

THE REPUBLIC OF MOLDOVA

STATE ROAD ADMINISTRATION

ROAD SECTOR PROGRAM SUPPORT PROJECT

ENVIRONMENTAL MANAGEMENT PLAN

Chisinau – Hincesti Project

FINAL VERSION

January 2008

ABBREVIATIONS AND ACRONYMS

AADT	Average Annual Daily Traffic
ADT	Average Daily Traffic
EBRD	European Bank for Reconstruction and Development
EHS	Environmental, Health & Safety
EIA	Environmental Impact Assessment
EIB	European Investment Bank
EMP	Environmental Management Plan
GoM	Government of Moldova
MENR	Ministry of Ecology and Natural Resources
MTRI	Ministry of Transport and Road Industry
OP/ BP/ GP	Operational Policies, Bank Procedures and Good Practices
QA/QC	Quality Assurance/Quality control
RoM	Republic of Moldova
SEA	Sectoral Environmental Assessment
SEI	State Ecological Inspectorate
SRA	State Road Administration
TRL	Transport Research Laboratory
UK	United Kingdom
vpd	Vehicles per day
WB	World Bank

1. INTRODUCTION

1.1. General

1.1. General

The Government of Republic of Moldova has sought assistance from international donors to improve key sections of its road network. The Republic of Moldova (Moldova) is a small, landlocked country in Eastern Europe located to the east of Romania and to the west of Ukraine, as shown on Figure 1.

Figure 1 – Location Map



Under an Agreement dated 11th June 2007 Roughton International of UK in association with TRL of UK and Blizzard Design of Romania undertook to provide consultancy services required for the first phase of the Road Sector Program Support Project with services commencing on 27th June 2007. On behalf of the GoM, the project is administered by the project office of the State Road Administration.

The project is intended to provide a holding action, which will prevent further deterioration of two principal trunk road routes within Moldova:

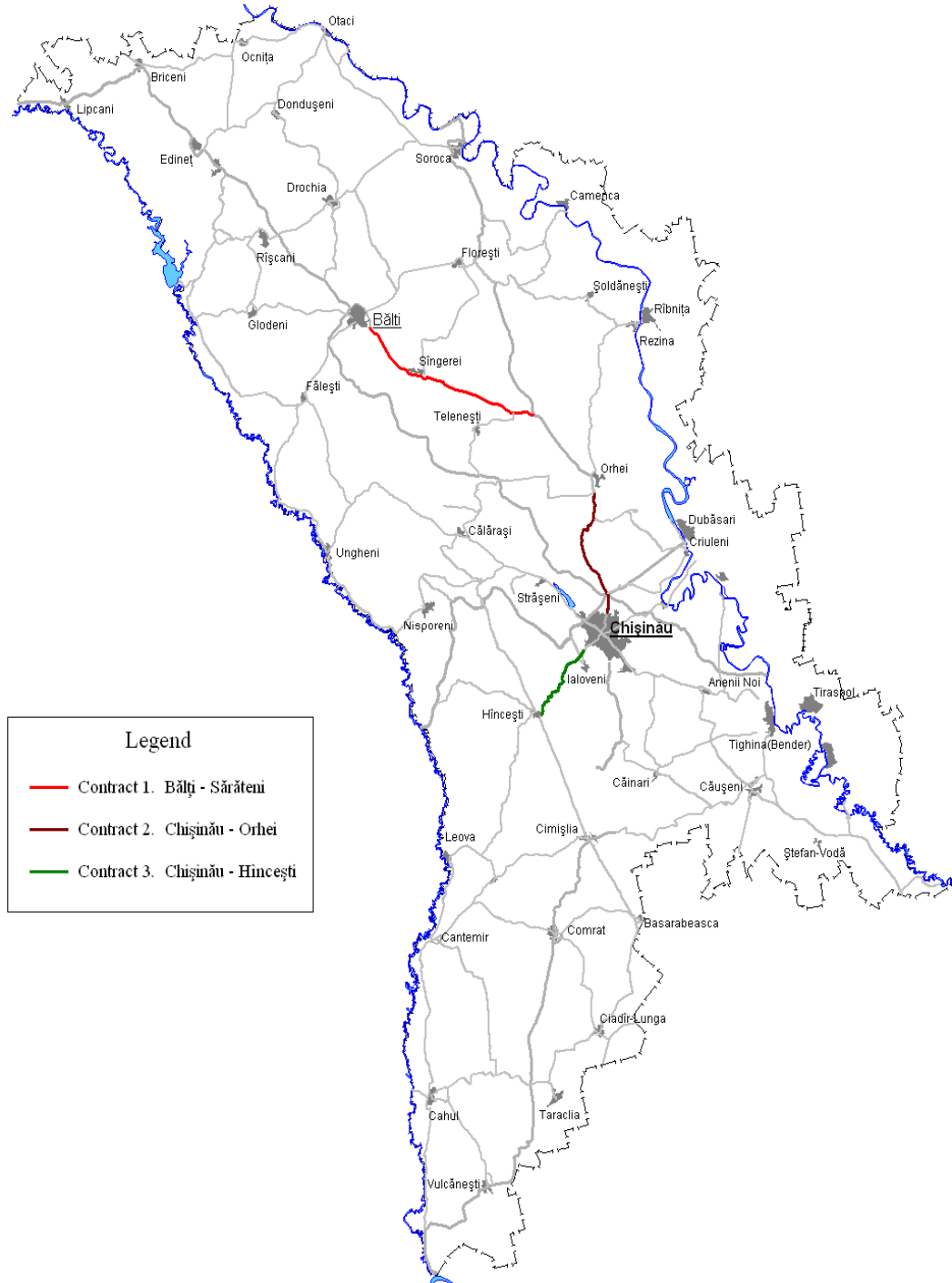
- Chisinau – Orhei – Sarateni - Balti; and
- Chisinau - Hincesti.

