50	0.0014	0.0012	0.0011	0.00123
4	CO	5.0	0.25	0.23	0.22	0.23
5	NO	0.4	0.0031	0.0029	0.0028	0.0029

Location 3. Project Road, near the restaurant “Orzu”

	Types of particles	Maximum permissible standards	Actual Measurement			Average Parameter
№	Parameter	Standard of Tajikistan, mg/m³	№ 1	№2	№	
1	PM_{10} и $PM_{2.5}$	0.15	0.024	0.023	0.021	0.023
2	NO_2	0.085	0.0015	0.0013	0.0013	0.0014
3	SO_2	0.50	0.0015	0.0013	0.0011	0.0013
4	CO	5.0	0.26	0.25	0.22	0.243
5	NO	0.4	0.0020	0.0027	0.0020	0.00223

Location 4. Gates of the Guliston village council

	Types of particles	Maximum permissible standards	Actual Measurement			Average Parameter
№	Parameter	Standard of Tajikistan, mg/m³	№ 1	№2	№	
1	PM_{10} и $PM_{2.5}$	0.15	0.020	0.023	0.022	0.022
2	NO_2	0.085	0.000	0.001	0.001	0.001
3	SO_2	0.50	0.002	0.001	0.000	0.002
4	CO	5.0	0.03	0.04	0.05	0.04
5	NO	0.4	0.001	0.002	0.001	0.001

Location 5. Levakand road junction

	Types of particles	Maximum permissible standards	Actual Measurement			Average Parameter
№	Parameter	Standard of Tajikistan, mg/m³	№ 1	№2	№	
1	PM_{10} и $PM_{2.5}$	0.15	0.017	0.018	0.016	0.017
2	NO_2	0.085	0.005	0.005	0.004	0.005
3	SO_2	0.50	0.002	0.003	0.003	0.003
4	CO	5.0	0.04	0.05	0.05	0.05
5	NO	0.4	0.006	0.005	0.004	0.005

Location 6. Km 14 Navobod village

	Types of particles	Maximum permissible standards	Actual Measurement			Average Parameter
№	Parameter	Standard of Tajikistan, mg/m³	№ 1	№2	№	
1	PM_{10} и $PM_{2.5}$	0.15	0.016	0.015	0.015	0.015
2	NO_2	0.085	0.004	0.005	0.003	0.004
3	SO_2	0.50	0.006	0.005	0.006	0.006
4	CO	5.0	0.05	0.06	0.05	0.053
5	NO	0.4	0.004	0.003	0.002	0.003

Location 7. Km 33 project road, Ergashobod village

	Types of particles	Maximum permissible standards	Actual Measurement			Average Parameter
№	Parameter	Standard of Tajikistan, mg/m³	№ 1	№2	№	
1	PM_{10} и $PM_{2.5}$	0.15	0.018	0.016	0.013	0.014
2	NO_2	0.085	0.002	0.001	0.000	0.001
3	SO_2	0.50	0.003	0.002	0.001	0.002
4	CO	5.0	0.03	0.02	0.01	0.02
5	NO	0.4	0.001	0.001	0.001	0.001

Location 8. Km 42 project road, Gonchi village

	Types of particles	Maximum permissible standards	Actual Measurement			Average Parameter
№	Parameter	Standard of Tajikistan, mg/m³	№ 1	№2	№	
1	PM_{10} и $PM_{2.5}$	0.15	0.017	0.016	0.012	0.014
2	NO_2	0.085	0.0006	0.0003	0.0003	0.00041
3	SO_2	0.50	0.0003	0.0002	0.0001	0.0002
4	CO	5.0	0.02	0.01	0.01	0.01
5	NO	0.4	0.000	0.001	0.001	0.001

Location 9. Km 50 project road, Sangtuda Junction village

	Types of particles	Maximum permissible standards	Actual Measurement			Average Parameter
№	Parameter	Standard of Tajikistan, mg/m³	№ 1	№2	№	
1	PM_{10} и $PM_{2.5}$	0.15	0.015	0.013	0.011	0.013
2	NO_2	0.085	0.0004	0.0001	0.000	0.0001
3	SO_2	0.50	0.0001	0.000	0.000	0.0001
4	CO	5.0	0.02	0.04	0.03	0.03
5	NO	0.4	0.001	0.001	0.001	0.001

Location 10. Km 54 project road, entrance to Khushdilon village

	Types of particles	Maximum permissible standards	Actual Measurement			Average Parameter
№	Parameter	Standard of Tajikistan, mg/m³	№ 1	№2	№	
1	PM_{10} и $PM_{2.5}$	0.15	0.016	0.012	0.011	0.013
2	NO_2	0.085	0.0004	0.0004	0.0003	0.0003
3	SO_2	0.50	0.0002	0.0001	0.0001	0.0001
4	CO	5.0	0.03	0.01	0.01	0.01
5	NO	0.4	0.0001	0.0001	0.0001	0.0001

Location 11. Project Road, exit from Khushdilon village

	Types of particles	Maximum permissible standards	Actual Measurement			Average Parameter
№	Parameter	Standard of Tajikistan, mg/m³	№ 1	№2	№	
1	PM_{10} и $PM_{2.5}$	0.15	0.017	0.014	0.014	0.02
2	NO_2	0.085	0.0006	0.0004	0.0004	0.0004
3	SO_2	0.50	0.0002	0.0001	0.0001	0.0001
4	CO	5.0	0.04	0.04	0.04	0.03
5	NO	0.4	0.0003	0.0002	0.0001	0.0002

Location 12. Km 51 + 100 project road, near 'Dangara' Free Economic Zone

	Types of particles	Maximum permissible standards	Actual Measurement			Average Parameter
№	Parameter	Standard of Tajikistan, mg/m³	№ 1	№2	№	
1	PM_{10} и $PM_{2.5}$	0.15	0.023	0.024	0.023	0.024
2	NO_2	0.085	0.007	0.005	0.004	0.005
3	SO_2	0.50	0.002	0.001	0.001	0.001
4	CO	5.0	0.05	0.02	0.02	0.03
5	NO	0.4	0.005	0.003	0.001	0.003

Location 13. Km 62 +200 entrance to the project road, Mekhtar village

	Types of particles	Maximum permissible standards	Actual Measurement			Average Parameter
№	Parameter	Standard of Tajikistan, mg/m³	№ 1	№2	№	
1	PM_{10} и $PM_{2.5}$	0.15	0.01	0.015	0.014	0.010
2	NO_2	0.085	0.008	0.005	0.003	0.005
3	SO_2	0.50	0.003	0.002	0.002	0.002
4	CO	5.0	0.06	0.004	0.003	0.022
5	NO	0.4	0.005	0.003	0.001	0.003

Location 14. Km 63 + 00 middle of the project road, Mehtar village

	Types of particles	Maximum permissible standards	Actual Measurement			Average Parameter
№	Parameter	Standard of Tajikistan, mg/m³	№ 1	№2	№	
1	PM_{10} и $PM_{2.5}$	0.15	0.02	0.018	0.014	0.02
2	NO_2	0.085	0.000	0.000	0.000	0.000
3	SO_2	0.50	0.0003	0.0001	0.0001	0.0001
4	CO	5.0	0.06	0.04	0.04	0.04
5	NO	0.4	0.000	0.000	0.000	0.000

Location 15. Km 64 + 500 exit from the project road, Mekhtar village

	Types of particles	Maximum permissible standards	Actual Measurement			Average Parameter
№	Parameter	Standard of Tajikistan, mg/m³	№ 1	№2	№	
1	PM_{10} и $PM_{2.5}$	0.15	0.016	0.015	0.014	0.015
2	NO_2	0.085	0.000	0.000	0.000	0.000
3	SO_2	0.50	0.000	0.000	0.000	0.000
4	CO	5.0	0.006	0.004	0.003	0.004
5	NO	0.4	0.000	0.000	0.000	0.000

Location 16. Km 66 +00 Road junction Bokhtar, Dangara and Kulyab

	Types of particles	Maximum permissible standards	Actual Measurement			Average Parameter
№	Parameter	Standard of Tajikistan, mg/m³	№ 1	№2	№	
1	PM_{10} и $PM_{2.5}$	0.15	0.022	0.020	0.021	0.021
2	NO_2	0.085	0.007	0.006	0.006	0.006
3	SO_2	0.50	0.002	0.002	0.002	0.002
4	CO	5.0	0.05	0.04	0.03	0.04
5	NO	0.4	0.004	0.004	0.003	0.003

Location 17. Entrance to the project road, Armugon village

	Types of particles	Maximum permissible standards	Actual Measurement			Average Parameter
№	Parameter	Standard of Tajikistan, mg/m³	№ 1	№2	№	
1	PM_{10} и $PM_{2.5}$	0.15	0.018	0.017	0.015	0.016
2	NO_2	0.085	0.0009	0.0007	0.0006	0.0007
3	SO_2	0.50	0.0003	0.0003	0.0003	0.0003
4	CO	5.0	0.08	0.08	0.06	0.06
5	NO	0.4	0.0004	0.0003	0.0002	0.0002

Location 18. Near the gate of the 'Farm-Tex' factory

	Types of particles	Maximum permissible standards	Actual Measurement			Average Parameter
№	Parameter	Standard of Tajikistan, mg/m³	№ 1	№2	№	
1	PM_{10} и $PM_{2.5}$	0.15	0.021	0.021	0.020	0.020
2	NO_2	0.085	0.0010	0.0011	0.0009	0.0011
3	SO_2	0.50	0.009	0.008	0.008	0.008
4	CO	5.0	0.34	0.33	0.34	0.33
5	NO	0.4	0.009	0.008	0.008	0.008

Location 19. Near the asphalt plant

	Types of particles	Maximum permissible standards	Actual Measurement			Average Parameter
№	Parameter	Standard of Tajikistan, mg/m³	№ 1	№2	№	
1	PM_{10} и $PM_{2.5}$	0.15	0.020	0.020	0.020	0.020
2	NO_2	0.085	0.0010	0.008	0.007	0.008
3	SO_2	0.50	0.008	0.008	0.008	0.008
4	CO	5.0	0.23	0.23	0.24	0.23
5	NO	0.4	0.005	0.004	0.003	0.004

Location 20. Junction of the Dangara-Bokhtar road at the end of the project

	Types of particles	Maximum permissible standards	Actual Measurement			Average Parameter
№	Parameter	Standard of Tajikistan, mg/m³	№ 1	№2	№	
1	PM_{10} и $PM_{2.5}$	0.15	0.025	0.024	0.023	0.024
2	NO_2	0.085	0.007	0.008	0.005	0.007
3	SO_2	0.50	0.007	0.005	0.005	0.006
4	CO	5.0	0.06	0.06	0.06	0.06
5	NO	0.4	0.005	0.005	0.005	0.005

Note: In all tables instrumental air measurements no excess of MPC standards was detected.

E. **NOTES / ATMOSPHERIC AIR**

Definitions and Concepts that Characterize the State of the Natural Environment and the Harm Caused to it.

Admissible is an environmental load under which a deviation from the normal state of the ecological system does not exceed natural changes and, therefore, does not cause undesirable consequences in living organisms and does not lead to deterioration of the quality of the environment.

Normalization of the quality of the environment is carried out in order to establish maximum admissible norms of impact, which guarantee the ecological safety for the population, preservation of the gene pool, ensuring the rational use and reproduction of natural resources in conditions of sustainable development of economic activity.

Maximum Permissible Concentrations (MPC) are the standards that establish the concentration of a harmful substance in a unit of volume (air, water), mass (soil) or surface (skin of workers), which, when exposed for a certain period of time, practically do not affect human health and do not cause adverse effects in his offspring.

Maximum one-time MPC (MPC) is the concentration of a harmful substance in the air of populated areas that does not cause a reflexive (including sub-sensory) reaction in the human body, when inhaling, during 20 minutes.

Average daily MPC (MPC cc) - concentration of the harmful substance in the air of inhaled areas that should not have a direct or indirect impact on a person by inhalation for an unlimited period of time (years).

Environmental monitoring - information system of observations, assessment and forecast of changes in the state of the environment created to highlight the anthropogenic component of these changes against the background of natural processes.

Maximum permissible emission (MPE) - the mass of a substance in the waste gases, the maximum allowed to be released into the atmosphere per unit of time.

Temporarily agreed emission of harmful substances (EHS) – the mass of substance in exhaust gases that exceeds MPE but allowed to be emitted for some time (usually necessary for technical improvement of production). For newly designed enterprises, the values of the EHS are not established.

Environmental Problems in the Production of Road Construction Materials

The increasing volumes and pace of construction on the territory of the GTS determine the development of permanent and temporary (at the construction stage) production of road building materials of various types: quarries of crushed stone, gravel, sand, stone crushing plants, bases for the preparation of organic binder emulsions, plants for processing tar into bitumen, asphalt concrete plants, cement concrete plants, factories of reinforced concrete structures, etc.

