KYRGYZ REPUBLIC

MINISTRY OF TRANSPORT AND COMMUNICATIONS

OF THE KYRGYZ REPUBLIC

«Third Phase of the Central Asia Regional Links Program» - CARs-3

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)

October 2021

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Annexes

Abbreviations

AO	-	Ayil okmotu
CP	-	Checkpoint
Chui-Bishkek TDSCEC KR	-	Chui-Bishkek Territorial Department of the State Committee on Ecology and Climate of the Kyrgyz Republic
EA	-	Executive Agency
ESMP	-	Environmental and Social Management Plan
GBV	-	Gender-based Violence
GRG	-	Grievance Redress Group
GRM	-	Grievance Redress Mechanism
GRS	-	Grievance Redress Service
IPIG	-	Investment Projects Implementation Group
KFHMSD	-	Kyrgyz Forestry and Hunting Management State Department under the Ministry of Agriculture, Water Resources and Regional Development of the Kyrgyz Republic
LC	-	Land Code
LD	-	Local Designe
MoF	-	Ministry of Finance
MoTC	-	Ministry of Transport and Communications
NGO	-	Non-Governmental Organization
OHCH	-	Objects of historical and cultural heritage
OP	-	Operational Policy
PO	-	Public Organizations
RDBKR	-	Red Data Book of the Kyrgyz Republic
RMU	-	Road Maintenance Unit
ROW	-	Right-of-Way
SCEC	-	State Committee on Environment and Climate
SNiP	-	Construction Norms & Regulations
TA	-	Technical Assistance
WB	-	World Bank

Executive Summary

The Ministry of Transport and Communications of the Kyrgyz Republic (MOTC), as the Executive Agency, has started implementation of the “Third Phase of the Central Asia Regional Links Program” CARs - 3 project, which provides for reconstruction/rehabilitation of the Tyup - Kegen road from 39 to 76 km, between Sary-Tologoy village in Kyrgyzstan and Kegen settlement in Kazakhstan (Karkyra - road border crossing point on the Kyrgyz-Kazakh border section). In addition, the project provides the rehabilitation of 13 km of mountain road turn-off from the Tyup-Kegen road leading to the mountain tourist camp, and unpaved road connecting the main road to the «Tamerlane Stones» historical monument, which is a cultural heritage site.

Based on the results of the environmental screening, the project was assigned environmental category "B" - reduced assessment, and the environmental safeguard policy involved for this project includes Environmental Impact Assessment OP/BP 4.01, Natural Habitat OP/BP 4.04 and Physical Cultural Resources OP/BP 4.11.

Based on the results of the technical design, the road widening will occur along nearly the entire length of the road. A detailed survey and the results of the technical design of the project sites revealed that there are no households and no structures near the existing road, and **the reconstruction/rehabilitation of the project sites will not affect the livelihood of the local community, will not result in physical and economic displacement, or the withdrawal of private land**. Due to the absence of persons affected by the project, World Bank Operational Policy OP 4.12 “Involuntary Resettlement” will not be applied. Given that the land to be taken for project needs is state-owned and will not impact the local community living in the project area, preparation of the Resettlement Action Plan will not required.

The withdrawn lands belong to the categories of agricultural (pasture) lands and forestry lands. In accordance with the requirements of the legislation of the Kyrgyz Republic, domestic procedures will be carried out to transform land from one category to another for reconstruction/rehabilitation of the road. Laws and procedures according to which land transformation will be carried out are presented in the document in the section "Normative-legal base of land transfer (transformation) in KR". For successful implementation of the project, all procedures will be completed before the start of road construction works on the project sites.

The Environmental and Social Management Plan (ESMP), which is part of this document, covers mitigation measures during the project design and implementation phase and the post-project period as well. These mitigation measures will be included in the tender documents and will help control risks to the environment and social environment, reducing them to the lowest possible level.

During the preparation of this document, meetings were held with stakeholders, residents of the project area and ayil okmotu (village administration), district administration, including government agencies (State Committee on Environment and Climate and its subdivisions, Department of Roads under MOTC KR, Road Maintenance Unit (RMU), Ministry of Culture, Information and Tourism) representatives and other relevant agencies.

The disclosure of the Environmental and Social Impact Assessment document and the Environmental and Social Management Plan (ESIA/ESMP) was organized at public hearings held in Tyup village and San-Tash ayil/okmotu on July 24, 2021.

Chapter 1. Introduction

The Government of the Kyrgyz Republic and the International Development Association (IDA) signed an agreement to implement the Project “Third Phase of the Central Asia Regional Links Program” (CARs-3).

The CARs-3 includes Components on reconstruction of the road Tyup – Kegen from 39 to 76 km to the Karkyra checkpoint, and a section of the road Karkyra-Turuk-Sary-Jaz, about 13 km long, adjacent to the tourist base in the Karkyra Gorge. In addition, the project includes components to improve the capacity of civil aviation of the Kyrgyz Republic, as well as the development of tourism potential of Issyk-Kul region.

Earlier in 2018, the Ministry of Transport and Communicatons of the Kyrgyz Republic developed a draft ESIA, which covered all components of the project, in particular, the road reconstruction/rehabilitation project sites, as well as aviation and tourism components. The previous document was posted on the IPIG website www.piumotc.kg, the English version of the document is made public on the World Bank website.

This document is compiled by “Proyapi Engineering & Consultancy Inc.” Company, with the assistance of the Executive Agency, and is an update of the previous draft ESIA prepared in 2018, namely, in terms of the implementation of the Road Reconstruction/Rehabilitation Component in Tyup District.

This Environmental and Social Impact Assessment (ESIA) report has been prepared in accordance with the World Bank's Environmental and Social Safeguard Policies and the legislation of the Kyrgyz Republic.

In the framework of the Phase III of the Program, transport links between Issyk-Kul Province in the Kyrgyz Republic and Almaty Province in the Republic of Kazakhstan and on to Russia, China and other neighboring countries will be a priority, thus supporting the creation of an integrated economic area between the countries. The main objective of this project is the development of the Central Asia Regional Links Program, which is aimed at improving the regional connectivity and supporting sustainable tourism development in Issyk-Kul region.

1.1 Tasks and objectives of the ESIA

The main objectives of the Environmental and Social Impact Assessment is to identify the Project impacts associated with construction activities on the natural and social environment at the road reconstruction/rehabilitation project sites, as well as historical and cultural heritage sites, and to propose mitigation measures where appropriate. This document contains an updated draft ESIA, supplemented with new and more recent data, and includes an analysis of the requirements of the World Bank’s Environmental and Social Safeguard Policies and the legislation of the Kyrgyz Republic.

The core of the ESIA document was prepared to manage potential issues that may arise during the construction period and as a basis for the Environmental and Social Management Plan (ESMP) to be implemented by the project.

This ESIA identifies the main sources and factors of the environmental and social impacts, as well as impacts on the historical and cultural heritage sites in the project area, and provides for measures to prevent, minimize or reduce any negative impact on the environment and social environment during road construction activities in the project areas.

1.2 Expected Impacts and the Scope of Land Acquisition

As a result of the research and assessment on the environment and social environment, it was found that the potential impact of the project will be moderate and mainly cover the period of construction works.

Environmental safeguards

In terms of environmental protection measures, the project is assigned category «B», in accordance with the assessed environmental impacts of the project area.

The project site runs in specially protected natural areas, and in this regard, detailed studies to determine the state of flora and fauna of the project sites, as well as instrumental studies of environmental components were conducted. In addition, during the detailed research phase, field-specific professionals were involved, who identified the presence of rare animal and plant species in the close vicinities of the project activities. However, the period of construction works will not affect their populations and life activity of the identified species, since a number of measures aimed at mitigating and minimizing the impact on the environment is foreseen.

Potential environmental impacts are expected to be moderate and mostly limited to the construction period: (i) air and noise pollution from trucks, construction equipment, asphalt plant and concrete mixing installation, (ii) soil disturbance during excavation and material extraction (gravel/sand/soil), (iv) tree cutting and vegetation loss, (iv) generation and removal of construction and domestic solid waste (from construction camps), (v) construction camp management (impacts will be temporary with minor and localized negative effects) and (vi) management of borrow pit areas. Potential environmental impacts can be mitigated through measures provided for in the ESMP.

Social safeguards

Research and screening of social analysis has shown that the project will not adversely affect the economic or physical movements of local residents living along the project sites, nor will it require the withdrawal of private land in the area of project activities.

Nevertheless, the updating of the project documentation and the topographic surveys conducted have determined that due to the widening of the Tyup-Kegen road section from 39 to 76 km, providing the change of road parameters from the IV - to the III - technical category, and measures for the sidewalks, bus stops, parking lots construction, and installation of lighting in the settlements will require about 12.24 hectares of additional land. In order to implement the above measures, for the needs of the project, the state lands that belong to the San-Tash Ayil/okmotu and the Tyup Mechanized Forestry are subject to acquisition.

There are no formal/informal users on the state lands subject to withdrawal who would carry out economic and other activities, including land cultivation and cattle grazing.

Given that the land to be withdrawn is public land and is not used by local people for any benefit, under the World Bank Operational Policy OP 4.12 “Involuntary Resettlement”, the preparation and implementation of the **Resettlement Action Plan** will not be required under this project. However, it should be noted that the social measures prepared as part of the detailed design will form part of the ESIA/ESMP document.

The expected impacts on the social environment will be temporary and minor, covering the period of construction works: (I) limited access to the places of residence due to construction activities; (II) dust and noise from heavy vehicles/special vehicles in settlements; (iii) traffic safety issues on roads and other minor impacts.

Objects of historical and cultural heritage

During the update of the detailed design, on the project sites, sites of historical and cultural heritage were identified, in particular, 23 complexes in the form of different-time burial grounds and medieval fortresses (burial mounds). Some of them are monuments of national significance, such as: San-Tash fortress, San-Tash burial ground located at 58 km of the Tyup-Kegen road and Karkyra burial ground located at 11 km of the road leading to the tourist alpine camp.

Identified objects of historical and cultural heritage:

- 41 burial mounds are in the zone of the project site up to 50 meters from the existing road;
- Ten complexes of historical and cultural heritage (9 burial grounds and one fortress) are located up to 150 meters from the project road.

In accordance with the World Bank Operational Policy 4.11. "Cultural Heritage" and the legislation of the Kyrgyz Republic "On the protection and use of the historical and cultural heritage", it is necessary to develop a plan of measures to preserve and protect sites of historical and cultural heritage during construction works.

For the development of a special Project of protected areas, a specialized company will be hired. It should be noted that in the Kyrgyz Republic there are only 2 companies that can perform the above work.

The development of the protected zones' design and other measures to protect historical and cultural heritage will be tentatively completed by the end of 2021. The activities to be developed will be a part of the Plans aimed at minimizing the impact of the ongoing construction works on the above-mentioned sites. The documents to be developed will be binding for the contractors during the construction works and are subject to strict monitoring.

If the requirements of the developed measures are observed and met, the impacts of construction work on the \historical and cultural heritage sites will be insignificant.

Thus, the issues of protective measures and impacts are limited to the typical impacts associated with road rehabilitation construction projects.

Chapter 2. Project Description

The proposed project “Third Phase of the Central Asia Regional Links Program” (CARs-3) is multi-sectoral and will go beyond the original goals and, in addition to improving transport connectivity with the Republic of Kazakhstan, will also include improving the competitiveness of key sectors of regional importance, in particular, external tourism and agribusiness for export purposes.

The project is expected to improve the quality of services and goods - tourism, agribusiness in Issyk-Kul region and improve their access to the markets by improving the reconstruction/rehabilitation of road sections.

The proposed project is expected to benefit the economy in the province and have a significant regional effect, in particular on the Almaty Province, given the existing links in trade and tourism.

Reconstruction of the Tyup-Kegen Road is of strategic importance in terms of development of the transit potential of the country. Its improvement will provide residents of Issyk-Kul Province with enormous opportunities for business development. It will improve access to markets for agricultural products in the Republic of Kazakhstan, in particular, to the largest one - the city of Almaty. By directly connecting Kazakhstan with the Issyk-Kul Province of Kyrgyzstan, the construction of the road will also significantly shorten the way for tourists from Kazakhstan and other neighboring countries. At the same time, the cost of transportation services can be significantly reduced by reduced transportation costs.

The expected improvements in the welfare of the region can be achieved in terms of social and economic benefits, which will be directed through the coordinated implementation of a set of measures to improve infrastructure, aviation and tourism components.

2.1 Basic data of the Component 1

Reconstruction of the 76 km long Tyup-Kegen road was started in 2008 financed from the state budget and was significantly delayed. In 7 years, no more than 25-30% of the envisaged work has been completed. To date, up to 39 km of the road has been completed.

Under “Component 1. Regional Connections, Associated Facilities and Equipment in Issyk-Kul Province”, reconstruction of the existing gravel road Tyup-Kegen from 39 km to 76 km «Karkyra-avtodorozhniy» checkpoint and a section of Karkyra-Turuk-Sary-Jaz road about 13 km long, adjacent to the tourist base in the Karkyra Gorge, as well as roadside facilities and access roads to the “San-Tash Tamerlane” historical monument at km 58 of the road is envisaged. This component also includes the purchase of road maintenance equipment, including snow removal equipment for year-round operation of the road.

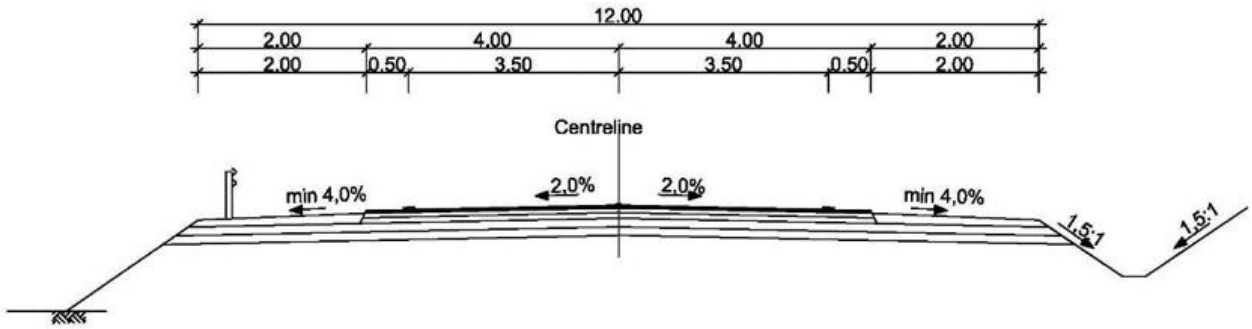
The project sites to be reconstructed/rehabilitated run along the existing gravel road, through rugged and mountainous terrain. There is an old asphalt-concrete surface in unsatisfactory condition in some places on the existing road.

The existing Tyup-Kegen road from 39 to 76 km, envisions reconstruction with transfer from the IV technical road category to the III technical road category.

The main parameters of the Tyup-Kegen road, from 39 to 76 km – “Karkyra-avtodorozhny” checkpoint, refer to the road category III by SNiP KR 32-01:2004:

- Road bed width – 12 m;
- Carriageway width: 7.0 m (2 x 3.50 m);
- Shoulder width: 2.50 m (2 x 2.50 m). 0.50 m (2 x 0.50 m) shoulders must be paved;
- Cross slope of the carriageway 2%;
- The slope of the shoulders is 4%.

Figure 1. Cross-section for the road category III

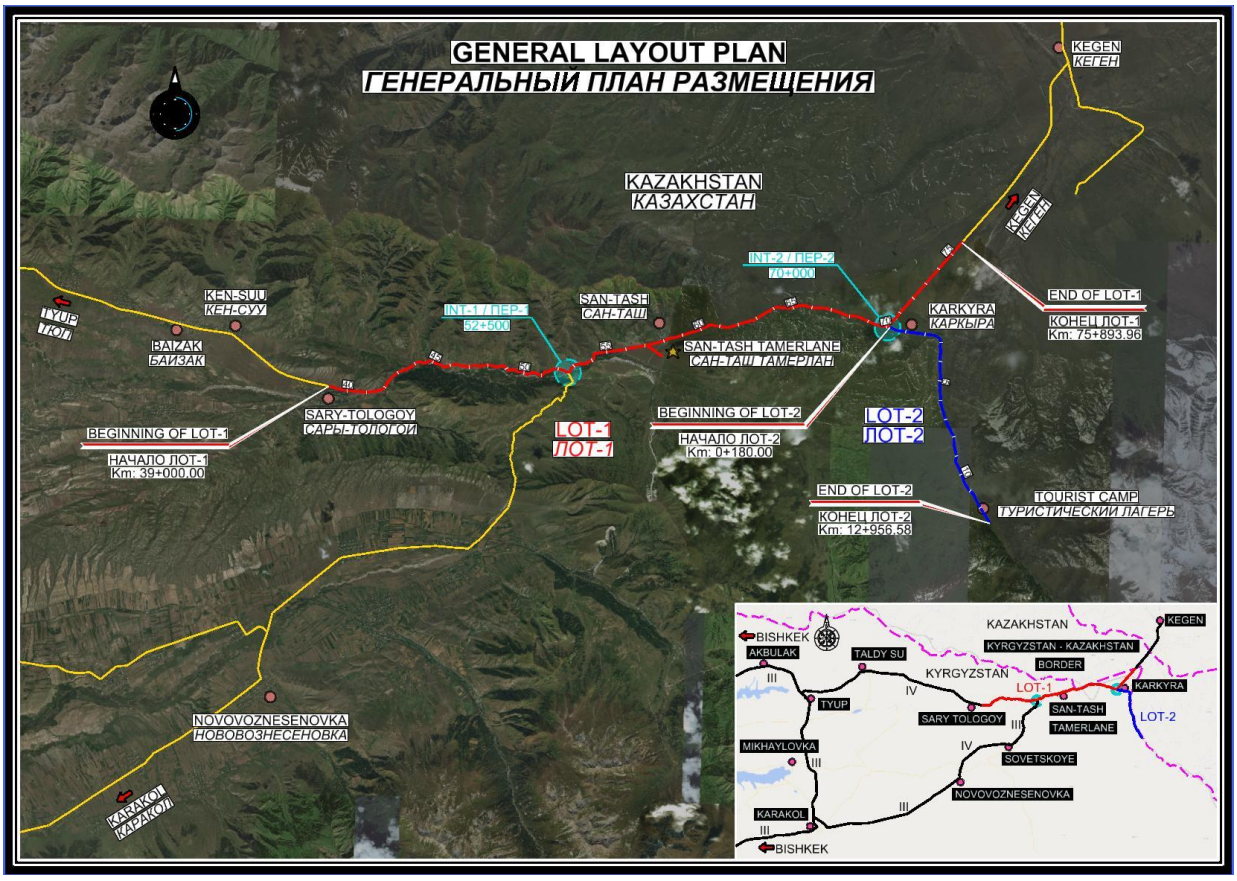


The project envisages the construction of 4 toilets at all parking lots planned to be built next to the road. This solution is based on existing national requirements and standards: each parking lot must be equipped with a toilet. The distance between parking areas (and therefore toilets) shall not exceed 30 km.

2-pit toilets (technical parameters to be determined by the contractor), adjacent to the parking lots, will be equipped with cemented septic tanks, lighting, and water supply arranged as a stationary tank for the tracked water. Subject to the identification of water sources, installation of appropriate communications, the toilets may be connected to the water supply.

There is no any access to the water sources at the cultural and historical site "Tamerlane's Stones". In this regard, it is planned to install a water tank, which will be periodically filled with clean water delivered in cisterns. Road Maintenance Unit-4 (RMU-4) will carry out the cleaning of septic tanks with the help of sewage trucks as needed. The toilets will be transferred to the balance of RMU-4, which will ensure the fulfillment of sanitary and hygienic requirements for the toilets' maintenance.

Map 1. Map of the project site and the location of villages along the road



Sections of the Karkyra-Turuk-Sary-Jaz roads, about 13 km long, adjacent to the tourist base in the Karkyra gorge, as well as roadside facilities and access roads to the historical monument "San-Tash Tamerlane", provide for rehabilitation according to the IV technical category, within the right-of-way of the existing earth roadbed.

Also, the implementation of this component includes:

- Construction of a bus stop in the Sary-Tologoy village on both sides;
- Construction of a bus stop in the San-Tash village on both sides;
- Construction of sidewalks and installation of lighting in the settlements San-Tash and Karkyra;
- Construction of sidewalk and lighting in Chaar-Kuduk, where the tourist alpine camp is located;
- It is planned to build 4 parking lots (150 meters long, 40 meters wide) near the San-Tash burial complex (“Tamerlane stones”), at the road fork located at 70 km in the village Karkyra, in the area of a tourist alpine camp and in the area of the “«Karkyra-avtodorozhniy»” checkpoint;
- Installation of road barriers in hazardous areas, curved places and where there is high road embankment.

2.2 Context of the project

The development of the transit transport potential of the country is also a priority, in particular the so-called Central Asian Way, which begins on the border with the Republic of Tajikistan (checkpoint "Kayragach", the project CARs-1), passes through an alternative road North-South and further to the «Karkyra-avtodorozhniy» checkpoint on the border with Kazakhstan, thereby representing the shortest route to Siberia.

Improvement of regional routes of communication along the Tyup-Kegen road will be an important incentive in improving transport connectivity between neighboring Central Asian republics, increasing the tourism potential of Issyk-Kul region and enhancing other related activities.

The sections under rehabilitation are a part of the Tyup-Kegen road corridor and start at the 39 km road in the village Sary-Tologoy, which is located in the northeast of the Tyup district and runs up to 76 km to the «Karkyra-avtodorozhniy» checkpoint, which is on the border with the neighboring state, forming part of the international corridor with access to the Republic of Kazakhstan.

At the fork of the existing road at 70 km of the road Tyup-Kegen, near the village Karkyra, begins the second section of the designed road, the length of which is 13 km, and it runs through the Karkyra gorge to the tourist alpine camp. Tourists from different countries come to the tourist alpine camp to climb Khan-Tengri and Pobeda peaks. Along the road there is a frontier guards of Karakol military unit and a place, where there are about 5 households. There are also tourist complexes engaged in mountain tourism, hiking and kumysotherapy in some locations.

Due to the COVID-19 outbreak that began in the country in the spring of 2020, and the imposition of the emergency state and travel restrictions, halted the flow of tourists to the region, which led to a drop in tourism capacity. In 2021, the third wave of coronavirus infection broke out in the country and swept through the spring and summer seasons. The COVID-19 vaccination activities carried out among the population, both globally and in the country, allowed a slight increase in the inflow of tourists to the region.

Rehabilitation/reconstruction of project sites under the CARs-3 Project will be carried out in Issyk-Kul Province, in the area of San-Tash ayil/okmotu, Tyup district.

San-Tash ayil/okmotu includes 5 villages: Baizak, Kensuu, Sary-Tologoy, San-Tash, Karkyra, and a small settlement Chaar-Kuduk with five households.

The administrative center of the San-Tash ayil/okmotu is in the village Bayzak, which is not included in the project area and is outside the km 39, similarly to the village Kensuu.

The project sites lie in a sparsely populated area with a total population of less than 2,500 people. Several villages along the project sites, namely Sary-Tologoy, San-Tash, Karkyra and Chaar-Kuduk, are located at a remote distance from each other. There are no commercial facilities, service stations, gas stations and other activities along the project sections.

Agriculture is the main branch of the district economy. The population living in the project area is mainly engaged in agriculture and cattle breeding, as well as the cultivation of household plots and

vegetable gardens. In the summertime, residents of the district use the pasture "Karkyra" for grazing and haymaking.

2.3 Socio-economic situation of the project area

The Issyk-Kul Province is located in the northeastern part of the republic. The Province borders with the Republic of Kazakhstan in the north-east, with the People's Republic of China in the southeast, with the Chui Province in the north-west, and with the Naryn Province in the south-west. Total area of the Province is 43.1 thousand sq. km, or about 22 percent of the territory of the Kyrgyz Republic. The population is 463,900. Administrative center of the Province is the city of Karakol.

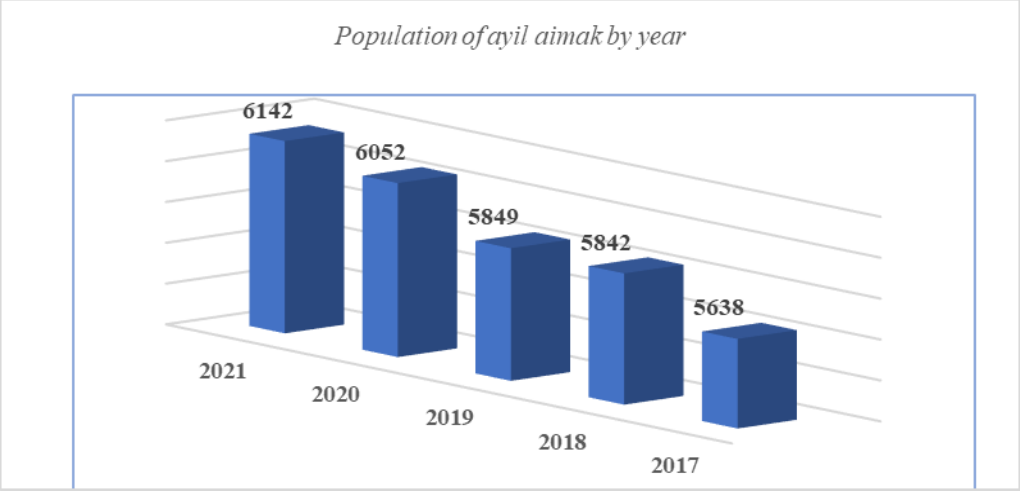
Tyup district is an administrative unit in the northeast of Issyk-Kul Province. The administrative center of the district is the village Tyup, located 27 km from the regional center, Karakol. To the southwest, the area adjoins the Issyk-Kul Lake, to the south-east it borders with Ak-Suu district, and to the west – with Issyk-Kul district. The area of the district is 2121 sq. km, it is located at an altitude of 1620 m above sea level. The Tyup district includes 13 ayil/okmotu, 36 villages and 1 settlement of urban type.

Population of the San-Tash ayil/okmotu and its dynamics

The territory of the ayil/okmotu is 21,726 hectares. The distance from the district center is 30 km, from the regional center – 60 km. The ayil okmotu represents the local level of state executive power.

The administration of the San-Tash ayil/okmotu is located in the village Bayzak. The total population of the ayil/okmotu is 6,142 people, the number of households is 1,026. Of them: men – 3,224 persons, women – 2,918. Population data obtained in ayil okmotu for the five-year period, from 2017 to 2021, shows an increase in the population by 8.9%.

Diagram 1. Population growth in the San-Tash ayil/okmotu over 5 years



Source: *San-Tash ayil okmotu, February 2021.*

Table 1: Ayil/okmotu villages, population, households, average family size

District	Ayil/okmotu	Villages	Population	Households	Average family size
Tyup	San-Tash	Baizak	1744	318	5,5
		Kensuu	2358	390	6,0
		Sary-Tologoy	1628	264	6,2
		San-Tash	195	36	5,4
		Karkyra	217	18	12,1

		Total	6142	1026	7,0

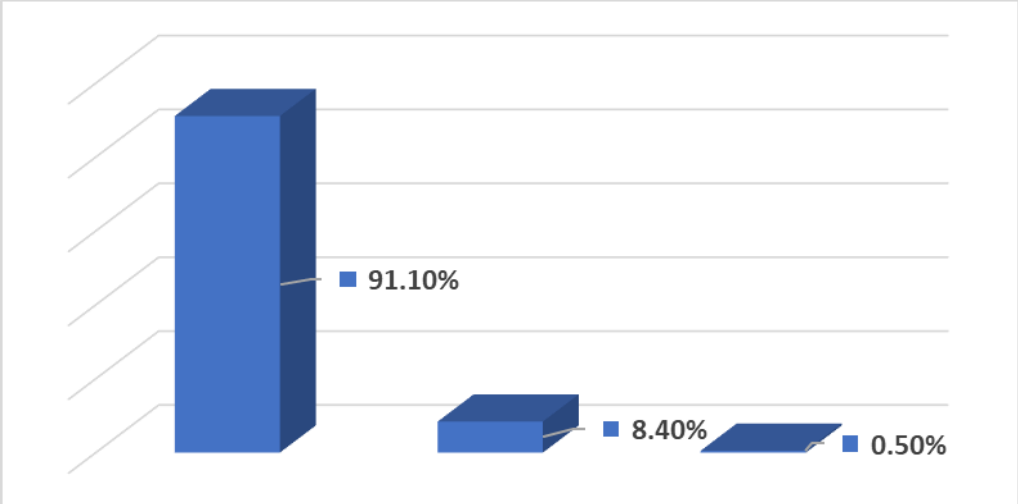
Source: *San-Tash ayil okmotu, data as of January 1, 2021.*

In the villages of the ayil/okmotu, residents aged 17 to 65 years prevail - 3,576 people (58.2%) of the total population.

Ethnic composition

In the settlements of the ayil/okmotu, there are: Kyrgyz - 91.1%, Kazakhs - 8.4%, others (Russians, Kalmyks, Uzbeks, Uighurs, Tatars, Dungans) - 0,5%.

Diagram 2. Ethnic composition



Source*: San-Tash ayil okmotu, February 2021.*

The villages of ayil/okmotu are mainly inhabited by representative of the Kyrgyz and other ethnic groups. The migration processes taking place in the villages, as well as in the entire republic, have led to a decrease in the number of national minorities, including the Kyrgyz themseslves. But, despite the intensification of migration processes, representatives of all nationalities historically living in these villages are present.

Agricultural activities

Residents of San-Tash ayil/okmotu received land shares in 1995-1996. The size of the land parcels allocated depend on the size of the family and the availability of land where a farmer's family lives. On average, one person received 0.2-0.3 hectares of irrigated land, rainfed – 0.7 hectares. People grow wheat, barley (for fodder), potato, carrot, garlic, perennial grasses, etc. on their land.

The main activities of the villagers are livestock breeding and cultivation of agricultural products. For almost all villagers, land and livestock are the principal sources of livelihood and commercial activity.

Land

Table 2: Land used in agriculture

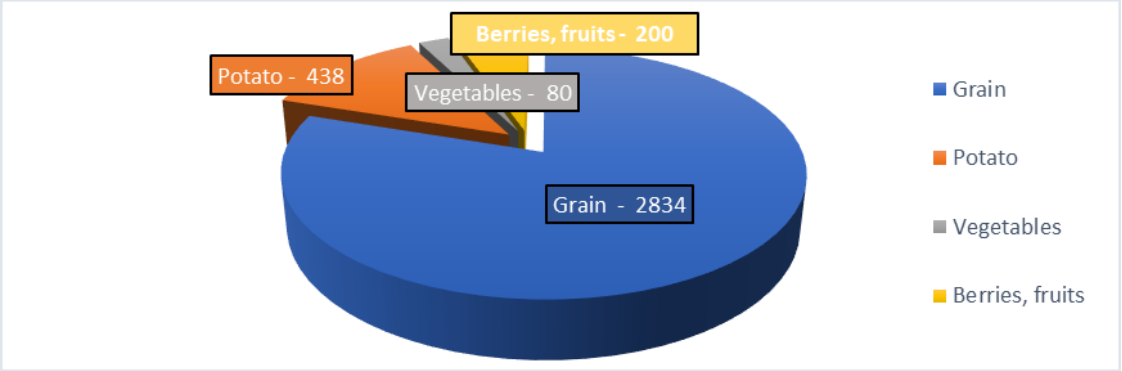
Agricultural land	Cultivated cropland	Irrigated land	Rainfed land	Gardens	Hayfields	ALRF [1]
3280	1437	1141	2139		1455	2672

Source: *San-Tash ayil okmotu, February 2021*.

Growing agricultural products is a very labor-intensive and costly process. Farmers face difficulties with the shortage of irrigation water, the sale of products, high cost of transportation, and lack of agricultural machinery. Agricultural products cultivated on land parcels and homestead plots (vegetable gardens) are used for personal consumption and sale.

Crop production

Diagram 3: Crop production, tons



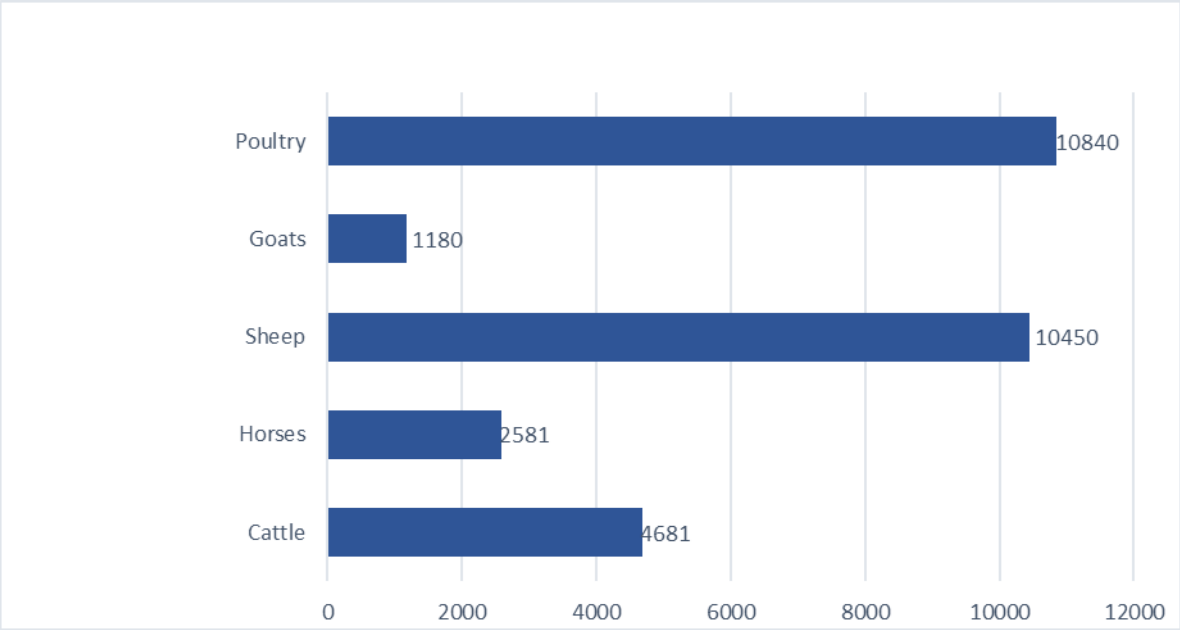
Source: *San-Tash ayil okmotu, February 2021*.

Livestock

Residents of villages breed livestock: cattle (4,681 heads), horses (2,581), sheep (10,450), goats (1,180), poultry (chicken and turkey – 10,840). Cattle are bred for own consumption and also for sale in the markets of Karakol and neighboring Kazakhstan.

[1] Agricultural Land Redistribution Fund (ALRF) - land plots used for agricultural production (irrigated and rain-fed arable land; fallow land; land occupied by perennial fruit and vegetable plantations; hayfields) that are state-owned.

Diagram 4: Livestock population



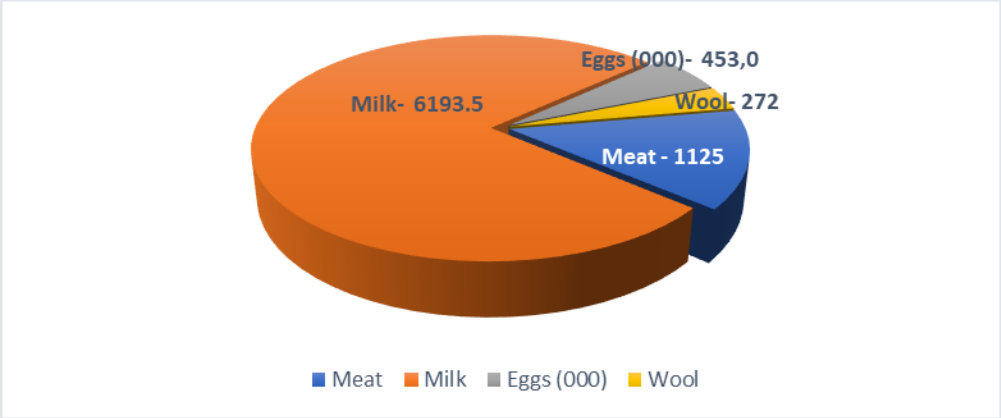
Source: *San-Tash ayil okmotu, February 2021.*

As can be seen from the chart, breeding sheep, poultry, and cattle is more common activity among families engaged in livestock breeding.

Livestock products

The principal categories of livestock products are meat, milk and eggs.

Diagram 5: Livestock products, tons



Source: *San-Tash ayil okmotu, February 2021.*

Some households are engaged in beekeeping, which is a specific industry for villagers. It is one of the few sectors of the economy that is important for the family budget.

Sources of income

Table 3: Main sources of income

Sources of income	San-Tash ayil okmotu
Livestock	50%
Crop production	20%
Pension/benefits	15%

Remittances	10%
Employment	5%

The income-generating activities of the inhabitants of ayil/okmotu are livestock and crop production. The number of livestock available to the population is the main "barometer" indicating the relative economic well-being of the inhabitants, which is related to people's assessment of their economic situation.

The monetary income of the population is also formed by wages, social transfers (pensions, benefits, and other payments). Remittances sent by labor migrants play a significant role in the structure of the population's income.

During the tourist season, residents also earn a certain income from the sale of dairy products (sour cream, clarified butter, kurut). Some products are in demand among tourists and locals.

Vulnerable groups

Socially vulnerable groups are categories of people who, for objective reasons, are unable to financially sustain themselves and their families in full. There is a state social protection system for them.

Table 4: State Social Protection of residents of the San-Tash ayil/okmotu

Type	The number of recipients of social payments
Old age pension	The total number of age pensioners is 420 people. Of these, 230 are women.
Disability pension	Total number of people with disabilities - 139.
State monthly allowance for low-income families with children	130 families

Source: *San-Tash ayil okmotu, March 2021.*

In addition, as shown in the table below, the poverty rate in San-Tash ayil/okmotu ranges from 8.8% to 55.5%, i.e., they are families who receive monthly poverty benefits and are among the vulnerable population.

Table 5. Data on the number of poor families by village in San-Tash ayil/okmotu as of 20.02.2021

Villages of San-Tash ayil/okmotu	Number of families	Surveyed according to new Social Passports	Poor families with a per capita income below 2674.40	% of living families	Extremely poor families with income below Guaranteed	% of living families	Extremely poor families with income 1000-1455.90	% of living families	Poor with an income of 1,455.90-2,674.40	% of living families
Baizak	318	279	45	14,1%	28	8,8%	10	3,1%	7	2, 2%
Ken-Suu	390	350	85	19,7%	50	10,7%	10	3,0%	25	6,4%
Sary-Tologoy	264	227	54	19,3%	40	14,0%	8	3,0%	6	2,2%
San-Tash	36	36	6	22,2%	2	11,1%	1	5,8%	3	8,8%
Karkyra	18	12	12	66,6%	10	55,5%	2	11,1%	0	0%
Total	1026	901	202	18,8%	130	11,8%	31	3,3%	41	4,0%

Source: *Department of Social Protection of San-Tash ayil okmotu, March 2021.*

Infrastructure

Key social and economic services

Various social and economic infrastructure facilities are located in San-Tash ayil/okmotu, as shown in the table below.

Table 6: Data on key social and economic services

Existing facilities	San-Tash A/O
Educational institutions	
Elementary School	1
Middle School	3
Medical Facilities	
Maternity Hospital	1
Village Health Posts (VHP)	4
Family Doctors Group (FDG)	1
House of Culture	1
Libraries	3
Stores	5
Mills	2
Length of water supply network	8 km
Water posts	The houses are connected to water supply network
Number of vehicles by category	
Passenger cars	1120
Cars for cargo transportation	80
Agricultural machines (tractors, combines)	14
Petrol Stations	1
Availability of electricity	100%
Fare to the district center - Tyup	40 Kyrgyz som
Fare to the regional center - Karakol	Public minibus taxi (marshrutka) - 65 som. Taxi - 100 som

Source: *Passport of San-Tash ayil okmotu, March 2021*.

The education system

Educational institutions are represented at the level of secondary education. School education includes three stages: primary general (grades 1-4), basic general (grades 5-9) and secondary (complete) general education (grades 10-11). In recent years, there has been a downward trend in the number of students in grades 10-11 due to an increase in the number of adolescents who want to get a profession at an earlier age. Some young people go to vocational schools, colleges or short-term courses that prepare them to enter the labor market as soon as possible.

Health care system

Health services located in the villages of the ayil/okmotu have more modest treatment and diagnostic capabilities and weak material and technical base. There are four village first-aid stations (FAS) in the ayil/okmotu. Services provided by FAS are limited to the most basic services. There is a maternity hospital, a group of family doctors (FDG). The better medical facilities are located in the district center.

Migration

The mass outflow of the young population is caused by unemployment, lack of prospects, and for some people - the unattractiveness of living in rural areas. The main motive for people to leave is economic one. People leave to earn money in other regions of the country, mainly in Chui Province, Bishkek city and suburbs with their wider opportunities for labor, as well as in Russia and neighboring Kazakhstan.

Demographic statistics show the number of absent population. Residents of villages leaving for other regions of the country or foreign countries to earn money do not check out of their places of permanent residence.

Chapter 3. Legal and Institutional Frameworks

3.1 Legislation of the Kyrgyz Republic and the Environmental Policy of the World Bank

The legal basis for environmental assessment in the Kyrgyz Republic is the Law of the Kyrgyz Republic "On Environmental Protection". (1999), the Law of the Kyrgyz Republic "On Environmental Impact Assessment" (1999), the Law of the Kyrgyz Republic "General Technical Guidance on Environmental Safety in the Kyrgyz Republic". (2009), Instruction on the Procedure of State Environmental Assessment of Pre-project, Design and other Materials and Documents in the Kyrgyz Republic (1997), and Instruction on the Procedure of Environmental Impact Assessment of Planned Activities in the Kyrgyz Republic (1997), as well as other normative acts. The Kyrgyz Republic joined the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters and the Espoo Convention on Environmental Impact Assessment in a Transboundary Context.

The State Committee on Ecology and Climate (SCEC) of the KR is the authorized body in the country responsible for the formation and implementation of environmental policy in the Kyrgyz Republic. The Department of State Environmental Expertise/Review of the SCEC KR is responsible for expert review of environmental impact assessment documents for the national importance projects.

The EIA report together with other supporting documents are submitted to the Department of State Environmental Review (SER) for review after public consultations. The project may be approved, rejected or sent for re-assessment/re-examination.

Public consultations should be conducted at the EIA stage and can also be initiated as a Public Environmental Expert Review (PER) in parallel with the SER. Implementation of any project is allowed only in case of a positive decision of the SER. The duration of the SER depends on the complexity of the project, but should not exceed 3 months from submission of all EIA documentation.

Table 7. Summary of the environmental protection legislation of the Kyrgyz Republic

No.	Document	Date of adoption	Summary
1.	Constitution of the Kyrgyz Republic	05.05.2021	The land, its subsoil, air space, waters, forests, pastures, flora and fauna, and other natural resources are the exclusive property of the KR and are used as the basis of life and activity of the people of the Kyrgyz Republic; to maintain a unified environmental system and sustainable development they are under control and special protection of the state.
2.	The concept of environmental safety of the Kyrgyz Republic	No.506, 23.11.2007	It establishes the basic principles of environmental policy and identifies global, national, and local environmental problems; national environmental priorities; and environmental security tools.
3.	National Strategy for Sustainable Development of the Kyrgyz Republic for 2013-2017	No.11, 21.01.2013	It represents the conceptual framework for sustainable development, which is to meet the needs of present generations without compromising the needs of future generations.
4.	Water Code of the Kyrgyz Republic	No.8, 12.01.2005	Regulates the use and protection of waters.
5.	Forest Code of the Kyrgyz Republic	No.66, 08.07.1999	Regulates the use and protection of forest resources.
6.	Law of the Kyrgyz Republic "On Environmental Protection"	No.53, 16.06.1999	Establishes requirements for environmental assessment in order to prevent possible harmful effects on the environment. It prohibits financing or implementation of projects without a positive conclusion of the state environmental expertise.
7.	Law of the Kyrgyz Republic "On Environmental Expertise /	No.54, 16.06.1999	The goal is to prevent negative impacts on human health and the environment as a result of economic or other activities.

