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The Kyrgyz Republic: CAREC Regional Road Corridor Improvement Project Environmental Report # 4

Prepared by the Ministry of Transport and
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This report is an update to the Environmental Report. It is designed for ready use by the project executing agencies to provide direct input into ADB's internal Project Progress and Project Completion Reports.

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ENVIRONMENTAL MONITORING AND EVALUATION REPORT
KARIMEK-SARY TASH ROAD
April 2011

1.0 Background and Introduction

There is a growing awareness that road development projects could have major environmental impacts, and the Karamyk-SaryTash Road is no exception. Some of the major environmental impacts of road projects include damage to sensitive ecosystems, loss of productive agricultural lands, resettlement of affected communities, permanent disruption of local economic activities, demographic changes, accelerated urbanization and the introduction of disease.

Road projects are generally intended to improve the economic and social welfare of people. Increased road capacity and improved pavements can reduce travel times and lower the costs of vehicle use, while increasing access to markets, jobs, education and health services and reducing transport costs for both freight and passengers.

For all the positive aspects of road projects, they may also have significant negative impacts on nearby communities and the natural environment. People and properties may be in the direct path of road works and affected in a major way. People may also be indirectly affected by road projects, through the disruption of livelihood, loss of accustomed travel paths and community linkages, increases in respiratory problems due to air pollution, loss of access to resource products (medicinal plants, wild fruit trees, grazing areas for cattle etc.) and injury from road accidents.

Disturbance to the natural environment may include soil erosion, changes to streams and underground water, and interference with animal and plant life. Temporary impacts during construction are also common and require specific mitigation to minimize them, e.g. keeping dust levels down during road pavement preparation through the use of water browsers to minimize health and safety impacts to nearby communities.

Failure to identify potential impacts may result in delays and cost increases later in the project's development. Neglecting to account for impacts may also cause the road designers to adopt solutions that compromise the environment. Poor environmental management has been shown to produce negative public perception of road projects, creating additional for those projects still to come. The following are some measures undertaken to minimize/eliminate such negative impacts:

1.1 Environmental Assessment (EA)

An EA is not aimed solely at identifying the negative impacts of a project in the context of the area it is being planned in, but also optimizes the positive effects of the project. Just as good road project planning, management and execution requires well trained professional transportation engineers, technically credible and environmentally sensitive, road EA's require experienced environmental professionals supporting the engineering team. Such personnel should be brought into the project development process at a very early stage.

1.2 Mitigation

Mitigation is the lessening of negative environmental impacts through: (a) changes in the design, construction practices, maintenance, and operation of the road; and (b) additional actions taken to protect the biophysical and social environment, as well as the individuals who have been impacted adversely by a project. Some aspects of mitigation can be incorporated into project design and can largely resolve the threat of impacts before construction begins. However many measures require a ongoing implementation plan to ensure that proposed actions are carried out at the correct times, that environmental measures such as grass planting and slope protection are maintained and that prompt remedial actions are taken when the initial measures are not fully successful.

1.3 Compensation

Compensation should be considered if steps to reduce impacts are not possible or sufficient. Compensation can be material (reconstruction of homes or natural environment), financial (compensation for loss of property), or a combination of both.

1.4 Monitoring

The implementation of mitigative measures is often the weakest link in the environmental management process. Any EA study needs to identify plans for works supervisors (design and supervising engineers), future environmental monitoring and evaluation studies. Once implemented these should ensure the full implementation of the mitigation measures.

While an EA and a mitigation plan have been conducted for the Karimek-SaryTash Road, the need for periodic monitoring to ensure compliance with the mitigation plan is necessary. The report at hand presents the findings of an environmental monitoring visit to the project site undertaken by the TERA international and national environmental experts in October 2010. The findings of the assessment were compared against the main components of the Contractor's environmental management and monitoring plan, and the mitigation action per good practice. Those findings are presented, along with recommendations in the following sections.