Sources of emissions of pollutants at road construction materials manufacturing enterprises are shown in table below.

Table 34- Emissions of pollutants at road construction materials

Source	Dust	Oxides of			Hydrocarbons
		carbon	nitrogen	sulfur	
Quarries and quarrying roads	+	+	+	-	+
Crushing - sorting machines	+	-	-	-	-
Places for loading, unloading and storage of mineral materials	+	-	-	-	-
Bitumen storage (tar storage)	-	-	-	-	+
Reactor plant for the preparation of bitumen from tar	-	+	+	+	+
Bituminous melting plant	-	+	+	+	+
Asphalt mixing plant	+	+	+	+	+
Emulsion plant	-	+	+	+	+

Source	Dust	Oxides of			Hydrocarbons
		carbon	nitrogen	sulfur	
Places of loading and unloading cement, drying drum of an asphalt concrete plant	+	+	+	+	-
Road transport	+	+	+	-	+

Notes:

1) Carbon oxides, nitrogen oxides and hydrocarbons in quarries are formed during explosions and the operation of internal combustion engines.

2) Sulfur oxides during the operation of drying drums are emitted when using sulfur-containing liquid fuel (fuel oil).

As a result of the work of production enterprises, the concentration of pollutants released into the atmosphere should not exceed the established maximum permissible concentrations (MPC) of pollutants in the atmospheric air of the populated areas at the border of the sanitary protection zone (SPZ) of this enterprise. The requirements of SanPiN-2.2.1/2.1.1.1031-01 stipulate that the manufacturing enterprises, including road facilities, will be separated from residential buildings by sanitary protection zones

Figure 40- Air sampling

F. **NOISE MEASUREMENT AT 20 POINTS IN THE DAYTIME**

№	**Locations where measurement made**	**Noise standards in decibels, (max) 10.00 -18.00**	**Baseline indicators, decibels (max)**
1	Km 0+00 Bokhtar-Okmazor-Dangara ring road	55 - 45	54.3
2	Near the entrance to the dekhkan farm “Buston”	55 - 45	53.4
3	Project Road, near the restaurant “Orzu”	55 - 45	55.3
4	Gates of the Guliston village council	55 - 45	52.8
5	Levakand road junction	55 - 45	55.0
6	Km 14 Navobod village	55 - 45	50.4
7	Km 33 project road, Ergashobod village	55 - 45	45.7
8	Km 42 project road, Gonchi village	55 - 45	40.5
9	Km 50 project road, Sangtuda Junction village	55 - 45	47.0
10	Km 54 project road, entrance to Khushdilon village	55 - 45	45.0
11	Project Road, exit from Khushdilon village	55 - 45	40.3

№	**Locations where measurement made**	**Noise standards in decibels, (max) 10.00 -18.00**	**Baseline indicators, decibels (max)**
12	Km 51 + 100 project road, near 'Dangara' Free Economic Zone	75 - 75	54.5
13	Km 62 +200 entrance to the project road, Mekhtar village	55 - 45	51.9
14	Km 63 + 00 middle of the project road, Mehtar village	55 - 45	42.8
15	Km 64 + 500 exit from the project road, Mekhtar village	55 - 45	54.8
16	Km 66 +00 Road junction Bokhtar, Dangara and Kulyab	55 - 45	44.3
17	Entrance to the project road, Armugon village	55 - 45	41.7
18	Near the gate of the 'Farm-Tex' factory	75 - 75	55.0
19	Near the asphalt plant	75 - 75	4.8
20	Junction of the Dangara-Bokhtar road at the end of the project road	55 - 45	53.2

Note: In Table No. 25 the testing shows that the average daily noise is below sanitary standards

Figure 41 - Noise measurement

G. **Notes / Noise**

Permissible levels of noise from external sources in premises are established under condition of ensuring normal ventilation of premises (or residential premises, wards, classes - with open vents, transoms, narrow sashes of windows).

Equivalent and maximum sound levels in dBA for noise generated by motor vehicles, 2 m from the protecting structures of residential buildings, hotel buildings, dormitories, facing the main streets of the city and district are allowed to accept above 10 dBA.

Standards of Tajikistan in accordance with sanitary norms SN 2.2.4/2.1.8.562-96 (provided by the sanitary-epidemiological supervision service of the Ministry of Health of Tajikistan)

55-45 dBa (max) - Living sector
75-75 dBa (max) – Commercial area
80-80 dBa (max) – Industrial zone
50-40 dBa (max) – Hospitals
55-55 dBa (max) – Schools, library

The noise level in the Project area of influence in June 2020 did not exceed the permissible norms.

H. FINDINGS

Based on the results of instrumental measurements and noise levels in the project area, the authors of the environmental impact monitoring came to the conclusion:

- At the time of monitoring no significant anthropogenic impacts have been recorded in the Project area.
- No extreme environmental impacts are expected during the construction process.
- The Project management is required: Take additional mitigation measures in terms of parameters:
    - inorganic dust content in the atmosphere;
    - noise level content.
- The Project Management should coordinate with the CEP under Government of RT; obtain permission to release pollutants into the atmosphere; and dispose (store) the industrial, solid domestic and construction wastes in the natural environment.

I. RECOMMENDATIONS

- Monitoring of the total dissolved solids and oil and fat in the Project area at four points should be organized on monthly basis, and they should be considered as "Indicators" of trouble.
- In atmospheric air, in the area of influence of the Project, the content of inorganic dust, nitrogen dioxide, sulfur dioxide, nitrogen oxide and carbon monoxide should be monitored on a monthly basis, as well as emissions of vehicles should be monitored, both carburetor and diesel.
- The noise level at all points should be tested on a monthly basis.

J. LIST OF REFERENCES AND REGULATORY DOCUMENTS

- Maximum permissible concentrations (MPC) of pollutants in the atmospheric air of populated areas (list 3086-84).
- Maximum permissible concentrations (MPC) of pollutants in the air of the working area.
- Sanitary norms for designing industrial enterprises SN245-71
- Guidance document. Nature protection. Atmosphere. Requirements for the accuracy of industrial emissions control. Methodical instructions. RD 52704.59-85. Moscow,1986.

K. DETAILS OF INITIAL ENVIRONMENTAL MONITORING

- Air and noise quality monitoring.
- Air monitoring methodology.
- Noise monitoring methodology.
- Collection of methods for determining the concentration of pollutants on industrial emissions. L.: Gidrometeoizdat, 1987.
- Monitoring parameters

PM_{10} и $PM_{2.5}$
Carbon monoxide (CO)
Sulphur dioxide (SO2)
Nitrogen dioxide (NO_2)
Nitric oxide (NO)

- The following device was used to measure the atmospheric air:
    - Gas analyzer – GANG-4 A.

- A noise meter was used to monitor the noise
    - Noise was measured by noise meter TESTO-815.

Annex 3 - ALIGNMENT SHEETS

The following alignment sheets provide an overview of sensitive receptors alongside the road.

No.	Location	KM	Issue / Picture	Baseline parameters / additional remarks
1	Bokhtar Village, beginning of project road	0+000	Residential area. Sensitive receptor regarding noise and air emissions 	Noise and air quality monitoring will be conducted within villages traversed by Project Road and identified sensitive receptors
2	Bokhtar district	4+800	Tree plantations alongside Project Road. 	Mitigation and compensation measures required. Tree losses need to be compensated by new plantings at a ratio of 1:2.
3	Oksu village	6+100	Project Road traversing Village Oksu and water stream 	Noise, air and water quality monitoring will be conducted according to monitoring programme.
4	Sarband	9+000	Water crossing. Sensitive receptor regarding potential water pollution. 	Water quality baseline measurements have been carried out. Water monitoring in surface waters crossed by Project Road will conducted according to monitoring programme.

No.	Location	KM	Issue / Picture	Baseline parameters / additional remarks
5	Lolazor-2	25+900	Market Place adjacent to the road. Noise and dust impact on the marketplace. Improved road may increase speeds of vehicles on the road. Social safeguards – road safety. 	Noise and air quality monitoring will be conducted. Speed limits implemented.
6	Lokhur village	55+000	Project Road traversing Village Lokhur 	Noise and air quality monitoring will be conducted within villages traversed by Project Road and identified sensitive receptors
7	Sarband district	57+700	Water crossing. Sensitive receptor regarding potential water pollution. 	Water quality baseline measurements have been carried out. Water monitoring in surface waters crossed by Project Road will conducted according to monitoring programme.
8	Mehtar village	62+300	Residential area. Sensitive receptor regarding noise and air emissions 	Noise and air quality monitoring will be conducted within villages traversed by Project Road and identified sensitive receptors

No.	Location	KM	Issue / Picture	Baseline parameters / additional remarks
9	Sarband district	63+100	Road traversing alongside grave. 	Project alignment and design avoids encroachment into the cemeteries alongside the Project Road.
10	Sargazon village	63+200	Residential area in both sides of road, willow tree 	Noise and air quality monitoring will be conducted within villages traversed by Project Road and identified sensitive receptors Tree losses need to be compensated by new plantings at a ratio of 1:2.
11	Sargazon village	63+800	Water crossing. Sensitive receptor regarding potential water pollution. 	Water quality baseline measurements have been carried out. Water monitoring in surface waters crossed by Project Road will conducted according to monitoring programme.
12	Dangara district	65+400	Water crossing. Sensitive receptor regarding potential water pollution. 	Water quality baseline measurements have been carried out. Water monitoring in surface waters crossed by Project Road will conducted according to monitoring programme.

Annex 4 - BIODIVERSITY SURVEY

REPORT
Biodiversity surveys for the Rehabilitation and Reconstruction of Dangara – Bokhtar

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Dushanbe 2020

INTRODUCTION

Floodplains and river valleys are complexes of ecotone-type intrazonal biotopes, which determines their role in the dynamics of the region's ecosystems. To date, the transformation of floodplain landscapes as a result of human activities (growth of settlements, plowing of valleys, information of floodplain forests, expansion of pasture areas, increased recreational load, etc.) has led to a significant change in the ecosystems of floodplains and river valleys. Against the background of anthropogenic transformation of landscapes, the results of studying the ecology of communities are increasingly being used in planning a system of environmental measures, and ecosystem diversity is one of its main measurable characteristics.

Objective: The Impact of the road construction was studied: Khulbuk - Temurmalik - Kangurt; Bokhtar - Dangara; Dangara - Guliston on the species richness and diversity of the population of flora and fauna in the adjacent territories.

MATERIAL AND METHODOLOGY

The studies were conducted in the nesting and winter period in the classical route method. The main places of research conducted on the map.

The main center for the rehabilitation and reconstruction of the road of this project is the Dangarinsky massif - to which we give a brief description.

The Dangara massif is located in the interfluve of the river. Vakhsh and Pyanj, between the Vakhsh ridge and the valley of the Kyzylsu river at an altitude of 550-570 m above sea level. The north-western border runs along the southern slopes of the Vakhsh ridge and the Sarsarak mountains. In the south, crossing the valley of the river. Toirsu, reaches the left bank of the river. Kyzylsu continues to hilly hills, covering the Selbursai reservoir. In the west, on the outskirts of the Dangara massif, there is a valley of the salty river Toirsu flowing through a deep loessic ravine. On the right bank of the river. Kyzylsu, bypassing Kongurt, the border reaches the eastern spurs of the Vakhsh ridge.

In the middle of the massif are parallel roads and railways connecting the city of Kulyab with the cities of Bohtar and Dushanbe.

Prior to development, the Dangara massif was used as autumn-winter pastures. After construction on the Vakhsh river of the Nurek hydroelectric station and the Nurek reservoir (length of about 70 km, width from 800-900 m to 3-4 km), the possibility of flooding the Dangara massif appeared. To date, about 20-25% of virgin and fallow lands have been developed.

The development of the Dangara massif influenced the state of the avifauna of the region. At the beginning of the XX century, the usual nesting species here were: Otis tarda, Chlamydotisundulata, Burhinusoedicnemus, Pteroclesorientalis, Pteroclesalchata. By the middle of the XX century, they had not met at the nesting grounds, and did not linger on the Tetraxtetrax massif in the Dangara massif.