Initially the project is to examine the feasibility of rehabilitating these routes and then is to prepare final designs and documentation works to be carried out by tender.

Using finance from European Bank for Reconstruction and Development, European Investment Bank and the World Bank this project aims to rehabilitate as much as possible

of three sections of the routes examined; (i) Balti – Sarateni (56 km) funded by WB; (ii) Chisinau – Orhei (approx 40 km) funded by EBRD; and, (iii) Chisinau – Hincesti (25 km.) funded by EIB.

Figure 2 – Project Roads



It is intended that the subsequent construction work will be arranged in three contracts corresponding to the sections defined above, with each contract being funded by the agency indicated above. The proposed construction work does not currently include the section Orhei – Sarateni.

The preliminary phase of the project requires the Consultant to examine the feasibility of about 225 km of roads (Balti – Sarateni, Orhei – Sarateni, Chisinau – Orhei and Chisinau – Hincesti).

The second phase of the project will comprise the final design for the selected sections, as shown on Figure 2, complete with tender documentation for the three proposed contracts. The final design and contract definition will take into account the available funding and will tailor the extent of the proposed contracts to suit.

1.2. The Project

Designated as the R3, this road runs from the southwestern edge of Chisinau for some 25 kilometers to the start of the Hincesti Bypass. The section of road under study starts at Km 7.820 at the Chisinau city boundary and ends at Km. 29.915 at the start of the Hincesti Bypass.

Traffic counts have shown the road carrying an AADT of 8784 vehicles per day. Vehicle weightings show a very much higher proportion of heavily loaded commercial vehicles in the southbound direction than in the northbound. Examination of the pavement corroborates this with substantial more damage and deformation visible in the southbound lane(s).

The first 3.7 kilometers of this road have a 4 lane concrete pavement. This pavement provides a poor running surface and has some damaged areas, which will require repair or reconstruction. The concrete surface has been covered with either a thin skin of asphalt concrete or with one or more heavy coats of surface treatment in the past. Uneven wear of this additional surface has not helped to preserve a fair running surface. Nonetheless, the pavement appears to be fundamentally sound and strength measurements and traffic levels do not justify complete pavement replacement.

The 4 lane construction extends beyond the concrete section to Km 17.200 where it reduces to 2 lane for a length of approximately 1.15 kilometers. This short two lane section is followed by a 3 lane section of 650 meters after which the road remains as 2 lane for the remaining 10.75 kilometers to Hincesti.

Along much of the route, the terrain is rolling with substantial sections of road having gradients in excess of 5%. This results in a situation where a substantial part of the 2 lane section of road does not meet local standards in respect of width related to traffic volume and gradient; the proposed design includes a correction of this situation through the provision of some additional climbing lane at km 19.100 – km 20.300, km 21.325 – km 23.875, km 24.050 – km 25.350, km 25.550 – km 26.650, km 27.050 – km 27.250, and km 28.300 – km 29.900.

From Km 7.500 to Km 8.500 the road runs on a substantial embankment. In the area around Km 8.000 this embankment has been subject to slide failure and the nominally 4 lane carriageway has been reduced to 2 lane over a distance of about 300 meters in order to route traffic around the head of the slide which has partially destroyed the southbound carriageway pavement. Various remedial works have been undertaken, but not completed, in the past, and the project now includes further remedial works to complete stabilization of this slide area and permit reopening this section of road for continuous 4 lane operation.

As noted above, widening is required in six locations where the existing road is only two lane, in order to accommodate a passing lane; km 19.100 –20.300; km 21.325 –23.875; km 24.050 –25.350; km 25.550 –26.650; km 27.050 –27.250; and km 28.300 –29.900.

The most critical section is between km 19.100 and km 20.300. At the start of this section the road narrows from four to two lanes on the approach to a curve, there are vineyards on both sides of the road, on the left-hand side the planting is below the road in the valley, on the right-hand side of the road the planting is at the top of a cut slope.

Due to the road being in cut through this section, widening can not be accommodated on the left-hand side of the road as the shoulder is narrow and is not of a uniform width. Extending the width of the road by one lane will be provided by the existing unsealed shoulder and additional cutting on the right-hand side of the road. These works can be wholly accommodated within the existing right-of-way (protection zone), and will not require encroaching into the vineyard. It is also very unlikely that the existing trees will need to be removed.