2.0 Environmental Management Provisions in the Contractor's EMP versus Field Observations

At the beginning of the project, the conditions to be implemented and applied by the Contractor (China Road and Bridge- CRBC) to avoid adverse impacts on the environment and communities in the vicinity of the Site caused by the Project are summarized in Matrix 1 below.

Valued Environmental Component	Mitigative Measures to be Implemented by CRBC
Air Quality	<ul style="list-style-type: none"> • Adhere to Kyrgyz Government's pollution control guidelines and standards (see Appendix); • Prohibit the open burning of waste or materials; • Ensure that construction equipment will be maintained to a good standard and fitted with pollution control devices. • Discourage the idling of engines; • Prohibit the use of equipment and machinery that causes excessive pollution (i.e. visible smoke) at the Site; • Ensure that all vehicles transporting potentially dust-producing material will not be overloaded, will be provided with adequate tail-boards and side-boards; • Not permit the operation of hot-mix, asphalt, aggregate or concrete plant in close proximity of populated settlements nor within 500m of sensitive uses • Locate material stockpiles in sheltered areas and cover them with tarpaulins or other such suitable covering to prevent material becoming airborne; • Undertake regular watering/spraying of the project road, especially in the vicinity of the villages/settlements, and any roads being used for haulage of materials during the dry season; • Prepare, and submit to the Engineer for approval, a dust suppression plan. • Undertake periodic air quality monitoring
Water Quality	<ul style="list-style-type: none"> • Prevent interference with natural water flow in rivers, water courses or streams within or adjacent to work sites, • Protect water courses, rivers, streams, lakes, drains, canals and ditches within and adjacent to the Site from pollution • Ensure that any temporary constructions are located at least 50m from water courses, • Include sediment controls such as silt fences, coffer dams and silt barriers • Not permit the discharge of sediment laden construction water or material • Store hydro-carbons, petroleum products to be used in bitumen mixes, and other chemicals in secure and impermeable containers or tanks located away from surface waters. • Equip construction work camps and site offices with sanitary latrines that do not pollute surface waters; • Engage a suitable qualified organization to undertake a baseline and water quality monitoring as required by the Contract. • Give priority to locating material stock-piles, borrow pits and construction camps on unused land and non-agricultural land. • Monitor embankments during construction for signs of erosion; • Not permit random and uncontrolled tipping of spoil and vegetate exposed areas including; • As per the requirements of the Contract only licensed quarrying operations will be used for material sources. • Locate borrow areas outside the right-of-way; • Restore all borrow pits, following the completion of works, in full compliance with all applicable standards and specifications;
Noise and Vibration	<ul style="list-style-type: none"> • Ensure all equipment, especially exhaust systems, be maintained in good working order and that regular equipment maintenance will be undertaken; • Prepare a schedule of operations that will be approved by the Engineer. The schedule will establish the days and hours of work for each construction activity and identify the types of equipment to be used; • Prohibit any construction activities between 10pm and 6am in settlements or close to sensitive receptors such as hospitals and schools; • Consult with the community in respect of construction activities and potential noise and vibration impacts. • Use blasting mats to reduce noise during blasting operations; • Undertake a baseline and monitoring of levels of noises and vibrations. • CRBC will engage a suitable qualified organization to undertake a baseline and noise and vibration monitoring as required by the Contract. Monitoring will be conducted in at least two sites per village along the road and other sites as required by the Engineer.
Fuel and Chemicals Storage	<p>Strictly control filling and refuelling, and subject the same formal procedures to avoid leakage or spills; Store all inflammable and chemical agents in waterproof and secure tanks, Ensure that the contents of any drums, tanks or vessels are clearly marked; Ensure that all fuel valves and trigger guns will be located so as to avoid interference and vandalism, Take all necessary measures to ensure that no contaminated discharges enter any drain or watercourses;</p>