No.	Document	Date of adoption	Summary
	Review"		
8.	Law of the Kyrgyz Republic "General technical regulations for ensuring environmental safety in the Kyrgyz Republic"	No.151, 08.05.2009	Defines the basic provisions of technical regulation in the field of environmental safety and establishes general requirements for environmental safety in the design and implementation of activities.
9.	Regulations on the Procedure for Conducting Environmental Impact Assessment in the Kyrgyz Republic	No.60, 13.02.2015	Establishes the procedure for assessing the impact of planned activities on the environment.
10.	Regulation on water protection zones and zones of water bodies in the Kyrgyz Republic	No.271, 7.07.1995	Determines the procedure for establishing water protection zones and strips on water bodies of the Kyrgyz Republic, establishes the regime of economic activities and use of land included in water protection zones, as well as responsibility for maintaining them in proper condition.
11.	Rules for the protection of surface waters in the Kyrgyz Republic	No.128, 14.03.2016	Regulate the protection of surface waters from pollution and depletion, while carrying out various types of economic activities by water users and regulate the procedure of water protection measures.
12.	Law of the Kyrgyz Republic "On protection of atmospheric air"	No.51, 12.06.1999	Regulates relations on the use and protection of atmospheric air.
13.	Law of the Kyrgyz Republic "On production and consumption waste"	No.89, 13.11.2001	It defines the state policy in the field of production and consumption waste management and is designed to help prevent the negative impact of production and consumption waste on the environment and human health.
14.	Law of the Kyrgyz Republic "On the protection and use of the flora"	No.53, 20.06.2001	Creates a legal framework to ensure the effective protection, rational use and reproduction of flora resources.
15.	Law of the Kyrgyz Republic "On the animal world	No.59, 17.06.1999	Establishes legal relations in the field of protection, use and reproduction of wildlife.
16.	Law of the Kyrgyz Republic "On Subsoil"	No.49, 19.05.2018	Establishes standards for the safe exploitation of mineral resources and rehabilitation of land after mining operations.
17.	Law of the Kyrgyz Republic "On Water"	No.1422-XII, 4.01.1994	Regulates relations in the sphere of use and protection of water resources, prevention of environmentally harmful impact on water bodies and water management facilities and their improvement.
18.	Laws of the Kyrgyz Republic "On Biosphere Territories"	No.48, 9.06.1999	Defines the legal framework for the establishing and functioning of biosphere territories in the Kyrgyz Republic
19.	Law of the Kyrgyz Republic "On mountainous territories of the Kyrgyz Republic"	No.151, 1.11.2002	Defines the creation of a socio-economic and legal framework for the sustainable development of mountain territories, the conservation and management of natural resources, historical, cultural and architectural heritage.
20.	Law of the Kyrgyz Republic "On Local Self-Government and Local State Administration"	No.101, 15.07.2011	Establishes the principles of organization of local self-government at the level of administrative-territorial units of the Kyrgyz Republic.

No.	Document	Date of adoption	Summary
21.	Law of the Kyrgyz Republic "On Civil Protection"	No.54, 25.05.2018	Regulates legal relations arising in the field of civil protection of population and territory of the Kyrgyz Republic in emergency situations in peacetime and wartime.

3.1.1 International conventions

The Kyrgyz Republic has ratified the following international conventions related to environmental management:

- UN Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, 1996;
- Convention on Biological Diversity, 1996;
- Convention on Long-range Transboundary Air Pollution, 2000;
- United Nations Framework Convention on Climate Change 2000;
- United Nations Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade 2008;
- Vienna Convention for the Protection of the Ozone Layer, 2000;
- Montreal Protocol on Substances that Deplete the Ozone Layer, 2000;
- Stockholm Convention on Persistent Organic Pollutants, 2002;
- UNECE Convention on Environmental Impact Assessment in a Transboundary Context, 2001;
- Ramsar Convention on Wetlands, UN Convention on Wetlands of International Importance, Mainly for Waterfowl Habitats, 2003;
- UNECE Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters; 2001;
- The Convention to Combat Desertification in Countries Experiencing Serious Drought and / or Desertification, Particularly in Africa; 1999;
- Convention on International Trade in Endangered Species of Wild Fauna and Flora; 2006;
- Cartagena Protocol on Biosafety; 2005;
- Convention on the World Cultural and Natural Heritage; 1995.

3.2 The Safeguard Policies of the World Bank applicable to the Project

The World Bank's Environmental and Social Safeguard Policies are considered a cornerstone of its support for sustainable poverty reduction. The purpose of these Policies is to prevent and mitigate unnecessary harm to people and the environment in the development process. These policies guide the World Bank and its recipients in identifying, preparing, and implementing programs and projects. The project includes the following Environmental and Social Safeguard Policies: Environmental Assessment (OP/BP 4.01), Natural Habitats (OP/BP 4.04), and Physical Cultural Resources (OP/BP 4.11), and Involuntary Resettlement (OP/BP 4.12).

Table 8 below summarizes the differences between the Kyrgyz Republic's Environmental Legislation and the World Bank's Safeguard Policies.

Table 8. Comparison of World Bank Operational Policies and Environmental Legislation in the Kyrgyz Republic

Environmental Impact Assessment OP/BP 4.01	Constitution of the Kyrgyz Republic, 2021, May 5	5 May 2021
	The concept of environmental safety of the Kyrgyz Republic	No.506, 23.11.2007
	National Strategy for Sustainable Development of the Kyrgyz Republic for 2013-2017	No.11, 21.01.2013
	Law of the Kyrgyz Republic "On Environmental Protection"	No.53, 1999
	Law of the Kyrgyz Republic "On Environmental Expertise"	No.54, 1999
	Law of the Kyrgyz Republic "General technical regulations for ensuring environmental safety in the Kyrgyz Republic"	No.151, 2009
	Regulations on the Procedure for Conducting Environmental Impact Assessment in the Kyrgyz Republic	No. 60, 13.02.2015
Natural Habitats	Forest Code of the Kyrgyz Republic	No.66, 1999

OP/BP 4.04	Water Code of the Kyrgyz Republic	No.8, 2005
	Regulations on water protection zones and zones of water bodies in the Kyrgyz Republic	No.271 7.07. 1995
	Rules for the protection of surface waters in the Kyrgyz Republic	No.128 14.03.2016
	Law of the Kyrgyz Republic "On protection of atmospheric air"	No.51 1999
	Law of the Kyrgyz Republic "On production and consumption waste"	No.89 2001
	Law of the Kyrgyz Republic "On the protection and use of the flora"	No.53 2001
	Law of the Kyrgyz Republic "On Animal World"	No.59 1999
	Law of the Kyrgyz Republic "On Subsoil"	No.49, 2018
	Law of the Kyrgyz Republic "On mountainous territories of the Kyrgyz Republic"	No.151, 2002
Physical Cultural Resources OP/BP 4.11	Law "On the Protection and Use of Historical and Cultural Heritage"	No.91 26 July, 1999

3.3 Legal and Regulatory Acts of the Kyrgyz Republic Regulating Resettlement and Land Acquisition

The legal and policy framework of the Project is based on the laws related to land acquisition and resettlement policies in the Kyrgyz Republic and the WB OP/BP 4.12 policy on “Involuntary Resettlement”.

The regulatory framework of the Kyrgyz Republic consists of the following normative legal acts with the specified hierarchy of execution:

- Constitution of the Kyrgyz Republic;
- Civil and Land Codes;
- Legislation of the Kyrgyz Republic;
- Decree of the President of the Kyrgyz Republic;
- Resolution of the Government of the Kyrgyz Republic;
- Normative legal acts of public authorities having legislative powers delegated by the relevant act;
- Normative/Regulatory legal acts of local executive authorities.

3.3.1 Constitution of the Kyrgyz Republic dated May 5, 2021

The Constitution of the Kyrgyz Republic provides for:

Article 16.

- The land, its subsoil, air space, waters, forests, pastures, flora and fauna, and other natural resources are the exclusive property of the Kyrgyz Republic.
- Land and natural resources are used as the basis of life and activity of the Kyrgyz Republic’s people; in order to maintain the unified ecological system and sustainable development they are under the control and special protection of the State.
- Land with the exception of pastures and forests, may be in private and municipal forms of ownership. Land may not be privately owned by foreign citizens and legal entities with foreign participation.
- Guarantees of rights protection for land owners is determined by the law.

3.3.2 Civil Code of the Kyrgyz Republic

Part 1, Civil Code of the KR, (May 8, 1996, as amended on September 2, 2021) stipulates that a person whose right is violated may claim full compensation for the losses incurred, unless otherwise stipulated by law or a relevant contract (Article 14, paragraph 1). The Civil Code defines the following losses to be compensated:

- Expenses that the person whose right is violated has made or will have to make to restore the violated right (Article 14, paragraph 2);
- Loss or damage to property (Article 14, paragraph 2);

- Unearned income which the person would have received under normal conditions of civil turnover if his right had not been violated (lost profits) (Article 14, paragraph 2).

If a person has received income as a result of a violation of the law, the person whose rights have thereby been violated may claim full compensation for losses along with other expenses, actual losses in an amount not less than the income received by the wrongdoer.

Article 15. Compensation for Losses Caused by State Agencies and Local Authorities

Losses incurred by a citizen or a legal entity as a result of illegal actions (or inaction) on the part of state agencies, local self-government bodies or representatives of these bodies, including as a result of a state body issuing an act that does not comply with the law, shall be subject to compensation by the state and local self-government bodies in cases provided for by law.

3.3.3 Land Code of the Kyrgyz Republic

The Land Code of the Kyrgyz Republic (of June 2, 1999, as amended on March 17, 2021) defines:

- The seizure (redemption) of a land plot for state and public needs may be carried out on the basis of an agreement between the authorized body and the owner of the land plot or land user. In the event of disagreement of the owner of the land plot or land user with the withdrawal (redemption) or its terms, the authorized body is entitled to apply to court with a claim for compensatory withdrawal (redemption) of the land plot within two months after receiving the refusal (article 68, paragraph 1);
- In determining the repurchase price of a land plotthe market value of the right to land and buildings and structures located thereon, as well as losses caused to the owner or land user due to termination of the right to land, including losses associated with early termination of obligations to third parties are included (Article 68, paragraph 3).
- When a land plot is withdrawn for state or public needs with the consent of the land plot owner or land user, he/she may be provided with another land plot with offset of the cost of the right to it in the redemption price (article 68, paragraph 4).

The Land Code of the KR also defines cases in which rights to land and ancillary structures may be taken, including the following grounds:

Article 66. Grounds for withdrawal of a land plot

- Use of the land plot in violation of its designated purpose;
- Withdrawal (redemption) of the land plot for state and public needs;
- Non-use of the land plot provided for agricultural production within three years;
- Failure to use the land plot provided for non-agricultural production within the established period of time;
- Failure to pay land tax;
- Failure to pay insurance premiums;
- Termination (cancellation) of the right to use subsurface resources in accordance with the Law of KR "On Subsurface Resources".
- Withdrawal of a land plot for state and/or public needs is carried out after payment of the cost of the right to land plot and compensation of losses.
- The land plot shall be withdrawn in case of non-payment of land tax within the established terms in accordance with the procedure established by the Tax Code of the Kyrgyz Republic.
- The land plot in the event of non-payment of insurance premiums within the established time limits shall be withdrawn in the manner prescribed by the Law of the Kyrgyz Republic "On Rates of Insurance Contributions for State Social Insurance".

The land plot and the structures attached to it may be withdrawn by court decision in the cases stipulated by paragraphs 1-4 of Article 66 of the Land Code. Land may be withdrawn on the basis of paragraphs 1-4 only after the payment of compensation for the withdrawal of rights and related costs (Article 49, paragraph 4).

According to paragraph 1 of Article 49 of the Land Code of the KR, the owner of a land plot and land user, unless otherwise stipulated by law, documents certifying the right to a land plot, or an agreement, has the right:

- To manage land independently, using it for its intended purpose (Article 49, paragraph 1, sub-paragraph 1);
- To erect buildings and constructions not contradicting the intended use of the land plot in the prescribed manner, in compliance with architectural, planning, construction, environmental, sanitary, hygienic, fire safety and other special requirements (norms, rules, regulations) (Article 49, item 1, sub-paragraph 6);
- For compensation of losses in cases stipulated by the legislation of the Kyrgyz Republic (Article 49, Clause 1, Sub-clause 5).

The Land Code of the KR (Article 78, paragraph 2) also defines the procedure for using public lands. In particular, it defines those public lands of settlements/cities/villages (roads, streets, squares, sidewalks, roadside land strips, boulevards, public gardens, reservoirs, etc.), are not provided for ownership. In exceptional cases they may be provided by an authorized body for fixed-term (temporary) use by private individuals and legal entities on lease terms for a period of up to five years. Erection of light buildings and structures may be permitted on the lands of general use provided for temporary (temporary) use by an authorized body (Article 78, paragraph 3).

3.3.4 Law “On state registration of rights to immovable property and transactions with it” (December 22, 1998, last amended February 25, 2021)

The law stipulates that the State recognizes and protects the rights to immovable property and encumbrances that are registered according to legally established procedures (Chapter 1, Article 1, paragraph 1). Any document of title or other document on rights or restrictions subject to compulsory registration shall be submitted to the registration authority not later than thirty days from the date of conclusion (drawing up) of the abovementioned document (Chapter 1, Article 7, Paragraph 1). Rights and restrictions subject to mandatory registration include (Chapter 1, Article 4):

- Right of ownership;
- Right of economic management;
- Right of operational management
- The right of perpetual (without indicating the term) use of the land plot;
- Rights arising from mortgages, including mortgages by virtue of law or pledges;
- The right of temporary use, lease or sublease for a period of three years or more;
- Easements
- Restrictions on rights of design, construction and use of a separate unit of real property;
- Rights arising from court decisions;
- Rights arising from court judgments; rights of natural resources management;
- Rights arising from legalization of property.

The following rights and restrictions are considered valid regardless of whether they have been registered or not, but are not afforded state protection under the Act (Chapter 1, Article 6):

- the right of access to existing power lines, telephone and telegraph lines and poles, pipelines, geodetic points, and other rights resulting from public needs at the time of the opening of the registration office;
- the rights of spouses, children and other dependents;
- the right of temporary use, lease or sublease for a period of less than 3 years;
- the right of actual users to preferential use of real estate;
- rights of tax authorities;
- restrictions acting as general rules and prohibitions (on health care, public safety, environmental protection, etc.).

3.3.5 Legal and regulatory acts of the Kyrgyz Republic regulating the issues of labor legislation (including forced and child labor), gender equality, procedures for considering of citizen's appeals and access to information.

3.3.5.1 Labor Code of the Kyrgyz Republic as of August 4, 2004 № 106

Article 9.The prohibition of discrimination in employment

- No one couldn't be restricted in his/her labour rights and freedoms or receive any advantages in exercising them depending on sex, race, nationality, language, origin, property and official status, age, place of residence, attitude to religion, political convictions, membership or non-membership in public associations, criminal record (except for restrictions envisaged by legislation on labour relations) and also on other circumstances unrelated to professional qualities of an employee and the results of work;
- Unequal pay for equal work is not allowed;
- Persons who consider that they have been subjected to discrimination at work have the right to apply to court for the restoration of their violated rights, compensation for material damages and compensation for moral harm.

Article 10. Prohibition of Forced Labour

Forced labour, i.e. compulsion to perform work under the threat of any form of coercion, is prohibited, except in the following cases:

- performance of work which is conditioned by the legislation on military duty and military service or alternative service replacing it;
- performing work under extraordinary circumstances, i.e. in cases of declaration of state of emergency or martial law, disaster or threat of disaster (fires, floods, famine, earthquakes, severe epidemics or epizootics) and in other cases endangering life or normal living conditions of all or part of the population;
- performance of work as a result of a court sentence that has entered into legal force, under the supervision of the state bodies responsible for the observance of the law in the execution of court sentences.

The use of child labor in the worst forms is prohibited.

3.3.5.2 Children's Code of the Kyrgyz Republic, as of July 10, 2012, No.100

Article 15. Use of child labor

1. It is prohibited to accept or engage a child to perform any work that may be hazardous to his/her health or serve as an obstacle to his/her education or be detrimental to his/her health and physical, mental, spiritual, moral and social development.
2. Exploitation of child labor in its worst forms, as well as forced labor of children in any form at enterprises, institutions and organizations, regardless of their form of ownership, including cooperatives, peasant farms and farm is prohibited.
3. Child labor is prohibited in jobs with harmful or hazardous working conditions, in underground work, at night, as well as in jobs the performance of which may harm their health and moral development (gambling business, work in night entertainment establishments, production, transportation and trade of alcoholic beverages, tobacco products, drugs and toxic substances, etc.).
4. Children are prohibited from lifting, carrying and moving weights in excess of the limits established for them.

The list of jobs where child labor is prohibited, as well as weight limits are approved in accordance with the procedure established by the Government of the Kyrgyz Republic.

According to the legislation of the Kyrgyz Republic, children under the age of 18 are considered minors.

3.3.5.3 Law of the Kyrgyz Republic "On State Guarantees of Equal Rights and Equal Opportunities for Men and Women" (No. 184 dated August 4, 2008)

Article 5.Prohibition of gender-based discrimination

Direct and indirect gender discrimination in any sphere of activity against persons of different sexes is prohibited.
Direct gender-based discrimination includes:

- Discrimination because of marital status, pregnancy, potential pregnancy and family responsibilities;
- Sexual harassment;
- Different payment for equal work of equal qualifications.

Indirect gender discrimination includes:

- Reproduction of gender stereotypes through the media, education, culture;
- Establishment of conditions, requirements that have caused or may cause negative consequences in the form of harm to persons of a certain sex.

Persons carrying out direct or indirect discrimination shall be held liable in the cases and according to the procedure provided by the legislation of the Kyrgyz Republic.

Article 6.State Policy for Ensuring Gender Equality
The foundations of State policy to ensure gender equality are as follows:

- Formation, improvement and development of the normative legal base for ensuring gender equality;
- Creation of institutional mechanisms to implement gender policy;
- The development and implementation of state targeted programs aimed at achieving gender equality;
- Adoption of special measures aimed at eliminating the imbalance between the capabilities of women and men;
- Integration of a gender approach in state, regional and local programs and development strategies;
- Protection of society from information, propaganda and agitation aimed at violation of gender equality;
- Education and promotion of a culture of gender equality;
- Implementation of generally recognized principles and norms of international law, as well as international obligations of the Kyrgyz Republic related to gender equality issues.

3.3.5.4 Law of the Kyrgyz Republic"The procedure for considering citizen's appeals" (No. 67 dated May 4, 2007)

Article 4.The right of citizens to appeals

1. Every citizen of the Kyrgyz Republic has the right to appeal in person or through his representative to public authorities, local self-government bodies and their officials.
2. The bodies specified in Part 1 of this article, their officials have no right to deprive citizens of the right to appeal with proposals, appeals and complaints or to restrict them in such a right.
3. Applications and complaints on behalf of minors or incapacitated persons have the right to be filed by their legal representatives, as well as guardianship and trusteeship bodies.
4. Foreign citizens and stateless persons enjoy the right to appeal under this Law, unless otherwise provided by the current legislation of the Kyrgyz Republic or international treaties.

5. Appeals of citizens received in the prescribed manner from the editorial boards of newspapers, magazines, television, radio and other mass media, via direct telephone communication are considered in the manner and within the time limits prescribed by the legislation of the Kyrgyz Republic and this Law.
6. Citizens exercise the right to appeal freely and voluntarily. The exercise by citizens of the right to appeal shall not violate the rights and freedoms of other persons.
7. The consideration of citizens' appeals is free of charge.

Article 6.Requirements for a written appeal

1. A citizen in his/her written appeal shall mandatorily specify the name of the state body or local government body to which he/she addresses a written appeal, or the surname, first name, patronymic of the relevant official or position of the relevant person, as well as his/her surname, first name, patronymic (the latter if available), postal address to which a reply shall be sent, shall state the essence of the propos al, statement or complaint, shall put his/her personal signature and date.
2. Appeal, complaint of a citizen must be substantiated. If necessary, they shall be accompanied by documents supporting the citizen's arguments.

3.3.5.5 Law of the Kyrgyz Republic"The Access to Information Maintained by the Public Bodies and Local Self-Government Bodies of the Kyrgyz Republic"(No. 213 dated December 28, 2006)

Article 1. Tasks of this Law

The objectives of this Law are to ensure the implementation and protection of the right of access to information under the jurisdiction of state agencies and local governments, and achieve maximum informational openness, publicity and transparency in the activities of state agencies and local governments.

Article 6.Ways to Provide Information

1. The main ways of providing information by state and local self-government bodies are:
- publication and dissemination of relevant materials, including on the official or specialized website;
- provision of information to individuals and legal entities on the basis of their request;
- public disclosure of information on the activities of state bodies and local self-government bodies;
- provision of direct access to documents and materials of state bodies and local self-government bodies;
- provision of direct access to open sessions of state and local self-government bodies.

2. State bodies and local self-government bodies have the right to use any other means not prohibited by the legislation of the Kyrgyz Republic to inform the public about their activities.
3. State and local self-government bodies' provision of one of the ways of access to information about their activities cannot serve as a basis for refusal to provide information through any other lawful way.

3.4 Comparisons of Legislations of the Kyrgyz Republic and the World Bank regarding the Resettlement

The main differences between the KR Legislation and WB policies are presented in Table 9.

When there is a discrepancy between the the relevant laws of the KR and the requirements of the World Bank OP 4.12 "Involuntary Resettlement", the principles and procedures of OP 4.12 apply, as this priority of WB regulations over the legislation of the Kyrgyz Republic is a requirement for the projects financed by the World Bank.

Table 9. Comparison of the Legislations of the Kyrgyz Republic and the WB Operational Policy OP 4.12 on "Involuntary Resettlement"

Legislation of KR	WB policy on involuntary resettlement
Compensation for land acquisition only to landowners with ownership, who have formal ownership rights to land use, or who are holders of a land share. This category includes tenants who have lease agreements to work on public or private land.	Lack of formal ownership to land will not be a barrier to compensation of PAPs (Project Affected Persons). Persons without ownership to land and/or structures occupied or used by them are eligible for various options of resettlement assistance if they have cultivated crops/occupied land before the deadline.
Consultation with PAPs or communities regarding the withdrawal of land or property is not required.	PAPs must be fully informed and consulted about compensation, including rights and resettlement options, including resettlement places and also including consultation, participation, information dissemination campaigns and opportunities to participate in monitoring depending on the nature and scale of impacts; Resettlement plans should be developed and prepared in consultation with PAPs and other stakeholders; Displaced persons should be constructively consulted and be able to participate in the planning and implementation of resettlement programs. Gender consultation requirements are mandatory; All PAPs should be informed, by all means, about the end date. Persons who settled on the Project area after the end date will not be eligible for compensation or any other form of resettlement assistance; The RAP should include mechanisms for addressing and redressing grievances.
Compensation for land is made at the redemption price of the land plot, including the market value of the right to land and buildings and structures located on it, as well as losses caused to the owner or land user due to termination of the right to land plot, including losses associated with early termination of obligations to third parties.	Provision of land to replace the withdrawn plot is preferred, and the proposed plot must be acceptable to the PAP and must match the area and fertility of the lost plot. If it is impossible to find suitable land, compensation in cash, or provision of another plot with additional payment, at the cost of replacement is done. The replacement cost for land plots is equal to the market value of land with similar productivity potential or use, located near the affected land, plus the cost of preparing the land to a condition similar to the condition of the affected land plot, plus the cost of fees for registration and re-registration of land tenure and land use rights.
Compensation for other assets (buildings, crops and trees, and income from business activities) is provided in accordance with the procedure regulated by the Resolution of the Government of KR, and not at replacement value. There is no provision for clarification of high impact or vulnerable PAPs. Costs of transportation and relocation are not provided for by the legislation of the KR.	The amount of cash or in-kind needed to replace the property at the current market price, without deducting depreciation or restoration costs and including transaction costs (administrative costs, taxes, registration or ownership costs). Also includes the provision of moving or relocation benefits.
At the design stage, if other lands are available, proposals to withdraw agricultural or high-yield lands are rejected.	Any land acquisition and relocation should be avoided, but if it is not possible, it should be minimized by exploring all possible options.
Lack of legal provisions regarding income/livelihood restoration during resettlement, including for vulnerable people.	Compensation is required for changes in living conditions and loss of income as a result of land acquisition for project purposes. In addition to being technically and economically feasible and appropriate, the packages should also take into account the national and cultural preferences of the persons to be

Legislation of KR	WB policy on involuntary resettlement
	resettled and be developed in close contact with these persons. For vulnerable persons, special measures may need to be taken. There are various aspects of vulnerability (age, disability, belonging to a particular ethnic minority, etc.), which are not related to the project, but may lead to a disproportionately strong / adverse impact of the project on a particular PAP and, therefore, to specific additional impacts. Provisions may be required to cover or help people in these categories.

Detailed inspection and results of technical design of the project sites revealed that there are no households and any structures near the existing road, and reconstruction/rehabilitation of the project sites will not affect the livelihoods of local communities, will not result in physical and economic displacement, as well as withdrawal of private land**. Due to the absence of persons affected by the project, World Bank Operational Policy OP 4.12 "Involuntary Resettlement"will not be applied.**

3.5 Legal Framework for land transfer (converting) in the Kyrgyz Republic

The Constitution of the Kyrgyz Republic was adopted on June 27, 2010. It is the principal legal document that guarantees for the implementation of the rights of country citizens. Article 12 states that «The land, its subsoils, air space, waters, forests, flora and fauna, other natural resources are the exclusive property of the Kyrgyz Republic, and used to preserve the unified ecological system as foundations of life and activity of Kyrgyz nation and it is under special protection of the state".

Land can be in private, municipal and other types of ownership with an exception of pasturelands that cannot be held in private ownership.

There are a number of laws and regulations that define the legal basis, conditions and procedures of land converting (transfer) from one category to another: Law of the Kyrgyz Republic as of July 15, 2013 № 145 "On land transfer (converting)»; Law of the Kyrgyz Republic as of March 19, 2016 № 21 "Amendments to the Law of the Kyrgyz Republic on land transfer (converting)"

Law of the Kyrgyz Republic as of July 15, 2013 № 145 "On land transfer (converting)"

Article 3. Land categorization and land transfer (converting)

1. Land categorization is made in accordance with its designated purpose.

Land transfer (converting) from one category into another is a state function and is carried out in case of its primary designated purpose change.

Category of land and type of land are indicated in:

1) in the acts on provision of land plots of local state administration, local government bodies;

2) in agreements, when land is a subject matter of the contract;

3) in land records;

4) in right certifying documents of the land plot.

2. Violation of the established procedure for land converting is the basis for invalidating acts of the local state administration or local self-government body.

Misuse of land is not allowed, except for the provision of land within the size limits not exceeding 20 m2 to telecommunications operators for the construction or installation of lightweight communication facilities (non- solid construction).

Article 6. Competence of the Kyrgyz Republic Government for land converting

Government of the Kyrgyz Republic:

1) converts (transfer) agricultural land (arable land, land under perennial plantations, fallow land, cultivated pastures, hayfields of comprehensive improvement and pastures of comprehensive improvement) into other types of land or into other land categories;

2) converts forestry fund lands to other land categories;

5) approves funds use procedure received from compensation for agricultural and forestry losses.

Article 8.Consideration of documents on land transfer based on a "one-stop-shop" system

1. Processing of land converting application is reviewed on a "one-stop-shop" basis.

2. Functions of preparing land surveying documentation on land transfer are carried out by dedicated government agency.

Article 9.Procedure for preparing documents and review of applications for land converting

1. To carry out the land converting, with the exception of converting to the category “Settlement lands” for individual housing construction, natural person or legal person submit land converting application to rayon state administration.

The application shall state information about the land title, the category and size of the land plot to be converted, and the justification for land converting from one category to another or from one type of land to another.

Copies of documents must be attached to the application: for natural person a copy of ID document, for legal person a copy of Certificate on State Registration of the Legal Entity, copies of right identifying and right certifying documents for the land plot, development master plan or urban planning documentation and a feasibility study.

2. Dedicated government agency, at the request of rayon state administration compiles documents of the land plot and sends land surveying documentation within ten working days for consideration of the commission established by rayon state administration.

3. Rayon state administration establishes a commission with the participation of local self-government body’s representatives where the land to be converted, applicant itself and local authorities (hereinafter - rayon commission) are located: architecture and construction department (when converting land into category of “settlement lands”), environmental protection and forestry department (when converting land from forestry fund lands or converting into categories of forestry fund lands, specially protected natural resources), agriculture and water management, health, emergency situations, energy, verification inspections over the use and protection of lands. Rayon commission is headed by the first deputy head of rayon administration.

Rayon commission within ten working days submits to rayon state administration a conclusion on possibility or impossibility of converting land plot.

4. In case of a negative conclusion on converting of a land plot, rayon state administration sends to applicant a justified refusal with the conclusion of the commission.

5. In case of a positive decision on converting of a land plot for construction, rayon commission appends to its decision a development master plan of the site or urban planning documentation, and a feasibility study, in accordance with the established procedure.

6. After receiving a positive decision of rayon commission, specially authorized state body compiles land management file for land converting with the following documents:

1) application;

2) development master plan of the site or urban planning documentation, and a feasibility study, in accordance with the established procedure.

3) calculation of losses in conversion of agricultural land and (or) forestry fund;

4) explication of lands by types with a breakdown into each proprietor and land user;

5) land plot map with boundaries and its scale;

6) rayon commission conclusion.

Chapter 2. Peculiarities of converting land plots

Article 12. Peculiarities of converting agricultural lands

1. Conversion of agricultural lands to another category is permitted in cases involving:

2) establishing of a specially protected natural areas, in connection with classification of lands as lands of ecological, scientific, nature-conservation, historical and cultural, and recreational purpose;

6) construction of roads, power transmission lines, communication lines, oil, gas and other pipelines, railway lines;

9) siting of social, public utility, health and education facilities in the absence of other options for location;

Article 14. Peculiarities of converting forestry funds lands

Conversion of forestry fund lands is allowed in cases of:

2) in order to create specially protected natural areas - by classifying lands as nature-conservation, historical, cultural, recreational and other outstanding lands, in case of a positive conclusion of state environmental expertise;

3) if the change of land's designated purpose is stipulated by the forest management documentation or land-use planning documents for the construction and operation of health, cultural and social, housing and utility facilities;

5) Siting (locating) of state or municipal facilities if other options for locating of these facilities are unavailable;

Chapter 3. Final Clauses

Article 19. Categorization of land plots

1. Categorization of land plots as per the categories established by the Land Code of the Kyrgyz Republic is mandatory.

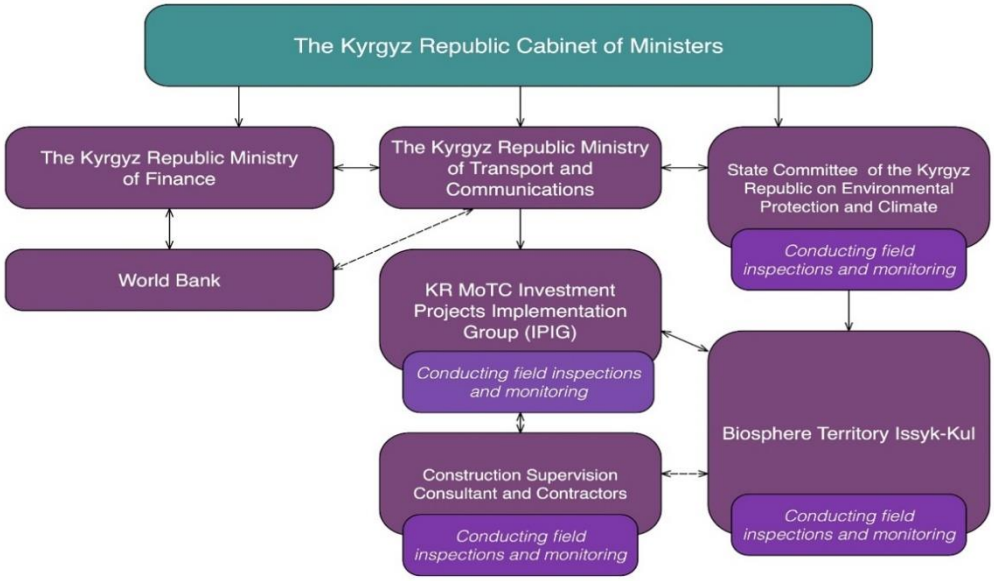
For the successful implementation of the project, all procedures for trasnformation of the land will be completed before the start of road construction work on the project sites.

The state system of measures for the preservation of objects and sites of historical and cultural heritage is developed in the Kyrgyz Republic. The leading among them is the Law "On Protection and Use of Historical and Cultural Heritage" No. 91, dated 26.07.1999, as well as other normative legal and regulatory acts, the main purpose of which is to ensure the preservation, protection and comprehensive effective use of the objects of historical and cultural heritage, the protection of monuments from destruction, vandalism and other appropriate measures.

3.6 Institutional Structure of the Project

Figure 2, shows the organizational structure of the Project, including the Wordld Bank, the Kyrgyz Republic Cabinet of Ministers, Ministry of Finance (MOF), Ministry of Transport and Communications (Executive Agency), State Committee of the Kyrgyz Republic on Environment and Climate (SCEC) responsible for issuing environmental permits, subordinate organizations under SCEC, and the World Bank.

Picture 2. Organizational structure of the project



The MOF is the government agency responsible for coordinating external assistance from the World Bank and other donors. MOTC is responsible for transport sector development and is an Executive Agency. MOTC has overall responsibility for project planning, design and implementation. The SCEC is responsible for environmental policy, regulation and coordination of expertise, and issuance of permits. Its functions include:

- management, coordination of subordinate structures - regional and territorial divisions;
- development of environmental policy and its implementation;
- environmental information services;
- environmental monitoring;
- state environmental expertise/review;
- issuance of environmental licenses;
- international cooperation.

SCEC has a territorial office in the city of Karakol with the same specific responsibilities as the central state committee. The Head Department of Hydrometeorology, Kyrgyzhydromet, which is a part of SCEC, is responsible for air and water quality monitoring.

Additionally, to the SCEC, which is responsible for the formation and implementation of environmental policy in the Kyrgyz Republic, other important entities - state and municipal bodies responsible for environmental assessment issues are:

- Ministry of Health and Social Development (health and safety, drinking water quality, noise and vibration);
- Ministry of Emergencies (risks and conditions associated with natural disasters);
- The Ministry of Agriculture, Water Resources and Regional Development (use of agricultural land and pastures), which now includes the Forestry Department and the function of developing policies for the development of forestry and hunting;
- The Ministry of Culture, Information and Tourism is responsible for the implementation of the state policy in the field of culture, information and tourism;
- State Agency for Geology and Interior Use under the Ministry of Energy and Industry (certificates and licenses for stocks of inert materials);
- District state administrations (DSA) in terms of resettlement and land acquisition, public hearings, information disclosure, etc.;
- Local government bodies - ayil okmotu (provision of land for landfills, asphalt plants, workers' settlements, etc.).

Chapter 4. Environmental Safeguards

4.1 Initial state of the environment

4.1.1 Physical Resources

Climate

Kyrgyzstan's location in the center of the largest continent and its remoteness from seas and oceans, as well as the significant elevation of the territory relative to sea level, determine differences in the degree of continental climate of the country. Such features determine the moderate climate in most of the country's territory; in the Chui and Fergana valleys the climate in its features is close to subtropical; in the central part of the Issyk-Kul basin, the climate is close to maritime; deserts and dry steppes surrounding Kyrgyzstan from the north, west and south make differences in climate at different altitudes even sharper[2].

Solar radiation, general circulation of the atmosphere, and the underlying surface of the territory play a major role in the formation of Kyrgyzstan's climate.

The orographic isolation, the presence of the vast lake at the bottom of the basin are the reason for the significant features of the general climatic conditions. According to more than one hundred years of observations, the average annual amount of atmospheric precipitation in Karakol City is 410 mm, in wet years - 660-680 mm, in droughty years - 225-260 mm. According to the San-Tash meteo-station, the total annual precipitation is 783 mm.

Winters near the lake are not very cold, severe frosts are almost not observed. However, in the mountainous areas, where, in particular, the project road passes, the climate is strongly influenced by the altitude above sea level and the corresponding temperature regime. Conditions in mountainous areas, as well as in other mountainous regions of the country, are characterized by severity, sometimes severe frosts reaching minus 20°C in winter, heavy snowfall, and winds. Summer temperatures are not high either. Average July temperature ranges from +16…+18°C.

Features of the climate are also seen in the values of the lowest and highest temperatures. The average value of the highest temperatures observed near Cholpon-Ata City is +27°C, Karakol +30°C, and the absolute maximum is +31°C and +34°C. In the eastern part of the basin, the average value of the lowest temperatures is -21°C. Absolute minimum for the whole coast of the lake is minus 35°C was detected in the area of the village Koi-Sary.

More detailed climatic characteristics of the survey area are given according to data of meteorological stations (MS) "Karakol" and "San-Tash" (Tables 13-24), which are situated in the south-west of the survey area at the heights of 1,714 m and 2,000 m, and according to SNiP KR 23-2-00 "Construction Climatology".

Table 10. Climatic zoning and zoning for construction

Administrative unit, point	Climatic area	Climatic sub-area	Zone by degree of humidity
MS Karakol	II	IIB	dry

[2] *Physical geography of Kyrgyzstan. Bishkek. Turar Publishing House, 2013. P. 79-80, 89-91.*

Climatic zoning of Kyrgyzstan was developed on the basis of a complex combination of average monthly air temperatures in January and July, average wind speed for the three winter months, average monthly relative humidity in July.

Table 11. Climatic zoning

Climatic sub-area	Zone by degree of humidity	Average monthly air temperature in January, t^0 C	Average wind speed for the three winter months, m/s	Average monthly air temperature in July, t^0 C	Monthly average relative humidity in July, %
IIB	dry	from -4 to -14	5 and more	+12 to +21	≥ 75

The main factor influencing the distribution of air temperature is the relief, namely the altitude of the terrain and the degree of enclosure of the valleys. In the mountainous part of the basin, the air temperature decreases with increasing altitude. However, it is generally accepted that up to about 2000 m of absolute altitude, the average annual temperature is higher by 2-3°C compared to the Northern Tien Shan. At higher altitudes, thermal conditions become the same throughout the Tien Shan.

Regularities of temperature decrease during general elevation of terrain are often broken under the influence of forms of relief, underlying surface and exposition of slopes. This is one of the conditions for the formation of temperature inversions. On Terskey Ala-Too slopes the temperature gradients vary from -0.27 to 1.14°C per 100 m in winter and from 0.11 to 0.73°C in summer.

Transition of air temperature through -5°C in the mountains is in strict dependence on the forms of relief. At an altitude of 2000 m, transition of air temperature through -5°C in spring is noted first of all on the plateau (at the end of February), then on slopes (in the first ten days of March) and, finally, in depressions (in the second ten days of March). Transition of air temperature through -5°C in autumn occurs in reverse sequence.

Stable transition of average daily temperatures through 0° in spring gives an idea of the average timing of the period of intensive snowmelt, and in autumn the timing of the beginning of snow cover formation. In the mountains, transition of temperatures through 0° in spring is delayed with the altitude of the terrain. Thus, from 2,000 to 3,000 m, the establishment of positive temperatures is completed in the second decade of April. In autumn, establishment of negative average daily temperatures occurs from the second decade of November to the second decade of December. Characteristics of air and soil temperature regimes are given in the following tables 15 - 20.

Table 12. Average monthly and annual air temperature, t°C

I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Год
-6,6	-5,2	0,4	7,4	11,8	14,8	16,9	16,3	12,3	6,7	-0,3	-4,3	5,9

Table 13. Average maximum air temperature, t°C

I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Год
-1,3	0,1	5,7	13,8	18,1	21,2	23,8	23,7	19,8	13,7	5,4	1,0	12,1

Table 14. Average minimum air temperature, t˚C

I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Год
-11,6	-10,1	-4,0	1,5	5,5	8,5	10,1	9,4	5,5	0,6	-4,9	-9,1	0.1

Table 15. Absolute maximum and minimum air temperatures, t^0C

Mec.	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Год
Max.	7	11	21	27	31	33	33	35	30	25	16	10	35
Min.	-22	-21	-19	-12	-10	-2	1	1	-7	-13	-22	-21	-22

Figure 3. Graph of average monthly maximum, and minimum air temperatures, ˚C

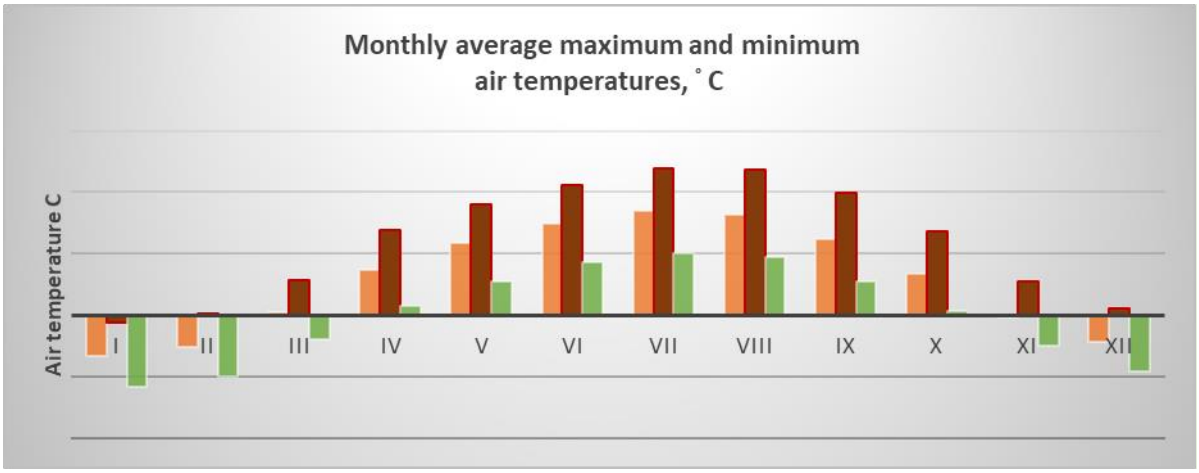


Table 16. Duration and average air temperature (°C) of the period with average daily temperature

Air temperature, ˚C					
≤ 0^0C		≤ 8C		≤ 10˚C	
Number of days	Average temperature	Number of days	Heating period	Number of days	Average temperature
112	-4.2	187	-1.1	206	-0.1

Table 17. Date of first and last frost and duration of frost-free period

Date of frost						Duration of frost-free period, days		
Last			First					
Average	The earliest	The latest	Average	The earliest	The latest	Average	Smallest	Biggest
7.V	5.IV	23.VI	30.IX	6.IX	25.X	145	99	184

Thermal circulation between slopes and valley bottoms forms slope winds that transform into mountain-valley winds from side valleys and gorges. In mountain valleys with well-developed mountain-valley circulation, the average wind speed in winter is about 2 m/s. Wind speeds in the area have a clearly pronounced annual course.

The yearly break-down provides an assessment of the wind conditions of the middle and high mountain zone of the study area. Winds of eastern and southern direction prevail in winter. In the warm period of the year there is also a high frequency of easterly, southerly and westerly directions.

Table 18. Average monthly and annual wind speed, m/s

I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Year average
1,4	1,6	1,7	2,0	2,0	1,6	1,4	1,4	1,6	1,6	1,7	1,4	1,6

It should be mentioned about the maximum wind speeds, which are noted in the area of San-Tash pass and reach 15-20 m/s, sometimes 40 m/s.

Wind speeds, directions and recurrence by directions are given in table 10 and on figure 4.

Table 19. Repeatability (%) and average wind speed (V av) by direction, m/s.

January								July							
N	**NE**	**E**	**SE**	**S**	**SW**	**W**	**NW**	**N**	**NE**	**E**	**SE**	**S**	**SW**	**W**	**NW**
6	13	43	7	18	6	4	3	12	12	19	5	12	8	21	11
1,1	2,4	3,2	1,3	1,4	2,5	3,2	1,0	1,7	2,3	2,7	1,6	1,6	2,0	2,2	2,0

Figure 4. Wind roses for characteristic months of cold and warm periods of the year

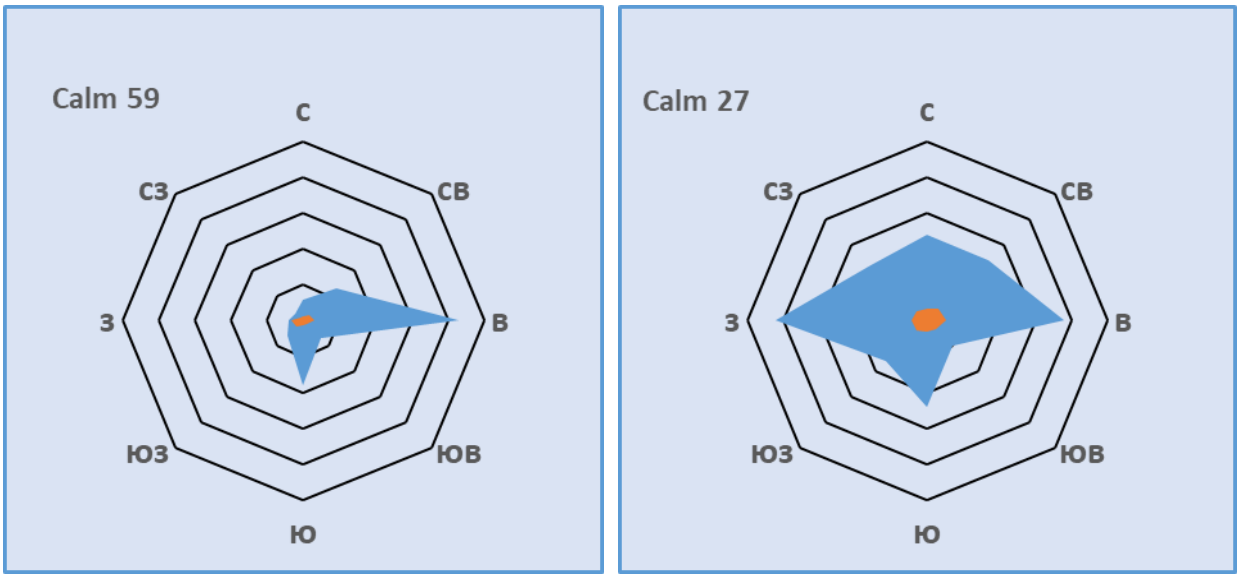


Table 20. Maximum wind speed and gust (m/s)

Wind characteristics	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Year

Speed	17	20	20	18	20	20	17	17	20	20	24	20	24
Gust	20	22	25	24	-	-	20	20	-	-	-	-	25

Table 21. Maximum velocities, V m/s and velocity head q_0, Pa (H/m2) of wind for different periods of repeatability

Windy area	Wind speeds, m/s repeatability once per				Wind velocity gusts, Pa with repeatability once per			
	5 years	10 years	15 years	25 years	5 years	10 years	15 years	25 years
IV	31	33	34	36	590	670	710	800

** The district number is given according to the schematic map of wind regions of Kyrgyzstan*.

The climatic features of the project road area indicate that the distribution of snow cover height (in cm) is one of the most significant for the territory of Kyrgyzstan as a whole. The San-Tash area, according to the long-term observations, is characterized by a snow cover height of 129 cm. Only four regions in Kyrgyzstan have a higher snow cover: Chatkal (134 cm), Akterek-Gava (136 cm), Aktash (146 cm), and Chaar-Tash (286 cm) regions. Although in the highlands such a level is considered as average, however, it should be taken into consideration that in absolute values can affect quite strongly the different sides of activity in the area. For comparison, in the south of the country, in Jalalabad and Osh Provinces, snow cover in the lower zone is usually 10-25 cm, it lays 1.5-2 months, in the upper (mountain) zone - up to 4 months.