Bustard (Otis *tarda)*

Until the 1960-1970s of the XX century, it was still possible to observe stable flights of bustards, belladonna and grouse. Our monitoring observations of recent years have shown that only single birds *Otis tarda, Chlamydotisundulata, Burhinusoedicnemus, Pteroclesorientalis, Pteroclesalchata, Tetraxtetrax* occasionally fly within the Dangara massif.

little bustard (*Tetraxtetrax*)

According to the results of our research conducted in the last 14 years and analysis of the literary sources of the Dangara massif, about 68 species and subspecies of wild birds belonging to 10 orders and 26 families were identified. By the nature of their stay, they are divided into settled - 18 species, migratory-nesting - 34, migratory - 12, wintering - 21 and migratory - 1 species (table). Criterion A1 refers to 11 species of birds under global threat of extinction: *Aegypeusmonachus, Aquila heliaca, Circus macrourus, Falco vespertinus, Falco naumanni, Falco cherrug, Otis tarda, Tetraxtetrax, Chlamydotisundulata, Columba eversmanni, Coracias garrulous.*

Criterion A3 refers to 10 species limited to one biome: Ammoperdixgriseogularis, Irariiagutturalis, Oenanthe finschii, Oenanthe xanthoprimna, Oenanthe picata, Hippolaislanguida, Phylloscopus neglectus, Sitta tephrpnota, Emberizabuchanani, Emberiza steward. From 44 species and subspecies of birds listed in the Red Book of Tajikistan on the Dangara massif, the following Red Book species of birds can be found: Aegyptus monachus, Neophron percnopterus, Gypaetus barbatus, Aquila chrysaetus, Hieraaetuspennatus, Accipiter nisus, Falco cherrug, Falco peregrinus babylonicus, Ammoperdixgriseogularis, Otis tarda, Chlamydotisundulata, Pteroclesorientalis.

Glden eagle (Aquila chrysaetus)

Common wintering birds are: *Anser anser, Tadorna ferruginea, Grus grus, Columba livia, Circus cyaneus, Circus macrourus, Accipiter nisus, Buteo buteo, Buteo rufinus, Heraeetus pennatus, Falco cherrug, Falco peregrinoides, Falco peregrinus, Pterocles orientalis* and other.

Common nesting birds are: *Apus apus, Apus melba, Merops apiaster, Merops persicus, Coracias garrulous, Upupa epops, Corvus corax, Alauda cristata, Alauda arvensis, Melanocorypha calandra, Hirundo rustica, Anthus spinolentaAnthusspinolenta, Motacilla alba, Saxicola caprata, Oenanthe picata.* In ravines and loess niches nest: *Falco tinnunculus, Athene noctua, Otis scops, Bubo bubo.*

Eurasian eagle (Bubo bubo)

Land development for sowing of leguminous crops contributed to an increase in the number of waterfowl, near-water and large grain-eating birds. A monitoring survey of the number of wintering waterfowl and near-water birds in the Dangarinsky massif and in the vicinity of the Selbursai reservoir established a large concentration of birds belonging to *Anseriformes, Gruiformes, Charadriiformes, Lariformes*. It turned out that many species of wintering waterfowls on feeding adhere to the arable and virgin lands of the Dangara massif, and at night flock to the Selbursaysky reservoir, located to the south. According to the annual counts of the number of wintering birds in the above-mentioned territories, more than 18 thousand birds are counted, belonging to: *Anseranser, Anas, Anas strepera, Tadornaferruginea, Anas Penelope Aythya ferina, Aythya fuligula, Mergus merganser*, etc. In fields with winter crops about 500 *Grus grus* individuals winter each year.

Common crane (Grus grus)

The Selbur reservoir, located on the right bank of the river. Kyzylsu attracts wintering birds to a watering place and spend the night from all over the Dangara massif. The presence of the Selbursai reservoir in the southeast of the Dangara massif is one of the important environmental factors that play a decisive role in the accumulation of several hundred thousand waterfowl and near-water birds, cranes, gulls, daytime predators and passerines during wintering, migration and nesting.

Pisces in the Kyzylsu and Toirsu rivers, there is a marinka - Schisothorax intermedius, a carp - Cipriniuscarpio, a catfish - Silurus: Marinka and carp are found in the Selbursai reservoir.

Amphibians (Amphibia) are represented by a lake frog - Rana ridibunda and a green toad - Bufo viridis.

Reptiles - Reptilia: steppe tortoise (Testudo holsfieldi), Caspian bare-footed gecko (Gymnodactyluscaspius), steppe agama (Agama sanguinolenta), gray monitor lizard (Varanus griseu), yellow-bellied penguin (Ophisaurus opodus), Asian long-necked (blue-eyed) Eumescesschnejderi), worm-shaped blind snake (Typhlops vermicularis), oriental strangler (Eryx tataricus), multi-colored snake (Coluber ravergieri), cobra (Naja axiana), gyurza (Viperalebetina).

Tereofauna - Mammalia. Until the end of the XX century, the open spaces of the Dangara massif; adhered to numerous gazelles *(Gasellasubgutturosa)*. To date, they have disappeared without a trace. On the slopes of the Vakhsh ridge and at the foot of Mount Sarsaryak there are urial *(Ovis vignei)*, screw-goat *(Capra falconeri).* They are included in the Red Book of Tajikistan. Over the past 30 years, the number of wild boars (*Sus scrofa*) has increased dramatically.

Urial (*Ovis vignei)*

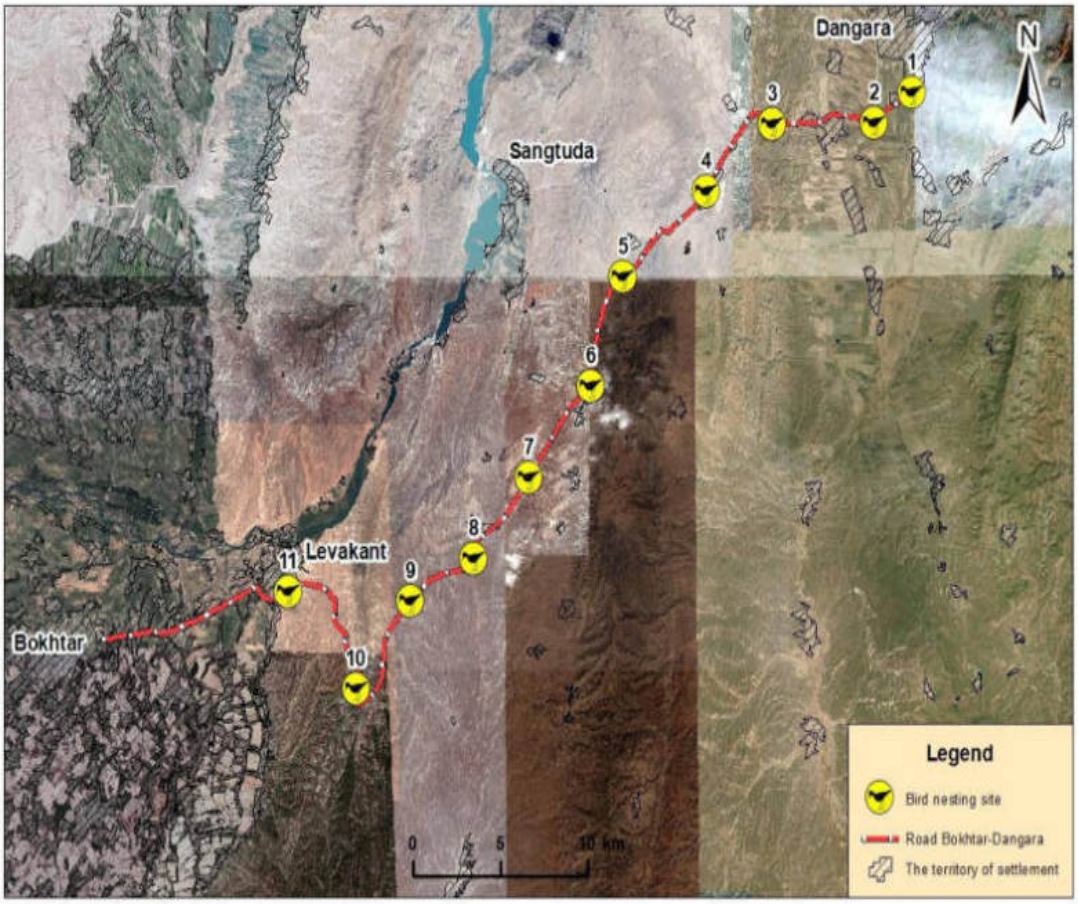
Among predatory mammals, there are: wolf (Canis lupus), fox (Vulpes vulpes), striped hyena (Hyaena hyaena), ligation (Vormela peregusna), reed cat (Felis chaus) and jackal (Canis aureus). Until the mid -XX century, the leopard (Fells pardus) inhabited. Porcupine (Hystrix leucura), Turkestan rat (Rattus turkestanicus), plate-toothed rat (Nisokia indica), Eastern mole rat (Ellobius lupinus), large gerbil (Rhambomys opimus), hare (Lepus tolai) is found.

The flora of the Dangara massif is typically semi-desert, the vegetation is predominantly grassy. Vegetation begins in mid-February, active flowering in early spring, March-April. From mid-May, vegetation begins to fade. In the belt of undersized bluegrass-point blue-headed half-savannahs there are: bulbous bluegrass and sedge (Poa bulbosa, Carex pachystylis). In the foothill sand dzhangals: Richter's hodgepodge (Salsola Richteri), white saxaul (Haloxylon persicum). Mostly ephemeral cereals: Psilurus aristatus, Parapholis and others. In the upper band, longer growing ephemeroids, mainly Phlomis bucharica. In the hollows between the hills, species of the genera Tamarix and Rosae are found. Later only Flhagi kirghisorum and several species of Artemisia.

On the territory of the Dangara massif, grain, melons, cotton, and fodder are grown, used for orchards and as winter-spring pastures.

Geographic coordinates of the Dangara-Bokhtar Road

points on the map	Geographical coordinates	Remark
1	N 38^0 04' 33,374" E 69^0 20' 23,222" height 628 m above sea level m.	Y-intersection of Dushanbe-Kulyab and Dangara-Bokhtar. On both sides there are sowing fields where mulberries are planted along the road; nesting sites for weaver and shrike.
2	N 38^0 03' 52,234" E 69^0 19' 0,804", height 682 m above sea level m.	At1st kmfrom the Mehtar village begins on the right side of the nesting pistachios stacia longtail shrike and bile oatmeal.
3	N 38^0 03' 52,822" E 69^0 14' 56,611" height 735 m above sea level m.	Nesting colonies begin on both sides in the loess cliff of Coracias garrulus, Acridotheres tristis, Merops apiaster and Merops superciliosus, Passer domesticus, Athene noctua and possibly Columba livia.
4	N 38^0 02' 0,835" E 069^0 12' 19,315" height of 754 m above sea level m.	Tochmakhal village on the left side is a lake where representatives of waterfowl and near-water birds' winter in winter and nesting birds in summer.
5	N 37^0 59' 55,048" E 69^0 09' 4,779" height 764 m above sea level m.	Before reaching the Sangtuda Y-intersection, 1st km begins a rocky cliff where the common Falco naumanni, Oenanthe oenanthe, Oenanthe picata and Sitta neumayer tephronota nest.
6	N 38^0 57' 1,778" E 69^0 07' 44,811" height of 780 m above sea level m.	Clay cliff where Coracias garrulus, Acridotheres tristis, Merops apiaster, Merops superciliosus, Passer domesticus nest. Around pistachio plantings.
7	N 37^0 54' 44,008" E 69^0 05' 20,344" height 950 m above sea level m.	Rocks, where they met a pair of vultures soaring in the air.
8	N 37^0 52' 38,002" E 69^0 03' 8,462", height of 698 m above sea level m.	A stepped plot where along the trails met a rodent settlement of gerbils. Three individuals of Neophron percnopterus also met two adult individuals and one young individual, the number of nests compared to the previous points on clay cliffs is less, possibly this is the lack of space for a watering place.
9	N 37^0 51' 31,059" E 69^0 00' 36,839" height 765 m above sea level m.	Large colony in clay cliffs on both sides. Coracias garrulus, Acridotheres tristis, Merops apiaster and Merops superciliosus, Passer domesticus nested.
10	N 37^0 49' 21,025" E 68^0 58' 30,156" height 879 m above sea level m.	Rocky places begin the descent to the city of Levacant. The voice of Sitta neumayer tephronota singing in the nuptial voice is heard. Met a white-headed rash.
11	N 37^0 51' 44,777" E 68^0 55' 48,585" height 628 m above sea level m.	Y-intersection in Levokant – Bokhtar city.



IMPACT ON BIODIVERSITY

The potential impact of the project on biodiversity is relatively low due to the fact that the road is built in an already broken channel and is located in a degraded environment, which has been subjected to anthropogenic impact for many years (in particular, grazing). Ecosystems have been substantially transformed since the previous construction work was carried out in Soviet times. During construction, major impacts will include direct loss of habitat in the immediate vicinity of the project road, within the construction work areas adjacent to the road. There will also be interference and inconvenience associated with construction activities, mainly noise and vibration effects. Loss of habitat will typically affect areas of relatively low biodiversity value. The greatest impact will occur when individual plantings of the territory of increased interest for biodiversity, primarily any remnants of ancient fruit trees, for example, from the Khulbuk side, mulberry plantations on which representatives of the weaver family (Passer domesticus and Passer montanus) and the starling family (Sturnus roseus). It is not currently believed that the magnitude of this impact will have any significant impact on biodiversity; however, mitigation will be implemented to further guarantee this. Impacts related to disturbance of peace, silence and order will affect the fauna, which uses landscapes along the route to shelter, find food or carry out other activities within the distance of construction work.

