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v2

# National Roads Rehabilitation Project

Osh – Batken- Isfana

Environmental Impact Assessment

July 2009

# Table of Contents

## Abbreviations

## Executive Summary

<b>1. INTRODUCTION.....</b>	<b>1</b>
1.1. COUNTRY BACKGROUND AND CONTEXT.....	1
1.2. EXISTING ROAD NETWORK AND TRANSPORTATION .....	3
1.3. BACKGROUND TO THE PROJECT.....	4
1.3.1 <i>Rationale for the Project</i> .....	5
1.3.2 <i>Links to Other Studies</i> .....	5
1.4. SCOPE OF THE ENVIRONMENTAL STUDIES.....	6
1.4.1 <i>Requirements for Environmental Assessment in Kyrgyz Republic</i> .....	6
1.4.2 <i>Assessment Requirements of the World Bank</i> .....	8
1.4.3 <i>Recommended Categorization of the Project</i> .....	9
1.4.4 <i>Comparison of Kyrgyz and World Bank Safeguards Requirements</i> .....	10
1.5. PURPOSE AND METHODOLOGY OF EIA .....	12
<b>2. THE PROJECT .....</b>	<b>14</b>
2.1. GENERAL DESCRIPTION OF PROJECT .....	14
2.2. TRAFFIC VOLUMES AND TRANSPORT MODES.....	19
2.3. DESCRIPTION OF THE ROAD .....	20
2.3.1 <i>Osh to Pulgon Section</i> .....	20
2.3.2 <i>Pulgon to Batken Section</i> .....	21
2.3.3 <i>Batken to Isfana Section</i> .....	23
2.4. ANALYSIS OF ALTERNATIVES .....	24
2.5. CONSTRUCTION FORCE AND EQUIPMENT.....	25
<b>3. DESCRIPTION OF THE EXISTING ENVIRONMENT.....</b>	<b>27</b>
3.1. PHYSICAL CHARACTERISTICS .....	27
3.1.1 <i>General</i> .....	27
3.1.2 <i>Topography</i> .....	27
3.1.3 <i>Geology, Soils &amp; Minerals</i> .....	28
3.1.4 <i>Landslides, Avalanches &amp; Earthquake Activity</i> .....	28
3.1.5 <i>Climate and Air Quality</i> .....	31
3.1.6 <i>Groundwater Resources</i> .....	32
3.1.7 <i>River Systems &amp; Surface Water Resources</i> .....	32
3.2. BIOLOGICAL RESOURCES .....	33
3.2.1 <i>Flora</i> .....	33
3.2.2 <i>Fauna</i> .....	34
3.2.3 <i>Protected Areas</i> .....	36
3.3. SOCIO-ECONOMIC CHARACTERISTICS.....	38
3.3.1 <i>Industry</i> .....	38
3.3.2 <i>Agricultural Activities</i> .....	38
3.3.3 <i>Population and Demographics</i> .....	38
3.3.4 <i>Livelihoods and Poverty</i> .....	39
3.3.5 <i>Physical Cultural &amp; Heritage Resources</i> .....	40
<b>4. ASSESSMENT OF IMPACTS AND MITIGATION MEASURES .....</b>	<b>41</b>
4.1. ROAD PROJECTS: BASIC ENVIRONMENTAL CONSIDERATIONS .....	41
4.2. SCREENING OF IMPACTS .....	42
4.3. CONSTRUCTION IMPACTS ON THE PHYSICAL ENVIRONMENT .....	44
4.3.1 <i>Air Quality</i> .....	44
4.3.2 <i>Impacts from Quarry Sites and Borrow Pits</i> .....	45
4.3.3 <i>Soils, Erosion, and Slope Stability</i> .....	46
4.3.4 <i>Water Quality</i> .....	48
4.3.5 <i>Emergency Response Measures</i> .....	49
4.4. CONSTRUCTION IMPACTS ON THE BIOLOGICAL ENVIRONMENT.....	49
4.4.1 <i>Flora and Fauna</i> .....	49
4.4.2 <i>Protected Areas</i> .....	51

4.5.	CONSTRUCTION IMPACTS ON THE SOCIAL ENVIRONMENT .....	51
4.5.1	<i>Noise and Vibration</i> .....	51
4.5.2	<i>Impacts on Access and Traffic</i> .....	53
4.5.3	<i>Health and Safety</i> .....	54
4.5.4	<i>Land Acquisition and Resettlement</i> .....	56
4.5.5	<i>Impacts on Physical Cultural Resources</i> .....	58
4.5.6	<i>Other Social Impacts</i> .....	58
4.6.	OPERATION IMPACTS ON THE PHYSICAL ENVIRONMENT .....	59
4.6.1	<i>Air Quality</i> .....	59
4.6.2	<i>Soils, Erosion, and Slope Stability</i> .....	59
4.6.3	<i>Water Quality</i> .....	60
4.7.	OPERATION IMPACTS ON THE BIOLOGICAL ENVIRONMENT .....	60
4.7.1	<i>Flora and Fauna</i> .....	60
4.7.2	<i>Protected Areas</i> .....	60
4.8.	OPERATION IMPACTS ON THE SOCIAL ENVIRONMENT .....	61
4.8.1	<i>Noise</i> .....	61
4.8.2	<i>Access and Traffic</i> .....	61
4.8.3	<i>Health and Safety</i> .....	61
4.9.	SUMMARY OF IMPACTS.....	62
<b>5.</b>	<b>INSTITUTIONAL REQUIREMENTS .....</b>	<b>63</b>
5.1.	ORGANIZATION ROLES AND RESPONSIBILITIES .....	63
5.2.	MINISTRY OF TRANSPORT AND COMMUNICATIONS .....	63
5.3.	OTHER AGENCIES AND INSTITUTIONS .....	64
5.4.	OVERALL EA PROCESS AND PROCEDURES .....	65
<b>6.</b>	<b>ENVIRONMENTAL MANAGEMENT AND MONITORING .....</b>	<b>67</b>
6.1.	ENVIRONMENTAL MANAGEMENT PLAN .....	67
6.2.	ENVIRONMENTAL MONITORING PLAN .....	69
6.3.	COSTS OF MITIGATION AND MONITORING .....	72
<b>7.</b>	<b>CONSULTATION AND DISCLOSURE.....</b>	<b>74</b>
7.1.	CONSULTATION ACTIVITIES UNDERTAKEN .....	74
7.2.	RESULTS OF THE CONSULTATION .....	74
7.2.1	<i>Focus Group Discussions and Meetings</i> .....	74
7.2.2	<i>Public Hearings on EIA</i> .....	76
7.3.	DISCLOSURE.....	79
<b>8.</b>	<b>FINDINGS, RECOMMENDATIONS AND CONCLUSIONS.....</b>	<b>80</b>
8.1.	FINDINGS.....	80
8.2.	RECOMMENDATIONS .....	80
8.3.	CONCLUSIONS .....	80
	<b>APPENDICES.....</b>	<b>1</b>
	<b>APPENDIX 1 – ENVIRONMENTAL REGULATIONS, GUIDELINES IN KYRGYZSTAN .....</b>	<b>2</b>
	<b>APPENDIX 2 – BIRDS IN KYRGYZSTAN .....</b>	<b>4</b>
	<b>APPENDIX 3 - BIRDS IN KYRGYZSTAN .....</b>	<b>6</b>
	<b>APPENDIX 4 – CHANCE FIND PROCEDURES PLAN .....</b>	<b>8</b>
	<b>APPENDIX 5 – MEASURES TO BE INCLUDED IN DESIGN.....</b>	<b>11</b>
	<b>APPENDIX 6 – PROTOCOL OF PUBLIC HEARINGS ON DRAFT EIA.....</b>	<b>13</b>

# Executive Summary

## Background

The Government of the Kyrgyz Republic (the Government) has asked the World Bank to finance the rehabilitation of section totalling about 30 kilometers (km) of the Osh-Batken-Isfana Road corridor (total length 358 km) that currently crosses foreign territory (Tajikistan and Uzbekistan) at various locations. The Project responds both to the general need to improve the road network, and, specifically to accommodate the growth of traffic along this important route, which provides the only connection between the Fergana Valley and the rest of the country. The Southwest is the poorest region of the Kyrgyz Republic, and transport links to the rest of the country are interrupted due to enclaves of two neighbouring countries, Tajikistan and Uzbekistan. The unlocking of this region through the improvement of the existing route will have a major positive impact on rural communities who rely on the corridor for the delivery of, and access to, socio-economic services. This comprises a population of about 1.5 million.

## Objectives of the Project

The objectives of the Project are: (i) to contribute to the reduction of transport costs and travel time along the Osh-Batken-Isfana Road corridor and (ii) to improve road safety planning. The main beneficiaries of the project are (i) the general population of the area serviced by the road corridor; (ii) the transport corridor users; and (iii) the key social and economic services which rely on access in, and around, the south-west region. The completion of the proposed Project will make a significant improvement in the level of service offered as the road provides the only connection between the Kyrgyz cities in Fergana valley and the rest of the country.

The proposed Project activities to be supported by the World Bank to achieve this objective include (i) rehabilitation of a section of the Osh-Batken-Isfana (financing of physical works and consultants' services), , (ii) road safety planning improvement (provision of goods, and consultants' services for the development and launch of a national road safety program, preparation of demonstration projects on road safety, and improvement of road safety planning, and (iii) project management and implementation support (provision of goods, consultants' services, training, and operating costs including an audit to support Project coordination, implementation, and management).

## Analysis of Alternatives

The alternatives to the proposed Project include doing nothing, and a complete realignment of the road traversing a new and separate transport corridor.

The Osh-Batken-Isfana road corridor, which is central to the economy of Southwest Kyrgyzstan, is in poor to fair condition. The road corridor runs close to the Kyrgyz Republic's international border with Uzbekistan. The road traverses the Uzbek enclave of Kok-Talaa, as well as through Uzbek (Sokh) and Tajik (Surkh and Vorukh) territories. The do nothing option is not considered feasible because it would not address the existing problems. To travel the route nowadays causes frequent delays at border crossing points arising from lengthy and sometimes cumbersome control procedures, which severely hamper connectivity along the road. In addition, local communities along the road feel physically and economically isolated from Osh and the rest of the Kyrgyz Republic; and agriculture, as one of the region's main economic activities, is severely constrained by the poor access offered by the existing road corridor.

A complete realignment of the road corridor to either the north or south of the existing alignment is feasible but of significant cost. The construction of a completely new road linking Osh and Isfana would result in significant environmental and social impacts and incur in major resettlement.

Such a project would be classified as Category A and require several months of detailed environmental study and rounds of public consultations, causing delays in addressing the problems mentioned above.

The communities along the route have already waited some considerable time for improvements to access, and any additional delay required for the study, design and construction of an entirely new road would be considered untenable.

The proposed Project is considered to be the most suitable option for contributing to the reduction of transport costs and travel times along the Osh-Batken-Isfana Road corridor with minimal environmental and social impact. Through the rehabilitation of the existing road corridor, the Government intends to eliminate the need to cross foreign territory when travelling through Batken and Osh oblasts. Given the strategic importance of this corridor, the Government is implementing the rehabilitation of the Osh-Isfana road corridor in two stages (each of approximately 180kms) and by firstly focusing on the elimination of major bottlenecks in order to restore accessibility to a basic level. While some work has already been undertaken by the Government, the remainder is foreseen to be financed by development partners.

The first phase (about 180 km of the corridor) will include the rehabilitation of the sections between Kok-Talaa (Km 108) to Ak Taty (Km 271). The construction of a 23 km section between Tortgul (Km 248) and Ak Taty (Km 271) has been substantially completed with European Union (EU) financing in July 2009. In addition, some earthworks, bridges, drainage and pavement construction have commenced and been completed with funding from the Government. Additionally, the construction of a new bridge over the Sokh River and approach road has been completed by the Government.

### **Environmental Conditions**

The road traverses two oblasts (Osh and Batken) in the southwest of the country which together comprise a population of about 1.5 million people. The road leads west over a distance of about 358 km from the outskirts of Osh (Km 2) through Batken (Km 230) to Isfana (Km 358), a town close to the Tajik border. For the most part the Project is rehabilitation of the existing alignment and will involve raising the road to a new surface elevation of, on average, 0.5 meters above the existing road. Deviations from the original road corridor total 110 km, where the corridor will follow existing secondary roads and unpaved tracks which have already been in use for several years and constructed to avoid the Tajik and Uzbek territory. There is one section of new alignment between Km 195 and Km 200 which includes a bridge over the Sokh River and its approach roads, which involved construction and has already been completed. Settlements along the existing road are sparse.

The climate in this region of Kyrgyzstan is continental and dry, resulting in arid, often semi-desert landscapes with few perennial water courses. The road corridor is located mostly on the flat alluvial fans and gentler hills of the foreland, occasionally climbing slightly higher into the foothills to altitudes just below 1,500 m. The natural vegetation is very sparse, dominated by grassy rangelands with small clusters of forest near rivers and in valleys, or where irrigation based agriculture is located. The few perennial streams crossing the alignment are fed from snow- and glacial melt from the mountains, with highest peaks reaching an altitude of over 7,000 m. The land is mostly used for animal

grazing; agriculture and horticulture are concentrated around settlements along the perennial rivers, where irrigation sustains mainly fruit and vegetable crops.

## **Impacts**

A range of positive impacts and benefits is expected to arise from upgrading and maintaining the road including increased accessibility, improved opportunities for economic development, and local poverty reduction.

As in all development including large scale civil works, a certain measure of potential negative environmental and social impacts can be expected. The main *environmental issues* concerning the construction stage can be grouped as follows:

**Physical:** In general there are no potential adverse impacts, which can not be avoided or mitigated by good design and engineering practice. Most of the impacts are connected to the rehabilitation works within settlements, towns and villages. In respect of river crossings and gorges, effects are limited and readily mitigated through implementation of the measures included in the environmental management plan (EMP). Particular attention will be paid to the risks of water pollution and erosion. The impacts on hilly and mountainous terrain, such as earthworks or rock cuttings, will not be carried out at areas susceptible to erosion or landslide. All works in this type of terrain will be carefully planned and implemented.

**Social:** Effects will be temporary and minor, such as noise and dust, and can be managed through implementation of the EMP. A risk associated with the spread of Human Immune-deficiency Virus (HIV) and sexually transmitted infections (STIs) will be addressed (see below).

**Land acquisition:** Will be managed, and compensated for, through implementation of the resettlement plans, prepared in consultation with affected people.

The overall level of negative environmental impacts will be minor. The majority of impacts will be temporary, localized, and readily controlled, and will occur during the civil works (construction) stage. Examples of such impacts include noise and dust generation, water quality deterioration, disruption to access to properties, and exacerbation of local flooding and drainage concerns. These impacts can be mitigated and managed through implementation of the EMP prepared for the project.

*Negative operation stage environmental impacts* will generally be minor and can be largely avoided through appropriate subproject design and operation and maintenance activities. Examples of such impacts include changes to local flooding, noise generation, and erosion and scouring of areas of cut and fill and waterway crossings.

The spread of HIV and STIs has been identified as a potential risk during the construction phase and operation phase. This risk will be addressed through an HIV and STIs awareness and prevention campaign which includes training on HIV in the workplace to be provided by an NGO and UNAIDS to the contractors' work-force and adjacent communities.

## **Mitigation Measures**

No significant adverse environmental impacts are foreseen. As previously mentioned, most of the adverse impacts which may be caused during the construction phase can be avoided or reduced by good engineering practices and compliance with the EMP.

A number of measures to be included in design have been defined. Some information, such as exact work methods, location of quarries and borrow pits sites, labour camps, final new alignments and detours will be updated as design progresses.

However, no significant environmental impacts are expected, assuming that significant earthworks are not needed and that the measures identified in the environmental impact assessment (EIA) prepared for the Project are implemented. All required permits (for asphalt plants, quarries) will be obtained before commencing construction. The main mitigation measures are:

- EMP - outlining the measures and actions to be implemented during construction (by the contractor) to ensure that the impacts identified in the EIA are avoided or mitigated. The compliance with the EMP will be monitored;
- Design standards - standards of curvature and gradient are of particular relevance in terms of the space required for the road and the amount of soil and rock, which has to be excavated, hauled and stored, especially in the case of the new alignments. Road width is also important, particularly in the rehabilitation of the existing road. Widths should be uniform and appropriate to the anticipated traffic flows. Over-dimensioning causes excessive problems particularly in populated areas and environmentally sensitive areas such as narrow gorges;
- Road alignment – the sections of new road, using existing unpaved tracks and secondary roads, avoid environmentally sensitive areas such as areas with erodible soils, forests, reservoirs, rivers, cultivated land and areas with contaminated soils. This is achieved for the 30 km World Bank financed section;
- Erosion control – prevention and/or control of erosion will be achieved through special attention to the design of drainage structures, river training works, slopes, spoil dumping areas, and reinstatement of quarries and borrow areas;
- Material extraction - the potential locations of quarries and borrow pits will be identified and methods for use and rehabilitation will be described in a quarry management plan. The quarry management plan will (i) describe the areas and depths of permissible utilization determined in the designs; (ii) identify areas for the disposal of surplus materials; (iii) include the specifications for the methods of operation, clean-up and landscaping/re-vegetation for such areas; and (iv) demonstrate how the procedures comply with Kyrgyz legislation and specific national guidelines regulating such activities;
- Traffic management and safety – during construction traffic will be managed in such a way to ensure safety and maintenance of access. Work areas will be carefully marked by signage, and any detours or temporary deviations required by works will be discussed and agreed by the contractor, MOTC and the communities affected. For longer-term safety, all necessary markings, signs and guardrail locations will be shown on drawings. The designs will account for pedestrian movements in urban, semi-urban and rural areas and proper provision for sidewalks, where needed, to give satisfactory and convenient separation of traffic and pedestrians will be included;
- The designs will also incorporate measures to improve access to and across the main stream of traffic for light flows on side roads. Controlled

pedestrian crossings will be provided where appropriate in urban areas. The designs will include proper rest areas for trucks and other vehicles with environmentally safe service facilities. Rest areas should be provided in places where private service entrepreneurship has already arisen;

- Stormwater and drainage - drainage system design will take into account local irrigation systems and the other needs of water users. Consultation with local people is needed. Special attention will be paid to the protection of water quality in rivers adjacent to the roads. Direct discharge of to waterways will not be permitted, construction and operation phase discharges will be diverted to settlement ponds prior to discharge.

### **Land Acquisition and Resettlement**

The land acquisition and resettlement requirements of this Project are expected to be minor because the works will primarily involve the rehabilitation of the existing alignment or the upgrading of existing gravel traces and secondary roads to national road standard. Long sections of the corridor, between settlements, traverse uninhabited land. It may be necessary to remove a number of trees, fences, boundary walls, and acquire narrow strips of agricultural or commercial land. In only a small number of cases will residential property be acquired by the Project. In order to mitigate the potential negative impacts of land acquisition, the following principles will be followed:

- The land acquisition and involuntary resettlement requirements of the project will be minimized through exploring alternative designs.
- People affected by land acquisition will be provided compensation that will allow them to at least maintain their living standards before the land was acquired or resettlement occurs.
- Lack of formal or legal title will not be a hindrance to the provision of assistance to restore living standards following land acquisition.
- Particular attention will be paid to households headed by women or other vulnerable groups such as the elderly, disabled, or ethnic minorities and assistance provided to ensure the restoration or improvement of living standards,
- Land acquisition and resettlement will be planned and executed as part of the project and the full costs of compensation will be included in project costs.
- Compensation or assistance will be paid prior to the acquisition of land or before any impact occurs.

A resettlement policy framework (RPF) has been prepared by the Government and has been disclosed and discussed publicly in order to ensure these principles are adhered to. The RPF summarizes the steps the Government will take in acquiring land for the Project and requires the preparation of specific resettlement plans for each section of the road, once designs are finalized. The resettlement plans will be based on a comprehensive socio-economic survey of the people who will be affected and an inventory of the losses incurred. Each plan will be disclosed, and discussed locally with the people who will be affected before being finalized.

In addition to several rounds of consultation, the EIA has been the subject of two public hearings and been disclosed to the communities. The issues and concerns raised during the hearing have been addressed and incorporated into this version of the EIA.

# **1. INTRODUCTION**

## **1.1. Country Background and Context**

The Kyrgyz Republic, a former Soviet Union country, became independent on 31 August 1991, and is now a member of the Commonwealth of Independent States (CIS). The country is situated in the north-eastern part of Central Asia and has a surface area of 198,500 square km. Almost 90% of its territory is situated at more than 1,500 m above sea level, 40.8 % lies above 3,000 m and the average altitude is 2,750 m. The highest point in Kyrgyzstan is Peak Pobeda at an elevation of 7,439 m situated in the North-Eastern corner of the country. The lowest parts, situated in the valleys between mountain ranges, are around 400 m above sea level. The length of the country (South-North) is 453.9 km and the width (East-West) 925 km.

Mountain ranges (the Tien Shan, the Pamir and their subsidiary ranges) separate the country's economic-demographic centres, namely the Chui Valley in the North and the Fergana Valley in the South.

The country is landlocked having borders with China, Kazakhstan, Tajikistan and Uzbekistan (totalling 4,508 km). The Kyrgyz Republic has seven administrative provinces (Oblasts): Chui, Jalal-Abad, Issyk-Kul, Naryn, Osh, Talas and Batken. The country's capital – Bishkek – is located in Chui. Each oblast is divided into rayons (districts), of which there are 43 in total). The rayons are further divided into *aiyl okmötus* (cities, towns and settlements) of which there are 478 in total.

After independence in 1991, Kyrgyzstan was faced with the huge challenge of building a self-sufficient administration, economy and infrastructure. During the eighteen years since independence, other difficulties have emerged and the problems concerning administration, economy and infrastructure remain significant.

The key reforms and developments required have been formulated as a National Strategy for Sustainable Human Development (NSSHD). The major components of this strategy deal economic development, the political system (including non-governmental sectors and issues concerning human rights), social issues, human capacity, safety issues, and the environment.

The Kyrgyz Republic faces serious challenges concerning the public road network, especially in developing the main roads to a condition which satisfies the needs of domestic and international long distance transportation.

As in other countries of the former Soviet Union, adequate maintenance funds have not been available following independence and the traditional institutions and agencies have been unable to maintain the investment in the road system. Consequently, there is much to be done to recover and sustain the investment, and the Kyrgyz Government, with assistance from World Bank (WB), Asian Development Bank (ADB), Islamic Development Bank (IDB), and European Union (EU), has been undertaking a number of road upgrading and rehabilitation projects to improve national and regional road transport networks and facilitate socio-economic development.

The National Statistics Committee (NSC) estimated the total population at the end of 2008 was 5.28 million, the population of the larger project area is 3.4 million. The population is concentrated in small areas in the north and southwest in the Chui (north-central), Fergana (south-western), and Talas (north-western) valleys. Approximately 70% of the population is Kyrgyz, 14% Uzbek, 8% Russian, and 7% other (Kazakhs, Tajiks, Dungan, Uighur, Turks). The main religions are Sunni Islam (80%) and Orthodox Christianity (17%).

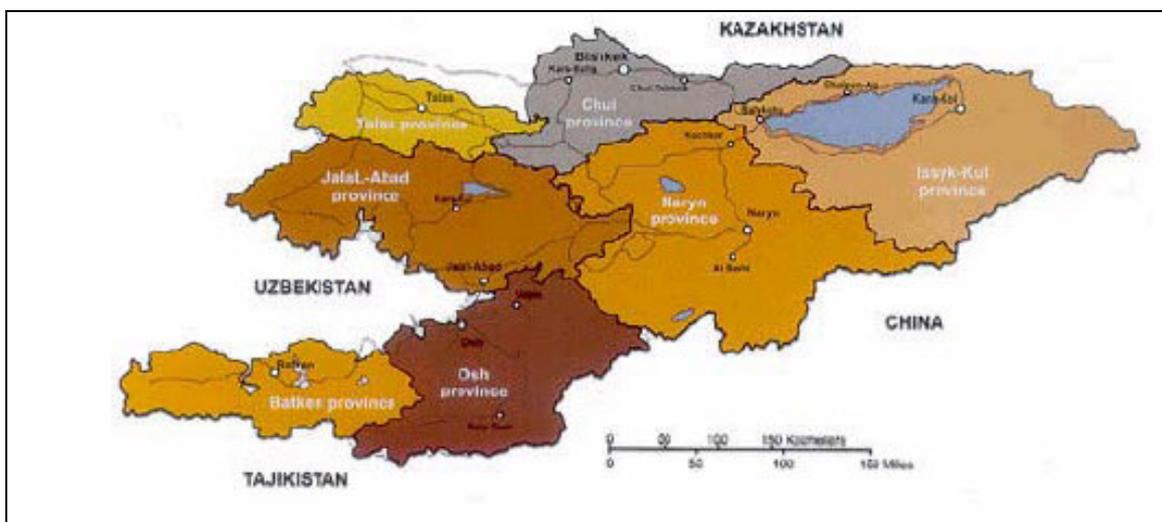
The Kyrgyz population is diverse in many respects:

- The northern and southern parts of the country are more densely populated than the centre;
- The population consists of more than 80 nationalities, the biggest ethnic groups being Kyrgyz, Uzbek, and Russian;
- The structure of population in the north and the south is different in relation to the level of urbanisation, age distribution, and ethnic composition; and
- The north (Bishkek and Chui region) has about 1.5 million inhabitants and the south 2.5 million inhabitants. The mountainous and isolated central area has only about 130,000 inhabitants.

The regional differences in the country are significant. Northern Kyrgyzstan is economically more developed, more urbanized and has a more diverse ethnic composition. Southern Kyrgyzstan has economic potential, but its development is constrained largely by poor access as a result of under-developed transportation system and network, exacerbated by bottlenecks created by passage through foreign territory.

In the south, where the project road is situated, the demographic distribution differs significantly from that of the whole country. In Osh and Batken oblasts, close to the Uzbek border, in some villages Uzbeks are the majority, and in many areas there are few, if any, Russians. There are two main centres of population, trade, industry and agricultural activities. The largest, the capital Bishkek, is on the northern edge of the country, and the second, Osh, is located at the eastern end of the fertile Fergana valley in the southwest of the country.

**Figure 1 - Kyrgyz Republic**



The most striking physical characteristics of the country are the mountain ranges, deep gorges and fertile valleys, resulting in an unusual geomorphology which frequently affects the development of the country's infrastructure, particularly the costs of developing and maintaining the road network.

This geomorphology, together with climatic conditions, creates a number of environmental issues that can be exacerbated by infrastructure construction if the activities are not managed well.

The economic decline created a favourable opportunity for improving the environmental situation in the country. Following the demise of the Soviet rule and economy, the pressures of industrial production diminished dramatically and it has been possible to introduce firm environmental legislation and new practices in administration, and to strengthen environmental awareness. In principle this has been partially achieved but issuing basic legislation and putting into effect changes in environmental administration have not yet resulted in adequate or obvious improvements in the state of the environment or in the environmental management of the country, and enforcement is being actively carried out for construction projects.

To some extent the decentralization of public administration has introduced new difficulties concerning the environment. On the one hand, the local state administration is a financial burden to government and, on the other hand, the local state administration is confusing to the public in its complexity and has little actual power of decision.

## **1.2. Existing Road Network and Transportation**

Since independence, new construction and upgrading of public infrastructure directly by the Government has almost entirely ceased due to lack of funds. Since 1995, investment in infrastructure has been made mainly through development programmes financed by international donors as part of the Public Investment Programme (PIP).

The transport and communications infrastructure in the CIS republics was developed to support movement and trade within the former Soviet Union. Consequently, some of the Kyrgyz road network, including sections of the Osh to Isfana Road, crosses salients and enclaves belonging to the territories of Uzbekistan and Tajikistan. Over 60% of the Kyrgyz Republic road network is in poor condition, including the roads connecting the southern oblasts of Osh and Batken with the rest of the country. Travel times on the road network are unpredictable and many roads are impassable during winter.

The Government's PIP has placed emphasis on increasing air traffic, enhancing the bus and truck fleet, encouraging privatisation of transport enterprises and on the rehabilitation of the road network, particularly the Bishkek-Osh highway, all of which relies heavily on external financial assistance.

According to 2007 statistics, transport infrastructure includes about 34,000 km of road and 450 km of rail. Transportation by road accounts for the greatest proportion of freight (50%) and passengers (96%). The second most important mode of freight transport is rail (45%) while the second most important mode for passengers is air (3%). Refer to Table 1.1 and Table 1.2. The predominant role of road transport is very likely to prevail for the foreseeable future.

**Table 1.1 - Freight Transportation in Kyrgyzstan (million ton-km)**

Mode	2001	2002	2003	2004	2005	2006	2007	To November 2008
Rail	331.6	394.6	561.7	714.9	661.8	751.7	853.7	872,0
%increase		19	42.3	27.3	-7.4	13.6	13.6	
Road	1050.5	875.1	797.2	847.4	821.2	819.0	900.0	937,2
%increase		-16.7	-8.9	6.3	-3.1	-0.3	9.9	
Water	6.4	7.2	7.4	6.3	4.9	6.3	4.8	7,7
%increase		12.5	2.8	-14.9	-22.2	28.6	-23.8	
Air	49.6	38.8	42.8	45.5	42.4	34.2	44.5	55,3
%increase		-21.8	10.3	6.3	-6.8	-19.3	30.1	

Source: ADB; Maintenance of Regional Road Corridors IEE (2007)

**Table 1.2 - Passenger Transportation in Kyrgyzstan (million passenger-km)**

Mode	2001	2002	2003	2004	2005	2006	2007	To November 2008
Rail	50	43.1	49.8	45.3	46.1	61.5	59.9	79,5
%increase		-13.8	15.5	-9	1.8	33.4	-2.6	
Air	381.4	341.9	410.5	458.9	421.2	360.2	509.3	590,0
%increase		-10.4	20.1	11.8	-8.2	14.5	41.4	
Road	5033.2	5080,8	5273.7	5623.9	5874.2	6116.8	6482.2	6146,4
%increase		0.9	3.4	6.6	4.4	4.1	6	
Car	4774.1	4857.3	5090.9	5407.3	5684.8	5945.9	6366.9	6080,1
%increase		1.7	4.8	6.2	5.1	4.6	7	
Bus	4715.7	4803.4	5026.1	5337.7	5600.5	5816.6	6162.6	5871,0
%increase		1.6	4.6	6.2	4.9	3.8	5.9	
Trolleybus	259.1	223.5	182.8	216.6	189.4	170.9	101.3	66,3
%increase		-13.7	-18.2	18.5	-12.5	-9.7	-40.7	
Taxi	58.4	53.9	64.8	69.6	84.3	129.3	204.3	209,1
%increase		-7.7	20.2	7.4	21.1	53.4	58	

Source: ADB; Maintenance of Regional Road Corridors IEE (2007)

### 1.3. Background to the Project

An initial environmental examination (IEE), prepared for Asian Development Bank (ADB) in compliance with ADB safeguard policy on environment (2003), has been updated and revised as part of the updating of the feasibility studies for the rehabilitation of the road. This environmental impact assessment (EIA) has been prepared based on the earlier IEE and complies with World Bank safeguard policy. The primary objective of the studies is to develop a road rehabilitation project suitable for external financing. Environmental and social impact studies are therefore necessary for the completion of project processing and subsequent financing by World Bank, European Bank for Reconstruction and Development (EBRD), and EU. A separate social assessment has been prepared. The project road includes 11 sections (refer to Section 2.1) and traverses west from Osh city over a distance of 360 km through Batken to Isfana, a town close to the Tajik border in the south-west.

