

Environmental Monitoring Report

Annual Report
January 2013

**GEO: Sustainable Urban Transport Investment
Program — Tranche 1**
(Rehabilitation and Reconstruction of Secondary
Road Zugdidi-Jvari-Mestia-Lasdili KM.74-KM.80,
KM.89, KM.91-103 and KM.21-KM.125)

Prepared by the Municipal Development Fund of Georgia for the Government of Georgia and
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**SUSTAINABLE URBAN TRANSPORT INVESTMENT PROGRAM
TRANCHE 1**

Annual Environmental Monitoring Report

**Project: Rehabilitation and Reconstruction of Secondary Road Zugdidi-Jvari-Mestia-
Lasdili KM.74– KM.80, KM.89, KM.91 - 103 and KM.21-KM.125**

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ABBREVIATIONS

ADB	Asian Development Bank
EA	Executing Agency
EARF	Environmental Assessment and Review Framework
EIA	Environmental Impact Assessment
EIP	Environmental Impact Permit
EMP	Environmental Management Plan
GoG	Government of Georgia
SUTIP	Georgian Sustainable Urban Transport Investment Program
IA	Implementing Agency
IEE	Initial Environmental Examination
MDF	Municipal Development Fund
MoEP	Ministry of Environmental Protection
MoRDI	Ministry of Regional Development & Infrastructure

I. INTRODUCTION

Upgrading and improvement of local transport and transport-related infrastructure plays a significant role in the development of Georgia infrastructure. To this effect a number of important activities have been implemented and financed from the budget of Georgia and from other sources. Development of transport and related infrastructure plays an important role in improvement of Georgia's urban infrastructure. Recently several significant programs, financed through state budget, loans and grants, have been implemented with this regard. Notwithstanding the efforts undertaken so far several problems need to be solved regarding development of transport infrastructure.

The project was implemented under tranche 1 of Sustainable Urban Transport Investment program. Program aims efficient, reliable and affordable urban infrastructure development and service improvement. In effect, urban transport service will be improved, and the level of different types of public and social services will be increased.

Rehabilitation of Zugdidi-Jvari-Mestia-Lasdili motor road was initiated by the Department of Motor Roads of Georgia. The road is of national significance and connects upper Svaneti region with Tbilisi-Senaki-Leselidze main motor road. The road needed significant rehabilitation in order to restore its operational capacity and insurance of traffic safety. Certain sections and infrastructure facilities of the road needed significant reconstruction.

The secondary road Zugdidi-Jvari-Mestia-Lasdili links the villages located in Zeda Svaneti region, Daba Mestia and Mestia with the region Zugdidi as well as with the trunk road Tbilisi-Senaki-Leselidze, which is the main road in the region. It should be noted that the present project aims to significantly contribute to the socio-economic development of Zeda Svaneti region and facilitate development of tourism infrastructure.

Presented project is one of various projects backed by international donor organizations to be implemented by the Municipal Development fund (MDF).

The Municipal Development Fund of Georgia (MDF) is a legal entity under Public Law. Its objectives are to facilitate institutional and financial capacity building of the local municipalities, invest in the development of local infrastructure and services and improve economic and social services to the local communities.

The presented investment project has been implemented under SUTIP tranche 1 and envisaged reconstruction/rehabilitation of the following four sections of Zugdidi-Jvari-Mestia-Lasdili motorway:

- 1) Section 1 – motorway section from km 74 to 80;
- 2) Section 2 – demolition of the existing balcony (260 m long) at km 89 and construction of a new tunnel instead;
- 3) Section 3 - from km 91 to 203 of the motorway;
- 4) Section 4 – from km 121 to km 125 of the motorway.

The following subprojects were financed under Zugdidi-Jvari-Mestia-Lasdili motorway reconstruction/rehabilitation project:

Subproject 1 - contract # P42414-ICB-1.01-L1: Rehabilitation of section km 74 – km 80 of the Secondary Road Zugdidi-Jvari-Mestia-Lasdili

The rehabilitated section is located in Mestia, mainly on uninhabited area. The project section starts at PK 73+200 of Zugdidi-Jvari-Mestia- Lasdili road corresponding the PK 0+00. The end section is PK 80+200 corresponding with project PK 70+00.