Waste Management	<p>Prohibit the discharge of polluted or hazardous materials or chemicals to the ground or water sources; Store liquids in tanks or drums that are not able to spill or discharge to water courses or streams; Construct temporary treatment and drainage systems to collect and discharge liquid wastes. Prohibit the dumping of unsanitary material, waste-water, chemicals, soil, waste oil and chemicals, fuel, lubricating oil etc. Construct and rehabilitate all temporary drainage systems and take all measurements to prevent flooding or damage associated with flushing during work activities; and Ensure that construction workers and staff are aware of, and comply with, the provisions of HSEMP and the Contract in respect of liquid and solid waste management.</p>
Revegetation and Landscaping	<p>CRBC will be responsible for landscaping and re-vegetation of the Site as per the requirements of the Contract, especially the provisions of Section 8.6 of Bidding Documents Volume II Section 6a.</p>

2.1 Field Observations during First Field Inspection 2012

In May 2012, the local Environmental Expert visited the project site and conducted an inspection for the main facilities as it relates to the environmental management aspects presented in the original CRBC plan.

The visit coincided with the period of preparations for the arrival of the Team 1 and Team 2 workers to commence their works for this year's construction season. Some of the workers had just recently arrived to the Site and were at the stage of the preparations for the forthcoming works. Thus, the national Environment Expert had an opportunity to compare the conditions against the conditions that had been observed during the same period of the previous year for judgment concerning the environmental and sanitary conditions at the Project site afterwards. In addition, another monitoring visit is planned for July/August 2012 in order to assess the environmental conditions in the midst of this year's season and prior to final hand over of the project.

Generally, the conditions at the site were acceptable and meet the requirements of the EMP with some minor non compliance at the Team 1 site in terms of oil and tar spillages. There are also some concerns regarding the hygiene conditions of the workers facilities that should be improved for better public health and sanitation conditions at the site. Observations made during the visit are described below at the appropriate sections of the report.

The following observations were made as per the various environmental components.

1. Team 1 workers have not been fully deployed at the site yet. The China Roads company Project Manager is waiting for the arrival of the workers. The toilet and latrine facilities were judged to be in an acceptable condition in terms of cleanliness. The water reservoir, located behind the residential houses is also clean and does not create any apparent sanitary problems. However, the reservoir, which had been used for dust suppression contains solid waste and garbage. The Consultant recommended cleaning it up before the works for this year's season start.
2. At the Team 2 worker camp: Everything is clean, and the places where the works on repairing machines or refueling oil is conducted are properly covered by concrete. Soils are well protected against the penetration of industrial oils and fuels. The only observation made by the Consultant related to the fact that the enclosing ditch around the perimeter of the camp, contains household garbage along its entire length (especially the parts close to the gate).
3. The remaining parts of the pit do not contain waste and are clean. It was noted that local worker staff had been using this trench for garbage collection and disposal. The Consultant pointed out the need to clean out the garbage from the trench. Also, the Consultant pointed out that it was not permissible if the waste would remain at the bottom of the trench, and would be covered with a thick layer of soil. The disposed solid waste was noted to contain many items made of plastic and foam, which are not biodegradable. Therefore, this waste should be collected in one place and destroyed/burnt according to the national standards and requirements. Those parts that are subject to decomposition in the environment can be buried or burned.

4. Visiting the site for the production of bitumen and fillers - Team 2, revealed that the situation with the spillage of industrial oils and tar has worsened when compared to last year's conditions. The Consultant identified numerous and large enough spots of tar spill and industrial oils in places where the covering protection (concrete bottom or protective film) is not provided.
5. The CRC Project manager was informed regarding the violations and pollution of the natural environment. The Project Manage promised that within a week all violations will be rectified.
6. After consultation with staff SAEPF, it was decided that all contaminated soil will be collected in one place on an impermeable layer until a decision is made on the appropriate method for disposal, treatment, or remediation.
7. In accordance with existing practice in the KR, contaminated soil is usually collected and disposed at an authorized waste landfill. No further treatment is usually performed in relation to such sort of soils. However, due to the fact that in the vicinities of Daroot-Korgon, there are no authorized landfillsfor household waste, it is necessary to consider the possibility of disposal the soil in the areas with no access for local people, domestic animals, or close to the surface and high water table. The contractor is requested to investigate possible solutions for soil remediation and presenting them to the consultant for consideration.