In particular, this will include especially nesting birds that directly nest in cliffs along the roads and cannot change nesting sites. These mainly include representatives of the syovoronovy family (Coracias garrulous), the bee-eater family (Golden beetle (Merops apiaster)) and wintering sheltering reptiles and amphibians, which are sensitive to such landscape disturbances. Representatives of the starling family (lane or Indian starling (Acridotheres tristis)) of the weaver family (Indian sparrow (Passer domesticus)) also nest on cliffs of roads, which can change nesting sites. The Project list contains 13 species of trigger species for the Dangara massif of birds that are of the least concern. Part of this fauna is listed in the Red Book, in particular, the Saker Falcon

(Falco cherrug coasti) area, which covers a large territory, and which will not be seriously affected by the construction.
I would like to add that the destruction of colonies on clay cliffs, although it causes quite serious damage to biodiversity, is temporary. Our studies in other areas along the Tajik routes, where similar destruction of colonies was observed during rehabilitation, showed expensively that over time, colonies begin to recover. This is clearly visible on the Dushanbe-Kurgan-Tyube road.

Complete restoration of the colonies is expected to be 5-6 years.

Saker Falcon (*Falco cherrug coasti*)

Сизоворонка (*Coraciasgarrulous*)

Щурка золотистая *(Merops apiaster)*

Щурказеменая*(Merops persicus)*

MITIGATION

The potential impact of the project on biodiversity is considered limited, however, mitigation measures should be taken for this:
Control examination of the full route in order to clearly identify features / species / areas of particular interest for conservation (for example, ancient fruit trees, natural forest plantations, suitable species of nesting birds, plants listed in the Red Book, etc.);
Implementation of the Biodiversity Management Plan, which will document the results of the control survey and the detailed measures that need to be taken to protect these species;
Implementation of the Biodiversity Management Plan, which will document the results of the control survey and the detailed measures that need to be taken to protect these species;
Timelines to avoid the most sensitive windows for sheltering species. In cases where this is not possible, preliminary checks of the elements immediately before work and subsequent fencing and exclusion of workers and construction objects from the zone where these species are present during construction until they are no longer used;
Workforce awareness training program to prevent hunting / poaching / collecting rare seeds, etc.

Sympathetic restoration of temporary building sites, i.e., re-planting of local plant and animal species with increased biodiversity value.

USING LITERATURE

1) Abdusalyamov I.A. (1971). Fauna of the Tajik SSR. Birds. T. XIX, part 1. Dushanbe: Donish. 299 p.
2) Abdusalyamov I.A. (1973). Fauna of the Tajik SSR. Birds. T. XIX, part 2. Dushanbe: Donish. 250 s
3) Abdusalyamov I.A. (1977). Fauna of the Tajik SSR. Birds. T. XIX, part 3. Dushanbe Donish. 279 p.
4) Abdusalyamov I.A. Repl. ed. Red Book of the Tajik SSR. (1988). Dushanbe: Donish. S. 14-160.
5) Abdusalyamov I.A. (2003). About the wintering of the gray crane in southern Tajikistan. Bulletin No. 6. - Eurasia Cranes Working Group. Moscow. June 2003. (Newsletter No. 6, June. Crane Working Group of Eurasia). C. 9-10.
6) Abdusalyamov I.A. (2004). Information on the number of gray cranes in Tajikistan in 2003-2004 // Newsletter No. 7-8. International Crane Protection Fund. Moscow. (Newsletter No. 7-8. Crane Working Group of Eurasia). C. 74-76.
7) Abdusalyamov I.A. (2004). The current state of the species diversity of vertebrates and their distribution in the main ecosystems. // Fauna and animal ecology of Tajikistan. Dushanbe. S. 28-53. Abdusalyamov I.A. (2004). Current status of the number of wintering wetland birds in Southwest Tajikistan. // Bosphere territory “Ysyk-Köl. The second issue. The collection of materials of the V Issyk-Kul Symposium on October 24-25, 2003, Cholpon-Ata. Bishkek. S. 30-31.
8) Abdusalyamov I.A., Solokha A.V., Abdulnazarov A.G., Mirzobahodurova, Sh.R. (2005). Monitoring and conservation of Anseriformes in Tajikistan. // III International Symposium: Anseriform birds of Northern Eurasia. Abstracts of the report. St. Petersburg. S. 5-6.
9) Ivanov A.I. (1940). Birds of Tajikistan. M.-L.: Publ. USSR Academy of Sciences. 299 p.
10) Ivanov A.I. (1945). Wintering of birds in the lower river. Watch in southern Tajikistan. // Izv. TFAN, No. 6. P. 36-59.
11) Ivanov A.I. (1969). Birds of the Pamir-Alai. L.: Ed. USSR Academy of Sciences. 448 p.
12) Said-Aliyev S.A. Amphibians and reptiles of Tajikistan. Dushanbe: Donish. 147 p.
13) Sokov A.I. (1979). (1993). The fauna of Tajikistan. Mammals are artiodactyls. T. XX, part V. Dushanbe Donish. 338 p.
14) Chernov S.A. (1959). Reptiles. Fauna of the Tajik SSR, t. 18. Tr. IZIP AN Taj.SSR. Stalinabad, vol. 48.220 s.
15) Chernyshev V.I. (1958). Fauna and ecology of mammals of the tugai of Tajikistan. Tr. IZIP AN Taj.SSR. Dushanbe: Publishing House of the Academy of Sciences of the Tajik SSR, T. 85. 167 p.
16) Solokha Alexander. (2006). Results from the International Waterbird Census in Central Asia and the Caucasus 2003-2005. Wetlands International. C. 25-28.

THE SPECIES COMPOSITION AND THE NATURE OF THE OCCURRENCE OF BIRD SPECIES IN THE DANGARINSKY MASSIF

№	Russian name	Latin names	English names	Nature of the stay	Remark
I	**Отряд ПоганкообразныеОтрядПоганкообразные- Podicipitiformes – Grebes**				-
1	**Сем. Поганковые**	**Podicipitidae**	**Grebes**	-	-
1	Большаяпоганка	*Podiceps cristatus*	Great grested grebe	winter	A rare species for Southwest Tajikistan.
II	**ОтрядГусеобразные – Anseriformes – Anseriformes**				-
2	**Сем. Утиные**	**Anatidae**	**Anatides**		-
2	Хохлатаячернеть	*Aythya fuligula*	Tufted duck	flight, winter	Occursfrom 5 to 15 individuals
3	Красноголовыйнырок	*Aythya ferina*	CommonPochard	Nestle, winter	Numerous species are found in 100-500 individuals during wintering.
4	Красноносыйнырок	*Netta rufina*	Red-Crested Pochard	nestle, winter	Numerous species are found in 50-100 individuals during wintering
5	Широконоска	*Anas clypeata*	NorthernShoveler	flight, winter	There are single features during wintering.
6	Свиязь	*Anas penelope*	(Euraspean) wigeon	flight, winter	There are single features during wintering.
7	Шилохвость	*Anas acuta*	Northern Pintail	flight, winter	There are single features during wintering.
8	Сераяутка	*Anas strepera*	Gadwall	nestle	There are single features during wintering.
9	Кряква	*Anas platyrhynchos*	Mallard	nestle, winter	It occurs during wintering from 15 to 25 individuals.
10	Огарь	*Tadornaferruginea*	Ruddy Shelduck	nestle, winter	There are single features during wintering.
11	Серыйгусь	*Anseranser*	Grey lag goose	winter	Numerous species are found in 450-500 individuals during wintering
III	**ОтрядХищныептицы – Falconiformes – Bird of prey**				-
3	**Сем. Ястребиные**	**Accipitridae**	**Hawsk, accipitrides**	-	-
12	Чёрныйкоршун	*Milvus korschun*	Black Kite	winter	Single individuals hibernate during flight forms flocks of up to 600 individuals
13	Чёрныйгриф	*Aegyptus monachus*	Cinereous Vulture	settled	The species is included in the Red Book of Tajikistan. Vulnerable view of VU.
14	Белоголовый сип	*Gyps fulvus*	Griffon vulture	settled	A rare but stable occurring species.
15	Стервятник	*Neophron percnopterus*	Egyptian Vulture	nestle	The species is included in the Red Book of Tajikistan. Vulnerable view of EN.
16	Бородач	*Gypaetus barbatus*	Bearded vulture	settled	The species is included in the Red Book of Tajikistan. Vulnerable view of EN.
17	Беркут	*Aquila chrysaetus*	Golden eagle	settled	The species is included in the Red Book of Tajikistan. Vulnerable view of VU.
18	Могильник	*Aquila heliaca*	Imperial eagle	flight	A rare migratory bird. Occurs not every year.

№	Russian name	Latin names	English names	Nature of the stay	Remark
19	Орёл-карлик	*Hieraaetuspennatus*	Booted Eagle	nestle	The species is included in the Red Book of Tajikistan. Vulnerable view of EN.
20	Обыкновенныйканюк	*Buteo buteo*	Common buzzard	flight, winter	A rare but stable occurring species.
21	Ястреб-перепелятник	*Accipiter nisus*	(Europea) sparrowhawk	flight, winter	The species is included in the Red Book of Tajikistan. Vulnerable view of EN.
22	Полевойлунь	*Circus cyaneus*	Hen Harrier	flight, winter	A rare but stable occurring species.
23	Степнойлунь	*Circus macrourus*	Pallid harrier	flight	A rare but stable occurring species
4	**Сем. Соколиные**	**Falconidae**	**Falcons**	-	-
24	Туркестанскийбалобан	*Falco cherrugcoasti*	Saker Falcon	settled	The species is included in the Red Book of Tajikistan. Vulnerable viewof EN.
25	Сапсан	*Falco peregrinus brevirostris*	Peregrine Falcon	winter	The number of species continues to decline.
26	Рыжеголовыйсапсан	*Falco peregrinus babylonicus*	Peregrine Falcon	winter	The species is included in the Red Book of Tajikistan. Vulnerable viewof EN.
27	Кобчик	*Falco vespertinus*	Red-footed	flight	Therearesingleindividuals.
28	Степнаяпустельга	*Falco naumanni*	Lesser Kestrel	nestle	Rare view
IV	**ОтрядКуриные – Galliformes –Fowl-like birds**				-
5	**Сем. Фазановые**	**Phasianidae**	**Pheasants, peacocks**	-	-
29	Пустыннаякуропатка	*Ammoperdixgriseogularis*	See-see Partridge	settled	The species is included in the Red Book of Tajikistan. Vulnerable viewof EN.
V	**ОтрядЖуравлеобразные – Gruiformes – Gruiformes**				-
6	**Сем. Настоящ. журавли**	**Gruidae**	**Granes**	-	-
30	Серыйжуравль	*Grus grus*	Common [gray] crane	flight	The last decades have a numerous look.
7	**Сем. Дрофиные**	**Otididae**	**Bustards**	-	-
31	Дрофа	*Otis tarda*	Great Bustard	nestle, winter	It is included in the Red Book of RT. Vulnerable view of CR. Not nesting
32	Стрепет	*Tetraxtetrax*	Little Bustard	flight, winter	A smallwinteringspecies.
33	Джек	*Chlamydotisundulata*	Houbara Bustard	nestle	It is included in the Red Book of RT. Vulnerable view of CR. Rare migratory
VI	**ОтрядГолубеобразные – Columbiformes – Pigeons, doves**				-
8	**Сем. Голубиные**	**Columbidae**	**Pigeons, doves**	-	-
34	Сизыйголубь	*Columba livia*	Rock Pigeon	settled	It is inhabited in human settlements. Nests in attics and in ravines with clay soils.
35	Бурыйголубь	*Columba eversmanni*	Yellow-eyed Pigeon	nestle	Rare view