In addition to the passing lanes, works will include both strengthening by asphalt overlays and extensive areas of pavement reconstruction together with shoulder rehabilitation and replacement and drainage improvements.

In order to address the technical solutions proposed to mitigate the observed landslide (km 8), temporary occupation of land might be required. The actual finished works will not fall outside the SRA right of way and no more detail on possible temporary requirements will be available until appointment of a contractor(s) and agreement on his working schedules and planning. Any temporary occupation of small land plots is addressed by the present document, in terms of mitigation (including compensation and rehabilitation) and monitoring.

This project requires construction works such as:

- minor additional earthworks, as widening is required in order to accommodate a passing lane in six locations where the existing road is only two lane: km 19.100 – km 20.300; km 21.325 – km 23.875; km 24.050 – km 25.350; km 25.550 – km 26.650; km 27.050 – km 27.250; and km 28.300 – km 29.900.
- laying a foundation of gravel and crushed stone layers on top of which asphalt is laid using specialised equipment, on the reconstruction sections.
- asphalt laying using specialised pavement equipments
- stabilizing the areas where active land sliding was observed (km 8).
- placing warning traffic signs, marking the road centreline and the road sections where overtaking is forbidden with reflectorized paint or thermoplastic.
- cleaning and refurbishment of side drainage.

Environmental Assessment policy (WB OP/BP 4.01) is triggered due to the potential for localized site-specific impacts from road rehabilitation and maintenance projects. These potential impacts are quite limited, for example dust and noise emissions, and some increase in suspended solids in run-off water down gradient from the project areas during the construction phase (since runoff controls may not be fully effective in all situations).

Short-term impact from noise, dust, vibration, and traffic congestion particularly during execution of road works cannot be avoided. Noise emissions will increase significantly due to movement and operation of construction machinery and vehicles.

No new roads segments will be financed and no permanent works will be carried out beyond the existing right-of-way. Hence, no land acquisition is foreseen and the involuntary resettlement safeguard will not be triggered. For the same reason the activities supported by the project will not trigger the cultural heritage safeguard (though provisions for "chance finds" are placed in construction contracts should unexpected artifacts be encountered).

Long-term impacts may result from increased traffic and increased traffic speed. For roads sector in some cases restored road infrastructure may result in increased rate of certain categories of road accidents. Adopting proper design including adequate signs and traffic calming measures will mitigate this. A traffic safety expert has reviewed the existing road and his recommendations incorporated into the designs.

1.3. Environmental setting. Points of interest/significance

No significant point of interest could be noted on biological and physical environment, socio-economic environment and cultural/historic environment on the setting of the mentioned project.

Several environmental issues of general concern have to be mentioned, as follows:

- The relief has an important influence on the microclimate, landscapes and soil conditions and to a great extent determines specific road safety measures, already incorporated in the analyzed project.
- Location of geologic deposits, available for local building materials (sand, clay, gravel) may influence selection of different sites temporarily required for the road rehabilitation; a decision in this sense should be produced by the Contractor.
- Most of the internal rivers are canalized, with regulating dams and flood protection dykes, built in cascade and regulated by weirs. Those reservoirs have been designed to trap sediments, provide water for irrigation, domestic and industrial needs, and support fishery. Local surface water resources (ponds, reservoirs, small rivers) are strongly affected by soil erosion, contaminated runoff from the earth surface, waste water discharges and unauthorized waste disposals/ dumps.
- The floodplains of several small rivers might be exposed to flooding, due to climate and landscapes characteristics, poor technical status of weirs and inadequate dam safety management, as several cases of severe floods on small rivers have been reported over the last decade.
- Apart from the project roads being located in the vicinity of one such retention structure, as well as crossing the surface water network in several places, no sensitive surface water related issue, as well as no critical contamination of waters and sediments was reported along the analyzed routes.