The works covered preparatory works: repair and cleaning of culverts, construction of new culverts, repair of road pavements and bridge PK 68+00, repair and construction of retaining walls.

Subproject 2 - P42414-ICB-1.01-L2: Reconstruction of section km 89 (Tunnel and Gallery) of the Secondary Road Zugdidi-Jvari-Mestia-Lasdili

This section of a road was characterized with intensive rock falls (on the total length of balcony) and snow avalanches.

Reconstruction of this section included the construction of tunnel and gallery against snow slide with length 84 m.

For the transportation safety tunnel on this section of the road has been considered. The length of the project tunnel was 260 m.

Blasting works generally were done by specialized authorities and team.

Subproject 3 - P42414-ICB-1.01-L3: Reconstruction of section km 91- km 103 of the Secondary Road Zugdidi-Jvari-Mestia-Lasdili

Design considered restoration of the road bed on separate sections of the rehabilitated road with construction of retaining walls by gabion boxes. Repair of the existing retaining walls had done as well. Walls repair included rising in height, filling with stones and construction of reinforced concrete casing.

In total design considered:

- Gabion lower retaining walls –589/2738 linear m/m³;
- Gabion upper retaining walls–62/275 linear m/m³;
- Gravity gabion walls – 101/1702.5 linear m/m³;
- Repair of the existing concrete retaining walls– 32/1005 u/linear m;

The following works were performed immediately upon the completion of preparatory works: repair and cleaning of culverts, construction of new culverts, repair of bridges, repair and construction of gabion retaining walls.

Blasting of 63905 m³ rocky soil (31^a, 31^g, 28^b) was required on the road Zugdidi-Jvari-Mestia-Lasdili km 91-km 103.

Subproject 4 - P42414-ICB-1.01-L4: Reconstruction of section km 121-km 125 of the Secondary Road Zugdidi-Jvari-Mestia-Lasdili

The rehabilitated section km 121-km 125 (section I) with the length of 5.14 km of the road is located in Mestia, mainly on uninhabited area. Along the project section the village Becho is located, at 23 km the road junction is located directing the way to the villages Magarduli, Lezgara, Tskhumari and etc.

Construction of new road pavement instead of heavily damaged asphalt-concrete pavement was stipulated under the present project

9 reinforced concrete pipe culvert and one box-culver 1.0x1.0 s from 16 had been repaired.

7 new box-culverts of 1x1.5 m had been constructed under the present design.

At 121 km of the rehabilitation road PK 203+40 crosses the river Dolra bridge. Design considered bridge repair, in proper: total removal of bridge deck and construction of new one, replacement of steel railings, sidewalk blocks, movement joints and pavement.

Repair of 17 existing down retaining walls had been done under the project. The total length of walls is 659 L.m.

Blasting of 19770 m³ rocky soil was required on the road Zugdidi-Jvari-Mestia-Lasdili km 121-km 125.

Contract-1: The construction works under Contract 1, had started on 17th of January, 2011 and had completed on 17th of September, 2011 The proposed Environmental Monitoring Report is prepared considering the hole time period of subproject implementation.

Contract-2: The construction works under Contract 2, had started on 28th of January, 2011 and had completed on 1st of February, 2012 The proposed Environmental Monitoring Report is prepared considering the hole time period of subproject implementation.

Contract-3: The construction works under Contract 3, had started on 27th of January, 2011 and had completed on 1st of February, 2012 The proposed Environmental Monitoring Report is prepared considering the hole time period of subproject implementation.