№	Russian name	Latin names	English names	Nature of the stay	Remark
9	**Сем. Рябковые**	**Pteroclidae**	**Sandgrouse**	-	-
36	Чёрнобрюхийрябок	*Pteroclesorientalis*	Black-bellied Sandgrouse	nestle, winter	The species is included in the Red Book of Tajikistan. Vulnerable viewof EN.
37	Белобрюхийрябок	*Pteroclesalchata*	Pin-tailed Sandgrouse	nestle, winter	Not always a met
VII	**ОтрядСовообразные – Strigiformes –Owls**				-
10	**Сем. Настоящиесовы**	**Strigidae**	**(Typical) owls**	-	-
37	Домовыйсыч	*Athene noctua*	Little Owl	settled	It inhabits cultural landscapes. Nests in burrows, caves, hollows and in attics.
38	Сплюшка	*Otus scops*	Eurasian Scops-owl	nestle	The usuallook.
39	Филин	*Bubo bubo*	Eurasian Eagle-owl	settled	Inhabits forests near rivers, lakes and swamps. Nests in rocks and empty nests of other birds
VIII	**ОтрядСтрижеобразные – Apodiformes – Swifts, Hummingbirds**			-	-
11	**Сем. Настоя. стрижи**	**Apodidae**	**Swifts**	-	-
40	Черныйстриж	*Apusapus*	NorthernSwift	nestle	Normal breedingspecies.
41	Белобрюхийстриж	*Apus melba*	Alpine swift	nestle	Inhabits and nests in conglomerate and loessous steep riverbanks
IX	**ОтрядРакшеобразные –Coraciiformes –Coraciiformes**				-
12	**Сем. Зимородковые**	**Alcedinidae**	**Kingfishers**	-	-
42	Обык. зимородок	*Alcedo atthis*	(Common) kingfisher	nestle	Inhabits rivers, lakes and other bodies of water with clear water. Breeds in burrows on cliffs
13	**Сем. Сизоворонковые**	**Coraciidae**	**Rollers**	-	-
43	Сизоворонка	*Coracias garrulus*	European Roller	nestle	It inhabits dry landscapes from forests to deserts. Nests in hollows of other birds
14	**Сем. Щурковые**	**Meropidae**	**Bee-eaters**	-	-
44	Золотистаящурка	*Meropsapiaster*	Bee-eater	nestle	Inhabits steppe spaces with ravines and steep riverbanks. Breeds in burrows on cliffs.
45	Зелёнаящурка	*Meropssuperciliosus*	Blue-cheeked	nestle	Inhabits steppe spaces with ravines and steep riverbanks. Breeds in burrows on cliffs
15	**Сем. Удодовые**	**Upupidae**	**Hoopoes**	-	-
46	Удод	*Upupaepops*	Hoopoe	nestle	Adheres to the coastal strip with woody vegetation.
X	**ОтрядВоробьиные – Passeriformes –Perching birds**				-
16	**Сем. Жаворонковые**	**Alaudidae**	**Larks**	-	-

№	Russian name	Latin names	English names	Nature of the stay	Remark
47	Степнойжаворонок	*Melonocoryphacalandra*	Calandra Lark	settled	It lives in open spaces: meadows, fields. Nests in dimples lined with dry herbs.
48	Хохлатыйжаворонок	*Galerida cristata*	Crested Lark	settled	Common widespreadsedentarybird.
49	Полевойжаворонок	*Alauda arvensis*	Sky lark	flight, winter	It lives in open spaces: meadows, fields.
17	**Сем. Ласточковые**	**Hirundinidae**	**Swallows**	-	
50	Деревенскаяласточка	*Hirundo rustica*	European swallow	nestle	It lives in human settlements. Builds a nest of mud on village buildings.
18	**Сем. Трясогузковые**	**Motacillidae**	**Wagtails, pipits**		-
51	Туркестан. белаятрясогузка	*Motacilla alba personata*	Pied wagtail	nestle, winter	Settles on an open area near roads, fields, in gardens and parks. Breeds in the form of a hole on the ground
52	Горныйконёк	*Anthusspinoletta*	Water Pipit	nestle, settled	Inhabitant of dry forest species. Nests on the ground in the form of dimples lined with leaves and thin branches.
19	**Сем. Дроздовые**	**Turdidae**	**Thrushes**	-	
53	Обыкновеннаякаменка	*Oenanthe oenanthe*	Northern Wheatear	nestle	Inhabits deserts, steppes, forests and mountains. Nests among dry, open rocky areas.
54	Чёрнаякаменка	*Oenanthe picata*	Variable Wheatear	nestle	Rare bird.
55	Златогузаякаменка	*Oenanthe xanthoprymna*		nestle	A smallnestingbird.
56	Соловей-белошейка	*Irania gutturalis*		nestle	Nestingbird.
57	Чёрныйчекан	*Saxicola carpata*	Pied Buchchat	nestle	The inhabitant of the meadows of the cultural landscape. Nests on the ground among low and rare grass.
20	**Сем. Славковые**	**Sylviidae**	**Old World warblers**	-	-
58	Иранскаяпеночка	*Phylloscopus neglectus*	Plain Leaf-warbler	nestle	Adheres to the coastal strip with shrubby vegetation.
21	**Сем. Поползни**	**Sittidae**	**Nuthatches**	-	-
59	Скалистыйпоползень	*Sitta neumayertephronota*	Eastern Rock Nuthatch	settled	Adheres to the foot of rocky slopes.
22	**Сем. Овсянковые**	**Emberizidae**	**Buntings**	-	
60	ОвсянкаСтюарта	*Emberizastewarti*	White-capped bunting	nestle	Adheres to rocky slopes with sparse shrubs.
23	**Сем. Ткачиковые**	**Ploceidae**	**Weavers**	-	-
61	Индийский воробей	*Passer domesticus*	House Sparrow	nestle, settled	Common numerous nesting bird. Breeds in ravines.
62	Полевойворобей	*Passer montanus*	Tree sparrow	settled	Common numerous sedentary bird. Breeds in ravines
24	**Сем. Скворцовые**	**Sturnidae**	**Starlings**	-	-
63	Майна	Acridotheres tristis	Common [Indian] myna	settled	Numerous sedentary bird. Like the Indian sparrow, it occupies a nesting site of bee-eater in ravines of roads.

№	Russian name	Latin names	English names	Nature of the stay	Remark
64	Розовыйскворец	Sturnus roseus	Rose-coloured Starling	nestle	. Foothill nests and less often open spaces and watering places.
25	**Сем. Иволговые**	**Oriolidae**	**Oriolus**	**-**	**-**
65	Иволга	Oriolusoriolus	European Golden Oriole	nestle	Widespread nesting bird gardens.
26	**Сем. Врановые**	**Corvidae**	**Crows**	**-**	**-**
66	Сорока	Pica pica	Eurasian Magpie	settled	Widespread sedentary bird
67	Чёрнаяворона	*Corvus corone*	Carrion crow	settled	It lives in groups of trees among fields, meadows and settlements. Nests on tall trees.
68	Ворон	*Corvus corax*	Raven	settled	Settles in rocky places. Nests on rocks, ravines and trees

Note: Ос. – settled, Гн. – nestle, Пр. – flight, Зим. – Winter. EN = endangered (species)

Annex 5 - MOM OF PUBLIC CONSULTATIONS

On 16 November 2021, Public Consultation Meetings were carried out in Jamoat Bustonkala and Jamoat Guliston of Rayon Levakant. Minutes of Meeting are the following.

Minutes of the Public Consultation
On Environment, Social and LAR issues for
Bokhtar - Okmazor road Section

Date: 16 November 2021
Time: 10.00
Location: Jamoat Bustonkala

Participants:

1. Residents of town Levakant and owners of potentially project affected commercial facilities (in total 50 participants)
2. Representatives of Jamoat Bustonkala, raisi mahalas of local villages
3. Representatives of PIURR, Hurmatzoda Fathiddin and Sherali Temurzoda
4. Consultants of Kocks Consult GmbH: Jurgen Mayer, Lela Shatirishvili and Fozil Fozilov

Agenda:

- Brief review of Road Network Sustainability Project and description of Bokhtar - Okmazor road Section
- Project benefits, expected environmental impact and mitigation measures
- Discussion on expected social and LAR impacts, eligibility and principles of compensation as defined in the LARP in compliance with country legislation and ADB IR guidelines (SPS 2009); essence of cut-off date, Importance of participatory involvement of APs in DMS and all field surveys, brief description of valuation methodology exercised during determination of compensation unit rates.
- Grievance redress mechanism, GRC and rules for GRM application
- Question – Answer session

On 16 November 2021, the official Public Disclosure Meeting was held in the Meeting of Hall of Jamoat Guliston. At the beginning of presentations, the handout materials were provided to each and every participant together with a bottle of hand sanitizer and facial mask.
Mr. Fathiddin Hurmatzoda, Lead Resettlement Specialist at PIU opened the meeting and briefed the audience on the objectives of pending road project and its importance for the local population, road users and future development of country economy.
Mr. Jurgen Mayer briefed the audience of the findings of the Initial Environmental Examination (IEE), technical parameters, road category and cross sections. He also explained the importance of environment assessment to identify the project's impact on physical, biological and human environment and develop suitable mitigation and monitoring measures to the technically best possible degree.
Mrs. Shatirishvili described major aspects and objectives of Land Acquisition and Resettlement Plan (LARP) prepared in compliance with ADB SPS, country legislation and best international practice. She described the activities undertaken during LARP preparation and highlighted their importance to develop fair compensation package for each and every project affected household and legal or physical person.
Mr. FozilFozilov continued the presentation of social and LAR impacts and touched upon the method of calculation of compensation unit rates for affected structures, annual crops, perennials and replacement saplings; spoke about additional one-time allowance allocated for vulnerable and severely affected households, etc.

Additionally, he once again explained the importance of the **cut-off date, 25 June 2020** as defined for the given project; touched on the legislative instruments of country legislation as used in general practice during implementation of land acquisition and resettlement projects.
At the end of each presentation, reference was made to the Grievance Redress Mechanism and Grievance Redress Commission on the district and national levels operating during the entire project cycle and being available for any aggrieved person.
After the completion of presentation, the panel opened a question-answer session. In the closing phase, the PIU representative once again voiced that the MoT and PIURR will put allefforts to ensure LARP implementation procedures were held smoothly through meaningful negotiations with APs. The official Public Meeting was then closed.

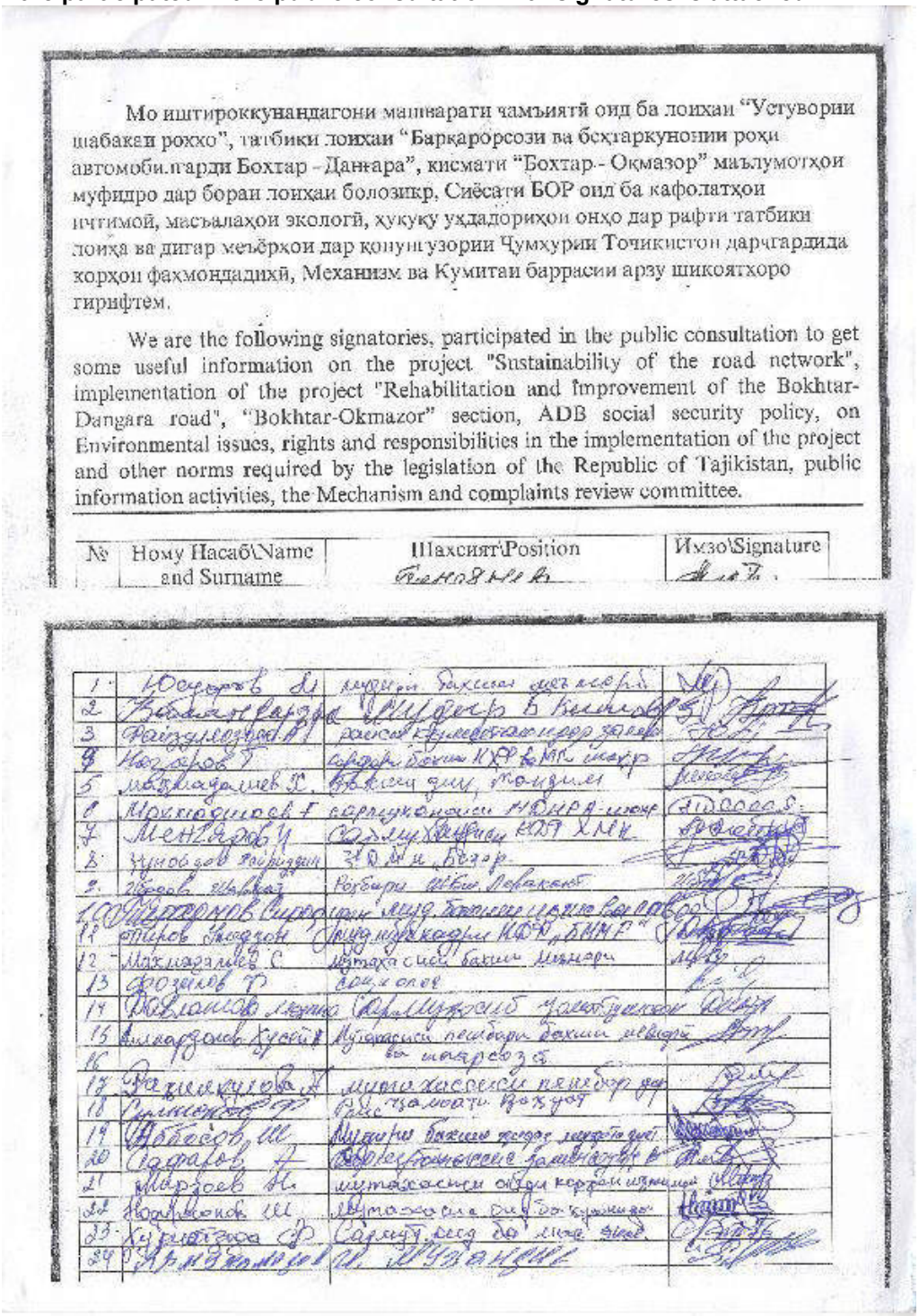
Question-Answer Session:

Question 1: Is any cash compensation considered for land of Dehkan farm and fruit trees?
Answer: Certainly, Dehkan farms will receive cash compensation for project affected land, annual crops and fruit bearing perennials, and if any other affected assets and /or improvements are identified. In addition, onetime allowance to cover the cost of certificate renewal will be issued as well.
Question 2: Are there any culverts included in the road design? For instance, in Levakant in vicinity of the Road Asset Management office?
Answer: Drainage system is included in the road design. After double check with the engineer and review of drawings, it is confirmed that all required drainage standards are met by the design. Within section Bokhtar-Levakand, there will be three culverts implemented. The Road Asset Management Office is located at PK 417+20 and at PK 417+55 where there is a 2.0x2.0 m culvert. In our project, we reconstruct this pipe - extend it from the inlet side.
Question 3: Is there any U-turn included in the road design?
Answer: Certainly, U-turns are included in the road design in compliance with Road Safety requirements and in coordination with the State Auto Inspection Agency.
Question 4: It is clear that some non-fruit bearing trees (mostly “Platan”, locally called Chinar) will be affected during road works. What mitigation measures will be applied?
Answer: Replacement Deciduous trees will be planted along the edges of new road as mitigation measures considered under IEE.
Question 5: Can we please offer to consider underground or overground passage for passengers at three locations: a. railway station, b. Chemical Factory in JamoatGuliston, c. in the village Eshonobod.
Answer: Within settlements the preference is often given to Traffic lights and Zebra crossings. However, your suggestion will be delivered to Management of Project Executing Agency, Engineer and Design Company to review, assess and in compliance with established standards offer the best and most efficient approach.
The selected design solution for the Bokhtar-Levakant project provides one underground pedestrian crossing and two overground pedestrian crossings in the following places:
- PK 0+30 – underground pedestrian crossing;
- PK 20+05 - overground pedestrian crossing;
- PK43+20 - overground pedestrian crossing.