- Shallow groundwater is a major source of drinking water for rural population: about 50% of the country population relies on simple shallow dug wells. The shallow groundwater is highly vulnerable to anthropogenic impacts and sources of water contamination are mainly linked with rural areas. While no baseline assessment was carried out, the existing information determines us to consider that the range of natural and man-induced present contaminants includes nitrates and microbiological indices.
- The good condition of the soil is crucial for agriculture and is a basis for development of a productive export-oriented agriculture and food-processing industry. No critical soil contamination areas and deep erosion by ravines has to be noted in the implementation area of the project.
- Due to the slope landscapes, clay soil profile and groundwater level, landslides are quite a common feature of Moldova's nature. Landslides most commonly occur during the winter and spring months due to increased precipitation rates, snow melt and soil saturation. The landslide observed in the road rehabilitation area, need to be treated and considered with due respect paid to groundwater drainage
- No critically polluted areas are noted along the analyzed road. Average annual concentrations exceeding the national standards (maximum allowable concentrations) are reported for: nitrogen dioxide (in Chisinau) and formaldehyde (in Chisinau).
- This project is proposing normal rehabilitation/maintenance works to be carried out within the existing right of way, without permanent land expropriation and/or building any new bridges. The proposed works do not pose a significant risk to the neighbouring environment and no significant impact on flora and fauna is expected to occur, as all existing migration patterns would be maintained.
- No areas of protective interest were reported along the analyzed road sections. Awareness signalling along the roads is to be proposed as mitigation for any natural heritage site located near to the route, as requested by various stakeholders.
- While several forest areas were noted, no expropriation is proposed on those areas. No significant loss of trees would occur on this project, as only a limited number of trees might be cut in order to construct the mitigation measures designed for the land-slide area. Re-vegetation is proposed for the two sections, as part of the mitigation plan.
- There will be no impact on existing agricultural land or other productive land, or housing or other structures (including kiosks and small commercial enterprises).
- The project will avoid the permanent taking of land or affecting structures during the works. Minor widening will be required in six locations to expand the road from two to three lanes to provide a passing lane, this work will not encroach on adjacent land uses and can be accommodated wholly within the existing right-of-way (including shoulder and berm/verge area) known as the road's protection zone.
- Temporary occupation of land might be required in order to address the technical solutions proposed to mitigate the observed landslide (km 8), as well as for borrow pits and waste (soil) disposal areas (for slides), and contractor's working areas. No more detail possible until appointment of a contractor(s).

- Therefore there is no requirement for preparation of a resettlement framework for the project or preparation of resettlement plans for this contract.
- While no cultural heritage site is reported along the route, special mitigation is proposed in cases where any artefacts are encountered during project implementation. Awareness signalling along the roads is proposed as mitigation for any cultural heritage, tourist (including craftsmen traditional areas) and landscape sites of interest, located near the route, as requested by various stakeholders.
- Proper road signalling and traffic safety measures should be considered along the route as the present vertical and horizontal signalling status is considered poor. Special attention should be paid to speed limitation areas, to road curvature signalling, to pedestrian crossings and to the village name posts, which actually constitute speed limit areas.
- Usage of road surroundings areas for cattle grazing was observed to be a common practice. In some circumstances specific warning signs should be provided to draw attention to the dangers posed by this practice.

2. MITIGATION PLAN

The mitigation plan consists mainly of good management and construction practices that have to be monitored by all relevant stakeholders, as presented in the following table. It should be noted that the World Bang EHS General Guidelines already enforces most of those measures, as it does the local legislation (the stringer between them will imposed by the EMP and works contract). All remaining measures are part of the proposed construction works.

Phase*				Issue/Impact	Mitigation measure	Supervision requirement	Location	Performance indicator	Commence moment	Cost		Institutional Responsibility	
P	C	O	SD							Install	Operate	Install	Operate
Physical and human Environment													
				Soil	Re-vegetation of embankments	Monitor implementation	Earthworks areas	Visual/ Construction Works	Works completion	work specs	N/A	Designer/ Contractor/ Engineer	N/A
					Prevent soil compaction		Temporary occupied areas	Visual/ Remedial Works				Contractor/ Engineer	
				Water resources and water quality	Scheduling construction activities near waterways for seasonably dry periods, wherever possible	Monitor implementation	Construction sites located near waterways	Visual/ Construction Works	Works forecast	work specs	N/A	Contractor/ Engineer	N/A
					Waste oils and other liquids must be disposed off in a proper manner				Permanent				
				Air quality	Traffic speed should be reduced (in the villages) and regular application of water on unpaved roads may be required to prevent high dust emission	Monitor implementation	Construction sites located near villages	Visual/ Construction Works	Permanent	work specs	N/A	Contractor/ Engineer	N/A
					All trucks carrying fine material should be covered		Construction road						
					Construction machinery must be well maintained to minimize emissions								
				Nuisance noise	Activities producing excessive noise levels (asphalt and concrete plants, borrow pits and dump sites, site management) should be normally restricted to the day time and equipment normally producing high levels should be suppressed working during night	Monitor implementation	Asphalt and concrete plants, borrow pits and dump sites, site management	Visual/ Construction Works	Permanent	work specs	N/A	Contractor/ Engineer	N/A
					Protection the critical surrounding areas (kindergardens, schools, hospitals) with temporary noise barriers		Construction road					Contractor/ Engineer	
					Creation of green screens with shrubs and bushes on embankments >3m height		High embankment areas					Designer/ Contractor/ Engineer	
				Construction site	Consultations with local officials before locating and building the camps, including discussions on appropriate sites, resources, dispute resolution procedures and rights and responsibilities of various parties	Monitor implementation	All areas temporary occupied during construction	All legally required permits and agreements are valid and in place	Before/during construction works	work specs	N/A	Contractor/ Engineer	N/A
					Restore vegetation immediately after end of works			Visual/Remedial Works	Works completion				
					Assess vector ecology in work areas and avoid creation of undesirable habitats (e.g. stagnant water)		All construction areas	Visual. No of fines paid	Before/during construction works			Designer/ Contractor/ Engineer	
				Proper storage of the hazardous materials by the construction camps and during their use in construction (vehicles, asphalt plants etc.). Install and operate proper disposal system as not to harm environment.									