The existing road traverses Uzbek territory between Kyzyl-Kyya and Pulgon, and again between Pulgon and Batken. Tajik territory is also crossed west of Batken. Diversions to avoid these sections of foreign territory are included in the studies. It is anticipated that the improvement of this route will have a positive impact on the economy of the region and further promote the towns of Batken and Osh as regional centres (including links through the airports located there).

### **1.3.1 Rationale for the Project**

1. *Over the past years, the Government has received assistance in the roads sector through investments in infrastructure and support towards reforming sector operations.* The ADB is currently financing the sixth road project in the Kyrgyz Republic. ADB assistance to the road subsector which totals US\$210 million was provided for rehabilitating roads from Bishkek to Osh and on to Irkeshtam, and from Bishkek to Almaty in Kazakhstan. In addition, the Islamic Development Bank (IsDB), Japan Bank for International Cooperation (JBIC), and the People's Republic of China (PRC) have also extended assistance.

2. *In recognition of the need for close coordination, key donors to the Kyrgyz Republic have jointly prepared a strategy, which identifies road subsector development and regional cooperation as priorities for assistance.* The external assistance provided to the road subsector and other related projects are summarized in Annex 2. The World Bank has supported the government through (i) the Urban Transport Project (2000-2005), (ii) technical assistance on road maintenance and public expenditures (2005/2006), and (iii) technical assistance on regional transport corridor performance measurements (ongoing since 2003).

3. *There are three main reasons for the involvement of the World Bank in this Project:* (i) the World Bank was asked by the Government to act as the lead donor for the preparation of the rehabilitation of the entire road corridor from Osh to Isfana (the updated Feasibility Study and detailed technical designs for the corridor were financed out of a Project Preparation Advance, PPA), (ii) The Bank together with the World Health Organization have taken the leading role internationally to improve road safety, and (iii) The Bank is well placed to define and implement support for institutional development. There are significant needs for support and capacity building in the areas of road safety and road management. Links to Other Studies

During the past decade various donors have been active in assisting Kyrgyzstan to develop its transportation infrastructure, specific goals being the main road linkages to neighbouring countries and the enhancement of road network maintenance.

Other projects of relevance to the present studies include:

- The World Bank financed Urban Transport Project (2000-2004).
- The ADB financed Institutional Strengthening of the Road Sector project in 1996-1997 which led to the grouping of all Kyrgyz roads under the Ministry of Transport and Communications.
- The ADB financed First, Second and Third Road Rehabilitation projects which produced the feasibility study, detailed design and construction for the rehabilitation of the Bishkek to Osh national highway. These projects have been completed, and now only two sections (Km 0-61 and 507-575) remain to be rehabilitated at a future date.
- The IDB and ADB financed feasibility studies for the rehabilitation of the Bishkek-Naryn-Torugart road (Km 0-539) which is now proposed to be

improved in three phases (projects), being funded by or proposed to be funded by:

- Chinese Exim Bank, possibly covering some or all of the Km 0-265 section.
- Km265-400 (Sary Bulak-Atbashe), under a consortium of islamic banks
- ADB under the CAREC Transport Corridor 1 Project, namely Km 400-439 currently in progress, and then Km 439-539 under two further sections/phases in the coming years;
- The Tacis (TRACECA programme) financed Road Maintenance (1997-1998) and Regional Traffic Forecasting Model (1996-1997) projects which produced assessments and guidelines for the maintenance of roads, pavements and bridges, and a comprehensive transport database covering all of the eight original TRACECA beneficiary countries.
- The ADB financed feasibility study, detailed design, and subsequent rehabilitation of the Almaty to Bishkek road;
- ADB financed Technical Assistance for Improvement of the Road Sector Efficiency (TA No. 3531-KGZ)
- ADB financed Improving Road Maintenance and Strengthening the Transport Corridor Management Department (TA 4444–KGZ);
- ADB financed Support to the Development and Implementation of the National Poverty Reduction Strategy II - Roads Sub-Sector (TA 4705-KGZ);
- EU funded Pre-feasibility and Feasibility Studies for Road Sections of the Termez - Dushanbe – Sary Tash (with particular reference in the Kyrgyz Republic to the 136km Sarytash-Karamuk section);
- World Bank funded Kyrgyz Republic: Training in Tools for Prioritizing Budget Expenditures (providing HDM-4 training as a follow up to the KDTP /WB project); and
- ADB financed Maintenance of Regional Road Transport Corridors Project (TA-6309-REG).

#### **1.4. Scope of the Environmental Studies**

The background research for the environmental impact assessment of the project road commenced in 2001 and again in 2008 by Kyrgyz Design Institute (Kyrgyzdortransproekt). The Design Institute also provided assistance for the field work and collecting of data. This has been supplemented by the IEE completed for the ADB funded Maintenance of Regional Road Transport Corridors Project (TA-6309-REG; 2006) which originally included the Osh to Isfana road as one of the 11 roads being considered for rehabilitation at that time. The design work and IEE have been reviewed and additional studies and consultations undertaken where necessary, to present this EIA which complies with both Kyrgyz environmental protection law and World Bank's environment safeguard policy.

##### ***1.4.1 Requirements for Environmental Assessment in Kyrgyz Republic***

The environmental administration of the Kyrgyz Republic consists of numerous different pieces of legislation (Appendix 1). Environment policy of the Kyrgyz Republic is anchored in the 1995 National Environment Action Plan (NEAP) which effectively shaped the

evolution of the country's environmental laws and regulations. The two most significant pieces of legislation being the Law on Environmental Protection (No. 53 of June 16 1999) and Law on Ecological Expert's Review (No. 54 of June 16 1999).

The Law on Environmental Protection requires that in the process of designing, placing, construction, re-construction, putting into operation facilities, and other activities having a direct or indirect impact on environment, the actions for protection, use and restoration of the environment and natural resources shall be identified and undertaken "according to ecological norms". The Law also requires that an EIA be prepared for a planned activity (Article 17).

The Law on Ecological Expert's Review states that EIA means the identification, analyses, assessment, and taking into consideration possible impacts of development activities (Article 1). Article 10 defines the activities that require EIA and the process for the project proponent to undertake the EIA. The activities that require EIA include:

- Concepts, programs and plans for sectoral or territorial socio-economic development;
- Plans for the integrated use and/or protection of natural resources;
- Master plans for cities and settlements as well as other town-building; and
- Any new construction, reconstruction, expansion or re-equipment of operating economic entities or other entities which are likely to have impacts on the environment.

According to the Temporary Instruction for Procedure for Performance of Environmental Impact Assessment of Planned Economic and Other Activities (Instruction 1), the documentation prepared must reflect the full extent of the project and meet the specified requirements for EIA, while to ensure consistency of EIA reports, the Instruction on Procedure for Performance of Environmental Impact Assessment of Planned Activity should be fully consulted (Instruction 2).<sup>1</sup> According to Instructions 1 and 2 the EIA must include:

- Description of the project or planned activity;
- Possible alternatives for the project or planned activity;
- Description of the existing environment;
- Types and degree of impact on environment and population;
- Forecast any possible changes in environmental quality;
- Description of socio-economic and ecological consequences; and
- Actions to prevent environmental damage or mitigate the level of ecological risk.

Once prepared the EIA is reviewed by the authorized government body on environmental protection<sup>2</sup> as per the *Instruction on Procedure for Performance of State Ecological*

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<sup>1</sup> Instruction 1 - as approved by the Minister of Environmental Protection of the Kyrgyz Republic (June 27, 1997) and Instruction 2 - No. 386 as registered by the Ministry of Justice (July 04 1997).

<sup>2</sup> Previously the mandate of the Ministry of Environment and Emergency Situations (MEES) following Government restructuring this role has been taken over by Government of Kyrgyz Republic's State

*Expert Review of Materials and Documents*<sup>3</sup> which describes what must be submitted for state review of an EIA. It should be noted that Instruction 2 is developed in accordance with regulations of the *International Convention on Environmental Impact Assessment in a Trans-boundary Context* and also defines:

- Scope of the EIA application;
- Organization and procedure for the EIA performance;
- Responsibilities and liability of EIA participants;
- Registration of the EIA results; and
- Procedure for public hearing.

The final EIA shall be the statement on ecological consequences of a project or planned activity and contain guarantees for adoption of the actions to ensure protection of the environment and ecological safety throughout the implementation of the project or planned activity. Consultation with State Agency for Environmental Protection and Forestry (SAEPF) has confirmed that updating of the EIA originally prepared, presented as this EIA, will be acceptable as the level of assessment for this project.

#### **1.4.2 Assessment Requirements of the World Bank**

The World Bank undertakes environmental screening of proposed projects to determine the appropriate extent and type of environmental assessment (EA). The World Bank classifies proposed projects into one of four categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts.

- Category A – describes a proposed project if it is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works. EA for a Category A project is an EIA which examines the project's potential negative and positive environmental impacts, compares them with those of feasible alternatives (including the "without project" situation), and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance;
- Category B – describes a project if its potential adverse environmental impacts on human populations or environmentally important areas (including wetlands, forests, grasslands, and other natural habitats) are less adverse than those of Category A projects. These impacts are site-specific; few if any are irreversible; and in most cases mitigation measures can be designed. The scope of EA for a Category B project may vary from project to project, but it is narrower than that of Category A. Like Category A, the assessment examines the project's potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance;

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Agency on Environment Protection and Forestry – Department of Ecological Expertise.

<sup>3</sup> As registered by the Ministry of Justice (No. 407, October 15 1997).

- Category C – describes a project if it is likely to have minimal or no adverse environmental impacts. Beyond screening, no further EA action is required for a Category C project; and
- Category FI – describes a project if it involves investment of WB funds through a financial intermediary, in subprojects that may result in adverse environmental impacts.

#### **1.4.3 Recommended Categorization of the Project**

The World Bank's system of environmental categorization is determined according to the likelihood and magnitude of risk associated with a project (and subprojects) when implemented without mitigation. Earlier assessments of the project concluded that Category B is the appropriate categorization of this Project. The overall risks associated with the Project are considered low because:

- Most of the works (235 km) are rehabilitation of existing established asphalt roads such as shaping of the formation including shoulders and drains, construction of new pavement (where in poor condition) or repairing cracks and potholes, sealing and overlaying;
- Environmental improvements are expected as a result of the project (improved drainage);
- There are only limited sections of alignment (125 km) which require upgrading as they run along existing gravel tracks and secondary roads, most of which have already been engineered to full required width with the exception of the section Km 193-195. These sections have been in use by the public, and the remaining work is completion of some filling, drainage works, pavement and road furniture; and
- From Km 2-108, the road traverses generally arable land, and section Km 108-358, the road generally traverses sparsely populated and rough grazing land.

In October 2007, a visiting World Bank mission expressed concerns in its Aide Memoire concerning the design adequacy and possible environmental impacts of the proposed bridge across the Sokh River at Km 197. The bridge was constructed in 2008. This issue has been reviewed (see Volume 2 - Technical Appendices, Appendix 1). The main conclusions are that the bridge design is adequate, and possible environmental impacts are minimal. In addition a resettlement due diligence has been completed. The due diligence found that there has been land acquisition in Zartash village, compensation has been paid in full (in the order of 79,700 som). There has been no requirement for removal of structures of plantations through this section. Land owners have received compensation award in full and no complaints or grievances have been made.

The overall assessment process has determined that the Project will fall into Category B. The improved road alignment already exists, the majority of the works will be rehabilitation within the existing alignment and constitute pavement and surface treatment works only. There will be upgrading of existing alignments to bypass the salients/enclaves, these construction activities will upgrade existing secondary roads and gravel roads to bring these sections up to national road standard comparable with the remainder of the alignment. Overall works will be limited, but are anticipated to create a range of potentially adverse, but not significant, environmental impacts if implemented without mitigation. The magnitude of the impacts will be reduced through implementation of mitigation measures set out in the project's environmental management plan (EMP).

Therefore, the recommendation is that the project can have an overall environmental classification of Category B.

#### 1.4.4 Comparison of Kyrgyz and World Bank Safeguards Requirements

The objective of environmental and social safeguards is to prevent and mitigate undue harm to people and their environment in the development process. Safeguard policies are the cornerstone of the assistance provided to developing countries by their development partners. The policies provide guidelines for donors and borrowers in the identification, preparation, and implementation of programs and projects. The WB has ten plus one safeguard policies, the policies relevant to the project are shown in Table 1.4.1.

A review of the similarities and differences between Kyrgyz and WB safeguards requirements concludes that in respect of the equivalence analysis there is a broad equivalence between the Kyrgyz legal framework for EA, natural habitats and physical cultural resources and WB's objectives and operational principles (as set out in OP 4.00). However, a number of remedial measures are required to ensure that national law and regulation fully meets the WB policies, and the following recommendations propose ways in which the gaps can be filled during the preparation of the EIA and land acquisition processes.

**Table 1.4.1 - Social and Environmental Safeguards Triggered by Road Projects**

Safeguards	Triggers and Requirements
Environmental Assessment	This policy requires EA of projects to help ensure that they are environmentally sound and sustainable. EA evaluates a project's potential environmental risks and impacts; examines project alternatives; identifies ways of improving the project by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and enhancing positive impacts. Projects that will affect the environment (temporary or permanently) will be subject to EA. The depth of the EA is function of the level of socio-environmental risk associated with a project (i.e. the project category) and depending on the significance of impacts, either an EIA or EIA is required.
Natural Habitats	This policy promotes and supports natural habitat conservation and improved land use by requiring that projects integrate conservation of natural habitats and the maintenance of ecological functions into the project design. If a project is located in a protected area or considered as a critical or sensitive area from an environmental point of view, or if a project can cause irreversible damages to such areas, it will be excluded from financing.
Forests	This policy requires that where possible involvement in the forestry sector aims to reduce deforestation, enhance the environmental contribution of forested areas, promote afforestation, reduce poverty, and encourage economic development. Includes adoption of a comprehensive and environmentally sound forestry conservation and development plan that clearly defines the roles and rights of the government, the private sector, and local people.
Involuntary Resettlement	This policy covers the direct economic and social impacts that are caused by the involuntary taking of land resulting in (i) relocation or loss of shelter; (ii) loss of assets or access to assets; or (iii) loss of income sources or means of livelihood, whether or not the affected persons <b>must</b> move to another location; or the involuntary restriction of access to legally designated parks and protected areas resulting in adverse impacts on livelihoods. When a project requires either land acquisition or resettlement (as defined above), depending on the scale of the impact (significant or non-significant) either an abbreviated or full Resettlement Plan (RP) will be required.

Ethnic Minority (indigenous) People	This policy requires assessment of whether ethnic minority groups, as distinct from the dominant social or ethnic groups, will be more vulnerable to, or unable to fully participate in, and benefit from, a project. If a project is located in an area where ethnic minority groups are located, a screening and assessment must be undertaken to determine the impacts on the group and determine whether an ethnic minority development plan (EMDP) or specific action (to be included in an EIA, EIA or RP) is to be prepared for the project.
Cultural Property (physical cultural resources)	This policy requires the protection of "cultural property" (including archaeological, historic, religious, sites as well as areas of unique natural value). Cultural property comprises remains left by previous human inhabitants and unique natural environmental features such as canyons and waterfalls. Projects that will significantly damage non-replicable cultural property will be excluded from funding. Projects shall include a plan for the protection and/or enhancement of cultural properties accidentally encountered ("chance find").

Existence of such gaps does not necessarily require amendments to laws and/or regulations but instead can be dealt with through the provisions included in the subsequent EIA and environmental management plan (EMP) and the land acquisition and resettlement plan (if required).

#### Recommendations in Respect of EIA

- The EIA shall provide for assessment of alternatives to compare relative feasibility under local conditions for different alignment options and techniques for construction, including costs, and institutional, training and monitoring requirements and to justify the alternatives considered;
- The EIA shall provide a full description of the institutional capacity, including the additional capacity needed and training for environmental management;
- The EIA shall provide for analysis of all alternatives to the proposed project including the no-project alternative;
- The EIA shall include guidelines for ongoing public participation and consultation including timeline, documentation and follow up; and
- The EIA shall provide for the respective roles and responsibilities of executing agencies in charge of road construction, rehabilitation or management and SAEPF for monitoring implementation and enforcement of the EMP and mitigation measures.

#### Recommendations in Respect of Natural Habitats

- The EIA shall provide for inclusion of a provision stating that if the road project (or any part thereof) will be sited on natural habitats (unconverted lands), and if no alternative is found, the EIA will include a compensation offset provision for conversion of non-critical habitat; and
- The EIA will state that the salient/enclave bypasses (realignments) will not be located in critical natural areas.

#### Recommendations in respect of Physical Cultural Resources

- The EIA will include a process involving local communities in the process of identifying, assessing, surveying and protecting physical cultural resources; and

- The EIA will include specific guidelines for the management of “chance finds” and management of physical cultural resources discovered during road project implementation.

### **1.5. Purpose and Methodology of EIA**

The purpose of the EIA is to define the baseline environmental conditions in order to identify and assess the impacts of the various activities of the proposed project. As noted in Section 1.1, this Project has already been the subject of study and investigation. This EIA updates the IEE initially prepared under an ADB technical assistance, by updating the original information and supplementing it with new and more recent data, and including an analysis of WB requirements viz-a-viz those of Kyrgyz Republic. In addition this EIA has prepared an EMP and monitoring plan.

The following methodology was employed:

- Existing baseline data (including all available environmental legislation and guidelines) and relevant reports from previous projects were collected, reviewed and analysed. This baseline has been updated based on field visits undertaken during 2008 and 2009;
- Discussions held with local experts from the Ministry of Environment, Ministry of Transport and Communications and the local associate, Kyrgyzdortransproekt;
- Informal interviews and participatory discussions were held with people living and working along the project roads. This includes a number of consultations along the project road in 2006 and 2007 as part of the ADB’s Maintenance of Regional Road Transport Corridors Project;
- Interviews were held with representatives from the government (both transport and environment) and international agencies in Bishkek, Osh and Batken;
- All engineering data, designs, field notes and the like produced for the studies were reviewed and discussed to identify the various environmental issues involved. These are also in the process of being updated as part of this feasibility study review and revision;
- Field trips and consultations were undertaken to examine the existing environmental conditions along the roads and along the routes of the proposed enclave/salient bypasses. As noted above, this includes field visits and consultations over the period 2008 – 2009 period, as further explained in Section 7. Environmental surveys were undertaken between August and October 2008 (in collaboration with the technical team carrying out geotechnical and road condition surveys for Phase I - Feasibility Study). Additional work included environmental surveys between 3<sup>rd</sup> and 8<sup>th</sup> February 2009 and consultations undertaken between June and August 2009;
- The possible environmental impacts and planning mitigation measures for each step of the planning, design, construction and operation processes were assessed, including updating and revision of the EMP;
- Monitoring programs were prepared and have been updated to reflect additions in this updated EIA.

- Consultations have been held in Bishkek and at Project site on the draft EIA.

The potential environmental impacts have been assessed in accordance with the guidelines of the WB's OP 4.00 (including good practice notes). Mitigation measures have been prepared and considerations concerning the relevant institutional aspects have also been included.

## **2. THE PROJECT**

### **2.1. General Description of Project**

The project being studied under this feasibility study consists of road rehabilitation along the existing alignment of the road between Osh and Isfana and upgrading of some existing secondary tracks or gravel tracks, the location being shown in Figure 2. Short bypasses are required to avoid two Uzbek enclaves and a salient, and a Tajik salient; one from Kok Talaa to Pulgon to Burgandinskoye (Kyrgyz Kyshtak), one close to the village of Chon-Kara over the Sokh River, and one west of Batken town around the Törtkul reservoir at the village of Ak Taty. The enclave and salient bypasses are located through barren terrain which substantially reduces the significance of impacts.

The road rehabilitation comprises improvements along the existing alignment, significant environmental impacts are not expected to be encountered. Where new alignments can create new openings and opportunities for increased access to resources, these risks will be avoided under the Project as proposed largely because works consist of rehabilitation of the existing road by pavement and surface treatment and upgrading of existing tracks and routes, these effects are considered to be moderate and able to be mitigated.

During rehabilitation, activities usually include minor widening of the road in places, removal of old, deteriorated or otherwise unsatisfactory layers of the road pavement (which will be generally reused in the new construction, especially existing asphalt which has been found to be very useful for the top layer of shoulder when broken down to - 40mm and blended with natural gravel, requiring less annual maintenance compared with slightly plastic gravel, due to being a slightly cohesive but non-plastic material as a result of its residual bitumen content and angularity) and replacement with new materials, minor alignment improvements and improvements to drainage structures such as culverts and bridges.

Quarries, borrow pits and asphalt plants as well as labour camp and base camp operations are normally associated with these works.

Although no significant environmental impacts are anticipated to arise as a direct result of the road rehabilitation works, special attention during planning, design and construction is nevertheless essential to ensure that there will be no residual adverse impacts. The EMP is an important aspect of mitigation management.

The scope of works for the project road includes rehabilitation of 235 km and upgrading of 125 km of existing tracks and secondary roads around Uzbek and Tajik enclaves/salients. As a result of the division of the project into two phases for prioritisation, and selection of sections for each phase, the project now comprises the following sections as shown in Table 2.1.1.



**Table 2.1 - Osh to Isfana Road by Section**

Section	From-To	Description of works
1	Osh Outskirts – Start of Naukat Pass Area (Km 2.3-10)	Rehabilitation
2	Naukat Pass Area (Km 10-28)*	Rehabilitation
3	End of Naukat Pass Area - Kok-Talaa (Km 28-108)	Rehabilitation
4	Kok Talaa – Pulgon (Km 108-123)*, bypassing uzbek salient	Upgrading <sup>(1)</sup>
5	Pulgon – Frunze (Km 123-125)*	Rehabilitation
6	Frunze – Burgandy (Km 125-175)*, bypassing uzbek Sokh enclaves	Upgrading <sup>(1)</sup>
7	Burgandy – Akturpak (Km 175-193)*	Rehabilitation
8	Akturpak – Chongkara (Km 193-200, area around Sokh Bridge, bypassing Uzbek enclaves (proposed to be excluded from Phase 1 and to be completed by MOTC)	Upgrading <sup>(2)</sup>
9	Chongkara – Batken (Km 200-232), bypassing uzbek Sokh enclaves*	Upgrading <sup>(1)</sup>
10	Batken – Tortgul (Km 232-248*, including 6km bypass of Batken Town Centre)	Rehabilitation
11	Tortgul – Ak Taty (Km 248-271)*, bypassing tajik salient	Upgrading <sup>(3)</sup>
12	Ak Taty – Isfana (Km 271-358)	Rehabilitation
Total Rehabilitation (km)		235
Total new construction (km)		125
Notes: * = Phase 1 (most urgent 180 km)		
(1) Earthworks are partially done, including some drainage works.		
(2) Earthworks are partially done, including bridge and some drainage and pavement works.		
(3) Upgrading already in progress under EU funding, due for completion by 9/09.		

A more detailed description of the project and the activities it includes is provided in the updated feasibility report.

The existing road from Osh to Isfana is generally paved for most of its 358 km length. The bypass to avoid the Uzbek salient and enclave between Kok Talaa (Km 108) and Pulgon (Km123-125) and Burgandy (Km 175) and Batken (Km 232) includes some 95 km of existing gravel road and also makes use of some 20 km of the existing paved road between Chong Kara in Kyrgyzstan and Rishtan in Uzbekistan (specifically between Burgandy (Km 175) and Akturpak (Km 195). In all some 130 km of upgraded alignment are necessary for the bypasses of Uzbek and Tajik territory, and realignment to avoid natural river erosion as follows:

- Km 108-123 (Kok Talaa – Pulgon)
- Km 123-175 (Pulgon-Burgandy)
- Km 193-195 (Akturpak - Sokh River realignment. Note this is the only section of truly new alignment still to be constructed under this project. It is required to correct an existing perpendicular road junction, and a steep or very sinuous alignment running through a barren uninhabited oil/gasfield area. It does not deviate more than 100m from the existing alignment)
- Km 195-200 (Sokh River realignment -Chonkara)
- Km 200-232 (Chonkara-Batken, including some 3km of existing asphalt road. This section is not required to avoid uzbek or tajik territory (although it does appear to cross a very old uzbek border at Km 209 (assured as obsolete by MOTC) and there is a Kyrgyz checkpoint at Km 216, near the tajik border), but it is required to connect the current critical Km108-200 section to the existing road to Batken and Isfana.

- Km 232-248 (Batken bypass, which is located on an existing, but deteriorated, road. The existing road runs westwards to the Tortkul reservoir.
- Km 248-271 (Tortkul Reservoir - Ak Taty. Note that this section is already under construction under EU funding, having commenced in 3/08 and due for completion by or before 9/09. In the original 2001 feasibility study, it commenced at Km 246 and ran around the southern side of the reservoir. This was subsequently changed to branch off the existing road at Km248 and run around the northern side. It is considered a better as well as shorter new alignment); and
- Km 324-327 the gorge section near Isfana. MOTC have already reconstructed this section up to first layer of asphalt. The extent to which this work can be incorporated in the new pavement will be assessed during detailed design.

It should also be noted that a 6 km bypass is proposed for Batken City centre to avoid its narrow congested streets, the proposed alignment uses existing generally wide asphalt roads with little, if any, encroachment, running around the south-west side of the city past the airport. The bypass has been designed but not to a more limited extent than originally planned. An alternative alignment was proposed on the opposite side of the airport traversing mainly government land but also crossing some private land. This option would be considerably more expensive as it is several km longer and would require at least one new bridge. It would also require private land acquisition. Therefore it was not the recommended option.

The condition of the road is variable, many sections being poor, particularly east of Batken to Isfana, in addition to the gravel sections mentioned above. Vehicle operating costs are therefore high and delays are experienced as a result of vehicle breakdowns and border crossing procedures.

The existing road crosses Uzbek territory near Pulgon and at the Sokh enclave. The territory of Tajikistan is also crossed between Batken and Isfana. The proposed alignment is approximately 358 km long and includes 102 km of detours of Uzbek territory on both sides of Pulgon and a 23 km detour of Tajik territory west of Batken using existing tracks and roads. Since the existing road through Uzbek territory is not being considered for rehabilitation, environmental assessments of these sections are not included in this EIA. However, some recommendations concerning these sections are included in this report.

The detour through Tajik territory at Km 248-271 has been settled as a 23 km at grade road, and is under construction, due for completion in 9/09. The other alternatives available included the above mentioned 23 km detour east of Batken with the acquisition or lease of a 200-300 m long corridor through Tajik territory to facilitate the construction of a flyover or an underpass, or two 1 km sections of rock tunnel with a bridge across the Israna River connecting them (more expensive than the present solution), or the rehabilitation of the existing road for 17 km through Tajikistan (less effective than the present solution). Discussions have been ongoing between the Kyrgyz and Tajik Governments, which have now agreed upon crossing the Tajikistan enclave with the at-grade solution, and it is an undisputable issue. The due diligence has been completed and compensation has been paid, except in one case in Kyrgyz territory where the compensation has been agreed, but not officially documented or paid yet.

Rehabilitation works envisaged by the project include:

- Where already in poor condition, or inadequate for the whole design life (even with a strengthening overlay) or where the road needs to be raised

or locally realigned to overcome an existing problem such as drainage, unsafe or otherwise unsuitable alignment, or an obstruction, the existing asphalt will be removed for reuse, the underlying granular pavement will be reshaped for the new road formation, side drains, pavement including shoulders will be reconstructed (if necessary after raising on new fill or lowering in cut), cleaning out bridges/culverts/ drainage and repairing/replacing them as required;

- Where the existing asphalt and pavement are already largely in very good condition and where the existing road horizontal/vertical alignment and smoothness are already completely satisfactory for the design life (only in a minority of cases), there may be localised reconstruction/widening/patching/crack sealing/single reseal/regulating, followed by asphalt overlay;
- Gravel surfaced sections of roads – cleaning out bridges/culverts/ drainage and repairing/replacing them as required, cutting/filling (where required), followed by new pavement;
- Upgrading of existing gravel tracks and routes used as bypasses of foreign territory along the existing road; and
- Bridges – construction of new bridges, or re-construction through replacing girders and/or decks; and providing suitable erosion protection to abutments.

A separate important issue is the effect of the advance works already carried out by MOTC or in progress. These can be divided into: (i) the Sokh River bridge at Km 197; and (ii) the rest of the new works already carried out or in progress. As noted earlier, a resettlement due diligence has also been undertaken, and concludes that acquisition complies with the law and framework, land owners have received the compensation award in full, and there are no outstanding issues.

Regarding the environmental impact of the bridge, it was noted that the area required for the bridge itself and the eastern approach is barren river bed. Approximately 5,000m<sup>2</sup> of rice paddy has been covered by the western approach road, and a strip approximately 10m wide on each side of the embankment remains to be reinstated. The irrigation pattern has not been disrupted. The bridge (3 x18 m spans, 54 m total length) has been required to cross the Sokh River, just north of the Uzbek Sokh enclave. The bridge was constructed by MOTC in 2008, along with 2 km of approach on each side. The Updated Feasibility Study concludes that the bridge does not have significant additional environmental impacts. In fact, the new Sokh Bridge has a positive effect on the environment as it is effectively training the river, which previously meandered and eroded the rice paddy terraces on the river banks and impacted upon livelihoods. The visible damage to the rice paddy terrace (western river bank) has been caused by the river prior to bridge construction, not as a result of construction of the bridge. The bridge will not cause flooding upstream due to 'backing-up' or undesirable changes of the river course either upstream or downstream of the bridge. The bridgeworks have been constructed in the barren river bed area. No environmental assets are affected as a result of the new bridge.

For the remaining road works carried out elsewhere to date, these appear to have been generally responsibly constructed without extensive environmental impacts such as uncontrolled dumping of material. However re-vegetation of embankment slopes and reinstatement of borrow areas will either be done by MOTC or be included in the new works.