Photo 1. The village of San-Tash at the end of March 2021: high level of snow

The number of days with snow cover in the project zone is standard, and is observed practically for all highland areas of Kyrgyzstan, comprizing 200 days, that is, about 6.5-7 months per year. Despite the fact that in comparison with other mountainous areas of the country this figure seems quite usual, for the nearby areas of the Issyk-Kul lake coast the difference is significant: figures for the coastal zone vary from west to east from 10 to 150 days per year. This fact affects various social aspects of the local population, and may also have a significant impact on the duration of construction works both on the Tyup-Kegen and on the Karkyra-Turuk-Sary-Jaz road sections, where climatic conditions periodically appear in an even more severe form.

In order to conduct environmental monitoring at the project site in accordance with the requirements of the environmental legislation of the KR and the WB policies, in late April-early May 2021, field instrumental studies of the project sites were carried out: samples of water, soil, air were taken, and noise/vibration levels were measured. The samples were analyzed in certified laboratories in Kyrgyzstan. The results of the analyses concluded that, in general, the components of the environment along the road are in good condition, are not polluted and are not subject to the degradation process.

During the process of sampling environmental components, samples were taken at points linked to certain types of anthropogenic and technogenic impacts, including vehicular traffic and the presence of vulnerable social infrastructure.

4.1.1.1 Air

On May 4, 2021, from 11:30 a.m. to 6:30 p.m., staff from the environmental laboratory of the Chui-Bishkek Territorial Deparment of SCEC measured air pollutant concentrations and determined baseline air quality along the project road. The map below shows the sampling points: green icons indicate noise and vibration sampling points, and red icons indicate air sampling points. Ten points were identified for air sampling and 10 for noise and vibration sampling.

Air sampling was carried out in parallel with measurements of vibration and noise levels. This work option was chosen due to the fact that during the preliminary preparation and discussion of specific points in the field, the air sampling points and noise and vibration level measurements appeared to be in close proximity to each other. In order to optimize and speed up the necessary work, it was decided to send employees of the relevant laboratories together.

Map 2. Map with air and noise/vibration sampling points (start of route)

Map 3. Map with air and noise/vibration sampling points (end points)

Air sampling points and noise and vibration measurements were established in connection with vulnerable social infrastructure objects: in populated areas, near residential houses, schools, near tourist objects, border crossings and road crossings with large concourse of people.

Exact coordinates of water sampling points and noise and vibration measurements, as well as brief description of environmental conditions at the time of works argiven in the table below:

Table 22. Location of air sampling points

No.	Km	Sampling point on the map	Approximate time of sampling	Distance from the road (m)	Coordinates	Landmarks (infrastructure, settlements)
1.	(Km 12+700)	A09	12:10-12:40	5	42.672075N 79.201553 E	Karkyra Gorge, neighborhood of the border bridge and Ak-Sai Travel camping
2.	(Km 1+300)	A07	13:15-13:40	3	42.758539 N 79.152108 E	Karkyra village
3.	(Km 2+650)	A08	13:45-14:20	5	42.757643 N 79.165642 E	Turn to the Karkyra Gorge, a group of houses above the road
4.	(Km 0+100)	A06	14:30-14:50	5 и 50*	42.761849N 79.136580 E	Crossroads, one of which leads to Karkyra and the other to Kegen
5.	(Km 75+800)	A10	15:45-16:30	2	42.800134 N 79.180291 E	200 meters from the border crossing point "Kegen", where transport stops before leaving
6.	(Km 58+200)	A05	15:41-16:00	3	42.752666 N 78.996825 E	San-Tash village, the intersection of the main and country roads leading to the village
7.	(Km 57+150)	A04	16:00-16:15	5	42.750034 N 78.985014 E	Crossroads, one of which leads to Kegen and the other to the Tamerlane Stones.
8.	(Km 52+600)	A03	16:25-16:45	4	42.736520 N 78.936004 E	At the structures and kiosks, at the turn to the big bridge and the intersection of roads, one of which leads to Jergalan, the other further to Karkyra and Kegen.
9.	(Km 40+000)	A02	17:00-17:20	5	42.725510 N 78.805051 E	At the end of the village of Sary-Tologoy, next to farmland and a few houses in the distance, on the opposite side of the road
10	(км 38+750)	A01	17:25-17:50	5	42.728033 N 78.782937 E	The turn to the village of Sary-Tologoy, next to the arch.

Results of the study of May 2021

Air sampling was performed during 20-30 minutes at each point, in special fluorurethane sampling bags, by portable equipment produced by OPTEC (Russian Federation): within 12 hours the bags with the selected samples were delivered to the laboratory in Bishkek, where the samples were tested on the stationary equipment of the laboratory. The following gas analyzers were used:

- Carbon monoxide CO gas analyzer, model "K-100", measurement range 0-50mg / m3;
- Gas analyzer of nitrogen oxides (NH3, NO, NO2), model "H-320";
- Chemiluminescent gas analyzer of sulfur dioxide SO2, model "S-310A".

The results of the analyses showed that at present, due to the low traffic, there is no excess of the maximum single MPC in the atmospheric air along the road:

- nitrogen dioxide, with a MPC of 0.085 mg / m^3, does not exceed this mark at any point, being mainly within the range of 0.007-0.01 mg / m^3;
- sulfur dioxide is three orders of magnitude (approximately 250 times) lower than the maximum permissible standards, is in the range of 0.002-0.004 mg / m^3;

- carbon monoxide is present in the air of the study area in quantities 10 times lower than the current MPC, equal to 5.0 mg / m^3.

Table 23. Results of air studies for the concentration of pollutants along the Tyup-Kegen road and the Karkyra-Turuk-Sary-Jaz road section

Contaminating agent	Units of measure	MPC max. single concentration, mg/ m^3	Point readings on the road									
			A-9 Km 12+700	A-8 Km 2+650	A-7 Km 1+250	A-6 Km 0+050	A-10 Km 75+800	A-5 Km 58+200	A-4 Km 57+150	A-3 Km 52+600	A-2 К Km 40+000	A-1 Km 38+750
Nitrogen dioxide (NO2)	mg/m 3	0,085	0,009	0,013	0,013	0,019	0,009	0,01	0,01	0,01	0,008	0,007
Sulfur dioxide (SO2)	mg/m 3	0,5	0,002	0,002	0,002	0,003	0,002	0,003	0,002	0,002	0,004	0,003
Carbon monoxide (CO)	mg/m 3	5,0	0,6	0,4	0,4	0,8	0,6	0,4	0,3	0,5	0,4	0,3
PM 2.5	mg/m 3	0,16	0,001	0,001	0,002	0,003	0,003	0,011	0,004	0,021	0,006	0,026
PM 10	mg/m 3	0,3	0,004	0,003	0,005	0,006	0,007	0,026	0,008	0,05	0,01	0,057

Levels of fine particulate matter (PM 2.5 and PM 10) also indicate that the air along the project road has reasonably good cleanliness indicators, at least during the spring period of the year. At the same time, the limit values set for these indicators are not exceeded in any of the studied points.

It is possible that with the beginning of the tourist season, when the flow of vehicles increases, dust pollution will increase, which will also be facilitated by the friction of car tires against the asphalt, the road surface, where it exists, will also be damaged, and the small particles rising into the air from the damaged surface will also contribute to air pollution in the area of the road.

4.1.1.2 Noise and vibration

According to the existing WB recommendations for noise levels, the values should not exceed 55 dB in the daytime for residential premises, institutions, educational institutions, and for industrial and commercial enterprises - 70 dB. At night these values should not exceed 45 dB and 70 dB, respectively.

Results of the study of May 2021

The field studies along the project route conducted in May 2021 at various times during the daylight hours (in accordance with the existing standards) allow us to state that the current noise and vibration loads do not exceed the existing standards defined at 55 and 70 dB (see Table 15 below). For residential buildings, institutions and educational facilities, the level of noise background does not exceed 55 dB, and even does not exceed the mark of 70 dB set for industrial and commercial enterprises. It should also be noted that the noise load along the road is not constant, but has a pronounced discrete character. The indicators of background noise pollution and vibration load near vulnerable objects of social infrastructure do not exceed the existing standards

Table 24. Noise and vibration load along the project road in May 2021.

#	No. of points and their location (km)	Noise level (dB)		
		1 measurement	2 measurement	3 measurement
1.	09/12+700	49	49,5	49,7
2.	07/1+300	48	49,3	44
3.	08/2+650	42	45,8	42
4.	06/0+100	41	45	44
5.	10/75+800	47	50,4	48
6.	05/58+200	50	52	50,2
7.	04/57+135	42	50,8	50
8.	03/52+600	50	50	50,1
9.	02/40+000	50	50,6	50,3
10.	01/38+750	45	50	49

Along with the measurements of the background noise level, the vibration level was measured.

Table 25. Vibration load levels in the vicinity of the project road

No.	No. of points and their location (km)	Vibration load level (dB) on the X-Y-Z axes		
		1 measurement	2 measurement	3 measurement
1.	09/12+700	95-89-80	92-86-82	92-86-82
2.	07/1+300	93-89-80	92-88-79	93-85-80
3.	08/2+650	91-94-85	91-94-85	93-85-75
4.	06/0+100	92-91-85	89-90-88	93-92-80
5.	10/75+800	96-90-83	94-90-86	93-88-85
6.	05/58+200	93-92-82	93-88-80	92-90-82
7.	04/57+135	90-89-80	92-92-82	92-90-84
8.	03/52+600	94-92-82	92-87-86	87-80-81
9.	02/40+000	89-88-78	91-88-82	88-82-78
10.	01/38+750	88-85-79	88-86-73	87,5-78-75

At the stage of construction and operation of the road these indicators will be a starting point for a comparative analysis of noise and vibration loads.

4.1.1.3 Topography

The area has a rugged topography, characterized by numerous mountain ranges separated by deep and narrow gorges with smoother undulating foothills.

4.1.1.4 Geology and Geomorphology

The geological structure of the project road area under consideration is mainly Upper and Lower Quaternary deposits. However, in some places from the north, the road is approached by granite formations of Ordovician and Silurian, which, as the road moves from west to east, give way to the rocks of the lower section of the Carboniferous deposits of the Kyzylmazar Suite, represented by pseudolithic limestones, andesites and silicates with thickness from 430 to 700 m, as well as sandstones, gravelites, conglomerates, and rare interlayers of limestone of Tiek Suite with thickness of 470 m. Further, the road passes the rocks of the Ordovician system (Saryaigyr formation, 1000 m thick) in the form of sandstones, turf sandstones, and conglomerates lying at the base of the geological structure, and above - formations in the form of andesite lavas, dacite tuffs, basalt and andesic basalt horizons.

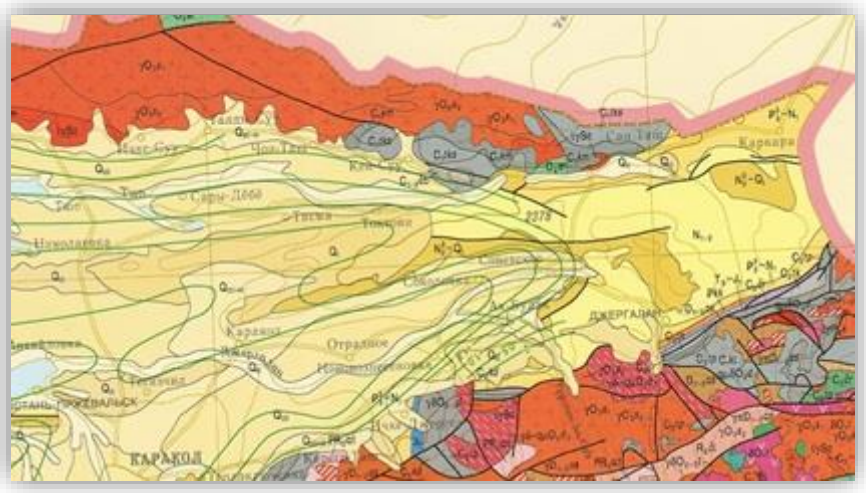
The easternmost, bordering part of the road lies in Neogene-Paleogene formations. This means that, from the engineering-geologic viewpoint, the above-mentioned sediments are loose, poorly to moderately lithified formations, prone to easy destruction and erosion processes.

Geomorphologically, the territory is confined to the upper Tyup valley. The right-bank terrace of the Tyup River is vast and has a plain character. Left-bank terrace is almost obliterated, the river

approaches here to the very foot of the Tasma ridge. The right-bank terrace is composed of pebbles, covered from the surface by a layer of fine-grained deposits, which thickness does not exceed 1.5-2.0 meters, and the pebbles show a definite tendency to sink as they move westward.

In the intermountain valley, the parent rocks are various Quaternary deposits, among which are thick loess-like loams underlain at different depths by boulder and pebble deposits.

Map 4. Geological features of the Tyup-Kegen road area



Source: Geological map of the Kyrgyz Republic. Scale 1:500 000

4.1.1.5 Landscape

The territory of the Issyk-Kul region is characterized by high-altitude zoning of mountainous areas, which by absolute altitudes are divided into the following types:

- Plain-foothill desert altitudinal zone 1650-1800 meters;
- Foothill-middle-mountain steppe zone 1800-2500 meters;
- Mid-mountain forest-meadow-steppe zone 2150-3000 meters;
- Alpine meadow and meadow-steppe 2900-3700 meters;
- Glacial-nival zone - over 3500 meters.

The territory, through which the project road passes, covers several types of landscape, determined by the altitude zonality, climatic characteristics, to which correspond the types of soil, and the types of vegetation characteristic of them. Part of the territory along the road represents anthropogenically transformed agricultural landscape, lands used for arable farming during the last two hundred years.

The entire diversity of landscapes of the study area is presented as follows in tables 29-31 below.

Table 26. Classification of landscapes in the project area - 1.

1. Slope mid-mountain erosion-denudation landscapes				
with tall grass meadows, in some places shrubs and Turkestan	with mountain forest dark-colored soils, juniper forests and sparse forests in combination with spruce and juniper forests, tall grass meadows, shrub meadow steppes on mountain-meadow chernozemic soils (26);	with mountain meadow and subalpine soils and sedge-grass and mixed grass-cereal meadows and willow forests (25);	with mountain chernozem forest soils and spruce forests (31);	with mountainous chernozem-forest soils, spruce forests in combination with herb-grass meadows and meadow steppes (28).

creeping juniper (23[3]);				

Map 5. Landscape map for the project road segment.

Source: Atlas of the Kyrgyz SSR. Moscow, 1987

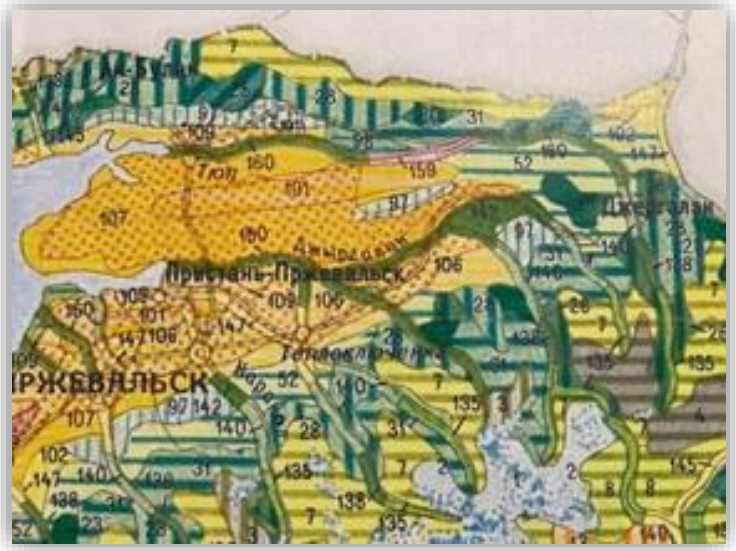


Table 27. Classification of landscapes in the project area – 2.1.

2.1. Intermountain basin mid-mountain accumulative landscapes			
1) Subalpine meadow landscapes		2) Steppe landscapes	
Represented by steep-sloping hilly plains composed of alluvial-proluvial sediments, with meadow and mountain valley dark-chestnut soils, sedge-motley grass meadows in a complex with motley grass-cereal meadow steppes (97);	Represented by slightly sloping undulating plains, composed of alluvial-proluvial sediments, with meadow-bog and meadow soils with reed and cattail meadows, often in a complex with cereal-grass meadows and willowgrass (98)	With mountain and mountain valley dark chestnut soils, with sagebrush, feather-grass and oat grass steppes (102);	Cereal-prawberry steppes (domesticated) (109).

Table 28. Classification of landscapes in the project area – 2.2.

2.2. Intermountain basin mid-mountain accumulative landscapes
3) Mountain valley erosional and erosion-accumulative landscapes are represented by

[3] *Here and below is the numbering of landscape types along the project road, given in the map of Fig. 9 above*.

Undrained and poorly drained types of landscapes	Meadow-tugai landscapes	
With meadow-boggy peat soils, reedbeds and grasslands (159).	Floodplain loamy-pebble valleys with a complex of alluvial-meadow, alluvial soils, with poplar, birch, buckthorn tugai, spots of meadows and soils (160);	With mountain valley chestnut and dark chestnut soils, sagebrush and bearded steppes, in some places in combination with hogweed and sea buckthorn and tugai thickets (147)

4.1.1.6 Soils

The area belongs to the Alay-Central-Tien-Shan province, the Issyk-Kul soil sub-province, the East Issyk-Kul district. The soil-forming rocks of the slopes are deluvial, proluvial-deluvial sediments. The formation of soils is due to the complex interaction of soil formation factors, while the different degree of influence of each of them determines the diversity of soils.

The following soil types are common here:

1. mountain-valley dark chestnut;
2. mountain-valley meadow-chestnut;
3. medium-humus mountain chernozems.

Mountain valley dark chestnut soils. These soils are located at an absolute height of 1823 to 2101 m above sea level. Soils are formed under desert, semi-desert-feather-grass, fescue vegetation, which is characterized by good growth, diversity of species composition, and complexity. In connection with this, the considered soils are characterized by non-carbonate, high-humus content, neutrality and low alkalinity.

Mountain valley dark chestnut soils in agricultural production are used as:

- *irrigated arable land;*
- *pastures*.

Meadow and dark brown are used*:*

- *in rain-fed agriculture;*
- *as hayfields and;*
- *pastures*.

Mountain chernozems are of high value for agricultural use and are mainly found under pasture land.

Research in the project area in April 2021
The results of studies conducted in the project area showed that the soil resources around the road Tyup-Kegen and Karkyra-Turuk-Saryzhaz have a good level of fertility, belong to several classes, and have different characteristics. The results of the laboratory tests are presented in the tables below.

According to the results of laboratory analysis of heavy metals content (gross forms) in soil, it was found that **lead, cadmium, manganese and zinc** do not exceed the maximum permissible concentration (MPC) at all surveyed locations.

In all above-mentioned soils, coarse dust fractions of 0.05-0.01 mm prevail. Because of this, these soils are easily susceptible to wind and water erosion and, therefore, are vulnerable to any mechanical influences.

The soil study was aimed at determining its basic geomorphological characteristics and determining the level of soil value along the roadway. The most important morphological features in describing the section are: soil structure (i.e., differentiation into horizons A1, A2, B1, etc.), thickness of soil horizons and depth of their occurrence, color, mechanical composition, texture, structure, inclusion, new formation, root system distribution, moisture and character of soil-forming rock.

The methodology for studying soils in the project area included determining the locations and number of samples in the study area, fixing the samples on the map. During the planning phase, sampling points were identified on a satellite map. The final number of points where soil samples were taken was 20.

Soil samples were taken in two genetic horizons: at a depth of 0-20 cm and 20-50 cm, where the root system is mainly located and nutrients (humus, gross nitrogen, phosphorus, potassium) are concentrated. The sampling location was fixed on the map using GPS.

The degree of contamination by heavy metals and petroleum products is assessed exactly by the condition of the top soil layers at the depth of 0-20 cm and 20-50 cm.

Chemical analyses for fertility were performed according to standard methods used in the KR and CIS countries [See Arinushkina E. V., "Handbook on chemical analysis of soils" (1970), and "Methods of agrochemical analysis of soils" (Nauka Publishing House, 1975)].

The following types of analyses were carried out in the soil laboratory of the Republican Soil Agrochemical Station:

- Mechanical composition by pyrophosphate method (modified by Simakov);
- Determination of pH on a pH meter;
- Analysis of the aqueous extract according to generally accepted standard methods;
- General humus - according to the method of Tyurin and Kononova (modified by Simakov);
- Absorption capacity by the Bobko-Askinazi method (modified by Grabarov and Uvarova);
- Determination of total nitrogen by the Kjeldahl method;
- Determination of gross forms of phosphorus by the Ginzburg method;
- Determination of gross forms of potassium by the Smith method;
- Determination of CO2 with a calcimeter;
- Absorbed sodium according to Antipov-Karataev and Mamaeva (modified by Grabarov);
- Determination of heavy metals and the presence of petroleum products by ICP spectrometry.

The soils were named according to the "Systematic list of soils of the Kyrgyz Republic". When determining the degree of stoniness of soils the relevant gradation adopted in Kyrgyzstan is used:

- slightly stony - the soil surface is covered with stones up to 10%;
- medium-stony - 10-20%;
- highly stony - 20-40%;
- very stony - 40%.

According to the thickness of the fine-grained layer:

- low-powered - up to 50 cm;
- medium-powerful - 50-100 cm;
- powerful - more than 100 cm.

The distribution of vegetation on the territory of the study area is subordinated to the vertical zonality. In the belt of foothills and lowlands semi-desert vegetation prevails. Steppe types are characteristic of the mid-mountain zone. Meadows and meadow-steppes dominate in the high-mountain zone.

The most widespread of the desert and semi-desert types are the saltwort, wormwood-saltwort, and wormwood-feathergrass types. With an increase in absolute height, pastures are replaced by mountain feather grass and fescue steppes, which, in turn, give way to subalpine shimyur and geranium meadows and fescue-forb meadow-steppes.

Table 29. Mountain valley dark chestnut soils

No.	No. of points	Picket	Side	Distance from the axis (m)	Altitude above sea level (m)	Coordinates		Types of lands
						N	E	
Soil Tests								
1	**S-1**	39+150	Right	10,00	1823	424337.7	0784719.3	Irrigated arable land
2	**S-2**	39+150	Left	50,00	1838	424339.6	0784717.6	Pastures

3	**S-3**	40+600	Right	10,00	1829	424331.8	0784814.8	Pastures
4	**S-4**	40+600	Right	50,00	1843	424330.0	0784814.3	Irrigated arable land
5	**S-7**	49+500	Right	20,00	1908	424413.4	0785407.2	Pastures
6	**S-8**	49+500	Left	50,00	1925	424416.2	0785408.2	
7	**S-11**	64+200	Right	10,00	1991	424535.1	0790132.1	
8	**S-12**	64+200	Left	50,00	2005	424537.3	0790132.8	
9	**S-15**	75+600	Right	10,00	1999	424751.4	0791040.1	
10	**S-16**	75+600	Right	50,00	1998	424750.4	0791042.0	
11	**S-17***	4+900	Right	10,00	2101	424418.5	0791009.3	
12	**S-18**	4+900	Left	50,00	2085	424417.6	0791012.1	

The morphological profile of these soils is characterized by a brownish-dark gray or brownish-brown color of the upper humus horizon, lumpy-grainy-dusty structure, recycled by earthworms and earthworms; the lower horizons are brown in color, significantly compacted, coarse-lumpy unstable structure, humus runs and cartilages are rare, there are few roots, transition is gradual: Horizon C is pale-gray or grayish-pale-brown in color, unstructured, often cartilaginous and stony from a depth of 40-80 cm or more.

Photo 2. Mountain valley dark chestnut soils/ General view of the site S-4.

Photo 3. Soil section on dark chestnut soil

According to the mechanical composition, the described soils are medium-, heavy-loamy, and less often light-loamy. Here the prevailing fraction is coarse dust (particles 0.05-0.01 mm), the amount of which varies along the profile in the range 23.92-42.00%. The silt content (particles less than 0,001 mm) is from 12,32% to 25,40% in the upper soil horizon, which indicates the development of erosion processes. The ratio of particles smaller than 0.01 mm (physical clay) is 20.64-56.60%.

The content of humus in the arable horizons, depending on erodibility, is 3.12-8.58%. Soils are provided with total nitrogen in medium and high degree, the upper horizons contain 0.140-0.517% of nitrogen. Gross forms of phosphorus are provided in average degree - 0,09-0,29%. The content of gross potassium in the average degree - 1.20-2.16%.

Soils are non-carbonate, CO_2 is 0.17-2.64%. The reaction of the soil environment is from neutral to slightly alkaline pH = 6.00-8.40. Within the studied territory of mountain-valley dark-chestnut soils, alkalinity was not observed, the content of absorbed sodium from the absorption capacity is 0.4-1.5%. Salinization is also not observed, i.e. the value of dense residue does not exceed 0.031-0.097%.

These soils are used in agricultural production as irrigated arable land (S-1, S-4) and pastures (S-2, S-3, S-7, S-8, S-11, S-12, S-15, S-16) and should receive special attention during road rehabilitation. Appropriate protection measures must be taken as the soils have high value.

Mountain-valley meadow-dark chestnut soils (points No. 5, 6, 9, 10, 13, and 14). These soils are located at an absolute height from 1823 to 2101 m above sea level and are distributed within the region of mountain-valley dark chestnut soils, developing mainly under conditions of additional ground moisture. They are somewhat darker than dark chestnut soils, the transitions of the horizons are more pronounced, the humus horizons are more powerful. There are signs of gleying below.

Table 30. Distribution of mountain-valley meadow-dark chestnut soils in the project area

No. п/п	No. of points	Picket	Side	Distance from the axis (m	Altitude above sea level (m)	Coordinates		Types of lands
						N	E	
Soil Tests								
1	**S-5***	43+100	Right	10,00	1865	424407.6	0784956.7	Pastures
2	**S-6**	43+100	Right	50,00	1866	424406.0	0784957.2	Pastures
3	**S-9***	57+400	Right	10,00	1979	424501.6	0785916.4	Pastures
4	**S-10**	57+400	Right	70,00	1990	424459.2	0785917.8	Rainfed cropland
5	**S-13***	70+100	Left	10,00	2026	424540.5	0790807.9	Hayfields
6	**S-14**	70+100	Left	50,00	2030	424542.1	0790807.3	Hayfields

In terms of texture, they are mainly heavy, light and medium loamy. Fractions of coarse dust (particles 0.05-0.01 mm) prevail in the soil profile, the content of which is 11.64-19.96%. The ratio of particles less than 0.01 mm (physical clay) is 4.04-55.00%.

The humus content in the arable horizons is medium to high and ranges from 4.21 to 7.80%.

The soils are provided with total nitrogen to a medium and high degree, the upper horizons contain 0.245-0.450% nitrogen, the subsoil is provided with a very low and medium degree and contain 0.088-0.207% nitrogen. The gross forms of soil phosphorus are provided to the upper horizons in a weak-medium degree 0.148-0.197%, the subsurface horizons are provided very weakly and in an average degree 0.108-0.162%. The content of gross potassium is an average of 1.77-2.19%.

Soils are non-carbonates throughout the profile, CO_2 is 0.0-0.22%. The reaction of the soil environment is mostly neutral, pH is 5.85-7.50. Alkalinity is absent, the content of absorbed sodium from the absorption capacity is 0.6-2.7%. Salinization is not observed; the value of the solid residue does not exceed 0.027-0.051%.

Mountain-valley meadow-dark chestnut soils in agricultural production are used in rainfed agriculture (S-10), as hayfields (S-13, S-14) and pastures (S-5, S-6, S-9), so special attention must be paid during road rehabilitation.

Mountain chernozems medium-humus soils. These soils are located at an absolute height of 2101 to 2213 m above sea level.

Table 31. Distribution of mountain chernozem medium-humus soils in the project area

No. п/п	No. of points	Picket	Side	Distance from the axis (m)	Altitude above sea level (m)	Coordinates		Types of lands
						N	**E**	
Sampling points					**Coordinates**			
1	**S-17***	4+900	Right	10,00	2101	424418.5	0791009.3	Pastures
2	**S-18**	4+900	Left	50,00	2085	424417.6	0791012.1	Pastures
3	**S-19**	12+300	Right	10,00	2210	424034.0	0791151.4	Pastures
4	**S-20**	12+300	Left	50,00	2213	424234.2	0791151.6	Pastures

The morphological profile of mountain chernozems of medium-humus soils is clearly differentiated into horizons. Sod horizon “A” is firmly soddy, brownish-black in color, dusty-granular structure. The sub-sod horizon "B" is also very dark, lumpy, the number of roots is large, but there is no sodding. The transitional horizon "BC" is lighter, less coherent, always carbonate-free, lumpy, gradually passes into the horizon "C". The total thickness of the A + B horizons is 20-70 cm.

In terms of texture, they are mainly light loamy and at points No. S-19, 20 sandy loam. The amount of particles less than 0.01 mm (physical clay) is 14.40-28.36%.

The humus content in the arable horizons is from low to high and ranges from 3.01-10.24%. The soils are provided with total nitrogen in a medium and very high degree, the upper horizons contain 0.183-0.630% nitrogen, the subsoil is provided with a very low and medium degree and contain 0.082-0.220% nitrogen. The gross forms of soil phosphorus are provided to the upper horizons in a weak-medium degree 0.131-0.212%, the subsurface horizons are provided very weakly and in an average degree 0.092-0.148%. The content of gross potassium is on average 1.50-1.71%. The soils are not carbonated throughout the profile, CO_2 is 0.0-2.82%. The reaction of the soil environment is mostly neutral and slightly alkaline pH is 6.80-8.50.

Alkalinity is absent, the content of absorbed sodium from the absorption capacity is 0.6-2.0%. Salinization is not observed; the value of the solid residue does not exceed 0.041-0.087%. Medium-humus mountain chernozems are used mainly as pastures (S-17, S-18, S-19, S-20).

Heavy metals

Soil accumulates pollution to a greater extent than the atmosphere and natural waters. Heavy metals enter the soil in different ways: as part of gas-dust emissions, atmospheric precipitation, irrigation water, polluted industrial effluents, etc. The danger of heavy metals entering the human body is also that a number of their compounds are characterized by high toxicity and carcinogenicity.

The ability of soils to adsorb heavy metals depends on the content of humus. By toxicity, distribution, ability to accumulate in human body, in animals, soil and vegetation 12 elements are recognized as priority pollutants: lead-Pb, arsenic-As, cadmium-Cd, copper-Cu, vanadium-V, Tin-Sn, Zinc-Zn, Surma-Sb, molybdenum-Mo, cobalt-Co, mercury-Hq, nickel-Ni and a number of their compounds. Among them, lead, cadmium, arsenic, and mercury are considered the most dangerous to human health and are subject to priority control. Interpretation of laboratory analyses on heavy metals and petroleum products was carried out on the basis of readings of five components (lead, cadmium, manganese, zinc and petroleum products).

Table 32. MPC of heavy metals in mg/kg of soil (Ilyin V.A., 1982)

Chemical element	MPC	Chemical element	MPC
Zn	320,0	**Sr**	150,0
Mn	2600,0	**Te**	20,0
Mo	10,0	**Ti**	1100,0
Cu	150,0	**V**	175,0
Co	50,0	**La**	80,0
Pb	160,0	**W**	40,0
As	150,0	**γ**	35,0
Ba	470,0	**Sc**	30,0
Cd	3,5	**Zr**	15,0
Cr	100,0	**Se**	30,0
Bi	20,0	**Sb**	35,0
Ni	120,0	**Be**	35,0

An important factor influencing the behavior of heavy metals in the soil is pH (soil environment), as the alkaline reaction of the medium produces poorly soluble forms of heavy metals. With an increase in acidity, the opposite process takes place: hardly soluble forms pass into more mobile ones (Alekseev Y.V 1987).

Petroleum products in the soil. The speed, depth and nature of oil penetration, as well as the scale of pollution, depend not only on the physicochemical properties of the oil itself, but also on the soil and climatic conditions of the region. Oil pollutants change the physical state of the soil, disrupt the water-air regime, the structural state and the carbon-nitrogen balance. In Kyrgyzstan, no studies have been conducted on the negative impact of oil and oil products on soil fertility and its properties, therefore, the following is the accumulated material of foreign studies.

Thus, according to the results of the content of heavy metals (gross forms) in the soil, it has been established that lead, cadmium, manganese and zinc at all studied points do not exceed the maximum permissible concentration (MPC). Accumulation of oil products is noted at points No. 9 (90-140 mg / kg), 13 (130-190 mg / kg) and at point No. 17 (140 mg / kg): exactly where there are crossroads, in particular, a road branch towards the San-Tash-1 burial ground, "Tamerlane's Stones", and a road branch towards the Karkyra village.

4.1.1.7 Surface waters

The chemical composition of river waters in the Lake Issyk-Kul basin is influenced by low air and water temperatures, abundance of precipitation, soil leaching from readily soluble salts, different types of river feeding and the wide distribution of crystalline rocks (Kadyrov, 1986). These waters have different mineralization, which is due to the peculiarity of physical-geographical conditions of individual basins and differences in the degree of wetting of the territory (the annual amount of precipitation increases from west to east).

The rivers of the basin are typical alpine watercourses. According to the distribution of the intra-annual runoff, most of the Issyk-Kul rivers are classified as rivers of glacier-snow supply with the maximum flood in July.

The largest river among the northern tributaries of the Lake Issyk-Kul is the Jyrgalan river. The second largest is the Tyup River. In hydrochemical terms, the rivers of the basin are considered in separate areas, which is associated with the difference in natural factors that affect the formation of the chemical composition of water. Calcium predominates in the chemical composition of river water, while the concentration of other ions is low.

The projected road is laid for a considerable length on the right bank of the Tyup River, which belongs to the basin of the Lake Issyk-Kul. The eastern section of the route, beyond the San-Tash pass, passes in the upper reaches of the Irsu River, which belongs to the Karkyra River basin.

The Tyup River originates on the northern slopes of the Terskey-Ala-Too ridge, up to the San-Tash pass, it flows in a submeridian direction, then the channel changes its direction to latitudinal. In the section from the San-Tash pass to the confluence with the Tyup Bay, the Tyup River runs parallel to the route at a distance from the first meters to a kilometer, while numerous right-bank tributaries flow into it, the flow of which is formed on the southern slopes of the Kungei-Alatoo ridge. The largest tributaries of the Tyup River are the Shaty, Ichkesu, Taldysu, Korumdu, Kuochi, Korumdy, Chongtash, Zhilubulak, Kensu, Tabylgaty, Chonbet, Tukumbulak rivers.

According to genetic characteristics, three main phase-homogeneous periods should be distinguished in the annual runoff of the Tyup River:

1. The period of snow flood, formed mainly by melt water of seasonal snows of the lower and middle tiers of mountains. The onset of floods is determined by the onset of stable positive air temperatures.
2. The period of snow-glacial high water, formed mainly by melt waters of high-mountainous snows, snowfields and glaciers. This period of high water coincides with the hottest period of the year and its runoff correlates well with the sums of positive air temperatures.
3. The low-water period, when the river runoff is fed mainly by the waters accumulated by the active surface of the catchment, primarily by groundwater. This period is characterized by relatively low water discharge, gradually decreasing until the beginning of the next flood. In view of the small role in the feeding of low-thawed water, intra-diurnal fluctuations in water discharge during this period are not observed.

Average calendar boundaries between phase-homogeneous periods: for snow floods - April-June; for snow and glacial floods - July-September; for low water - October - March.

The Irsu River is formed by the confluence of the Taldybulak (western arm) and Kylchikbai (eastern arm) rivers. The upper reaches of these rivers are crossed by the final section of the Tyup-Kegen highway. In turn, the Irsu River is a left-bank tributary of the Karkyra River.

For the survey period (March-April 2021), the groundwater level along the highway route to a depth of 2.0 m was not revealed.

In the areas of small artificial structures and on bridge crossings, the level of ground (under-channel) waters was opened at a depth of 0.3-1.0 m and more meters.

It is recommended to take water for technical purposes from the Tyup River and its tributaries crossing the route.

The Tyup River is well studied and further its characteristics are given by the upper gauging station, located above the village Sary-Tologoy. The catchment area of the river is 513 km^2, the weighted average height is 2800 m, the length of the river is 120 km, the average slope of the river bed is 290/00, the weighted average is 240/00, the average slope of the catchment is 2400/00. The flow module is 16.1 l / s s 1 km. The glaciated area of the basin is> 1.0%. Altitude marks of the river range from 4300 m to 1600 m. The river flows into the lake Issyk-Kul.

In winter, there are banks of ice that sometimes merge into ice bridges, sludge and ice jams. In the upper course, the river is covered by solid ice. The river does not dry up and does not freeze.

The river is fed by snow and glaciers. Coefficient δ = 0.45, the main volume of runoff occurs in the period March-June, the maximum is observed in May.

The average annual flow rate is 8.44 m^3/ s, the average maximum flow rate is 12.3 m^3/ s, and the maximum flow rate is 151 m^3/ s (flow rate is 1% of availability).

Table 33. Main hydrographic characteristics

Section of the river (hydropost)	**Catchment area km^2**	**Distance from the source km**	**Average river slope $^0/_0$**	**Weighted average height of catchment, km**	**Glaciation %**
Tyup	513	67	42	2.8	>1.0

Catchment of the right-bank streams overlooking the road is approximately identical, that is, the upper boundary is a watershed with a mark of 2900-3100 m. Outcrops of rocky rocks, below - well sodden slopes, coniferous forests, in the lower reaches - wood and shrub vegetation. The catchment areas are from 3 to 20 km^2 and their length varies from 2 to 7 km. Watercourses operate all year round. At the time of the reconnaissance survey, although watercourses were covered with ice and covered with snow (20-40 cm), the flow did not stop. Under the bridges, ice was observed.

These watercourses are fed mainly by ground water, in spring and summer by snow and rain. The main volume of flow passes in April-June, the maximum flow occurs in May.

The main hydrographic characteristics of the main watercourses, which exit to the road, are given in the table 34.

Table 34. Principal hydrographic characteristics

n/n	Watercourse	Coordinates	Catchment area km^2	Length of watercourse km	Average river slope $^0/_0$	Average elevation of the catchment area, km	Glaciation %
1	Tabalgaty stream	N 42°44.068 E 78°49.737	22.1	10.1	123	2.5	-
2	Chonbet stream	N 42°44.341 E 78°50.417	13.1	7.6	81	2.6	-

n/n	Watercourse	Coordinates	Catchment area km^2	Length of watercourse km	Average river slope $^0/_0$	Average elevation of the catchment area, km	Glaciation %
3	Tukumbulak stream	N 42°44.325 E 78°53.670	9.4	6.2	177	2.5	-
4	Stream before turn to Karakol	N 42°44.270 E 78°55.582	9.3	6.5	164	2.5	-
5	Stream after turn to Karakol	N 42°44.745 E 78°57.237	3.4	3.4	176	2.2	-
6	Stream before turn to San-Tash	N 42°45.548 E 79°01.999	7.8	3.7	156	2.2	-
7	Stream Kylchikbai before turn to the Customs checkpoint.	N 42°45.547 E 79°02.005	20.7	6.5	42	2.1	-

Attention should be paid to the outlets of non-pressure groundwater on the roadbed. In the warm season, this water will destroy the roadbed, and in winter, ice will form in this area, which is dangerous for traffic.

Runoff in surface watercourses depends on specific hydrometeorological conditions determining the intensity of snow or ice melting, accumulation of solid precipitation during the cold season and on conditions of transformation of surface runoff into groundwater and back. Poor study of the above factors of formation of surface runoff of mountain rivers does not allow directly identifying their relationship with the average runoff. In this regard, the hydrological characteristics of the river are calculated according to MSP 3.04-101-2005 "Determination of basic estimated hydrological characteristics" and the guidelines of the monograph "Surface Water Resources of USSR", volume 14, Central Asia, v.1, basin of the Syr-Darya River.

Table 35. Runoff rates for the studied watercourses, m^3/s.

Output characteristics	Runoff rate by watercourse, m^3/s						
	1	2	3	4	5	6	7
Watercourse	Tabalgaty stream	Chonbet stream	Tukumbulak stream	Stream before turn to Karakol	Stream after turn to Karakol	Stream before turn to San-Tash	Stream Kylchikbai before turn to the Customs checkpoint.
Runoff rate	0,204	0,145	0,087	0,086	0,013	0,029	0,067

Surface water studies in the project area in 2021

As part of the research to establish the baseline condition of multiple surface watercourses crossing the project road along its entire length, sampling was conducted in early May 2021 by staff of the Cholpon-Ata Laboratory of SCEC KR, at 19 points (one of which was dry). By prior agreement, they took samples for general standard characteristics (temperature, pH, etc.). Also, to determine the content of various elements, including heavy metals by atomic emission spectrometry with ICP AES at the Central Laboratory of the State Committee of the KR on Industry and Energy, and for petroleum products - at the ecological laboratory of Chui Territorial Department of Environmental Protection under SCEC KR. Samples collected for testing with ICP AES were preserved and stored in a refrigerator during their delivery from the sampling site and prior to their analysis.

The analyses were conducted in accordance with the provisions of the Hygienic Regulations "Maximum permissible concentrations of chemical substances in water bodies of domestic and cultural and domestic water use", approved by the KR Government Decree, No.201, dated 11.04.2016, as well as the Rules for protection of surface waters of the Kyrgyz Republic, No.218, dated 14.03.2016. The results of analyses of water from streams crossing the road in different places along the entire length showed that there were no exceedances of this indicator for water bodies for household and cultural and domestic purposes, with MPC for petroleum products equal to 0.3 mg/l.

Table 36. Results of water samples for petroleum products*:

Sequence No.	Point on the map	Km	Distance from the road (m)	Analysis result (mg/l)	Characteristics of the area
1.	W 1	39+000	250	0,045	Outside the village of Sary-Tologoy, on the banks of the Tyup River, near the bridge
2.	W2		15	0,043	Before the village
3.	W3	42+965	3	0,08	Floodplain thickets
4.	W 6	51+760	5	0,058	Near the village of Basharina
5.	W4	44+050	20		Above the bridge
6.	W5	48+750	15		Above the bridge (pipe), next to the forestry nursery
7.	W 7	52+580	30	0,121	Near the kiosk and the bridge over the Tyup river, where the road goes to the Jergalan gorge
8.	W8	54+545	5		Below the road is a dense floodplain forest, saz
9.	W9	58+900	250		Lake San-Tash
10.	W 10	61+315	5	0,08	Mountain-valley landscape
11.	W 11	64+090	5	0,06	Concrete tray, higher up the slope - a house
12.	W 18	12+800	30	0,056	The end point, next to Aksai Travel, below the bridge over the river. Tyup
13.	W 17	10+940	15	0,065	The slope of the left side of the valley
14.	W 16	7+885	7	0,06	Floodplain thickets
15.	W 15	4+565	30	0,075	Section 2, slope from the road, descending to the river, floodplain forests
16.	W 13	69+955	8	0,136	Near the beginning of the village of Karykyra
17.	W 12	67+310	5	0,058	Rangeland
18.	W14	3+200	40	0,04	On the Tyup River, behind the floodplain forest growing on flooded grounds and saz

**MPC for water bodies for household and domestic purposes - 0.3 mg/l*

Water analyses conducted on ICP AES in the Central Laboratory for 23 elements, showed exceedances for several heavy metals: aluminum, iron, and manganese. The nature of distribution, quantitative data, absence of industrial production in the upper reaches of the tested watercourses indicate that these exceedances of MPC represent natural background of this region, the presence of a local metallogenic province.

Photo 4. Water sampling site, sample W16, km 7+885

Photo 5. Water sampling site, sample W7, km 52+058

It is worth noting that compared to the results of surface water analyses in 2018, when three out of eight points showed some exceedances of MPC for manganese in the river water, in 2021, out of 18 samples, only one sample, number W14, showed a more or less serious, tenfold excess, which was taken at the Karkyra River, crossing the road at km 3+200, in the direction of the gorge of the same name. At the previous stage, the MPCs for fishery water bodies were taken as a basis. Since the rivers in the region are mainly of a different use and are used more for irrigation and cultural and domestic purposes, it would be appropriate to use MPCs for drinking and cultural and domestic purposes rather than fishery purposes, since the choice of the wrong study model and river designation leads to incorrect results and conclusions. From this point of view, exceedances of MPC remain relevant only for one point, on the Karkyra River, which may be related to the presence of a natural metallogenic province in the region.