Phase*				Issue/Impact	Mitigation measure	Supervision requirement	Location	Performance indicator	Commence moment	Cost		Institutional Responsibility	
P	C	O	SD							Install	Operate	Install	Operate
				Natural vegetation	Maximum care should be taken in selection of access routes to all areas temporary occupied during construction	Monitor implementation	All areas temporary occupied during construction	All legally required permits and agreements are valid and in place	Before/during construction works	work specs	N/A	Contractor/ Engineer	
					Minimize destruction of trees and vegetation			Visual. Permits in place				Designer/ Contractor/ Engineer	
					Restore vegetation immediately after the end of works		Visual/Remedial Works	Works completion	Contractor/ Engineer				
					Forbid project staff to fish, hunt, kill, injure or poach fauna		All construction areas	Visual; No. of complaints	Before/during construction works				
				Borrow pits, quarries and waste dumps	Pit or quarry location and access arrangements	Monitor implementation	All areas temporary occupied during construction	Permits and agreements are valid and in place	Before/during construction works	work specs	N/A	Contractor/ Engineer	
					A working plan giving an outline of the direction, phasing and depth of working			Working plan approved by Owner's Engineer					
					A restoration plan giving details of final grading, drainage and sediment control, re-soiling and re-vegetation measures			Restoration plan approved by Owner's Engineer					
				Materials	The contractor will restrict the use of materials to sources appropriately licensed under Moldavian legislation for permits	Monitor implementation	All construction areas	The contractor will be responsible for having on file evidence of such permits.	Before/during construction works	work specs	N/A	Contractor/ Engineer	
					Only licensed quarries and borrow sites will be used			Visual/ Construction Works					
					Precaution will be required to prevent the spillage of materials during transportation; all vehicles will be covered to avoid spillage during transportation of quarry materials.								
				Water Pollution from improper materials disposal	Cover material storage areas	Monitor implementation	All areas temporary occupied during construction	Visual/ Construction Works	Before/during construction works	work specs	N/A	Contractor/ Engineer	
					Construct channels to direct water to collectors.								
					Wherever possible recycling / re-use of materials shall be considered;			Visual/ Construction Works					
					Solid wastes generated during the construction phase shall be systematically collected, stored and disposed of in suitable locations approved by the Project Manager and in accordance with national and national relevant regulations.			All legally required permits and agreements are valid and in place					

Phase*				Issue/Impact	Mitigation measure	Supervision requirement	Location	Performance indicator	Commence moment	Cost		Institutional Responsibility	
P	C	O	SD							Install	Operate	Install	Operate
				Solid waste from construction, construction camps and construction debris	Construction debris (concrete, asphalt, fuels, paints, contaminated soil etc.) shall generally be removed from the site in an orderly manner and disposed off in accordance with the existing regulations.	Monitor implementation	All construction areas	All legally required permits and agreements are valid and in place	Before/during construction works	work specs	N/A	Contractor/ Engineer	N/A
			Clean soil material, indicated as Spoil Material that is not reusable shall be removed from the site and transported to the soil dumping areas in accordance with relevant regulation, or designated in the design documents		Visual/ Remedial Works								
			Domestic waste from temporary construction camps shall be systematically collected and hauled to the designated areas in accordance with the relevant regulation.		All legally required permits and agreements are valid and in place								
			Construction camps should be erected within a reasonable distance to larger settlements, camp's solid waste may be integrated into existing collection and disposal facilities of nearby communities by their approval.		All legally required permits and agreements are valid and in place								
			Water and soil pollution from improper material management, usage, storage, and sediment run-off	The contractor shall make all necessary arrangements to ensure that pollution of soils and groundwater will be avoided as far as possible.	Monitor implementation	All construction areas	Visual. Permits in place	Before/during construction works	work specs	N/A	Contractor/ Engineer	N/A	
				Organize and cover material storage areas; isolate concrete, asphalt and other works from watercourse by using sealed formwork; isolate wash down areas of concrete and asphalt									
				Trucks and other equipment from watercourse by selecting areas for washing that are not free draining directly or indirectly into watercourse.									
			Water and soil pollution from improper disposal of waste materials	Dispose waste material at appropriate location protected from washing out, specified by Environmental local authorities.	Monitor implementation	All construction areas	Visual/ Construction Works	Before/during construction works	work specs	N/A	Contractor/ Engineer	N/A	
			Site clearance	Clearing and grubbing, debris generated due to dismantling of existing road, tree cutting, etc. before the commencement of the construction activities shall be done in accordance with local regulations	Monitor implementation	All construction areas	Visual/ Remedial Works	Before/during construction works	work specs	N/A	Contractor/ Engineer	N/A	
			Traffic disruption during	Traffic management plan with appropriate measures and signaling system to redirect traffic that is easily seen or easy to follow	Monitor implementation	All construction areas	Visual. Permits in place	Before/during construction works	work specs	N/A	Contractor/ Engineer	N/A	