The observations made by the National Expert were delivered to the CRBC representatives and they were requested to rectify all non compliant practices.

2.3 Reporting of Indicators as Per Good Environmental Practice

The following Matrix is a guide on the environmental indicators that are to be provided by the Contractor. It had been submitted to the Contractor in 2008, however, it has not been totally satisfied. The Contractor shall periodically provide those indicators in regular report to be reviewed by the National Expert, and verified by the International Expert during his visits in 2012.

Potential Impact	Mitigation Action Per IEE & Good Practice	M&E Indicators
Erosion or sedimentation caused during clearing or earthworks	Utilization of sediment measures such as silt fences to trap sediment before it enters waterways	Linear length of silt fences installed Areas of vegetation undertaken Liner length of embankments treated Volume of excavation materials re-used Volumes of gabion baskets installed
	Undertake progressive re-vegetation of cleared areas	
	Avoid clearing activities during the rainy season where possible	
Soil erosion, land slide or rock fall	Undertake progressive re-vegetation of cleared areas	Number and frequency of storage facilities along the length of the alignment and proximity to camp sites Response time to leaks and maintenance programs of plants
	Embankments in areas of steep slopes to be stepped	
	Side slopes of cuttings and embankments designed to reflect soil strength etc	
	Re-use excavated material wherever possible	
	Rip-rap, retaining structures, gabion baskets etc to be used wherever necessary for slope and river-bank protection	
Soil contamination from spillage of oil or other chemical substances	Store chemicals in secure area/compound, with concrete floor and weatherproof roof	Frequency of watering activities as per the construction schedule Proportion of covered truck trips and frequency of replacing covers Maintenance frequency of construction equipment including preventative maintenance
	Ensure construction plant are maintained in good condition and any leaks are quickly repaired	
Air pollution from dust or exhaust emissions (CO, Nox, Sox, etc)	Implement dust suppression measures including watering of exposed surfaces	Areas of vegetation undertaken
	Cover all trucks carrying dispersible materials to or from the site	
	Minimize size and duration of cleared areas	
	Ensure all construction vehicles and equipment are well maintained	
Clearing of vegetated area	Undertake progressive re-vegetation of cleared areas with fast-growing, native species Avoid the felling of road-side trees wherever possible	Locations and specifications of access roads Re-vegetation activities undertaken Frequency of tree protection measures (e.g., fencing) installed Training and awareness activities for workers relevant to the subject
Exploitation of local resources incl. poaching of fauna	Poaching of fauna or felling trees that are 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 works	Vehicle and equipment maintenance programs Construction schedules in the vicinity of habitats and small communities Site maps of asphalt mixing relative to nearby communities and minimum distances from various resources to be continuously provided Communication plan and meeting logs with community representatives Frequency and quantity of gear and equipment dispersed to employees and staff
Noise emissions from construction equipment	Ensure all construction vehicles and equipment are well maintained	List of signage installed along the alignment List and maps of access roads opened Communication plans and meetings with community representatives
	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	
	Fresh concrete and asphalt mixing stations must not be located nearby residential areas, schools and hospitals	
	Inform nearby community of schedule and duration of construction works	
Changes to road safety / traffic movements, property access	Provide workers with noise abatement equipment (ear-muffs etc)	Waste management plan for various sites Inventory of liquid storage sites and equipment Plans of drainage and disposal systems
	Install signage and lighting in vicinity of works on road	
	Install temporary access to affected properties	
	Reinstate good quality permanent access to affected properties on completion of construction works	
	Notify nearby community of schedule and duration of construction works	
Waste disposal problems from solid waste generated during construction	As far as practical, limit construction vehicle movements to main transport routes and avoid movements in peak hours	Waste management plan for various sites Inventory of liquid storage sites and equipment Plans of drainage and disposal systems
	Prepare and implement "waste management plan"	
	Train construction workers in appropriate waste disposal methods	
	Remove waste regularly from site for disposal to landfill	