Full analysis protocols are attached to this report (See Annex 12, Volume 2). Only figures for elements above or close to the MPC are given here, in accordance with the Sanitary and Epidemiological Rules and Regulations of April 11, 2016, No.201. All other elements tested were identified in the samples in amounts measured in thousands of the MPC and therefore pose no risk to humans or animals.

*Table 37. Indicators for aluminum, iron, manganese in water samples from the watercourses (ICP AES)**

No. Of sample number according to the laboratory protocol	Sample No. on the map	Sampling point (km)	Aluminum(Al) (MPC = 0.5 mg/l)	Iron (Fe) (MPC = 0.3 mg/l)	Manganese (Mn) (MPC = 0.1 mg/l)
2	W2	40+000/2	0,35	0,36	0,021
3	W3	43+000/3	0,38	0,54	0,023
4	W4	44+050/4	0,37	0,29	0,014
1	W1	39+000/1	0,58	0,52	0,074
5	W5	48+750/5	0,5	0,48	0,049
6	W6	51+760/6	0,15	0,13	0,024
7	W7	52+580/7	0,55	0,42	0,064
8	W8	54+545/8	0,2	0,26	0,01
9	W10	61+315/10	0,12	0,84	0,02
10	W11	64+090/11	0,28	0,22	0,018
11	W9	58+900/9	0,04	0,05	0,007
12	W18	12+800/18	0,47	0,5	0,088
13	W17	10+940/17	0,22	0,5	0,024
14	W16	7+885/16	0,2	0,22	0,018

15	W15	4+565/15	0,09	0,09	0,09
16	W14	3+200/14	0,51	0,53	1,09
17	W13	69+955/13	0,08	0,06	0,009
18	W12	67+310/12	0,33	0,32	0,027

**Exceedances of MPC and values equal or close to it are highlighted in orange*.

Below is a photo of the water sampling point from the Karkyra River, and the location on the map: you can clearly see the dense floodplain forests, thickets of buckthorn, willow, hips, located between the road and the river and increased water turbidity due to spring floods and increased turbulence in the water flows.

Photo 6. Photo of point W14, and a map on the Karkyra River, where all three metals (aluminum, iron, and manganese) have elevated values, compared to the MPC (fishery standard)

Map 6: Location of point W14 on the map, where all three metals (aluminum, iron, and manganese) have elevated values, compared to the MPC (fishery standard)

4.1.1.8 Hydrogeology

The area under consideration, according to the existing zoning system, belongs to the Issyk-Kul artesian basin. In particular, the area of the project road passes through the area of marginal parts of the basin with the outcrop of the middle floor of the groundwater to the surface. The zone of formation (main supply) of groundwater is also located here.

The project road runs in the area of groundwater distribution in the Quaternary sediments represented by groundwater and pressurized mainly pore water located in gravel, sand and gravel, and sands, with a flow rate of 0.5 l/s, and salinity of 0.1 g/l with a predominance of hydrocarbonate anion (HCO_3). In the middle part, the road gets into the groundwater distribution zone, partially pressurized fractured, less frequently - fractured-vein and pore-fractured water of Middle Paleozoic formations in sedimentary, effusive-sedimentary and metamorphic rocks: sandstones, conglomerates, gravelites,

siltstones, shales, filites, quartzites, massive limestone, marble and effusives (see: Map of Hydrogeological Resources, Map 7).

Map 7. Map of hydrogeological resources of the eastern part of the Issyk-Kul basin

Source: *Atlas of the Kyrgyz SSR. Moscow, 1987*

The cycle of groundwater formation begins with precipitation, which drains into the lowlands as rainwater and snow in the mountains penetrate into the ground through cracks in the rocks. It then comes to the surface through deep cracks or air channels, like thermal mineral water. Most of the infiltrated groundwater becomes part of the surface runoff in the seamount ridge; and about 15-20% of it remains in the basin as groundwater. In the next stage, water enters the basin with river runoff below the mountains, mainly due to peripheral currents. Here, most of the surface runoff is filtered through the river bed (about 50 m^3/s) and irrigation canals (20 m3 /s). Precipitation feeds only a small source of groundwater compared to filtration through the vadose zone and groundwater bodies at 1.5 m3 /s. Irrigation changes the groundwater regime, locally raising the water level to the soil surface, causing waterlogging and salinization in some places.

Groundwater supplies a significant portion of the required household water in the basin through public water supply networks in villages and private wells in rural areas. Below are the data showing the predicted and permissible precipitation in the Issyk-Kul Basin. In 2007, an inventory of the water supply system revealed that there are about 500 utility wells, and many of them are located in resort areas. Most of the old wells are out of order due to insufficient maintenance and repairs, but there are many new wells, especially in tourist areas with small-scale control. While there is no direct evidence that resources are being used beyond their natural recovery levels, water quality is a concern, including the existing high groundwater table and unsanitary wastewater disposal practices, especially in pit latrines.

Groundwater also has a major impact on the basin's economy, as many tourists visit the thermal mineral springs located around the lake in more than 50 locations. However, some of these sites are poorly maintained and are polluted, reducing their attractiveness and therapeutic value.

4.1.1.9 Natural and man-made disasters

Kyrgyzstan is a mountainous country, almost 90% of the territory of Kyrgyzstan is covered with mountains. There are 3 peaks with a height of more than 7000 meters, more than 30 mountain peaks with a height of more than 6 thousand meters and more than 40 peaks with a height of more than 5 thousand meters. Due to the vertical orientation of the country's relief, many processes in the geological environment are of a dynamic nature. This means that any disturbance on the mountain slopes can and often leads to the development of adverse consequences, such as landslides, mudflows, rockfalls, avalanches, etc. The situation is aggravated by the fact that under climate change these processes have a negative tendency, considerably exacerbated by the enormous anthropogenic pressure represented by overgrazing, chemical, mechanical pollution, as well as ill-conceived schemes of rural and urban infrastructure development.

In this regard, considering such a factor as natural and man-made disasters on the territory of construction works is almost of primary importance in the development of engineering and design documentation.

The seismic regime of the Issyk-Kul region (Northern Kyrgyzstan) is characterized by the presence of 5-, 4-, 7-, 10- and 33-year harmonics. The phase of seismicity activation is possible in the period 2019-2021. when earthquakes with KR = 12.5-15.0 with shaking I = 6-8 points are possible.

Landslide processes are mainly developed in the zones of the Kungei and Teskey Ala-Too foothills, in the structure of which Neogene and Quaternary sediments prevail, where there are about 60 landslide areas. On the territory of the region there are also ancient landslides, as a rule, deep-seated, represented by rocky and semi-rocky rocks. Due to the remoteness of settlements from landslide foci, in most cases there is no threat to the population. The exception is landslides on the territory of the settlements Pristan Przhevalsk, Ichke-Dzhergez, Shaty, Taldy-Suu, Toktoyan, Chon-Tash.

The frequency of mudflows in the high-mountainous syrts (plains) of the Issyk-Kul region is once every 6-10 years, on the southern slopes of the Kungei Ala-Too range and the northern slopes of Teskey Ala-Too once every 3-5 years. Most often, up to 1-2 times a year, torrential mudflows occur, accounting for up to 80% of all mudflows. An intensification of mudflow and flood processes in the Tyup region can be expected with intensive melting of snow reserves over a large area (March-May); melting of glaciers and snowfields, abnormal temperatures in the alpine zone (June-August); heavy rainfall; precipitation during the flood period; breakthrough of alpine lakes and reservoirs. About 18% of the area of the Tyup region belongs to the third degree of mudflow hazard. Up to 30% of the area of the district, covering medium and low mountain zones, is characterized by the fourth degree of mudflow hazard. The remaining 53% of the area of the district, with the exception of river beds and canals, is not mudflow hazardous.

Flooding in the Tyup region is developed in the valley part of the region along separate coastal areas of Lake Issyk-Kul, in the valleys of some rivers flowing from the slopes of the Kungei Ala-Too ridge, as well as along the channels of the Tyup River and its tributaries. In some areas, a rise in the level of groundwater is possible.

Study “Design for sustainability and vulnerability assessment at km 36.6 - km 76”

In 2019, a special study was conducted by Japanese consultants in the area of the project road (km 39.6-76) to determine its susceptibility to natural and man-made disasters. The study was funded by a grant from the Global Facility for Disaster Reduction (GFDRR). The purpose of this study was to assess the vulnerability of the road corridor to climate change or natural disasters and to recommend appropriate safe and affordable technical solutions for problematic sections. The major findings of the Japanese consultants were summarized in the **Annexes 9** and **10** of the given report (according to the Final Report on the Hazard Assessment and Recommendations).

4.1.1.9.1 Snow drifts

As part of this study, it was concluded that snow drifts are the biggest problem, which is determined by the existing weather and climatic features of the area. It is known that snow drifts on roads develop from drifts formed as a result of snowfalls, subsequent snow removal and its storage on the roadsides. By repeatedly clearing snow on the roadway, the roadside snowbank becomes large and must be removed. On the other hand, roadway features also contribute to roadside drifts. This implies that roads with low embankments are prone to snowdrifts and drifts. On the section of the project road km 64-67, where the snow drift situation was assessed as the worst along its entire length of the road, the roadbed is slightly lower in elevation than the surrounding terrain, resulting in drifts, especially during snowstorms and blizzards. In addition, there are also a number of issues areas along kilometers 55 through 70 that become blocked by snow drifts during the winter and require engineering solutions.

4.1.1.9.2 Landslides

As mentioned above in the relevant section, due to the fact that the road runs in Neogene and Quaternary formations, many sections represent unstable blocks of loose rock, which, if disturbed, may well lead to the formation of landslides, rockslides, or rockfalls. This would pose a number of risks to human health and life, as well as to vehicles and livestock.

During the design of the road in two sections (km 42.5 to 43.5 and km 67.5 to 68.5) it was noted that undercutting the slopes in these sections could lead to landslides.

After all types of possible natural and anthropogenic disasters on the road had been studied, a list of 32 items was compiled, presenting the characteristics of possible catastrophic phenomena, their risk level, and the possible types of protective measures that could be used. The list is presented below in **Annex 9** of this report. However, it should be kept in mind that snow drifts are not included in this table, being considered as a separate important area of work for road engineers, who will make separate decisions for these aspects.

4.1.1.9.3 Rockfalls

Rockfall traces are widespread along the roadway, indicating that the side slopes are subject to damage and pose some risk to people and vehicles traveling along the road. Almost 50% of all hazards on the road are associated with rockfalls, although the level of risk is mostly rated as low to medium to moderate, and only in one case is it a high risk (km 49.750-50.115).

4.1.1.9.4 River bank erosion

Coastal erosion was identified at km 41.320-41.630 (moderate level), 41.890-42.620 (high level), 42.620-43.160 (very high level), 52.915-53.110 (low level), 54.130-54.635 (high level), 70.260-70.270 (medium level).

This factor seems to deserve special attention where it is very high and high level: erosion may have a destructive effect on the roadbed in the area at km 42+300 and km 42+800 - 43,000. Obviously, this will require special measures to be developed by the project engineering team.

Map 8. River bank erosion next to the road

4.1.1.9.5 Embankment failure and slope sliding

While examining the road corridor for possible catastrophic events, it was observed that the embankment could collapse in several sections, which could result in loss of life and financial and material resources. Thus, the sections at km 43.185-43.195, where the level of danger is assessed as very high, should be carefully considered. There is a high risk at km 65.740-65.745 and a medium risk at km 66.430-66.435.

There is also a moderate risk of slope failure, which can be seen at km 41.630-41.890 (high risk), km 48.425-48.900 (moderate risk), km 52.060-52.260 (moderate risk).

4.1.1.9.6 Road displacement

Two adjacent sections (km 49.460-49.930 and 49.930-50.210) present a medium risk of collapse and displacement of the road embankment, which could also have some devastating consequences for people, tractors, and animals stranded in this section under unfavorable circumstances.

4.1.2 Biological resources

Specially protected natural areas (SPNA)

The Lake Issyk-Kul is an attractive and, to some extent, an unusual habitat, and one of the main reasons for the rich biodiversity of this region. In this regard, the Issyk-Kul Biosphere Territory was established in 1998 to preserve the rich natural and cultural heritage. Its area is 43,100 km^2. On its territory, there is also a number of smaller protected areas, of different level and orientation, among which almost all categories of territories are represented, where the environment is under special protection (Tables 41, 42, 43 and Map 9).

Table 38. Reserves on the territory of the Issyk-Kul Province

No.	Name	Year of establishment	General description
1.	Issyk-Kul State Reserve	1948	15 sites around the lake, a total length of 400 km. The total area of SPNA is 19,661 hectares.
2.	Sarychat-Ertash State Reserve	1995	To preserve unique natural complexes, rare and endangered species of animals and plants of the syrt (plain) zone of the Issyk-Kul region, to maintain the overall environmental balance of the region. The area of SPNA is 134,140 hectares, including 72,080 hectares - the core of the reserve, and 6,062 hectares - the buffer zone.

Table 39. National parks on the territory of the Issyk-Kul region

No.	Name	Year of establishment	Obective and general description
1.	Karakol National Park	1997	To preserve tree and shrub plantations and to provide recreational services. The territory of the national park is located on an area of 38095.3 hectares mainly in the forest zone of the Karakol river basin.
2.	Kyrchyn	2004	To preserve the landscapes of the high mountain zone, the area of the park is 35,000 hectares.

Table 40. Botanical preserves of the Issyk-Kul region

No.	Name	Obective and general description
1.	Tyup	The site is organized for the purpose of preserving the creeping juniper in the floodplain of the Tyup River with an area of 100 hectares.
2.	Malaya Ak-Suu	in the Ananievsky forestry unit of the Issyk-Kul forestry on the lands of the State Forest Fund to preserve spruce forests, with an area of 95 hectares
3.	Baidamtal	For the conservation of saltwort in the western part of the Issyk-Kul hollow (Kok-Moinok village) with an area of 20 hectares.

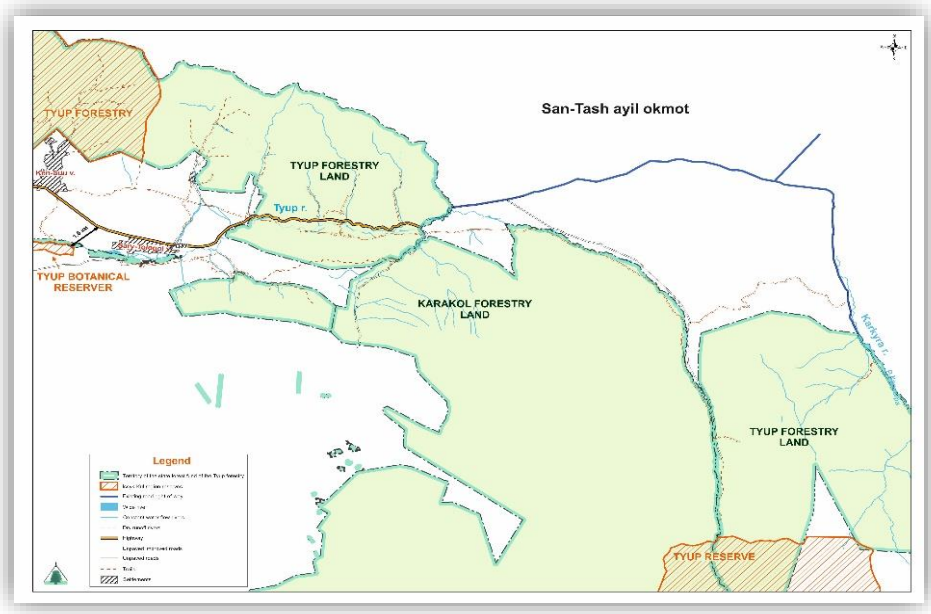
There are also several other reserves of different specialization in the Issyk-Kul region: Uzengyu-Kuush, Jety-Oguz, Jargylchak, and Ken-Suu.

Another site that is in close proximity to potential works is the valley of the Karkyra River. It occupies an area of about 5,000 hectares. This area is known as a place of mass migration of the crane (Grus virgo) (IUCN LC) in April. In autumn and early spring, the skylark (Ibidorhyncha struthersii) (IUCN LC) can be found here. Among rare birds, the black stork (Ciconia nigra) (IUCN LC) and saker falcon (Falco cherrug) are noted here. The site is located along a mass flyway of passerines, sandpipers and duck species.

As can be seen from the map below, to the south of the project road on the Karkyra-Turuk-Sary-Jaz section, approximately 10 kilometers away is the Tyup zoological wildlife sanctuary (zakaznik). In the vicinity of the Sary-Tologoy village, 1.6 km from the Tyup-Kegen road, there is a Tyup botanical wildlife sanctuary. To the north of Sary-Tologoy village lies Ken-Suu wildlife sactuary. None of the above-mentioned santuaries is crossed by the road under consideration. There are also no places where the

project road crosses the territories of the Sarychat-Ertash State Reserve and Karakol National Park, which are located southward at a considerable distance from the planned construction sites. In this regard, negative impacts on these natural sites are not expected.

Map 9. Map of the project road sections running through the territory of San-Tash ayil/okmotu and the lands of Tyup Forestry and the location of epy natural protected areas



Source: State Institution "KyrgyzLesOkhotUstroystvo" under the Ministry of Agriculture, Water and Regional Development KR, 2021.

Based on the IUCN Red List of Threatened Species, it was determined that Critically Endangered (CR), two Endangered, and three Vulnerable (VU) species occur in protected areas and natural habitats near the project area, but none of these habitats are located directly within the project area. Moreover, the types of reported and confirmed threats to the identified EN and VU species are not directly related to any type of linear infrastructure development (construction or rehabilitation).

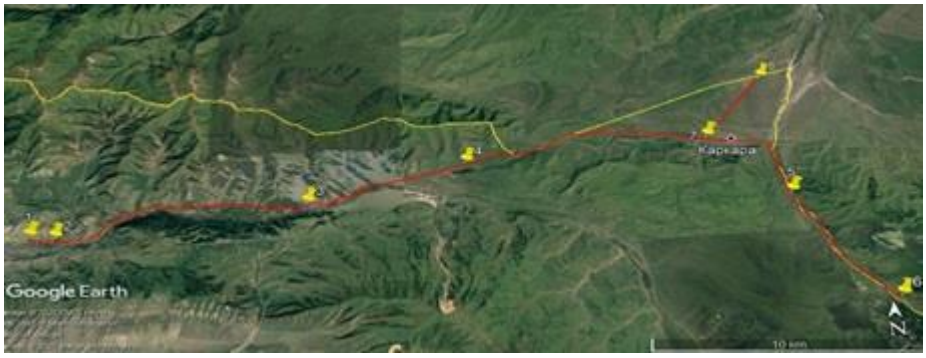
4.1.2.1 Fauna

Fauna studies in the project road area in 2021

Ornithofauna. In order to survey the state of the ornithofauna of the project site in May 2021 an inventory of the bird population was carried out which included observations and collection of samples of all taxonomic groups of birds inhabiting the Tyup-Kegen section between km 39-76 and adjacent areas. All birds were entered in a list with the place of their occurrence. To observe and count birds, the method of vehicle and foot route survey was used, to count the population of birds during the day, routes were taken along all biotopes of the Tyup-Kegen road section, counts were carried out visually, by voices and by careful observation at possible feeding and nesting places. Birds were counted on an unrestricted strip at the first detection, followed by recalculation of the average group range according to the method of en-route counts.

Counting was conducted in the period of highest bird activity, when there was the least chance of missing individual birds. Usually this period was early morning, right after sunrise, from 6 to 10-11 a.m., and from 14 to 17 p.m. The width of the survey strip was taken on both sides of the track at 25 m for small passerines, and within visual range for large passerines.

Map 10. Scheme of the reconnaissance route for the study of animals and birds



The total number of recorded birds in the Issyk-Kul Lake basin from the generally known (according to literature data) is 97 species. In the spring period, 71 species consisting of 9 orders, 23 families and 47 genera were recorded on the reconstruction of the Tyup-Kegen road, between km 39-76 and the adjacent territory. Of them 65 species were observed nesting in different biotopes and 4 species are found in the migration period in this area (Steppe Eagle, Shore Swallow, City Swallow and Warbler). Two species, Merlin and Black-throated Thrush, are wintering. In particular, the following Red Data Book species inhabit the area of the project road and nest at a distant distance from the route (more than 1 km)):

- ***Hieraaetus pennatus (Gm.)*** *- dwarf eagle;*
- ***Aquila chrysaetos (L.)*** *- golden eagle;*
- ***Aegypius monachus (L.)*** *- black neck (NT);*
- ***Gyps himalayensis Hume*** *- Himalayan vulture (snow) (NT);*
- ***Gypaetus barbatus (L.)*** *- bearded vulture (NT);*
- ***Grus grus (L.)*** *- gray crane (LC);*
- ***Falco Cherrug*** *- Saker Falcon (NT);*
- ***Coconia Nigra*** *- Black Stork (LC);*
- ***Cygnus cygnus (L.)*** *- Whooper swan (LC).*

And one species, the **Steppe Eagle** (Aquila rapax (Temm.)), is found only in migration flight, but is also included in the Red Book of Kyrgyzstan and the IUCN with the status (LC).

The main species composition of birds is nesting in the forest zone and anthropogenic buildings, in meadow-steppe areas along the route 4 species are nesting - skylark, waxwing, common moorhen and yellow-headed wagtail. It is possible to establish an additional 5 nesting species. The route "Tyup-Kegen" between 39-76 km runs on the main migration corridor of birds. Several hundred thousand birds migrate here during the season, the main mass of migrating birds are small passerines - swallows, skylarks and sparrows. The reconstruction and paving of the roadway will not have a significant impact on nesting birds.

Photo 7. Black Stork in flight at km 70; Photo 8. Grey Crane at San-Tash River; Photo 9. Black-backed Gull on temporary water bodies at 70 km; Photo 10. Eurasian Golden Plover male at 70 km of the route; photo 10. A male of the common wheatear in the vicinity of the village Karkyra

Mammals. In parallel, in May 2021, a survey of the mammalian population in the area of the project road was carried out. The number and species composition of mammals was considered on the transect, using a walking and road route. Ten-fold binoculars were used to determine the species and quantitative records. When excrement and other traces of vital activity were found, their species was established. In places where the animals were supposed to be found, the area was examined most carefully.

The processing of the collected material was carried out in the laboratory of zoology of the Institute of Biology of the National Academy of Sciences of the Kyrgyz Republic according to generally accepted methods. Mammals are registered - 12 species, consisting of 4 orders, 6 families and 10 genera. 1 species is included in the Red Book of Kyrgyzstan and the IUCN.

When examining the location of the Tyup-Kegen road section and based on the available information, no snow leopards were found near the existing road.

The total length of the survey route was 50 km. The data obtained were extrapolated to a suitable area for the species. Suitable area - a site or territory that meets the requirements for the existence of a particular species, where the presence of three components is required: a food base, relative dormancy, and nesting or brood sites.

The census was carried out during the period of the greatest activity of birds, when there is the least chance of missing individual individuals. This is usually in the morning, just after sunrise, from 6 to 10-11 and from 14 to 17 hours. The width of the counting strip was taken on both sides of the route by 25 meters for small passerines, for large ones - within the range of visibility.

Mammals were counted along the entire route. From research data it was found that the dominant species are the mole vole and the narrow-headed vole, the presence of these species was recorded along the entire route along the Tyup-Kegen roadway.

On the first section from the village Sary-Tologoy to the border with Kazakhstan in a belt of tall-herb meadows and meadow-steppes in a complex with shrubs and spruce forests from 1800 to 2000 m above sea level. sea, the following species of mammals have been recorded:

- ***Canis lupus*** L. – Wolf - according to the survey data of the local residents of San-Tash village. In winter, 5 wolves were seen south of Lake San-Tash and Karkyra;
- ***Canis aureus*** L. – We heard a "roll call" of several jackals in the evening at 18:27 on the 47th km among the bushes on the right bank of the Tyup River;
- ***Vulpes vulpes*** (L.) – They observed one Red Fox at distance of 74 km, but it disappeared into a burrow when people approached. They also saw tracks in different parts of the area;
- ***Meles leucurus*** Hodgs. – Asiatic badger, at 50 km in the forest area its inhabited burrow was found;
- ***Martes foina*** (Erxleben) – observed a stone marten on the right bank of the Tyup River in the bushes, but one animal hid in the bushes at the sight of people;
- ***Mustela (s. str.) erminea*** L. – Ermine, on 46 km on the slopes of the mountains of the southern exposure among the bushes of creeping juniper one specimen was spotted;
- ***Marmota (s. str.) baibacina*** Kastschenko – Grey marmot, from 47 to 58 km along the southern slopes of Kungei Ala-Too, a total of 12 individuals were recorded;
- ***Microtus (Stenocranius) gregalis*** (Pall.) – Narrow-skulled vole - individual colonies of this species were noted throughout the route section;
- ***Ellobius (s. str.) tancrei*** Blasius – Oriental mole vole (Zaisan), there were colonies of this species in open areas along the route;
- ***Lepus (Proeulagus) tolai lehmanni*** Sev. – Sand-tolai hare - only one specimen was recorded at 50 km among bushes.

The section from the frontier post (Karkyra village) to the alpine camp is represented by a belt of spruce forests and bushes, subalpine mixed grass, mostly flomis meadows. In this area there were representatives of the following mammal species.

Here among bushes we registered one individual of **Martes foina** (Erxleben), a stone marten on the left bank of the Karkyra River, which is included in the Red Book of Kyrgyzstan.

Photo 11. Stone marten - a species listed in the Red Book of KR

A total of 12 species were registered (out of 19 species according to literature data), consisting of 4 orders, 6 families and 10 genera. 1 species, included in the Red Data Book of Kyrgyzstan and IUCN - stone marten LC (see Photo 11 above).

There are 335 species of terrestrial and aquatic vertebrates in the basin, including 4 species of amphibians, 31 species of fish (including 12 endemic species in the lake), 11 species of reptiles and 54 species of mammals (10 of them are endemic species of the Tien Shan). Rare and endangered animals are the snow leopard (Panthera unica), the Siberian ibex (Capra sibirica), the Tien Shan brown bear (Ursus arctos isabellinus), and the manul (Haliaeetus leucophrys). Other inhabitants are roe deer (Capreolus pygargus), marten (Martes foina), black grouse (Tetrao tetrix).

Most of the mammalian species live in the forest zone, only such species as the mole vole and the narrow-headed vole, which are of no scientific interest, live along the Tyup-Kegen road. The existing vast meadow-steppe areas in the interval from 50 to 76 km are species-suitable territories for the gray marmot, but these species are completely absent in these areas. Perhaps this is due to intensive and long-term overgrazing and a large number of herding and stray dogs, which cause great damage to the marmot population.

From these conversations with the local population, it is possible to meet an additional 4 species of mammals (maral, mountain sheep, dressing and corsac), which are included in the Red Book of Kyrgyzstan and the IUCN. During this survey of the territory, these species were not found.

Ichthyofauna. From 25 to 28 April 2021, ichthyological and hydrobiological studies were carried out on watercourses: the Karkyra River, the Tyup River.

All flowing bodies of water are of ecological importance as habitats for the peculiar highland Asian fauna of fish and many invertebrates. The studied rivers are inhabited by communities of plants (periphyton) and animals that are extremely resistant to harsh and constantly changing external factors.

The organisms found here are either widespread or endemic or sub-endemic to the Central Asian region.

For hydrobiological studies, the following points were established:

- **Point 1** - the Karkyra river. N 42.673336, E 79.201714, altitude above sea level –2215 m. The water is clear, the current is strong, the rocky bottom of medium size, boulders in places. Width 8-10 meters, depth 30-50 cm;
- **Point 2** - the Karkyra river. N 42.723093, E 79.172933, altitude above sea level - 2109 m. The bottom is sandy and rocky, the banks are steep;
- **Point 3** - the Tyup river. N 42.740526, E 78.949537, altitude above sea level - 1952 m. The water is muddy, the current is strong with ripples, overgrown bushes along the banks. The bottom is sandy and rocky, with small stones;
- **Point 4** is the right tributary of the Tyup River. N 42.741518, E 78.949034, altitude above sea level - 1958 m. small channel, width about 3 meters, depth 15-20 cm, clear water, relatively moderate current, dense thickets along the banks. The bottom is covered with small stones;
- **Point 5** - the Tyup river (after the confluence of the Tukumbulak river). N 42.737741, E 78.891636, altitude above sea level - 1913 m. The bottom is covered with stones of various sizes;
- **Point 6** - Tyup River (above the village of Sary-Tologoy). N 42.724836, E 78.813914, altitude above sea level - 1839 m. The water is muddy, the current is strong, the bottom is covered with stones, overgrown bushes along the banks.

The collection was processed at the Laboratory of Ichthyology and Hydrobiology of the Institute of Biology of the National Academy of Sciences of the Kyrgyz Republic. A total of 6 hydrobiological samples were taken.

Map 11. Ichthyofauna sampling points

Bottom invertebrates. The species composition of benthic invertebrates in the above-mentioned streams is represented by 36 species. The picture of distribution is rather mosaic, zoobenthos is represented by larvae of bivalves, mayflies, stoneflies, copepods, as well as amphipods.

Table 41. Quantitative development of the main groups of benthic invertebrates in the watercourses: the Karkyra river, the Tyup river, pcs/m²

Groups of organisms	T.1	T.2	T.3	T.4	T.5	T.6
Worms	-	1	-	-	-	-
Amphipod	-	-	-	-	1	-
Diptera larvae	77	25	8	122	36	34
Mayfly larvae	341	105	32	75	73	61
Stonefly larvae	24	5	4	10	21	8
Caddis larvae	7	1	2	122	42	6
Beetle larvae	1	-	-	1	-	-
Total:	**450**	**137**	**46**	**330**	**173**	**109**

From the above table we can see that the greatest number of benthic organisms is observed in points 1 and 4, i.e., in the Karkyra river, where the larvae of mayflies clearly prevail, in the Tyup river in the quantitative proportion is occupied by larvae of bivalves and caddisflies. At Points 2, 5, and 6, the larvae of mayflies make up the majority of the community. T.3 differs in the species composition of zoobenthos, this is explained by different conditions (strong current, high gradient rifts, deep channel).

Thus, 36 species, 33 genera from 22 families of benthic invertebrate animals inhabiting the studied watercourses were found and identified.

Characteristics of the ichthyofauna of the Karkyra River. Sampling was conducted on this river at different points, including tributaries. Used tackle: dragnet, screen, rod.

In the studied watercourses of this site, according to the literature data, the Ili River basin, of which the Karkyra River is a tributary, is inhabited by: Balkhash minnow (Phoxinus poijacovi Kessler), Iliya marina (Schizotorax pseudaksaiensis Herzenstein), Tibetan minnow (Triplophysa stoliczkai Steindachner), spotted loach (Triplophysa strauchi Kessler), downstream - gray loach (Triplophysa dorsalis Kessler) and ottomans (Diptychus dybowskii Kessler, D. sewerzowi Kessler, D. gymnogaster Kessler).

Table 42. Fish caught in the Karkyra River

Type of fish			
Family	Genus	Latin name	Russian name
Nemacheilidae-	*Triplophysa* Rendahl	*T. dorsalis* (Kessler)	Gray loach
Diptychus Steindachner	*D. (Gymnodiptychus) dybowskii* Kessler (=*D. przewalskii* Kessler)	*D. (G.) d. dybowskii* Kessler	Naked osman

Characteristics of the ichthyofauna of the Tyup River. On this river sampling was conducted along the road, at different points including tributaries.

Used tackle: dragnet, net, screen, 3-wall, gill nets, rod.

According to literature data and according to local residents, this watercourse is inhabited by chebak (Leuciscus schmidti), trout (Salmo ischchan issykogegarkuni Lushin), osman (Diptichus dybovskii lansdelli Gunther), carp (Carassius auratus gibelio), and carp (Cyprinus carpio), and in the lower reaches pikeperch (Sander lucioperca) come in.

Table 43. Fish caught in the Tyup River

Type of fish			
Family	Genus	Latin name	English name
Nemacheilidae-	*Triplophysa* Rendahl -	*T. Dorsalis* (Kessler)	gray loach
Cyprinidae	*Carassius* Nilsson	*C. Auratus gibelio* (Bloch)	crucian carp
	Alburnoides Jeitteles	*A. taeniatus* (Kessler)	striped bullhead
	Pseudorasbora Bleeker	*P. parva* (Temm. Et Schl.)	silver chub
	Gobio Cuvier	*G. gobio latus* Anikin	Isykkul gudgeon
Odontobutidae (Eleotrididae auct. Part.)	*Micropercops* Flower et Bean (*Hypseleotris* auct. Part.)	*M. cinctus* (Dabry de Thiersant)	Eleotris chinensis
Diptychus Steindachner	*D. (Gymnodiptychus) dybowskii* Kessler (=*D. przewalskii* Kessler,	*D. (G.) d. dybowskii* Kessler	naked osman
Salmonidae	*Salmo* Linnaeus	*S. ischchan issykogegarkuni* Lushin	Isykkul salmon, Isykkul trout

On the territory of this site, watercourses were investigated: r. Karkyra, r. Tyup. In total, 6 hydrobiological samples were taken at the established points. Eight species of fish were caught.

Aquatic invertebrates are represented only by benthic organisms. Zoobenthos is represented by 22 families, 33 genera and 36 species.

Every natural watercourse crossing the highway planned for reconstruction are inhabited by fish. Ichthyofauna is represented by 5 families, 8 genera and 8 species.

Among aquatic invertebrates, there are no species listed in the Red Data Book of the Kyrgyz Republic. Among fish – naked Osman (Diptychus dybowskii) is listed in the Red Book of the Kyrgyz Republic. This freshwater ray-finned fish from the carp family with a total body length of up to 50 cm and weighing up to 3 kg. The body is elongated, rolling, almost naked. Osman lives in Central Asia, in such reservoirs as Balkhash, Issyk-Kul, Zaisan, as well as in lakes and rivers of Mongolia. By nature, he loves clean and fast water, cool – even at very low temperatures. Often based in the upper reaches of the rivers of the Central Asian mountains. Osman spawns in the river on shallow rifts, in July – August at a water temperature of + 10 … + 12 ° C. The project activities will not have a direct impact on this species, however, during construction work, it is necessary to adhere to the implementation of mitigation measures on water resources, namely during the spawning period and in the upper reaches of rivers.

Based on the studies carried out, it can be concluded that the composition of zoobenthos in the studied watercourses is quite rich, both qualitatively and quantitatively. This means that the aquatic environment in the studied rivers is not polluted: zoobenthos for fast-flowing streams, especially in mountain ecosystems, has informative significance for characterizing water quality, since the species have high stenobionticity, confinement to certain substrates, relative inactivity and instability to

increased water turbidity and the number of suspended solids, sensitivity to the effects of both organic and toxic contamination.

Insects. According to some estimates, the arthropod fauna of Kyrgyzstan numbers 30,000 species. It is still not well studied, and new arthropods are discovered in different regions of the Republic every year, some of which are new to science, others have come from other countries together with humans, and the species membership of others remains unclear.

Entomological research was conducted from April 25 to 28, 2021 by a specialist of the Biological and Soil Institute of the Kyrgyz Republic National Academy of Sciences along the entire length of the project road.

Preliminary information on protected species in the area.

Out of 18 species of arthropods listed in the Red Book of the Kyrgyz Republic (hereinafter referred to as RDBKR) in the project area, according to different sources, including both publications (Toropov, Zhdanko, 2006, etc.) and archival and collection data, one species – **Parnassius apollo** (Linnaeus 1758) ssp. Merzbacheri Fruhstorfer, 1906: was noted, as well as archival and collection data, one species – Parnassius apollo (Linnaeus, 1758) ssp. Merzbacheri Fruhstorfer, 1906: Parnassius 65erzbacher (another name: “Common Apollo, Merzbacher subspecies”), see Photo 12 below.

Photo 12. Butterfly, Common Apollo, Merzbacher subspecies: species included in the Red Data Book of the KR, Parnassius apollo merzbacheri (right ♀, left ♂) from IBB collections

In addition, this area is included in the distribution area of two other possible species from the KRRDB: crowned mace [Sonjagaster coronatus (Morton, 1916)] and Masaris longicornis [Masaris longicornis (N. Kuznetzov, 1923)].

From the IUCN Red List of Thretened Species [IUCN RLTS], in addition to the already mentioned Parnassius apollo (with status VU ("Vulnerable"), the following species are registered in the studied area:

Table 44. IUCN Red List species registered in the studied area

Latin	English
Calopteryx splendens (Harris1782)	Banded demoiselle
Sympecma fusca (Vander Linden1820)	Common winter damselfly
Platycnemis pennipes (Pallas1771)	Blue featherleg damselfly
Ischnura pumilio (T. Charpentier1825)	Small bluetail damselfly
Ophiogomphus reductus Calvert1898	Calvert's pincertail
Aeshna juncea (Linnaeus1758)	Moorland hawker
Anax imperator (Linnaeus1758)	Blue emperor dragonfly
Anax parthenope (Selys-Longchamps 1839)	Lesser emperor dragonfly
Sympetrum flaveolum (Linnaeus1758)	Yellow-winged darter
Sympetrum pedemontanum (Allioni1766)	Banded darter
Orthetrum cancellatum (Linnaeus1758)	Black-tailed skimmer
Ladona depressa (Linnaeus1758)	Broad-bodied chaser
Hyles hippophaes (Esper1789)	Seabuckthorn hawkmoth
Pontia daplidice (Linnaeus1758)	Bath white
Maculinea alcon (Denis et Schiffermüller1775)	Alcon large blue.

Of the species listed in the Annexes (any of the three) of the CITES Convention (Convention..., 2010), only the already mentioned Parnassius apollo is registered in the area. This species is included in **Appendix 2** of the KRRDB.

Survey Results. Entomological surveys were conducted in April 25-28, 2021, by a specialist of the Biological and Soil Institute of the the Kyrgyz Republic National Academy of Sciences along the entire length of the project road. In fact, 80 invertebrate species were identified (28 were definitively identified), representing 42 families from 14 orders.

The following conclusions can be made about the species listed on the KRRDB:

1) *Parnassius apollo* (Linnaeus, 1758) ssp. *merzbacheri* Fruhstorfer, 1906 **Common Apollo, Merzbacher subspecies** in the territory of the RoW and in the surveyed strip, its forage plants were not found, therefore, the project will not affect the breeding sites (oviposition, hatching and feeding of caterpillars) of this species. It is impossible to categorically state this with regard to pupation sites, and with regard to accidental flights of adults (butterflies), it is even possible to predict the inevitability of encounters of butterflies directly on the territory of the project corridor in June-August in the gorge of the river Tyup (in the other two mapped areas, presumably less frequent and with a delay of the flight peak by a week).

2) *Sonjagaster coronatus* (Morton, 1916) – **Coronate spiketail**: in the surveyed strip of the project corridor, no species suitable territories were found (places that females prefer to visit and males to guard); accidental flights are not excluded.

3) *Masaris longicornis* (N. Kuznetzov, 1923) – Kuznetzov's **longicorn wasp**: no areas with optimal biotopic conditions for nesting of these wasps were found in the surveyed strip of the project corridor; Accidental flights of adults (the adult stage of the individual development of insects) are not excluded.

Regarding the species that are endemic to the Kyrgyz Republic (formally recognized as such according to the 1996 "Cadastre ..." data), the habitats of which are protected by the Decree of the GKR dated 03.05.2013 No. 224, it is advisable to make several of the following remarks:

1.*Carabus erosus* is an active terrestrial predator in the adult and larval stages, therefore, if part of the local population inhabits the territory of the project road corridor, the stripe areas do not meet the criteria for critical habitats of this endemic species. Scientists are not aware of effective measures to mitigate the negative impact on habitats of archer species in such situations.

In addition, the first volume of the Catalog of Palaearctic Beetles (Lóbl & Smetana, 2003) contains indications of the registration of this species in the adjacent regions of Kazakhstan, Uzbekistan and Xinjiang, i.e. the revised status of a species may no longer meet the endemic criterion.

2.*Carabus balassogloi* is also an active terrestrial predator, but more stenobiont (occurs noticeably less frequently than the previous species); not a single live specimen was encountered in the project corridor, which suggests that the critical habitats of the endemic species are located at a distance from the impact area. The place where the dead specimen was found is indicated on the map.

In addition, similar to the previous species, the first volume of the Catalog of Palaearctic Beetles (Lóbl & Smetana, 2003) also contains indications of the registration of this species in the adjacent regions of Kazakhstan and Xinjiang, i.e. the revised status of Carabus balassogloi may no longer meet the endemic criterion.

3.*Prosodes rugulosa* appears to be a common, almost widespread species in a number of sections of the project corridor and in the adjacent territory. The adults are phytosaprotrophs and actively move in the daytime; the larvae are endogeic unspecialized saprorisophages. Taking into account the known habitat in the Issyk-Kul region mountains, as well as information from the fifth volume of the Catalog of Palaearctic beetles about the finding of this species in the adjacent regions of Kazakhstan, Uzbekistan, Xinjiang, and even Gansu (Lóbl & Smetana, 2008), it is natural to assume that the species is widespread is broader than was known in 1996 (and is not endemic) and that road reconstruction, including site design, will not have a critical negative impact on its habitats.

4) *Platyscelis sp. and Oodescelis sp*., in spite of the absence of specific names (identification of these darkling beetles is difficult and will require consultations from foreign taxonomists), formally have the status of endemic species on the grounds that in the “Cadastre of gene pool of the Kyrgyz Republic” (1996) all representatives registered in the Kyrgyz Republic are endemic. It is not possible to propose any significant measures to preserve the habitats of these species due to the poor knowledge of their biology.

4) *Dorcadion semenovi* is a flightless epigeobiont, a wonderful endemic, "decoration of our fauna." Its larvae feed on the roots of various types of cereals, including fescue (Festusa spp.), The aerial parts

of which serve as food for adults (Toropov & Milko, 2013). Beetles also clearly prefer to hide from insectivorous birds in cheegrass tufts. The fact that the spring abundance allowed this species to be classified as “common” indicates the absence of overgrazing (competition with domestic ungulates for food resources), or simply a successful peak period of the long-term dynamics of the local population. The road reconstruction works will not have negative consequences for the habitats of this species in case of inviolability of 2–3 plots of at least a hectare in size, occupied by fescue and 1–2 cheegrass.

5) *The ants Myrmica saposhnikovi*, which are non-specialized social nest-building epigeic predators, apparently even have a selective benefit from road construction, because reliably identified residential nests were all located in the trough of the existing roadbed on the Kylchikbay / Karakerege plain.

Myrmica saposhnikovi belongs to the species with small nests, the search for and fencing of which is associated with a number of difficulties with low ecological efficiency. Taking into account the positive results of the conservation of any large anthills (belonging to other species), it is advisable to provide for the transfer of such anthills in cases if they fall into the zones of destruction of the soil cover when straightening sections of the road.

6) *Sirex tianshanicus* (Semenov-Tian-Shanskij, 1921) - Tien Shan horntail, from Siricidaefamily, on the grounds that there are several (old) collectible specimens with the labels “right bank of r. Tyup at farm Zharganak, on Shrenk's spruce. " The potential habitat of this poorly studied species from among the "candidates for the Red List" is included in the impact area in small areas, however, due to the lack of modern data, it is possible to recommend only observation in optimal biotopes at optimal times.

In general, more detailed surveys will be needed to calculate exactly what area of habitat of endemic species will be destroyed during construction of the project. According to the location of areas of natural ecosystems characteristic of these species, and the nature of the impact, this will not be a continuous area, but a number of limited fragments.

4.1.2.2 Flora

The flora of the area under consideration mainly consists of drought-tolerant and salt-tolerant shrubs, grasses and plants such as Sympegma regelii, Kalidium caspica, Eurotia ceratoides and others.

Pastures are the dominant habitable environment and occupy most of the lake basin and intermontane areas as well as foothills where the original forest environment was removed. The steppes of this region are part of a significant pasture zone that covers most of southern Russia and Central Asia, stretching from Ukraine in the west to China in the east, forming the largest area of the world's coldest steppes.

Despite the impact of human activity, a large area of natural environment and areas of secondary planting on abandoned agricultural land have been preserved in the project area. Typical species are Stipa caucasica, Stipa splenden (feather grass), Polygonum karelini (mountaineer), Caragana multiflora (caragana), Aconitum rotundifolium (aconite) and others.

Alpine plains include cold tolerant species including Festuca rubra (red fescue), Helictotrichon pubescens (oats), Origanum vulgare (wild marjoram), Lamium album (dead nettle), Geranium collinum (cranesbill), Leontopodium lutens (edelweiss), etc. Numerous shrubs also grow in this area, including Lonicera altmanni (honeysuckle), Rosa spp (rose hips), and Hippophae spp. (buckthorn).

Most of the preserved forest is coniferous, with a predominance of endemic Picea schrenkiana (Tien Shan spruce), found mainly on the cold and humid northern slopes at an altitude of 1900-2800 m. There are also some broad-leaved trees, mainly birch, poplar and oak. found in the lowlands. There are few trees in the high-mountain tundra zones due to the low temperature and short growing season. There are some forms of stunted trees, but the main vegetation consists of low shrubs, sedges and grasses, including mosses and lichens.