## 2.2. Traffic Volumes and Transport Modes

The present day traffic volumes as recorded on the Osh to Isfana road are summarised in Table 2.1. The forecast of annual growth in traffic volume is between 5 and 7 %. No significant increase in international traffic on the Osh to Isfana road is expected.

**Table 2.1 – Estimated AADT Traffic Volumes (2008)**

Station (Km)	Car, Jeep	Pick-up Van	Small Bus	Large Bus	Mini Truck	Truck 2-axle	Truck 3-axle	Tractor Trailer	Tractor (Semi)	Total
6	3759	553	104	2	423	180	142	11	9	5183
91	5520	348	32	10	438	143	121	26	8	6646
129 <sup>1</sup>	6640	362	55	1	256	57	36	0	10	
133 (diversion) <sup>2</sup>	1516	1280	39	2	102	39	49	7	13	3046
176	623	254	9	0	126	44	48	4	18	1126
227	1462	239	39	2	97	39	70	7	10	1965
326	411	140	27	1	34	33	31	1	1	677

Notes: 1 - Existing road through Uzbek Sokh enclave; 2 - Km 133 refers to location on the existing diversion track west of Pulgon/Frunze

2005 data is also available from the HDM-4 model run for the Maintenance of Regional Road Transport Corridors Project which produced traffic data based on 2005 volumes, these are presented in Table 2.2.

**Table 2.2 - Existing Traffic Volumes & Traffic Composition**

Road	AADT (2005)	Composition of total traffic (%)					
		Car	Minibus & van	Bus	Light truck	Medium truck	Heavy & artic. Truck
Osh - Isfana	3,712	80	5	5	3	2	5

Source: Maintenance of Regional Road Transport Corridors Project PPTA Data (Results of HDM-4 analysis)

The traffic surveys did not collect data on non-motorized transport (NMT), however, the household survey undertaken for the PPTA (2007) provided data on transport ownership, as shown in Table 2.3. In respect of transport mode, 47% of households surveyed own some form of transportation. Between 23% and 37% own a bicycle and around a fifth of households own a car, only a small proportion own a van, bus or truck.

Compared with other roads included in the PPTA study, the roads in Osh/Batken record the highest ownership of animal drawn cart with 20% (compared with 3% overall) and including the ownership of bicycles gives a total of 57% non-motorized transport (NMT).

**Table 2.3 - Ownership of Transport Mode**

Road Location (Osh/Batken oblasts)	Transport mode (%)								
	None	Bike	M'bike	Car	Van	Truck	Bus	Animal Cart	Other
North	46	23	4	18	-	3	1	4	1
South	7	37	3	20	3	10	-	20	-

Source: PPTA Socio-economic Beneficiary Survey (2007)

### 2.3. Description of the Road

The alignment is 358 km long, including 130 km of detour to avoid Uzbek territory on both sides of Pulgon (Km 108–123, Km 125-175, Km 193-195, Km 195-200, and Km 200-232), a 23 km detour of Tajik territory west of Batken (Km 248 - 271). These detour routes will use existing alignments already constructed and will comprise upgrading the tracks and gravel traces to gravel road or surface treatment of sealed sections. There is also 3 km of realignment, already constructed by MOTC, at Km 324-327 to avoid river erosion.

The detours around Pulgon are already constructed. The existing road through Uzbek territory is not being considered for rehabilitation. However, some recommendations concerning these sections are included in the engineering studies.

While areas of the country are subject to landslides, avalanches, and seismic activity (especially in the south), as discussed in Section 3.1.4, the road itself is not located directly on areas of avalanches or landslides, and no areas subject to frequent landslides or avalanches observed during the field visits. The main problems are small shallow isolated erosion gullies due to outwash fan activity between Km 125-175, river erosion of the road at Km 280-284, and Km 325-340 (where short sections of road is currently being realigned by MOTC to avoid this), and several large mudflows from unstable eroding catchments near the road in the gorge section between Km 326-336.

#### 2.3.1 Osh to Pulgon Section

Osh – Isfana Road: Osh to Pulgon				
Section	Section 1		Section 2	Section 3
Town	Osh	Pulgon	Batken	Isfana
Station (Km)	2	123	232	358
Altitude (m)	1000	1100	1000	1250
<p>From Osh, the road runs south and south-west over the foothills (altitude 1400 m) to the towns of Eski-Nookat and Jangy-Nookat in the valley halfway to Kyzyl Kyya. It then turns to the west and follows the valley to Kyzyl Kyya. The first diversion to avoid Uzbek Territory begins around Km 108 after Kyzyl Kyya. From this point, the alignment will utilise an already constructed track, south-west meandering through arid plains and low hills until it rejoins the existing road at Km 123 in Pulgon. The second diversion to avoid Uzbek territory begins around Km 125 in Frunze and follows an alignment through arid low hills and plains for some 50 km before joining the existing Batken to Rishtan road at Km 175.</p>				

The typical existing road conditions are shown in Appendix 9 of Volume 2 - Technical Appendices.

There are many villages, towns and major rivers crossings along this length of the existing road. Typical problems concerning the river crossings are the flash floods which occasionally occur in this region. The valley between Eski Nookat and Kyzyl Kyya is quite densely populated and very fertile. Through the towns and villages, the width of the existing road is generally sufficient to accommodate the proposed improvements, although some clearance and replacement of utilities and low grade trees may be required for sidewalks where these do not already exist, they may only be possible on one rather than both sides at some locations, for both space and cost reasons.

The road will be generally designed for a speed of 60-100km/hour outside towns, but in the towns, a lower speed limit (40-60 km/hour) will usually apply for safety reasons. Hence the requirements for a higher speed road geometry will not be so essential here. In the major towns, to maintain the design road capacity and avoid congestion, it will be necessary in the near future to implement no-parking zones (except for deliveries, and provide chargeable off-road parking areas close to the town centres.

These could be small transport interchanges, with shuttle mini-buses to/from the town centres. If funds were not available for constructing such parking areas/interchanges, and/or if government land was not available for these, land could be purchased and work could be financed from royalties from local aggregate sources. This is considered a more acceptable alternative than planning new bypasses around the towns, which would be very expensive and usually have significant adverse environmental and social impacts.

Some 24 km after Kyzyl Kyya is the first detour of Uzbek territory on an existing south-west alignment until the outskirts of Pulgon. A few km of this detour has already been constructed by MOTC, and lack of funding is the main reason for non-completion. The alignment passes through an orchard of apricots shortly before the existing road enters Uzbekistan. Compensation for the land and trees affected by the alignment is required, as per the Resettlement Policy Framework prepared for the Project. Land acquisition was also required along the final kilometre where the alignment enters Pulgon and the width of the track is insufficient for the level of improvement required. These issues were reportedly settled in 2000 and copies of legal agreements or 'Akts' have been provided. As part of ongoing due diligence, these documents and satisfaction with the compensation awards are being rechecked, for final resolution before signing of construction contracts.

There are no significant forest stands along or near this section of the road. However, occasional and dispersed and non-productive trees planted on the roadside will be removed during construction works and replaced by new tree planting.

Activities and effects at bridge structures that are to be rehabilitated will be managed according to the EMP to minimise damage.

### 2.3.2 Pulgon to Batken Section

Osh to Isfana Road: Pulgon to Batken				
Section	Section 1	Section 2		Section 3
Town	Osh	Pulgon	Batken	Isfana
Station (Km)	2	123	232	358
Altitude	1000	1100	1000	1250
This existing road is followed until Km 195 where a 5 km length of new alignment is used to cross the Sokh river at the village of Zortash (Chong Kara), rejoining the existing Batken to Rishtan (Uzbekistan) road at Km 200. From this point, the proposed route follows this existing road until Batken and beyond to Km 248 at the Tortgul Reservoir.				

The Km 108 to Km 123 detour rejoins the existing road in Pulgon some two km prior to the second detour at Km125 to Km 175 (being the Frunze – Burgandy section, proposed to be funded by WB from Km125-155, and EBRD-funded from Km 155-175). Two rivers are crossed within this short length of the existing road through the town. From the turnoff at Km 125 on the existing road through Pulgon-Frunze, the road initially ascends a small river valley which is dry for the most of the year. For the first 1.5 km, there are several sites used as rubbish dumps along the river banks, these areas will be cleared and any contaminated soil removed prior to civil works for the road. The river bed itself appears to have been used both for extraction of gravel and disposal of surplus/unsuitable material during the initial works carried out by MOTC. This is not acceptable and will be remediated as part of the current Project. Further, the EMP requires that there will be no extraction of gravel from river beds, a gravel extraction plan must be prepared and approved, and river beds and areas adjacent to river beds/rivers will not be permitted to be used as materials storage stock-pile or dumping areas for unused material or waste/debris. Erosion protection will also be installed along the edge of the road along the river bank.

Some 4 km from Pulgon (Km 129), the existing road enters an area where the waste ponds for the Kadamjay antimony plant are located, about 100m at the nearest point from the road. The storage capacity of the ponds is about 600,000 cubic metres, and the storage area occupies some 8 hectares. Only 5-6 % of the storage capacity is presently being utilized, but it is reasonable to assume that substantial environmental damage has already been incurred since this storage area has been in use since 1976. The waste stream consists of different salts (chemical content: NaOH 1%, Na<sub>2</sub>SO<sub>3</sub> 2-4%, Na<sub>2</sub>SO<sub>4</sub> 7%, Na<sub>2</sub>S 12%, Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> 6%) and water. Many of the ponds are empty and the insulating plastic liner appears to be damaged in places. The soil is likely to be contaminated as evidenced by visible waste outside the ponds and their enclosing bunds. The site is fenced off with warning signs. The road does not traverse this area and therefore will not be affected by soil contamination.

The new route from Frunze crosses very dry, arid and almost semi-desert country, and the granular soil is erodible. Some sections of this route follow established roads which require to be upgraded, with the longer section comprising construction of a new road. The route traverses low hills for the first 8 km after Frunze and then turns west to continue across the fairly flat plains/rolling semi-desert for the next 42 km.

The project road meets the Batken to Rishtan Road (near Uzbekistan) at Km 175 (Burgandy) and includes sections that have been studied by different development partners since 2001 (including EBRD). The road between Burgandy and Isfana includes Akturpak (Km 193), Chonkara (Km 200), Batken (Km 232), and the Tort Gul reservoir at Km 248.

The road continues for 18km on an existing asphalt alignment in poor condition (cracked and very uneven/deformed) to Km 193. This appears to be mainly due to the road being almost at-grade with the surrounding fields, which are flooded for irrigation. Some of the 'latoks' (sections of pre-cast concrete irrigation channels) are higher than the road and cause damage to the road at leakage points (detailed in Appendix 9 - Volume 2). Deep side drainage will not solve this problem, and the road will have to be raised by about 1m in granular fill, with suitable cross drainage provision to preserve the existing irrigation/storm drainage system.

This existing road alignment is followed until Km 195 where a 5 km length of new alignment is used to cross the Sokh river at the village of Zortash (Chong Kara), rejoining the existing Batken to Rishtan road. This crossing has already been described.<sup>4</sup> From this point, the proposed route follows the existing road, already constructed as a wide gravel trace which will be upgraded to the new standard to Km 232 at Batken. From Batken, the route follows the existing road for about 20 km to the Tort Gul Reservoir. The road crosses a small fertile valley between the Pamir (Baitak or Turkestan) mountains to the south and a lower but steep range of hills to the north.

Chong-Kara village itself will be avoided by a realignment approximately 500 m east of the village. After passing Chong-Kara, the route joins the existing Batken-Chong-Kara-

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<sup>4</sup> As noted a WB Mission required review of the design and possible environmental impacts of the proposed bridge in 2007. Following review, the bridge has been constructed in 2008. This issue has been further reviewed as part of a due diligence (Volume 2 - Technical Appendices, Appendix 1). The main conclusions being that the bridge design is adequate, and there will be limited, if any, negative environmental impact. Environmental benefits are expected with the river training associated with the bridge.

Rishtan road and turns south-west towards Batken. This existing road is mainly gravel (29 km), with approximately 3 km of existing asphalt in two separate sections.

### 2.3.3 Batken to Isfana Section

Osh to Isfana Road: Batken – Isfana				
Section	Section 1	Section 2	Section 3	
Town	Osh	Pulgon	Batken	Isfana
Station (Km)	2	123	232	358
Altitude	1000	1100	1000	1250
<p>The proposed alignment follows the existing road to Batken and beyond to Km 248 at the Tortgul Reservoir. From here, some 23 km of new at-grade alignment around the reservoir to the village of Ak Tatyр is being constructed as a means of avoiding Tajik territory. A 2km rock tunnel connected by a bridge or a flyover or underpass some 200 to 300 m long would otherwise have been necessary to cross the Isfana river in Tajikistan. The existing road is rejoined at Km 271. Thereafter, the road ascends gently to the village of Korgon across an arid plateau, passing through a spectacular gorge section at Km 324-337, before descending to the town of Isfana at Km 358.</p>				

Construction under EC funding of a 23 km section between Km 248-271) around the reservoir to the village of Ak Tatyр as a means of avoiding Tajik territory is already under way. It commenced in March 2008, and is scheduled for completion by September 2009.

The realignment passes the reservoir to the north and then follows an existing track across the very barren terrain at the foot of the mountains. The large Podvodyashiy irrigation canal, which diverts water from the Isfara river to the reservoir, is situated close to the alignment. The existing track and new alignment follows the canal from approximately Km 253 - 267. The biological environment is limited with the only flora comprising small grasses growing on the foot of the mountains. These types of environmental conditions continue through the villages of Koktash and Ak-Tatyр (Km 271).

The alternatives for the 275 m bottleneck section across Tajik territory at Km 268 Isfara River Crossing that have been considered include: (i) two 1 km sections of rock tunnel around the southern end of the Tajik enclave connected by a bridge; (ii) the acquisition or lease of a 200-300 m long corridor through Tajik territory to facilitate the construction of a flyover or a cut-and-cover underpass; or (iii) the rehabilitation of the existing 20 km road through Tajikistan. Options (i) and (ii) were very expensive and exceeded the proposed budget for the project. Option (iii) would not solve the border issues and disputes. The current solution for this section, is an at-grade road for the 275 m Tajik section, and has been agreed between the Kyrgyz and Tajik Governments.

Near Km 268, a small mill is powered by water from a minor canal along the bank of the river. Resettlement or compensation issues, if any, are most likely to emerge here, these are further assessed and discussed in Updated Volume 4 – Social Issues. Demolition of some dwellings, storage sheds and fences and cultivated land would also be taken for the road rehabilitation. These issues will be further investigated and a resettlement plan prepared as per the requirements of the project's Resettlement Policy Framework.

After crossing the Isfara River at Km 268, the road re-enters Kyrgyz territory and re-joins the existing road at Km 271. The road then follows a broad valley gently traversing a plateau. From a minor crest at Km 308, the road descends and follows small river valleys until reaching Korgon village. After Korgon, the road crosses the Leylek River and Djangakty River, passing through a spectacular gorge section at km 324-337, and then gently descends across an arid plateau to the town of Isfana (Km 358).

## 2.4. Analysis of Alternatives

The Osh-Batken-Isfana Road corridor is a corridor of strategic importance to the Kyrgyz Republic as it provides the only access to the south-western part of the country and Batken Oblast. The most urgent portions are the new alignment sections needed to bypass the Uzbek and Tajik border problems (totalling approximately 130 km out of 360 km). However most of the remaining existing road is in need of rehabilitation as a result of its age and substandard construction. The road traverses generally plains/rolling terrain (with short hill sections totalling approximately 80kms) through an arid area and there appear to be no particular engineering difficulties associated with the rehabilitation of the existing road, other than mudflow problems and river erosion around Km 325-340. Due to the low diversity of the ecological environment, the direct impacts of the road rehabilitation and short re-alignments will not likely be significant.

In view of the above, a “do nothing” or without project option is not feasible if regional access is to be maintained and existing regional road networks, and investments therein, are not permitted to further deteriorate. The do nothing option is not considered feasible because it would not address the existing problems. To travel the route nowadays causes frequent delays at border crossing points arising from lengthy and sometimes cumbersome control procedures, which severely hamper connectivity along the road. In addition, local communities along the road feel physically and economically isolated from Osh and the rest of the Kyrgyz Republic; and agriculture, as one of the region’s main economic activities, is severely constrained by the poor access offered by the existing road corridor.

The project road provides access to other Central Asian republics such as Tajikistan and Uzbekistan. Poor maintenance has been cited as one of the main factors which has resulted in the present deterioration of the road network with the resulting extra costs to both regional and national economies. Clearly, maintenance has received insufficient attention for some years. As a result there is a backlog of maintenance work. Given that this is the case, one would expect to find parts of the network that have deteriorated to the extent that rehabilitation is the best option and this is indeed the case. However, as pointed out in the ADB funded study TA 4705,<sup>5</sup> although rehabilitation shows high rates of return, if the effect of rehabilitating some sections is to starve other parts of the network of maintenance money, the return from the investments may be less than first appears.

Improved roads and access, therefore, require more emphasis on a sustainable road network maintenance program, as well as road maintenance capacities and skills to achieve and sustain the benefits from the investment. A program must be put in place to ensure that the regional road network does not deteriorate further. Maintenance equipment should therefore be kept functional regardless of circumstances. Regular inspections of the road and implementation of corrective measures are essential. Proper maintenance of bridges, road signs, markings, guardrails and other safety equipment is also important. Therefore maintenance is not an alternative to the proposed Project but an integral part of it.

A complete realignment of the road corridor to either the north or south of the existing alignment is feasible but at significant cost. The construction of a completely new road

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<sup>5</sup> ADB; Support to the Development and Implementation of the National Poverty Reduction Strategy II - Roads Sub-Sector.

linking Osh and Isfana would result in significant environmental and social impacts and incur in major resettlement. Such a project would be classified as Category A and require several months of detailed environmental study and rounds of public consultations, causing delays in addressing the problems mentioned above.

The communities along the route have already waited some considerable time for improvements to access, and any additional delay required for the study, design and construction of an entirely new road would be considered untenable.

The proposed Project is considered to be the most suitable option for addressing the existing access problems with minimal environmental and social impact. Through the rehabilitation of the existing road corridor, the Government intends to eliminate the need to cross foreign territory when travelling through Batken and Osh oblasts. Given the strategic importance of this corridor, the Government is implementing the rehabilitation of the Osh-Isfana road corridor in two stages (each of approximately 180 km) and by firstly focusing on the elimination of major bottlenecks in order to restore accessibility to a basic level. While some work has already been undertaken by the Government, the remainder is foreseen to be financed by development partners.

## **2.5. Construction Force and Equipment**

The road projects will be divided into several contract packages. Due to their anticipated large values, the contract packages will be bid by prequalified international contractors, with Kyrgyz contractors possible as JV partners or as subcontractors.

Based on experience from recent construction contracts in Kyrgyzstan:

- packages will require construction workforces of approximately 4 persons/km (skilled /unskilled labour, machine operators and supervisors for all stages of construction including setting up and operation of camps and works areas (including quarries/borrow areas/crushers/screening units/asphalt plants/concrete (both precast and cast-in-situ, survey, demolition and site clearance, utility relocation, structural works, earthworks, drainage, pavement, and finishing works, and ancillary staff such as cook and security guards); and
- each layer of pavement work and sealing can be undertaken at an average rate of 0.25 km/day;

It is likely that the contractors will opt to have a single large centrally-located base camp for both working and living areas, and construction teams would travel along a section of up to 30 km on gravel road and 60 km on a sealed road, before needing to consider relocation of the base camp. This is especially important for transport of centrally mixed concrete and asphalt, especially in colder weather. There may also be smaller temporary satellite camps every 25 km or so. Therefore any one construction force could be located in an area for between 12-18 months, especially if the decision is located to base in a town and work from there.

Even assuming that 60% of the civil work can be undertaken by local unskilled labor (usually few from and living in the immediate area of the project due to disappointing uptake by suitable local residents of preferential employment clauses in construction contracts), construction camps will be required for the contractor's permanent employees and those supplying the skilled labor, and contractors from within an oblast will still be required to provide a camp for the construction workforce at the subproject site.

The equipment and plant to be used on the project includes; bulldozer, excavator, loader, large and small tipper trucks, concrete mixer, vibratory and rubber-tired rollers, rock crusher and mobile crusher, asphalt plant, concrete batching plant, a truck mounted sealing machine, and pavers. A workshop will also be required to be constructed for the maintenance of equipment and vehicles.

### 3. DESCRIPTION OF THE EXISTING ENVIRONMENT

This chapter describes the baseline environmental conditions relevant to the road rehabilitation project.

#### 3.1. Physical Characteristics

##### 3.1.1 General

Kyrgyzstan is a landlocked country located in the centre of Central Asia having borders with China (858 km), Kazakhstan (1,051km), Tajikistan (870 km) and Uzbekistan (1,099 km). The total area of the country is 198,500 sq km of which waters count for less than 4% (7,200 sq km). High snow-capped mountains, deep gorges and fertile valleys are the principal physical characteristics of the country. The elevation ranges from less than 500 m in the Fergana valley up to 7,439 metres at the Pobeda Peak, one of the highest mountains in the world.

The biggest lake in Kyrgyzstan, Lake Issyk-Kul located in the Northeast at an elevation of 1,600 metres, is the second deepest (668 metres) mountain lake in the world. With clear blue water, sandy beaches and surrounded by snow-capped mountains, the lake has great potential as a tourist resort. Besides Issyk-Kul there are very few natural lakes in Kyrgyzstan, but there are many artificial lakes and reservoirs originally constructed for hydroelectric power or irrigation purposes.

##### 3.1.2 Topography

The Kyrgyz Republic is a high mountain region, where several of the highest parts of Tien-Shan mountain range are located. In terms of relief structure the Kyrgyz Republic is divided into the several geo-morphological zones: downhill declivity, plains, adyrs (hills) and foot-hills, inter-mountain hollows, mid-range zones, and highly elevated (alpine) zones. Across the project area the topography of the road ranges from flat valleys to high mountain relief. The main topographical features are shown in Table 3.1.

Table 3.1 - Topographical Features of Project Area

Oblast	Topographical Features
Osh/ Batken	<p>Main orographic units are Alai and Zaalai Ridge (mountains, gorges, depressions)</p> <p>Alai Ridge: 350 km in length and 20 km width, max. peak elevation 5,539 m, av. elevation 4,500 m;</p> <p>Turkestan Ridge: 300 km in length and 30 km width, , maximum peak elevation 5,509 m, average elevation of the ridge 4,400 m;</p> <p>Change in altitude 400 m – 6,000 m</p> <p>Depressions: Batken – elevation 900 – 1,500 m, 60 km in length and 24 km width;</p> <p>Isfara-Isfana – elevation 900 – 1,600 m, 120 km in length and 26 km width;</p> <p>Nookat – elevation 1,200 – 1,700 m, 45 km in length and 12 km width;</p> <p>Fergana – elevation 400 – 1,200 m, 340 km in length and 160 km width;</p> <p>Verhnegulcha – elevation 1,900 – 3,000 m, 40 km in length and 10 km width;</p> <p>Shahimardan-Isfairam – elevation 1,100 – 2,700 m, 96 km in length and 10 km width;</p> <p>Kichikalai-Turuk – elevation 2,200-3,000 m, 30 km in length and 6 km width</p> <p>Pass: Chyiyrchyk – 2,408 m, Taldyk – 3,615 m, Kyzyl-Art – 4,280 m.</p>

Source: State Agency for Environment Protection & Forestry (2006)

### **3.1.3 Geology, Soils & Minerals**

The Kyrgyz Republic comprises several distinct geologically structured regions, with a foundation of sedimentary volcanic layers of middle and higher Palaeozoic, and Lower Palaeozoic and Precambrian rocks and with variable extents of metamorphosed volcanic shale rocks and epidot-chloritic, quartzitic-chloritic, sericitic, and silicious schists.

Soils are the products of destruction of primary (Palaeozoic) and secondary (Mesozoic) rocks and deposits, loess-like loams and pebble conglomerate quaternary layers in the valleys and diluvium in the alpine zones. Different types of soils occur in the project area; soils of semi-closed inter-mountain valleys, soils of closed mountain valleys, soils of *syrt* plateaus, and soils of mountain slopes. The main characteristics of the soils in the project area include: significant soil diversity, gray earth, gray-brown and brown soils and marked hydro-thermal activity, gray rocky gravel soil, and medium erosion potential (including inner soil erosion).

- Soil erosion has increased in the past three decades, attributable to inadequate irrigation processes, cattle herding, agricultural production, and urbanization (including road building).<sup>6</sup> Related issues include:
- Erosion has affected 5.59 million ha of agricultural land (including 4.5 million ha of pasture);
- Salinization has increased covering 666,300 ha in 1985 to 1.17 million ha by 1990; and
- Waterlogged areas have increased affecting an additional 62,000 ha.<sup>7</sup>

The following mineral resources can be found in significant quantities within the project area:

- Gravel – general Osh-Batken-Isfana area;
- Brown coal - Eski Nookat (35 km from Osh), around Borbash (60 km from Osh, close to Kyzyl Kyya), Vostochnyy (20 km northeast from Isfana);
- Sand - Eski Nookat;
- Brick clay - Nayman (70 km from Osh);
- Antimony - Pulgon (Kadamzay);
- Mercury - Chauvay (20 km southeast of Kyzyl Kyya and Khaydarkan (40 km southwest of Pulgon, and 10 km south of Ravat (30 km after Ak Taty); and
- Dolomite - close to Isfana.

### **3.1.4 Landslides, Avalanches & Earthquake Activity**

The Kyrgyz Republic is a highly disaster prone country, being exposed to 20 different kinds of natural hazards, the most dangerous in terms of prevalence and, recurrence and damage include; earthquakes, debris flow, flash floods, landslides, rock-falls, and

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<sup>6</sup> Estimates by Economic Commission for Europe (2000) are a reduction in agricultural land from 3.11 ha/per capita in 1975 to 2.35 ha/per capita in 1995.

<sup>7</sup> UNDP/Economic Commission for Europe; op cit

avalanches. In order, the regions most affected by natural disaster are Jalal-Abad, Osh, Chui, and Issyk-Kul, experiencing approximately 425, 275, 175, and 150 events respectively over the period 1993 – 1999.<sup>8</sup>

The greatest risk of landslides and spring floods comes from breakthrough of high altitude lakes, created by glaciers, snow or rock avalanches or glacial clay. The risk of a snow avalanche is at its maximum in February and March in the Osh-Batken area. Of the rayons in the Osh oblast, Nookat is characterized by the highest occurrence of emergency situations per capita, with the most calamity prone months being April through June.

**Table 3.2 - Landslide, Rock-fall, Mudflow & Avalanche Risk Areas**

Oblast	Area	Risks, Zones & Catchments
Osh/ Batken	Nookat Yassy, Kyzul Suu, Khorog Kara-Kulja, Chon-Alay, Uzgen, Kara Suy Aravan (Ferghana Valley) Nookat and Aravan	Very high number of registered emergencies Avalanche prone river basins (every 3 – 5 years) Most avalanche prone rayons Floodplain area, spring floods, least prone to avalanches Seismic activity rating is 9 points

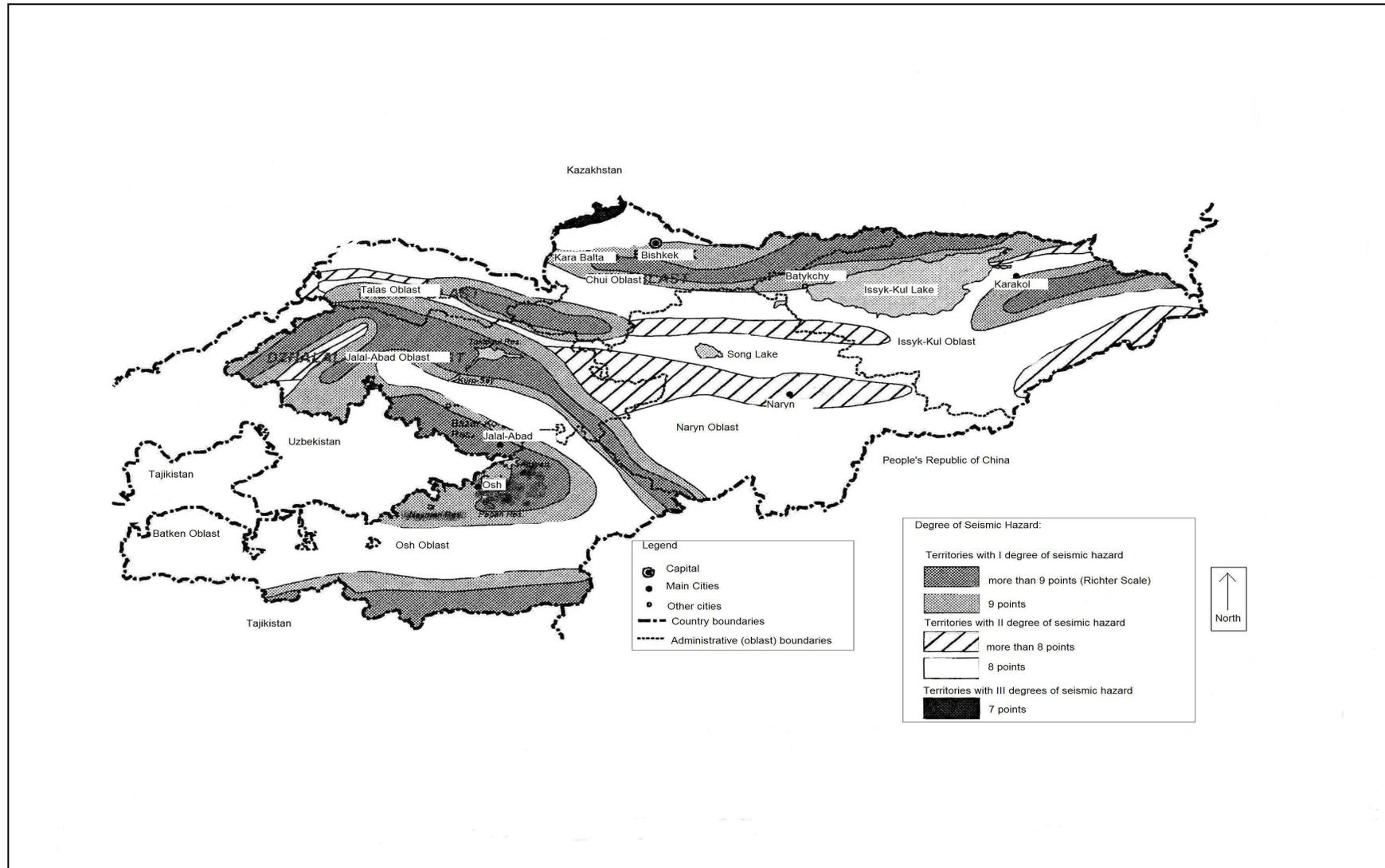
*Source: Ministry of Emergency Situations (2005)*

The project area is located within the Central Asian Fold Belt in the Tien-Shan Mountain System formed by the collision of the Siberian and the North Chinese, Tarim, Afghan-Tajik and Kazakhstan-North Tien-Shan plates. The area is still very seismically active. Earthquakes with magnitudes of six-seven on the Richter scale are rather frequent and there are records of catastrophic earthquakes in the relatively recent past. The most severe earthquakes in the area occurred in the past i.e. Kemin (1911, M=8.2), Chilik (1889, M=8.4), Vernyi (1887, M=7.3). Recent earthquakes include Suusamyr (1992, M=7.3), Kyrgyzstan – PRC Border (2002, M=5.5).