activity or wastes generated in construction camps		installed
	Install waste collection and temporary storage facilities in construction camps	
	Wastewater systems from construction camps must not discharge into water bodies which are use for water supplies for domestic and industrial purposes	
Disrupts commercial activities on roadside	Install temporary access to affected Properties	Number of access facilities installed for this purpose
	Reinstate good quality permanent access to affected properties on completion of construction works	
	Notify nearby community of schedule and duration of construction works	Communication plan and meetings with community leaders
Construction workers cause social disruption or sanitation/health conditions	Ensure construction camps maintained in clean/hygienic conditions, implement "waste management plan"	Monthly logs of inspections on hygiene of construction camps
	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)	Training programs and numbers of trainees trained on the subject
	Consult with local authorities to plan construction worker housing arrangements	
Visual and landscape impacts	Implement low maintenance landscaping along roadside	Landscaping plans and inventories of plantings put it
Employment or livelihood benefits from employment of local people	Maximize the number of local people involved in the construction works	Numbers of employees hired locally in the various job descriptions for them
Risks to public or cost construction worker health or safety	Provide safety equipment to workers and train them in its use	Monthly reports of the health and safety units
	Secure construction site and restrict access by local community	
Interference with existing infrastructure	Consult with subproject engineering staff to minimize physical impacts on public infrastructure and disruption to services	Meeting minutes and correspondence with the relevant utilities
Water afflux in depressions along the road	Provide proper cleaning to remove silt from the channels and maintain the channeling on the permanent basis in future	Number and locations of temporary drainage facilities installed Program of cleaning activities of water drainage facilities
	Provide better conditions for water drainage in the areas where usually the water afflux occur	

Appendix 1 - Ambient Air Quality Standards in Kyrgyzstan

Pollutant	Maximum Permissible (mg/m ³)	Average Daily Concentration (mg/m ³)
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 ₂	0.5	0.05
Carbon monoxide	5	3
Nitrogen Dioxide NO ₂	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

To avoid adverse impacts from noise and vibration CRBC will:

Appendix 2 - Ambient Outdoor Noise Standards in Kyrgyzstan

Activity Category ¹	L_{eq} ²	L_{max} ³	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)

¹ 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.

² 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.

³ L_{Max} = maximum sound level.

Appendix 3 –Sample Photos from Site Visit



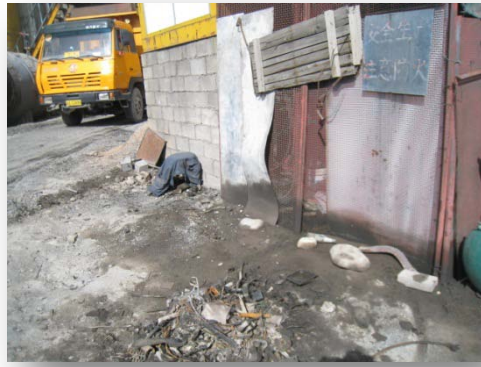
Picture 1. Toilet at Team 1 is clean



Picture 2. Water reservoir for dust suppression at the Team1 that contains garbage



Picture 3. Team 2: Spots of oil are numerous and big



Picture 4. Team 2: Spots of oil are numerous and big



Picture 5. The enclosing ditch at Team 2 gates with garbage



Picture 6. Team 2 example: ground is properly covered with concrete to protect against oil and tar spillage



Picture 7. Asphalt plant at Team 2: numerous and big enough spots of tar at the ground



Picture 8. Team 2 ground: numerous and big spots of oil were found where there were not any protective coverage/cement coating