One of the important features of this natural habitat is that due to the short growing season, most angiosperms bloom at the same time in early summer. Some types of vegetation found in the basin are rare, and nine of them are listed in the Red List of the Kyrgyz Republic as endangered species. These include calamus (Acorus calamus) (found in a flooded meadow on the Tyup River), snow lotus Saussurea villosa involucrate (Teskey Alatoo, upper reaches of the Sary-Jaz River), legumes Chesneya villosa (in the west of the basin), Hedysarum kirgisorum (Teskey Alatoo) Kolpakovsky tulip (Chu valley), Anemone obtusiloba (Teskey Alatoo, in the Sary-Jaz river basin).

The general information provided above and available for the region was complemented by additional research conducted in the vicinity of the project road at the end of April 2021 by a native flora specialist at the National Academy of Sciences. The results of the florist's research, including the methodology and descriptions, are shown below.

Research Methodology. The study of vegetation cover was carried out by route survey. Photographs were taken of the places where the plants grew. Plants that were not identified in the field were collected in a herbarium and determined at the next, so-called, stage of cameral processing.

Since the surveys were conducted in late April-early May, plants with a spring vegetation period (ephemeral-ephemeroid vegetation) were actually counted. Information on plants of summer and autumn vegetation periods is given according to scientific literature sources and earlier results of various expedition trips to this territory, as well as to territories similar in natural conditions. The systematic list of plants in Latin (division, family, genus, species) is **given in Appendix 2 to the researcher's report.**

Description of vegetation. According to the geobotanical zoning described in the Atlas of the Kyrgyz SSR (1987), the study area belongs to the Asian desert region, Issyk-Kul region, East Issyk-Kul region and is located in Aksuu-Tyup administrative district: meadow-steppe with fragments of forests and shrubs.

According to the scheme of botanical-geographical zoning of Kyrgyzstan (Kamelin, 2002), the study area belongs to the East Issyk-Kul floristic region - Dzhungar-Tien Shan-Alai province - South-West Asian region - the Ancient Mediterranean sub-kingdom of the Holarctic.

The territories under consideration are inhabited by several types of vegetation, the general characteristics of which are given below.

Vegetation type: Meadow-steppe. Meadow-steppe are communities that combine the features of meadows and steppes with a characteristic abundance of forbs from mesophilic mountain grasses (meadows). These plant communities are very important as they provide a forage base for livestock. They are especially vulnerable to anthropogenic impact (overgrazing, etc.).

The vegetation is formed by herbaceous-cereal (Trifolium-Achillea-Taraxacum-Festuca), herbaceous-fescue-ash (Festuca-Stipa-Plantago-Achillea) communities and clusters of chi-grass (Achnatherum / Lasiagrostis). The dominant species is sheep fescue (Festuca valesiaca), accompanying species - Stipa capillata (esparta herb), Achillea millefolium (yarrow), Taraxacum officinale (common dandelion), Plantago lanceolata (lymphatic herb).

The condition of the grass cover can be assessed as less than satisfactory. Weedy, thorny, inedible plants prevail, Onopordum acanthium, Cirsium vulgare, Bromus tectorum, Urtica dioica, Capsella bursa-pastoris, Marrubium anisodon, Achillea millefolium, which indicates a strong overgrazing.

Vegetation type: Meadows. These are communities of herbaceous perennial mesophytic grasses, in particular turf grasses. The herbaceous cover consists of a herb-hedgehog (Achillea-Trifolium-Ranunculus-Dactylis), a herb-flemis-cuff (Geranium-Rumex-Phlomoides-Alchemilla) communities. In addition to the dominants Dactylis glomerata (tropolushkan ak sokto - hedgehog national team), Alchemilla retropilosa (rejected hairy mantle), Ranunculus alberti (Albert's buttercup), Achillea millefolium (yarrow), Trifolium pratense (Pratense pratense) (Trifolium pratense) (Yarrow) Flomoides meadow), Geranium rectrum (Geranium straight), Rumex pamiricus (Pamir sorrel).

Growth in a large number of non-food, poisonous weeds, such as: Veratrum lobelianum, Aconitum soongoricum, Euphorbia latifolia, Rumex pamiricus, Alchemilla retropilosa, Artemisia dracunculus, Achillea millefolium, Arctium tomentosum, Leonardo turkey, Thallus Rumantus, Thallus Rumantus, Ph. foetidum, characterizes a significant anthropogenic load.

Vegetation type: Steppe shrubs. Basically, communities of mesoxerophytic, xerophytic shrubs, which are of great importance, because prevent the processes of soil erosion on mountain slopes, serve as a protective place for shelter of small mammals and birds. This type also includes the juniper elfin, communities of juniper / juniper species of elfin trees. The vegetation is formed from juniper-shrub (Juniperus-Rosa-Lonicera-Hippophae-Berberis), caragana-cherry-ephedra (Caragana-Cerasus-Ephedra) communities.

Shrubs are widely represented: Juniperus sabina (Juniper / Casats juniper), Caragana pleiophylla (Caragana multifoliate), Berberis sphaerocarpa (Round barberry), Ephedra equisetina (Ephedra,

Horsetail Ephedra), Rosa alberti (Rosehip Albertus tians), Hippophae turkestanica (Turkestan Sea buckthorn), Lonicera microphylla (Small-leaved honeysuckle), Clematis orientalis (Eastern clematis).

As a result of overgrazing, there were many abattoir paths on the mountain slopes, an abundance of non-eating weeds Artemisia santolinifolia Taraxacum officinale Ziziphora clinopodioides Allium carolinianum Gentiana kaufmanniana Cirsium Erigeron. As you know, shrubs, especially juniper, are vulnerable to overgrazing.

Vegetation type: White forest (floodplain forests) consists of a community of small-leaved deciduous trees and shrubs, ecologically mesophilic and hygro-mesophilic.

Willow-sea buckthorn (Salix-Hippophae) and willow-herb communities (Salix-Agrostis-Epilobium-Prunella) grow along the road. The upper layer is formed by the dominants Salix iliensis (Iva willow), mainly in sector 2, in sector 1 - Salix tenuijulis (Willow willow), Salix tianschanica (Tyanshanskaya willow). Codominants include Hippophae turkestanica (Turkestan sea buckthorn), Berberis sphaerocarpa (Round barberry). The lower layer is made up of such herbaceous species as Agrostis gigantea Roth. (Giant bent), Epilobium tianschanicum (Tyanshansky fireweed), Prunella vulgaris (Common chernogolovka), Arctium tomentosum (Felt burdock), and many others.

The disturbed state of the ecosystem of floodplain vegetation is evidenced by the wide distribution of Erigeron acris, Rhinanthus songaricus, Barbarea vulgaris, Pedicularis rhinanthoides, Taraxacum officinale, Cirsium esculentum, Arctium tomentosum.

Vegetation type: Mountain taiga. This type is formed by spruce forests from Picea schrenkiana (Shrenka spruce), the main edifier of the vegetation cover of the Northern Tien Shan, from the following communities: spruce-mountain ash-honeysuckle (Picea-Sorbus-Lonicera), spruce-shrub (Picea-Cotoneaster-Ribes), spruce - herb (Picea-Alchemilla-Thalictrum-Erigeron).

In the upper level, there are trees and shrubs Sorbus tianschanica (Rowan Tien Shan), Cotoneaster melanocarpus (Black cotoneaster), Lonicera karelinii (Karelin's honeysuckle), Spiraea hypericifolia (Meadowsweet meyeri, Ribesara sibirica) *Caragana* jubata (Caragana maned), Euonymus semenovii (Beresklet Semenova).

The lower tier is formed by herbaceous plant species Alchemilla sibirica (Siberian cuff), Thalictrum simplex (Basil simplex), Erigeron aurantiacus (Orange small petal), Alfredia nivea (Snowy Alfredia), Plantago major (Big plantain), Cicerbita azurea (Tsitsorita sibirica) (Siberian Skerda), Aconitum nemorum (Forest Aconite), and others.

Numerous populations of non-eating coarse-stemmed thorny herb from Aconitum nemorum, Ligularia heterophylla, Alchemilla sibirica, Alfredia nivea, Thalictrum simplex, Cirsium vulgare, Alfredia acantholepis, Cirsium ochrolepiDEPm, and Erigeron aurantiacus ecosystems are a result of disturbance in the grazing ecosystem in the zone of willow grass in the area.

Conclusions of the research. Thus, the general state of vegetation in the surveyed area can be characterized as depressed due to the constant increase in the number of grazing and mass visits of tourists. The processes of digression of meadow, meadow-steppe communities, gradual formation of ephemeral communities are observed. Primary vegetation is gradually replaced by secondary plant communities with sparse cover. There is a change in the dominant grasses to non-dominant weedy poisonous plant species with low productivity. On the other hand, these species are good honeybees, medicinal, dye, tannin, ornamental plants. With proper use in economic needs, their numbers could be regulated positively.

Endemic, rare plant species. During the survey of this territory, 2 plant species were found, which are included in the "Red List of the Kyrgyz Republic" (2007).

Tulipa tetraphylla Regel (four-leafed tulip) subendemic, Red Data Book species, VU (vulnerable) status (photo 1.16, Appendix 1 of the researcher's report.). It grows in rather numerous populations for 40 km along a stony-gravelly slope among the thickets of caragana and for 52 km among the juniper / juniper-forb community. This species, in addition to the Issyk-Kul depression, grows in the Inner and Western Tien Shan.

Allium semenovii Regel (photo 1.17, Appendix 1 of the researcher's report) subendemic, Red Data Book listed species, VU (vulnerable) status, occurs in small populations along small streams in the road section 2 and was not found in the extension zone of the road. The range of this species includes, in addition to the Issyk-Kul lake basin, the Northern Tien Shan and the Inner Tien Shan.

Achnatherum splendens (Lasiagrostis) (Trin.), Achnatherum splendid. This relict plant of the Pleistocene time forms unique rare communities of the Issyk-Kul basin (Ionov R.N. and others). With the development of agriculture and animal husbandry, the potholes began to plow up in the basin, and their area was sharply reduced. Cheegrass is widespread throughout Kyrgyzstan, has a wide ecological amplitude, high adaptability to environmental conditions, and is found in semi-desert, steppes, and meadows. Populations of chia grow on the surveyed territory and during the construction of the highway, they will not be significantly damaged, because major populations are not included in the road extension zone.

Juniperus sabina L. does not belong to especially valuable tree species, it is found along the route and during the construction of the highway some specimens are destroyed.

Many economically important plants grow in the study area: forage plants, medicinal plants, honeybeans, dyes and tannins, food and vitamin-bearing plants, ornamental plants, essential oil-bearing plants, etc.

Chapter 5. Social Risks and Impacts

A detailed survey and research, as well as technical design of the project sites revealed that there are no households and any structures and structures near the existing road. Therefore, the reconstruction / rehabilitation of the project sites will not have an impact on the life of the local community will not entail physical and economic displacement, and also the acquisition of private land.

Due to the absence of affected persons, the World Bank's Operational Policy OP 4.12"Involuntary Resettlement" will not apply.

At the same time, to ensure the social safeguards measures to be successfully implemented, the basic requirements and Directives of the World Bank and the legislation of the Kyrgyz Republic will be applied, such as - GRG / GRM, Contractor's Staff Code of Conduct, Child Labor / Gender Equality, Gender Violence, HIV / AIDS Program, Prevention and the spread of COVID-19 and other mandatory activities that will be covered by the ESIA / ESMP. These activities will be able to improve the implementation of the project and complete it in a successful aspect.

In addition, trainings and workshops, as well as consultations and meetings with all stakeholders during the construction period will be held to carry out the above activities and to better understand the basic requirements for social protection measures.

Implementation of the above measures will reduce risks and avoid delays in the implementation of the project, as well as provide access to all stakeholders to express any grievances that may arise during the implementation of the component.

The results of the ongoing activities on social safeguards measures will be reflected in the monthly, quarterly and annual reports of the Consultant on construction works to achieve transparency in addition, monitoring will be carried out by the World Bank, the Executive Agency / IPIG.

The implementation of the above activities will reduce risks and avoid delays in the implementation of the project, as well as provide access for all stakeholders to express any grievances that may arise during the implementation of this project.

Stakeholder identification and analysis

Stakeholder engagement is an ongoing and iterative process. It takes into account the different access and communication needs of different groups and individuals. Local community participation is highly important to the success of the project to ensure smooth cooperation between project staff and local communities, and to minimize and mitigate the environmental and social risks associated with the project.

The Tyup-Kegen road is of strategic importance, and all groups of people will benefit from its reconstruction. All users of the rehabilitated road and those living along the project road are stakeholders. For more effective interaction with stakeholders, they can be divided into several groups.

1. Project-affected parties:
    - All the local population living along the project road;
    - Farmers. Agricultural products grown by them will be delivered to large markets faster and with less losses after road reconstruction;
    - Traders (faster transportation of goods and increased volume of transported goods);
    - Drivers of minibuses and passenger cars engaged in passenger transportation;
    - Tourists. Tourists come through the "Karkyra - Avtodorojnyi" checkpoint to the Karakol ski base and the Ak-Sai Travel alpine skiing camp, and in the summer to rest on Lake Issyk-Kul. For tourists from Kazakhstan, this is a shorter, more direct and convenient route.
2. State authorities:
    - San-Tash ayil okmotu;
    - RMU - 4 (road maintenance unit);
    - Medical institutions (FAP, maternity hospital);
    - Educational institutions (schools).
3. Vulnerable and vulnerable groups of the residents of San-Tash ayil/okmotu
    - Poor population (with income below the subsistence minimum) and disabled people;

- The unemployed;
- Single female heads of households.

In the context of stakeholder engagement, the above groups may be considered vulnerable groups who, due to the possible limitations of social media, may find it more difficult to obtain information about the benefits of the project.

Stakeholder Mapping

In order to effectively organize the stakeholder engagement process, stakeholders were mapped and divided into groups:

1) Potentially affected parties:
   - All the local population living along the project road;
   - Farmers;
   - Farmers o Commuters;
   - Drivers of trucks;
   - Drivers of shuttle buses and passenger cars;
   - Tourists.

They must be engaged with throughout the life of the project, and possible impacts on them must be monitored and mitigated.

2) Other stakeholders: refers to individuals, groups, or organizations interested in the project, which may be related to the project location, characteristics, impacts, or public interest issues.
   - San-Tash ayil okmotu;
   - RMU-4 (Road Maintenance Unit);
   - Medical institutions (FAP, maternity hospital);
   - Educational institutions (schools).

3) Vulnerable and vulnerable groups of the residents of the San-Tash ayil/okmotu:
   - Poor population (with income below the subsistence minimum) and disabled people;
   - Unemployed people;
   - Single female heads of households.

As part of the project, it is necessary to carry out activities to interact with these stakeholders. Such activities will include information campaigns, especially targeting women and PWD (persons with disabilities) through information materials, media, social networks, focusing on the rules and principles of equality and non-discrimination, such as employment opportunities during the implementation of the Project.

Methods of interaction

Stakeholders	Channels of interaction	Frequency	Methods of interaction	Responsible parties
All stakeholders	Campaigns to inform and consult stakeholders	Annually	Public hearings, consultations, personal meetings with all stakeholders	IPIG / Construction Supervision Consultant
All stakeholders	GRM (grievance redress mechanism)	Regularly	Web-site, telephone, email, social networks, messengers, leaflets, advertisements, banners, brochures, handouts	Local and Central level

All stakeholders	Brochure with brief information about the project, its location, history and principal measures in the framework of the project		Providing stakeholders with information on the progress of the Project. As the ESIA is updated and significant changes in the Project appear.	IPIG, Construction Supervision Consultant
Vulnerable groups	Focus-groups, Individual interviews	Regularly	Group interviews with use of special guide (structured plan) to discuss specific issues aimed at reaviling of the people'sopinion	IPIG / Construction Supervision Consultant
Other stakeholders	Official correspondence	Regularly	Progress of the project works, budget, funding. Monitoring reports	IPIG, Ministry of Transport and Communication, Construction Consultant
Other stakeholders	Written requests via official letters and electronic messages	As required	Proress reports, official requests and letters	MoTC / IPIG / Construction Supervision Consultant

Summary of events held

The first public consultations were held by the Executive Agency with the participation of the Tyup District State Administration, heads of ayil okmotu located along the road Tyup - Kegen, representatives of the Tyup Forestry, RMU-4 and other stakeholders on April 24, 2018 in the village of Tyup to discuss the ESIA prepared under the planned Project of the CARs-3, which includes the rehabilitation of the road Tyup – Kegen, section from km 39 to km 76, from village Sary-Tologoy to the "Karkyra – Avtodorojnyi" checkpoint and the local adjoining road leading to the tourist camp with a length of about 13 km and an dirt road leading from the main road to the "Tamerlane Stones" historical monument, which is a cultural heritage site

To update and refine the ESIA prepared in 2018, Proyapi Engineering&Consultancy conducted data collection and update, consultation with stakeholders of the project area in 2021.

One type of stakeholder consultation was key person interviews and focus group discussions conducted in March 2021 to obtain information and conduct social analysis related to assessing the benefits and benefits of the upcoming project.

Both methods provided important information about the needs of the local population, identified significant issues to be considered in the implementation of the project, and identified the basis for mitigation measures. The following is a detailed description of the named activities.

For the survey, a range of people who are reasonably knowledgeable about the social aspects of the project area were identified. These are - government officials, village leaders, a deputy of the local Kenesh, village headman, a member of the youth movement, head of the Family Doctors Group (FGD), senior inspector of the Road Safety Department.

10 - 11 June 2021 held public consultations in all villages, where the project road to determine the informal users of the land to be allocated for the transformation. Residents of the villages confirmed that no one rents these plots of land, no one conducts any economic activities, does not use for any benefits, there are no buildings. Residents noted that they have their own agricultural land shares (irrigated and rain-fed lands, and vegetable gardens). Residents noted that the land along the dusty road does not attract anyone to conduct any commercial activities.

On July 24, 2021, the Consultant together with the IPIG/MOTC KR held public consultations with all stakeholders - local self-government bodies, local communities, government organizations and

institutions, NGOs, media. Public consultations were held in the district center of Tyup district (Tyup village) and in San-Tash ayil/okmotu (Baizak village). The purpose of the public consultations was to publish the Environmental and Social Impact Assessment (ESIA) document.

The public consultations conducted have shown that in the future, during road construction, the same active participation of stakeholders can increase the environmental and social sustainability of the project, ensure their positive attitude towards the project and contribute to its successful implementation. Contractors need to engage with stakeholders and conduct public consultations throughout the project cycle.

5.1 State land acquisition for project needs

The **Tyup-Kegen** road section to be rehabilitated from 39.6 to km 76 and the access road to the touristic alpinist camp pass along simple and straight sections of the existing gravel road.

With the widening of the earth roadbed and additional land acquisition, the project will not have an impact on private land, incomes, livelihoods of residents (loss of land, property, structures, economic activities, including grazing, etc. in order to obtain benefits). Since there are no residential buildings near highways. Given that the land taken for the needs of the project is state-owned, the project will not have an impact on the local community living in the project area.

For the Tyup-Kegen road it is expected to withdraw and transfer (transform), 3.94 hectares of state (pasture) lands of San-Tash ayil/okmotu and 6.49 hectares of Tyup mechanized forestry. The total size of the state lands allocated for this section of the road is 10.43 hectares.

For the Karkyra-Turuk-Sary-Jaz road it is expected to withdraw and transfer (transform) 1.20 ha of state (pasture) lands of San-Tash ayil/okmotu and 0.60 ha of Tyup Mechanized Forestry. The total size of the state land allotment for this road section is 1.80 ha.

The size of the necessary additional land allocation for the needs of the project the Tyup branch of the state institution "Cadastre" (State Enterprise "Cadastr") has agreed with the San-Tash ayil okmotu and the Tyup mechanized forestry.

According to the letter received from Tyup State Unitary Enterprise "Cadastre", the total amount of lands from San-Tash Ayil/okmotu necessary for the needs of the project is 5.14 ha and 7.1 ha belonging to the Tyup Forestry. These sizes of state lands will be withdrawn and transformed for the reconstruction/rehabilitation of the Tyup-Kegen road and the Karkyra-Turuk-Sary-Jaz road. *(Letter from the Tyup branch of the state institution "Cadastre" dated July 2, No. 01-14-81).*

5.2 Non-formal users

The existing climatic conditions of the project site, as well as the gravel road, limit the economic activities of local residents. As a result, there are no formal or informal users along the project site.

In addition, the above situation with the development of income-generating activities for local residents is complicated by the COVID-19 pandemic and the imposed restrictive measures in the country, a decline in the influx of tourists from neighboring countries and the non-functioning of the «Karkyra-avtodorozhniy» checkpoint.

It should also be noted that in winter the «Karkyra-avtodorozhniy» checkpoint does not function, the border with the Republic of Kazakhstan is completely closed.

Official letters were received from local executive services on the absence of informal users along the project sites, in particular - July 4, 2021 from the San-Tash ayil okmotu, from June 7, 2021 from RMU-4 and June 11 this year from the Tyup Mechanized Forestry.

Also, at public consultations that were held in the villages of Sary-Tologoy, San-Tash, Karkyra and in the Chaar-Kuduk gorge (tourist camp), the participants confirmed that none of the residents of the project zone leases roadside land plots and does not conduct economic activities. Roadside state lands (pasture areas of the San-Tash ayil/okmotu and the Tyup mechanized forestry enterprise), which will be used for widening roads, for the construction of parking lots, bus stops, sidewalks, lighting, to be allotted for transformation for the needs of the project, are not used by residents of the project area for receiving any benefits.

Termination/expiration date (cut-off date)

As part of the reconstruction / rehabilitation of road sections, there are no persons in the project area that are affected by the project. However, in accordance with the requirements of the World Bank, a deadline for submitting requests for compensation must be set.

Previously, the official cut-off date was the month of March 2019. On June 14, 2021, the Executive Agency by an official letter repeatedly notified the local authorities about the previously established deadline for registration of objects.

Persons who move to the project area after the cut-off date will not be eligible for compensation and assistance under the project. This procedure was announced at consultation meetings with local authorities, as well as with the local community, held in the project area.

5.3 Code of Conduct for Personnel of Contracting Companies

During the construction period, employees of contractors must adhere to certain norms and requirements of the Code of Conduct to ensure a favorable working environment throughout the project implementation, which is aimed at achieving a work well-being and respectful relationships in the team.

When hiring, each employee must be familiar with the basic requirements of the Code of Conduct. Cases of violation of the requirements by an employee can lead to serious consequences, up to dismissal or litigation.

At the same time, if violations of the Code of Conduct by employees of the contractor company are detected during the construction period, the Construction Consultant must immediately respond, record the violation and promptly notify the Executive Agency / IPIG, as well as reflect them in the submitted reports for review by the World Bank.

Requirements for the Code of Conduct for employees of contracting companies are given in Appendix 4.

5.4 Gender Aspect

Rehabilitation of roads is one of the priority issues of the rural women. Improving roads helps them improve access to social facilities (schools, preschools, hospitals, clinics, markets), as well as income opportunities, and to fully reap the benefits of the road project. Upgrading the Tyup-Kegen road will facilitate the creation of roadside markets, cafes, the development of the tourism business, the establishment of services, in which women are mainly employed, and women will be able to benefit in the sector where their participation is most in demand.

Improved road safety, lighting, bus stops will all address the needs of women and children for safe road crossings and well-lit transport stops.

The project should pay special attention to ensuring that the priorities of women and men are heard and appropriate measures are taken, and women are included in the consultation process. It is necessary to involve women in solving issues that will arise during the implementation of the project.

5.5 Gender-Based Violence

Any act that causes physical, sexual or mental harm or threats of such acts against women or men constitutes gender-based violence. As we know, violence is most often committed against women.

Large infrastructure projects, such as road construction, can be high-risk environments for gender-based violence (GBV), sexual exploitation, violence (SEV) and sexual harassment (SH) due to the large influx of labor from outside the country.

Large influxes of labor can pose risks in terms of gender-based violence, sexual exploitation, abuse and sexual harassment. These risks increase when workers come into close contact with the local population.

Women's employment in road construction, such as in the service industry or trade, can be risk factors.

Gender-based violence is a sensitive issue and requires a special approach, sensitivity and confidentiality when dealing with such cases, to ensure that the victim and the victim's family are supported and safe. The latent nature of such crimes predetermines many factors, including fear of public condemnation, lack of knowledge of their rights, and mistrust of the law enforcement system.

At an early stage of the project, a gender-based violence, sexual exploitation and harassment complaints team/commission should be established. For effective grievance redress, the IPIG can engage a gender-based violence, sexual exploitation and harassment counselor to provide appropriate training to the grievance redress group (GRG). For grievance redress training, to reduce the risks of GBV and sexual harassment cases. This will facilitate more sensitive handling of violence and harassment against women.

Once the contractors will be mobilized, the IPIG will conduct SEA/SH risk assessment based SEA/SH risk screening tool and together with a contractor will develop mitigation measures appropriate to the evaluated risk.

The reconstruction/rehabilitation of the project road is assessed as having a low risk of gender-based violence because migrant workers will not be accommodated in the villages. However, the Contractor must commit in the contract to introduce measures to prevent gender-based violence (GBV), sexual exploitation, abuse (SEA) and sexual harassment (SH).

In case of violations of the rights of the local population related to SS and SRs, the affected persons can apply to the GRM, use the complaint mechanism (GRM), which will be involved during the implementation of the project.

WB directives and KR legislation punish gender-based violence in any form.

A tool for obtaining additional information on gender-based violence is provided in Appendix 5.

5.6 Countering the use of child labor

Poverty is the main reason why children work. For some families, the income generated by a child's work is the most important factor in the family's survival. In addition, there is a widespread belief that work is good for children's character and skill development.

Families themselves and parent-child relationships are an important factor. In rural areas, adult children work with their parents in family enterprises (farms, private sector enterprises, family land holdings, etc.).

National legislation of the Kyrgyz Republic allows the hiring of teenagers at the age of 18 years old. Under this project, the Contracting Company shall not employ any children under the age of 18.

5.7 COVID-19 prevention program

Given that the COVID-19 situation is rapidly changing, the Contractor and/or Construction Consultant will need to include appropriate measures to reduce the risk of spread of this disease. These measures include raising employee awareness of COVID-19.

All workers should be trained on COVID-19 issues and understand their responsibility to protect themselves from coronavirus infection.

The illness and spread of COVID-19 among workers can affect construction activities. Therefore, the Contractor needs to ensure that during construction work: (i) precautions are taken to prevent, contain and/or minimize an outbreak of COVID-19 and (ii) a Coronavirus Outbreak Action Plan must be in place. These measures include the following steps:

- develop action plans in the event of an outbreak of coronavirus infection;
- provide medical personnel with all the necessary means of protection against coronavirus infection and its treatment;
- carry out sanitary and preventive work in the camps of workers;
- control the conduct of disinfection in places of public catering, in the living quarters of the personnel of the construction company;

- to conduct information and explanatory work among workers about the rules of personal hygiene for the prevention of coronavirus infection and provide them with personal protective equipment (medical masks, antiseptic gel, or hand fluids, gloves, etc.);
- liaise with district and local health services to carry out COVID-19 activities.

5.8 The HIV/AIDS program

The responsibility for informing workers about HIV / AIDS should be borne by the Contractor, considering the fact that the composition of the personnel in the construction works will be heterogeneous in terms of social responsibility, education, and culture. Therefore, a prerequisite for hiring should be that all employees have a medical certificate for HIV / AIDS.

The Contractor's Medical Officer is to educate workers about Sexually Transmitted Diseases (STDs) and HIV / AIDS as part of the health and safety program in the construction camps during the construction period. Information boards should be installed in the camps, where educational information about HIV / AIDS is posted.

The health worker must ensure that construction workers undergo medical examinations for HIV / AIDS / STDs regularly once every six months. Implementation of awareness raising and prevention campaigns for HIV / AIDS / STDs should be included in the Health Worker Work Plan.

Chapter 6. Historical and Cultural Heritage

6.1 Ancient and mediaeval sites of historical and cultural heritage in the project area

During the period of updating the detailed design of the project sites, an archaeological study was carried out, as a result of which historical structures and objects were identified in the coverage area of the project activities. Such objects can be represented by (1) places, structures or sites of archaeological, paleontological, historical, religious or other cultural significance, as well as (2) natural environmental objects of cultural significance (for example, sacred sites, sites of worship and pilgrimage). Also, domestic procedures were carried out to coordinate the prepared report with the relevant state authorities.

Based on the results of the study, a detailed report was prepared with recommendations for the preservation and protection of the sites of historical and cultural heritage. In particular, there were identified 23 complexes of historical and cultural heritage sites in the form of burial grounds of different times and mediaeval fortresses. Of these, the San-Tash fortress (No.261), the San-Tash 1-3 burial grounds (No.257, 261 and 263) and the Karkyra burial grounds 1-9 (No.260) are monuments of republican significance. The Tamerlane Stones Historic Site, listed on the National List of Historic Sites, is part of the San-Tash complex.

It was determined that emergency archaeological excavations are required at 41 burial mounds, consisting of 11 burial grounds located at a distance 50 meters from the road rehabilitation site. For 10 complexes - 9 burial grounds and 1 fortress, located at a distance 150 meters from the road rehabilitation site, it is necessary to organize work to elaborate design for protection zones and to establish them. 7 complexes are located in a relatively safe area more than 150 meters from the road rehabilitation site and do not require any additional measures.

Map 12. Karkyra burial grounds 2 and 3 at km 8+550 - km 8+800

Map 13. Karkyra burial grounds 7-9 and Kalchykbai

6.2 Modern memorial structures along the road

The traditions of the local population related to the perpetuation of the memory of relatives and friends who died in road accidents are reflected in the installation of obelisks where the fatal events took place. Four such objects were found during the study. Usually, such memorial structures are installed 3-4 meters fr om the road and are not associated with gravesites. Such objects may be vulnerable to construction work and are expected to be subject to destruction or removal. These objects will certainly need to be considered during construction works and protective measures: at Km 2+240, Km 3+150, Km 17+600, Km 7+800 there are obelisk monuments erected by the local population during different periods of road functioning.

Chapter 7. Environmental Impacts

Within the framework of the study of the initial state of the environment in the zone of the project sections of the Tyup-Kegen and Karkyra-Turuk-Saryzhaz road, as well as the proposed design solutions, potential and real factors were identified that may have different nature, magnitude and duration of impact on various components of the environment and social environment. Each such factor has been considered and evaluated.

In general, the level of negative impact on the environment will be minor. Most of the impacts will be temporary, localized and controlled. Mitigation activities, formalized in the form of an Environmental and Social Management Plan (ESMP), are detailed below and are subject to strict implementation by the Contractor during construction works.

The main sources of environmental pollution in the process of road reconstruction are emissions of pollutants from:

- earthworks (removal of the soil and vegetation layer; excavation and planning of the roadbed);
- development and transportation of inert materials from the quarries recommended by the project;
- functioning of the asphalt and concrete plants for the preparation of the necessary mixtures and materials;
- functioning of the construction camp (delivery and storage of building materials and fuels and lubricants, parking of vehicles, accommodation of workers with sanitary conditions, functioning of a toilet, shower rooms, solid waste management, etc.);
- work of vehicles and equipment involved in construction work.

The Contractor needs to obtain all necessary permits and approvals for the placement of construction camps, filler extraction sites (quarries) and sources of construction materials, as well as the placement of the asphalt and concrete plants from authorized state bodies and local authorities before any construction activities and extraction of materials started.

To assess the impact of the planned facility on the environment, the section considers the following components: atmospheric air, water and land resources and biological resources.

7.1 Impact on atmospheric air

During the construction period, the negative impact on the environment will be caused by construction activities, the sources of release of pollutants are:

- Excavation work for the preparation of the roadbed (development and leveling of the soil, removal and storage of the soil and vegetation layer);
- Operation of asphalt and concrete plants. It is also possible to influence the atmospheric air during the operation of the construction camp;
- Work of construction machines and mechanisms.

At the same time, the main pollutants are:

- Inorganic dust generated during earthworks, due to the movement of vehicles and dust generated during the transportation of inert materials to construction sites;
- Exhaust gases (CO, NOx, SOx, etc.) from the work of vehicles and construction equipment.

The following pollutants are emitted into the atmosphere during the operation of motor vehicles and machinery (exhaust gases):

- carbon oxide;
- hydrocarbons;
- nitrogen dioxide;
- soot;
- sulfur dioxide.

The project does not provide for drilling and blasting operations during the construction of roads, which could have an impact on the atmospheric air, accompanying the release of burst dust formation.

Drilling and blasting operations are possible in open pits, which will be considered within the framework of the technical project by the Contractor.

The degree of impact of construction work on the atmospheric air is of an exclusively temporary and local nature, since it occurs in construction sites and during work leading to dust formation in areas remote from settlements. Thus, the expected impact is considered insignificant in terms of impact and local in terms of spatial scale.

No inorganic dust emissions are expected **during the operation of the road**, since the road will be asphalted.

During the operation of roads with the exhaust gases of vehicles will be emitted:

- carbon monoxide CO;
- the amount of nitrogen oxides NOx;
- CH hydrocarbons;
- soot;
- sulfur dioxide SO_2;
- formaldehyde CH_2O
- benz (a) pyrene $C_{20}H_{12}$.

The volume of formation of exhaust gases at the project sites will not exceed the maximum permissible values, and as a consequence, it can be assumed that the impact on atmospheric air will be minimal.

7.2 Impact on land resources

The construction of the road will have an impact on soil resources at:

- carrying out earthworks, namely, when cutting the soil layer, excavating the soil, leveling the subgrade at project sites and quarries;
- implementation of construction work and movement of construction equipment (spillage of fuels and lubricants and other hazardous substances on the soil and the accumulation of oil products in soils, etc.);
- the formation of construction and household waste at construction sites.
- Possible disposal of hazardous waste in the form of parts of asbestos-cement structures.

In the process of construction, the soils are subjected to mechanical stress: before starting work, they are removed from the permanent right of way, from territories for temporary roads, concentrated soil reserves, from construction sites and tracks and areas of transport. The removed soil layer is shifted to a depth of 15 cm into cavaliers for temporary storage until reclamation work. To reduce quality losses and preserve the optimal physicochemical parameters of the soil, the height of its storage should not exceed 5 m. With a high stack height, during long-term storage, microbiological activity in the soil fades, the soil becomes overcompacted and its properties deteriorate.

In the process of removing and moving the soil layer, the structure of the soil is destroyed and the soil horizons are mixed. At the same time, the soil does not lose its fertile properties, and when sowing it with herbs, their high germination is noted.

A significant issue in this part of construction work is the rather long period between the moment of soil removal and recultivation, which usually lasts several months. During this time, the soils in the cavaliers undergo wind deflation, eroded by atmospheric precipitation, and the losses are often very large, in particular, with strong and prolonged winds at a speed of 15-20 m / s, the soils in the cavaliers can almost completely dissipate.

In addition, it should be kept in mind that the road passes through a mountainous area, where there is a cliff on one side and a mountain slope on the other, which also affects the engineering decisions taken and, therefore, determines the magnitude of the impact on the geological environment of the area.

Chemical pollution leads to the triggering erosion processes. Over time, the processes of wind and water deflation can lead to the formation of gully erosion and, consequently, to the withdrawal of large zones of fertile farmland from circulation, as well as to the creation of foci of ecological instability.

In addition to this, during construction work, there is a change in the existing type of use of hayfields or pastures for storage of building materials. Thus, this leads to the destruction of vegetation cover in a given area, which, even after the removal of building materials, requires a long period of restoration of vegetation and soil cover.

Also, during the construction of the project road, in some places in the area of the Santash pass, the adjacent mountain slopes will be trimmed to widen the roadbed, which may subsequently lead to a partial loss of stability of the disturbed mountain slope. This is fraught with the possible risk of collapses or landslides.

At the construction site, the ground will be affected by accidental spills of oil products during the operation of construction equipment and the formation of waste (construction and solid household).

The project plans to dismantle and replace the existing artificial structures with new ones. The existing facilities will be handed over to local representatives of MoTC (RMU-4) for possible further use. If structures and structures made of asbestos materials are found, they will also be dismantled and transferred to the disposal of RMU-4.

Asbestos exposure mitigation activities will be regulated by the ESMP.

During the operation of highways, chemical contamination of the soils of the adjacent territories is prevalent. The exhaust of internal combustion engines of cars contains about 20% of conditionally solid emissions of dust particles: soot, aerosols of lead, zinc, cadmium and other substances. They, together with the exhaust gases, are dispersed by the wind and then deposited on the soil surface in the roadside. Lead is one of the main harmful substances and soil pollutants.

The degree of soil pollution depends on the following factors:

- on the intensity of traffic;
- depending on the distance from the edge of the carriageway to the point of impact;
- from the direction and strength of the winds;
- from the content of lead additives in the fuel;
- on the average operating fuel consumption of vehicles (depending on their types);
- from the average speed of the traffic flow.

In general, the impact of road construction under this section on land and soil cover is predicted to **be minor**.

7.3 Impact on water resources

During construction, work on road sections may have short-term and minor adverse impacts on water quality, including:

- irrational use of water from surface runoff for technical purposes (dust suppression);
- construction materials such as gravel, sand, which have the potential to fall / wash into local rivers during rain;
- accidental leaks of fuels and lubricants and / or spills in river floodplains during water intake for technical purposes;
- deliberate release / discharge of garbage by workers into river floodplains or rivers;
- prohibited discharge or discharge of contaminated water, etc.

In addition, groundwater is vulnerable to oil pollution. Gasoline / diesel fuel can seep through the soil into groundwater if it spills onto the ground. In the case of groundwater pollution with oil products, the pollution persists there for a very long time and for the worse, the polluted stream expands in the direction of the groundwater flow.

The road construction project does not provide for works that require the use of water with subsequent discharge into water bodies, that is, no discharge and discharge into water bodies is provided. Within the framework of the construction project of this road, water is used only for the purpose of dust suppression during earth and transport works.

In addition, construction of a recreation area with a parking lot, a flyover and a public toilet is envisaged at the project sites. Long-term neglect of sanitary requirements can affect the soil layer with further contamination of groundwater.

Operation stage. In terms of positive changes for the environment, it can be noted that the laying of asphalt pavements will reduce the load on water flows from sediments and silty soils during rainy seasons.

During the period of construction work, all measures to exclude pollution of water bodies in accordance with the ESMP will be observed. So, considering the envisaged measures for the protection of water resources, the project will not have any impact on surface water bodies.

7.4 Impacts on flora and fauna (biological resources)

Flora

Small impacts on flora and habitats are expected as a result of construction work in the work area. Rehabilitation works will lead to some degradation of flora due to the clearing of small areas from trees and shrubs at work sites and adjacent areas. However, construction activities will only affect a relatively narrow strip of vegetation adjacent to the roadbed.

Possible anthropogenic impact on the flora is unauthorized felling of trees and green spaces by the Contractor's personnel. Neglect of safety measures on construction sites can lead to fires during dry grass periods. In addition, deviations from the traffic routes may be a source of impact on the vegetation cover at the project site.

Cutting slopes and additional areas beyond the existing road RoW will result in the cutting of 300 trees, including spruce, willow, elm, mountain ash, and 3.2 hectares of shrubs, including juniper, rose hips, barberry and sea buckthorn. Felling and / or replacing of trees will take place where slopes will be trimmed or shoulders cleared to provide additional space for widening the road. Also, when the road is widened, vegetation will be cleared on the sides of the road.

Another factor affecting vegetation is the intersection of the road with the Tyup Botanical Reserve. The limited area on the territory of the Tyup reserve may be subject to insignificant impact during the period of construction work on the Karkyra-Turuk-Sary-Jaz section. However, the impact will be limited and will not deviate far from the existing roadbed. Works on the territory of the Tyup Botanical Reserve will be carried out only in the right-of-way of the road.

Red Data Book Plants. Among the vegetation objects in the project area there are rare and endangered plant species that are listed in the Red Book of the Kyrgyz Republic: **Tulipa tetraphylla** Regel (four-leafed tulip), **Allium semenovii** Regel (Semenov's onion) and **Achnatherum splendens** (Chiy, Akhnatherum brilliant). The total area affected by these species is approximately 15 m2. The necessary mitigation measures for these types are reflected in the ESMP, which are mandatory for the Contractor and are subject to strict supervision of the activities being carried out and monitoring by the Construction Consultant.

During the operation phase, the impact on the flora will be expressed by the accumulation of fuel combustion products on the vegetation cover. However, in view of the predicted decrease in the amount of emissions due to more stable operation of motor transport engines in view of maintaining a single speed of movement, the expected impact will have a cumulative effect. In the short term, its manifestation will be of negligible magnitude.

Considering compliance with the requirements of the ESMP during the works, **the impact on the flora is expected to be moderate and local.**

Fauna. During the reconstruction and laying the roadbed, a technique will be used that will create a dust curtain, which will negatively affect the nesting birds near the road, in order to avoid negative consequences, the roadway should be watered more often.

The construction works will not have a negative impact on the migration flows of the local feathered fauna. In these conditions, it is the birds that are of paramount importance, because there are always large flows of migratory and nesting species in these areas, as already indicated above in the description of the baseline conditions of the project area. The road works planned will not reach such a large extent that they will affect the migratory flows of birds.

As for mammals, it should be noted that the processes of interstate delimitation and demarcation have already affected the migratory flows of mountain sheep and roe deer, which have completely stopped since the establishment of engineering structures (wire fences) on the border. Therefore, at the

moment there is no reason to believe that the construction work could affect the migratory flows of mammalian species.

In terms of impact on fauna, there is some danger that construction workers will carry out illegal hunting (poaching) of acceptable animals and birds in areas where it is prohibited. Contractors will be responsible for communicating adequate information on fauna protection issues to workers.

During operation, the vehicle speed (from km 40 to km 76) should be limited to 80 km / h, since when vehicles move at a speed of more than 80 km / h, birds, especially small passerines, during the migration period (in spring and autumn) die en masse in as a result of collisions with transportation means.

Critical damage to protected local populations of arthropod species is not expected (the only exception is the possibility of unintentional introduction of invasive species, which has not been assessed).

The implementation of the project for the reconstruction of the highway along its entire length will entail minor changes in the local complexes of the population of free-living invertebrates.

Based on the above, it can be affirmed that when all environmental protection measures are taken, the project **will not have a negative impact** on the fauna of the work area.

7.5 Impact from noise and vibration

During the period of construction work, the sources of intermittent **noise** are the running engines of construction and road equipment.

Temporary negative impacts are expected due to noise from construction equipment, and especially from heavy vehicles. Compaction equipment, blasting operations when excavating soil and other inert materials for road embankments, as well as excavation, can produce minor noise and vibration, but do not exceed the exposure level and there is no population living in the vicinity. In addition, it should be noted that there are no places where people live nearby.

All settlements are located at a distance of about 50-60 meters from the road where construction work will be carried out. The vulnerable receptors include three houses in the village Karkyra from the side of the hills, which are located up to 20 meters from the existing road. Another sensitive receptor is a school in the village of Santash, which is located at a farther distance from the road (at least 50 m) and will not be exposed to a large sound impact of the works. The situation is similar in the Aksai Travel tourist center. The distance will absorb most of the sound pollution and thus mitigate possible negative impacts.

Thus, in the area of work, the sound level during the construction period will be manifested during operation only during the daytime. The noise on the site is **short-term**, only when the equipment and mechanisms are in operation.

Vibration during the construction period will also be a significant concern, especially the vibratory rolling of the granular pavement layers. Blasting operations directly on the road are not envisaged, although it is not excluded in the areas of laying new quarries to obtain inert materials.

In road operation, in the most optimistic scenario of increasing commercial traffic flow, the background noise level after the completion of rehabilitation works along the road will not be significant in order to require acoustic mitigation.

Since noise is a derivative of traffic, background noise levels will not increase significantly as relatively low traffic levels are predicted, at least for the next few years.

Works on the sites should be carried out only during the period of the project, so when measures are taken to reduce noise, **the impact will be local and minimal.**

7.6 Impact on objects of historical and cultural heritage (OHCH)

An archaeological survey conducted has identified the location of the OHCH that will be impacted. During the construction period, the impact will be expressed only in the form of physical impact. Physical disturbance of objects can only be rendered by builders. However, this impact is irreversible due to the impossibility of designing alternative routes for the road and will be controlled by measures

in accordance with the requirements of the legislation of the Kyrgyz Republic and the policy of the World Bank.

Emergency excavations will be carried out in strict accordance with 41 OHCH, which were identified during the study and are subject to emergency excavations.

Rehabilitation of a 500 m long dirt road leading to the historical monument San-Tash (Tamerlane Stones) will not affect the site itself. However, construction will have a temporary impact on access to the site.

The list of identified OHCHs that will be affected is reflected in the Chapter 6.

7.7 Transboundary environmental impact

The Kyrgyz Republic is a party to the Convention on Environmental Impact Assessment in a Transboundary Area in accordance with the Law of the Kyrgyz Republic "On the accession of the Kyrgyz Republic to the UNECE Convention on Environmental Impact Assessment in a Transboundary Context" dated January 12, 2001 No. 6.

In accordance with this convention, the parties have agreed in the event that decisions are made on the implementation of any activity, as a result of which the work is capable of having a significant impact, take all appropriate and effective measures to prevent significant harmful transboundary impact, as well as to reduce and control it. The Party of origin (proponent) shall ensure that an environmental impact assessment, in accordance with the provisions of this Convention, is carried out before a decision is taken to authorize or carry out a proposed activity.