Question 6: Is there any water supply project aside to Road project in this area?
Answer: We cannot provide any answer to your questions, as we are only involved in Road Network Sustainability Project in the Republic of Tajikistan.
Question 7: I am representing one of the project affected fuel stations. Is there any possibility to narrow the width of the road, amend some technical parameters to eliminate project impact from road side businesses and more importantly partially affected fuel stations, where some other operating businesses, such as shops, car repair and car wash facilities remain outside of ROW, after the main business element-fuel stations is going to be demolished and there is no space left to build a new fuel station and restore the “chain” of business we currently keep operating.
Answer: We are aware of such cases and understand the sensitivity and severity of impact. We will reassess every single case with similar impact conditions and if confirmed that

remaining assets will lose economic value in coordination with AP the decision may be made to compensate residual land and assets in addition to assets directly affected by the given road project.

The list of the participated in the public consultation with signatures is attached.



Мо иштироккунандагони машварати чамъиятй оид ба лоихаи "Устувории шабакаи роххо", татбики лоихаи "Баркарорсози ва бехтаркунонии роҳи автомоби.гарди Бохтар - Данғара", кисмати "Бохтар - Окмазор" маълумотҳои муфидро дар бораи лоиҳаи болозикр, Сиёсати БОР оид ба кафолатҳои иҷтимой, масъалаҳои экологй, ҳукуқу уҳдадориҳои онҳо дар рафти татбики лоиҳа ва дигар меъёрҳои дар қонунгузории Ҷумҳурии Тоҷикистон дарҷгардида хорҳои фахмондадихй, Механизм ва Кумитаи баррасии арзу шикоятҳоро гирифтем.

We are the following signatories, participated in the public consultation to get some useful information on the project "Sustainability of the road network", implementation of the project "Rehabilitation and Improvement of the Bokhtar-Dangara road", "Bokhtar-Okmazor" section, ADB social security policy, on Environmental issues, rights and responsibilities in the implementation of the project and other norms required by the legislation of the Republic of Tajikistan, public information activities, the Mechanism and complaints review committee.

№	Ному Насаб\Name and Surname	Шахсият\Position	Имзо\Signature

Photos of Public Consultation hold on November 16, 2021

Annex 6 - IDENTIFIED AREAS FOR SURPLUS MATERIAL DISPOSAL

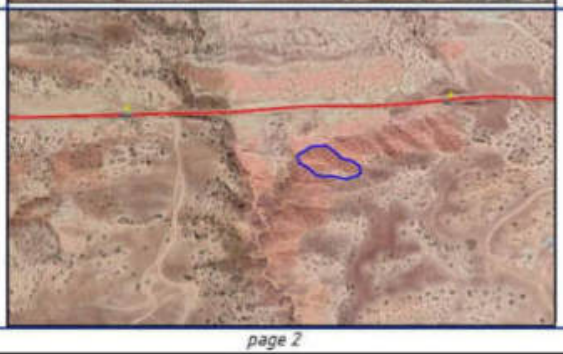
Preliminary dumpsites for unsuitable or excess materials
(Rehabilitation and reconstruction of Bokhtar – Dangara – road)
to PC 97+22.39 and PC 668+100

No of dumpsites	Location, Km	For section, Km	Local map	Estimated volume m3
1	11+700	97+22.39 – 12+500		45 000
2	13+300	12+500 – 16+00		288 000
3	16+600	16+00 – 17+500		23 000
4	18+00	17+500 – 18+500		98 000

page 1

Взам. инв. №
Подпись и дата
Инв. № подл.

Preliminary dumpsites for unsuitable or excess materials
(Rehabilitation and reconstruction of Bokhtar – Dangara – road)
to PC 97+22.39 and PC 668+100

No of dumpsites	Location, Km	For section, Km	Local map	Estimated volume m3
5	18+700	18+500 – 19+800		194 000
6	20+500	19+800 – 21+00		154 000
7	22+300	21+00 – 22+500		90 000
8	23+600	22+500 – 24+500		190 000

page 2

Взам. инв. №
Подпись и дата
Инв. № подл.

Preliminary dumpsites for unsuitable or excess materials
(Rehabilitation and reconstruction of Bokhtar – Dangara – road)
to PC 97+22.39 and PC 668+100

No of dumpsites	Location, Km	For section, Km	Local map	Estimated volume m3
9	28+00	24+500 – 26+00		82 000
10	30+400	26+00 – 31+00		227 000
11	35+700	31+00 – 40+00		144 000
12	42+300	40+00 – 43+00		125 000

page 3

Взам. инв. №
Подпись и дата
Инв. № подл.

Preliminary dumpsites for unsuitable or excess materials
(Rehabilitation and reconstruction of Bokhtar – Dangara – road)
to PC 97+22.39 and PC 668+100

No of dumpsites	Location, Km	For section, Km	Local map	Estimated volume m3
13	42+300	43+00 – 45+00		158 000
14	46+00	45+00 – 47+00		76 000
15	59+600	47+00 – 68+100		398 000

Взам. инв. №
Подпись и дата
Инв. № подл.

Annex 7 - MoT's Letter to the CEP on IEE Submission for the Bokhtar-Dangara Road

ҶУМҲУРИИ ТОҶИКИСТОН
МАРКАЗИ ТАТБИҚИ ЛОИҲАҲОИ
ТАҶДИДИ РОҲҲО

РЕСПУБЛИКА ТАДЖИКИСТАН
ЦЕНТР РЕАЛИЗАЦИИ ПРОЕКТОВ
РЕАБИЛИТАЦИИ ДОРОГ

REPUBLIC OF TAJIKISTAN
PROJECTS IMPLEMENTATION UNIT FOR ROADS REHABILITATION

ш. Душанбе, кӯчаи Айнӣ 14
Тел/Факс: (992 37) 222 20 73
E-mail: piurr@bk.ru

14 Ayni str., Dushanbe
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г. Душанбе, улица Айни 14
Тел/Факс: (992 37) 222 20 73
E-mail: piurr@bk.ru

10 11 20 №1242

Кумитаи ҳифзи муҳити зисти назди
Ҳукумати Ҷумҳурии Тоҷикистон

Маркази татбиқи лоиҳаҳои таҷдиди роҳҳо барои ҳамкории судманд изҳори миннатдорӣ менамояд.

Ҳамзамон иттилоъ медиҳем, ки оғози корҳои сохтмонии лоиҳаи "Таҷдиди роҳи автомобилгарди Бохтар – Данғара" дар аввали соли 2021 дар назар аст.

Тибқи талаботи сиёсати Бонки Осиёгии Рушд (БОР) оид ба кафолатҳои иҷтимоӣ, ҳисоботи арзёбии аввалаи экологӣ бояд пеш аз оғози корҳои сохтмонӣ таҳия ва аз ҷониби БОР ва Кумитаи ҳифзи муҳити зисти назди Ҳукумати Ҷумҳурии Тоҷикистон тасдиқ карда шавад.

Бинобар ин, бо мақсади саривақт ва босифат татбиқ намудани лоиҳа, хоҳиш менамоем, ки ҷиҳати баррасӣ ва ба ҳисоботи арзёбии аввалаи экологӣ барои додани хулоса мусоидат намоед.

Директори иҷроия /Н. Арабзода

Un-Official translation

The State Committee for Environmental
Protection under the Government of the
Republic of Tajikistan

The Project Implementation Unit for Road Rehabilitation expresses its gratitude for the fruitful cooperation.

At the same time, we would like to inform you that the construction works of the Bokhtar - Dangara is expected to start in the beginning of 2021.

In accordance with the requirements of the Asian Development Bank's (ADB) Social Safeguard Policy, the initial environmental assessment report should be prepared prior to the works commencement and approved by ADB and the Committee for Environmental Protection under the Government of the Republic of Tajikistan.

Therefore, in order to implement the project in a timely and quality manner, we ask you to assist in the consideration of the Initial Environmental Examination and issue your conclusion.

Executive Director N. Arabzoda

Annex 8 - CEP's Letter to MoT on SEE Conclusion for the Bokhtar-Dangara Road

КУМИТАИ ҲИФЗИ МУҲИТИ ЗИСТИ
НАЗДИ ҲУКУМАТИ ҶУМҲУРИИ ТОҶИКИСТОН
ЭКСПЕРТИЗАИ ДАВЛАТИИ ЭКОЛОГӢ

734034, Ҷумҳурии Тоҷикистон,
ш.Душанбе, кӯчаи Шамсӣ, 5/1.
тел: 2359583, 2359577, факс:2361353;
№1537-15
«16» 11 с.2020.

Тасдиқ мекунам:
Сардори Экспертизаи
давлатии экологӣ
_____Маҳмадуллозода Х.Р.

Хулосаи Экспертизаи давлатии экологӣ
барои «Таҷдиди роҳи автомобилгарди Бохтар-Данғара».

Ҳуҷҷатҳои пешниҳодшуда:

Дархости директори иҷроия Маркази татбиқи лоиҳаҳои таҷдиди роҳҳо Арабзода Н. аз 11.11.2020, №794-15.

Ҳисобот оид ба арзёбии таъсиррасонӣ ба муҳити зист оид ба «Таҷдиди роҳи автомобилгарди Бохтар-Данғара».

Эксперти Экспертизаи давлатии экологӣ Сайдамиров С. дар асоси талаботи қонунҳои Ҷумҳурии Тоҷикистон «Дар бораи ҳифзи муҳити зист», «Дар бораи экспертизаи экологӣ», «Дар бораи арзёбии таъсиррасонӣ ба муҳити зист», қарорҳои Ҳукумати Ҷумҳурии Тоҷикистон аз 3 декабри соли 2012, №697 «Дар бораи тартиби гузаронидани экспертизаи давлатии экологӣ» ва аз 1 ноябри соли 2018, №532 «Дар бораи Тартиби арзёбии таъсиррасонӣ ба муҳити зист, таснифи объектҳои арзёбии таъсиррасонӣ ба муҳити зист аз рӯи гурӯҳҳо вобаста ба хусусияти таъсиррасонии онҳо ба муҳити зист, меъёрҳое, ки дараҷаи хатарнокии объектҳои фаъолияти банақшагирифташавандаро барои муҳити зист муайян мекунанд» ҳисоботро оид ба арзёбии таъсиррасонӣ ба муҳити зист барои «Таҷдиди роҳи автомобилгарди Бохтар-Данғара», ки аз ҷониби директори иҷроияи маркази татбиқи лоиҳаҳои таҷдиди роҳҳо Арабзода Н., мавриди баррасӣ қарор дод.

Тибқи ҳисоботи пешниҳодшуда таҷдиди роҳи автомобилгарди Бохтар-Данғара, дар масофаи 70 км ба нақша гирифта шудааст.

Нохияҳое, ки лоиҳаи мазкур фаро мегирад аз рӯи шароитҳои ботаникӣ-ҷуғрофӣ, релеф, сохти геологӣ, таркиби олами наботот ва ҳайвонот ва хусусиятҳои фишори экологӣ ба музофоти табиии Тоҷикистони Ҷанубӣ мансуб ҳастанд.