Phase*				Issue/Impact	Mitigation measure	Supervision requirement	Location	Performance indicator	Commence moment	Cost		Institutional Responsibility	
P	C	O	SD							Install	Operate	Install	Operate
				construction activity									
Socio-economic Environment													
Social structure and cultural values													
				Social disturbance by construction camps	Respect local regulations for construction of plants and camps	Monitor observation of rules	All construction areas	Permits are valid and in place	Before/during construction works	work specs	N/A	Designer/Contractor/Engineer	N/A
				Impacts on cultural heritage sites	Specify rules and means regarding preservation and recovery of cultural remains	Monitor observation of rules	All new construction areas	Training on legal requirements	Before/during construction works	work specs	N/A	Designer/Contractor/Engineer	N/A
Property values													
				Temporary loss of land	Oblige contractor not to interfere unnecessarily or improperly with access to, use and occupation of properties	Monitor observation of rules	All areas temporary occupied during construction	Visual; No. of complaints	Before/during construction works	work specs	N/A	Designer/Contractor/Engineer	N/A
					Oblige contractor to select, arrange for, and if necessary pay for storage sites and/or other temporary uses	Monitor implementation		No. of complaints; Legal contracts in place					
					Oblige contractor to clean up and restore areas used			No. of complaints					
Road safety													
				Accidents during road construction period due to construction traffic and machinery and due to interferences with local roads	Determine safety measures for construction sites through contract obligations	Monitor implementation	All construction areas	Safety measures part of contract obligations	Before/during construction works	work specs	N/A	Designer/Contractor/Engineer	N/A
					Post traffic signs and warning in advance			Visual; No of complaints					
					Inform adjacent population in advance about scheduling of planned works			Visual; No of complaints					
					Speed limits on construction traffic			Visual; No of accidents					
					Fencing of quarries and borrow pits			Visual					
					Exclusion of the public where heavy machinery is working			Visual; No of incidents					
					Appropriate EHS training for workers			Visual; No of trainees					
					Regulation of storage and construction activities	Monitor observation of rules		Visual; No of incidents					

* P – Planning/Project Preparation; C – Construction; O – Operation; SD – Site Decommissioning

3. MONITORING PLAN

During construction phase, as well as during decommissioning of each site occupied by Contractor, if the case, monitoring of the following environmental indicators is recommended to be completed by an independent company that will sub-contracted by the Contractor.

Phase	What?	Where?	How?	When?	Cost (if significant)		Responsibility		
					Install	Operate	Install	Operate	
Baseline					Not required				
Construction	Air	Most affected residential areas	NO _x , CO, SO ₂ , VOC, PM ₁₀	Quarterly, by a specialised company	Not applicable	1000 USD/quarter	Not applicable	Contractor	
	Water	Most vulnerable areas to pollutant releases	pH, solid suspensions, Ca ²⁺ , Mg ²⁺ , SO ₄ ²⁺						
	Soil	Most vulnerable areas to fuel discharges	Total hydrocarbons from oil products						
	Noise	Most affected residential areas	Noise levels – dB(A)						
	Vegetation	Most affected areas	Dust deposition						
Operation	Noise	Residential areas	Noise levels – dB(A)	Periodic, together with traffic census	SRA	SRA	SRA	SRA	
Decommission	Not required for the road rehabilitation project, but for all temporary occupied sites. The same monitoring company will perform it, by taking into account all agreements and permits issued for the usage of each site occupied by Contractor, if the case.								

4. INSTITUTIONAL STRENGTHENING

4.1. Equipment Purchases

Not directly applicable. In order to monitor the quality of the environmental factors and activity, the Contractor should sub-contract a specialised company to monitor environment-related activities. That company's contract may need to include purchase of equipment.

4.2. Training/Study Tours

Not directly applicable. In order to assess training needs the SRA might contract a specialised company to evaluate requirements. The same company may subsequently be used to organise the relevant training.

4.3. Consultant Services

In order to monitor compliance with the terms of the contracts, the quality of the environmental factors and the acceptability of the work methods, it is considered necessary that the Contractor sub-contract a specialised company, to monitor all environment-related activities on a quarterly basis, during the whole construction period, as well as during decommissioning of each site occupied by Contractors.

4.3.1 Scope

The environmental effects in the project area can be generated by traffic, construction equipment, site management, asphalt and concrete plants, temporary storage of construction materials and of fuel, borrow pits and waste dump areas, temporary occupation of agricultural land for works.

Monitoring is carried out to assess any disturbance or degradation to the environment and to protect both State Road Administration and the affected parties from false allegations of environmental damage.

4.3.2 Methodology

It is considered that the monitoring campaigns can be performed quarterly, based on a predefined scheme. This approach will reveal the maximum values and the exceptions, as the results will be presented as diagrams compared with the background and limit values.

This methodology will clearly show the lacks and mistakes in the site management or in the equipment maintenance. The reports will also show the need for corrective actions, such as mandatory actions enforced by Moldavian environmental legislation, by World Bank EHS Guidelines and/or any mitigation measures imposed by agreements and permits in place, issued by relevant stakeholders.