The road to be rehabilitated does not cross the territory of the Republic of Kazakhstan, but only approaches the border of the Republic of Kazakhstan at a distance of 120 m. Karkara is 10.65 km, 16.05 km to the village Buleksaz, 18.51 km to the village Koipiyaz, 22, 31 km from the village Kegen.

The Karkyra-Turuk-Sary-Jaz automobile road with a length of 13 km is a regional road, it connects the Tyup-Kegen road with the eastern part of the valley. The division of borders is due to the passage of the Karkyra River.

Thus, the assessment of the transboundary impact of the project activities on the natural environment of the Republic of Kazakhstan was carried out for the section km0 - km13 of the Karkyra-Turuk-Sary-Jaz road (from km 70 of the Tyup-Kegen road to the Chaar-Kuduk (Ak-Sai travel) tourist camp).

Since the work will be carried out in warm seasons, during the work the wind will be directed to the east, south and west (the territory of Kyrgyzstan), which means that the dust generated during earthworks does not have the property of dissipating to the territory of the Republic of Kakhzakhstan, it has local and short-term and has no emissions of transboundary impact.

Chapter 8. Environmental and Social Management Plan

The attached ESMP documents the impacts identified in this draft ESIA Report, the actions required to mitigate these impacts to an acceptable level in accordance with the legistaltion of the Kyrgyz Republic and World Bank Operational Policy, and the monitoring activities to be undertaken by the project to confirm that mitigation actions have been effective in achieving their objectives or to trigger changes in actions required. The ESMP also details the institutional arrangements and opportunities that currently exist or will be established during project implementation to ensure that environmental assessments (including the ESMP) fully consider Kyrgyz Republic and World Bank environmental requirements, identify all potential environmental impacts and propose appropriate mitigation measures, and establish systems to ensure that effective environmental monitoring procedures are implemented the ESMP will be implemented in 4 phases: (i) detailed design, (ii) pre-construction, (iii) construction, and (iv) operation and maintenance of the road.

Table 45. Environmental impact management plan for the construction phase

Environment	Potential impact	Mitigation measures	Responsible parties
General requirements	**Submission of Applications/Special Environmental Management Plan prior to work commencement**	Immediately after the Contractor is selected and prior to the start of construction, the Contractor will update this ESMP to an SESMP and submit it to the Construction Consultant for review and approval by the Client. This SESMP shall include the following Plans: 1. Dust Suppression Plan 2. Camp and Workshop Management Plan 3. Borrow Pits Management Plan 4. Tree cutting and planting management plan 5. Solid and Liquid Waste Management Plan 6. Traffic safety regulation and organization Plan 7. Cultural & Historical sites Management Plan 8. Health and Safety Management Plan 9. The COVID-19 Prevention Plan 10. Spoil Soil Management Plan 11. Material Processing Plants/Equipment and Storage Facilities 12. High Slope Protection Plan 13. Method Statement for Construction of Structures	• Contractor upgrades to SESMP; • The Construction Consultant reviews the SESMP and, if necessary, makes adjustments; • IPIG approves the SESMP after review by the Construction Consultant.
Air quality	**Exhaust from construction machinery and equipment**	During construction work, in order to reduce exhaust fumes and atmospheric air pollution, the contractor must ensure the following: • Use of quality fuel; • Use of modern vehicles with improved environmental performance in terms of emissions of fuel combustion products into the atmosphere; • Providing quality maintenance and control of vehicles; • Construction vehicles and vehicles must be kept in good working order; • All construction machines and mechanisms, motor vehicles will operate with serviceable engines, adjusted for the minimum emission of exhaust gases; • Prevent idling of engines by turning off mechanisms that are not used for more than 3 minutes; • Prohibit the use of machinery or equipment that cause excessive smoke emissions; • Use low emission mechanisms; • Install a noise barrier if necessary.	• The contractor is implementing mitigation measures; • Construction Consultant regularly monitors the Contractor's activities.
	Fugitive pollutants from quarries and asphalt and concrete plants	Contractor places conveyor belts against windbreaks (at pits), hoppers unloading hatches must be covered to avoid blowing dust. All conveyor material must be fully covered and combined with the belt cleaning device to avoid blowing dust.	• The Contractor is implementing mitigation measures; • Construction Consultant regularly monitors the Contractor's activities.

Environment	Potential impact	Mitigation measures	Responsible parties
	Dust from unpaved and other roads	The Contractor shall provide the necessary measures to prevent dust formation: • All trucks carrying material must be covered with tarpaulin or other material installed to prevent the transported materials from falling out of the body and blowing away their dust; • Landfills should be rammed as soon as possible to avoid dust formation and blowing away. • In places of constant movement of machinery, the roads must have a hard surface, and • Spraying water (on construction site roads and unpaved sections, roads are watered at least twice a day or more, if necessary at the discretion of the Construction Consultant). These activities should be detailed with a precise indication of the frequency and locations in the Dust Suppression Plan approved by the Construction Consultant. Preliminary sensitive sites for the implementation of dust suppression measures: places within a 30-meter strip from the road, with high and medium grass, during the nesting period of birds (April-May).	• The contractor is implementing mitigation measures; • The Construction Consultant, after review, approves the Dust Suppression Plan; • The Construction Consultant regularly monitors the Contractor's activities.
	Smoke from burning	The Contractor shall not install, without the approval of the Construction Consultant, burners, boilers and similar installations or equipment using any type of fuel that may generate pollutants in the course of work.	• Contractor implements mitigating measures; • Construction Consultant regularly monitors Contractor's activities.
	Open burning of garbage and / or waste	The Contractor shall not allow open burning of debris or other materials without the approval of the Building Official.	• Contractor implements mitigating measures; • Construction Consultant regularly monitors Contractor's activities.
Water quality	**Dust Suppression**	For the implementation of measures for dust suppression the Contractor does not allow the water intake in places not agreed with the relevant authorities and local authorities, as well as not approved by the Construction Consultant	• Contractor implements mitigating measures; • Construction Consultant regularly monitors Contractor's activities
	Contamination by chemicals	During construction work, the contractor must avoid contamination by carcinogenic or any other foreign substances with various chemical compounds, during their transportation or other activities in the process of work in the water, in accordance with the provisions of national legislation of the Kyrgyz Republic.	• Contractor implements mitigating measures; • Construction Consultant regularly monitors Contractor's activities

Environment	Potential impact	Mitigation measures	Responsible parties
	Pollution due to spills of fuels and lubricants, and hazardous materials	During construction work, the contractor must have equipment to eliminate spills of fuel and lubricants and ensure that the following conditions are met: • All fuel and chemical storage facilities (if any) must be located on a watertight base, under the roof protecting from the bad weather, away from water sources and wetlands, and fenced off. The base itself and the walls of the embankments must be capable of withstanding 110% of the storage tanks; • Refueling is strictly controlled and regulated by formal procedures and performed in areas surrounded by the embankment to avoid spills of fuel and potentially hazardous liquids. \ • All valves and guns must be tamper-proof and vandalized, disconnected and locked when not in use. • Containers or barrels shall be clearly marked for their contents. Any contaminants must be avoided from entering water sources. • Disposal of fuel and other potentially hazardous liquids into the ground or into water sources is prohibited. • If accidental spills of fuel and lubricants occur, they must be cleaned up immediately; such materials shall be stored in a safe place provided for the storage of hazardous materials These and other measures to protect water sources should be reflected in the Plan on the Prevention of Surface Water Pollution approved by the Construction Consultant.	• The Contractor implements mitigating measures; • The Construction Consultant, after review, approves the Plan on the Prevention of Surface Water Pollution; • The Construction Consultant regularly monitors the Contractor's activities/
	Cutting and excavation	The Contractor shall not allow excess bulk material to be disposed of into water resources (rivers and any other tributaries/watercourses) if it cannot be used.	• The Contractor implements mitigating measures; • The Construction Consultant regularly monitors the Contractor's activities.
	Drainage	During construction work, the contractor constructs, maintains, removes and replaces, as necessary, temporary drains and takes other safety measures to avoid damage from flooding and wrecking, or from construction sites.	• The Contractor implements mitigating measures; • The Construction Consultant regularly monitors the Contractor's activities.

Environment	Potential impact	Mitigation measures	Responsible parties
	Construction camps and material storage sites	Contractor shall submit documents for approval Site and Camp Management Plan prior to commencing construction camp set-up. A site plan on an appropriate scale. The above documents shall specify: • The location of the site, the necessary surface area and the location of the workers' camp. The Location Plan shall also include details of proposed measures to address adverse environmental impacts resulting from its arrangement. • A wastewater management plan to provide sanitary facilities and a proper wastewater collection and disposal system to prevent pollution of watercourses; • A waste management plan covering provision of waste containers, regular collection and disposal in a hygienic manner, and proposed landfills for disposal of various types of waste (e.g., household waste, used tires, etc.) in accordance with proper standards; • Description and location of equipment maintenance areas and fuels and lubricants storage areas, including distance from water sources and irrigation facilities. Fuel and chemical storage areas shall be located away from watercourses. Such facilities will be confined and provided with impermeable lining to collect spilled fuel and prevent soil and water contamination. Site installations must be inspected for approval prior to work commencing. The selected site must not be on top of a groundwater or near surface water. The main requirements for the Contractor during construction work on water resources are: • Carry out production works during the low water period; • Minimize anthropogenic impact on water bodies and watercourses in fish breeding and feeding areas; • Carry out preventive measures to prevent carcinogenic or any other foreign substances with various chemical compounds, during their transportation or other activities in the process of work in the waters, in accordance with the provisions of the national legislation of the Kyrgyz Republic; • Conduct regular monitoring of watercourses to ensure that there is no negative impact from trucks and other mechanisms that will be used for rehabilitation works; • It is prohibited to discharge wastewater into watercourses and terrain; • It is prohibited to store construction waste in the floodplains of rivers.	• The Contractor implements mitigating measures; • The Construction Consultant, after review, approves the Site and Camp Management Plan; • The Construction Consultant regularly monitors the Contractor's activities.
	Construction of bridges	During the bridge construction, the Contractor shall ensure: • Diversion of streams at bridge abutments; • Installation of cofferdams, silt traps (catchers), or other silt trapping structures; • Dewatering and cleaning of cofferdams to prevent siltation.	• The Contractor implements mitigating measures; • The Construction Consultant regularly monitors the Contractor's activities.
	Arrangement of excavation pits during the construction of man-made structures	Contractor shall ensure: • Restoration of excavation pits upon completion of work in full compliance with applicable standards and requirements; • Contract conditions for opening of excavation pit and use of material are binding; • Extraction from and restoration of excavation pit and surrounding area shall be in accordance with contract; • Reclamation of disturbed land, including, in addition to grading slopes, their sowing with seeds of grasses typical for the area; • No additional excavation pits shall be opened without restoration of unused ones.	• The Contractor implements mitigating measures; • The Construction Consultant regularly monitors the Contractor's activities.

Environment	Potential impact	Mitigation measures	Responsible parties
Soil quality	**Loss of fertile soil layer**	The Contractor shall ensure that adequate measures are taken to prevent irretrievable loss or destruction of topsoil by construction equipment or construction activities. Conservation of the topsoil is a critical task. Topsoil preservation measures shall be described in detail in the Vegetative Layer Management Plan approved by the Construction Consultant. Topsoil shall be removed in the site clearing corridor. It shall be stored for reuse. Long-term topsoil stockpiles will be immediately protected to prevent erosion or loss of fertility. Topsoil in areas to be used as storage for excess construction materials shall be removed and stored for reuse to cover these areas upon completion. In addition, the Contractor will submit a Soil Management Plan detailing measures to mitigate wind and water erosion on stockpiles, measures to minimize loss of topsoil fertility, temporary.	• The Contractor implements mitigating measures; • The Construction Consultant regularly monitors the Contractor's activities.
	Erosion	In order to prevent the development of erosion during construction work, the contractor shall ensure: • When constructing around bridges, the Contractor shall use material least susceptible to erosion, and trenches with ditches or drainage slopes shall be designed for the foot of slopes in undercut sections to divert melt water or rainwater in order to prevent erosion; • Revegetation of bare slopes includes; (i) selection of fast-growing and grazing-resistant plant species; (ii) immediate landscaping of all slopes and embankments if they are not covered with gabions or geotextile material; (iii) placement of fiber mesh to promote plant growth; • Water bodies, rivers, canals, and ditches within and near the project area will be protected from pollution, siltation, or erosion that may occur as a result of construction activities; • Side slope undercuts and embankments will be designed to consider slope stability and soil cover in order to reduce landslide phenomena or erosion during construction; • In order to prevent soil erosion on steep mountain slopes, the project provides for measures to protect against rockfalls, such as covering with stone riprap to protect the river banks from erosion • In the area around km 75+600 and km 4+900, where soils have a low-power, shortened profile and erosion processes are developing, bank protection works are envisaged around the bridges to prevent the formation of gullies, especially as a result of spring mudflows.	• The Contractor implements mitigating measures; • The Construction Consultant regularly monitors the Contractor's activities.
	Pollution due to spills of fuels and lubricants and hazardous materials	In the process of refueling machinery and equipment to avoid spills of fuels and lubricants and other hazardous materials, the contractor must ensure: • Filling by means of hoses with gates at the outlet. When filling, pallets are placed under the closures. The use of buckets and other open utensils for filling is excluded. All valves and guns shall be tamper-proof and vandal resistant, disconnected and locked when not in use; • Clear markings of contents shall be placed on containers or barrels. Any contaminants must be avoided in water sources; • No bitumen containers or barrels should be stored on the open ground - They should be placed on waterproof pallets; • Areas where bitumen is used should be on a solid waterproof surface; • Areas where bitumen is handled should be on a waterproof base.	• The Contractor implements mitigating measures; • The Construction Consultant regularly monitors the Contractor's activities.

Environment	Potential impact	Mitigation measures	Responsible parties
	Construction camps and other auxiliary buildings	The Contractor shall ensure: • Concreting of the floors in all repair shops and warehouses (as part of the construction camp organization); • Storage facilities for fuel and lubricants shall be located at a distance from residential buildings; • Refueling of machines and vehicles shall be performed only on concreted areas; • No parking or leaving vehicles or machinery outside places that have been specifically designated for this purpose; • Before construction camps begin, the Contractor shall remove the soil and vegetative layer and lay it in perimeter; • To prevent dust dispersion, the entire camp area should be covered with gravel; • Для предотвращения рассеивания пыли на всей территории лагеря следует устроить гравийное покрытие; • Only foundations of residential and service buildings should be concreted. Concrete precast blocks should be placed on specialized sites. • Exclusion of the location of construction camps on land that is the habitat of red-listed plant species identified in the project area during field surveys and listed in this report in Section 4.1.2.2: Tulipa tetraphylla Regel (tulip tetraphylla, growing in populations at km 40+000 on stony-cobble slopes among caragana shrubs and at km 52+000 among juniper/jungle-grass communities), Allium semenovii Regel (Semenov's onion, found in small communities along small streams and watercourses of the Karkyra-Turuk-Sary-Jaz road section), Achnatherum splendens (Lasiagrostis) (Trin.) Nevski (Chiy, Achnatherum splendens, found everywhere along the road). When determining locations of construction camps and other ancillary structures, it is necessary to strictly follow the results of botanical studies of the project area, and to ensure the preservation of red-listed vegetation species.	• The Contractor implements mitigating measures; • The Construction Consultant regularly monitors the Contractor's activities.
Noise and vibration	**Noise from construction machinery and equipment**	During the operation of road vehicles, compliance with the permissible level of noise using a noise meter in accordance with Building codes and regulations (SNiP) II-12-77 "Design standards. Noise protection" will be monitored. In order to reduce the noise level from road construction machines and technological equipment, the following measures will be applied: • technical means to combat noise (the use of construction equipment with less noise generation, etc.); • protective acoustic devices (noise insulation, fences, protective covers, etc.); • organizational measures (choice of work mode, limitation of work time, etc.). Areas with sound levels above 85dB will be marked with safety signs, and those working in areas with increased sound levels will be provided with personal protective equipment. When performing mechanized work, the norms for vibration levels should be observed. Only serviceable equipment that meets sanitary standards according to these indicators will be allowed for operation. The operation of machines and equipment will be carried out in modes that provide the most satisfactory hygienic working conditions Only serviceable equipment that complies with sanitary standards will be allowed to operate. Particular attention will be paid to the prevention of harsh noise impacts in undeveloped areas in order to preserve the safety of wildlife. To reduce the level of vibration, the equipment is installed in separate rooms on vibration isolation foundations using shock absorbers made of steel springs and rubber pads. For personal protection against vibration, shoes with thick rubber soles or felt soles, vibration-absorbing gloves, rubber mats and other means are used. The Contractor also ensures compliance with the requirements for the placement of stationary equipment near environmentally sensitive areas. Optimizing noise exposure and the use of protective mechanisms, where appropriate, is carried out according to standard procedures.	• The Contractor implements mitigating measures; • The Construction Consultant regularly monitors the Contractor's activities.

Environment	Potential impact	Mitigation measures	Responsible parties
Relief (topographic conditions)	**Cutting and excavation**	The Contractor shall: • Prohibit disposal into rivers and any tributaries/watercourses of excess bulk material if it cannot be used; • Notify the Construction Consultant about the need to determine a special storage/disposal site for excess material (if not required by the project). This shall be reported to the Construction Consultant to determine a special storage/disposal site; • Temporary and permanent material storage areas must be located on public lands, and under no circumstances must they be dumped on agricultural, fertile, or lands of Special Protected Natural Areas, or any water sources; • In case if construction debris is dumped in one of the specified areas, or silt is washed away there, such pollutant or debris shall be removed immediately and the land and grounds restored to their natural state at the discretion of the Construction Consultant.	• The Contractor implements mitigating measures; • The Construction Consultant regularly monitors the Contractor's activities.
	Slope stabilization	The Contractor shall ensure that the following activities are carried out: • The final design of slopes is carried out in places determined by the Project and Construction Consultant as soon as possible after backfilling them with soil; • Where necessary, planting furrows are arranged on the slopes, where seeds of fast-growing plants peculiar to the area are planted; • Planting of fast-growing seeds of plants is carried out immediately after filling the soil to prevent its erosion; • Construction in areas prone to erosion and flooding is carried out only in the dry period; • Undercuts of side slopes and embankments will be designed to take into account the stability factor of slopes, soil cover on them to reduce landslide phenomena or erosion during the construction phase.	• The Contractor implements mitigating measures; • The Construction Consultant regularly monitors the Contractor's activities.

Environment	Potential impact	Mitigation measures	Responsible parties
	Borrow Pits	When determining quarries, the Contractor shall give preference to placing dumps and quarries on unused land and land not belonging to the category of agricultural land. Land intended for the construction camps shoud not be the habitat of red-listed plant species identified in the project area during field surveys and listed in this report in Section 4.1.2.2: Tulipa tetraphylla Regel (tulip tetraphylla, growing in populations at km 40+000 on stony-cobble slopes among caraga shrubs and at km 52+000 among juniper/jungle-grass communities), Allium semenovii Regel (Semenov's onion, found in small communities along small streams and watercourses of the Karkyra-Turuk-Sary-Jaz section), Achnatherum splendens (Lasiagrostis) (Trin.) Nevski (Chiy, Achnatherum splendens, found everywhere along the road). When determining locations of construction camps and other ancillary structures, it is necessary to strictly follow the results of botanical studies of the project area, and to ensure the preservation of red-listed vegetation species. Upon completion of the construction work, all lands will be recultivated (quarries will be reclaimed) in full compliance with existing norms and regulations. A Borrow Pits Management Plan must be submitted prior to a quarry development. If the Contractor will seek materials from an existing and active quarry, the Contractor must obtain approval from the Territorial Department of the State Committee on Ecology and Climate and local authorities, and take appropriate operational and management measures to minimize impacts to the general environment. On the other hand, if the Contractor opens a new quarry site, official permits from authorized government agencies will also be required. Quarries should be located in environmentally safe locations at least 500 m away from watercourses. In quarries of inert materials, overburden removal should be carried out before any other work in the quarries. Soil must be removed to a depth of 0.5 m and laid along the perimeter of the quarry in the form of embankments 1-2 m high to preserve soil fertility. When reclaiming the soil, the removed soil should be distributed over the entire area of the quarry with the arrangement of slopes of 30° on the sides of the quarry. The entire volume of soil laid out in the form of earth-deposits around the quarry, where they are not physically or chemically affected by construction equipment, should be stored, covered with tarpaulin or other materials that will prevent deflation processes. Alluvial material to be excavated upstream from areas of blocked culvert can be used as base material (for foundation). This material must be inspected by the Contractor and the Construction Consultant for suitability as base material before it is used. The Contractor shall use such material in the first instance prior to the use of any other quarry or soil reserve. In addition, the Borrow Pits Management Plan must include: • Borrow pits capacity and operating hours; • Sequence of development and extraction; • Topsoil stripping and excavation techniques and mechanisms; • Pit operation and schedule; • Mining method and transportation plan, including route(s); • Safety rules and operating hours; • Expected quality of extracted materials; • Topsoil storage/protection measures and environmental protection measures; • Restoration of disturbed land during site decommissioning; • Fee calculation for mobile source emission. When cutting down trees and greenery in the area of the proposed quarry, the Contractor must obtain a corresponding permit from the forestry authority.	• The Contractor, in consultation with the environmental consultant, obtains permits; • The Construction Consultant verifies the existence and correctness of the permits obtained before opening and developing the quarry; • Construction Consultant checks the material for suitability.

Environment	Potential impact	Mitigation measures	Responsible parties
Flora	**Loss of flora**	The Contractor will develop a Tree cutting and planting management plan describing the number of trees and green spaces to be cut and replanted, as approved by the Construction Consultant. In order to preserve the existing flora, the Contractor should: • During construction work, exclude the use of materials and substances that may have an adverse effect on the flora; • Completely prohibit the use of open fires (campfires) in the construction area; • Do not allow unauthorized cutting of trees and shrubs. The cutting shall be carried out only with the permission of the local authorized bodies in the field of environmental protection and forest resource protection; • Exclude spills and leaks during transportation and loading and unloading of fuel and lubricants, discharge of untreated waste water onto the soil and vegetation cover; • During logging, transportation, skidding, and storage of trees, tree-length logs, and logs, the Contractor shall observe the principle of maximum preservation of forest plantations outside the logging site; • All workers are obliged to take precautionary measures during the fire season to prevent dry grasses from catching fire. • On the areas planned for construction needs, where grass, shrubs and woody vegetation have to be removed, native, fast-growing grasses will be sown after the work is completed.	• The Contractor implements mitigating measures; • The Construction Consultant regularly monitors the Contractor's activities.
	Cutting and replanting of trees and greenery/plants	Conifers should be transplanted in early spring or late fall. Larger specimens are better planted in winter with a frozen clump, i.e. digging up the tree in advance and watering the clump with water. The impact on red-listed plant species in the section from km 39 to km 76 of the Tyup-Kegen road, found in two places on an area of approximately 15 m^2. They grow among shrubs planned to be cut down for road construction. In this regard, the Contractor needs to replant the tulips to another safe location prior to the start of construction works in this area as recommended by the Construction Consultant, as well as the authorized body on environmental protection, and National Academy of Sciences of KR. The schedule of construction works at ghe task specific area, combined with the factor of required time of replanting of red-listed vegetation should be taken into account.	• The Contractor implements mitigating measures; • The Construction Consultant regularly monitors the Contractor's activities.
Fauna	**Loss of fauna**	In order to prevent exposure and loss of animals and other fauna, the contractor must: • Fence around bird nesting sites and rare species habitat; • Restrict construction activities during breeding and nesting periods; • Equip work areas with fences, reflectors that deter animals; • Prohibit vehicle traffic off highways; • Categorically prohibit illegal hunting, fishing in rivers, and cutting trees during the entire project period; • Dispose of food waste to avoid attracting predators. • It is advisable to provide for the transfer of anthills in cases where they fall into the areas of destruction of the soil cover when straightening sections of the road.	• The Contractor implements mitigating measures; • The Construction Consultant regularly monitors the Contractor's activities.
Poaching / Unauthorized Unsanctioned cutting of trees	**Poaching**	The Contractor ensures the prevention of poaching by conducting information campaigns among the Contractor's personnel.	• The Contractor implements mitigating measures; • The Construction Consultant regularly monitors the Contractor's activities.
	Unsanctioned cutting of trees	• The Contractor shall perform tree cutting activities in accordance with the Tree cutting and planting management plan; • No unauthorized cutting of trees by the Contractor shall be allowed. Otherwise, the Contractor shall be fully responsible for compensatory measures.	

Environment	Potential impact	Mitigation measures	Responsible parties
Waste and pollutants	**Solid and liquid waste**	The Contractor shall develop a Liquid and Solid Waste Management Plan for the quality management of solid and liquid wastes and minimize impacts from them. The Contractor shall ensure: • Collection of wastes separately by type and hazard class into containers (containers, barrels, etc.) specially designed for this purpose; • Placement of all types of wastes that are not recyclable in places agreed with the Department of Disease Prevention and State Sanitary Epidemiological Surveillance (DGSN) and the State Committee on Ecology and Climate; • Timely removal of generated and accumulated waste suitable for further transportation and recycling to specialized enterprises; • Collection and burial of solid household and some industrial waste at an authorized dump; • Waste oils and oily rags will be removed under the contract to specialized organizations. • No burning of waste is allowed; • Training of all personnel in waste management practices and procedures as part of the environmental process • Keeping construction sites clean and tidy, and providing everything necessary for the temporary storage of all waste until final removal.	• The contractor, in cooperation with the Department of Disease Prevention and State Sanitary Epidemiological Surveillance, determines waste disposal sites, and implements mitigating measures; • Construction Consultant approves Waste Management Plan; • The Construction Consultant regularly monitors the Contractor's activities;
	Hazardous waste	Hazardous waste management, handling and disposal regulations shall be written into the Contractor's Waste Management Plan. Hazardous waste disposal sites shall be coordinated with the State Committee on Environment and Climate. The Contractor shall collect carbon-containing waste, including oils, for safe removal, recycling or disposal at temporary storage sites, or transfer them to a licensed operator.	• Contractor in agreement with the State Committee on Environment and Climate determines the disposal sites for hazardous wastes;
	Pollutants and other hazardous substances	Under no circumstances should excess material be disposed of without the approval of the Construction Consultant. Excess material may not be discharged into rivers or streams. Approval of the Engineer and Ecologist is required.	• The Contractor implements mitigating measures; • The Construction Consultant regularly monitors the Contractor's activities.
Land use	**Construction camps and other auxiliary buildings**	• The Asphalt plants/Crushing and screening plants should be located at a safe distance from populated areas and other sensitive areas, and protected areas (not less than 500 m). The exact location shall be reflected by the Contractor in the C-ESMP after agreement and approval by the Construction Consultant; • The location of the construction camp shall be reflected in the C-ESMP in consultation with the Construction Consultant. In this case, the Contractor shall develop a Construction Camp Plan describing: (i) use and disposal of wastewater, fuels and lubricants, solid and liquid wastes; (ii) refueling, storage and disposal of construction and other materials, fuels and lubricants, chemicals; (iii) equipment, use and management of restrooms; (iv) other non-essential aspects; • The contractor is responsible for restoring the used area to an optimum condition within a specified time frame.	• The Contractor implements mitigating measures; • The Construction Consultant approves Construction Site and Camp Management Plan; • The Construction Consultant regularly monitors the Contractor's activities.

Environment	Potential impact	Mitigation measures	Responsible parties
Traffic Safety	**Closure of roads and development of possible detour roads**	The contractor will develop a Traffic Management and Safety Plan, especially for sensitive receptors, by installing the necessary safety measures, as specified in the design or technical specifications, to ensure community safety and traffic safety during construction activities, taking into account: • Safety barriers; • Road signs; • Road crossings; • Speed bumps; • Speed limits; • Flagger if necessary; • Public awareness about the scope, schedule of construction work, anticipated violations, and access restrictions. In the course of construction work, when constructing bypasses, the Contractor must not affect Specially Protected Natural Areas and other sensitive sites.	• The Contractor implements mitigating measures; • Construction Consultant approves the Traffic and Safety Control Plan; • The Construction Consultant regularly monitors the Contractor's activities.
Infrastructure	**Power lines**	The contractor will ensure coordination of its activities during construction works to avoid disconnection of all power lines, including temporary lines. During relocation of poles, the Contractor will adjust temporary line disconnections according to its work plan.	• The Contractor implements mitigating measures; • The Construction Consultant regularly monitors the Contractor's activities.
	Water supply	The contractor will not affect the water supply infrastructure during construction work.	• The Contractor implements mitigating measures; • The Construction Consultant regularly monitors the Contractor's activities.

Environment	Potential impact	Mitigation measures	Responsible parties
Occupational Safety and Health	**Health and safety of workers**	The Contractor shall employ a health and safety specialist who will implement measures in accordance with the Health and Safety Management Plan developed by the Contractor and approved by the Construction Consultant. In order to ensure occupational safety, the following must be provided: • Adequate medical facilities and personnel (including first aid facilities) on construction sites, should be accommodated for the doctor's visit, who will visit regularly and as necessary; • Training of all Contractor personnel in basic sanitation and health, general health and safety issues, taking into account the specifics of work; • Personal protective equipment for workers, such as safety boots, helmets, gloves, protective clothing, goggles and ear protection in accordance with Kyrgyz law; • Clean drinking water for all employees; • Adequate protection for the general public, including safety barriers and hazard markings; • Safe access to the construction site for people whose places of residence and access are temporarily disrupted by road construction; • Adequate drainage in the camps to avoid forming of the stagnant pools and puddles; • Sanitary restrooms and garbage containers on the construction site, which will be cleaned when the capacity of contractors is reached to prevent an outbreak of disease; • Conducting monthly safety meetings, and conducting daily safety briefings, unless otherwise provided for by the Construction Consultant; • Regular inspections to routinely inspect, test and maintain all safety equipment, falsework, handrails, working platforms, mounts, ladders and other means, lifting, lighting, signaling and safety equipment; • Lighting and markings must not be obscured and must be legible. Equipment that is dirty or out of place must be repaired immediately and put back in place; • Asbestos-cement waste must be dismantled by workers in PPE (respirator, gloves and goggles) to avoid adverse effects on the health of workers (asbestosis). The contractor will cooperate with local health authorities and must enter into an agreement with them for the use of hospitals and other facilities.	• The Contractor implements mitigating measures; • The Construction Consultant approves the Health and Safety Management Plan and related training programs and regularly monitors the Contractor's activities.
	Occupational safety	The Contractor shall ensure: • Preferential provision of jobs for the poor from the local population; • A categorical prohibition on the use of unskilled and semi-skilled foreign labor while local unskilled and semi-skilled labor is available; • Payment of legal wages to workers; • Non-use of child labor: in order to avoid risks associated with child labor, the Contractor will use age verification procedures based on identity document provided; when hiring young people - taking into account the provisions of “Children's Code of the Kyrgyz Republic”, indicating that employee can be an adult person over the age of 18. Contractor can sign an employment contract only to an adult. • To not use child labor or slave labor (human trafficking) in construction and road maintenance activities; • Inclusion of women as well as the poor in local labor force groups; • Eliminating the possibility of different remuneration for work for women and men for equal work; • Using locally produced and locally sourced materials in the road rehabilitation process for as long as possible; • Asbestos-cement waste must be dismantled by workers in PPE (respirator, gloves and goggles) to avoid adverse effects on the health of workers (asbestosis).	• The Contractor implements mitigating measures; • The Construction Consultant regularly monitors the Contractor's activities.

Environment	Potential impact	Mitigation measures	Responsible parties
	HIV/AIDS	Contractor will ensure that workers are aware of measures to counter the spread of HIV/AIDS. In addition, the Contractor shall ensure that the personnel undergo medical examinations for HIV/AIDS at least once a year. It shall be a prerequisite of employment that all workers have a medical certificate for HIV/AIDS. The Contractor's medical officer shall provide education and information to workers about STDs and HIV/AIDS as a health and safety program in construction camps during the construction period.	• The Contractor implements mitigating measures; • The Construction Consultant approves appropriate training programs and regularly monitors the Contractor's activities.
	COVID-19	Contractor develops the COVID-19 Prevention Plan based on the World Bank's Interim COVID-19 Guidelines and Kyrgyz Republic regulations governing COVID-19 prevention activities The Contractor is required to: • Agree with local health authorities to use hospitals and other medical supplies to respond to COVID-19 cases; • Provide personnel with personal protective equipment and compliance with the sanitary regime in the field and on the territory of the construction camp, asphalt and concrete plants and other construction sites, as well as at the entrance and exit to construction sites (masks, sanitizers, thermometers, etc.). • Conduct COVID-19 response training, • Prevent personnel from leaving the territory of the construction site unnecessarily; • Limit staff contact with local communities.	• The Contractor implements mitigating measures; • The Construction Consultant approves the COVID-19 Prevention Plan; • The Construction Consultant regularly monitors the Contractor's activities.
	Social and Gender Aspects	• Local norms and customs will be followed. • Contractor's team will not enter the communities/populated areas located nearby the construction areas. • Communication with the community will be supported. • World Bank guidance will be used to address potential impacts caused by the temporary influx of labor force. • The World Bank Gender-Based Violence (GBV) Manual will be used to address potential impacts caused by temporary labor influxes resulting from the Project. • The Contractor will prepare and implement a Code of Conduct for its staff. • All contractor staff will be instructed and trained on the Code of Conduct. Information materials will be used as needed. • Contractor camps will be located at a remote distance from communities. Contractor staff access to local communities will be minimized as much as possible/appropriate. • GRM will address community grievances related to social risks.	• The Contractor implements mitigating measures; • The Construction Supervision Consultant regularly monitors the Contractor's activities
	Damage to pastures	• Worker Camps will not be placed on the cultivated areas. • Any damage caused by the camps will be compensated.	• The Contractor implements mitigating measures; • The Construction Supervision Consultant regularly monitors the Contractor's activities.

Environment	Potential impact	Mitigation measures	Responsible parties
	Social conflict due to the influx of labor force.	• Local norms and customs will be respected. • Communication with the local community will be supported. • World Bank Guidelines will be used to address potential impacts caused by temporary labor force influx. • The World Bank Gender-Based Violence (GBV) Guidelines will be used. • All contractor staff will be briefed and trained on the Code of Conduct. Information materials will be used as needed. • The involvement of contractor staff in local communities will be minimized as much as possible/appropriate. • GRM described earlier will also address community grievances related to social risks.	• The Contractor implements mitigating measures; • The Construction Supervision Consultant regularly monitors the Contractor's activities.
Disaster/emergency risk management	**Response to natural and man-made emergencies**	The Contractor ensures the implementation of measures to respond to natural and man-made disasters in accordance with the SSEMP, namely the Emergency Response Plan. On the territory of the construction camp, as well as other construction sites, there must be evacuation plans in the event of a threat or emergencies, fire shields with serviceable fire extinguishers and other relevant equipment On the sections from 55 to 70 km of the road, where heavy snow drifts are observed, provide for the installation of snow retention fences of various types. In places where the direction of the wind is not constant and subject to frequent changes, provide snow barriers on both sides. Provide for an increase in the height of the road embankment in order to ensure the transfer of snow and reduce its accumulation on the road. Contractors will also be responsible for preparing a response plan in case of man-made emergencies, which will cover containment issues in the event of spills, spread or spillage of hazardous materials or liquids, including fuels and lubricants, and accidents at work facilities. This plan will detail the disaster management process and the involvement of the appropriate organizational structure of the contractors (including authorized personnel). The plan will be submitted to the MoTC / IPIG for consideration and the Construction Consultant for approval. Implementation will be monitored by IPIG and the Construction Consultant. Any emergencies and their management process will be reflected in monthly reports on the current situation at the construction site.	• The Contractor implements mitigating measures; • Construction Consultant approves Emergency Response Plan; • The Construction Consultant regularly monitors the Contractor's activities.
Historical and cultural heritage	**Preservation and protection of objects of historical and cultural heritage (OHCH)**	During construction works, the Contractor shall protect and preserve the historical and cultural heritage in accordance with the developed Cultural and Historical Sites Management Plan approved by the Construction Consultant. At the same time, the Contractor should appoint (hire) an appropriate archaeological specialist with the necessary permits and documents to carry out the excavation of the historical and cultural heritage sites. The Contractor shall ensure that: ▪ In case of an accidental find/discovery of the OHCH during excavation, all work are stopped. The contractor should report the results to the local executive authorities or some other competent agency (Ministry of Culture, Information, Sports and Youth Policy of the KR, Institute of History and Cultural Heritage, National Academy of Sciences of the KR, Faculty of History, Balasagyn Kyrgyz National University); MoTC KR; ▪ In order to avoid stopping the construction work, the preservation and protection of OHCH must be taken into account at the planning stage; ▪ To protect these cultural sites, physical barriers must be arranged (fencing); ▪ Warning and information signs for workers should be put; ▪ It is necessary to educate the Contractor's staff on the strict prohibition of physical destruction, desecration and contamination of OHCH; ▪ All road equipment must be used in the area designated for construction; ▪ Exclude works on sites of cultural and historical interest without the permission of the Construction Consultant; ▪ During construction work, a traffic control specialist must be assigned to prevent physical damage to machines and machinery. In addition, the Contractor shall apply techniques during construction works (vibration) with minimal or no vibration impact on any cultural, historical or archaeological structures along the road. A physical cordon should be installed around certain areas to minimize construction impacts and to prevent workers/people from disturbing archaeological excavations.	• The Contractor implements mitigating measures; • Construction Consultant approves Cultural and Historical Sites Management Plan; • The Construction Consultant regularly monitors the Contractor's activities.

Environment	Potential impact	Mitigation measures	Responsible parties
	Emergency archaeological excavations and documentation (41 burial mounds according to the report of the archaeologist) ▪ burial ground Sary-Tologoy 2 (5 out of 26 burial mounds); ▪ burial ground Sary-Tologoy (5 out of 11 mounds), ▪ burial ground San-Tash (3 out of 64 burial mounds); ▪ burial ground San-Tash 2 (3 out of 9 burial mounds); ▪ burial ground Taldy-Bulak (1 mound out of 4); ▪ burial ground Karkyra 6 (2 out of 2 mounds); ▪ burial ground Karkyra 5 (5 out of 9 mounds); ▪ burial ground Karkyra 4 (3 out of 3 mounds); ▪ burial ground Karkyra 2 (7 out of 7 mounds); ▪ Karkyra burial ground (4 out of 4 burial mounds); ▪ destroyed burial mounds (3 burial mounds).	The Contractor shall ensure that excavations are carried out in accordance with the requirements of Kyrgyz legislation by an appropriate archaeological specialist who has the necessary permits and documents to carry out excavations of objects of historical and cultural heritage.	• The Contractor implements mitigating measures; • The Construction Consultant regularly monitors the Contractor's activities.

Table 46. *Mitigation plan for the operational phase*

Sphere	Potential impact	Mitigation measures	Responsible parties
Air quality	**Air pollution**	The organization that receives the road on its balance (Road Maintenance Unit-4) must: • Prohibit the burning of debris formed along the length of the road; • Ensure the normal functioning of the road; • In case of breakage or damage to the roadway, ensure timely repair of the road; • Eliminate traffic jams caused by traffic accidents on the road; • Prohibit idling of vehicles, etc.	• RMU-4 (Road Maintenance Department), local authorities, MOTC KR, State Inspectorate for Environmental and Technical Safety under the GKR
Water quality	**Pollution of water sources**	The organization that receives the road on its balance (Road Maintenance Unit) must: • Ensure the operation of public toilets in compliance with sanitary requirements, clean the territory of toilets and parking lots. • Timely remove wastewater from public toilets as they are filled; • Ensure proper management of waste generated along the constructed road and in public toilets, which would otherwise entail the spread of waste along rivers and surrounding areas.	• RMU-4 (Road Maintenance Department), local authorities, MOTC KR, State Inspectorate for Environmental and Technical Safety under the GKR
Soil	**Soil and ground contamination**	The organization that receives the road on its balance (Road Maintenance Unit) must: • Ensure the operation of public toilets in compliance with sanitary requirements, clean the area of toilets and parking lots. • Ensure proper management of waste generated along the constructed road and public toilets; • Timely remove garbage from toilets to authorized landfills under the signed contract.	• RMU-4 (Road Maintenance Department), local authorities, MOTC KR, State Inspectorate for Environmental and Technical Safety under the GKR
Flora and fauna	**Loss of animals**	installation of road signs, including for the dispersal of animals. In case of their damage, timely restoration.	• RMU-4 (Road Maintenance Unit), local authorities, MOTC KR, State Inspectorate for Environmental and Technical Safety under the GKR
	Loss of trees	Maintaining newly planted trees.	
Noise	**Reduction of noise to a permissible level**	Limit vehicle speed to 70 km/h within sensitive receptors/populated areas. Must be adjusted in cooperation with the traffic police.	• Department of Internal Affairs of MIA KR, RMU-4 (Road Maintenance Unit), local authorities, MOTC KR, State Inspectorate for Environmental and Technical Safety under the GKR

Chapter 9. Institutional Arrangements

This chapter describes the role, authority and responsibility of state bodies and other agencies involved in preparation and implementation of the Project.

Institutions and their responsibilities

№	Agencies	Role, authority, responsibility
1	World Bank	The overall mission of the World Bank in the Kyrgyz Republic is to reduce poverty by improving infrastructure facilities, promoting economic growth, and providing credit and grant assistance for successful project implementation. Support for project implementation. Guidelines for the preparation of the ESIA. Approval of the ESIA. Disclosure of the ESIA in World Bank publications and website. Issuance of a letter of no objection to start construction works
2	Cabinet of Ministers of the Kyrgyz Republic	The Cabinet of Ministers of the Kyrgyz Republic approves the composition of the delegation for negotiations between the Kyrgyz Republic and the Donor Bank, determining the timing, location of negotiations and issues of financing promising projects. Also conducts the necessary domestic procedures for approval of the draft agreement and its further ratification by the Jogorku Kenesh (Parliament) of the Kyrgyz Republic. Issuing a decree on the transformation of state lands for the implementation of the project.
3	Jogorku Kenesh (Parliament) of the Kyrgyz Republic	The agreed draft resolution of the Cabinet of Ministers of the Kyrgyz Republic is sent to the relevant committees of the Jogorku Kenesh together with other documents on the draft for ratification. The Jogorku Kenesh of the Kyrgyz Republic conducts the ratification procedure in accordance with the "On International Treaties of the Kyrgyz Republic".
4	Ministry of Finance of the KR	Budget allocation. The Ministry of Finance is the responsible government body for coordination with the World Bank and other donors.
5	Ministry of Transport and Communications of the Kyrgyz Republic (MoTC)	Initiation and preparation of the project. Responsible for project implementation plans, timely development of project funds. Coordinates and monitors the implementation of the project. Organization of regular meetings with donors to discuss the implementation of the project. Manage and ensure the procurement process for the project implementation. Implementation of necessary procedures in accordance with the legislation of the Kyrgyz Republic related to allocation of land for construction. Responsible for ensuring inter-agency coordination and communication with relevant government agencies involved in project implementation. Responsibility for the overall implementation of the ESIA.
6	Investment Projects Implementation Group (IPIG)	The IPIG was established by order of the Ministry of Transport and Communications of the Kyrgyz Republic. The main objectives of the IPIG are to assist the MoTC KR in project preparation and implementation, as well as technical cooperation projects in the field of road infrastructure development financed by international financial institutions. The IPIG is responsible for project coordination as well as for the administration of activities on: financial management, reporting, environmental and social management, procurement and contract management of all components, etc. IPIG under the direct supervision of the MoTC KR is responsible for project implementation, also procedures related to public land transformation, environmental and social assessment, social and environmental impact assessment and mitigation measures during project implementation. Ongoing supervision and monitoring of the project is entrusted to IPIG staff, in particular,

		specialists on protective measures (sociologist/protective measures specialist and ecologist/environmental specialist). Responsible for consultation with local communities in the project area. Assist the Consultant in the preparation of the ESIA and in the disclosure of the ESIA and the implementation of the ESIA. Prepare a report on the ESIA implementation process and a completion report.
7	State Committee on Environment and Climate of the Kyrgyz Republic (SCEK)	Responsible body for environmental policy and coordination of environmental protection activities during project implementation. Its functions include: • Development of environmental policy and its implementation; • carrying out state environmental impact assessment; • issuing environmental licenses; • environmental monitoring; • Providing information services on the environment. Approval of the project documentation.
8	Bodies of local self-government (regional state administration, district state administration, ayil okmotu)	Issuance of consent decrees for the transfer (transformation) of lands from one category to another for the implementation of the project. Preparation of relevant documents for the state institution "Cadastre". Representatives of local authorities will be involved in the process of project implementation. Successful implementation of the project will require close coordination of IPIG activities with local authorities, which will assist IPIG in the following: ▪ Disseminating information regarding the ESIA; ▪ Participating in the resolution of complaints and assisting in the resolution of complaints; ▪ Receiving information about any unintended impacts.
9	State Enterprise “Cadastr”	Considers the land management file and develops a draft resolution of the Cabinet of Ministers of the Kyrgyz Republic on the transformation of land from one category to another.
10	Grievance Redress Group	Timely reviewing and resolution of complaints during project implementation. Registration of all incoming complaints and appeals. Compliance with the grievance procedure and their monitoring.
11	RMU-4	Prior to the start of construction works, RMU-4 transfers the project road to Contractors. During the construction period, the Contractor is responsible for the Project Road. The project road will be accepted by RMU-4 after the completion of construction works together with the commission. RMU-4 will be involved in the issues of: location of pits; reclamation, dumps, etc. It will also take into its balance the entire old road infrastructure, which is on the project road (old asphalt, reinforced concrete products, pipes, fences, road signs and others). Further, after the construction is completed and the roads are accepted transfer of ownership, RMU-4 will be responsible for ensuring the preservation of roads, which includes a set of measures to prevent premature destruction and deterioration of the roadway, roadbed, artificial structures and road improvements.
12	Consultant for the preparation of the ESIA	The ESIA Consultant performs studies on the environmental and social impacts in the project area and mitigation measures during the construction works to be implemented by the Contractors. The Contractor's implementation of the mitigation measures will be monitored by the Construction Supervision Consultant throughout the construction period. IPIG shall assist in the preparation of an Environmental and Social Impact Assessment (ESIA).