The seismic activity map is shown on Figure 3.

<sup>8</sup> Ibid

Figure 3 – Seismic Activity Map



Parts of the project area are seismically active and geologically complex. According to the seismic hazard maps for Kyrgyz Republic most of the project roads traverse areas of I Degree of Seismic Hazard (on a scale from I Degree to II Degree). As shown on Map 3, the most prone areas and the risks include a I Degree area from Osh city itself (> 9 points on the Richter scale) to an area of around 9 points (on the Richter Scale) to the Pulgon/Frunze area. The remainder of the area long the project road, and most of Batken Oblast are classified as a Degree II area (8 points on the Richter Scale).

### **3.1.5 Climate and Air Quality**

#### Climate

The climate of the Kyrgyz Republic varies according to altitude and orography. There are two distinct types of climate in the country being either continental – hot summer, wet spring and autumn, and cold winter (fogs, rain and snow); or, diverse – clearly expressed dry summer and wet and cold winter (rain, snow fall and permafrost) with snow also falling in autumn and spring. The Osh to Isfana route is nearly all through “dry steppe” with the exception of the last 90 km which traverses a “temperate steppe” environment.

The climate of the project area is diverse and includes the following characteristics:

- Average annual temperature between -3 and 3 °C;
- Average maximum temperature is 30 °C;
- Average minimum temperature is -35 °C;
- Temperature range in July between 15 and 41 oC;
- Temperature range in January between -6 to -2 oC;
- Average rainfall 328 – 580 mm, decreasing westwards.

#### Air Quality

Although air emissions in Kyrgyz Republic have been steadily decreasing from 662,000 tonnes in 1989 to 239,000 tonnes in 1998, the contribution from mobile sources has increased from 73% to 83% over the same period.<sup>9</sup> Dust is the largest contributor accounting for 46% of emissions, followed by SO<sub>2</sub> (26%), CO (12%) and NO<sub>x</sub> (8%).

The average annual per capita emissions are in the order of 51 kg (significantly lower than OECD average of 80 kg). The ADB's *Country Environmental Analysis* comments that while the decline in the country's industrial sector has resulted in greatly reduced levels of air pollution, this has been more than offset in urban areas by an increase in vehicular emissions. Air pollution from vehicles is exacerbated by the use of locally made ethylene petrol and an obsolete vehicle fleet.

Air quality also differs across the project area, largely as a result of micro-climates and density of industry and transport routes. The level of air pollution is especially high in cities and towns. Major contributors including vehicle emissions (leaded or poor quality gasoline and diesel), and emissions from mining and processing industries. In the Osh area up to 90% of air pollution is a result of vehicle emissions. Reduced air quality in the

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<sup>9</sup> UNDP/Economic Commission for Europe; *Kyrgyzstan: Environmental Performance Reviews* (Geneva, 2000).

industrial zones of Osh, Kyzyl-Kia, Frunze and Khaidarkhan is of concern. There are also concerns regarding trans-boundary air pollution, especially in the Ferghana Valley (Jalal-Abad and Osh – Batken) which is shared by Uzbekistan, Tajikistan and Kyrgyz Republic.

Uzbekistan is the largest contributor to air pollution in the Ferghana Valley because of its higher emissions and prevailing wind patterns, some of this pollution is transmitted to Kyrgyz territory.

### 3.1.6 Groundwater Resources

Across the project area existing surface waterways, significant amount of rainfall, glaciers and snowfields create favorable conditions for the formation of underground waters. Hydro-geological conditions of mountain ridges differ according to morphology and geological structure with fracture and vein aquifers being typical for ridges formed by Paleozoic rocks. The complex geological structure of the territory, diversity of kinds of rocks and lengthy period of their formation, relief and climate, as well as human activities (irrigation and water-supply) have defined the peculiarities of hydro-geological and hydro-chemical conditions of ground water resources.

However the general pattern is that natural surface water is generally perennially available from Km 2.3-108, but thereafter, the terrain becomes arid, and relies on irrigation (where water is sufficient) for cultivation. Near Batken, the groundwater table is reported to be as low as 92m depth.

In the Osh area, groundwater is sourced from the Akbuura underground water reservoir next to Osh city of Osh, and the Tuya Muyun underground water reservoir in Aravan. There are some areas subject to flooding and these include Aravan and Nookat. There are in the order of 2,59 million m<sup>3</sup>/day estimated reserves, with 1.13 million m<sup>3</sup>/day being actually proven reserves. Some 20 aquifers and wells in the order of 1300 also make up the project area's water resources.

### 3.1.7 River Systems & Surface Water Resources

The hydrology of the Kyrgyz Republic is a complex pattern of rivers and lakes, and includes the longest river in the country (Naryn) which traverses Jalal-Abad and Naryn oblasts and represents a nearly third of the country's water volume. Rivers of importance in the Ferghana valley (Osh - Jalal-Abad) are Kara-Darya, Kugart, and Kara-Unkur irrigating significant areas of land. The river systems and water resources in the project area are as follows:

**Table 3.3 - River Systems & Water Resources of the Project Area**

Oblast	River/ Water Resource	Features
Osh/ Batken	Akburra Abshirsay Isfairmsay Shakhimardan Naiman	Watershed of 2,540 km <sup>2</sup> , length 136 km, av. annual flow 19.7 m <sup>3</sup> /sec Watershed of 620 km <sup>2</sup> , length 62 km, av. annual flow 1.6 m <sup>3</sup> /sec Watershed of 2,200 km <sup>2</sup> , length 122 km, av. annual flow 22.9 m <sup>3</sup> /sec Watershed of 1,300 km <sup>2</sup> , length 112 km Reservoir

Source: State Agency of Environment Protection & Forestry (2006)

## 3.2. Biological Resources

### 3.2.1 Flora

The Kyrgyz Republic is characterized by a high level of biodiversity of plants, the concentration of plants is two to three times higher than in other Central Asian countries, with some 3,786 types of higher plant and 3,600 types of lower plant being registered. Eighty-nine of the plant species found in the Republic were listed as endangered in 2005.<sup>10</sup>

Approximately 4% of the country is under forest cover and the area of forests has been halved over the past 80 years, the period between 1930 and late 1970s alone saw a reduction from 1.3 million ha to 624,000 ha.<sup>11</sup> The natural forests are composed of more than 120 wood species, rivers and lakeshores in the flatlands have dense thickets of elm, poplar, reeds and shrubs, while the alpine and high mountain ecosystems comprise both rare and endangered species.<sup>12</sup>

The biggest fir woods are in the north with very few fir woods in the south. Juniper woods occupy half of the forest area, and are mainly concentrated in the south and southwest in the Alay and Turkestan Mountain Ranges, as well as in Ferghana and Chatkal Valleys. In the south, the juniper grows to some 18 m in height, and the bushy variety is prevalent in the sub-alpine zone.

The Kyrgyz nut and fruit woods are among the largest in the world. They occupy 27,000 ha and represent a unique natural formation, growing mainly in the Ferghana and Chatkan Mountain Ranges at an altitude of 1,000 – 2,200 m. Osh is the center of origin for wild relatives of important horticulture and agricultural species. The vegetation of the project area is predominated by walnuts and berries, archa and fir forests. Forest resources include: 5,012 ha of fir forests, 4,287 ha of nut and berry trees, 38,859 ha of archa.

**Table 3.4 - Characteristics of Flora in Project Area**

Habitat Type	Elevation	Flora
Arid steppes	700 - 1,000 m	Wormwood, roll-floor, feather grass and others
Steppes	1,000 -1,600 m	Chestnut soil – fescue, wormwood, elecampane, couch-grass, nut and berry
Meadow steppes	1,600 - 1,900 m	Mountain chernozem soil - fescue, lousewort, juniper
Meadow-forest-steppes	1,900 – 2,700 m	Mountain-wood/meadow soils - fir, archa, mountain ash, barberry, dog-rose
Sub alpine	2,700 - 3,100 m	Flora of medium mountain ecosystems, forest reserves (Section 3.2.3)
Alpine	3 100 – 3,500 m	Flora associated with high mountain ecosystems, forest reserves (Section 3.2.3)

Source: State Agency of Environment Protection & Forestry (2006)

<sup>10</sup> Government of Kyrgyz Republic - SAPF; *Third National Report - Convention on Biological Diversity*, (Bishkek, 2005).

<sup>11</sup> ADB a, and UNDP/Economic Commission for Europe; op cit

<sup>12</sup> World Bank/Global Environment Facility; *Regional Plan of West Tien-Shan Biodiversity Conservation*, (Astana, Bishkek, Tashkent, 2005)

The main flora species found in the project area include; walnut (*Juglans regia*), Turkestani maple (*Acer turkestanicum*), Shrenk's fir (*Picea schrenkiana*), Semenov's abies (*Abies semenovii*), walnut (*Juglans regia*), juniper, Sogdian wild prune (*Prunus sogdiana*), Turkestan hawthorn (*Crataegus turkestanica*), dog bramble (*Rosa canina*), barberry (*Berberis spp.*), black currant (*Ribes meyerii*), almond (*Amygdalus*), pistachio (*Pistacia vera*), pear (*Pyrus spp.*), wild rose. Approximately 2 km south of Km 210 on the existing alignment through Sokh Enclave is found the Aigul (Edward's Pentilium), a rare (and protected) flower found only in Kyrgyz Republic and Afghanistan. Seeds take seven years to ripen, plus another seven years for the flower to appear, and it only blooms for a few days in April/May. The plant will not be affected by the works.

It should be noted that as a result of intensive development of adjacent areas of the Fergana valley, walnut forests have been reduced by half and archa forests by a third.

### 3.2.2 Fauna

Despite its small area the Kyrgyz Republic provides habitat for one per cent of all known species on earth (and three per cent of all fauna) and lies at the center of a biodiversity "hotspot".<sup>13</sup> The fauna of Kyrgyzstan is relatively varied and non-homogeneous in its origin. The known species of vertebrates include more than 75 kinds of fish, four kinds of amphibians, 33 reptiles plus some 368 birds and 83 mammals. In all, there are more than 500 kinds of vertebrates, and more than 20,000 – 30,000 kinds of protozoa and invertebrates, of which only about 4,000 have been studied.<sup>14</sup>

Many animal and plant species are concentrated in relatively small areas and are therefore especially vulnerable. Some 71 species of flora and 122 species of fauna are threatened.

**Table 3.5 - Threatened Species in Kyrgyz Republic**

Species	Total No.	Threatened (%)	Species	Total No.	Threatened (%)
Lower plants	3,676	NA	Fish	75	8
Higher plants	3,786	2	Amphibians	4	75
Annelid worms	1,282	1	Reptiles	33	15
Molluscs	168	1	Birds	368	10
Insects	10,290	1	Mammals	83	18

Source: UNDP/Economic Commission for Europe (2000)

Kyrgyzstan's ecology is diverse in its relief, climatic conditions, flora and fauna. Many animal and plant species are concentrated in relatively small areas and are therefore vulnerable. With the purpose of protecting its current biological diversity, the country has introduced its Red Book which lists endangered species, as shown in Table 3.6.

**Table 3.6 – Number of Species Registered in the Red Book of Kyrgyz Republic**

Species	1991	1992	1993	1994	1995	1996	1997	1998
Marco Polo sheep				16,296	15,747	15,289	16,658	18,050

<sup>13</sup> ADB a; op cit

<sup>14</sup> UNDP/Economic Commission for Europe; op cit

(European) bison	9	10	5	8	8	3	3	3
Ibex				59,128	69,227	65,572	70,543	71,069
Roe deer	5,285	6,128	5,410	5,810	6,370	5,551	5,362	5,029
Siberian deer	450	450	450	300	237	235	278	258
Bear	216	237	276	274	245	233	226	337
Deer	129	91	90	94	92	95	97	98
Lynx	13	13	11	9	28	33	39	38
Snow leopard	22	15	20	15	22	22	32	31

Source: State Agency of Environment Protection & Forestry (2006)

The animals of the deserts and semi-deserts are limited in their composition of types, this being the result of the poor living conditions and the small total areas involved. Most of the reptiles in Kyrgyzstan are found in the desert habitats. These include turtles, agamas, desert monitors, lizards and racerunners. The fauna of the sand deserts is generally richer than the fauna of the deserts with compacted soils. The desert fauna of Kyrgyzstan is however poor in comparison to Central Asia in general. Amphibians are very scarce in these deserts and semi-deserts.

The fauna of the steppes include marmots (*Marmota baibacina*, *Marmota caudate*), porcupine (*Hystrix leucura*), mice and moles (*Microtus gregalis*, *Microtus avalis*), wolf (*Canis lupus*), badger (*Meles meles*), Pallas's cat (*Felis manul*) and other cats are widely spread and quite common in the steppes.

The animals of the forests differ noticeably depending on the type of forest. The most ancient types are fruit and nut forest, which formerly occupied large territories and are now preserved as relic islands in the Chatkal and Fergana mountain ranges. Their fauna has preserved some particular features. Typical birds include doves, owls and warblers. The fauna of the nut and fruit forests is typically diverse and has links with the southern regions of Asia and the Mediterranean. However, the fauna of the coniferous forests relates to European-Siberian boreal. Relatively few mammals live near water in Kyrgyzstan. Stoat (or ermine) (*Mustela erminea*) and weasel (*Mustela nivalis*) were brought in and their populations grew large in many places.

Birds are numerous in all of the varied habitats of Kyrgyzstan, the true birds of the steppes include the Houbara Bustard and Little Bustard, of which only the Little Bustard nests in Kyrgyzstan. Birds of prey, falcons, eagles, and owls, were once common inhabitants of the steppes a few decades ago, but cultivation, hunting (which was only prohibited fairly recently) and excessive use of pesticides has had a harmful effect on predatory birds, causing them to relocate to more austere but more beneficial terrain.

Almost one third of the bird species in Kyrgyzstan are associated with water. Most of them do not nest, and nesting species are not numerous. Among the latter, lapwing, snipe, redshank and little ringed plover are the most common. Wading birds such as snipe, black winged stilt and lesser sand plover are found on the pebbly sand banks of the mountain rivers. Pallas's Sandgrouse is a typical of the bird of the desert region. In the dry mountain areas species such as wheatears, skylarks and sparrows are found (see Appendices 1 and 2).

Common and black terns are commonly found at the nesting places. Caspian grebe and Slavonian grebe are nesting more often in Chong-Kol and other reservoirs, the red-necked grebe, little grebe and great crested grebe being less common. Grey heron, bittern and corncrake have been observed, and also single pairs of demoiselle crane and crane. The true birds of the steppes include the Houbara Bustard and Little Bustard, of which only the Little Bustard nests in Kyrgyzstan. Birds of prey, falcons, eagles and owls, were

once common inhabitants of the steppes a few decades ago but cultivation, hunting, (which was only prohibited fairly recently) and excessive use of pesticides has had a harmful effect on predatory birds causing them to relocate to more austere but more beneficial terrain.

The main fauna of the oblasts through which the project road traverses are presented in Table 3.7.

**Table 3.7 - Species of Fauna Found in Oblasts**

Oblast	Fauna
Osh/Batken	Stone marten, fiber, bear, lynx, snow leopard, wild boar, mountain goat, mountain ram, red marmot, Indian porcupine, wood mouse, Turkestani rat, hare (tolai), red pishuha. Animals such as red wolf ( <i>Canis alpinus</i> ), centralasian otter ( <i>Lutra lutra</i> ), gazelle ( <i>Gazella subgutturosa</i> ) have not been reported as seen for long time. The population of snow leopard, argali and bear in all rayons is vulnerable

Source: State Agency of Environment Protection & Forestry (2006)

There are endangered (Red List) species in the wider Osh/Batken area, none have been observed along the corridor of the project road and none are known to exist in the project corridor or its immediate environs. The project road does not pass through known snow leopard territory.

### 3.2.3 Protected Areas

Preservation of biological diversity is controlled by the Government. The parliament (Jogorku Kenesh) has adopted a number of laws aimed at regulating the use of nature, one of them being the UN Convention on Biological Diversity which has been ratified by Kyrgyzstan.

Reserves are regarded as unique territories or areas of most typical geographic features. The purpose of the reserves is to preserve and protect certain species or habitats and to provide researchers with the opportunity to study the populations in these areas.

National Parks are territories which preserve specific national ecological, historical and cultural landscapes and nature in general. Specific areas are allocated for recreational, educational, scientific and cultural purposes.

The Kyrgyz Republic has also passed ten laws to support biodiversity conservation. Protected areas in Kyrgyz Republic have a three-fold classification; zapovednik – state reserves or protected areas with complete protection (255,000 ha); national parks which include territories which preserve important national ecological, historical and cultural landscapes and nature in general, with specific areas allocated for recreational, hunting, educational, scientific and cultural purposes (259,000 ha); zakaznik – a botanic or geological reserve with lower levels of protection, hunting and collection of non-timber forest products (NTFP) are allowed (391,000 ha). It is noteworthy that, since independence, the number of national parks and reserves has doubled and now cover approximately 4% of the country as a whole (904,000 ha), however, this is still short of the global average of about 6%.

**Table 3.8 - Development of Protected Territories in Kyrgyzstan**

Item	1991	1992	1993	1994	1995	1996	1997	1998
No. of national parks/ reserves	5	5	5	7	7	8	11	11
Area (000 ha)				163.9	163.9	174.7	332.6	329.0

Source: State Agency of Environment Protection & Forestry (2006)

Zapovednik – eight in total - are managed by SAEPF and have an IUCN classification of I. The national parks (nine) and zakaznik (70) are managed by the Department of Forestry (SAEPF) and are IUCN categories II and III respectively, there are also several nature memorials that have an IUCN categorization of IV.

Only 15 of the zakaznik are larger than 5,000 ha and therefore large enough to be considered as multi-habitat reserves, these have deteriorated conditions due to hunting.<sup>15</sup> The protected areas located in the project area are given in Table 3.9.

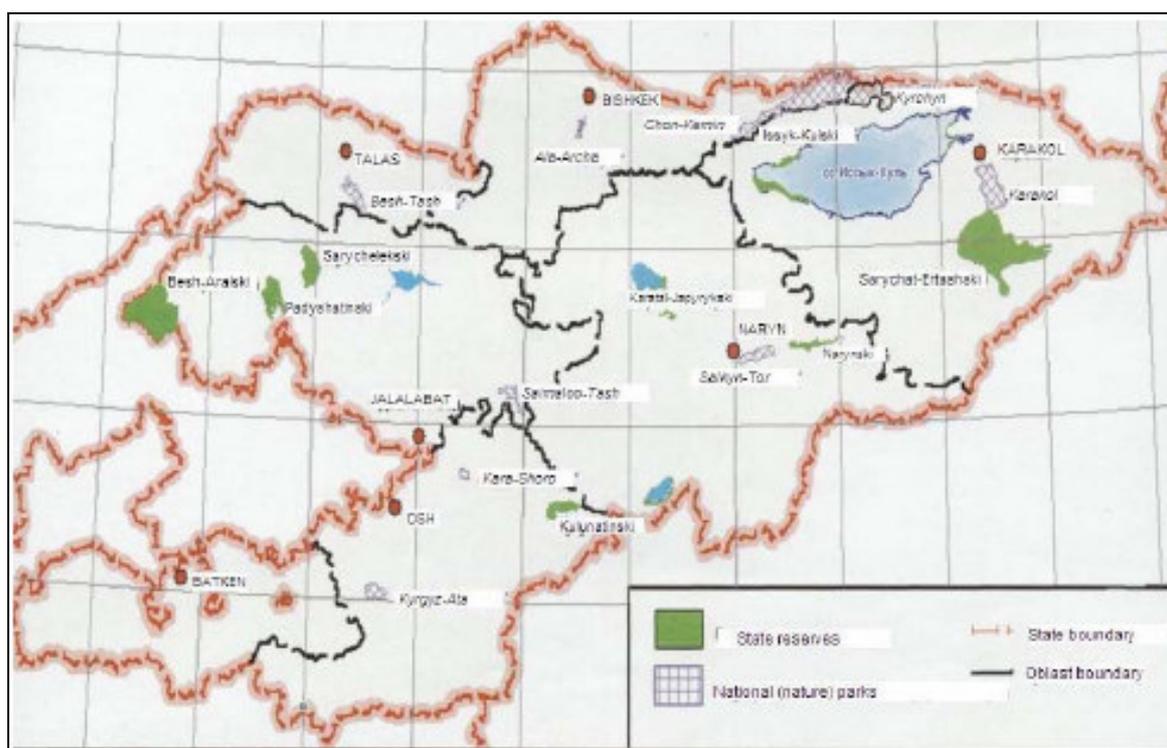
**Table 3.9 - Protected Areas: State Reserves, National Parks and Reserves**

Reserves in Osh/Batken	Location	Approx. Area (ha)	Description
Kyrgyz Ata	Nookat rayon	11,200	National park – protection of archa forest, regulated eco-tourism
Kulunatinski	Border with Naryn	72,600	Zapovednik - preservation of small fir groves
6 geologic reserves	Nookat, Aravan	...	Zakaznik – preservation of caves and Paleozoic waterfall
That-i-Suleyman	Osh city	60	Zakaznik – preservation of natural geologic complex around Sulaiman mountain

Source: State Agency for Environment Protection and Forestry (2006)

The locations of zapovednik (state reserves) and national parks are shown on Figure 4.

**Figure 4 - State Level Protected Areas**



Source: State Agency of Environment Protection and Forestry (2006)

<sup>15</sup> Economic Commission for Europe; op cit

In Osh there is one zapovednik, two national parks and seven geological zakaznik. The roads located in Osh oblast do not pass near any of these areas. The Ayktul forest reserve in Batken is located well south of the project road adjacent to the border with Tajikistan.

The World Bank's Global Environmental Facility and Regional Implementation Units of Kazakhstan, Kyrgyz Republic and Uzbekistan have been working on a biodiversity conservation plan for a "trans-boundary protected area" for the West Tien-Shan area. In Kyrgyz Republic the area includes all of Jalal-Abad oblast, approximately half of Talas oblast and a small part of Osh oblast. As part of the overall plan for biodiversity conservation of the West Tien-Shan area, the plan proposes extensions to some existing reserve areas in Kyrgyz Republic, including the Besh Aral and Uzun-Akhmat state reserves. The road is located well south of the proposed Tien-Shan protected area.

### **3.3. Socio-economic Characteristics**

#### **3.3.1 Industry**

Industrial resources in Osh are concentrated in Osh city, and towns such as Kyzyl-Kia, Frunze and Khaidarkhan. The main industrial sector is mining, including two large enterprises: Kadamjay antimony factory and Khaidarkhan mercury factory, a large nickel plant has not operated at full capacity since the collapse of the Soviet Union. There are oil, natural gas and coal mines producing in the order of 100,000 – 150,000 tons per year. The oblast is actively pursuing the development of industry associated with construction (bricks, limestone, plaster, dolomite, asphalt and concrete), and has a well-developed light industry, particularly silk and cotton fabric production. However its regional share of GDP is low at five per cent, reflecting a large reduction in coal and nickel mining.

The main products of the area include: steel, cast iron, non-ferrous metals, meat and food products (incl. sausages, milk, butter, vegetables), vegetable oil, tobacco, flour, cotton, silk, lime and limestone, concrete, motor engines, and dolomite.

#### **3.3.2 Agricultural Activities**

Overall nearly 28% of the country's land area is designated for agricultural purposes (excluding range land). The actual area under cultivation is about 2.5 million ha. Agriculture activities are concentrated in the valleys. A World Bank study noted that irrigated cropland makes up three quarters of cultivated crop land, and this compares well with other Central Asian countries which together provide an average of 26%.

The agriculture sector of Kyrgyz Republic makes up about 35% of gross national product. Its main products include meat, leather, wool, sugar, cotton, silk, vegetables, fruit, and tobacco. Livestock breeding accounts for 60% of all agricultural income, the remaining 40% stemming from crop production. By 1998, even though agricultural production had increased by 4.1%, gross domestic product (GDP) had not increased equally (increasing by only 1.8%). Agriculture contributes significantly to regional GDP of all oblasts, and contributes to about 56% of GDP in Osh and Batken.

The main crops grown in the project area are sugar beet, corn, grain, rice, tobacco, cotton, potato, vegetables, oil bearing vegetables, and animal fodder.

#### **3.3.3 Population and Demographics**

The National Statistics Committee (NSC) estimated the total population at the end of 2007 was 5.2 million. The largest populations are centered around the big cities of

Bishkek and Osh. Approximately 14% of the population lives in high mountain regions (>1,500 m), and these people amongst the poorest and least served by public institutions. The population is concentrated in small areas in the north and southwest in the Chui (north-central), Fergana (south-western), and Talas (north-western) valleys.

The population of Osh Oblast is 1.089 million (21% of the total population), and the population of Batken Oblast is 431,000 (8% of the total population) (2007). There are two rayons, one municipality, and six significant settlements along the Osh Oblast (Km 2.3-74) section of the road, and three rayons, one municipality, and eleven significant settlements along the Batken Oblast section of the road (Km 74-358).

The project road passes through areas of both dense urban population and vast rural areas. The three largest ethnic groups in the Kyrgyz Republic are the Kyrgyz, Uzbek and Russian. Kyrgyzs are the majority with 69.6 per cent with Uzbeks totalling about 14.5 and 8.3 per cent respectively. Among the 'other' are communities of Dungan (Chinese Muslim), Tajik, Korean, Ukraine, Uygur, Tatar, Kazhak and Turkish.

### **3.3.4 Livelihoods and Poverty**

According to the Poverty and Social Assessment (PSA) undertaken for the ADB PPTA (2007), the most predominant livelihood sector in the project area, whether on a regular or irregular basis, is agriculture (including processing of farm and meat products), accounting for 44% of all households. Agriculture also accounts for 29% of those engaged in waged work. Small business and trade is the sector accounting for next largest proportion of working people (15 per cent) followed by work in the education and health sector (14%).

In the Osh-Batken area, based on data provided in the PSA (which correlates well with 2006 data from NSC), the average income per month is 1,551 som/person, the maximum monthly income is 9,014 som/person and minimum income is 498 som/person.

Based on data provided in the 2007 report, the survey identified four income groups: (i) *Poor* - this group includes households with people who earn incomes that fall below the poverty line;<sup>16</sup> (ii) *Vulnerable* - this group includes those who have moved above the official poverty line and earn between 793 and 1,400 som/person/month; (iii) *Non-Poor* - this group includes households with people who earn between 1,401 and 2,200 som/person/month; and, (iv) *Better off* - households in this category include those with members earning more than 2,201 som/person/month.

Overall, some 52% of households surveyed fall into the poor income group, 25% fall into the vulnerable group, 15% are non-poor, and 9% are better off. Table 3.10 shows the distribution of households across the income groups on the basis of gender and ethnicity. The ethnic group with the highest proportion of poor is the 'other' group which includes Tajik and Chinese, just over half of Kyrgyzs (51%) and Russian (53%) of households are poor, 49% of Uzbek households are poor, the Tatar households have the smallest proportion of poor, although still high (and close to the national rate of 44%), with 43%. When looking at the gender of household head, the distribution of households across the income groups is very similar, and there are no significant differences that merit project specific gender actions based on poverty rates.

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<sup>16</sup> The 'poverty line', as determined by NSC in 2006, was 792 som/person/month including the extremely poor with incomes less than 697 som/person/month.

**Table 3.10 - Income Group by Gender & Ethnicity**

Gender & Ethnicity of Household Head	Income group (%)			
	Poor	Vulnerable	Non-poor	Better off
Male	52	25	14	9
Female	51	24	17	7
Kyrgyz	51	26	15	8
Uzbek	49	17	17	16
Russian	53	26	11	9
Tatar	43	29	14	14
Other	67	24	9	0
Total	52	25	15	9

*Source: PPTA Socio-economic Beneficiary Survey (2007)*

### **3.3.5 Physical Cultural & Heritage Resources**

In Osh oblast there are six natural resources that are considered sights of interest for tourists; Dangi Canyon, Taht-i-Sulayman mountain, Ajydar Unkur cave, Chil Ustun cave (Chil Mairam), a large barytic hollow, and the Abshyr Ata water-fall.

None of these potential resources are located within the project area of the road.

## **4. ASSESSMENT OF IMPACTS AND MITIGATION MEASURES**

### **4.1. Road Projects: Basic Environmental Considerations**

Water, wind and pasture erosion are some of the most significant factors affecting the environment in Kyrgyzstan. Erosion is a major threat, not only to the physical and biological environment, but also for the people dependent on arable land for farming or on land fertile enough for grazing. At present, only some 7% of the area of the country is covered with arable soil. Pastures cover about half of the country, but more than one third of this area is only available for summer grazing as a result of the high altitude.

Of the total land area affected by erosion, 63% is considered as pasture erosion, 30% water erosion and 7% wind erosion. One fifth of the pasture erosion area and one quarter of the wind and water erosion area are regarded as severely eroded. The severity of the problem is best illustrated by the fact that, of all land fertile enough for farming or grazing, 24% is regarded as severely eroded (severely eroded areas, as classified in the Atlas of the Kyrgyz Republic, are those where over half of the land area is eroded). The methods and criteria which were used to derive these figures are not defined in the source, but nevertheless it is clear that erosion is one of the fundamental environmental problems in the country. Thus, these issues should not be overlooked in any project, especially one having direct impacts, positive or negative, on erosion.