For reducing the costs and necessary time for study elaboration, the following approach is proposed:

- Establishing of the most affected residential areas by the working sites, regarding the air and noise pollution

- Establishing the most vulnerable areas regarding the soil pollution with oil products, such as heavy oil or diesel fuel, and VOC released in the atmosphere:
 - Fuel tanks for heavy oil or diesel fuel;
 - Ramp for charging or discharging of oil products
- Establishing on each quarter the relevant pollutants released in the activity:
 - NO_x, CO, SO₂, PM₁₀, volatile organic compounds (VOC) (as air pollutants);
 - Total hydrocarbons from oil products (as soil contaminants) if necessary
 - pH, solid suspensions, Ca²⁺, Mg²⁺, SO₄²⁺ (as surface water pollutants).
- Establishing the Moldovan regulations (presented in Annex A) and the World Bank EHS general guidelines that impose limit values for the mentioned pollutants, in ambient air, water, residential areas and soil;
- Measurements of air pollutants concentrations, noise levels, soil and surface water contaminations in the vicinity of the working sites;
- Comparison of the measurements results for the specified pollutants with the regulated limits such as:
 - Limit values
 - Alert thresholds for sensible utilities (residential areas or agriculture areas)
 - Intervention thresholds for sensible utilities (residential areas or agriculture areas).
- Proposal of corrective actions in order to mitigate the environmental issues identified on the working sites.
- Issuing a hard copy report.

4.3.3 Reporting

A monitoring report should be produced on a quarterly basis. The proposed structure is:

- General data
- Methodology
 - Investigations over environmental media (noise, air, soil, water, vegetation)
 - Assessment criteria
- Results of the site investigation.
- Management of construction materials, of deleterious substances and of waste
- Conclusions and recommendations
 - Corrective actions required to mitigate the environmental issues

4.4. Special Studies

Not applicable. There is no need for special studies.

5. SCHEDULE

Project Implementation Plan from SRA suggests contract signature around April/May 2008. Duration 24 months. No more detail will be available until appointment of a contractor(s) and agreement on his working schedules and planning.

6. INSTITUTIONAL ARRANGEMENTS

Adherence of construction workers to environmental requirements is a major aspect of environmental protection in road projects. This adherence is best achieved through training and contract stipulations, as outlined in tender documents. Monitoring and enforcement of the requirements are necessary aspects of the process.

Contractor will be requested to present a Quality Management System, and appoint a QA/QC Director and an Environmental, Health & Safety Officer, both with relevant training and experience in the field. Contractor shall provide to all employees general environmental awareness training, as part of their standard environmental, health & safety training.

In line internal communication should include reporting of any incident to the Environmental, Health & Safety Officer, QA/QC Director and Site Manager. The Owner's Engineer would be presented with a written report on any incident. SRA Environmental Coordinator and other relevant authorities shall be informed, if the case.

A monitoring report should be presented on a quarterly basis to the Owner's Engineer that would hand-over a copy of this report to the SRA Environmental Coordinator, in order to have an independent perspective on the environmental performance of the Contractor. Corrective Action Request or Non-Conformity Report might be issued and Competent Environmental Protection Authorities informed, if the case.

Any problem requiring immediate attention should be noted by monitors and brought IMMEDIATELY to the attention of the Owner's Engineer who is responsible for ensuring that the Contractor complies with the contract.

7. CONSULTATION WITH LOCAL NGOs AND PROJECT-AFFECTED GROUPS

This EMP was prepared in conformity with national and WB requirements. Both English and Romanian versions were checked and published on SRA webpage www.asd.md, were delivered to more than 300 NGOs and individuals by Regional Environmental Center mailing list and posted on <http://www.rec.md>; Environmental news portal www.greenmedia.md (<http://ro.greenmedia.md/842-842.html>), link with EMP at <http://www.salvaeco.org/>. We waited for comments and suggestions on EMP during public disclosure process till the end of February 2008.

The comments and suggestions were from the leader of Ecological Movement of Moldova, Chisinau Branch, Mr. V. Garaba. Below are the key remarks with replies:

Comment 1: It is not clear what will be the proportion of the reclamation of trees and bushes along the road reconstruction areas. Also, it is not known the type of the trees that will be necessary to replace the removed forested vegetation. I think it will be necessary for each project to conduct a preliminary estimation of the volume and the cost of works with identification of the nurseries from which the seedling material will be purchased.

A – During project activities will not be affected any state protected zones. It is not anticipated any deforestations of forested vegetation. The land on which the project will be implemented is the property of State. The removal of trees and bushes (small number) might occur in some isolated cases, along the road protection areas, on which the consolidation works of the landslides which are presented on the cross-sections of the management plans will be executed. Removal of trees will be coordinated with ecological services. After the construction is finished the vegetation cover will be restored. This will be the duty of the construction company and we don't know from which nursery they will purchase the seedling material, probably they will announce a tender for that.