Chapter 10. Public Consultations and Disclosure of Documents

The first public consultations were held by the Executive Agency with the participation of the Tyup District State Administration, the heads of ayil okmotu located along the Tyup-Kegen road, representatives of the Tyup Forestry, RMU-4 and other stakeholders on April 24, 2018 in Tyup village to discuss the ESIA prepared in within the framework of the planned Project CARs-3, including the rehabilitation of the Tyup-Kegen road (section km 39 - km 76, Sary-Tologoy village to the «Karkyra-avtodorozhniy» checkpoint and the local adjoining road leading to the tourist camp, 13 km).

To update and finalize the ESIA prepared in 2018, the Consulting Company "Proyapi Engineering & Consultancy" Company carried out the collection and updating of data, consultations with stakeholders in the project area.

One of the types of stakeholder consultations was interviews with key persons and focus group discussions in order to obtain information and conduct social analysis related to assessing the benefits and benefits of the upcoming project.

Both methods provided important information about the needs of the local population, identified significant issues that need to be considered in the implementation of the project, and established the basis for taking mitigation measures. Below is a detailed description of these activities.

For the survey, a circle of people was identified who knew the social aspects of the project area well enough. These are: government officials, village leaders, a local kenesh deputy, a village head, a member of the youth movement, the head of the Group of Family Doctors (GFD), a senior inspector of the Road Safety Department.

10.1 Opinions of key persons regarding the planned road reconstruction

Key persons interviewed noted the main problems of settlements in the project area as follows:

- The road has long deteriorated, is outdated, has lost its reliability and needs urgent rehabilitation. Accidents are more frequent due to sharp turns, snow drifts and bad weather conditions. Due to the poor road, especially in winter, transport links to the villages of San-Tash and Karkyra are reduced, often even stopping;
- Lack of special equipment for clearing snow on the roads also makes it difficult to drive. Difficulties in transporting hay from hayfields due to the narrow and emergency road;
- Drinking water is brought into houses from mountain rivers and springs, but in rainy weather the water is dirty;
- Lack of agricultural machinery during the period of arable work and harvesting, it is necessary to hire agricultural machinery from the Chui Province and from other regions;
- New families appear, there is no land for building houses because of the moratorium on the transformation of agricultural land;
- There are no kindergartens;
- Unemployment.

Significance of the Tyup-Kegen Road for the population:

- The road is important for the entire population of Kyrgyzstan, especially for the entire Issyk-Kul region. The road will contribute to regional development, improving the socio-economic situation of the local population;
- Tyup-Kegen is the main strategic road for the development of trade and tourism;
- Farmers bring their agricultural products to the markets of the Kegen region (Kazakhstan) for sale;
- In the period from May to October, when the «Karkyra-avtodorozhniy» checkpoint is functioning, tourists come to the Ak-Sai Travel alpine camp, to rest on the Issyk-Kul Lake. For tourists from Kazakhstan, this is a shorter, more direct, more convenient route;
- Reconstruction of the Tyup-Kegen road will improve transport links between Kyrgyzstan and Kazakhstan. This will increase the flow of tourists. Jailoo - tourism will develop. There are many tourists coming from Kazakhstan for kumis treatment.

On possible environmental issues that may arise during and after road rehabilitation

On environmental problems that may arise during and after the rehabilitation of the road, interviewees noted that quarries will be used to rehabilitate the road. After the use of quarries, there are risks that the reclamation (restoration) of land disturbed in the process of excavation will not be carried out. For example, when Tyup-Kegen road was made (km 0 to 39) there was no reclamation of land after the use of quarries. Gravel and sand extraction sites were in the village of Baizak. The company “TERA Group” was engaged in the construction. This was around 2013-2014. Sometimes there were cases when livestock fell in places previously used as quarries.

Wishes to road designers

During the meetings with the staff of the San-Tash ayil okmotu, focus group discussions and interviews with key people, the wishes of people to the road designers were expressed and these wishes of the residents of the project sites were taken into consideration. These are the following:

- In the village of Sary-Tologoy, installation of bus stops on both sides;
- Construction of a parking lot at the San-Tash mound complex (Tamerlane Stones);
- In the village of San-Tash - installation of a bus stop on both sides, sidewalk and lighting;
- in the village of Karkyra, located at the 70th kilometer, at a fork, construction of a parking lot, lighting, sidewalks;
- In the area of the “Karkyra-Avtodorozhniy” checkpoint - construction of a parking lot;
- In the area of the tourist camp - construction of a car park, sidewalk and lighting.

10.2 Opinions of the participants in the focus group discussions

The purpose of the focus group discussions: to identify public attitudes towards the reconstruction of the project road, opinions and expectations regarding the implementation of this project.

Discussion venues

The first focus group discussion (FGD) was held in Baizak village in the administration building of the San-Tash ayil/okmotu. The second one was held in San-Tash village in the school building.

Photo 13. Focus - group discussion in Baizak village, March 18, 2021

Photo 14. Focus group - discussion in the village of San-Tash, March 18, 2021

Composition of participants

Farmers, village heads, doctors, deputies of ayil kenesh, specialists of ayil okmotu, pensioners, leader of youth movement, school directors, librarian, teachers, and housewives participated in the discussion. In total 38 people participated in focus group discussions, of which: men - 26, women - 12. The duration of the discussions was 1.5 and 1.2 hours.

Project Information

Participants of the discussions were informed that the Ministry of Transport and Communications of the Kyrgyz Republic, as the Executive Agency, started implementation of the Project: Third Phase of the Central Asia Regional Links Program (CARs-3), under which the reconstruction of the road Tyup - Kegen is envisaged. The project road has a length of about 52 km:

- section of the road with a length of 37 km village Sary-Tologoy to the «Karkyra-avtodorozhniy» checkpoint on the border with the Republic of Kazakhstan (from km 39 to km 76, the first section) and
- local adjoining road Karkyra-Turuk-Sary-Jaz with a length of 13 km, which leads to the Ak-Sai Travel camp in the Karkyra gorge (second section of the road).

Use of the Tyup-Kegen road:

- This is the only road that connects the villages of the San-Tash ayil/okmotu with the district and regional centers;
- Farmers harvest hay (natural haymaking) in the Karkyra pasture and are transported home along this road;
- Residents who graze livestock in the Karkyra alpine pasture transport wagons and yurts along this road;
- Local merchants bring flour, vegetable oil, fuels and lubricants from Kazakhstan.

Problems related to the condition of the road:

- Due to the harsh climatic conditions and poor road, in winter cold, transport links to the villages of San-Tash and Karkyra are reduced, often even stops;

- Frequent vehicle breakdown;
- Winding and bad roads, snow drifts affect road accidents;
- Lack of special equipment for clearing snow on the roads also creates difficulties in the movement of the population;
- Difficulty transporting hay from hayfields due to winding road sections and sharp turns.

The difference between women's and men's trips. Benefits of the upcoming project for women

The participants in the discussions noted that women's trips differ from men's trips in that women, when they go somewhere, as a rule, they take more luggage and carry-on luggage. Women, when traveling, take their children with them and are more responsible for looking after children, and especially small ones. Therefore, travel for women is more difficult than for men.

Women are more likely to visit children who study in the regional center, Bishkek. They often accompany elderly relatives to doctors in the city of Karakol (regional center), go to buy groceries and other goods.

The participants noted that women are also active during pregnancy and travel for various purposes. Traveling pregnant women on a bad road creates certain difficulties for them. It also distinguishes trips for women and for men.

The participants in the discussion concluded that the improved road would benefit everyone: doctors who travel monthly to submit reports to the district center; teachers who go to different seminars; pensioners and recipients of benefits, as pensions and benefits are received in the regional center, at an ATM; municipal employees who often travel to participate in district and regional meetings, events; and AA residents who go to buy groceries, to the bazaar, to the hospital and on other matters to the district and regional centers.

10.3 Public consultations on of the updated ESIA disclosure

On July 24, 2021, the Consultant together with IPIG/MOTC KR held public consultations on discussion of the results of Environmental and Social Impact Assessment (ESIA) with all stakeholders, including LSGs, local communities, government organizations and institutions, NGOs, and media in the district center of Tyup district (Tyup village) and in San-Tash ayil/okmotu (Baizak village). Of the 56 participants, 38 were men and 17 were women.

The purpose of the public consultation was to release the Environmental and Social Impact Assessment (ESIA) document.

Prior to the public consultation, the participants were registered with their name, title, address and telephone number.

Invitation to participate in the public consultation was made by:

- Invitation published on the IPIG website, July 09, 2021, 2 weeks before the scheduled hearings;
- Preparation and mailing of official letters to regional and district state administrations and other relevant services, as well as representatives of the civil sector;
- Oral invitations by phone.

In addition, for the purposes of public awareness and to attract as much public attention as possible, the Executive Agency was assisted by the local executive authorities to participate in the activities.

Participants were given booklets about the project in Kyrgyz and Russian, which contained key information about the project, its goals, objectives, identified environmental and social impacts and mitigating measures to be implemented during construction activities. The presentation was presented by the representative of the IPIG/MOTC.

Participants were informed that in 2022 the construction of the Tyup-Kegen road will begin, which will improve regional transport links with Kazakhstan. The improved road will also have a positive effect on the development of tourism in the Issyk-Kul region. The project provides for the reconstruction/rehabilitation of the Tyup-Kegen road from km 39 to 76, between the village of Sary-

Tologoy in Kyrgyzstan and the settlement of Kegen in Kazakhstan (the Karkyra - road border crossing point on the Kyrgyz-Kazakhstani section of the state border) and a section of the road leading to the mountain tourist camp with a length of about 13 km. The participants of the public consultations were also informed that the construction plans include the construction of 1000 meters of road connecting the main road to the historical monument San-Tash ("Stones of Tamerlane"), which is a cultural heritage site.

The participants were informed that according to the project implementation plan, the construction works are planned to start next year, in spring, after the selection of the contractor, under appropriate weather and climatic conditions.

Participants received information about the ESIA document, including project benefits, current environmental and social conditions, and expected environmental and social impacts, as well as measures for the protection and preservation of historical and cultural heritage sites (HCPHS).

The most important part of the ESIA report, the Environmental and Social Management Plan (ESMP), includes a number of mitigation and monitoring activities to be undertaken during project implementation.

At the public consultations, participants were mainly interested in engineering and environmental issues. There were few comments on social issues, as earlier, during the field works, there were formal and informal meetings with the staff of ayil okmotu (village administration), focus group discussions with the local population, interviews with key persons, in which a number of issues were considered in detail and removed. Public consultations on social issues were also held earlier, on June 10, 2021, in 4 settlements of the project area. Minutes of these public consultations are attached to the main document.

In response to questions from participants about trees and shrubs to be cut down due to road widening, the WB IPIG officer noted that the cutting of trees where they grow on slopes to be trimmed will be done with the maximum preservation of existing arrays and reduction of the number of trees to be cut down. Where this cannot be avoided, compensatory planting will be budgeted for on a 1:3 basis. During the implementation phase, the Construction Supervision Consultant will strictly monitor this area. Payments for contractors' work will be stopped until the reforestation work is completed in full.

The project specialist also explained the situation on types of juniper - Zeravshan, semi-spherical, creeper and levels of value of its different species, and in this regard she shared information that creeper juniper has low value, in connection with which its cutting will not entail high costs or will not require planting of compensatory plants. The KyrgyzForestry State Institution will develop a Forest Management Plan for this area, which will guide contractors and district forestry staff in their work to restore forests impacted by construction activities.

Dangerous winding road sections where snow drifts occur in winter. According to the project, the project engineer explained, the longitudinal profile of the road will be raised to a height of 0.7-0.9m, that is, above the existing profile. Snow protection barriers will be installed (4 units of shields, 40 meters each), snow protection strips will be planted. In addition, as noted by the employee of IPIG/MOTC, the project plans to purchase snow protection equipment and machinery.

Roadside parking lots. Project staff explained that the project includes sidewalks, parking lots, and stops. These were not originally included in the project, but were later incorporated at the request of residents in the project areas.

Drilling during construction to widen the road. The project specialist explained that drilling and blasting works are not foreseen on the roadway, it is planned to use a hydraulic hammer, as it is better and safer.

The Karkyra-Turuk-Sary-Jaz road section will have parameters according to the IV-technical category, the project specialist explained. At the historical and cultural complex of San-Tash ("Stones of Tamerlane") a road with all the necessary infrastructure will be constructed, where a parking lot and a public toilet will be provided.

Locations of the quarries. The IPIG/MOTC officer provided information on the proposed locations of quarries, asphalt plant/diesel treatment plants, and contractor camps. The participants were also informed that due to the division of the project site into two lots, two asphalt mixing plant/distribution plant and two contractor camps are to be arranged. Joint visits to the project site by representatives

of the San-Tash Ayil Okmotu, Tyup Mechanized Forestry, consulting company and WB IPIG were conducted to agree on the use of the proposed quarries, as well as the location of the above-mentioned facilities. All suggestions and comments from the San-Tash Ayil Okmotu and Tyup Forestry are taken into account in the project documentation and in the documents on protective measures.

Whether the road construction will affect the residents of the project sites. The project specialist said that with the widening of the road and additional land acquisition, the project will not affect the private land, livelihood of the residents (loss of land, property, structures). Since there are no residences near the highways. The lands withdrawn for the needs of the project are state - pasture lands of San-Tash ayil/okmotu and Tyup Forestry, in connection with which the project will not have an impact on the local community living in the area of project activities.

The Tyup-Kegen road section has sensitive areas of the category of historical and cultural heritage: ancient and medieval burials. Those archaeological excavations, which are up to 50 meters from the boundaries of the existing road, will be carried out before the start of construction works.

The participants were informed that certain environmental negative impacts are expected during the construction phase, which will be mitigated through a series of special measures, will be monitored so that there will be no disturbances. Among the expected impacts on the social environment is a possible increase in noise and dust levels for the residents of the project areas.

The public consultations conducted have shown that in the future, during the implementation of the project, the same active participation of stakeholders can increase the environmental and social sustainability of the project, will ensure their positive attitude towards the project and contribute significantly to its successful implementation. Contractors need to engage with stakeholders and conduct public consultations throughout the project cycle.

Participants were informed that in order to improve project performance and eliminate shortcomings, there will be ensured the reception and timely consideration of appeals, complaints from stakeholders. For this purpose, a grievance redress mechanism (GRM) will function during the road construction period. Appeals can be both individual and collective. The means of filing complaints can be in writing, by e-mail, by telephone, by fax. And a Grievance Redress Group (GRG) will be established for this purpose. The purpose of the GRM is to address and resolve any complaints that may arise during the course of the project. The GRM is designed to resolve complaints and grievances in an immediate and transparent manner. There are two levels of grievances, appeals through which the project stakeholders, citizens can lodge complaints/appeals. All complaints are resolved at the local and central level, if the central level does not resolve the complaint, applicants can apply to the World Bank Grievance Redressal Service (GRS) or judicial authorities.

Chapter 11. Grievance Redress Mechanism

Objectives

The principal purpose of the Grievance Redress Mechanism (GRM) is to provide an effective and systematic mechanism for responding to appeals and complaints from persons whose interests are affected by the project activities, as well as for providing feedback.

All complaints related to the project will be dealt with through the GRM. The GRM will operate throughout the duration of the project, and IPIG/MOTC will provide administrative support to the GRM.

Great attention will be paid to preventing grievances from all parties, so that all incoming complaints and statements are dealt with in a timely and impartial manner. All affected parties will have access to a grievance and resolution mechanism. Effective procedures for resolving complaints and grievances can significantly reduce public concerns in the project area.

Grievance Redress Group (GRG)

During the project implementation period, a **Grievance Redress Group (GRG)** will be established by Order of the MoTC, which will consider issues related to the project.

The task of the GRG includes all activities necessary to discuss complaints, assess their validity, assess the scale of their possible impact, address social, environmental and other issues.

Grievance Submission Methods

Complaints could be submitted in different ways: in writing, by e-mail, by phone, by fax, via messengers (the most convenient).

In cases of appeal in electronic form, the applicant in his appeal indicates his surname, first name, patronymic, contact phone number (home, mobile or work), residence address, and sets out the essence of the appeal.

Complaint log

Each party involved in the GRM at local and central levels should keep a record book for registering complaints. GRM members should regularly report details of grievances to the responsible person: about grievances and status of their resolution.

The responsible person shall coordinate with each GRM member at local and regional levels, collect relevant documents, maintain a consolidated register of complaints received at GRM level, monitor the resolution status of each complaint received, keep an updated database of complaints and report accordingly.

All grievances will be recorded and include, but not limited to, the following data:

- Contact information for the complainant;
- Date and place where the complaint was received;
- Name of the person who registered the complaint;
- A brief description of the complaint;
- Resolution of the complaint.

Grievance Resolution Process

The Grievance Redress Mechanism (GRM) includes the following 2 stages of grievance redress:

Table 47: Grievance Redress Process

Step	Level of action	Process	Timeframe
Step 1	**Local level**	The complaint is initially filed and reviewed at the local level. The complainant applies to the applies to the local designee (LD). The LD initiates the work of the GRG, which assesses the situation and seeks a solution through negotiation with the complainant. If the complainant is not satisfied with the decision made at the local level, with the help of the LD, submits his complaint in writing to the central GRG under the MoTC, together with the conclusion and supporting documents prepared at the local level.	15 days
Step 2	**Central level**	If the local level grievance is not resolved within 15 days, the applicant, with the assistance of the local designee, submits the grievance to the central level, where a decision is made and submitted to the Executive Agency for review. A final decision is made at the Central level.	15 days

If issues cannot be resolved at the central level, where the final decision is made, and if dissatisfied with the resolution of the issue, the applicant may appeal to the World Bank Grievance Redress Service (GRS) or to the judicial authorities.

The World Bank Grievance Redress Service (GRS)

Employees can submit grievances through existing mechanisms offered at the project level, or directly to the World Bank Grievance Redress Service (GRS). The Grievance Redress Service (GRS) reviews complaints received as soon as possible to resolve project-related issues of concern. Project staff can file a complaint with an independent World Bank panel, which will determine whether any harm has been (or is likely to be) caused by non-compliance with WB policies and procedures.

For information on how to file a complaint with the World Bank Complaint Service, visit: https://projects.vsemirnyjbank.org/ru/projects-operations/products-and-services/grievance-redress-service.

It should be noted that the complainant can go through each step of the described grievance process before, during, or after filing a complaint with the World Bank.

Complaint monitoring and analysis

All complaints received are classified and systematized by the nature - issues of complaints, complaints and monitoring data are counted (number of complaints received, number of complaints considered and found valid, number of repeat complaints, number of complaints processed and closed) in order to identify systematic (repeat) and single complaints, assess trends in different categories of complaints.

According to the results of the reporting period, responsible persons on work with complaints form a report-analysis, which includes information:

- on the dynamics of changes in the number of written and oral appeals, complaints, as well as the dynamics of changes in the number of repeated appeals, complaints, appeals recognized as justified;
- on the strengths and weaknesses of the services, processes, working methods.

11.1 Grievance Redress Mechanism for communities/road users

According to the Order of the MoTC, GRG will be established at the local and central levels. The composition of GRG at the local level will be established in the area covered by the project activities, providing the following composition:

Table F-1. Composition of the local GRG

Group members	Position
Local designee	Group Chairman
Representative of the Supervision Consultant	Group Member
RMU-4 representative	Group Member
Community Representative/Village Leader (as agreed)	Group Member
Representatives of the local NGO/Obmudsman, etc. (as agreed)	Group Member

1. Duties of GRG members at the local level

Local designee (LD):

The Chairman of the GRG shall take the following actions:

- presides over the meetings of the GRG and ensures that minutes of the meetings are shared with all interested parties;
- acquainted with the content of each decision drafted after discussions to ensure correctness;
- provides administrative and organizational support for the work of the GRG members;
- supports the decision made by the GRG and ensures control over its implementation;

- prepares a grievance note, which shall be signed by the complainant and the LD, indicating the name of the complainant, date and place of the complaint, describing the complaint and providing supporting documents (if any);
- sends a note with the complaint to all members of the local GRG, convenes them to a meeting of the GRG and sets a date for the first meeting to consider the complaint (and, if necessary, subsequent ones);
- transmits requests and questions from complainants to the IPIG/MOTC and other members of the GRG at the local level;
- minutes all meetings and contacts with applicants;
- provides administrative and organizational support to GRG members;
- disseminates information about the IWG to affected local communities.

The representative of the RMU-4

Upon receipt of the notice of complaint and the invitation to the complaint meeting from the LCP, the representative of the RMU-4 shall take the following actions:

- contacts the complainant and writes a note with his/her understanding of the complaint;
- registers the complaint and supporting documents submitted;
- participates in all meetings to review the complaint, expresses his/her opinion and analysis, takes minutes of discussions;
- based on reports of GRM members stating their position and their understanding of the case (essence of the grievance) prepares final report on grievance review and recommendations, which will be sent to the complainant, other members of GRM and IPIG. The report may state that: i) the case is resolved; ii) the case remains unresolved;
- When notified by the LD that a complainant with an unresolved grievance wants to file his/her grievance at a higher level, informs the IPIG/MOTC.

Community representative/village leader (as agreed)

- provides relevant information related to the complaint filed;

- provide the other members of the GRG with a note stating their position, which will be reflected in the final report of the meeting.

Representatives of the local NGO/Obmudsman (as agreed)

Upon receipt of a notice of complaint and an invitation to a meeting to consider a complaint, the Representatives of the local NGO/Ombudsman takes the following steps:

- contacts the complainant and writes a note with his or her understanding of the complaint;
- if needed, participates in all meetings of the grievance, expresses his/her opinion and analysis;
- provides other members of the GRG with a note outlining his/her position, which will be reflected in the final report of the meeting.

2. Duties of GRG members at the Central level

At the Central level, the GRG will include the following staff:

Table F-2. Composition of the Central GRG

Group members	Position
Director of IPIG or representative of the MoTC	Group Chairman
IPIG Safeguards Specialists	Group Member
IPIG Technical specialist	Group Member
and others as agreed	Group Member

Chairman of the GRG / Director of the IPIG/ representative of the MoTC

The Chairman of the GRG shall take the following actions:

- presides over the meetings of the GRG and ensures that minutes of the meetings are shared with all interested parties;
- acquainte with the content of each decision drafted after discussions to ensure correctness;
- provides administrative and organizational support for the work of the GRZ members;
- supports the decision made by the GRZ and ensures control over its execution.

IPIG Safeguard Specialists

When notified that a claimant has filed his or her claim at the central level, the safeguards specialists of IPIG take the following action:

- prepare a chronology of events in order to understand the sequence of circumstances that led to the complaint;
- express their views on environmental and social protective measures in relation to the impact the complainant is referring to;
- request meetings (if necessary) with the GRG Chair;
- liaise between the GRG and the complainants;
- the complaints log is kept in the IPIG.

Technical Specialist

When notified of the need for professional advice for the impact assessment claimed by the complainant, the appropriate technician will conduct the necessary research and prepare a report, which will be shared with the complainant and other members of the GRG. The tasks of the technical specialist include the following:

- Provide an appropriate technical opinion on the case at hand;
- Conduct the necessary research according to his or her qualifications.

11.2 Grievance Redress Mechanism for Contractor's staff

The Contractor shall develop its own grievance mechanism (GRM) for staff. The Contractor's proposed GRM does not prevent employees from using court procedures. At the time of hiring, all employees must be informed of the GRM.

The ways to file a complaint

The contractor's staff can file a complaint in different ways: in writing, by email, by phone, by fax, through messengers (the most convenient), etc. The anonymous complaint option can also be applied. IPIG and MoTC will have boxes for anonymous complaints, feedback will be provided through the official websites.

In cases of electronic appeal, the applicant in his/her appeal indicates last name, first name, middle name, contact phone number, and sets out the essence of the appeal.

Complaint log

Each party involved in the GRM at local and central levels should keep a record book for registering grievances. GRM members shall regularly report details of grievances to the coordinator: about the grievances and status of their resolution.

All grievances will be registered and include, but not limited to the following data:

- Applicant's contact information;
- Date and place where the grievance was received;
- The name of the person who registered the grievance;
- A brief description of the grievance;
- Decision on grievance.

According to the results of the reporting period responsible persons for handling complaints prepare a report-analysis, which includes information:

- on the dynamics of changes in the number of written and oral appeals, complaints, as well as the dynamics of changes in the number of repeated appeals, complaints, appeals recognized as justified;
- on the strengths and weaknesses of the services, processes, working methods.

Structure of the GRM and timelines for handling complaints

The GRM for contractor personnel will operate at two levels: at the local level and at the central level (Executive Agency/Supervision Consultant).

1. **Contractor (local level).** The authorized person appointed by the contractor will keep a record of grievances and appeals of workers and speed up the process of grievance resolution. If the problem cannot be resolved at the contractor level within 15 days, the issue will be referred to the central level.
2. **Central level.** If the contractor does not resolve the grievance received, or if the response received does not satisfy the applicant, then the person who sent the grievance and the authorized person has the right to apply directly to the MoTC/IPIG/Supervision Consultant. At the central level a final decision is made within 15 days.

If the issue is not resolved at the central level, the applicant may appeal to the World Bank Grievance Redress Service (GRS) or to the judicial authorities.

Monitoring of GRM

All received complaints are classified and systematized according to the nature - issues of complaints, complaints and monitoring data are counted (number of complaints received, number of complaints considered and found valid, number of repeat complaints, number of complaints

processed and closed) in order to distinguish systematic (repeat) and single complaints, assess trends of different categories of complaints.

11.3 Grievance Redress Mechanism for Gender-Based Violence

Gender-based violence (GBV) is a pressing global problem that women face in their lives.

The World Bank is actively involved in combating gender-based violence in all its forms and considers it absolutely unacceptable in the framework of projects carried out with financial support of the World Bank.

Construction, especially large infrastructure projects, can be a high-risk environment in terms of GBV affecting local communities and construction workers. Risks of GBV can increase in local communities when there is a large influx of male workers from outside. These risks increase when workers come into close contact with local communities.

Filing and Handling Grievances

Since gender-based violence is one of the sensitive aspects of most communities, this form of violence requires an ethical, sensitive and confidential approach to handling such cases in order to provide the victim and the victim's family with effective support and safety.

Given the local mentality, the nature of the GBV grievance is compounded by the culture of silence, fear of publicity and fear of public condemnation.

Confidence in the Grievance Redress Mechanism (GRM) can be strengthened by offering multiple grievance options through which affected individuals can be registered in confidence:

- Local GRG designee, preferably female
- At the request of the injured person, it is necessary to provide the opportunity to submit a complaint anonymously;
- Victims may want a female investigator to handle crimes of violence against women.

Structure of the Grievance Redress Mechanism (GRM) and timelines for grievance redress

The GRM on GBV will operate at two levels: at the local level and at the central level (Executive Agency).

Local level. A designated authorized person will keep a record of grievances and appeals. If the problem cannot be solved at the local level within 15 days, the issue will be referred to the central level.

Central level. If the grievance cannot be resolved at local level, or if the response received is not satisfactory to the complainant, the complainant and the authorized person have the right to apply directly to the MoTC/IPIG/Supervision Consultant. At the central level a final decision is made within 15 days. If the issue is not resolved at the central level, the complainant can appeal to the World Bank Grievance Redress Service (GRS) or to the judicial authorities.

Activities to reduce the risks of gender-based violence, sexual exploitation and harassment:

Include in the Contractor's Staff Code of Conduct a clause on the inadmissibility of sexual exploitation, violence and harassment against the local population. Notify employees that the WB Directives and the Legislation of the Kyrgyz Republic provide for penalties for gender-based violence.

Contact information to apply with questions and complaints related to the project implementation: Bishkek 720017, Isanova street 42, Ministry of Transport and Communication of the Kyrgyz Republic, Tel./fax: +996-312-314275, e- mail: carswbipig@gmail.com.

Chapter 12. Monitoring and Evaluation

Environmental and social monitoring during the implementation of project activities should contain information on the key environmental and social aspects of the project, and the effectiveness of measures taken to mitigate the consequences. This information will enable the Executive Agency / IPIG and the World Bank to assess the success of the mitigation measures as part of project oversight and allow corrective action to be taken if necessary.

The main elements of monitoring should be consistent with the mitigation measures reflected in the ESMP. Information on the implementation of the ESMP and monitoring will be an integral part of the reports provided.

During the site inspection, the responsible staff of the Executive Agency / IPIG should ensure that all environmental and social mitigation measures are being implemented in a timely and proper manner.

In addition, during the construction period, monitoring will be carried out regularly, the implemented environmental and social safeguards measures will be submitted through monthly, interim and annual reports to the World Bank, the Executive Agency / IPIG.

12.1 Environmental monitoring

Environmental monitoring is a key mechanism for environmental management during construction works, contributing to the preservation of the environment. Timely monitoring of the state of the environment during construction works allows: (i) to ensure protection of the embankment from possible soil erosion and restoration of soil reserves; (ii) control of quarrying, operation and condition of work areas and camps, storage areas for materials, operation of asphalt plants and crushers; (iii) interaction with the local community; (iv) compliance with precautions and other important aspects.

Monitoring of air quality and noise level should be carried out continuously during the implementation of road construction projects. The purpose of monitoring is to comply with standards for air pollution, dust, NOx and CO, as well as noise levels at construction sites, and maintain them at a level that is minimally acceptable for residents of nearby areas.

The frequency and points of sampling can be changed at the suggestion of the Construction Consultant and the Customer in view of the identification of new factors of impact on the environment.

Table 48. Environmental monitoring plan for the construction phase

Sphere	Control parameters	Control points	Methods	Frequency	Responsibility
Air quality	Dust, SO2, NO2	Near sensitive receptors of exposure within the settlements 1. Sary-Tologoy village, 2. San-Tash village (Farm-3), near the school. 3. Karkyra village (Farm-4), near 4. Tourist base, near Ak-Sai Travel camp	With the appropriate portable measuring device of specialized laboratories accredited by the KR	Initial tests should be carried out before the start of construction work. Then at least once every two months	Construction Supervision Consultant

Sphere	Control parameters	Control points	Methods	Frequency	Responsibility
	Verification of vehicle and equipment certificates	Asphalt and concrete plants, contractor's camp, garages or specialized storage/parking facilities	Visual inspection/check	Inspections during construction	Construction Supervision Consultant
	Degree of loading with material / use of tarpaulins or covers	Material transporting route, especially near sensitive areas	Inspection and control	Inspections during construction	Construction Supervision Consultant
Surface water quality (river)	Diesel fuel, chemical oxygen demand, SS, fecal coliforms, conductivity, turbidity, pH, temperature	Upstream and downstream, where the bridges are located, as well as the closest points of approach to the Tyup and Karkyra Rivers	Sampling of water in the river water using the appropriate portable measuring device of specialized laboratories accredited in the Kyrgyz Republic	Initial tests should be carried out before the start of construction work. Then at least once every two months	Construction Supervision Consultant
Noise and vibration	Sensitive receptors near populated areas	Near sensitive receptors of exposure within the settlements: 1. Sary-Tologoy village, 2. San-Tash village (Farm-3), near the school. 3. Karkyra village (Farm-4), near , 4. Tourist base, near Ak-Sai Travel camp	With the appropriate portable measuring device of specialized laboratories accredited in the KR, or organizations	Initial tests should be carried out before the start of construction work. Then at least once every two months	Construction Supervision Consultant
Cutting trees	Tree status. Tree parameters (thickness)	In areas with trees and greenery that are subject to road widening	Inspection and control. A slope fill of up to 30 cm at the bottom of the tree trunk can be accepted. Filling more than 30 cm will result in damage to the tree and cutting will be necessary.	During construction work	Construction Supervision Consultant and IPIG
Erosion of soil cover	Construction of dumps and blowing-out and washout protection measures	Dump	Visual inspection/check	Not less than once a month	Construction Supervision Consultant

Sphere	Control parameters	Control points	Methods	Frequency	Responsibility
Borrow Pits	Possession of an official approval and an appropriate development license	Sand and gravel borrow pits	Inspection and checking	Before the start of work on the development of quarries	Construction Supervision Consultant
Maintenance and refueling of equipment, machinery and vehicles	Prevention of oil and petrol spill	Construction camp	Inspection and checking	Inspections during construction	Construction Supervision Consultant
Storage of hazardous chemical materials	Spill prevention, disposal issues	Construction camp	Inspection and checking	Inspections during construction	Construction Supervision Consultant
Waste management	Storage and disposal	Construction camp	Inspection and checking	Inspections during construction	Construction Supervision Consultant
Asphalt and concrete plants	Possession of an official approval and an appropriate development license	Asphalt and concrete plants	Inspection and checking	Prior to installation work	Construction Supervision Consultant
Physical disruption of historical and cultural heritage	Integrity of historical and cultural heritage	41 burial mounds 10 complexes of historical and cultural heritage	Inspection and checking	Before and during construction works. Document to assess the condition of cemeteries and burials, before the start of construction work (protection zone project)	Construction Supervision Consultant

Table 49. Environmental monitoring plan for the operational phase

Sphere	Control parameters	Control points	Methods	Frequency	Responsibility
Noise from transport	Required noise level	Sensitive areas	Using an appropriate portable measuring device	Not less than once a year	RMU-4 (Road Maintenance Unit-4)
Increase in deaths on the road (increased traffic and speed)	Spillage of harmful substances as a result of an accident	Project areas	Statistical data	Throughout the year	MoTC KR jointly with the Traffic police of MIA and the Ministry of Emergency Situations of the Kyrgyz Republic
	Death of animals	Project areas	Statistical data	Throughout the year	Highways Department of MoTC KR

Sphere	Control parameters	Control points	Methods	Frequency	Responsibility
Maintenance of trees	Status of trees	Project areas	Visual inspection	Throughout the year	Local authorities and MoTC KR

12.2 Monitoring the social environment

Social environment monitoring is an important aspect of management during the road construction. A monitoring system will be adopted to ensure the project compliance with measures to protect the social environment. During construction phase, social environment monitoring will ensure protection, community relations and compliance with precautionary measures. Construction Consultant staff will constantly/regularly interact with local residents inquiring about any problems during the construction period.

During the road construction, in addition to all observations and recommendations, safety measures will be observed and monitored during the entire period of road rehabilitation. The social environment will be monitored on a daily basis during the construction season and consultations with stakeholders will be carried out if necessary. The list of issues to be monitored is included in “Social Environment Monitoring Plan”.

Table 50. Social environment monitoring plan

Issues	Mitigation measures	Responsible party
Increase in road signs in hazardous areas	The contractor must provide the required number of improved road signs	Construction Supervision Consultant
Impact of dust from road construction on the social environment	The contractor will carry out works on dust suppression in accordance with the approved Plan for dust suppression	Construction Supervision Consultant
Security measures	Ensuring that there are no accidents involving people or livestock. Increased protective measures	Construction Supervision Consultant
Interaction with the local population	The contractor will be advised, when implementing the project, to recruit from among the local residents to reduce the poverty level among the local population.	Construction Supervision Consultant
Social and Gender Aspects	Construction Supervision Consultant will report to the Contractor any cases of sexual exploitation and gender-based violence and child labor, if detected, to request Contractors to take appropriate actions and measures.	Construction Supervision Consultant
Social risks due to influx of labor	All Contractor personnel will be instructed and trained on the Code of Conduct.	Construction Supervision Consultant
Access roads to residential, social and commercial facilities, and land.	Ensuring that there is no difficulty	Construction Consultant
Establishing interactions with the public	Interact with local governments and stakeholders, including cooperation and coordination with local communities, civil society organizations, and analysis of their requests. Conducting public hearings, disclosing plans and schedules for the construction phase	Construction Supervision Consultant
Installation of temporary road signs on the project site, in the locations of social	Contractor shall install temporary road signs on project sites	Construction Supervision Consultant

facilities (educational institutions, preschool institutions, hospitals, clinics), as well as in settlements		
Complaints and appeals of citizens	Tracking the status of received grievances and appeals	Construction Supervision Consultant

Annexes

Annex 1. Summary of Public Consultations

Annex 2. Social Screening Sample

Annex 3. Complaints and Grievance Mechanism Form

Annex 4. Code of Conduct for personnel of Contracting companies

Annex 5. Gender Violence Protocol

Annex 6. Lists of participants in focus - group discussions, minutes of Public consultations

Annex 7. Rules for transplanting coniferous plants (spruce, juniper)

Annex 8. Rules for transplanting deciduous shrubs (barberry, rose hips, honeysuckle, cotoneaster, sea buckthorn)

Annex 9. Potential emergencies of natural and natural-technogenic character on the road and measures for their prevention (according to the Final Report on the Hazard Assessment and Recommendations)

Annex 10. Types of disasters identified in the route area and their characteristics (according to the Final Report on The Hazard Assessment and Recommendations)

Annexes

Annex 1: Summary of Public Consultations

Activities	Content
Objectives	Informing the public about the Third Phase of the Central Asia Regional Links Program (CARs-3), which provides for the reconstruction/rehabilitation of the road Tyup-Kegen from 39 km to 76 km from Sary-Tologoy village to "«Karkyra-avtodorozhniy»" checkpoint and the local adjacent road Karkyra-Turuk-Sary-Jaz, 13 km long.
Identification	• Upon the agreement with the local authorities • Conducting consultations in the areas of project component implementation.
Notification and invitation	• Verbal invitations by phone • The invitation was posted on the official IPIG website www.piumotc.kg for all interested parties 2 weeks before the start of public consultations • Sending invitations via email • Alerting the population through local executive authorities - provincial / district administrations, ayil okmotu
Participants	Participation in public consultations is open to all interested persons and organizations, NGOs
Participants Registration	• List of invited participants • Name • Position
Information process	• Project presentation - cards, powerpoint presentation • Feedback • Q&A procedures • Distribution of booklets
Individual meetings and consultations	• Stakeholders • Local executive authorities
Issues asked during consultations	• Archaeological excavations, • Deforestation of trees and their compensation planting • Snow strips • Blasting operations in road construction • Technical parameters and characteristics of roads • Expectations of local communities from project implementation • Other.
Results of public consultations	• Minutes • The minutes should include: • List of participants with contact details; • A summary of the information voiced, the main issues and proposals received at public consultations, as well as a list of problems or priorities voiced by the local population, indicating ways to solve them or include them in the project design • Photos of the meeting participants.

Annex 2: Social Screening Sample

a) Location: District, Village

Brief Description: [i.e. length of road, need/purpose of works, proposed works (list/explain activities), number of villages (approx. population) affected, describe communities to be affected, land types, land use, squatters/non-owners, include photos]

b) Screening Questions for Resettlement Categorization

Probable Involuntary Resettlement Effects	Yes	No	Possible	Remarks
Will project include any physical construction works Does the project include upgrading or rehabilitation of any facilities? The project/subproject is likely to result in the loss of housing, other assets, use of resources or income/livelihood? Is land acquisition likely to be necessary?				
Is the site for land acquisition known?				
Is the status of land ownership and use known at the present time? Will easements be utilized within an existing ROW? Are there non-owners of land who live and earning an income on construction sites or directly on the ROW? Will there be loss of housing?				
Will there be loss of agriculture plot?				
Will there be loss of crops, trees, and fixed assets? Will there be loss of business or enterprises?				
Will there be loss of incomes?				
Will people loss access to facilities, services or natural resources? **If involuntary resettlement impact are expected:** Are local laws and regulations compatible with World Bank's Involuntary Resettlement policy? Will coordination between government agencies be required to deal with land acquisition? Are there sufficiently qualified staff in the institutions to plan and implement the resettlement Are professional training and qualifications required prior to planning and implementing resettlement?				

Annex 3: Complaints and Grievance Mechanism Form

Detailed Information about the Applicant	
Name: Ayil okmotu: District: Mobile phone: E-mail:	Village: Town Province: Tel.: Fax:
Language:	☐ Kyrgyz ☐ English ☐ Russian
Describe the reason of grievance:	
Date of grievance submission: Results/Solutions:	
If the grievance is not resolved, write down the reasons:	
Signature: _____ Date: _____	

Annex 4: Code of Conduct for personnel of Contracting companies

This Code of Conduct is part of measures to deal with environmental and social risks related to the Construction Works. It applies to all staff, labourers and other employees at the Works Site or other places where the Construction Works are being carried out. It also applies to the personnel of each subcontractor and any other personnel assisting in the execution of the Construction Works. All such persons are referred to as "**Contractor's Personnel"** and are subject to this Code of Conduct.

This Code of Conduct identifies the behavior that we require from all Contractor's Personnel:

REQUIRED CONDUCT

Contractor's Personnel shall:

1. Carry out his/her duties competently and diligently;
2. Comply with this Code of Conduct and all applicable laws, regulations and other requirements, including requirements to protect the health, safety and well-being of other Contractor's Personnel and any other person;
3. Maintain a safe working environment including by:
    - ensuring that workplaces, machinery, equipment and processes under each person's control are safe and without risk to health;
    - wearing required personal protective equipment;
    - using appropriate measures relating to chemical, physical and biological substances and agents; and
    - following applicable emergency operating procedures.
4. Report work situations that he/she believes are not safe or healthy and remove himself/herself from a work situation which he/she reasonably believes presents an imminent and serious danger to his/her life or health;
5. Treat other people with respect, and not discriminate against specific groups such as women, people with disabilities, migrant workers or children;
6. Not engage in Sexual Harassment, which means unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature with other Contractor's or Employer's Personnel;
7. Not engage in Sexual Exploitation, which means any actual or attempted abuse of position of vulnerability, differential power or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another;
8. Not engage in Sexual Abuse, which means the actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions;

   Not engage in any form of sexual activity with individuals under the age of 18, except in case of pre-existing marriage;
9. complete relevant training courses that will be provided related to the environmental and social aspects of the Contract, including on health and safety matters, and Sexual Exploitation, and Abuse (SEA) and Sexual Harassment (SH);
10. Report violations of this Code of Conduct; and
11. Not retaliate against any person who reports violations of this Code of Conduct, whether to Contractor or the Employer, or who makes use of the grievance mechanism for Contractor's Personnel or the project's Grievance Redress Mechanism.

RAISING CONCERNS

If any person observes behavior that he/she believes may represent a violation of this Code of Conduct, or that otherwise concerns him/her, he/she should raise the issue promptly. This can be done in either of the following ways:

1. Contact the Contractor's Social Expert with relevant experience in handling gender-based violence, or if such person is not required under the Contract, another individual designated by the Contractor to handle these matters in writing or by telephone; or
2. Call to reach the Contractor's hotline (if any) and leave a message.

The person's identity will be kept confidential, unless reporting of allegations is mandated by the country law. Anonymous complaints or allegations may also be submitted and will be given all due and appropriate consideration. Contractor will take seriously all reports of possible misconduct and will investigate and take appropriate action. Will provide warm referrals to service providers that may help support the person who experienced the alleged incident, as appropriate.

There will be no retaliation against any person who raises a concern in good faith about any behavior prohibited by this Code of Conduct. Such retaliation would be a violation of this Code of Conduct.

CONSEQUENCES OF VIOLATING THE CODE OF CONDUCT

Any violation of this Code of Conduct by Contractor's Personnel may result in serious consequences, up to and including termination and possible referral to legal authorities.

FOR CONTRACTOR'S PERSONNEL:

I have received a copy of this Code of Conduct written in a language that I comprehend. I understand, that if I have any questions about this Code of Conduct, I can contact *Contractor's contact person with relevant experience* requesting an explanation.

Name of Contractor's Personnel: _____

Signature: _____

Date: (day month year): _____

Countersignature of authorized representative of the Contractor:

Signature: _____

Date: (day month year): _____

Annex 5: Gender Violence Protocol

THE WORLD BANK SEXUAL EXPLOITATION & ABUSE/

SEXUAL HARASSMENT RISK SCREENING TOOL

Project Context

Screening tool: Major Civil Works

Welcome to the Project Context section of the SEA/SH Risk Screening Tool. “Project context,” is critical since no matter what the country context, the project in itself can create new risks and vulnerabilities that can exacerbate or trigger SEA/SH that may not have existed before. This section is completed by Task Teams on project-related risks and vulnerabilities for SEA/SH and is weighted more heavily than Country Context.

Please click on the information buttons next to each question to see more information on why that indicator is included and how to select an answer that best represents your project.

1. Is the project in an area of the country with an active humanitarian or emergency situation? *

This indicator captures whether the area where the project will be implemented is undergoing a humanitarian or emergency crises such as a natural disaster, conflict, epidemic or famine, according to the latest humanitarian updates documented and monitored by the UN Office for the Coordination of Humanitarian Affairs (OCHA) or internal governmental designation to account for the enhanced risk for GBV that humanitarian or emergencies present. During OCHA designated emergencies GBV services are supported by the UNFPA led GBV Area of Responsibility. This may be an indicator of availability of services.