However in the Osh to Isfana road corridor, the main active form is isolated concentrated erosion at existing perennial or frequently running natural rivers and streams, and some mudflow activity around km324-337. There is sheet outwash fan erosion around km125-175, but this occurs only after occasional heavy rainstorms, and the actual effect of this seems minor. The main cause of sheet wind erosion would be desiccation of fine-grained granular non-cohesive local soils, either as a result of diversion of previous water supplies by surface channels or groundwater extraction or drought, and removal of vegetation cover, but there seems to be little activity of this type. The soils in these areas are generally gravels, in a cohesive matrix. Particularly from Km108 to 358, the terrain is naturally barren or at best sparsely vegetated anyway. The main reason for this is a natural shortage of water. Although the main farming use in this area is poor grazing for sheep, there are no major erosion processes attributable largely to human activities such as new water discharges or over-grazing. However care will be taken to ensure that the new or improved existing road does not further aggravate erosion in vulnerable terrain.

As previously mentioned, Kyrgyzstan's ecology is diverse in many respects. However, the living conditions for many species are close to the edge of survival. This is due to many reasons, for example climate, availability of water, use of pesticides and size of habitat. Thus, to promote biological diversity in infrastructure development projects, it is of the utmost importance to recognize the sensitivity and the poor power of regeneration of the Kyrgyz environment and to understand that the changes already caused to the habitats may prove irreversible with any further change.

One example of the issue presented above is the use of river bottoms as gravel pits which has been common practice for many years. It is very difficult, if not impossible, to assess comprehensively the impacts of this kind of activity due to a particular road project. Perhaps one indication of the vulnerability of the habitats is the change in the fish population in rivers during the past 10 to 20 years. The new fish species introduced by man very rapidly took over and the original species declined.

The annual variation of population sizes is also probably significant. This phenomenon would be described as a catastrophe if the same level of change occurred among the land mammals.

It should be noted that while extraction of gravel from rivers is a legal, licensed activity, it is recommended that river beds are not used as a source for gravel material for the Project. If an existing license is preferred as the option for gravel/aggregate source, then a due diligence will be required to be carried out comparing the proposed river extraction with other possible sources. For example, the crushing of quarried stone for use as aggregates, although more expensive, is environmentally more acceptable. In any event, an aggregate extraction plan for all sources to be used for the project is required to be prepared and submitted for approval by the Supervising Engineer.

## 4.2. Screening of Impacts

Screening is used to determine the extent of the environmental studies required for the project. This screening is carried out in accordance with the checklist contained in WB's Environmental Assessment Sourcebook. Using criteria such as the type, scale and location of project, the sensitivity of the environment and the magnitude of the impacts, the purpose of this checklist is to screen out those impacts of no significance thus enabling the emphasis to be placed on those impacts which require measures for their mitigation.

The purpose of mitigation is the avoidance or reduction of any potential adverse environmental impacts. There are often different alternatives to mitigate certain effects. Selecting mitigation methods to be used should therefore be a joint process between the engineering and environmental specialists. The methods used should be economically feasible and the best available. The selection of appropriate mitigation methods is not however, enough to guarantee the desired outcome. Co-operation and supervision is needed to ensure that the method is implemented correctly. Adequate supervision is frequently neglected.

Although this project is considered to have no significant potential impacts, there is still a need to avoid or decrease those smaller scale impacts which may cause inconvenience, unnecessary loss or damage or avoidable risks. Mitigation should not be a separate action in planning, design, construction and maintenance. To ensure a successful outcome, it is essential that mitigation measures be integrated with all stages of the project.

Each environmental factor which could be affected by implementation of the project has been addressed, and the scope and importance of each potential environmental impact has been assessed. The following definitions of significance of impact have been used in the environmental impact screening:

- **No impact** - a potential impact is assessed as having no impact if the project activity is physically removed in space or time from the environmental component, or if the impact is so small as to be unmeasurable (i.e. negligible). No mitigation measures are required for project activities that will create 'no impact';
- **Minor impact (positive or negative)** - if an impact occurs but does not meet the criteria for a major impact it is considered minor. For minor negative impacts, appropriate mitigation measures have been identified;

- **Major impact (positive or negative)** - an impact is major if the project has the potential to affect an environmental component. The following criteria are used to determine whether an impact is major; (i) spatial scale of the impact (site, local, regional, or national/ international); (ii) time horizon of the impact (short, medium, or long term); (iii) magnitude of the change in the environmental component brought about by the project activities (small, moderate, large); (iv) importance to local human populations; (v) compliance with international, national, provincial, or district environmental protection laws, standards, and regulations; and (vi) compliance with guidelines, policies, and regulations of Kyrgyz Republic and WB. Where potential major negative impacts are identified, mitigation measures are developed to reduce them to acceptable levels; and
- **Unknown impact** - the potential impact of the project will be assessed as being unknown if the magnitude of the effect can not be predicted for any of the following reasons; (i) the nature and location of the project activity is uncertain; (ii) the occurrence of the environmental component within the study area is uncertain; (iii) the time scale of the effect is unknown; or (iv) the spatial scale over which the effect may occur is unknown. Where possible mitigation measures are identified for impacts categorized as 'unknown impacts'.

Mitigation measures have been developed according to the following hierarchy:

- The first priority is to make changes to the subproject design or location during the pre-construction phase to avoid the potential impact;
- The second priority is to make changes to the subproject design or location, or to implement other measures to minimize the scale or magnitude of the impact, or confine it to less sensitive areas;
- The third priority is to implement measures to mitigate any residual impacts to an acceptable level of impact; and
- The fourth and final priority is to compensate any residual impacts through 'in kind' compensation or monetary compensation.

There are several types of impacts to be considered. Direct impacts are caused by a project activity, and occur at the same time and place and can be created during both project construction and operation. Direct impacts will be limited in this project because the work is to be concentrated within existing rights-of-way (ROW) of the road for the most part, and along currently unformed tracks and routes. Indirect impacts, which may include growth-inducing impacts, are caused by a project activity, or the overall project, and while they are later in time or farther removed in distance, they are still reasonably foreseeable.

Short-term impacts, like the noise and fumes associated with heavy equipment occur during road construction and are usually without long-lasting effects. Long-term impacts, on the other hand, could affect regional land use and development patterns and even mobility and migration. The project, however, is limited to small-scale rehabilitation works and maintenance of existing roads, and thus, there is little possibility for long-term environmental impacts.

The environmental screening for the project identifies the range of potential environmental impacts that could occur from the rehabilitation and maintenance activities proposed for the subprojects. Where the environmental impact is deemed to be major (or significant) mitigation measures are provided, generally to be incorporated into the project design documents.

Impacts created during construction activities are dependent on a number of factors including the temporary use of land and its rehabilitation post-construction, 'best practices' being employed during construction activities, coordination and cooperation with local authorities in terms of impact management, and strict enforcement of environmental conditions included in project bid documents and specifications and adherence to a comprehensive EMP.

### 4.3. Construction Impacts on the Physical Environment

#### 4.3.1 Air Quality

During construction the rehabilitation and ongoing maintenance works will have a minor impact on local air quality through emission of exhaust from vehicles and asphalt, aggregate and concrete plant, as well as through dust generation from vehicles transporting materials and from exposed stock-piles of material. The rehabilitation of the road, including construction of new sections, will result in reduction of dust emissions compared with existing unsurfaced or damaged sections. The project's monitoring plan requires that baseline conditions be recorded prior to the reconstruction works in order that air quality can be monitored both during and post rehabilitation works.

The national standards to be observed for monitoring, as shown in the table below, follow Soviet standards: GOST 17.2.3.01-86: Rules for Air Quality Control in Settlements (1986) and RD 52.04.186-89 Manual on Atmospheric Pollution Control (1989).

**Table 4.1 - Ambient Air Quality Standards in Kyrgyzstan**

Pollutant	Maximum Permissible (mg/m <sup>3</sup> )	Average Daily Concentration (mg/m <sup>3</sup> )
Particulate Material:		
With silica content > 70%	0.15	0.05
70 - 20% (cement, coal, clay, etc.)	0.3	0.1
< 20 % (dolomite, etc.)	0.5	0.15
Cement dust (Calcium oxide > 60% and silica >20%)	0.5	0.05
Sulfur Dioxide SO <sub>2</sub>	0.5	0.05
Carbon monoxide	5	3
Nitrogen Dioxide NO <sub>2</sub>	0.085	0.04
Nitrogen Oxide NO	0.40	0.06
Lead (Pb) and compounds (except tetra ethyl)	-	0.0003
Lead sulphurous (in terms of Pb)	-	0.0017

*Source: Kyrgyz Agency on Hydrometeorology*

During construction the rehabilitation and ongoing maintenance works will have a minor impact on local air quality through emission of exhaust from vehicles and asphalt, aggregate and concrete plant, as well as through dust generation from vehicles transporting materials and from exposed stock-piles of material. These impacts will be mitigated by:

- Adherence to Kyrgyz Government's pollution control guidelines and standards and WB's air quality standards;
- Prohibition of the open burning of waste or materials;

- Construction equipment being maintained to a good standard and fitted with pollution control devices. The equipment (including the pollution control devices) will be checked at regular intervals to ensure they are maintained in working order and the checks will be recorded by the contractor as part of environmental monitoring;
- Discouraging of the idling of engines;
- Prohibition of the use of equipment and machinery that causes excessive pollution (i.e. visible smoke) at project work sites;
- Ensuring that all vehicles transporting potentially dust-producing material are not overloaded, are provided with adequate tail-boards and side-boards, and are adequately covered with a tarpaulin (covering the entire load and secured at the sides and tail of the vehicle) during transportation;
- Not permitting the operation of hot-mix, asphalt, aggregate or concrete plant in close proximity of populated settlements nor within 500m of sensitive uses (such as schools, and hospitals);
- During periods of high wind any dust generating activities will not be permitted within 200m of populated settlements located in the direction of prevailing wind;
- Material stockpiles being located in sheltered areas and be covered with tarpaulins or other such suitable covering to prevent material becoming airborne;
- Regular watering/spraying of unsurfaced project roads and all unsurfaced roads being used for haulage of materials during the dry season;
- Preparation of a dust suppression program, submitted to the Project Implementation Unit (PIU) prior to commencement of the works. The plan (which can be included in the EMP) will detail the action to be taken to minimize dust generation (e.g. spraying unsurfaced roads with water, covering stock-piles, and blasting with use of small charges etc) and will identify the type, age and standard of equipment to be used; and
- Periodic air quality monitoring.

As noted in the following sections, potential impacts on water flow and flooding can be adequately mitigated through design measures. The project road is localized and will upgrade and improve already existing access and therefore will not create any impacts on rainfall, unexpected snow-melt or groundwater depletion, which in turn could affect risk of, or induce, climate change.

#### **4.3.2 Impacts from Quarry Sites and Borrow Pits**

Quarry sites will be identified during detailed design. As noted previously, extraction of river gravels is not recommended for the project, even where an existing license exists. Contract documents will specify that, unless otherwise agreed and approved, only licensed land-based quarrying operations are to be used for material sources. If licensed quarries are not available the contractors will be responsible for setting up dedicated crusher plants at quarry sites approved by the PIU and SAEPF. Further, for all borrow sites, contractors will ensure that they acquire appropriate environmental permits from SAEPF before sourcing the material.

In the event that a river source is proposed, a due diligence will be required which will compare the effects of the river extraction with other available sources and methods. The due diligence will be reviewed and approved by SAEPF and WB.

The contractors will be required to prepare an aggregate extraction plan to identify the sources of material and of spoil that will be used for the works. The plan will be submitted to PIU, which will ensure that the plan is implemented. The materials and spoil plan should show the location of any borrow pits to be used, the volume of material to be extracted, extraction methods, and the measures to be taken to rehabilitate these sites/pits upon finalization of the project. PIU will approve and monitor implementation of the plan.

To mitigate the impacts from quarry sites and borrow pits, it is recommended that in addition to the preparation of the materials and spoil plan, that bid and contract documents specify that (i) borrow areas will be located outside the right-of-way (use of suitable material arising from necessary excavation for the permanent works within the ROW being excluded from this restriction); (ii) pit restoration will follow the completion of works in full compliance all applicable standards and specifications; (iii) arrangements for opening and using material borrow pits will contain enforceable provisions; (iv) the excavation and restoration of the borrow areas and their surroundings, in an environmentally sound manner to the satisfaction of the project supervision consultant (PSC) will be required before final acceptance and payment under the terms of contracts; (v) topsoil from borrow pit areas will be saved and reused in re-vegetating the pits to the satisfaction of the PSC; and (vi) additional borrow pits will not be opened without the restoration of those areas no longer in use.

#### **4.3.3 Soils, Erosion, and Slope Stability**

Soil characteristics and topographic conditions have been taken into account in the proposal of works and maintenance activities. With the exception of three bypasses (along existing tracks), there will be no alteration in alignment along the project road and no relocation of ROW is required.

The main impacts on soil and slope stability during rehabilitation works are from (i) loss of agricultural soil or soils of high productive value; (ii) extraction of fill materials from rivers and/or borrow pits; (iii) conversion of the existing land uses such as agriculture and grassland to stockpiles of materials; (iv) soil erosion in areas of mountainous slopes, side slopes, and un-compacted embankments; and (v) soil contamination of from chemicals and/or construction material spillage.

There will be no loss of soil for agricultural production as all rehabilitation activities in lowland areas will be confined to the existing right-of-way and therefore no loss of agricultural land due to road widening or re-alignment will occur. Good quality land mainly occurs between Km 2-108, and between Km108-358, the land is generally barren or at best poor grazing.

Earth embankments and material stockpiles will be susceptible to erosion, particularly during the rains and re-suspension of dust during the dry seasons. Certain types of road improvements, e.g. road widening, result in increased runoff and/or increased velocities that could lead to loss of soil. Project activities will be confined to existing ROW and no significant increase in the amount of impervious surfaces and/or the quantity or velocity of runoff is anticipated.

Suitable excavated material will be re-used wherever possible, the engineering investigations noted that quality of existing material is highly variable along the road and in many cases re-use for the project will not be possible. However, this does not preclude its re-use for local roads that require maintenance to a lower standard, and village roads may be upgraded through re-use of surplus reclaimed AC pavement.

The foregoing impacts will be mitigated by:

- All required materials will be sourced in strict accordance with Government guidelines, project provisions, and the EMP;
- Priority will be given to location of material stock-piles, borrow pits and construction camps on unused land and non-agricultural land. All land will be rehabilitated to its original or better condition upon completion of the project works;
- The side slopes of cuttings and embankments will be designed to reflect soil strength and other considerations as included in the project specifications in order to reduce slips or erosion;
- To prevent soil erosion in areas of steep mountainous slopes, rock-fall fences, rip-rap, retaining structures and gabion baskets for river bank protection will be included in the engineering design;
- For embankments greater than 6m, stepped embankments will be used;
- Embankments will be monitored during construction for signs of erosion;
- Material that is less susceptible to erosion will be selected for placement around bridges and culverts;
- Ditches shall be designed for the toe of slopes in cut sections with gutters or drainage chutes designed to carry water down-slope to prevent erosion. Interceptor ditches shall be constructed near the top of slopes, or on benches, in cut slopes. For steep slopes drainage will be designed and constructed to intercept longitudinal flow and carry water away from fill slopes;
- Random and uncontrolled tipping of spoil will not be permitted. Suitable tip sites will be designated (generally wide gently sloping areas located away from streams and rivers) at a maximum average spacing of approximately 1 km, and usually with a tipping zone from the road edge of not more than 10m width (unless a wider area clearly will not be detrimental), to minimise the area affected by tipping and requiring reinstatement;
- Re-vegetation of exposed areas including; (i) selection of fast growing and grazing resistant species of preferably local grasses and shrubs; (ii) immediate re-vegetation of all slopes and embankments if not covered with gabion baskets; (iii) placement of fiber mats to encourage vegetation growth, although due to the arid conditions in most of the road, this may only be feasible where there is regular rainfall or other natural water supply;
- Acquisition of all necessary permits and approvals for location of construction camps, quarry sites and sources of construction materials from SAEPF and local government agencies prior to any construction or erection of camps and extraction of material; and
- It should be noted that the engineering investigations observed erosion of hills and plains in the catchments of the road. The project will contribute to the prevention of further or ongoing erosion in areas where it has been identified.

#### **4.3.4 Water Quality**

The project has the potential to create some short-term and minor adverse impacts on water quality including (i) an increase in silt loads at culverts and bridge sites; (ii) construction materials such as gravel, sand, and fill being washed out into local streams and rivers during rain; (iii) hydro-carbon leakage and/or spills at storage and mixing plant locations; and, (iv) discharge of waste water and sewage from work camps to local streams and rivers.

There will also be longer term environmental benefits created by the project through upgrading of gravel road sections to asphalt and reduced silt laden run-off from unsurfaced roads in the rainy season.

In addition to a number of the items outlined above employed to mitigate soil erosion and effects on slope stability that will also mitigate adverse effects on water quality, the following measures will be included in the engineering design and EMP:

- Interference with natural water flow in rivers, water courses or streams within or adjacent to work sites, and also prevention of abstraction from, and pollution of, water resources in the project sites will not be permitted;
- Water courses, rivers, streams, lakes, drains, canals and ditches within and adjacent to project works sites will be protected from pollution, silting, flooding or erosion as a result of project activities;
- Streams, rivers and watercourses (including drains) within and adjacent to the work sites will be kept free from debris and any material or waste arising from project works;
- Sediment controls such as silt fences, coffer dams and silt barriers and other devices will be included in the engineering design to prevent both siltation and silt migration during project activities in the vicinity of rivers and streams. Sediment control devices will be cleaned, dewatered and discharged to settling ponds or containment units;
- Discharge of sediment laden construction water or material (including dredged spoil) directly into surface waters will not be permitted. All such construction water will be discharged to settling ponds or tanks prior to final discharge;
- Water used for dust suppression purposes will be discharged to specially constructed settlement tanks allowing for sedimentation of particulates. After settlement the water may be re-used for dust suppression and rinsing of vehicles and equipment;
- Hydro-carbons, petroleum products to be used in bitumen mixes, and other chemicals will be stored in secure and impermeable containers or tanks located away from surface waters, the storage areas will require a concrete base or other forms of containment that will allow any spills to be contained and immediately cleaned up. Any contaminated soil will be handled according to SAEPF standards;
- Spoil and material stock piles will not be located near waterways, rivers or streams;
- All storm drainage will be adequately contoured, sized, and lined where necessary;

- Discharge zones from drainage structures will be carefully identified and structures will be lined with rip-rap, and down-drains and chutes will be lined with rip-rap, masonry or concrete. Spillage ways will be lined with rip-rap to prevent under-cutting;
- Construction and work camps will be equipped with sanitary latrines that do not pollute surface waters. A waste management plan, covering all liquid and solid waste, will be prepared by the contractor and submitted to the PIU;
- Discharge or deposit any material or waste into any waters except without the approval from the relevant regulatory authorities will not be permitted; and
- All water, waste-water and other liquids used or generated in execution of project works and activities will be collected and disposed in an approved manner in an approved location and will not cause either pollution or nuisance.

#### **4.3.5 Emergency Response Measures**

The contractor will be responsible for preparation of an emergency response plan which will cover containment of hazardous materials, oil spills, and work-site accidents. The plan will detail the process for handling, and subsequently reporting, emergencies, and specify the organizational structure (including responsibilities of nominated personnel).

The plan will be submitted to MOTC/PIU for approval. Implementation of the plan will be monitored by PIU and PSC. Any emergencies, and how they were handled, will be reported in monthly progress reports.

### **4.4. Construction Impacts on the Biological Environment**

#### **4.4.1 Flora and Fauna**

Minor impacts upon habitats and flora of the project area are expected as a result of the road rehabilitation and formation of new alignments (enclave bypasses). Rehabilitation work will directly cause minor degradation of local ecology through the clearance of small areas of vegetation – mostly ground cover - at work sites and ancillary sites. A short-term impact on ecology along the road is likely due to minor vegetation clearance of road-side vegetation, around the quarry sites, material stockpiling areas and worksites during the construction period.

Habitat fragmentation occurs when a road cuts through an ecosystem, the project road has existed for some time and if original construction caused habitat fragmentation, the ecosystems have re-established albeit as smaller units around the roads. The project will not cause any further physical habitat fragmentations as the rehabilitation works will be within the existing ROW and detours will utilize existing tracks and roads which have been cut for some time. The possibility of the road creating a wildlife barrier is discussed below.

Plant species present within the ROW are either introduced species or ubiquitous native species, which are highly tolerant of agriculture, grazing, compaction, and other disturbances. The rare plant - Aigul (Edward's Pentilium) – is not located within the ROW or wider corridor to be affected by the works. The nearest plant is located 2 km south of the road and will not be impacted by the works.

Construction activities will impact only a narrow band of vegetation adjacent to the existing roads. Some road side trees (generally artificially introduced ones in towns) may have to be removed for footpaths or other road improvements). Each one removed will be replaced by at least five new saplings of the same species or other at suitable locations, all as designated by the tree owner. Other potential impacts to roadside trees will be avoided by ensuring that roadside activities such as asphalt plants, construction camps and other ancillary features are properly sited. Therefore, in light of the nature of the project and the types of works envisaged, there will be little, if any, loss of flora or habitat.

Sites for contractor work camps, batch plants, rock crushers, material storage, borrow pits and quarries will all be approved by the PSC and will not be permitted in any ecological important areas.

In terms of impacts on fauna, there is the potential for construction workers to poach edible animals and birds of the locality in spite of prohibitions. Poaching is regulated by the Law on Animal World (1999) and Regulations on Hunting in Kyrgyz Republic (2003) as well as the Criminal Code, 1997 (Article 276 Illegal Fishing and Article 278 Illegal Hunting). Illegal logging or tree cutting is also regulated by the Criminal Code (Article 279 Illegal Tree and Scrub Cutting) and the Code of Administrative Responsibility No. 198 (Article 127 Illegal Tree Cutting). The contractors will be responsible for providing adequate information to the workers regarding the laws and protection of flora and fauna, and imposing sanctions (fines and dismissal for more than one infraction) on workers who cut trees or timber not requiring to be removed for the project, or who catch, for any reason, animals and birds.

No interrupted corridors of wildlife migration have been observed in the project area. The road corridor has existed for some time and wildlife has either got used to its existence or found alternative migratory routes. The works proposed for the project will not create any additional or new interruption of wildlife migration patterns.

No endangered flora or fauna species will be impacted by the project. The assessment can confirm that the road project (or any part thereof) is not sited on natural habitat as defined in WB's policy, therefore no compensation offset provisions (for conversion of non-critical habitat) are required for this project.

Measures to be included in the project to ensure protection of flora and fauna within the project area include:

- The enclave bypasses (realignments) will not be located in critical natural areas/habitats;
- Contract documents and technical specifications will include clauses requiring training and awareness for construction workers in relation to existing laws and regulations regarding poaching and illegal logging, and expressly prohibiting the poaching of fauna and felling of trees, not requiring to be cleared by the project, by construction workers for the term of the project. Sanctions will be imposed on workers not complying with the law and prohibitions;
- Vegetation clearance during construction activities, especially of trees and along the road-side, will be minimized;
- Vegetative cover cleared from the roadside during rehabilitation activities will be kept for landslide and slope protection. Contractors will be responsible for re-vegetation in cleared areas;
- Contractors will be responsible for supplying appropriate and adequate fuel in workers' camps to prevent fuel-wood collection;

- Construction vehicles shall use carefully-located designated temporary access and haulage roads to minimize damage to habitats;
- The contractor will be responsible for providing adequate knowledge to construction workers in respect of fauna. The contractor shall ensure that the construction workers do not poach fauna, and will be responsible for imposing sanctions on any workers who are caught poaching or having poached fauna; and
- Construction workers will be informed about general environmental protection and the need to avoid un-necessary felling of trees wherever possible.

#### **4.4.2 Protected Areas**

In the project area there is one 'zapovednik', two national parks and seven geological 'zakazniks', and a forest reserve located in Batken. The project road does not pass near any of these areas.

It should be noted that the project road exists, carries traffic, and will be rehabilitated within the existing ROW and formation. During construction of the new formations (three sections providing bypasses of the salients and enclaves) extreme precautions will be taken to ensure that any sensitive environments such as water course and rivers are protected. It is highly recommended that contractors consult with local people during civil works in the vicinity of such areas.

The rehabilitation of the project road will not impact upon protected areas within the wider project area, and existing laws and regulations prohibit poaching or logging which will be strictly enforced during construction, as set out above.

### **4.5. Construction Impacts on the Social Environment**

#### **4.5.1 Noise and Vibration**

During construction, there will be a temporary adverse impact due to the noise of the construction equipment, especially heavy machinery. Compaction equipment, blasting operations for cuts and excavation for foundations and grading can produce noise and vibration. Construction noise is generally intermittent, attenuates quickly with distance, and depends on the type of operation and location and function of equipment.

Data provided in the environmental assessments for the nearby ongoing Southern Transport Corridor Road Rehabilitation Project and the Maintenance of Regional Road Transport Corridors Project noted that potential construction related noise levels of 85-90 decibel (dBA) at 18 m from the source would be reduced to less than 62 dBA at a distance of 600 m from the source. For example, excavation noise levels, assuming bulldozer and dump truck activity only, would yield an equivalent continuous noise level (Leq) of approximately 85 dBA at 18 m. These noise levels would decrease by about three or four dBA with every doubling of distance and would be reduced to approximately 67 dBA at 250 m.

Noise levels will be monitored, as required by the project's EIA monitoring plan, to ensure they meet national standards as shown in the table below. The standards were promulgated as Collection of the Most Important Records on Sanitary and Anti-epidemiological Issues; Volume 2, Part 1 (Information Publishing Centre of Goskomsanepidnadzor, Russian Federation, 1994).

**Table 4.2 - Ambient Outdoor Noise Standards in Kyrgyzstan**

Activity Category <sup>17</sup>	$L_{eq}$ <sup>18</sup>	$L_{max}$ <sup>19</sup>	Description of Activity Category
8	Day = 45	Day = 60	Areas immediately adjacent to hospitals and sanatoriums
	Night = 35	Night = 50	
9	Day = 55	Day = 70	Areas immediately adjacent to dwellings, polyclinics, dispensaries, rest homes, holiday hotels, libraries, schools, etc
	Night = 45	Night = 60	
10	Day = 60	Day = 75	Areas immediately adjacent to hotels and dormitories
	Night = 50	Night = 65	
11	35	50	Recreational areas in hospitals and sanatoriums
12	45	60	Rest areas at the territories of micro-districts and building estates, rest houses, sanatoriums, schools, homes for the aged, etc

Source: Information Publishing Center of Goskomsanepidnadzor (Russian Federation, 1994).

The most sensitive receptors along the project road are schools and health clinics/hospitals. Consideration will be given to installation of a noise barrier if construction (or operation) noise levels exceed the national standards or cause nuisance or interfere with school or health service provision activities.

Vibration during the construction period will also be a significant consideration, particularly vibratory rolling of the granular pavement layers, or blasting, or diversion of abnormal amounts of public traffic onto usually lightly trafficked side roads. Some of the existing structures close to the road are of mud-bound construction or otherwise of poor quality, and may be damaged by vibration. The contractor will be required to carry out trials of his proposed construction methods close to vulnerable structures, for prior approval, and will not be permitted to use methods which will cause damage (even if he offers to be responsible for compensation).

A joint (building owner/consultant/contractor/PIU) dilapidation survey of vulnerable structures close to the new road will be carried out before construction. This will be used to verify any claims of damage allegedly caused by his work, for possible compensation. In addition, a similar prior survey will be made of condition of the road and adjacent structures along proposed diversion roads (whether to be used by the general public only, or by construction traffic also), which will be required to be maintained to at least their pre-construction condition, and reinstated after use.

Cooperation between the contractor and the local residents is essential and it is the responsibility of the project supervision consultant to arrange meetings between these parties and arrange such matters as work schedules (hours of equipment operation,

<sup>17</sup> Activity Categories 1 to 7 relate to indoor standards. The standards provide for allowable noise levels to be reduced in "green areas" or other designated sensitive areas.

<sup>18</sup>  $L_{eq}$  = the sound level equivalent, the  $L_{eq}$  represents the level of steady sound which, when averaged over the sampling period, is equivalent in energy to the fluctuating sound level over the same period.

<sup>19</sup>  $L_{Max}$  = maximum sound level.

traffic lanes to be kept open, diversion roads, etc.), locations of work camps and material storage areas, and siting of rock crushers and batch plants.

Measures to be included in the project to mitigate the effects of noise and vibration include:

- Requirements in the EMP and contract documents that all exhaust systems be maintained in good working order and that regular equipment maintenance will be undertaken;
- The contractor will prepare a schedule of operations that will be approved by the project supervision consultant. The schedule will establish the days and hours of work for each construction activity and identify the types of equipment to be used;
- Prohibition of any construction activities between 10pm and 6am in settlements or close to sensitive receptors such as hospitals and schools;
- The contractor will consult with the community in respect of construction activities and potential noise and vibration impacts. The consultation process will be facilitated by the project supervision consultant;
- Blasting will only be carried out during the day and according to a pre-established schedule, the adjacent communities will be notified of the blasting times well in advance;
- Use of blasting mats to reduce noise during blasting operations;
- Prior to commencement of construction, the contractor, in conjunction with the project supervision consultant, will undertake a dilapidation survey (including photographs) of all buildings adjacent to the new road and diversion roads (also the original pavement condition of diversion roads);
- Trials of the contractors' equipment (especially vibratory rollers) will be carried out adjacent to vulnerable structures, and if cracking or other damage is observed to occur, the contractor will be required to amend their working methods to avoid damage (for example, use of non-vibratory rollers with thinner layers or cement stabilization, or increased asphalt thickness);
- Use of low volume charges will reduce the potential for vibration induced damage to structures; and
- In the event of damage proven to be due to the contractor's activities, owners of structures will be fully compensated.

#### **4.5.2 Impacts on Access and Traffic**

The project will cause temporary impacts on local access and traffic in rehabilitation areas during the construction period due to detours and traffic inconveniences, also local roads could be damaged during transportation of borrow materials or by construction equipment, or by abnormal amounts of diverted public traffic, and this issue was raised during consultation.

Mitigation of the foregoing impacts will include:

- Contracts will include a clause specifying that care must be taken during the construction period to ensure that disruptions to traffic and road transport are minimized. The contractor shall ensure that the roads remain open to traffic during construction activities;

- The contractor will prepare a traffic control plan, to be approved by the project supervision consultant. The plan will include haulage and work site routes, traffic control devices, temporary fencing, barriers and barricades, detours, traffic signs and speed limits, and safe passage of pedestrians;
- Prior to construction activities, the contractor will install all signs, barriers and control devices needed to ensure the safe use of the road by traffic and pedestrians, as required by the traffic control plan;
- Signs, crossing guards and other appropriate safety features will be incorporated at grade level rail and road crossings;
- Local authorities and residents in a working area will be consulted before any detours for construction or diverted public traffic are established;
- Footpaths and roads will kept free of debris, spoil and other material at all times;
- Disposal sites and haul routes will be identified and coordinated with local officials; and
- Construction vehicles will use temporary roads constructed for that purpose to minimize damage to agricultural land and local access roads. Where local roads are used, they will be maintained and reinstated to their original condition after the completion of work.