Contract-4: The construction works under Contract 1, had started on 2nd of March, 2011 and had completed on 15th of October, 2011 The proposed Environmental Monitoring Report is prepared considering the hole time period of subproject implementation

All environmental procedures were provided in compliance with Environmental and Social Requirements of the ADB and Georgian environmental legislation. The environmental categorization of project was conducted using ADB's Safeguard Policy and Environmental Guidelines. The project was classified as category B, the required Environmental Impact Assessment was conducted, and the Initial Environmental Examination (IEE) including EMP was prepared. According to the Law on Environmental Impact Permits (EIP) the project didn't require Environmental Impact Assessment, preparation of EIA report and obtaining of environmental impact permit.

1. The Project's Environmental Impact Monitoring and Mitigation was carried out in accordance with the Environmental Management Plans prepared by the MDF/Consultant for current project. The construction activities affecting the environment were as follows:

1. Contractor's mobilization and site installation;
2. Excavation works;
3. Removal of old asphalt pavement and soil;
4. transportation of construction materials;
5. Arrangement of new drainage system, shoulders and asphalt-concrete pavements;
6. Surface water drainage during rains;
7. transportation and location of construction waste;
8. Fuel and oil lubricant spillages.

2. The following items were monitored during the implementation of the project:

1. Air Quality;
2. Noise;
3. Flora and Fauna;
4. Water Quality ;
5. waste management;
6. Loss of top soil;
7. fueling of machinery;
8. Health and safety issues;
9. Providing of living conditions for workers;
10. transportation safety;
11. Consultations with communities.

The only parameters monitored during the construction period were dust control to keep air quality at acceptable level and noise. Dust control issue was working positively to avoid complains from local residents.

3. The subproject sites were located on Government owned land. There are no protected areas, wetlands, mangroves, or estuaries. There were no land acquisition and resettlement issues involved. Trees, vegetation (mostly shrubs and grasses), and animals in the subproject sites were those commonly found in project areas.

The geological structure of the area was stable and no potential land subsidence had been occurred.

The MDF staff, particularly environmental specialists, has been involved in the monitoring of implementation of the environmental mitigation measures specified in the EMPs. The environmental specialists were carrying out environmental monitoring in accordance with the plans and schedules outlined in the EMPs and the schedule for conducting of monitoring approved by MDF management.

Environmental Management Team

4. An environmental protection analysis and resettlement division existing under MDF consists of Mr. Alexandre Dumbadze, Head of the division as Manager and Ms. Nino Patarashvili, Mr. David Baidurashvili, Mr. Nikoloz Soselia and Ms. Ekaterine Mumladze as

Environment and Resettlement Specialists of division. The responsible person on supervision of EMPs implementation from MDF under reconstruction/rehabilitation project of Zugdidi-Jvari-Mestia-Lasdili motorway SUTIP tranche 1 was Mr. Nikoloz Soselia - specialist of environmental protection analysis and resettlement division.

5. In order to supervise the progress of the Project, MDF hired the supervisory company - Joint Venture of Kocks Consult GmbH (Germany), DMEC Seoul (Korea) and Design & Consulting Company “BT” (Georgia) in August of 2011. In accordance with the contract, the company was also responsible on environmental monitoring of the sub-project.

Supervisors of MDF were undertaking daily monitoring of construction activities and environmental management on the site.

6. The following works were performed by the environmental management team:

- Explaining the Environmental Management Plan (EMP) to the Contractors, the site staff, the supervisors and other relevant personnel;
- On-site supervision of construction activities;
- Monitoring and implementation of the EMP;
- Ensuring that the contractor understands what was to be done to rectify and address any issues identified through monitoring.

Project Organization

Project organization for the awarded contracts listed above is given in the table below.

Contract #	Employer	Contractor
Contract-1 (P42414-ICB-1.01-L1)	MDF	Ltd Zimo
Contract -2 (P42414-ICB-1.01-L2)	MDF	LTD Sani
Contract -2 (P42414-ICB-1.01-L3)	MDF	JSC Arkeopolisi
Contract -2 (P42414-ICB-1.01-L4)	MDF	JV Enguri 2006 LTD and Arkeopolisi JSC

II. ENVIRONMENTAL MONITORING

The MDF staff has been conducting periodic unannounced visits to the project site in order to check the current situation on-site and consultations with local communities. If deficiencies were found the contractor was being warned and assigned to remedy these defects in due time. The major deviations during construction works were waste mismanagement, non-use of uniforms and safety gears, and incorrect application of machinery (incorrect fueling and transportation of construction materials). The environmental monitoring checklists have been signed at MDF.