- (•) Not working in a humanitarian or emergency situation in project area
- ( ) Working in a humanitarian or emergency situation in project area

Lower risk is that the project area is not experiencing an emergency characterized by conflict and/or fragility.

Higher risk is that the project area is experiencing an emergency characterized by conflict and/or fragility.

Add your comment:

2. How much infrastructure, construction, upgrading or rehabilitation does your project entail? *

This indicator captures the scale of infrastructure construction or upgrading included by a project and the impact it may generate in the community’s landscape and the use of space, social dynamics, labor influx, etc. among others, that can affect the safety of workers involved in the construction as well as of women, girls and boys in the surrounding areas.

- ( ) Small amount of construction, upgrading or infrastructure
- ( ) Medium quantity of construction, upgrading or infrastructure
- ( ) Major quantity of construction, upgrading or infrastructure

Lower risk is Small amount of construction, upgrading or infrastructure

Medium risk is Medium quantity of construction, upgrading or infrastructure

Higher risk is Major quantity of construction, upgrading or infrastructure

Add your comment:

3. Risk profile of the labor influx *

This indicator captures the level of risk of the project environment based on the criteria provided in the labor influx guidance note, which includes absorption capacity of host community and the ratio of workers to community members. The note provides some elements that can be used to inform the classification of risk. Rate low, medium or Higher risk according to the labor influx guidance note guidelines.

https://worldbankgroup.sharepoint.com/sites/wbsites/transition-surd-coffeehouse/Knowledge%20Base/Labor-influx-guidance-note.pdf

- (•) Low
- ( ) Medium
- ( ) High

Add your comment:

4. Were consultations undertaken with women's groups? *

It is important that during project preparation substantive consultations are undertaken with local women's groups, groups that advocate for children and adolescent rights, women's leaders and other stakeholders in the project area to identify women's and men's concerns in relation to the project, to identify key project risk and determine how to mitigate them. Consultations with local women, when properly facilitated, allow the project team to understand how safety, social tensions and dynamics can be affected by a project, and to anticipate and mitigate GBV risks. This is a particularly effective measure for understanding the context-specific patterns of GBV in the project context. These groups may also provide resources for alerting the World Bank to abuses during a project and can provide insight into which GBV services are available in a community. Recommendations, concerns and requests that arise in these consultations should be systematically documented and addressed to the extent possible. Consultations should provide a safe enabling environment for open conversation by women, recognizing that power dynamics in communities often limit women's full participation.

- (•) Yes consultations
- ( ) Unknown
- ( ) No consultations

Lower risk is having undertaken consultations with women's groups in a safe environment to allow free participation

Medium risk indicates that the answer to this question is unknown

Higher risk is not having undertaken consultations with women's groups in a safe environment to allow free participation

Add your comment:

5. Issues related to GBV and GBV-related concerns about the project have arisen in the community engagement discussions? *

This indicator intends to recognize issues that might have been identified in Environmental and Social Impact Assessments (ESIA), social risk assessments, other studies or in discussions and interviews with community or local organization representatives undertaken by the Borrower during the project design.

- (•) No
- ( ) Unknown

○ Yes

Lower risk is no issues related to GBV

Medium risk indicates that the answer to this question is unknown

Higher risk is yes, issues related to GBV

Add your comment:

6. Are military or paid security forces being contracted as part of the project? *

Having military or paid security forces contracted as part of a project can increase the risk of GBV. These groups are often predominantly or entirely male and may exploit the power imbalance arising from their position to engage in inappropriate or harmful behavior.

◉ No military or paid security forces

○ Unknown

○ Yes, military or paid security forces have been contracted

Lower risk is no military or paid security forces

Medium risk indicates that the answer to this question is unknown

Higher risk is employing military or paid security forces

Add your comment:

7. Is the project region or province in the lowest poverty quartile of the country? *

Regions in the lowest poverty quartile of a country may be underserved and the most vulnerable to neglect. High poverty scores may mean residents of these areas are particularly vulnerable to many forms of exploitation, including sexual exploitation and may lack the resources and agency to avoid and report abuse. This indicator can be adapted to different measurements of poverty based on what data the Bank project is using to determine poverty levels in the PAD context analysis section.

◉ Not in bottom quartile of poverty

○ Unknown

○ In bottom quartile of poverty

Lower risk is not being in the bottom quartile of poverty

Medium risk indicates that the answer to this question is unknown

Higher risk is being in the bottom quartile of poverty

Add your comment:

8. Is the project located in hard-to-supervise areas? *

Projects that are spread across a wider area, and/or whose activities are in remote, very diffuse or hard-to-access areas or are in areas to which PIU or Bank staff are unable to travel present greater challenges for supervision and therefore a higher risk of potential abuse and under-reporting of problems.

- (•) Compact or easily accessed project areas
- ( ) Hard-to-supervise areas

Lower risk is compact or easily accessed project areas

Higher risk is hard-to-supervise areas

Add your comment:

9. Is the project being implemented in rural, peri-urban, or urban areas? *

Rural, peri-urban and urban contexts all present unique challenges for addressing and preventing GBV. In urban settings, transactional sex and forced sex may be common, while rural settings may have higher risk of forced marriage or early marriage. None of these contexts are free from GBV however services may be harder to access in general and harder to access anonymously in rural areas. Because of the scarcity in services rural areas are given higher risk ratings.

- ( ) Urban
- ( ) Peri-Urban
- (•) Rural

Lower risk is urban

Medium risk is peri-urban

Higher risk is rural

Add your comment:

10. Is the project construction near school route or other pedestrian access that women and girls use for their daily activities? *

This indicator seeks to capture the risk for women and girls of having to use access routes that are not properly illuminated or supervised and being exposed to project workers or other men in unsafe areas.

- (•) No
- ( ) Yes

Lower risk: No

Higher risk: Yes

Add your comment:

11. Will the project be able to monitor implementation across the full span (both in terms of geographic spread and duration) of the work? *

This indicator seeks to determine whether a member of the Project Implementation Unit (PIU) or contractor who is knowledgeable about GBV, particularly IPV, SEA and SH, and how to identify related risks and its occurrence, will be mandated to periodically monitor project implementation, as well as obtaining feedback from the affected community to assess whether the project activities are aggravating GBV in its area of influence.

- (•) Yes
- ( ) Unknown
- ( ) No

Lower risk: Yes

Medium risk indicates that the answer to this question is unknown

Higher risk: No

Add your comment:

12. Are female workers in close proximity to male workers with limited supervision? *

This indicator intends to account for project activities that will involve women working alongside men in offices or project sites, irrespective of their distribution (men/women) with insufficient supervision. Supervision can take the form of a person watching that relations among staff and workers are respectful and abide by a Code of Conduct that explicitly prohibits any kind of SH among the employees.

- ( ) No
- (•) Unknown
- ( ) Yes

Lower risk: No

Medium risk indicates that the answer to this question is unknown

Higher risk: Yes

Add your comment:

Annex 6: **Lists of participants in focus - group discussions, minutes of Public consultations**

Список участников фокус-групповых дискуссий

Дата: 18. 03. 21 Место: с. Байзак Сайташ а/о

№	ФИО	Должность	Контакты
1	Бекбоева Чынара Конушбековна	угитель русск.яз и лит-ры	0708666162
2	Сейдалиев К. А	пенсионер	0708814774
3	Асматов Орозакун	пенсионер	депутат а-к 0500188833
4	Курманова Жолдукан	пенсионер	0703715445
5	Шаршенбаев Кубанычбек	с. Кен-Суу староста	0702480534
6	Байзаков Азамат	староста с. Байзак	0504121064
7	Сапанов Уларбек	лидер молодежи с. Кен-Суу	0505 [illegible]
8	Шаршенбаев Асыл	с. Талдуу Булак	0709 562050
9	Шабуков М Орозкулов	с. Байзак председатель	0701 95 0034
10	Шамуратов Анарбек	пенсионер	0702626931
11	Насилинова Гида	Отв.секретарь	0702729211
12	Садыков Шукурбек	спец. АО	0708438562
13	Арсанбаев Анарбай	с. Кен-Суу актив	0702392997
14	Жумубекова Чынар	ФСВ Сайташ	0702 642 541
15	Кулуйнова Азима	ГСВ сайташ	0505088134
16	Жудайбергенов у Азимбек	депутат а/о	0708898681
17	Бектенов Канат		0707036465
18	Мамыров Ж.Т	с.Кен-суу р-н	
19	Молдогазиев Элмурбек	Сан-таш	0708-777-627
20	Абдиев Джаннат	Байзак	
21	Черикбаев Бектур	—"—	

Список участников фокус-групповых дискуссий

Дата: 18.05.21 Место: с. Сай-Таш (Ферма 3)

№	ФИО	Должность	Контакты
1.	Козуборунова Т.	пенсионер.	0709441143
2.	Эшимбаева С.С.	пенсионерка	0700-987-174
3	Алиев У.Н (Урмат)	Директор шк.	0704647208 (вотсап)
4	Ниязбекова А.У	библиотекарь	0702478978
5	Аламбаева С.А	д/хозяйка	0708 59 31 05
6.	Конурбаева А.О.	Учительница	0707.07.90.64
7	Ишенбаев К.С	фермер	0709252401
8	Токомбаев С.	учитель	
9	Дуйшеев К	пенсионер	0706839052
10.	Абылаев М.К. Мирбек	депутат айылного кенеша	0702100601
11	Абыкеев Ж.Т.	фермер	0705437399
12	Омурбек у. С	фермер	0700588694
13	Жанырбаева А.Б	пенсионер	0708012614
14	Козуборунов М.Т.	фермер	0502210365
15	Ниязбеков У.Н.	фермер	070702443
16	Кемел уулу Н.		0700828493
17	Абдылдаева С	домохозяйка	0704596759

Public consultations in Sary-Tologoy village, San-Tash ayil/okmotu, June 10, 2021 in the building of the secondary school

(All four public consultations were held thanks to the great efforts of the ayil okmotu staff and village leaders. Without their help, it would have been very difficult to get people together during the third wave of COVID-19).

The attendees were informed that the road design engineers took into account the wishes of the residents and, within the framework of the project implementation, the installation of a bus stop in their settlement in included.

The participants noted that on the roadside land that will be used to widen the road, none of the residents is engaged in economic activities. They noted that the villagers do not have land along the road, no one leases land there, and there are no buildings. No one has a business along the road.

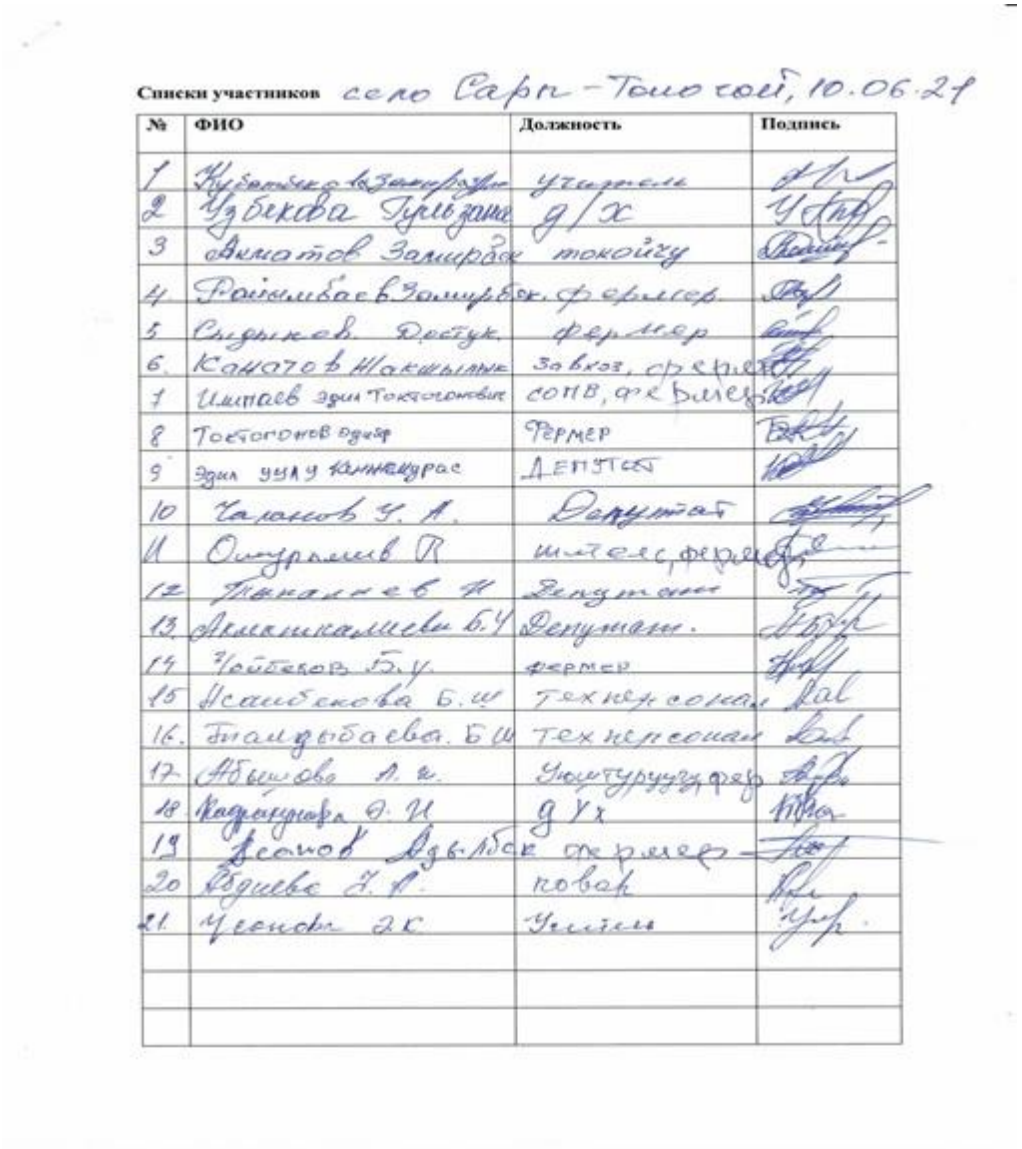
The audience was asked a question about cattle crossing the road which is dangerous for both livestock and drivers. Do they consider it necessary to build a cattle road in their village? Those present did not support the idea of a cattle road, noting that residents would not drive cattle from the other end of the village or from a different distance in order to pass through the cattle road. They noted that at first it will be interesting for someone to go with cattle through the cattle road, then people will not use it and it will be idle. Only one person supported the idea of the cattle road, but other participants did not his opinion.

Residents were informed about the Grievance Redress Group (GRG) and the Grievance Redress Mechanism (GRM).

At the end of the meeting, the participants expressed their readiness to help with the construction of the road.

There were 21 participants in total: 12 of them were men, and 9 were women. The list of participants is attached below.

Photo of participants in the village of Sary-Tologoy



Списки участников село Сарп-Тоготой, 10.06.21

№	ФИО	Должность	Подпись
1	Кубатбеков Замирбек	учитель	
2	Убекова Гульзада	д/х	
3	Аматов Замирбек	токойчу	
4	Райымбаев Замирбек	фермер	
5	Сырыков Достук	фермер	
6	Канатов Жакшылык	зоовет, фермер	
7	Ишпаев Эдил Токтогонович	СОНВ, ФАП	
8	Тоготонов Эдил	Фермер	
9	Эдил уулу Жанышбек	ДЕПУТАТ	
10	Танов У. А.	Депутат	
11	Отурбаев Т.	житель, фермер	
12	Танаев А.	Депутат	
13	Аманкалиев Б.Ч.	Депутат.	
14	Чойтаков Б.У.	фермер	
15	Исакбекова Б.Ш.	Технолог	
16	Тандыбаева Б.Ш.	технолог	
17	Абышова А.К.	Культорганизатор	
18	Кадыкунова Ф.И.	д/х	
19	Асанов Абылбек	фермер	
20	Эдиева Г.А.	повар	
21	Чоюнов Э.С.	Учитель	

Public consultations in San-Tash village, San-Tash ayil/okmotu, 10 June 2021 in the building of the secondary school

The attendees were informed that the road design engineers had taken into account the wishes of the residents and as part of the project the installation of bus stops on both sides, sidewalk and lighting will be provided.

Roadside land, used for road widening, construction of bus stops, sidewalk, installation of poles for lighting, are not used by any of the villagers. None of the residents conduct any economic activities there, and cattle do not graze along the road. In spring, the cattle graze in the pastures near the village. From the end of May until October, the cattle graze in the summer pasture "Karkyra". In autumn and winter, the cattle graze in the places designated for haymaking and the village pastures.

When asked about the need for a cattle road in their community, participants noted that not everyone will use the cattle road. People will move cattle where they feel comfortable. They noted that usually their cattle do not cross the road and graze behind the village, in the mountains, and in the village pastures. The participants were informed about the Grievance Redress Group (GRG) and the Grievance Redress Mechanism (GRM).

There was a total of 16 participants: 10 men and 6 women. The list of participants is attached below.

Photos of participants from San-Tash village

Списки участников с. Сан-Таш, 10.06.21

№	ФИО	Должность	Подпись
1	[illegible]	[illegible]	
2	[illegible]	[illegible]	
3	[illegible]	[illegible]	
4	[illegible]	фермер	
5	[illegible]	Санташ ЖК3	
6	[illegible]	Санташ ЖК3	
7	[illegible]	Санташ ЖК3	
8	[illegible]	Санташ ЖК3	
9	[illegible]	Санташ ЖК3	
10	[illegible]	Санташ ЖК3	
11	[illegible]	Санташ ЖК3	
12	[illegible]	[illegible]	
13	[illegible]	Технолог	
14	[illegible]	технолог	
15	[illegible]	домохозяйка	
16	[illegible]	фермер	

Public consultations in Karkyra village, San-Tash ayil/okmotu, 11 June 2021

The participants were informed that the road design engineers had considered the wishes of the residents and within the framework of the project implementation the parking at the fork located at 70 km of the road in Karkyra village; sidewalks and lighting will be provided.

Roadside land, which is used for road widening, construction of parking lots, sidewalks, installation of lighting, are not used by the residents. None of the residents conduct economic activities on these roadside land plots.

The participants were asked whether they considered it necessary to build a cattle road in their settlement due to the danger of cattle crossing the road. Participants noted that residents will not use the cattle road as people will drive the cattle where it is convenient for them. It was noted that cattle road may be used by someone located close to it wheras others will not drive cattle from a distance.

Attendees received information about the Grievance Redress Group (GRG) and the Grievance Redress Mechanism (GRM). Participants expressed gratitude to the road design engineers for paying attention to their requests. They noted the importance of the road for the villagers and for the whole region.

The total number of participants was 26 people: 15 men and 11 women.

Photo of participants from the village Karkyra

Списки участников с. Каркыра 11.06.21

№	ФИО	Должность	Подпись
1	Турдубердиев Кубанычбек	Айыл башчы	0235 770 444
2	Алмакова [illegible]	дх / пен	
3	Самакова Зейна	дх / пен	
4	Кочкорбаева Кыргызбек	дх	
5	Чолпонбаева Зин[illegible]	пен	
6	Асанов Калыйбек	фермер	
7	Абдыраимова Кен[illegible]	д/х	
8	Мусаева Умут	д/х	
9	Дордубаева А	д/х	
10	Сыдыкбеков Э	фермер	
11	Керимбаев Улан	фермер	
12	Каныбеков К.	фермер	
13	Сыдыкмаатов М	пенсионер	
14	Чолпонбаева Ж	пенсионер	
15	Тулобердиева А	пенсионер	
16	Алиева М	пенсионер	
17	Калыбаев Улан	фермер	
18	Асанакунов Ж	механизатор	
19	Рысбеков К	фермер	
20	Кожоев Улан	фермер	
21	Турманов Урмат	фермер	
22	Сарткамаков Темир	фермер	
23	Сыдыков Аскар	фермер	
24	Турсатбеков Тенти	учитель	

25 Калкенова Жазира учитель

26 Чолпонбаева Жыпара учитель

Public consultations in the Karkyra Gorge, village Chaar-Kuduk (tourist camp), 11 June 2021

The attendees were informed that within the framework of the project a car parking, sidewalk and lighting will be provided om this site.

Information was received from the participants that the roadside land plots that are used to widen the road, build a parking lot, sidewalk, and install lighting poles are not used by anyone. On these roadside plots, none of the residents is engaged in economic activities. Only five families permanently live here. They do not grow anything because of the harsh climatic conditions; all products are imported.

The participants were asked whether they consider it necessary to build a cattle road on this site because of the danger of cattle crossing the road. Participants noted that there is no constant flow of cars here. Cars appear from time to time. The cattle go to graze in the early morning. They noted that people would not use the cattle road and they do not have a lot of cattle. The cattle of the inhabitants of the San-Tash ayil/okmotu graze in the gorges in the summer.

The technical director of the tourist camp noted there were no tourists last year due to the coronavirus pandemic. The tourist camp holds a mountain marathon every year in June, runs races at different distances. In 2019 there were athletes from 9 countries. On June 19 - 20, a mountain marathon is planned for different distances. Over 300 athletes are expected to arrive.

Residents were informed about the Grievance Redress Group (GRG) and the Grievance Redress Mechanism (GRM).

The participants were happy to receive the information about the project. They noted the importance of the road not only for the residents of the region, but for the whole country, noting that the new road will attract more tourists.

There were 11 participants in total, including 6 men and 5 women.

Photo of participants, Karkyra Gorge, village Chaar-Kuduk (tourist camp)

Т

21.06.21 (Сар-Кудук) Туристический лагерь

Списки участников

№	ФИО	Должность	Подпись
1	Карыбаев Азат	дорожник	
2	Абдраимов К.	тех. дир. 0779910944 тех.директор РЧС	тех. дир. тур. лагеря
3	Кубандыков Олжобек	дом. хозяин 0778178169	
4.	Карыбаева Гулуста	пенсионерка	
5	Осмонкулова [illegible]	дома хозяйка	
6.	Абазганов Эрик	0779912259 Эгерь, тех. дом	
7.	Алиева Жаза	дома хозяйка	
9.	Абазганов Артанзин	фермер	
10.	Акматов Жолдошен	фермер	
11	Саламатова [illegible]	дом. хоз. (отдыхающая)	

Public consultation on the disclosure of the ESIA, July 24, 2021

Photo of participants in the public consultations in San-Tash ayil okmotu

ATTENDANCE SHEET / СПИСОК ПРИСУТСТВУЮЩИХ PROYAPI

EVENT TITLE AND DATE НАИМЕНОВАНИЕ МЕРОПРИЯТИЯ И ДАТА	**Public Consultation on the Project Tyup-Kegen (km 39-76) and Karkyra-Turuk-Sary-Jaz (km 0-13) road reconstruction /Общественные консультации по Проекту Реконструкция дороги Тюп-Кеген (км 39-76) и Каркыра-Турук-Сарыжаз (км 0-13), 24 июля 2021/ July 24, 2021**
NAMES OF IPIG AND PROJECT EXPERTS ФИО ЭКСПЕРТОВ ГРИП И ПРОЕКТА, ПРОВОДИВШИХ ОБЩЕСТВЕННЫЕ СЛУШАНИЯ	Erkingul Kasymova, Adilet Sekimov, Telman Pashshanov, Raya Osmonalieva, Djamila Aitmatova, Nursultan Kanaev/ Эркингуль Касымова, Адилет Секимов, Тельман Пашшанов, Рая Осмоналиева, Джамиля Айтматова, Нурсултан Канаев
МЕСТО ПРОВЕДЕНИЯ МЕРОПРИЯТИЯ PLACE OF EVENT	Tyup District, Santash Ayyl Okmotu/ Тюпский район, Санташский айыл Окмоту Санташский айылдык аймак, с. Байгак

#	ФИО Name	Должность Position	Контактные данные Contact data	Подпись Signature
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NAMES OF IPIG AND PROJECT EXPERTS ФИО Экспертов ГРИП и Проекта, проводивших общественные слушания	Erkingul Kasymova, Adilet Sekimov, Telman Pashahanov, Raya Osmonalieva, Djamila Aitmatova, Nursultan Kanaev/ Эркингуль Касымова, Адилет Секимов, Тельман Пашшанов, Рая Осмоналиева, Джамиля Айтматова, Нурсултан Канаев
МЕСТО ПРОВЕДЕНИЯ МЕРОПРИЯТИЯ PLACE OF EVENT	Tyup District, Santash AiyLOkmotu/ Тюпский район, Санташский айыл Окмоту Санташский айылдык аймак, с. Байзак

#	ФИО	Должность	Контактные данные	Подпись
#	Name	Position	Contact data	Signature
1.	Сананов Б.Ш.	[illegible] 10-4 ЯДОХ	0701 321710	
2.	[illegible]	[illegible]	0701 [illegible]	
3.	[illegible] К.Н.	Айыл Банки Каркыра	0771 970444	
4.	[illegible]	[illegible]	[illegible]	
5.	[illegible]	[illegible]	[illegible]	
6.	Байзаков А.Б.	[illegible]	0504 121064	
7.	Тойчиев З.А.	[illegible]	[illegible]	
8.	[illegible]	депутат а/к	0702726947	
9.	[illegible]	депутат	0505232964	
10.	[illegible]	депутат	[illegible]	

Photo of participants of public consultations in the Tyup district administration

ATTENDANCE SHEET / СПИСОК ПРИСУТСТВУЮЩИХ

PROYAPI

Event title and date
Наименование мероприятия и дата

Public Consultation on the Project Tyup-Kegen (km 39-76) and Karkyra-Turuk-Sary-Jaz (km 0-13) road reconstruction /Общественные консультации по Проекту Реконструкция дороги Тюп-Кеген (км 39-76) и Каркыра-Турук-Сарыжаз (км 0-13), 24 июля 2021/ July 24, 2021

Names of IPIG and Project Experts
ФИО Экспертов ГРИП и Проекта, проводивших общественные слушания

Erkingul Kasymova, Adilet Sekimov, Telman Pashshanov, Raya Osmonalieva, Djamila Aitmatova, Nursultan Kanaev/ Эркингуль Касымова, Адилет Секимов, Тельман Пашшанов, Рая Осмоналиева, Джамиля Айтматова, Нурсултан Канаев

Место проведения мероприятия
Place of event

Tyup District, Santash Aiyl Okmotu/ Тюпский район, Санташский айыл Окмоту
с. Тюп, Тюпский район

#	ФИО	Должность	Контактные данные	Подпись
#	Name	Position	Contact data	Signature
1.	Шукуралиева М.К.	РГА специалист	0703378515	
2.	Жанова С.Н.	РГА специалист	0703933103	
3.	Аранкулов М.Б.	МГС	0703222055	
4.	Абдыкеримов Ж.Т.	Тюп РГА водитель	0727012538	
5.	Алшибаева Г.Ф.	Тюп РГА заместит.	0703090260	
6.	Айдиев К.Ж.	Аким Тюпского	0509111011	
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Names of IPIG and Project Experts
ФИО Экспертов ГРИП и Проекта, проводивших общественные слушания

Erkingul Kasymova, Adilet Sekimov, Telman Pashshanov, Raya Osmonalieva, Djamila Aitmatova, Nursultan Kanaev/ Эркингуль Касымова, Адилет Секимов, Тельман Пашшанов, Рая Осмоналиева, Джамиля Айтматова, Нурсултан Канаев

Место проведения мероприятия
Place of event

Tyup District, Santash Aiyl Okmotu/ Тюпский район, Санташский айыл Окмоту
с. Тюп, Тюпский район

#	ФИО	Должность	Контактные данные	Подпись
#	Name	Position	Contact data	Signature
1.	Кенфердинов Т.К.	Спорт инстр-р	0707006609	
2.	Жуманова Р.У.	РГА зав. сект. экон.	0701123178	
3.	Бозгунов У.Ш.	вед. спец. РГА	0707610965	
4.	Масалбекова Н.	Зам. гауп.о/о	0701100101	
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МЕСТО ПРОВЕДЕНИЯ МЕРОПРИЯТИЯ PLACE OF EVENT	Tyup District, Santash Aiyl Okmotu/ Тюпский район, Санташский айыл Окмоту с. Тюп, Тюпский район

# ФИО		Должность	Контактные данные	Подпись
#	Name	Position	Contact data	Signature
1.	Исмаилов Б.Д.	нач. ДЭУ-24	0701821900	
2.	Самаков Т.М.	гл. спец. 70-й ДЭУ	0701 821710	
3.	Жумакадыров М.И.	СМИ „газета Каркыра"	0700 038161	
4.	Сартбаев Т.Б.	с. Кызыл-Суу [illegible]	0703717709	
5.	Насмамиев Б.К.	Ак-Суу а/о	0703 953840	
6.	Качкачаев Д.Н.	гл. спец. Тайга Суу	0702 129264	
7.	Усенов Э.З.	Тоо-Тау НО	0500 572267	
8.	Усубалиев Б.З.	с. Тюп.	0709 867554	
9.	Сулайманов М.Д.	с. Тюп	0705382048	
10.	Исманакунов Н.А.	гл. спец. ДЭУ4	0701 822010	

ATTENDANCE SHEET / СПИСОК ПРИСУТСТВУЮЩИХ

PROYAPI

EVENT TITLE AND DATE НАИМЕНОВАНИЕ МЕРОПРИЯТИЯ И ДАТА	**Public Consultation on the Project Tyup-Kegen (km 39-76) and Karkyra-Turuk-Sary-Jaz (km 0-13) road reconstruction /Общественные консультации по Проекту Реконструкция дороги Тюп-Кеген (км 39-76) и Каркыра-Турук-Сарыжаз (км 0-13), 24 июля 2021/ July 24, 2021**
NAMES OF IPIG AND PROJECT EXPERTS ФИО ЭКСПЕРТОВ ГРИП И ПРОЕКТА, ПРОВОДИВШИХ ОБЩЕСТВЕННЫЕ СЛУШАНИЯ	Erkingul Kasymova, Adilet Sekimov, Telman Pashshanov, Raya Osmonalieva, Djamila Aitmatova, Nursultan Kanaev/ Эркингуль Касымова, Адилет Секимов, Тельман Пашшанов, Рая Осмоналиева, Джамиля Айтматова, Нурсултан Канаев
МЕСТО ПРОВЕДЕНИЯ МЕРОПРИЯТИЯ PLACE OF EVENT	Tyup District, Santash Aiyl Okmotu/ Тюпский район, Санташский айыл Окмоту с. Тюп, Тюпский район

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PROYAPI

Event title and date *Наименование мероприятия и дата*	**Public Consultation on the Project Tyup-Kegen (km 39-76) and Karkyra-Turuk-Sary-Jaz (km 0-13) road reconstruction /Общественные консультации по Проекту Реконструкция дороги Тюп-Кеген (км 39-76) и Каркыра-Турук-Сарыжаз (км 0-13), 24 июля 2021/ July 24, 2021**
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Annex 7. Rules for transplanting coniferous plants (spruce, juniper)

1. It is very difficult to transplant aged conifers (spruce, junipers) from places of natural growth. As a rule, plants grow close to each other, the roots of different specimens are intertwined with each other. If they grow on slopes and the soil is rocky, this makes replanting even more difficult. There is no guarantee that such plants will survive after it. This will only happen if the earth clod around the root system is preserved as much as possible.
2. Before proceeding with planting plants, they carry out cleaning, planning, breaking the site for planting, digging holes. Transplant pits should be prepared in advance in order to plant the dug plants as quickly as possible. The landing pits are made a little wider than the coma (by about 30 cm), and deeper (by about 20 cm). The walls of the pit should be steep; nutritious soil is added to the bottom. The plant is planted so that the root collar is at ground level, not buried. The wrapping material is not removed because it collapses quickly. It is necessary to consider the distance between the planted plants and the distance to all nearby power lines.
3. For loading and transportation, special equipment is required. Careful handling is required to avoid damaging the earth ball and tree trunk.
4. Conifers are planted in early spring or late autumn. Larger specimens are best planted in winter with a frozen lump, i.e. dig in a tree in advance and pour water over a lump so that it freezes.
5. It is easiest to plant specimens from 0.6 to 1.5 m when the plant is young and, accordingly, small in size. Successful planting and further development of conifers depends on maintaining a clod of earth around the root system. Spruces and junipers are especially sensitive to the destruction of the earthen ball.
6. To dig out a seedling around it, they bayonet the ground with a sharp shovel and take out a plant with a lump, which is tied with gauze, burlap or other rapidly disintegrating material for strength. The lump for such seedlings should be 40 x 40 cm. Any non-destructive materials are removed.
7. The ground around the planted woody plants is tamped, watered abundantly with water, after which you can pour a solution of root, which is diluted with water according to the appropriate instructions. Further care consists of regular watering. In the first year, successfully transplanted trees will take root and grow new roots. A good sign will be the continued healthy color of the needles. When planting, it must be borne in mind that the earth will settle. The trunk circle is mulched to retain moisture, without filling the root collar. When planting on slopes, it is necessary to make a hole with sides up to 5 cm, again for better watering. If required, one or more pegs are placed for the stability of the plants.
8. The spruce has a superficial root system. When transplanting 3-4-meter specimens, the root pruning technique is often used. They begin to do this a year before transplanting, so that the plant has time to form additional new roots. A trench is dug around the tree about 30 cm wide and the same depth, they retreat from the trunk, depending on the height of the tree, about 30-60 cm or more. Old woody roots are pruned with pruning shears, and the trench is filled with an earthen nutrient mixture. After a year, new fibrous roots have time to form, which helps the tree to survive planting in another place more easily. Before starting work on the digging, the lower branches of the spruces are tied up. In horizontally growing junipers, highly overgrown branches can be shortened.

Annex 8. Rules for transplanting deciduous shrubs (barberry, rose hips, honeysuckle, cotoneaster, sea buckthorn)

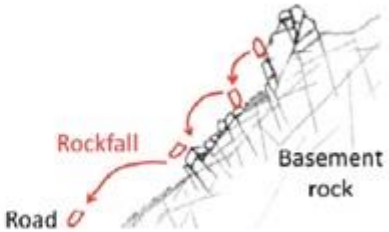
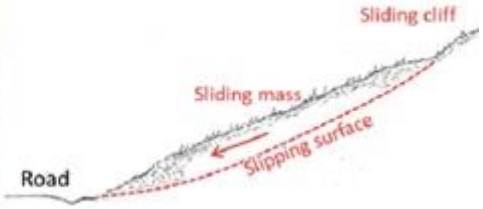
1. Shrubs are planted in the spring before the buds swell or in the fall after the beginning of leaf fall (September-October).
2. Mature shrubs are harder to replant, especially in places of their natural growth on rocky slopes.
3. For better survival, before planting, you can shorten the branches of the bush.
4. When digging, keep as many roots as possible. It is advisable to transplant with a lump of earth, plant immediately after digging into pre-prepared pits and water the bushes abundantly after planting. If possible, then pour with root solution.
5. Before planting shrubs, the site must be cleaned, planned and laid out, taking into account the distance between the plants.
6. The distance between shrubs ranges from 0.5 to 2 m.
7. When preparing the planting hole, usually the upper and lower layers of the soil are laid out in different directions, and when the shrubs are buried, they change their places, adding, if possible, fertilizer to the lower layer.
8. The size of the planting holes depends on the size of the shrubs and their root system. In any case, you need to look at the size of the root system of the planted shrubs so that they can freely fit in the planting pit.
9. With a bush height of 1 m with 3-4 shoots, the hole should be about 30 cm deep and 40 cm in diameter.
10. When transplanting high (2 m) shrubs, the depth of the pit is 50-60 cm, and the diameter is 60-70 cm.
11. When planting shrubs on a rocky area where soil replacement is required, the size of the planting holes should be further increased. Shrubs, for the most part, are not afraid of deepening, and at the same time they form additional roots.
12. When planting on gentle slopes, it is necessary to make a hole with sides up to 5 cm for better moisture retention. On steeper slopes, plants are placed on terraces, their width is 1.5-2 m.
13. After transplantation, the shrubs need care for their further cultivation.
14. It is necessary to loosen the soil around the trunk circles at least 3 times to a depth of no more than 8-10 cm, so as not to damage the roots. The diameter of the trunks for shrubs should be up to 1m.
15. Particular attention should be paid to the full watering of transplanted shrubs.
16. During their long stay in one place, shrubs absorb a large amount of nutrients from the soil, and therefore, the soil under them is gradually depleted, the leaves become small, the growth decreases. Therefore, it is necessary to apply both organic, mineral and special fertilizers.
17. To care for the crown of shrubs, it is necessary to prune, remove drying shoots, this makes it possible to lay new flowering shoots.
18. It is necessary to inspect shrubs, in the case of pests, diseases, take timely measures by contacting specialists.
19. Different types of shrubs have their own individual characteristics that must be considered:
    a. Sea buckthorn - forms clean thickets, as it is very photophilous and cannot stand the presence of other species. The annual growth is from 8.5 to 13.5 cm. In the first year, it forms an additional layer of roots;
    b. Rosehip - shoots grow by 30-80 cm in a year. It lends itself well to cutting, gives abundant root shoots;
    c. Barberries are fast-growing shrubs, cut well. Their annual growth is about 15-40 cm. Their main drawback is that they absorb rust, so barberries should not be planted near fields with cereals.
    d. Honeysuckle - annual growth is 10-20 cm, they are tolerant to cutting;
    e. Cotoneaster - shoots grow by 8-15 cm in a year, they also are tolerant to cutting.

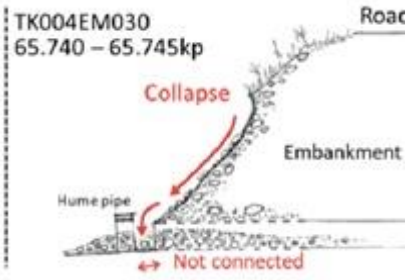
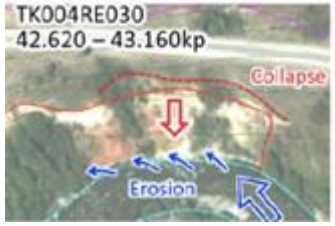
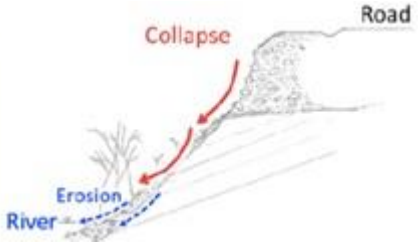
Annex 9. Potential emergencies of natural and natural-technogenic character on the road and measures for their prevention (according to the Final Report on the Hazard Assessment and Recommendations)

#	Type of potential disaster	Risk level	Geological formation, section length	Description of the possible consequences of the disaster	Kilometers (from- to)	Protective measures proposed by Japanese consultants
1.	Rockfall	Moderate	Q / N1; 310 meters away	The rockfall will reach the road (2 meters)	41.320-41.630	Crush boulders into small pieces
2.	Coastal erosion	Moderate	Q; 310 meters away	Low probability of road blocking for 5 years	41.320-41.630	-
3.	Sliding slope	High	N1; 260 meters away	L = 200 m. The risk of slipping increases	41.630-41.890	Cross drainage pipe device
4.	Coastal erosion	High	Q / N1; 730 meters away	L = 80 m. The d will disappear	41.890-42.620	Frame structure, reinforced concrete retaining wall, concrete block
5.	Rockfall	Moderate	N1 / Fault / Clnl; 540 meters away	The rockfall will reach the road (2 meters)	42.620-43.160	Crush boulders into small pieces
6.	Coastal erosion	Very high	Q, 540 meters	L = 100, the road will disappear	42.620-43.160	Frame structure, reinforced concrete retaining wall, concrete block
7.	Destruction of the embankment	Very high	Q, 10 meters	L = 50, the road will disappear	43.185-43.195	Reconstruction of the bridge
8.	Rockfall	Moderate	Q / Clnl, 810 meters	Low probability of road blocking for 5 years	44.280-45.090	-
9.	Rockfall	Average	Clnl, 510 meters	The road will be blocked by rockfall L = 60, Rockfall will reach the road (2 meters)	45.120-45.630	Anti-rockfall mesh, carpet type, trail fixing system
10.	Rockfall	Average	Q / O2l, 405 meters	The rockfall will reach the road (2 meters)	46.270-46.675	track anchoring system
11.	Rockfall	Moderate	rO3, 410 meters	Low probability of road blocking for 5 years	47.135-47.545	-
12.	Sliding slope	Moderate	Q, 475 meters	Low probability of road blocking for 5 years	48.425-48.900	-
13.	Rockfall	Average	O2l, 360 meters	L = 65, The road will be blocked by rockfall	49.315-49.675	Anti-rockfall mesh, carpet type, trail fixing system
14.	Road offset	Average	2l, 470 meters	L = 30, The side of the road will disappear	49.460-49.930	U-shaped drainage tray with gabion stacking
15.	Rockfall	High	O2l, 365 meters	The road will be blocked by rockfall L = 80, Rockfall will reach the road (2 meters)	49.750-50.115	Tight-fitting rockfall mesh; rockfall mesh carpet type

#	Type of potential disaster	Risk level	Geological formation, section length	Description of the possible consequences of the disaster	Kilometers (from- to)	Protective measures proposed by Japanese consultants
16.	Road offset	Average	O2l, 280 meters	L = 30, the roadside will disappear	49.930-50.210	U-shaped drainage channel with gabion stacking, maintenance of drainage along the road
17.	Rockfall	Average	O2l, 345 meters	L = 20, L = 30, The road will be blocked by a rockfall	50.210-50.555	Rockfall mesh, carpet type, Rockfall fence (simplified type)
18.	Rockfall	Low	rO3, 150 meters	Low probability of road blocking for 5 years	50.845-50.995	-
19.	Rockfall	Average	rO3, 435 meters	The rockfall will reach the road (2 meters)	51.115-51.550	Rockfall fence, retaining wall
20.	Sliding slope	Moderate	Q, 185 meters	L = 100, the road will be filled up with collapsed soil	51.665-51.850	Rockfall fence (simplified type)
21.	Embankment	Very high	Q, 10 meters	L = 5, the road will disappear	52.045-52.05, 5	Reconstruction of the bridge
22.	Sliding slope	Moderate	Q, 200 meters	L = 40, the road will be filled up with collapsed soil	52.060-52.260	Rockfall fence (simplified type)
23.	Rockfall	Average	C1, v2 + 3, 340 meters	L = 60, the road will be blocked by rockfall, rockfall will reach the road (0.5-1.5 meters)	52.770-53.110	Pocket-type rockfall net, rope anchorage system
24.	Coastal erosion	Low	C1, v2 + 3, 195 meters	Low probability of road blocking for 5 years	52.915-53.110	-
25.	Rockfall	Moderate	C1, v2 + 3, 185 meters	Low probability of road blocking for 5 years	53.110-53.295	-
26.	Rockfall	Low	C1, v2 + 3, 190 meters	Low probability of road blocking for 5 years	53.520-53.710	-
27.	Rockfall	High	C1, v2 + 3, 775 meters	L = 15, L = 60, L = 40. Rockfall will cover the road, rockfall will reach the road	53.094-54.715	Rockfall fence
28.	Coastal erosion	High	C1, v2 + 3, 505 meters	L = 50, the road will disappear	54.130-54.635	Gabions
29.	Destruction of the embankment	High	Q, 5 meters	L = 5, the road will disappear	65.740-65.745	Drainage reconstruction
30.	Destruction of the embankment	Average	Q, 5 meters	With the progression of erosion, the embankment will collapse	66.430-66.435	Gabions
31.	Landslide	Moderate	N1, 640 meters	Low probability of road blocking for 5 years	67.725-68.365	-
32.	Coastal erosion	Average	Q, 10 meters	L = 5, the road will disappear	70.260-70.270	River bed regulation

Annex 10. Types of disasters identified in the route area and their characteristics (according to the Final Report on The Hazard Assessment and Recommendations)

Type of natural disaster	Schematic diagram	Specifications
Slope collapse	 	• Collapse of the unconsolidated layer from the mountainside; • Mainly caused by infiltration and saturation of slopes with atmospheric precipitation; • Mainly occurs on the nodal slope line; • Incorporation of any disasters occurring in the mountains, such as, for example, spring melt water.
Rockfalls	 	• Free fall, falling of boulders / rocks from the slope; • The destruction of the slope occurs under the action of gravity and depending on the distribution of fracture zones of the rock mass; • Occurs on slopes with fractured rocks.
Landslide	 	• The rise or subsidence of a part of a road or a slope as a result of soil sliding; • They tend to occur on a site composed of sedimentary rocks of the Neogene period; • Mainly activated by the rise in the level of groundwater; • Landslide slopes tend to have a gentle angle.

Type of natural disaster	Schematic diagram	Specifications
Embankment collapse	 	• Collapse of the embankment and auxiliary structures; • The reason is insufficient embankment and broken drainage; • Mainly caused by heavy rainfall and seismic movements.
River bank erosion	 	• Erosion / washout of road slopes from the river side • Prone to occurrence in the zone of influence of the river flow • Mostly caused by floods.
The collapse of a section of the road	 	• Collapse / landslide / erosion on the slope of the valley under the road. • Mainly triggered by strong rainwater flows.

Type of natural disaster	Schematic diagram	Specifications
Mudflow/Mudstone Flow	 	• Occurs in a drainage area with a steep slope and damages the road; • Mostly caused by heavy rainfall; • Streams are composed of boulders, gravel, sand, silt and clay mixed with significant amounts of water • Site instability was not confirmed in this study.