Issues related to traffic safety are dealt with below.

#### **4.5.3 Health and Safety**

The project's construction phase can cause a range of health and safety impacts. The main impacts on health and safety are associated with (i) facilitation of transmission of communicable disease; (ii) contamination of local water supplies; and (iii) traffic safety issues.

The transmission of communicable diseases such as sexually transmitted infections (STIs) and even HIV/AIDS is a potential impact posed by construction workers engaging in either commercial sex or sexual relationships with local people. The civil works phase of the project can pose risks for both the construction workforce and the communities along the roads for the civil works/construction period. High risk groups in the project area include traders, people from household who travel for marketing or selling, seasonal migrants, poor rural people (who risk passing it on to their spouses or partners), intravenous drug users (IDUs), and commercial sex workers (CSWs).

Potential impacts to local water supplies include the possibility of temporary construction camps and the water supply and wastewater disposal associated with them. Contract provisions to ensure that these facilities are properly sited will be incorporated in project contract documents.

Road improvement projects can also inadvertently cause adverse impacts on road and traffic safety as a result of higher vehicle speeds due to improved road conditions. The proposed rehabilitation works do not include design improvements that could encourage higher speeds above the design speed. However some improvements may be carried out to improve safety, particularly line-of-sight, and at accident black spots. In towns, the design speed will be set at the statutory speed limit for such areas, with prominent speed limit and hazard signage and a ban on non-delivery parking, which are usually strictly enforced by the traffic police, and footpaths, pedestrian crossings, and other safety features. The project will create safety benefits as a result of reducing the conflicts between NMT and motorized traffic.

Currently both NMT and motorized carts mix with regular traffic in towns, even though they are much slower, swerve in and out of the main traffic stream, and make frequent stops. This situation is exacerbated by the use of the road by road-side sellers, who stand in the road with boxes of fruit, vegetables and tobacco to sell.

The main reason that users of NMT and the motorized carts travel with the main traffic stream, despite it being hazardous, is because the road shoulders are either gravel or earth, in many cases the gravel has disappeared leaving large holes and in other cases the existing shoulders also act as the drain and are often filled with water, making it impossible for use by NMT or pedestrians. Reducing the risk of accidents and improving the safety of pedestrians, NMT users and road-side sellers can be achieved by providing hard (sealed) shoulders in the road design, if budget permits, or at least strong, self-draining outward fall.

Air and noise pollution, which can affect the social as well as physical environment, have already been discussed.

Mitigation measures for the foregoing impacts include:

- Each contractor will recruit an environmental, health, and safety officer (ESO) to address health and safety concerns and liaise with the project supervision consultant and communities;
- Training of all construction workers in basic sanitation and health care issues, general health and safety matters, and on the specific hazards of their work;
- The contractor will provide personal protection equipment, such as safety boots, helmets, gloves, protective clothing, goggles, and ear protection, in accordance with relevant health and safety regulations, for workers;
- Implementation of a STIs/HIV/AIDS awareness and prevention campaign which includes HIV in the Workplace seminars and training provided through UNAIDS;
- Provision of hard, instead of soft shoulders, and road markings and signage to enhance safety and indicate that NMT and pedestrians should use the shoulders, rather than mix in the main stream if traffic;
- The contractor will provide adequate health care facilities including an HIV/AIDS education post and first aid facilities within construction sites;
- Contractors will ensure that no wastewater is discharged to local water bodies and safe and clean drinking water is provided to all workers;
- No site-specific landfills will be established at the construction camps;
- Septic tanks and garbage receptacles will be set up at construction work sites and camps, which will be periodically cleared by the contractors to prevent outbreak of diseases;
- Provision of adequate protection to the general public, including safety barriers and marking of hazardous areas in accordance with relevant safety regulations;
- Provision of safe access across the construction site to people whose settlements and access are temporarily severed by road construction; and
- The contractor will ensure that there is adequate drainage throughout the camps to ensure that disease vectors such as stagnant water bodies and puddles do not form.

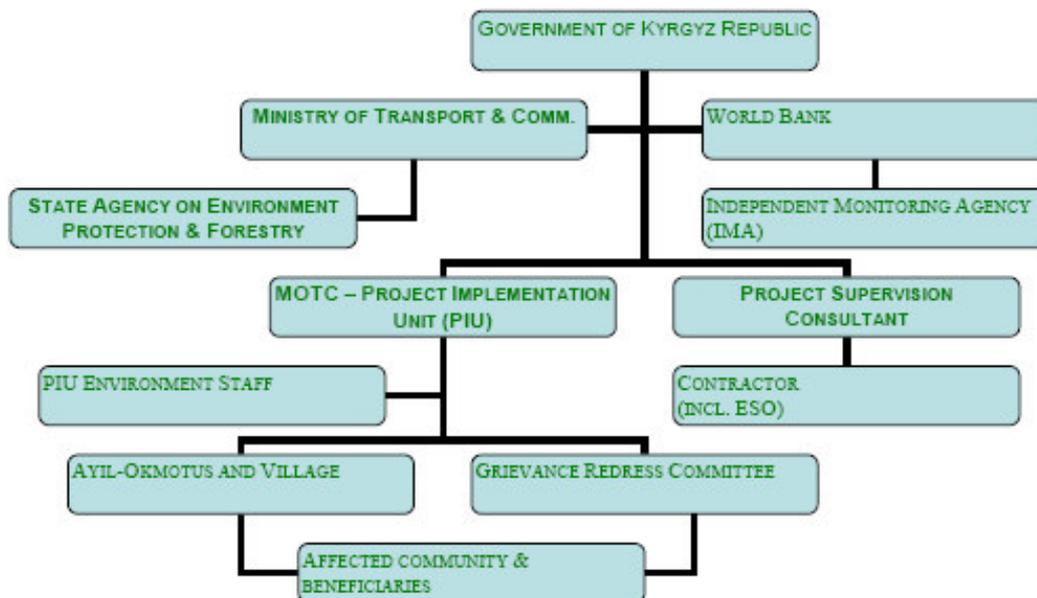
#### 4.5.4 Land Acquisition and Resettlement

It should be noted that approximately two thirds of the project (approximately 234km) involves rehabilitation of existing roads. Only one third requires more extensive works i.e. upgrading of tracks and engineered gravel tracks which have already been in existence for some time. There could be some remaining land acquisition incurred by the project because some upgrading works associated with the bypassing of the enclaves and salients require widening of existing tracks and traces to meet the standards adopted for the rest of the road. In such cases, resettlement plans will be prepared, in compliance with the resettlement Policy Framework prepared for the Project. Local people have expressed eagerness for the road to be completed as soon as possible, and when asked about the possibility to remove some remaining minor structures to achieve the full new road width and geometry, have even offered to give up their houses. Of course such informal offers would only be taken seriously if absolutely necessary and confirmed by formal written procedures. However they do give an indication of the generally positive public perception of the road.

The losses and impacts will be identified during detailed design, at which time a screening of resettlement impacts and losses can be undertaken and an appropriate resettlement document prepared, including for the gravel trace sections already completed. Some compensation awards were agreed, and formally registered through legally binding 'akts' in 2000, these will be reviewed as part of ongoing due diligence process.

The compensation and rehabilitation process, as described in Resettlement Policy Framework, involves different agencies. These include MOTC, MOTC's Project Implementation Unit (PIU), the State Agency on Environment Protection and Forestry (SAEPF), concerned ayil-okmotus, WB, and NGOs. The overall organizational structure is shown on the f

**Figure 5 – Organizational Structure for Environmental Management**



Based on experience it is expected that implementation of a 'Category A' (full) RP may take up to one year. A local NGO or a local consultant may be hired by MOTC to assist in the RP implementation process. For 'Category B' (short) RPs implementation may take between three and six months depending on the number of PAPs involved.

For all subprojects MOTC will announce the cut-off-date based on the date of census for the proposed subproject based on the eligibility criteria defined in the Resettlement Policy Framework.

The PAPs of affected structures/assets (houses, shops, etc.) will be paid their due compensations at least 1 months (30 days) prior to demolition of the structures from the corridor of impact. This time will allow them to dismantle and remove all salvageable material for rebuilding of houses and re-establishment of businesses. However, MOTC reserves the right of directly demolishing such structures if this has not been done by the PAP by the agreed deadline. Grievances or objections may be referred to the PIU through the process set out in Resettlement Policy Framework.

The basic steps for the preparation and implementation of RPs are summarized in Table 4.3.

Table 4.3 - Implementation Process

Step	Action	Responsibility
1	Preparation of checklist indicating for each specific subproject whether land acquisition is needed. If so, a scheduled action plan detailing RP tasks to be assigned to PIU, consultants, local government, and NGO will be established	PIU/PS consultant
2	Prepare impacts/PAP surveys forms, train impact assessment and valuation teams, and establish coordination with relevant local government agencies	PIU/PS consultant
3	Verify land records in affected areas, update cadastral maps and carry out impacts and valuation surveys;	Local government/ PIU & PS Consultant
4	Check surveys and, if necessary, request additional fieldwork to improve them	PS Consultant
5	Conduct public consultations and negotiations	PIU/Local government/PS consultant/NGO
6	Integrate impacts base-line and results of consultations/negotiations into RP	PIU/PS Consultant
7	Submission of RP to MOTC, local government. After this the RPs sent to WB for approval.	MOTC/PIU/Local government/WB
8	RP disclosure - distribution of RP and information pamphlets in Kyrgyzs, Russian and other languages as required; posting of RP in English on WB website	PIU/PS consultant/Local government/WB
9	Approval of contract awards	WB
10	Engage IMA	MOTC/WB
11	Conduct of baseline socio-economic survey for external M&E	IMA
12	Distribution of evacuation and relocation notices to PAPs	PIU

Step	Action	Responsibility
1	Preparation of checklist indicating for each specific subproject whether land acquisition is needed. If so, a scheduled action plan detailing RP tasks to be assigned to PIU, consultants, local government, and NGO will be established	PIU/PS consultant
13	Award of compensation for compensation, implementation of livelihood restoration activities	PIU/Ayil-okmotus/PAP
14	Demolishing/relocation of affected structures/assets	PAP/PIU/NGO
15	Review of RP implementation	PIU/PS consultant/NGO/ADB
16	If RP Implementation found satisfactory, notice to proceed for civil works is issued	WB/PIU
17	Independent monitoring and evaluation (semi-annual)	IMA
18	Internal monitoring. Quarterly reporting on land acquisition to ADB	PIU

#### **4.5.5 Impacts on Physical Cultural Resources**

The assessment included a process involving local communities in the process of identifying, assessing, surveying and protecting physical cultural resources. The heritage and cultural resources in the wider project area will not be impacted by the project works as they are located sufficiently far from the works corridor.

In the event that a “chance” discovery is made during any pre-construction clearance activities or construction works, the EMP, Appendix 3, and the construction contracts include specific guidelines for the management of “chance finds” and management of physical cultural resources discovered during road project implementation.

#### **4.5.6 Other Social Impacts**

Construction camps may place stress on resources and infrastructure of adjacent communities which could lead to antagonism between residents and workers. To prevent such problems, the contractor will provide temporary facilities in the camps such as health care, eating and sleeping areas (including a cook and provision of meals), water supply, and prayer areas.

The mitigation measures require a number of specific provisions to be included in contract documents including provisions for (i) a set aside for jobs for the poor (60% of the direct unskilled and semi-skilled labor), including a minimum number of persons to be given agreed structured training for more skilled posts; (ii) explicitly prohibiting the use of foreign unskilled and semi-skilled workers or unskilled and semi-skilled workers from elsewhere in Kyrgyzstan unless there are no local unskilled and semi-skilled workers available; (iii) payment of legal wages to workers; (iv) no use of trafficked or child labor for construction and maintenance activities; (v) inclusion of women as well as poor in the local construction force, in accordance with the local gender balance, to the maximum extent possible; (vi) no differential wages being paid between men and women for work of equal value; and (vii) use of locally sourced materials used in the rehabilitation to the maximum extent possible.

No additional mitigation measures are required.

The project has the potential to contribute to local poverty reduction through provision of income generation opportunities such as construction employment and provision of goods and services to workers.

## **4.6. Operation Impacts on the Physical Environment**

### **4.6.1 Air Quality**

Following the rehabilitation of the road, the project (through increased traffic) will create air pollution such as HC, CO, NO<sub>x</sub>, SO<sub>2</sub> and particulate matter. The current volume of traffic (between 700 and 6,600 AADT) and forecasted traffic growth are such that emissions will remain below ambient air quality standards. Approximately a quarter of vehicles, particularly buses (three per cent of traffic) and trucks (22% of traffic), have been observed to be highly polluting.

Emission standards are authorized under Kyrgyz Republic's Environmental Law and should be enforced to alleviate these sources of pollution. The anticipated levels of traffic and the excessive capacities of the road network (and therefore lack of congestion and concentration of traffic) are likely to result in more significant adverse impacts to air quality in the busier project areas without the project.

As noted in the adjacent ongoing Southern Transport Corridor Road Rehabilitation Project EIA, proposed road rehabilitation activities are unlikely to have any substantial impact on the numbers of vehicles using the roads and consequent impact on air quality. Increases in traffic are likely, but as a function of economic recovery and development. No diverted or generated traffic is likely to result from the rehabilitation activities alone. Economic recovery may lead to increased vehicular travel, and, if so, the rehabilitation will facilitate the flow of the increased traffic - but will not have induced it.

The project has the potential to reduce the volume of dust and particulates released into the atmosphere as a result of gravelling and asphaltting the existing unformed earth roads/tracks in the vicinity of the enclaves and repairing poor condition pavements which generate dust within 20 m to 30 m corridor along the road. Reduction in dust emissions will improve air quality, reduce health risks to communities living along the road, reduce damage to the biological environment, and reduce soil erosion through slope stabilization and pavement rehabilitation.

Maintenance of vehicles to maintain an acceptable level of, or to reduce, emissions is beyond the purview of the project.

The conclusion in respect of air quality is that the project road is likely to continue to operate at well under their design capacity and no significant air quality impacts warranting mitigating actions in the operational phase are anticipated.

### **4.6.2 Soils, Erosion, and Slope Stability**

During operation, release of spoil and particulates into water courses in the project area will be reduced as a result of retaining and slope protection structures and gabion baskets for embankment protection. No mitigation measures are required for the operation phase.

Maintaining vegetative cover in mountainous areas reduces run-off and landslides and would contribute to the sustainability of farming in mountain areas. Longer term solutions

to slope stability problems through prevention of ongoing land degradation are required but are beyond the purview of the project or this assessment.

#### **4.6.3 Water Quality**

Potential impacts on water quality and availability of water for domestic or agricultural use are not expected to occur. This water is not used for drinking and only occasionally for irrigation. Storm drainage will be upgraded.

During operation, negative impacts on water quality could be caused by accidental spills of polluting or hazardous materials should they occur near water courses. The road rehabilitation activities will not induce accidents and therefore there are unlikely to be any additional incidents over and above those that would occur without the project, hence no mitigation measures are proposed.

As noted above, there will also be longer term environmental benefits for water quality created by the project through upgrading of earth road sections (bypasses) and reduced silt laden run-off from earth roads in the rainy season. Water quality in water courses adjacent to the road may show slight improvements after road rehabilitation and maintenance due to reduced erosion from improved embankment slopes and stabilization by rip-rap or other material including vegetation to prevent soil erosion.

Proposed improvements to drainage structures will facilitate passage of high flows and reduce scouring and bank erosion in the vicinity of the road, ensuring the integrity of the surface of the road. The increased runoff due to rehabilitation activities (if any) will be statistically negligible along the road corridor.

### **4.7. Operation Impacts on the Biological Environment**

#### **4.7.1 Flora and Fauna**

There will be no impacts on flora during operation of the rehabilitated road. Signs indicating the existence of the rare flower 2 km south of the road could be erected as part increase awareness and possibly contribute to a site of interest for eco-tourists. This should be discussed with botanists and SAEPP.

Based on the assessment of types of existing fauna, no instances in which potential impacts might have warranted consideration of design modifications (for example underpasses to provide for wildlife migration patterns) have been identified. Even if not located in areas of major migration patterns, accidents involving wildlife attempting to cross roads are a potential impact due to the potential for increased speeds and other factors. In this instance, reviews of the available accident data have not indicated areas in which accidents involving wildlife are common. Upgrading the road, and likelihood of increased traffic volumes and traffic travelling at higher speeds, could create, a barrier to some wildlife wishing to cross, or accidents involving wildlife. Signs, requiring caution and awareness, will be erected in areas known as habitat for wildlife. Significant increases in the numbers of accidents involving wildlife are not anticipated as a result of rehabilitation and ongoing maintenance activities.

#### **4.7.2 Protected Areas**

Operation phase activities will not create any impacts on protected areas, as the project road is not located near protected areas. Awareness campaigns for the education of road users on the importance of the ecologically sensitive sites will help to protect and preserve them. The PIU will be encouraged to install road signage and display awareness

signs and boards in sensitive areas such as river crossings, and to identify the location of protected areas in the oblasts.

## **4.8. Operation Impacts on the Social Environment**

### **4.8.1 Noise**

As noted in Section 2, even under the most optimistic scenario of increased commercial traffic, the ambient noise level after the completion of rehabilitation activities along the roads (operational period) will not be of sufficient magnitude to require acoustical mitigation.

As noise is a function of traffic volume, ambient noise levels will not be appreciably increased due to the low forecast traffic. There are a number of sensitive receptors i.e. hospitals, schools and public buildings were noted along sections of the roads (mostly in the towns and settlements).

Maintenance of vehicles to maintain an acceptable level of, or to reduce, noise emissions is beyond the purview of the project.

### **4.8.2 Access and Traffic**

Following rehabilitation of the road, local access as well as the performance of a key regional corridor will be improved. This will facilitate the flow of traffic, goods, and passengers.

The implementation of the maintenance plan will ensure the sustainability of the various road improvements.

### **4.8.3 Health and Safety**

Traffic safety will be improved following rehabilitation and routine maintenance of the project road. Conflicts between different forms of transport will be reduced by the improvement of shoulders and improved signage will be provided at intersections, bridges, and railroad crossings.

In terms of risk of transmission of communicable diseases during operation, roads and highways have the potential to pose a risk as a pathway for disease transmission. The risk increases with the hierarchy of road, its location, and number of villages and towns connected with a larger town or city, and as the road is directly connected to an international border, and passes three enclaves/salients which are under the jurisdiction of two other territories (Uzbekistan and Tajikistan). With improved access to major markets in Bishkek and Osh, as well as facilitating international trade, truck traffic is likely to only increase with the roads potentially becoming major thoroughfares. The risk of truck drivers engaging in high risk behavior is increased by hospitality service industries (restaurants, bars, beer gardens, truck/bus stops, massage parlours etc) locating along the roads and acting as conduits for sex work to communities, travelling businessmen and officials, and truck/bus drivers. This will be mitigated by implementation of the HIV/AIDS awareness and prevention campaign.

## 4.9. Summary of Impacts

A range of benefits is expected to arise from upgrading and maintaining the road including increased accessibility, improved opportunities for economic development, and local poverty reduction.

The environmental issues concerning the construction stage can be grouped according to the following three distinct types of terrain traversed by the road:

1. Level Terrain: There are no potential adverse impacts, which could not be avoided or significantly mitigated by good design and engineering practice. Most of the temporary effects are connected to the rehabilitation works within settlements, towns and villages.
2. River Gorges: There are limited potential adverse impacts which can be readily mitigated by good design and engineering practice. Particular attention should be paid to the risks of river pollution and erosion.
3. Mountainous Terrain: There are few potential adverse impacts assuming no significant earthworks or rock cuttings are carried out at erosion sensitive locations without carefully planned and implemented aftercare.

The overall level of negative environmental impacts will be minor. The majority of impacts will be temporary, localized, and readily controlled, and will occur during the civil works (construction) stage. Examples of such impacts include noise and dust generation, localised water quality deterioration, disruption to access to properties, and exacerbation of local flooding and drainage concerns. These impacts can be mitigated and managed through implementation of the EMP prepared for the project.

Negative operation stage environmental impacts will generally be minor and can be largely avoided through appropriate subproject design and operation and maintenance activities. Examples of such impacts include changes to local flooding, noise generation, and erosion and scouring of areas of cut and fill and waterway crossings.

The risk of spread of HIV/AIDS/STIs has been identified as potentially significant and will be addressed through an HIV/AIDS awareness and prevention campaign which includes training on HIV in the workplace to be provided by UNAIDS to the contractors work-force.

Although no significant adverse environmental impacts are foreseen, it is advisable that the environmental issues are considered from the very beginning. As previously mentioned, many of the environmental issues and adverse impacts which may be caused by road construction, maintenance and traffic can be avoided or significantly reduced by good engineering practices.

The presence of an engineer familiar with environmental engineering in the design team is therefore likely to improve the existing road environment, prevent new problems being created and minimize the adverse effects of the construction and use of the new road.

A number of measures to be included in design are set out in Appendix 4.

Since the detailed engineering designs have only been finalised for 140 km out of 358 km as at April 2009, exact information concerning work methods, material sites, labour camps, final alignments and detours is presently available only for this portion. However, no severe environmental impacts are expected, assuming that significant earthworks are not needed and that the requirements and provisions given in this EIA are taken into consideration. All required permits (asphalt plants, quarries) should be obtained before commencing construction. The EMP will be updated following detailed design.

## **5. INSTITUTIONAL REQUIREMENTS**

The following section presents a discussion of the environmental management activities that will be undertaken as part of overall project implementation. The roles and responsibilities of various organizations in undertaking these activities are then defined and the institutional strengthening activities that will be required to allow those organizations to fulfill their nominated roles and responsibilities are identified.

An environmental monitoring program has been prepared and the cost associated with its implementation has been prepared on a preliminary basis.

### **5.1. Organization Roles and Responsibilities**

The overall organizational structure for environmental management for the project is shown in Figure 5, see chapter 4.5.4.

### **5.2. Ministry of Transport and Communications**

MOTC has overall responsibility for preparation, implementation and financing of environmental management and monitoring tasks as they pertain to the project. MOTC will exercise its functions through the PIU which will be responsible for general project execution, and which will be tasked with day-to-day project management activities, as well as monitoring. Specialist staff will be assigned to the PIU to undertake all environmental assessment related tasks.<sup>20</sup>

The PIU environment staff will be supported by the PSC. The PSC's team will need to include an environmental monitoring specialist and social impact monitoring specialist.

Currently there are no full-time staff in the PIU assigned to environmental assessment, management or monitoring. The PIU has stated that such tasks will be undertaken on a project by project basis. To this end, it should be noted that the EIA completed for the Southern Corridor Road Rehabilitation Project (Loan 2106-KGZ [SF]) recommended the attachment of a project-funded Environment & Safety Officer (ESO). According to that report the ESO's responsibilities are recommended to include day-to-day construction supervision to ensure that the environmental and social contract provisions are met and that training for the ESO would be through the provision of two-weeks of training by an international consultant with specific environmental management expertise in the context of road rehabilitation or related projects.<sup>21</sup>

In the implementation of environmental management and monitoring tasks specific technical assistance will be provided by:

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<sup>20</sup> Discussions undertaken with PIU in 2007 indicated it does not consider establishment of an "environment unit" is warranted. This should be further reviewed in terms of strengthening the institutional capacity of MOTC in environmental assessment and resettlement, particularly in light of the number of donor funded road projects being managed through PIU.

<sup>21</sup> The contract specifications and bid documents for Loan 2106-KGZ (SF) require the contractors to recruit an ESO and confirm the appointment to the project supervision consultant in writing.

- Environmental specialists that are part of the project supervision consultant's team. The specialists will assist in all aspects of environmental planning and implementation, internal monitoring and evaluation (M&E), and training of PIU and relevant government staff on environmental assessment and WB's Environment Policy; and
- An independent monitoring agency (IMA) could be hired to (i) conduct periodic monitoring and evaluation, (ii) third party validation of implementation of the EIA and EMP activities, and (iii) to ensure that all the identified adverse impacts are being/have been mitigated. On the other hand, this role is likely to be fulfilled by the Ministry of Ecology (SAEPF) anyway, in their preconstruction procedures and regular site inspections.

### 5.3. Other Agencies and Institutions

The SAEPF will be consulted during the feasibility and detailed design processes and will also be requested to confirm, or otherwise, the categorization of the project. The SAEPF will be requested to review the EIA and approve the project as having 'minor environmental importance'. Ongoing consultation with SAEPF will be required during the implementation of the project.

The ayil-okmotus and village leaders and organizations will assist in arranging meetings with, facilitating consultation with, and providing information about, affected communities and environmental impacts. An account of the process will be an integral part of the internal monitoring report prepared by PIU.

WB clearance of this EIA will be provided either by an WB Environment Specialist hired at the WB's Kyrgyz Republic Resident Mission in Bishkek, by a third party organization with environmental assessment capacity chosen by WB, or will be cleared at WB Headquarters in Washington DC, USA.

Responsibilities for the implementation of the monitoring requirements of this EIA are shown in Table 5.1. Implementation of mitigation measures during the construction stage will be the responsibility of the contractor in compliance with the contract specifications and loan requirements.

The environmental specialists of project supervision consultant will supervise the monitoring of implementing mitigation measures during the construction stage. The domestic environmental specialist will coordinate with the international environmental specialist for resolving complicated issues that arise in the field and to provide continuously updated information in order to submit reports to PIU and WB.

After project completion, MOTC will be in charge of the operation and maintenance of the project roads. PIU in cooperation with the district/regional administrations will undertake routine and random monitoring and analyze samples in SAEPF's analytical control laboratory in Bishkek as scheduled in the monitoring plan.

Table 5.1 - Responsibilities for Environmental Monitoring

Project Stage	Responsible Organization	Responsibilities
Detailed Design	PIU	Incorporation of mitigation measures into engineering design and technical specification. Translation of mitigation measures into clauses in contract documentation
	PIU and SAEPF	Review and approve environmental mitigation and management measures.
Construction	Contractor	Implementation of required environmental

Project Stage	Responsible Organization	Responsibilities
		measures
	District road maintenance engineer Project supervision consultant	Supervise contractor's implementation of environmental measures on a daily basis. Enforce contractual requirements
	Project supervision consultant; IMA	Audit construction phase through environmental inspections and review monitoring data. Submission of quarterly reports. Provision of awareness/training to workers and technology transfer to the contractor.
	District road maintenance engineer Regional Agency on Environment Protection	Ensure compliance with Government legal requirements during construction. Review complicated issues arises from the project.
Operation	PIU	Provide budget to undertake environmental monitoring for 3 years.
	PIU (and project supervision consultant if agreed appropriate); IMA	Undertake environmental monitoring and prepare bi-annual reports for 3 years.
	PIU and SAEPF; WB	Review monitoring reports

The requirements for monitoring are further elaborated in Section 6.

It is considered that no formal long-term environmental monitoring is necessary following the rehabilitation and upgrading works.

It is desirable that the formal acceptance of the works following the completion should include a full examination of the contractor's compliance with the specified requirements for the protection of the environment. This should include verification of the proper clean-up and restoration of all temporary work sites (quarries, camps, etc) and of the proper landscaping, planting and draining of all borrow and spoil areas.

In the longer term, it is essential that the road authorities monitor the effectiveness of the erosion and rockfall protection measures. Some form of reporting should be implemented to ensure that information regarding defects in design or construction methods is fed back to the centre and to the design organisations.

It is also recommended that periodic assessments of the fatality rate of livestock and migratory herds due to traffic impact be carried out. Corrective measures should be taken if the frequency of such occurrences increases significantly.

#### 5.4. Overall EA Process and Procedures

According to the requirements of law and policy (already discussed in Section 1.4), environmental impacts should be assessed, consequences identified, ecological and economic assessments should be carried out and measures to mitigate possible negative impacts should be identified prior to the construction or rehabilitation of roads. An ecological examination should also be undertaken (or reviewed) by the SAEPF at the time of feasibility study or detailed design.

The positive conclusions (decisions) of the ecological examination generally form the permit for construction, or rehabilitation of a road. If unacceptable to the SAEPF, the project has to be altered to take into account the remarks and requirements identified in the ecological examination and the project is then subject to a second ecological examination. Eventually, it is for the SAEPF and WB to decide whether any particular issues are to be addressed further.

The different phases of the overall EIA process are as follows:

- Planning of the road project with special account being taken of:
  - areas with large excavations (cuttings) and embankments, and quarries for construction materials,
  - soil reserves for embankments and dumping areas for spoil,
  - storage areas for toxic waste and garbage,
  - locations of temporary batching and other material processing plants, contractors' camps,
  - sources of water for construction purposes,
  - temporary access roads and other temporary constructions,
  - locations of unfavorable ecological sites (cemeteries, livestock burials, disposal areas for toxic substances, tailing ponds etc).
- Obtain written agreement from local administrative authorities concerning spoil dumps, burial of garbage, contaminated soils and toxic substances.
- Obtain written permits (from local authorities, representatives of the environmental protection authority and sanitary inspector) concerning permanent and temporary allotment of land area for road construction, quarries, spoil dumps, contractors' camps, batching plants and other materials processing plant.
- Agree any changes with the local agencies responsible for the irrigation networks if these are affected by the project.
- Agree the planning requirements for bridges and other structures in rivers or other water bodies with the agencies responsible for fisheries and the local representatives of the environmental protection authorities.
- Monitor (by measurement) emissions to the atmosphere and discharges into the ground during construction.
- Monitor (by measurement) vehicle emissions during the operation of the road.
- Monitor (by measurement) noise levels in towns and other settlements during construction, and the subsequent operation of the road.
- Monitor effects of construction-related vibrations, contractor will be responsible for any avoidable damage caused during construction works. The contractor will repair or compensate for any damage caused.

Contractors who do not comply with the legislative requirements must be held responsible for the violations and required to compensate for any damages caused.

Following approval of the EIA document, a copy of the approval and a summary of the document will be sent to all relevant ayil-okmotus' and villages. Information regarding the approved project and the proposed environmental management measures will be posted at suitable locations on the project site.

## 6. ENVIRONMENTAL MANAGEMENT AND MONITORING

### 6.1. Environmental Management Plan

As noted in Section 4, it is the construction phase, including bridge and culvert reconstruction, that has the potential to cause the greatest number of adverse impacts. These can be mitigated and/or avoided. Several of the impacts during the construction period cannot be assessed at this moment, because sites for temporary work activities have not been identified and/or information concerning the period and the duration of these activities are not available. The costs of mitigation can be determined during detailed design when the EMP is updated.