Қабати набототӣ гуногун аст ва аз растаниҳои биёбонӣ-регӣ, туғай ва токачангалҳои ксерофитӣ иборат мебошад. Олами ҳайвонот бо хазандагон, ширхӯрон ва паррандагон бой буда, дар байни онҳо намудҳои нодир ва эндемӣ бисёранд. Дар ҳудуди татбиқи лоиҳа намудҳои ба китоби сурх дохил будаи олами набототу хайвонот мавҷуд нест.

Ноҳия ба минтақаи намнокиаш начандон зиёд, бо тобистони гарм ва зимистони мулоим дохил мешавад.

Релефи маҳали татбиқи лоиҳа дар ҳудуди ноҳияҳои Бохтар-Данғара нисбатан ҳамвор буда, аз шимол ба ҷануб моил аст. Дар ҳудуди ноҳияҳо релеф кӯҳдоман аст.

Дар лоиҳа манбаҳои таъсир ба компонентҳои муҳити зист нишон дода шудаанд, вале дар он ҳисоби миқдории таъсир ба компонентҳои муҳити зист оварда нашудааст. Ҳангоми таъмиру баркарорсозии роҳ таъсир ба намудҳои гуногуни компанентҳои муҳити зист расонида мешавад. Ба таъсири эҳтимолӣ ба муҳити зист дохил мешаванд:

Ҳангоми корҳои сохтмонӣ манбаҳои асосии партов ба ҳавои атмосфера инҳо мебошанд:

- модлаҳои ифлоскунандаи ҳаво аз фаъолияти муҳаррикҳои техника ва воситаҳои наклиётӣ истифодашаванда;
- чанг ҳангоми кашонидан ва нигоҳдории масолеҳи сохтмонӣ;
- чанг ҳангоми ҷобаҷогузории техникаҳо;
- чанг ҳангоми гузаронидани корҳои сохтмонӣ.

Чӣ тавре аз ҳисобот бармеояд ҳангоми иҷрои корҳо манбаҳои асосии партов ба ҳавои атмосфера инҳо буда метавонанд: модлаҳои ифлоскунандаи ҳаво аз фаъолияти муҳаррикҳои техника ва воситаҳои наклиёти истифодашаванда, чанг ҳангоми кашонидан ва нигоҳдории масолеҳи сохтмонӣ, кафшеркунӣ, чанг ҳангоми ҷобаҷогузории техникаҳо.

Ҳангоми фаъолияти воситаҳои наклиёти сохтмонӣ, кафшеркунӣ ва иҷрои корҳои сохтмонӣ ба ҳавои атмосфера партовҳои зерин партофта мешаванд: чанг, дуоксиди нитроген оксиди нитроген, бенз(а) пирен, дуда, дуоксиди сулфур, алдегидҳо, карбогидрадҳои, оксиди карбон

Инчунин ҳангоми аз ҳудуди иншооти сохтмонӣ берун рафтани техникаҳо ва воситаҳои наклиётҳои боркаш чанг ба амал омада, роҳҳои мошингард олуда мешаванд, бинобарон наклиётҳо тибқи қоида шустушӯй карда шуда, тозагии онҳо таъмин карда шаванд. Аз ин рӯ зарур аст, ки барои пахн нагардидани чанг саривакт роҳ обпошӣ карда шавад. Ҳамзамон ҳангоми таҳдиду азнавсозӣ пайдо шудани партовҳои сохтмонӣ дар назар аст, ки ҳаҷми он аз ҳаҷми корҳои сохтмонӣ вобаста мебошад. Таркиби ин партовҳо аз бокимондаҳои асфалту бетон, оҳанпора, қубурҳои фарсуда, нокилҳо, партовҳои изолятсионӣ ва амсоли онҳо иборат мебошад.

Партовҳои сохтмонӣ бояд ба навъҳо ҷудо карда шуда, дар мувофика бо мақоми ваколатдори давлатии ҳифзи муҳити зист аз майдони сохтмон бароварда шаванд.

Ҷойгиронии хокҳои кандашудаи мавзеи сохтмон бояд дар асоси иҷозати мақоми ваколатдори давлатӣ ва муайян намудани хатсайр тавассути наклиёти боркаш амалӣ карда шавад.

Партовҳои сахти маишӣ аз ҳисоби кормандон, ошхонаи сохтмончиён ва рӯбучини майдонҳо ба амал меояд. Ҳаҷми партовҳои сахти маишӣ аз шумораи умумии одамон, ҳаҷми таъом ва масоҳати майдонҳои рӯфташаванда вобаста аст. Таркиби химиявии ин партовҳо аз

нитроген, фосфор, карбон, калий ва хокрубаҳо иборат буда, аз рӯи хосияти физикавӣ сахт, сӯзанда, ҳалнашаванда мебошад. Аз ҷиҳати инфексионӣ ба гурӯҳи чоруми партовҳои хатарнок дохил мешавад. Партовҳои сахти маиший бо истифода аз қуттиҳои махсус ҷамъ оварда шуда, дар асоси шартнома бо ташкилоти партовкашон ва ё бо иҷозати мақоми ваколатдори давлатии ҳифзи муҳити зист ба партовгоҳи расмӣ бароварда шавад.

Дар давраи омодагӣ ба оғози корҳои сохтмонӣ ичрои корҳои зерин тибқи лоиҳа пешбинӣ шудааст:

– сохтани майдончаи сохтмонӣ;

– бартараф намудани дарахтон ва буттаҳо, кандани решаҳо;

– бартарафсозии иншооти сунъии истифоданашаванда;

– баровардан ва азнавсозии шабакаҳои муҳандисӣ;

– гирифтани кабати ҳосилхези замин;

– бартарафсозии рӯйпуши асфалтобетонии мавҷудбуда;

– гузоштани аломатҳо ва иҳотагири муваққатӣ дар қитъаи сохтмонӣ.

Ҳангоми гузаронидани корҳои сохтмонӣ ҳамчунин садо ва ларзиш ба вуҷуд меояд, ки оромии минтақаро муваққатан халалдор месозад. Аз ин лиҳоз ҳангоми гузаронидани корҳои сохтмонӣ реҷаи муайяни корӣ муқаррар карда шуда, аз техникаю механизмҳои замонавӣ бояд истифода бурда шавад.

Тибқи лоиҳа бартараф намудани дарахтоне, ки ба рафти сохтмони роҳ халал мерасонад, пешбинӣ шудааст. Бинобарон бояд буриши дарахтон ва шинонидани ниҳолон дар асоси санад ва мувофиқаи мақоми ваколатдори давлатӣ ва риояи техникаҳои бехатарӣ амалӣ карда шавад.

Кабудизоркунии минтақаҳои азнавсозишаванда яке аз мақсадҳои ташкили нақшабандии меъмории ҳудуд буда, ҷиҳати беҳтар гардидани муҳити зист мусоидат менамояд. Пеш аз оғози корҳои ободонӣ номгӯи дарахтон, буттаҳо ва растаниҳои сабзанда барои сабзазоркунӣ аниқ карда шуда, мутобиқати онҳо ба шароити табиӣ-иқлимии маҳал ва тобоварии онҳо ба шароити номусоиди муҳити шаҳр муайян карда шаванд.

Дар марҳилаи биологӣ, бошад шинонидани растаниҳо, пошидани тухмии сабза, пошидани порӯ ва минералҳои агрокимёвӣ бо мақсади фаъол намудани нашъунамои дарахтон, буттаҳо, ниҳолҳо ва сабза амалӣ карда мешавад.

Аз нигоҳи экологӣ таҳдиду азнавсозии роҳи мазкур барои кам кардани таъсири антропогенӣ ба муҳити зист(махсусан ҳавои атмосфера) мусоидат хоҳад кард.

Бо мақсади ҳифз ва беҳдошти муҳити зист пешниҳодҳои ичроишашон ҳатмӣ барои ичро дода мешавад:

– Ҳангоми татбиқи лоиҳа талаботи қоида ва меъёрҳои сохтмони роҳсозӣ, меъёрҳои экологӣ ва қонунгузории Ҷумҳурии Тоҷикистон дар бахши ҳифзи муҳити зист қатъиян риоя карда шаванд;

– Аз тарафи пудратчӣ шахси масъул барои пеш бурдани назорати

соҳавӣ таъин карда шавад;

– Аз тарафи пудратчӣ нақшаи чорабиниҳо оид ба ҳифзи муҳити зист таҳия гардида он бо маҳомотҳои маҳаллии ҳифзи муҳити зист мувофиқа карда шавад;

– Бо мақсади ҳифзи ҳавои атмосфера ва пешгирии чанг ҷитъаи кор мунтазам обпошӣ карда шавад;

– Дар рафти иҷрои корҳои сохтмонӣ талаботи қойда ва меъёрҳои сохтмонӣ, бехатарӣ риоя карда шуда, чораҳои зарурӣ андешида шавад;

– Дарахтоне, ки ба рафти сохтмон халал мерасонанд танҳо дар мувофиқа бо мақоми ваколатдори давлатӣ дар соҳаи ҳифзи муҳити зист бартараф карда шаванд;

– Шинонидан ва кӯчонидани ниҳолон тибқи лоиҳа ва қоидаҳои агротехникӣ амалӣ карда шавад;

– Корҳои техникии сохтмон тибқи риояи талаботҳои меъёрҳои экологӣ ва таъсири ҳадалимкон ба муҳити зист амалӣ карда шаванд;

– Бо тартиби мукарраршуда аз болои риояи талаботи чорабиниҳо дар бахши ҳифзи муҳити зист назорати идоравӣ ҷорӣ карда шавад;

– Партовҳои сахти маишӣ бо тартиби мукарраршуда дар партовгоҳи расмӣ ҷойгир карда шаванд;

– Партовҳои сохтмонӣ дар рафти корҳои сохтмонӣ ва баъд аз анҷоми корҳои сохтмонӣ ба вуҷуд омадаро ба навъҳо ҷудо карда шуда, дар мувофиқа бо мақоми ваколатдори давлатӣ дар соҳаи ҳифзи муҳити зист ба партовгоҳи расмӣ бароварда шавад;

– Ҳангоми аз ҳудуди иншооти сохтмонӣ берун рафтани техникаҳо ва воситаҳои нақлиётҳои боркаш тибқи қоида шустушӯй карда шуда, тозагии онҳо таъмин карда шаванд;

– Ҳангоми ҷойгиронии корхонаи асфалтбарорӣ ва корхони коркарди маводҳои инертӣ тибқи талаботи қонунгузори дар бахши ҳифз ва беҳдошти муҳити зист зарур аст, ки ҳисобот оид ба арзёбии таъсиррасони ба муҳити зист таҳия карда шуда ва барои гирифтни хулосаи экспертизаи давлатии экологии Кумитаи ҳифзи муҳити зисти назди ҳукумиати Ҷумҳурии Тоҷикистон пешниҳод карда шавад.

– Ҳангоми сохтмони селпартовҳо санаҳои меъёрию-ҳуқуқӣ, стандартҳои давлатӣ, санитарӣ, бехатарӣ ва экологӣ амали карда шаванд;

– Корҳои технологӣ тибқи риояи талаботҳои меъёрҳои экологии таъсир ба муҳити зист амалӣ карда шаванд;

- Нусхаи хулосаи мазкур ба маҳомотҳои маҳалии ҳифзи муҳити зисти татбиқи лоиҳа манзур карда шавад.

Хулосаи мазкур дар сурати таъмини иҷрои пешниҳодҳои дар боло зикргардида эътибори ҳуқуқӣ дорад.

Назорат аз болои риояи қонунгузории Ҷумҳурии Тоҷикистон дар бахши ҳифз ва беҳдошти муҳити зист ба зимаи маҳомотҳои маҳалии ҳифзи муҳити зисти доираи татбиқи лоиҳа гузошта шавад.

Экспертизаи давлатии экологии Кумитаи ҳифзи муҳити зисти назди Ҳукумати Ҷумҳурии Тоҷикистон ҳуҷҷатҳои пешниҳоднамудаи директори иҷроияиМаркази татбиқи лоиҳаҳои таҳдиди роҳҳоро Арабзода Н-ро оид ба «Таҳдид ва азнавсозии роҳи автомобилгарди Бохтар-Данғара», бо назардошти риояи қонунгузорӣ дар соҳаи ҳифзи муҳити зист ва иҷрои катъии супоришҳои дар боло зикрёфта мувофиқа менамояд.

Эксперт С. Сайдамиров

Unofficial Translation

No.1537-15
16.11.2020

Committee For Environmental Protection Under The Government Of The Republic Of Tajikistan
State Environmental Expertise

Approved: Head of State
Environmental Expertise
MahmadulloevKh.R

Conclusion

of State Environmental Expertise for the Rehabilitation of the Bokhtar - Dangara Road Project:

Submitted document:

Request No.794-15 of the Executive Director of the Project Implementation Unit for Road Rehabilitation Mr. Arabzoda N. dated 11.11.2020.