Comment 2: Since during reconstruction of the roads the transport access will be limited, will be there any detour roads? Will be good to know what will be the quality of these new roads (country road, what type of pavement will be, etc)? It is necessary also to calculate how much will increase the length of the road, how much fuel will be additionally used, what will be the volume of emission in the atmosphere, what is the modality to recover the environmental damage and people involved in traffic.

A – It is not expected to close any portions of the road totally; the traffic will be oriented on single lane. The project is evaluated as category C, with non-significant impacts and doesn't require a full Environmental Impact Assessment. Therefore your suggestions/comments may be in the case when the traffic is closed and it is necessary to establish a long detour, which is not expected in these sub-projects. An Environmental Impact Assessment is demanded by a competitive authority (in this case the Ministry of Ecology and Natural Resources). The Ministry, by taking into

consideration the environmental documentation submitted for analysis and during management plan discussions, considered that it is not necessary to conduct an EIA study. With the official letter from the State Ecological Inspectorate (nr.1500 on 22.10.2007) it was mentioned that for such sub-projects it is necessary to elaborate only an Environmental Management Plan and not a complete/full Environmental Impact Assessment study.

Comment 3: I think it is necessary to organize public meetings with interested person to discuss the environmental plans. Before discussions it is necessary to have an independent environmental impact assessment study with impertinent analysis of environmental protection measures proposed by road authorities. I don't think that collection of suggestions and comments in digital format is sufficient to take correct conclusions/decisions regarding the impact assessment of the project activities.

A- Taking into consideration the minor impact during proposed activities, the present discussion form was agreed inclusively with the financing bank. Because of only a few comments, proposals and objections on EMP we consider that it is unnecessary to have public meetings on EMP discussions. If you consider that it is insufficient to present suggestions in digital format, please send your comments in written format to ASD. We assure you that your comments will be treated with full consideration regardless the format you have decided to send.

Also we would like to inform you that in the framework of the project there were elaborated Sectoral Environmental Assessments by independent experts. The SEAs contain the requirements for implementation of sub-project activities by SRA and construction companies. SEA is one of the most important documents guiding all environmental activities during project implementation. SRA and the State Ecological Inspectorate will monitor/supervise the implementation of the project.

ANNEX A – LEGAL AND REGULATORY FRAMEWORK FOR ENVIRONMENTAL AND ROAD SECTOR

RoM environmental and road sector policy and regulatory frameworks were analyzed in the SEA in terms of (i) legislation and (ii) specific by-law regulations (standards, requirements, rules). While compiling the following list, emphasis was placed on relevant EIA requirements and procedures - valid at the time present document was drafted, however, several other primary and secondary regulations might pose interest in terms of environmental legislation and performance - during execution. The list therefore is not meant to be relied on entirely, and for a correct and complete understanding of the whole legal framework, it might be necessary for the Contractor to hire an Environmental, Health & Safety Officer with good knowledge of the Moldavian code of law.

1. Basic legislation (Laws)

- Law on Environmental Protection, 1993, amended in 1997
- Water Code, 1993, revised and amended in 2003
- Land Code, 1991 revised in 1993, 1996, 1997, 1998, 1999, 2000
- Forest Code, 1996
- Law on Air Protection, 1997
- The Law on Regime of Harmful Products and Substances, 1997, amended in 2002
- Law on Wastes of Production and Consumption, 1997
- Law on State Land-Tenure Regulations, State Land Survey and Land Monitoring, 1992
- Law on the Payment for Pollution of the Environment, 1998.
- Law on Sanitary-Epidemiological Protection of the Population, 1993, amended in 1996, 2004.
- Law on Permitting of Certain Kinds of Activities, 2001
- Regulation on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters, 2000.
- Law on Quality in Construction, 1996.
- Law on Roads, 1995
- Law on Transport, 1997
- Motor Transport Code, 1998

2. Government Decision, Instructions, Standards

- Government Decision on Approval and Introducing of the State Sanitary-Epidemiological Rules and Standards for enterprises producing asphalt-concrete mixtures, 2006.

- Government Decision on increasing of exploitation safety of buildings and constructions, installations and pipe-lines which are sources of a heightened risk, 1996.
- Government Decision on verifying of projects and executing of construction works, technical expertise of projects and constructions, 1996..
- Government Decision on state sanitary-epidemiological supervision in the Republic of Moldova, 1995
- Sanitary Rules on atmospheric air pollution prevention in localities, 1998.
- State Standard GOST 17.2.3.01-86. Nature protection. Atmosphere. Air quality control regulations for settlements.
- Temporal Construction Norms 9-79. Guide for environment and land tenure protection measures for reconstruction of motor roads in Moldova, 1979.
- Construction Rules D.02.01-96. Road and bridges: Requirements for environmental protection during design, construction, rehabilitation, repair and maintenance of roads and bridges, 1996.
- Temporary Construction Norms 18-74. Instructions on architectural and landscape design of roads, 1975.
- Construction Norms and Rules 2.05.02-85. Motor roads.
- Construction Norms and Rules 3.06.03-85. Motor roads.