**Table 6.1 - Environmental Management Plan**

Potential Impact	Mitigation Measure	Responsibility	Cost (US\$)
<b>Construction Stage</b>			
Accidental discovery of physical/heritage resources	Cease activity; prepare "chance find procedures plan (as per Appendix 3)	Contractor & SAEPF	
Erosion or sedimentation caused during clearing or earthworks	Install sediment fences and/or sediment traps to collect sediment before it enters waterways	Contractor	TBA once number known
	Minimize size and duration of cleared areas	Contractor	No marginal cost
	Undertake progressive re-vegetation of cleared areas	Contractor	TBA
	Avoid clearing activities during the rainy season where possible	Contractor	No marginal cost
Soil erosion, land slide or rock fall	Undertake progressive re-vegetation of cleared areas	Contractor	Incl. in above
	Embankments in areas of steep slopes to be stepped	Design & Contractor	To be incl. in engineering cost
	Side slopes of cuttings and embankments designed to reflect soil strength etc	Design & Contractor	To be incl. in engineering cost
	Re-use excavated material wherever possible	Contractor	No marginal cost
	Rip-rap, retaining structures, gabion baskets etc to be used wherever necessary for slope and river-bank protection	Design & Contractor	To be incl. in engineering cost
Soil contamination from spillage of oil or other chemical substances	Store chemicals in secure area/compound, with concrete floor and weatherproof roof	Contractor	TBA
	Ensure construction plant are maintained in good condition and any leaks are quickly repaired	Contractor	No marginal cost
Air pollution from dust or exhaust emissions (CO, NOx, SOx, etc)	Implement dust suppression measures including watering of exposed surfaces	Contractor	TBA
	Cover all trucks carrying dispersible materials to or from the site	Contractor	No marginal cost
	Minimize size and duration of cleared areas	Contractor	No marginal cost
	Ensure all construction vehicles and equipment are well maintained	Contractor	No marginal cost
Disturbance of habitats of the rare and sensitive species	Document and map such species and mark or fence these locations, when necessary.	Contractor	No marginal cost
Interference with existing infrastructure (telecomm. or electricity etc)	Consult with subproject engineering staff to minimize physical impacts on public infrastructure and disruption to services	PIU	No marginal cost
Clearing of vegetated areas	Undertake progressive re-vegetation of cleared areas with fast-growing, native species Avoid the felling of road-side trees wherever possible	Contractor	Incl. in above

Potential Impact	Mitigation Measure	Responsibility	Cost (US\$)
Exploitation of local resources incl. poaching of fauna	Poaching of fauna or felling trees not required to be cleared or removed by the project within the project areas will be forbidden Contractor will impose sanctions on any worker poaching fauna or felling trees unnecessary for the project	Contractor	No marginal cost
Noise emissions from construction equipment	Ensure all construction vehicles and equipment are well maintained	Contractor	No marginal cost
	As far as possible limit noisy construction activities to day time hours in the vicinity of houses and hospitals and to night time hours in the vicinity of schools	Contractor	No marginal cost
	Fresh concrete and asphalt mixing stations must not located nearby residential areas, schools and hospitals	Contractor	No marginal cost
	Inform nearby community of schedule and duration of construction works	Contractor	No marginal cost
	Provide workers with noise abatement equipment (ear-muffs etc)	Contractor	No marginal cost
Changes to road safety / traffic movements, property access	Install signage and lighting in vicinity of works on public roads	Contractor	No marginal cost
	Install temporary access to affected properties	Contractor	No marginal cost
	Reinstate good quality permanent access to affected properties on completion of construction works	Contractor	No marginal cost
	Notify nearby community of schedule and duration of construction works	Contractor	No marginal cost
	As far as practical, limit construction vehicle movements to main transport routes	Contractor	No marginal cost
Waste disposal problems from solid waste generated during construction activity or wastes generated in construction camps	Prepare and implement "waste management plan"	Contractor	No marginal cost
	Train construction workers in appropriate waste disposal methods	Contractor	No marginal cost
	Remove waste regularly from site for disposal to landfill	Contractor	No marginal cost
	Install waste collection and temporary storage facilities in construction camps	Contractor	No marginal cost
	Wastewater systems from construction camps must not discharge into water bodies which are use for water supplies for domestic and industrial purposes	Contractor	No marginal cost
Disrupts commercial activities on roadside	Install temporary access to affected properties	Contractor	No marginal cost
	Reinstate good quality permanent access to affected properties on completion of construction works	Contractor	No marginal cost
	Notify nearby community of schedule and duration of construction works	Contractor	No marginal cost
Construction workers cause social disruption or sanitation/health conditions	Ensure construction camps are maintained in a clean and hygienic conditions and implement "waste management plan"	Contractor	No marginal cost
	Train workers on appropriate interactions with local community and institute awareness program about sanitation and communicable diseases. Implement HIV awareness and prevention campaign (incl. HIV in the Workplace training for workers)	Contractor and NGO or UNAIDS	TBA
	Consult with local authorities to plan construction worker housing arrangements	Contractor	No marginal cost
Visual and landscape impacts	Implement low maintenance landscaping along roadside	Contractor	Incl. in cost of re-vegetation
Employment of local people	Maximize the number of local people involved in the construction works	Contractor	No marginal cost
Risks to public or construction worker	Provide safety equipment to workers; Train workers in use of equipment	Contractor	No marginal cost

Potential Impact	Mitigation Measure	Responsibility	Cost (US\$)
health or safety	Secure construction site and restrict access by local community; Implementation awareness campaign	Contractor	No marginal cost
Generation of excess spoil	Give or sell the excess spoil to farmers or for local community purposes	Contractor	No marginal cost
Operation Stage			
Changes to road safety	Installation of road safety/speed limit signage where accidents are likely to occur	MOTC & local government	No marginal cost
	Work with local authorities to carry out enforcement of traffic regulations on upgraded roads		No marginal cost
Environmental damage from accidents involving spills of chemicals or other hazardous substances	Install speed limits and warning signs in areas of difficult driving conditions	PIU/MOTC	No marginal cost
Changes in dust levels or air quality	Vehicle emissions must be monitored according to national standards	PIU/MOTC	No marginal cost
	Implement landscaping along the roadside to reduce dust impacts	PIU/MOTC	No marginal cost
	Work with local authorities to ensure regular cleaning of the road surface	PIU/MOTC	No marginal cost
	Work with local authorities to implement regulations for trucks traveling on the road in relation to wheel washing and covering of dispersible loads	PIU/MOTC	No marginal cost
Erosion or scouring at waterway crossings, or on areas of fill or embankments	Implement stabilization and anti-scouring measures as required at bridges and culverts	PIU	No marginal cost
Creates areas of standing water	Drain and fill areas of standing water	PIU	No marginal cost
Causes surface water or groundwater pollution from contaminated road surface runoff	Undertake regular maintenance and cleaning of roads	PIU	No marginal cost
	Work with local authorities to restrict movements of polluting vehicles	PIU and local gov.	No marginal cost
	Ensure road drainage systems are well maintained and free of blockages	PIU	No marginal cost
	Vegetation or otherwise stabilize drainage systems	PIU	No marginal cost
Changes to visual amenity & landscape values	Implement low maintenance landscaping along roadside	Contractor	Incl. in cost of re-vegetation

## 6.2. Environmental Monitoring Plan

Environmental monitoring is a very important aspect of environmental management during construction and operation stages of the project to safeguard the environment. During construction, environmental monitoring will ensure the protection of landslide, side slope, and embankment from potential soil erosions, borrow pits restoration, quarry activities, sitting of work sties and material storages, sitting of asphalt plants, community relations, and safety provisions. During operation, air, noise, and surface water quality monitoring of the roads will be an important parameter of the monitoring program.

In response to the environmental impacts identified during the study, an environmental monitoring plan has been developed and is presented in Table 6.2. The contract documents will contain a list of all required mitigation measures (Section 4) and a time frame for the compliance monitoring of these activities. The monitoring will comprise

surveillance to check whether the contractor is meeting the provisions of the contract during construction.

The project supervision consultant in cooperation with PIU during project implementation will be required to:

- Develop an environmental auditing protocol for the construction period, and formulate a detailed monitoring and management plan;
- Supervise the environmental monitoring (to be sub-contracted) regularly, and submit quarterly reports: the main parameters to be monitored are outlined in Table 6.2; and
- Supervise the subproject roads regularly, and submit quarterly reports based on the monitoring data and laboratory analysis report. The main parameters to be monitored by the contractor are outlined in Table 6.2. The contractor will be responsible for subcontracting data collection of environmental monitoring to a recognized organization (e.g., SAEPF's Analytical Control Laboratory).

A lump sum budget is allocated to cover monitoring cost during operation stage of the project. PIU will hire a recognized organization for environmental monitoring and ensure that the road is monitored regularly following completion of the rehabilitation works. The following measures will be taken to provide an environmental compliance monitoring program during project implementation:

- The tender and contract documents will clearly set out the contractor's obligations to undertake the environmental mitigation measures as set out in Section 4 of this EIA and to be appended to contract specifications;
- The recommended environmental mitigation cost should be included as an item in the Bills of Quantities. This will ensure that there is specific environmental mitigation budget and will be implemented as required. During the procurement, contractors will be encouraged to include these costs in their rates and present the mitigation cost as a line item in the Bill of Quantities. There will be an identified extra payment in the contract to ensure measures are costed and carried out; and
- Each contractor will recruit an ESO, who will be responsible for implementing the contractors' environmental responsibilities, and liaising with district administration. The ESO will also be responsible for health and safety aspects of work sites.

The project's environmental monitoring plan is provided in Table 6.2. Costs for monitoring will be included during the review and revision of this draft, pending further details from the detailed design, costs for monitoring during operation will depend on the type and regularity of monitoring finally agreed to by MOTC and WB, the monitoring plan includes a recommendation for this but does not include costs.

Table 6.2 - Environmental Monitoring Plan

Parameter	Location	Monitoring	Frequency	Responsibility	Estimated Cost (US\$)
<b>Construction Phase</b>					
Quarries	Road corridor	Visual inspection to ensure fill is only obtained from designated quarries per EMP	Monthly	Contractor; PIU/PSC	Incl. in PSC contract
	Quarry Sites	Visual inspection to ensure quarry rehabilitation is conducted per EMP	Monthly	Contractor; PIU/PSC	Incl. in PSC contract
Material Storage Sites	Road corridor	Visual inspection. Ensure storage sites are using existing concrete hardstands. Ensure vegetation clearance has been minimized.	Monthly	Contractor; PIU/PSC	Incl. in PSC contract
Erosion	Road corridor	Visual inspection of prevention measures per EMP and occurrence of erosion	Monthly	Contractor; PIU/PSC	TBA
Rock fall	Active rock fall sections, steep slopes	Visual Inspection	Monthly	Contractor; PIU/PSC	Incl. in design & PSC contract
Hydrocarbon and chemical storage	Construction camps	Visual Inspection of storage facilities as per EMP and emergency response plan	Monthly	Contractor; PIU/PSC	Incl. in design and PSC contract
Waste Management	Construction camps	Visual inspection that solid waste is disposed per EMP	Monthly	Contractor; PIU/PSC	Incl. in design and PSC contract
Surface Water Quality	Bridge sites	Visual inspection of water management per EMP	Monthly	Contractor; PIU/PSC	TBA
	Directly downstream of pollution event	DO, COD, SS, fecal coliform, conductivity, turbidity, pH, temperature	After pollution event	Contractor; PIU/PSC	As required
Air Quality	Asphalt Plant	Visual inspection to ensure asphalt plant is located >500 m from residential areas	Monthly	Contractor; PIU/PSC	TBA
	Dust	Visual inspection to ensure dust suppression plan being impl. Particulate matter and smoke per EMP	Monthly After complaint	Contractor; PIU/PSC	Incl. in above
Noise	Sensitive areas	dBA at sensitive areas per EMP	Monthly	Contractor; PIU/PSC	TBA
Vibration	Sensitive areas	Ensure mitigation measures are being implemented per EMP	Monthly or after complaint	Contractor; PIU/PSC	Incl. in above
Rare and sensitive species	Sensitive areas	Visual inspection to ensure that construction activities keep a safe distance to any such species and potential harm can be averted immediately	Weekly to monthly, depending on distance to construction activities	Contractor; PIU/PSC	Incl. in design and PSC contract
Re-vegetation	Road corridor	Monitoring of progress of reforestation activities per EMP	Monthly	Contractor; PIU/PSC	Incl. in erosion mon. costs
Community	Road corridor	Consult with government and community groups along the alignment to monitor environmental concerns	Ongoing	Contractor; PIU/PSC	TBA

Table 6.2 - Project Environmental Monitoring Plan (continued)

Parameter	Location	Monitoring	Frequency	Responsibility	Estimated Cost (US\$)
<b>Operation Phase</b>					
Noise	Sensitive areas (densely settled areas, schools, hospitals)	dBA at sensitive areas as per EMP	Twice/year for 3 years or after complaint. Mid-term and post-eval. monitoring.	PIU; WB	TBA
Air Quality	Sensitive areas (densely settled areas, schools, hospitals)	Particulate matter and smoke as per EMP	Twice/year for 3 years or after complaint. Mid-term and post-eval. monitoring.	PIU; WB	TBA
Erosion	Road subproject corridors	Visual assessment of erosion resulting from project	Twice/year for 3 years or after complaint. Mid-term and post-eval. monitoring.	PIU; WB	TBA
Water Quality	Road corridor	Visual assessment of increased suspended solids from areas of erosion, if identified	Twice/year for 3 years or after complaint. Mid-term and post-eval. monitoring.	PIU; WB	TBA
Road Safety	Road corridor	Collect road accident data	Twice/year for 3 years or after complaint. Mid-term and post-eval. monitoring.	PIU; WB	TBA
Re-vegetation	Road corridor	Ongoing monitoring of re-vegetation as per EMP	Twice/year for 3 years or after complaint. Mid-term and post-eval. monitoring.	PIU; WB	TBA

### 6.3. Costs of Mitigation and Monitoring

It should be noted that the costs of side-slope protection such as gabion baskets, rockfall protection (fences etc) and retaining structures are considered to be standard engineering practices and requirements for road rehabilitation works and as such are not included as costs of environmental mitigation, these costs will be included in the detailed design costs.

The costs of mitigating the adverse environmental impacts and monitoring are included in the table below.

**Table 6.3 - Mitigation and Monitoring Costs**

Item	Unit	Quantity	Unit Cost	Total (\$)
<b>Estimated Mitigation Costs (EMP)</b>				
Chemical storage compounds <sup>1</sup>	site	35	10,000	350,000
Dust suppression measures (358kms, 2 years)	day	500	1,000	500,000
Re-vegetation and embankment regrassing <sup>2</sup>	km	358	5,000	2,000,000
<b>Estimated Monitoring Costs</b>				
Air quality and dust monitoring*	site	15	1,000	15,000
Soil and erosion monitoring (incl. re-vegetation activities) <sup>3</sup>	day	200	80	16,000
Water quality monitoring*	site	15	1,000	15,000
Social and community impact monitoring <sup>4</sup>	site	15	2,000	30,000
Noise and vibration monitoring*	site	15	1,000	15,000
<b>Total</b>				<b>2,941,000</b>

*Notes:*

<sup>1</sup> Assumes a total number of 35 are required based on a compound sited approximately every 11 km. Cost estimate includes safe drinking water, proper drainage facilities, solid waste disposal, first aid and other facilities, 2 years maintenance, and removal.

<sup>2</sup> Grassing for road sections requiring reconstruction and landscaping for slope protection (along approximately XX km of subproject roads) by plantation or grass turfs of 150-200m strip;

<sup>3</sup> Includes per diem of US\$10/day and costs for vehicle and driver (@ \$50/day); and

<sup>4</sup> Monitoring of 20 villages and towns along subproject roads four times. Includes per diem and costs for vehicle and driver, and expatriate input.

\*average once every 3 months, over 2 years.

## **7. CONSULTATION AND DISCLOSURE**

### **7.1. Consultation Activities Undertaken**

The outcomes of the following public consultation activities have been integrated into the preparation of the EIA and social impact assessment (SIA) which is reported separately in Volume 4:

- Consultation with MOTC, including consultants working on projects in the transport sector, on activities and practices in respect of environmental and social assessment, consultation and disclosure on other and similar projects;
- Consultation with SAEPF and local authorities during field visits to subproject sites to identify issues related to subproject environmental assessment and approval procedures; and
- Consultation with the communities through focus group meetings in various villages along the roads and informal interviews (including the 2001 studies). In addition a socio-economic survey was carried out in the communities along the project road as part of ADB's 2006/2007 study. The outcomes of that survey have also been integrated into the relevant sections of the EIA.
- Additional consultations have also been undertaken in 2008-2009; and
- Two public hearings to present the findings and proposed mitigation measures set out in the EIA and SIA held in August 2009.

A summary of the consultation outcomes is provided in the following sections.

### **7.2. Results of the Consultation**

#### ***7.2.1 Focus Group Discussions and Meetings***

Consultations with the communities in the project area revealed that they use the roads frequently for visiting and trading in local markets and for access to services such as health clinics and schools located in rayon headquarters. People who work in the nearby towns use the road for their daily travel and those who migrate to neighbouring oblasts in search of employment also use the road.

The communities expressed positive responses towards the need for the road improvements as well as ongoing maintenance of the roads. They are of the opinion that the project will improve and augment transportation and linkages between project oblasts as well with neighboring countries (PRC, Uzbekistan and Tajikistan) which are seen as vital in harnessing the use of resources, expanding markets and increasing employment opportunities.

The main environmental issues arising from these discussions and consultations are as follows:

- The bad condition and poor maintenance of the existing road.

- The need to deal (if possible) with long standing problems which affect the communities as well as the road, especially seasonal streams/mudflows.
- Threats to safety posed by increased speeds (especially children and livestock).
- The condition of the road and detours during the construction stage (experiences in 1997 with similar works on the Bishkek to Osh road).
- Effect of noise and vibrations on adjacent buildings (often constructed of weak adobe (rounded river boulders arranged in herringbone courses with mud cement), during construction (especially blasting (although few if any houses are situated close to rock excavations and other possible such areas), and vibratory rollers), and due to post-construction public traffic (which would have occurred with the existing road anyway even without the improvement). However it should be noted that the route is sparsely populated except for the towns and villages. Also these effects will be mitigated in the project design.
- The possible long-term consequences of careless construction, use of explosives, the use of river beds as borrow pits and the like, etc.
- The pollution of roadside pastures if traffic becomes heavy.
- The inconvenience and time lost at the border controls with Uzbekistan and Tajikistan.
- The uncertainty of the citizens along the existing roads concerning the future condition of the existing roads (on sections to be substituted by new alignments).
- The number of times an improved road, avoiding the Uzbek territories, had been promised to the people, yet they are still waiting.
- The vagueness, lack of unity and equality of the legislation and instructions which hampers proper environmental management and confuses road administrators and contractors.
- The diversity in environmental management.
- The future state of the environment on those sections of the roads to be substituted by new alignments (lack of road maintenance, inevitably increasing erosion, new "wild" routes, etc.)

There was a general consensus that there will be no potential adverse impacts, which could not be avoided or significantly mitigated by good design and engineering practice. Most of the effects are connected to the rehabilitation works within settlements, towns and villages. Should further investigation reveal that there is a need for land acquisition and resettlement, and a resettlement plan is to be prepared, then separate consultations will be undertaken with affected households and stakeholders in respect of that process.

During the consultations the following suggestions were made; (i) engage local skilled and unskilled workforce in the rehabilitation works and further look at the possibility of community participation in ongoing maintenance; (ii) restrict the contact of construction workforce with villagers, carefully monitor the workforce and prohibit workers from drinking while working, and restrict access to construction sites and camps by locals; (iii) co-ordinate rehabilitation works with local authorities; (iv) take into consideration probability of rock-falls, torrents, and landslides; and (v) build high quality and solid roads that could serve long-term.

Further, the conclusions of the assessments conducted since 2001 are that the absorptive capacity of project beneficiaries is considered adequate and their willingness to participate is high. The beneficiaries are strongly in favor of rehabilitating the roads.<sup>22</sup>

In addition, there is an educated but currently under-employed labor force available. Transport cost savings will be substantial for existing traffic, benefiting almost all residents of the primary impact area and providing them with the means to make any necessary contributions, so long as those contributions are proportional to their benefits. Improved transport in the primary impact area is necessary for economic development.

### **7.2.2 Public Hearings on EIA**

The two public hearings on the draft EIA were held in Bishkek City on 13<sup>th</sup> August with 40 participants, and in Pulgon, Batken on 14<sup>th</sup> August with 60 participants. These meetings presented the results of the draft EIA (and SIA) to the public and gave an opportunity for interested and/or affected parties to contribute to the final versions. The information on the hearings was publicized beforehand on mass media and posted on MOTC's website. In addition, the public hearing in Pulgon was also announced by distributing flyers to local people as well as posting announcements in public places, local newspapers and informing the local administration.

The main outcomes of those hearings as they pertain to issues covered/raised in the EIA and SIA have been summarised below. Questions were asked and various comments made by the participants, the State Secretary of MOTC answered the questions. It should be noted that in the Public Hearing held in Pulgon a large number of the questions and/or comments related to the length of time the people in Osh and Batken have been waiting for the road to be improved. They recounted a number of site visits and similar meetings, going as far back as late 1990s and early 2000s, where they had been promised an upgraded road. The people feel frustrated, but are still very supportive of the project. The minutes of the meetings, as recorded, are attached as Appendix 6.

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<sup>22</sup> As indicated by the surveys and Focus Group Meetings.

**Table 7.2.1 – Summary of Points Raised at Public Meetings**

Thematic	Question	Response
Technical	What protection measures are taken (from mudflows) during bridge construction?	The equipment used to build bridges is much more modern than previously. Piles are installed using “KATO” which are drilled and anchored in place about 20 m into the river-bed. This secures them from being washed out. Bridges over Soh and Ohna Rivers are being constructed with this method.
	What kind of materials will be used during the road construction? Will they comply with quality requirements, particularly, asphalt quality. Is there a laboratory that can test and control quality?	Materials and quality in international projects is guaranteed by Technical Specifications which are annexed to the Contract. All works and materials indicators stipulated in Technical Specifications are based on international standards (such as AASHTO). The Contractor and Consultant working on site are governed by these standards. Each project is equipped with a field laboratory which controls quality, all required tests can be done in the laboratory, including the asphalt-concrete mixture.
Environmental	What are the main risks in ecological and social impact?	The main issue is land acquisition, and this is being resolved. The completion of the road project will improve the ecological situation in the region since asphalt and concrete pavement will reduce dust generation and toxic gas emissions. In addition, road furniture such as signs, barriers, central line marking etc will increase the level of road safety.
	Through Kyrgyz-Kyshtak village the gravel surface is damaged, boulders are everywhere, it is hard to pass. Some measures should be taken by the commencement of scheduled works in the next year, what can you say on this?	MOTC will take all measures for contractors to start the repair of gravel pavement for normal passage. The construction of engineering structures and bridges is delayed due to insufficient funds being available, the main funds allocated to roads were used to cover the section of bridge over the Soh River plus the access roads, this should be complete within a short time.
	How will people be informed on this project, will brochures be distributed? How will they be informed of their rights?	Project staff have made several site visits for different aspects (technical, environmental, social and resettlement); there have been meetings and consultations with local people and local government stakeholders; brochures have been distributed; and information on the project as well as these public hearings have been publicized in media
	For the resettlement program, to what extent will owners' interests be considered, and what is the procedure for compensation payment?	Compensation for acquisition of the right-of-way (ROW) has been paid as per the Tashkumyr-Karajygach Road and Bishkek-Osh Road Rehabilitation Third Projects. Under the latter project, (in Sosnovka village) compensation was paid post-land acquisition to repair damages caused by vibration during construction. In general, under any project MOTC considers the interests of local people and attempts to resolve project impacts as quickly as possible. The procedure of payment registration takes some time, but MOTC makes an effort to minimize these delays.
	Along the Kok-Talaa – Pulgon section, how many houses will be demolished, and how many families will suffer? How will the issue of compensation will be resolved?	Currently an Inter-Departmental Commission is being established which will determine in detail the physical damage to householders (land, buildings, trees and crops etc), following this the estimation will be made and compensation cost determined.

<i>Thematic</i>	<i>Question</i>	<i>Response</i>
Social/consultation	During 10 years we have been promised that this road will be built, we are tired of waiting. We used to go to the Uzbekistan settlements tell us when will the road construction start? Can this part of road be constructed using funds of MOTC?	In 2000 the first Feasibility Study on Osh-Batken-Isfana road was made, and financial viability was estimated at that time, due to the absence of foreign investments over a few years, MOTC has implemented the construction of detour roads using its own budget. In this regard, there is President's Decree establishing priority for this project and its financing from budget sources. The high priority section (bridge over Soh river and approaches) is nearing completion. Separate sections of the road have been constructed by local administrations using local funds, this shows the road's importance to this region. MOTC, as line ministry, takes an active part in road construction, but due to the insufficient financing it has been impossible to fulfill the scope of works according to the schedule.
General	What are the conditions set for financing by banks-donors under this project?	There are several donors for this project, they have similar conditions: (i) European Commission is allocating a grant and administering the project independently; (ii) World Bank is allocating funds under a grant-loan (with conditions related to environmental and social impact etc); and (iii) the European Bank for Reconstruction and Development is allocating loan on a long-term basis. Based on the Kyrgyz Government's Decree the grant element of this project has been calculated, considering all involved investments to Phase 1 (Osh-Batken-Isfana Road Rehabilitation Project), and the grant element of project meets the approved standards.
	How much investment to this project, and to road projects in general, is economically feasible? By doing this do we increase our external debt?	The project's economic feasibility is calculated during the Feasibility Study and it meets the required parameters. Besides the issue is more than one of economics, there is both regional and social significance of this project. The road itself is not the source of all benefits. The economic efficiency of road re-construction is connected with the multiplicative effect, i.e. development of region, improvement of business environment, increased cargo turnover which will replenish the state budget through taxes etc.
	Concerning the participation of local contractors in bids. Are there any firms in Kyrgyzstan which can carry out similar projects on road construction?	The main problem preventing the participation of local companies in such projects is lack of sufficient equipment and capital (turnover). Local contractors can establish joint ventures with foreign companies, and then they can build up experience to later bid by themselves. Also there are problems with bank guarantees that are required to satisfy the international contracts.

### **7.3. Disclosure**

The EIA documenting the mitigation measures and consultation process will be submitted to PIU and WB and has been made available for public review and comment. The affected people and the local communities expressed support for the project during the consultations as they clearly saw the benefit to the community as well as the region. More informal consultation and disclosure will be undertaken during implementation through:

- The preparation and dissemination of a brochure in Kyrgyz, Russian and other languages as required, explaining the project, works required and anticipated timing of the works. This brochure or leaflet will also summarise the main points of the Project's resettlement policy framework; and
- Setting up a formal grievance redress committee with a representation from the affected people. The project supervision consultant in association with the contractor will be responsible for managing the effective grievance redress program.

The EIA have now been finalized (i) addressing comments by World Bank safeguards specialists; and (ii) incorporating the comments made and issues raised during the two public hearings.

Following approval of the final EIA, a copy of the approval and a summary of the document will be sent to all relevant ayil-okmotus. Information regarding the approved project and the proposed environmental management measures will be posted at suitable locations on the project site. Disclosure will conform to the policies of WB which requires that environmental assessment reports for WB projects be accessible to interested parties and the general public. The final EIA as part of WB project documents will be uploaded onto the WB website and made available through the Development InfoCentre.

## **8. FINDINGS, RECOMMENDATIONS AND CONCLUSIONS**

### **8.1. Findings**

The main findings of this EIA are that there need be no significant adverse environmental effects resulting from the proposed rehabilitation of the Osh to Isfana provided that full compliance with the recommendations set out below and the provisions of the EMP are achieved.

This EIA comprises the appropriate level of assessment for this project and additional environmental assessment is not required.

### **8.2. Recommendations**

The following recommendations result from this EIA:

- Apart from the realignments, the design of the rehabilitated road should not deviate significantly from the established road alignment.
- Designs should make full provision for the incorporation of the various mitigation measures previously described in the EMP and Appendix 4.
- Contract documentation shall include appropriate clauses to cover all of the environmental protection requirements previously listed in Section 4 and Appendix 4.
- Provision must be made for adequate future maintenance of the road, possibly through loan covenants.
- Consideration should be given to the inclusion of new, purpose built, maintenance depots in the contracts for the construction of the roads.

### **8.3. Conclusions**

The general conclusion of this EIA is that the proposed rehabilitation of the Osh to Isfana road will not generate significant environmental impacts provided that the works are designed and executed in accordance with sound engineering practice and that the mitigation and precautionary measures described in this report (EMP and Appendices 3 and 4) are fully implemented.

# Appendices

## Appendix 1 – Environmental regulations, guidelines in Kyrgyzstan

SNIP II – 12 - 77 – Acoustic protection.

SNIP 1.01.01 – 82 – Construction climatology and geophysics.

SNIP 2.01.14 – 83 – Identification of the design hydrological characteristics.

SNIP 2.06.15 – 85 – Engineering protection of the territories against pounding.

SNIP 3.06.03 – 85- Highways (auto roads).

SNIP 1.02.01 – 85 – Instructions on formulation, development order, concordance and approval of the design documents for construction of buildings and structures.

ODN 1-86 – Guidelines for consideration and agreement of the decisions and design documents for construction of buildings and structures by the fishing control authority (1986).

Practical instructions for the bridge's estimation. 1987

SNIP 1.02.07 – 87 – Engineering survey for construction works.

National Environment Action Plan (NEAP) (1995)

Law of the KR on Peasant Farm

Law of the KR on State Registration of Rights to Immovable Property

Law of the KR of the Kyrgyz Republic on Licensing;

Law of the KR of the Kyrgyz Republic on Pastures

Law of the KR “about subsoil” (1997)

Instructions on Implementation Procedures of Environmental Impact Assessment of a Planned Activity (1997)

Conception of strengthening and development of the environmental protection activity for 1998 – 2001. KR Government Decree No. 416 dated 04.07.1998.

Law of the KR of 13.05.1999 – “Protection of the Environment”

Law on Ecological Examination (1999);

Law on Protection of Atmosphere (1999)

Law on Animal Life (1999);

Law on Biosphere Territories in Kyrgyz Republic (1999)

Land Code of the Kyrgyz Republic (1999)

Forestry Code of the Kyrgyz Republic (1999)

Law of the KR “about population radiation safety” (1999)

Law of the KR “about drinking water” (1999)

Law of the KR “about waste products and consumption” (2001)

Law of the KR “about tailing pits and dumps” (2001)

Law of the KR “about flora protection and use” (2001)

Law of the KR “about mountainous areas” (2003)

SNIP KR 0-02: 2004 – Antiseismic construction. Design standards.