Initial Environmental Examination for the “Bokhtar-Dangara” Road Project.

Expert of the State Environmental Expert Saydamirov S. following the requirements of the laws of the Republic of Tajikistan "On Environmental Protection", "On Ecological Expertise", "On Environmental Impact Assessment", Decrees of the Government of the Republic of Tajikistan dated December 3, 2012, №697 On the Procedure for Conducting State

Environmental Expertise" dated November 1, 2018, №532" On the Procedure for Assessing Environmental Impact Assessment, Classification of Objects of Environmental Impact Assessment by groups depending on the nature of environmental impact assessment, criteria Environmental Impact Assessment Report for Rehabilitation of Bokhtar – Dangara Road Project, submitted by Arabzoda N., Executive Director of the Project Implementation Unit for Road Rehabilitation.

According to the submited report, the reconstruction of the Bokhtar - Dangara road with the distance of 70 km is planned.

The areas covered by the project are natural provinces of Southern Tajikistan in terms of botanical and geographical conditions, relief, geological structure, composition of flora and fauna and the characteristics of environmental pressure.

The vegetation layer is diverse and consists of desert-sandy, tuff and xerophytic

forests. Humans are rich in reptiles, mammals, and birds, and there are many rare and endemic species. There are no species of plants and animals listed in the Red Book in the project area.

The district enters the zone with low humidity, with hot summers and mild winters.

The terrain at Bokhtar-Dangara districts is relatively flat and slopes from north to south. The terrain is mountainous.

The project identifies sources of impact on environmental components but does not provide a quantitative estimate of the impact on environmental components. During the road rehabilitation, various types of environmental components will be affected. Potential impacts on the environment include:

The main sources of emissions during construction are:

- air pollutants from the operation of engines and vehicles;
- dust during transportation and storage of construction materials:
- dust during disassembly of equipment;
- dust during construction works

According to the report, the main sources of emissions into the atmosphere during the works can be air pollutants from the operation of engines and vehicles, dust during transportation and storage of construction materials, welding, dust during the installation of equipment.

During operating vehicles; construction, welding and construction works emit the following wastes into the atmosphere: dust, nitrogen dioxide, nitrogen oxide, benzene (a) pyrene, smoke, sulfur dioxide, aldehydes, hydrocarbons. carbon monoxide.

Also, when the machinery and vehicles leave the construction site, there will be dust and the roads will be polluted, so the vehicles should be washed and cleaned following the rules. Therefore, it is necessary to water the road in time to prevent the spread of dust. At the same time, during the reconstruction, it is expected that the construction waste will be generated, the amount of which will depend on the volume of construction works. These wastes include asphalt and concrete residues, scrap metal, worn-out pipes, cables, insulated wastes and the like.

Construction waste must be sorted and removed from the construction site following the authorized state body for environmental protection.

The placement of the excavated soils at the construction site should be carried out on the basis of the permission of the authorized state body and determination of the route by truck.

Solid household waste is generated by staff, construction canteens and site cleaning; The amount of solid household waste depends on the total number of people, the amount of food and the area of landfills. The chemical composition of these wastes consists of nitrogen, phosphorus, carbon, potassium and sludge and is physically solid, flammable and insoluble. In terms of infection, it belongs to the fourth group of hazardous waste. Solid household waste should be collected using special bins and disposed of in an official landfill on the basis of an agreement with a waste disposal organization or with the permission of the authorized state body for environmental protection.

During the period of preparation for the start of construction works, the project envisages the implementation of the following works:

- construction of a construction site;
- removal of trees and shrubs, uprooting;
- liquidation of unusable artificial structures;
- removal and reconstruction of engineering networks;
- removal of topsoil layer;
- removal of the existing asphalt pavement;
- installation of signs and temporary fencing on the construction site;

During the construction works, there is also noise and vibration, which temporarily disturbs the peace of the region. Therefore, during the construction works a certain work schedule should be established and modern techniques and mechanisms should be used.

The project provides for the removal of trees that interfere with the construction process. Therefore, felling of trees and planting of trees should be carried out on the basis of the document and the agreement of the authorized state body and compliance with safety regulations.

Landscaping of the reconstructed street is one of the purposes of the architectural planning of the territory and contributes to the improvement of the environment. Before the start of landscaping works, the list of trees, shrubs and green plants for planting should be clarified and their compatibility with the natural and climatic conditions of the area and their resistance to unfavorable conditions of the urban environment should be determined.

At the biological stage, planting of plants, sowing of grass seeds, application of manure and agrochemical minerals are carried out to activate the growth of trees, shrubs, plants and grass.

From an ecological point of view, the reconstruction of this road will help to reduce the anthropogenic impact on the environment (especially atmospheric air).

To protect and improve the environment, the following proposals are mandatory:

- Requirements of construction rules and norms, Strict observance of road construction, ecological norms and the legislation of the Republic of Tajikistan in the field of environment protection should be followed during the project implementation;
- by the Contractor should be appoint the person responsible for carrying out control;
- The Contractor develops an action plan for environmental protection, which is agreed with the local environmental authorities;
- To protect the atmosphere and prevent dust, the work area should be regularly sprayed;
- During construction work the requirements of construction rules and regulation, safety should be followed and take the necessary measures;
- Trees that interfere with the construction process should be removed only in coordination with the authorized state body in the field of environment protection;
- Planting and transplanting seedlings should be conducted following the design and agro-technical rules;
- Technical construction works to be carried out following the requirements of environmental norms and minimum impact on the environment;
- Following the established procedure to implement departmental control over compliance with the requirements of measures in the field of environmental protection;
- To dispose of solid household waste in the official landfill following the established procedure;

- Construction waste generated during and after construction works should be sorted and disposed of in an official dump in coordination with the authorized state body in the field of environmental protection;

- In case of departure from the territory of construction facilities, equipment and vehicles should be washed following the rules and their cleanliness should be ensured;

- During locating an asphalt plant and processing of inert materials following the requirements of the legislation in the field of environmental protection and sanitation, it is necessary to prepare the report on environmental impact assessment should be submitted to the State Environmental Expertise of the Committee for Environmental Protection under the Government of the Republic of Tajikistan for obtaining of conclusion.

- To implement normative and legal acts, state standards, sanitary, safety and environmental standards during arrangement of drainage/diverting to avoid waterlogging/pollution;

- Carry out technological work following the requirements of environmental impact;

- Copy of this report should be submitted to local environmental authorities.

This conclusion is valid in case of implementation of the above-stated proposals.

Control over the observance of the legislation of the Republic of Tajikistan in the field of protection and improvement of environment to assign to local bodies of environment protection during the project implementation;

State Environmental Expertise of the Committee for Environmental Protection under the Government of the Republic of Tajikistan agrees with the submitted documents by the Director of the Project Implementation Unit for Road Rehabilitation Arabzoda N. for the Bokhtar - Dangara road project considering the strict implementation of above-mentioned instructions.

Expert

S.Saidamirov

Annex 9 - Project Information Booklet distributed during consultations (see chapter XIII)

REPUBLIC OF TAJIKISTAN
MINISTRY OF TRANSPORT
PROJECT INFORMATION BROCHURE FOR
«BOKHTAR – DANGARA ROAD REHABILITATION AND IMPROVEMENT PROJECT»

Project Implementation Unit for Roads Rehabilitation

Dushanbe June 1

A. The proposed Project

The Government of Tajikistan and the Asian Development Bank (ADB) agreed to enhance income and reduce poverty in Republic of Tajikistan by improving road infrastructure, and thereby support the creation of productive employment opportunities. The Road Network Sustainability Project envisages the construction of the following road sections:

(1) Bokhtar-Dangara Road, 68.7 km in length is divided into three phases:
(i) Bokhtar– Levakand, 9.7 km in length;
(ii) Levakand – Okmazor, 30.3 km in length and;
(iii) Okmazor-Dangara, 28.7 km in length

Construction work is expected to begin in 2022

The executing agency for implementing the project is the Ministry of Transport (MoT), represented by its Project Implementation Unit for Roads Rehabilitation (PIURR).

The detailed design of the road has been completed by Kocks Consult GMBH.

The proposed project will improve the condition of the road and increase the volume of cargo traffic as well as passenger transportation between the settlements and also will provide an opportunity for year-round transport links to the main neighbouring cities and Dushanbe, the Capital City of Republic of Tajikistan. At the same time, it is important to emphasize that improving road infrastructure will increase the development of agriculture, tourism and increase industrial production.

B. Socio-economic census of affected persons

The social and economic census of the affected persons will be carried out by Kocks Consult GMBH. The team of experts will carry out required field surveys, such as DMS, census, SES, inventory of project affected assets to determine the scope of project impact within the project influence area. The analyses of field survey results will allow determination of all project affected households and businesses, develop relevant compensation and mitigation measures in the format of Land Acquisition and Resettlement Plan (LARP) prepared in accordance with ADB SPS requirements and provisions of all applicable laws and regulations of the Republic of Tajikistan.

The main objective of the LARP in relation to land and asset acquisition is to avoid physical or economic displacement, and when it cannot be avoided compensation and mitigation measures should be planned and implemented to ensure that affected persons are provided with fair compensation and reasonable assistance to improve, or at least restore their living standards and livelihoods to pre-project levels.

PIURR under MoT will exercise Grievance Redress Mechanism (GRM) and ensure effective and efficient operation of Grievance Redress Commission on National and Local levels through the entire project circle including the LARP implementation, construction and operation periods.

The role and responsibility of the GRC is to accept claims and complaints, assess its validity, determine the scope of eventual impacts, and timely resolve claims as raised during project planning and implementation period.

The objective of this Information Brochure is to provide essential information on pending project, planned field surveys and encourage participatory involvement of local population in project planning and LARP preparation activities. More public consultations will be carried out during the field surveys. Draft LARP will also be publicly disclosed and open comments and suggestions from representatives of affected persons, local government, NGOs, CBOs and any public society.

The route of Bokhtar – Dangara road section to be rehabilitated as a part of the Project is shown in the Figure 1 below.

F

C. Property acquisition principles adopted for the project

Civil works in Bokhtar – Dangara road may require acquisition of land and properties. As a part of ADB SPS requirements, a land acquisition and resettlement plan (LARP), based on the available design data and the inventory of affected assets, will be prepared.

The following core principles will be followed during the rehabilitation of Bokhtar – Dangara road:

- Land acquisition, and other involuntary resettlement impacts will be avoided or minimized by exploring all viable alternative project designs;
- Compensation at replacement cost for residential houses and commercial structures, supplementary structures and improvements, as well as annual crops, timber and fruit trees will be provided to PAPs;
- Land will be compensated either by the provision of a replacement plot or in cash. For agricultural land, replacement cost will be based on the production value of the affected plot (net income for 5 years generated from the affected land area at market rate at a time of taking);
- For residential or commercial land (a type of land that does not have fundamental productive value) replacement cost will be based on the current annual lease rate multiplied by 25 times since in Tajikistan there are no official land markets established as yet;
- PAPs without legal rights to land will be compensated for non-land assets;
- PAPs will be assisted to restore their livelihood;

- Persons who will need to relocate will be provided with transportation allowance sufficient to cover transport expenses, communal and site preparation cost for alternative land plot (including connection to power grid, water supply system, installation of latrine), as well as with livelihood rehabilitation allowance;
- Vulnerable PAPs will be provided with special allowances;
- Appropriate redress mechanisms to address PAPs grievances will be established;
- Census and socio-economic surveys and consultation with PAPs, will be conducted;
- The LARP will be disclosed to PAPs in a language and form that is understandable to them and posted on the MoT and ADB webs for general public disclosure;
- Compensation payments will be initiated only after ADB and Government of Tajikistan have approved the LARP;
- Civil works will commence only after the completion of LARP implementation.

D.Census, socioeconomic survey and the cut-off date

The cut-off-date for this Project is June 2021. Any affect that occurred after the cut-off date will not be subject to compensation. It should be noted that the official cut-off-date will be announced through the newspaper “Jumhuriyat” as well as the “Khatlon” TV and Radio broadcast. Relevant notification will also be displayed on the Information Boards in the lobbies of Hukumats and Jamoats located along the project ROW.

The census, socio-economic survey, and inventory of the Project's affected assets will be completed by the end of July this year.

E. Eligibility for compensation and entitlements

The following groups of Affected Persons will be included in the LARP for rehabilitation of the proposed road project:

- All PAPs losing land either with legal title, lease holding land rights or without legal status;
- Owners of buildings (residential houses, supplementary structures, other improvements) annual crops, fruit trees and other objects attached to the land;
- PAPs losing income and salaries whether temporarily or permanently;
- In addition to income and assets loss compensation, one time allowance will be considered for vulnerable groups, severely affected PAPs, and PAPs if subject to physical resettlement will be provided relocation subsidy;
- Official fees for update land/property use rights certificate and related registration costs will be covered in addition to compensation and one-time allowances.

For inquiries, please contact the following persons.

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