SNIP KR 32-01: 2004 – Road designing.

Water Code of the Kyrgyz Republic (2005)

Law of the KR “about ozonosphere protection” (2006)

Law of the KR “about government regulation of the policy on emission of greenhouse gases” (2007)

Conception of the ecological safety in KR. KR Government Decree No. 469 dated 16.10.2007.

## Appendix 2 – Birds in Kyrgyzstan

Common Name	Latin Name
deserts and semi-deserts	
Pallas`s Sandgrouse	Syrraptes paradoxus
Wheatear	Oenanthe picata
Black Redstart	Phoenicurus ochruros
Skylark	Caladrella cinerea
White-capped Bunting	Emberiza stewarti
Sparrow	Petronia Petronia
steppes	
Bustard	Otis Tarda
Houbara Bustard	Chlamydotis undulata
Little Bustard	Otis tetrax
Skylark	Alauda arvensis
Calandra Lark	Melanocorypha calandra
_____ Lark	Galerida cristata
_____ Lark	Calandrella cinerea
Stonechat	Saxicola torquata
Hazelhen	Perdix daurica
Lesser Kestrel	Falco naumanni
Yellow-eyed Stock Dove	Columba eversmanni
Feral Pigeon	Columba livia
Eagle-Owl	Bubo bubo
Little Owl	Athene noctua
Roller	Coracias garrulus
Hoopoe	Upupa epops
Jackdaw	Corvus monedula

Starling	<i>Sturnus vulgaris</i>
Tree Sparrow	<i>Passer montanus</i>
Rock Thrush	<i>Monticola saxatilis</i>
Blue Rock Thrush	<i>Monticola solitarius</i>
Isabelline Wheatear	<i>Oenanthe isabelina</i>
Wheatear	<i>Oenanthe oenanthe</i>
Black-eared Wheatear	<i>Oenanthe hispanica</i>
Pallid Harrier	<i>Circus macrourus</i>
Egyptian Vulture	<i>Neophron percnopterus</i>
Imperial Eagle	<i>Aquila heliaca</i>
_____ Eagle	<i>Aquila nipalensis</i>
fruit and nut forests	
doves	e.g. <i>Columba oenas</i>
_____ owl	<i>Strix aluco</i>
Scops owl	<i>Otus scops</i>
Great Tit	<i>Parus major</i>
_____ warbler	<i>Hippolais languda</i>
_____ warbler	<i>Hippolais caligata</i>
Golden Oriole	<i>Oriolus oriolus</i>

## Appendix 3 - Birds in Kyrgyzstan

Common Name	Latin Name
flood lands and thickets	
Bittern	<i>Botaurus stellaris</i>
Osprey	<i>Pandion haliaetus</i>
Pheasant	<i>Phasianus colchicus</i>
Corncrake	<i>Crex crex</i>
Trushes	<i>Phylloscopus</i>
Warblers	<i>Sylvia</i>
Bluethroat	<i>Luscinia svecica</i>
alpine zone	
Alpine Chough	<i>Pyrrhorax graculus</i>
Chough	<i>Pyrrhocorax pyrrhocorax</i>
Snow Finch	<i>Montifringilla nivalis</i>
Gyldenstädt`s Redstart	<i>Phoenicurus erythrogaster</i>
_____ dove	<i>Columba livia</i>
_____ dove	<i>Columba rupestris</i>
Shore Lark	<i>Eremophila alpestris</i>
Isabelline Wheatear	<i>Oenanthe isabelina</i>
Water Pipit	<i>Anthus spinoletta</i>
Himalayan Accentor	<i>Prunella himalayana</i>
Alpine Accentor	<i>Prunella collaris</i>
Peregrine	<i>Falco peregrinus</i>
Saker	<i>Falco cherrug</i>
Griffon Vulture	<i>Gyps fulvus</i>

Himalayan Vulture	Cyps himalayensis
Golden Eagle	Aquila chrysaetus
Bearded Vulture	Gypaetus barbatus
Black Vulture	Aegyptius monachus
reservoirs, lakes and rivers	
Lapwing	Vanellus vanellus
Snipe	Gallinago gallinago
Redshank	Tringa totanus
Little Ringed Plover	Charadrius dubius
Snipe	Gallinago solitaria
Black-winged Stilt	Himantopus himantopus
Lesser Sand Plover	Charadrius mongolus
Common Tern	Sterna hirundo
Black Tern	Chlidonias nigra
Caspian Grebe	Podiceps caspicus
Slavonian Grebe	Podiceps auritus
Red-necked Grebe	Podiceps griseigena
Little Grebe	Podiceps ruficollis
Great Crested Grebe	Podiceps cristatus
Grey Heron	Ardea cinerea
Bittern	Botaurus Stellaris
Corncrake	Crex crex
Demoiselle Crane	Anthropoides virgo
Crane	Grus grus

## Appendix 4 – Chance Find Procedures Plan

Contracts for civil works involving excavations should normally incorporate procedures for dealing with situations in which buried physical cultural resources (PCR) are accidentally discovered or unexpectedly encountered. The final form of these procedures will depend upon the local regulatory environment, including any 'chance find' procedures already incorporated in legislation dealing with antiquities or archaeology.

*Note:* The case for which the general guidance below is provided applies where there will be an archaeologist on call. In exceptional situations in which excavations are being carried out within PCR-rich areas such as a UNESCO World Heritage site, there will normally be an archaeologist on site to monitor the excavations and make decisions on-site. Such cases will require a modified version of these procedures, to be agreed with the cultural authorities.

The chance finds procedures plan (CFPP) will require the following elements:

1. Definition of Physical Cultural Resources

This section should define the types of PCR covered by the procedures in Kyrgyz law and regulation and World Bank's Policy on Cultural Property. In some cases the Chance-Finds procedure is confined to archaeological finds; more commonly it covers all types of PCR. In the absence of any other definition from the local cultural authorities, the following definition could be used: "movable or immovable objects, sites, structures or groups of structures having archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance".

2. Ownership

This section should state the identity of the owner of the artifacts found. Depending on the circumstances, the owner could typically be, for example, the state, the government, a religious institution, the land owner, or could be left for later determination by the concerned authorities.

3. Recognition

This is the most difficult aspect to cover. As noted above, in PCR-sensitive areas, the procedure may require the contractor to be accompanied by a specialist. In other cases, the procedures may not specify how the contractor will recognize a PCR, and a clause may be requested by the contractor disclaiming liability.

4. Procedure upon Discovery

Suspension of Work

This paragraph may state that if a PCR comes to light during the execution of the works, the contractor shall stop the works. However, it should specify whether *all works* should be stopped, or only the works immediately involved in the discovery, or, in some cases where large buried structures may be expected, all works may be stopped within a specified distance (for example, 50 m) of the discovery. This issue should be informed by a qualified archaeologist.

After stopping work, the contractor must immediately report the discovery to the Resident Engineer.

The contractor may not be entitled to claim compensation for work suspension during this period.

The Resident Engineer may be entitled to suspend work and to request from the contractor some excavations at the contractor's expense if he thinks that a discovery was made and not reported.

### Demarcation of the Discovery Site

With the approval of the Resident Engineer, the contractor is then required to temporarily demarcate, and limit access to, the site.

### Non-Suspension of Work

The procedure may empower the Resident Engineer to decide whether the PCR can be removed and for the work to continue, for example in cases where the find is one coin.

### Chance Find Report

The contractor should then, at the request of the Resident Engineer, and within a specified time period, make a *Chance Find Report*, recording:

Date and time of discovery;

Location of the discovery;

Description of the PCR;

Estimated weight and dimensions of the PCR;

Temporary protection implemented.

The *Chance Find Report* should be submitted to the Resident Engineer, and other concerned parties as agreed with the cultural authority, and in accordance with national legislation.

The Resident Engineer, or other party as agreed, is required to inform the cultural authority accordingly.

### Arrival and Actions of Cultural Authority

The cultural authority undertakes to ensure that a representative will arrive at the discovery site within an agreed time such as 24 hours, and determine the action to be taken. Such actions may include, but not be limited to:

Removal of PCR deemed to be of significance;

Execution of further excavation within a specified distance of the discovery point;

Extension or reduction of the area demarcated by the contractor.

These actions should be taken within a specified period, for example, 7 days. The contractor may or may not be entitled to claim compensation for work suspension during this period.

If the cultural authority fails to arrive within the stipulated period (for example, 24 hours), the Resident Engineer may have the authority to extend the period by a further stipulated time.

If the cultural authority fails to arrive after the extension period, the Resident Engineer may have the authority to instruct the contractor to remove the PCR or undertake other mitigating measures and resume work. Such additional works can be charged to the contract.

However, the contractor may not be entitled to claim compensation for work suspension during this period.

### Further Suspension of Work

During this 7-day period, the Cultural authority may be entitled to request the temporary suspension of the work at or in the vicinity of the discovery site for an additional period of up to, for example, 30 days.

The contractor may, or may not be, entitled to claim compensation for work suspension during this period.

However, the contractor will be entitled to establish an agreement with the cultural authority for additional services or resources during this further period under a separate contract with the cultural authority.

## Appendix 5 – Measures to be Included in Design

### Design Standards

Standards of curvature and gradient are of particular relevance in terms of the space required for the road and the amount of soil and rock, which has to be excavated, hauled and stored, especially in the case of the new alignments. Road width is also important, particularly in the rehabilitation of the existing road. Widths should be uniform and appropriate to the anticipated traffic flows. Over-dimensioning causes excessive problems particularly in populated areas and environmentally sensitive areas such as narrow gorges.

### Road Alignment

If possible, the new road alignment should avoid environmentally sensitive areas such as areas with erodible soils, forests, reservoirs, rivers, cultivated land and areas with contaminated soils. If this cannot be achieved, measures to minimize the negative effects to the areas in question should be taken.

### Erosion Prevention

Every possible means should be used to prevent erosion. Special attention should be paid to the design of drainage structures, river training works, slopes, spoil dumping areas and reinstatement of quarries and borrow areas.

The potential locations of quarries and borrow pits should be identified and the areas and depths of permissible utilization determined in the designs. Areas for the disposal of surplus materials should also be identified in the designs. Specifications should clearly state the methods of operation, clean-up and landscaping for such areas. These procedures should comply with Kyrgyz legislation and any specific national guidelines regulating these activities.

### Traffic Safety

All necessary markings, signs and guardrail locations should be shown on the drawings. The designs should account for pedestrian movements in urban and semi-urban areas and proper provision for sidewalks where needed to give satisfactory and convenient separation of traffic and pedestrians should be included.

The designs should also incorporate measures to improve access to and across the main stream of traffic for light flows on side roads. Controlled pedestrian crossings should be provided where appropriate in urban areas.

The designs should include proper rest areas for trucks and other vehicles with environmentally safe service facilities. Rest areas should be provided in places where private service entrepreneurship has already arisen.

### Foul Water Drainage

Drainage system design should take into account local irrigation systems and the other needs of water users. Consultation with local people is needed.

Special attention should be paid to the protection of water quality in rivers adjacent to the roads. Direct discharge of drainage waters from the rest areas should be prevented to avoid spillage from vehicles getting into rivers.

## Appendix 6 – Protocol of public hearings on preliminary assessment of environmental impact under the National Roads Rehabilitation Project (Osh-Batken-Isfana Road)

Bishkek city

Date: 13 August 2009

Information on public hearings had been previously published on mass media and posted on MOTC' website.

Totally about 40 persons took part in hearings including representatives of mass media, public organizations, relevant governmental agencies responsible for the ecology issues, technical safety (list is enclosed).

Mr. Mamaev, MoTC State Secretary announced information on project that made familiar all attendees with the details on Environmental impact assessment under Project implementation. Afterwards he requested questions (the full text of presentation is enclosed).

Question: Toycharbarov M. – Kyrgyz Tuusu newspaper

What measures are taken to protect from mudflows during bridge construction?

Why Osh-Batken-Isfana Road Rehabilitation Project does not cover the rehabilitation of section to Sulyukta city? This is one of the industrial centers of Batken oblast.

Will we have toll roads?

Answer: Mr. Mamaev:

Concerning the first question, before we did not have a modern equipment for the bridge construction, all bridges have been built on solid piers and there were risk of washout and collapse of piers. Currently we have a set of equipment for the installation of piles "KATO" using which we build bridges with a burial depth to 20m. This makes the bridge maintenance is safe from washout. With this equipment we have build bridges over Soh river, the bridge over Ohna river is under construction where the existing bridges was out of action due to the washout of solid piers.

Concerning second question the road to Sulyukta city is not covered by TRACEKA Transport Corridor, this is a local road to be financed from budget.

Concerning third questions, we have initiated such law and it is being considered in parliament. The procedure is long and public hearings should be done to consider the opinion of public community.

Question: Dautalieva A. –“Taza Tabigat” Public Association:

What are the conditions for financing of banks-donors under this project?

Answer: Mr. Mamaev:

European Commission is allocating a grant and administering the project independently. The World Bank is allocating the funds on the conditions of the grant-loan. The European Bank for Reconstruction and Development is allocating loan on a long-term base. Upon this based on the Kyrgyz Government’ Decree the grant element of this project have been calculated considering all involved investments to Phase I, Osh-Batken-Isfana Road Rehabilitation Project, and the grant element of project meets the approved standards.

Question: Dautalieva A. – “Taza Tabigat” Public Association:

From the information accommodated on the website it is seen that one of the delicate issues is resettlement program. In what extent the owners’ interests will be considered, what is the procedure of compensation payment? For example, in Kazakhstan where we’ve been invited to the similar activities upon the East-West Road Construction Project implementation the scaled resettlements will be carried out.

Answer: Mr. Mamaev:

As you are aware during the road projects implementation we have paid the compensation for the resettlement from the right of way, particularly, under the Tashkumyr-Karajygach road project under Bishkek-Osh Road Rehabilitation Third Project. Also in Sosnovka village and Uzgen-Osh road rehabilitation project the compensation have been paid for the damage to private households caused by vibration.

In general, under all our projects we maximally try to consider the interests of local people and promptly resolve the issues on project impact. The other thing is that the procedure of payment registration takes a long time and we also take some efforts to resolve this issue.

Question: Dautalieva A. – “Taza Tabigat” Public Association:

In what extent the population will be informed on this project, will the brochures on public hearings been distributed? To what extent they will know their rights?

Answer: Mr. Mamaev:

The Project staff visited a site on July, had meetings with local people and have distributed the brochures, besides this the information on project and public hearings have been accommodated in oblast newspaper, i.e. all procedures have been fulfilled in a full extent.

Question: Ms. Musaeva Z. – NTRK

What are the main risks in ecological and social impact?

Answer: Mr. Mamaev

In general, the main issue is a land allotment for the Project needs have been resolved, since we are constructing the existing gravel road during a long time. The full completion of road under the project will only improve the ecological situation in a region since during the asphalt concrete pavement the dust generation and toxic gases will be significantly

decreased. Besides this, the whole road furniture with installation of signs, barriers, central line installation will increase the level of road safety.

Question: Dautalieva A. – “Taza Tabigat” Public Association:

What kind of materials will be used during the road construction? How much it will comply with quality requirements, particularly, I am interested in asphalt quality and do we have a laboratory which will control quality?

A: Mr. Mamaev

The materials and work quality in international projects is written in a Technical Specifications which are annexed to Contract. All qualitative works and materials indicators stipulated in Technical Specifications are based on international standards AASHTO, BS etc. The Contractor and Consultant working on site are governed by these standards. Each project is equipped by the field laboratory which is completed in accordance with the standards of Technical Specifications and all required tests can be done in laboratory including asphalt-concrete mixture.

Besides this, the territorial divisions of GASK, with who we work closely, can take part in the inspection of quality of works to be done and materials used based on our legislation.

Q: Mr. Mamasaliev E. – AKI Press

Concerning the participation of local contractors in bids. Are there any firms in Kyrgyzstan which can carry out similar projects on road construction based on their own efforts?

A: Mr. Mamaev

The main problem preventing the participation of local companies in such kind of projects is lack of sufficient facilities and turnover means. But they can establish joint ventures between themselves or involving foreign companies and they have an experience. Also there are problems with bank guarantees required according to the international contracts.

Q: Mr. Mamasaliev E. – AKI Press

Are there asphalt-concrete plants in Osh and Batken oblasts' territories? Who will supply bitumen and asphalt?

A: Mr. Mamaev

The asphalt-concrete plant with small capacity under the MOTC is located near Soh river and in Bujum village in Batken rayon. Also there are private plants in Leylek, Kadamjay rayons and in Osh city. But in projects the Contractors will use their equipment including asphalt-concrete plant.

Question: Dautalieva A. – “Taza Tabigat” Public Association:

How much the investment to this project and to road projects in general is economically feasible? Doing this we increase our external debt. As it is known currently the Bishkek-Naryn-Torugart Road Project implementation is being started where some problems rose concerning customs terminal transfer.

A: Mr. Mamaev

The project economic feasibility is calculated under the Feasibility Study framework and it meets the required parameters. Besides this the issues on transport independency should be considered in this region and particularly, the social significance of project for the local population. The roads itself are not the source of benefits, but we have only two roads where we charge the scale customs and weight tolls, these are Bishkek-Naryn-Torugart and Osh-Sarytash-Irkeshtam. The economic efficiency of roads constructions is connected with the multiplicative effect, i.e. development of region, improvement of business environment, increase of cargo turnover which will replenish the state budget through taxes.

Concerning Bishkek-Naryn-Torugart Road Project we take efforts for attraction of investments for the whole road lengths. This option is most preferable since the completion of project will be done within short period and the transit potential of corridor will be used fully. Under such scheme the Osh-Sarytash-Irkeshtam Road rehabilitation Project implementation is currently ongoing where the works are being carried out along the whole length of road and during the further 2 years the project will be practically completed. This means that the whole project will take around 4 to 5 years but the Bishkek-Osh road we rehabilitated during 10 to 11 years.

#### Speech of Mr. K.A.Mamaev

At first I would like to greet all participants of public hearing concerning prevention risk of ecological and social impact under the rehabilitation Osh-Batken-Isfana national road project on the site Pulgon-Burgondu 125-155 km financed by World Bank. As you know, at the present there is a problem with providing unhampered transport communication on the cross borders of Batken with other neighboring countries, especially on the cross borders of thoroughfares.

In order to solve this problem, social –economic development, and providing transport independence of Kyrgyz Republic in Batken oblast, government of Kyrgyz Republic intimately with international donors is negotiating about attracting investments on Osh-Batken- Isfana road which runs across Batken oblast and for construction of roads along enclaves of neighboring countries.

Priority of rehabilitation the Osh-Batken-Isfana transport corridor noticed as in Road Sector Development Strategy for years 2007-2010, also in President's road sector development programme. Implementation of this project can solve problems connecting with the neighboring countries enclave crossings, which will provide execution of one of the tasks identified in the above-mentioned documents for providing of Kyrgyz Republic's transport independence.

Moreover, construction of detour roads along neighboring countries enclaves will facilitate road transport development, enterprising and provide foreign investments inflow to the region.

There also will be a great social importance from the Osh-Batken- Isfana road, as due to the lack of full operating road, mostly social services such as: education, health service, social welfare, domestic service etc. are unavailable for people. Implementation of this project will sharply change social –economic situation in the region.

Also taking into account predominance of agricultural production in this region, rehabilitation of the project contributes into realization of growing agricultural products on the external markets.

The total length of Osh-Batken-Isfana road is 358 km, the traffic route is from Osh to Isfana across Kizil-Kiya and Batken towns, lying mainly through flat places and

sometimes also hills. The road runs along unpopulated territories, aside main villages and towns. The work consist of rehabilitation of already existing road and improvement of existing asphalt road, but some areas on 108-123 km., 125-175 km, and 195-232 km will be built again, mainly on the existing gravel road. Route will bypass Batken town's centre, using for this existing asphalt roads. On the 248-271 km a new section with a length of 23 km has already been constructed. According to the plan it will be two-lanes road with asphalt-concrete pavement, roadway wide is 8 m and gravel shoulder is 1,5 m. Beginning from the 232-358 km road way will be 7 m wide, and gravel shoulder will be 1,5 m. wide. Along the road corridors 40 rehabilitated and new bridges, 500 rehabilitated and new culverts will be. The estimated speed will be 80/100 km per hour on the flat and 40-60 km. per hour on the hill areas. Duration of construction works for different areas will be 18-24 months. It is expected that works will be done only on the one part of the road which will stay open. In order to reach construction areas it will be possible to use some temporary bypasses.

The site financed by World Bank composes 30 km from Pulgon till Burgondu. This press-conference is devoted exactly this road section and also problems of local population suffering damages from the project.

During the implementation of the works under the project, Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) were prepared aiming reveal, minimization, or decreasing any negative impact on environment during road maintenance and construction works.

Resettlement policy foundations (RPF) were prepared in order to manage potential problems, arising during the obtaining of lands, as on temporary also on constant base and also as a base for special plans are due to be carried out from the project.

On the assumption of information received from EIA and RPF, the main expected ecologic and social impacts on project (positive and negative) are:

May be it will be requested to remove narrow land line (in general 2 m wide from each part of the road, but on some areas line will be wider) along addition accommodations, fences, trees, grains, and houses in this village. Above –mentioned will be decided by compensation procedures of KR Government and World Bank.

Road development is expected to decrease travel time (especially across Uzbek and Tajik territories) and expenses, increase travel comfort for all users, decrease level of poverty, also create additional work places. Speed increase will cause accidents-these problems will be solved by observance of traffic safety rules, strengthened patrol, and also by awareness campaign for road users.

Construction materials should be extracted from borrow pits along roads. Under this, unnecessary and inappropriate materials should be got out. Used areas are subject to rehabilitation. On these areas growth of noise, vibration, gas, dust, and sedimentary material in stream canals is possible, strengthening of problems concerning health and also increase of travel time during the construction works. Above-mentioned items will be under EMP control and other contract documents. If it is possible construction camps will be maximally independent. There is an erosion problem on some road areas, but it is expected to be decreased at the expense of road alignment. Noises and air pollution may be strengthened at the expense of future traffic movement-the question will be decided on legislative level. No other main long termed impacts on environment are expected.(project do not touch ecologic sensitive territories).

If participants have definite opinions concerning the project and questions need to be clarified, please share with us.

We are ready listen to all your proposals and remarks, and answer questions.

This Protocol was prepared by Erkingul Kasymova, PIU Social Expert, MoTC KR

Pulgon village, Batken oblast

Date: 14 August 2009.

Information on public hearings to be held have been distributed among local population by use of flyers, during project site visit by Consultant local specialists group, Finnroad Company.

Also, information on public hearing was published in the local newspaper, posted in public places, as well as local self-government administration was informed about it.

Totally about 60 participants attended the public hearing including local population, local self-government and oblast/region public authority representatives (participants list is attached).

Conference was held in the small hall of the Kadamjay rayon public administration.

Mr. Sarbagyshev S.Sh., MOTC KR PIU Highway Engineer, made the speech at the meeting and informed participants about project general objectives, project parameters and project implementation environmental impact details and World Bank resettlement procedures.

Questions:

Mr. Juzbaev A Head of "Alga" Village Administration:

During 10 years we are promised that this road will be built, we are tired of waiting. We used to go to the Uzbekistan frontier settlement crossing the Uzber territory, but since recently neighboring country have closed its border. Now we have to use unfinished detour road with gravel surfacing. That have negative effect on automobile operating costs, each week we have to change tires, there is clouds of dust. Can you give us exact answer, when road construction starts? Can this part of road be constructed at least using funds of MOTC?

Answer: Mr. S. Sarbagyshev:

Actually, in 2000 the first Feasibility Study on Osh-Batken-Isfana road was made, within the scope of which the project implementation financial viability have been estimated. Due to the absence of foreign investments over a few years, MOTC implements the construction of the detour roads using the budgetary financing. In this regard, there is President's Decree on this project priority and its financing from the budget sources. Particularly, the high priority section- bridge over Soh river with approaches is under completion, at present, the bridge is fully completed, and preparatory works on asphaltting of approaches with the length 4,7 km are ongoing.

As you know, the separate sections of the road have been constructed by the local administrations using funds of local population, which show this roads importance for this

region. MOTC, as branch ministry takes an active part in road construction, but due to the insufficient financing it is impossible to fulfill all scheduled scope of works.

Q: Mr. Rahmatullaev L., Head of "Halmion" ayil okmotu:

Polgon –Burgondu section is a high priority road section. You might use this road, vehicles are rapidly break, cloud of dust. I think, there will not problems in social and environmental issues, practically, along the road there is no houses, so no resettlement to be required. We are aware that donors have some procedures, which should be done before construction works beginning, but we request you to start the works as soon as possible. In case of any assistance from the local people, we are ready to help.

But before construction works start, it is important to open border with Uzbekistan. And you, as a public authority, should inform Government on this problem.

A: Mr. S.Sarbagyshev:

Of course, we understand you problems, and take any possible measures to start the project in a nearest future. We have signed Loan Agreement with EBRD for the km 155-km 200 and by the next construction season, we hope to finish the Consultants and Contractors selection procedures and start construction works on this section.

The procedures on the section Kok Talaa-Pulgon and from Pulgon to 155km the procedures are being fulfilled and we hope that we can complete them by the next construction season.

Q: Mr. Asrankulov Mirzali, resident of Halmion village:

The section between Km 125 and Km 155 is the most important, it should be started firstly. This section covers three populated ayil okmotu, about 40 thousand people are living there. It is difficult for population to go to Pulgon village; we were told many times that works would start today, tomorrow but so far no progress. Please inform donors and management on this.

A: Mr. S.Sarbagyshev:

As I already told each Bank has its own procedures and we take all measures to finalize them as soon as possible. We are also interested in beginning of construction works which would facilitate the passage through project section.

Q: Mr. Korgonbaev J., resident of Kyrgyz-Kyshtak vllage:

I would like to say about dust, the measures should be taken. Do we have any authority responsible for the existing road? Dust on road seriously affects the population health, it is good that settlements are far from road but in any case high dust level might have a negative consequences.

Please tell when, what month the road construction will start? And we also heard that your agency should lay around 100 different pipes but by today there none, bridge construction is ongoing but very slow. The gravel surface is damaged, boulders are everywhere, it is hard to pass. Some measures should be taken by the commencement of scheduled works in next year. What can you say on this?

A: Osh-Bishkek-Irkeshtam Road Department:

Since the Pulgon – Burgondu section is under construction, the Contractor, some construction divisions, particularly Jalal-Abad construction department are responsible for the gravel surface condition. We as an Employer, will take all measures that contractors to start the repair of gravel pavement for the normal passage. The construction of engineering structures and bridges is delayed due to the insufficient financing since the main funds allocated to roads were used to cover the section of bridge over Soh river with access roads which should be done within a short time. Also since previous year the crisis have affected due to which the budget allocations have been decreased.

Q: Mr. Akimov Abdutalip, resident of Jonush village, ayil okmotu Halmion;

How long should we wait, the population is losing the patience. All our management headed by Mr. Bakiev, President of the Kyrgyz Republic, has promised to complete this road, but the significant works have not been done. Of course, people are using this road as a reserve option, especially now when the border with Uzbekistan is closed. But the road should be constructed since gravel pavement is damaged and vehicles are permanently being broken.

The population is law-abiding, calm, understands the public problems but is awaiting more efforts from the government. Now we have to resolve the issues on opening of border with Uzbekistan, also the measures should be taken to commence the works on project urgently. But our main problem is to start a construction. We, from our side, shall help and assist in road construction.

Q: Mr. Akmatov Akim, resident of Pulgon village

I have one question regarding Kok-Talaa – Pulgon section, please tell how many houses will be demolished? And how many families will suffer? How the issue on compensation will be resolved, will all green plantations, trees and etc be taken into account? My house is from that will fall under the road right of way. Till the today there is no clear picture.

A: Mr. S. Sarbagyshev

As it was told before we shall try to avoid a resettlement. The fences, green plantations, partial dependency is falling under right of way. Currently the Inter-departmental commission is being established which will in detail determine the physical damage to householders (land, building, green plantations), afterwards the estimation will be done and compensation cost determined. The size of compensation will be agreed with each householder and after this by the Kyrgyz Government decision the financing source and compensation payment order will be specified.

Based on Feasibility study 5 households and one public institute will be affected. This will be re-checked during the Commission work and finalized.

Q: Mr. Osmonov Z. resident of Markaz village, Markaz ayil okmotu:

I have one question, when the construction is started where from the asphalt will be delivered? The asphaltting of our road have been started, it was promised to lay asphalt on 20 Km of section but actually works have been done on a section less of one km and everything was stopped. Will this situation be repeated again or not?

A: Mr. S. Sarbagyshev

The continuation of construction will be done using the funds international donors, but at this the international Consultants and international Contractors will be involved. The Contractors should have a full set of equipment for works fulfillment including asphalt-

concrete plants, so there will be no problems with provision of asphalt-concrete mixture for construction.

As you are aware, the road section along Toktogul water reservoir behind Batken, where currently the works have been completed. I assume everybody have traveled along the new road detouring the Tajik territory. The construction works on this section have been financed by European Commission. The contractor completed construction works within 1.5 year. Here also the works will be done according to the contract period, this is Contractor's responsibility.

Q: Syddikov Duyshobay – Head of state register of Kadamjay rayon:

Concerning the Pulgon-Burgondu section in general, there are no problems. When Mr. R.Finn arrived our people have visited this section with him and the single problem is a territory of antimonies industrial complex where around 4 km of vehicle-trucks park is falling under project road' right of way. And during the road widening 5 household and adjoining facilities might be damages on Kok-Talaa – Pulgon road section. If the assistance is needed we shall help. It would be better to start the road construction within this year.

A: Mr. S. Sarbagyshev

We highly appreciate the assistance of all local authorities. Concerning all issues we face understanding and this is vital for the smooth project implementation. I hope this kind of cooperation will continue in future.

Q: Mr. Tashov Asamidin Mamazairovich – Head of state administration – akim of Kadamjay rayon.

We, from our side shall prepare a letter with all questions raised on this meeting and forward to the President Administration and Kyrgyz Government. We need a road and population should not suffer. We shall make every effort to construction and will involve all local bodies. The urgent request, as it was sounded earlier, to rehabilitate the gravel pavement before construction and provide a normal passage and maintenance.

Please believe the population is suffering big inconveniences and tired of waiting. The measures should be taken. Let me on behalf of the rayon residents to express our gratitude to the international donors financing this construction. We hope for the smooth project implementation.

This Protocol was prepared by Erkingul Kasymova, PIU Social Expert, MoTC KR