The supervisory company had submitted filled monthly questionnaires on inspection of environmental impact for last four months of 2011.

During the project implementation no environmental issues or complaints were received from the local residents.

7. Within the project implementation period the contractors monitored and addressed the issue of air quality, industrial and construction waste disposal, noise, industrial and Health and safety issues safety during fueling of machinery

Air quality

8. Construction materials were provided to the site when required. Speedy completion of work and proper site clearance after completion were ensured. Wheels and undercarriage of haul trucks were washed prior to leaving construction site.

9. In order to limit soil disturbance, the access to the site was limited to construction workers and the site was fenced.

21. Dust was controlled through watering the roads where driving can easily generate dust. Excavated mounds of soil were damped down by water spray. Tarpaulins were used to cover loose materials that are transported to and from the site by track.

22. Dust generation was controlled while unloading the loose material at the site by sprinkling water inside barricaded area.

23. Regular and clean maintenance of the temporary labor camps was ensured.

Noise

24. The Contractor had employed practical means to minimize noise resulting from construction work. The plan of transportation routes were agreed with Municipality and Police. Tarpaulins were used to cover loose material that was transported to and from the site by truck. Wheels and undercarriage of haul trucks were cleaned.

25. Drivers were informed to limit speed 20-25 KMPH to avoid use of horn in populated areas. Local population was informed about project works. No nighttime activities took place.

Flora and Fauna

During construction works wasn't observed serious negative impacts on flora and fauna.

Water Quality

During construction works wasn't observed the cases of sub-soil and surface water pollution.

Loss of top soil

28. No topsoil was identified and subsequently stripped at the construction site within the reporting period.

Fueling of machinery

Fueling of machinery was provided through mobile and fuelling vehicles.

Health and safety issues

Personnel were provided by health and personal safety equipments.

Providing of living conditions for workers;

Necessary living conditions for workers were provided by the Contractor in living and on-site camps: Proper waste management, pollution prevention from storages; proper organization of fueling.

Transportation safety

During civil works construction sites were equipped with transportation and safety traffic signs.

Consultations with communities

To avoid any impacts on local communities the consultations with local communities were conducted during project implementation.

III. ENVIRONMENTAL MANAGEMENT

Site Inspections

29. The Contractor's and MDF field inspectors performed daily site visits to the project sites. Environmental specialists of MDF and supervisory company visited the project sites minimum once a month.

Reporting

30. The contractor supervisory company has submitted filled monthly questionnaires on inspection of environmental impact to the MDF/environmental management team.

Corrective Action Plans

31. The corrective actions during the project implementation period of January 2011 – February 2012 are presented below:

Subproject 1: Rehabilitation of section km 74 – km 80 of the Secondary Road Zugdidi-Jvari-Mestia-Lasdili

During monitorings in 2011.04.27 and 2011.05.23 contractor was issued a warning concerning road signs (installing of road signs on construction site, camps and access roads).MDF supervisor was informed about all the above-mentioned to take relevant measures. During monitoring in 2011.06.27 was observed the same violation. First Deputy of Executive Director of MDF was notified about the above-mentioned. Her had a meeting with contractor and issued a strict warning to avoid the similar cases.Due to 2011.07.26 monitoring contractor took into consideration issued remarks and provided certain section with road signs.

Subproject 2: Reconstruction of section km 89 (Tunnel and Gallery) of the Secondary Road Zugdidi-Jvari-Mestia-Lasdili

During monitoring in 2011.04.27 appeared, that certain part of machinery were in defective condition, namely, oil was leaking. Also, there was a problem with demolition waste management and the constructor was issued a warning concerning this issue. On the basis of 11.05.23 monitoring constructor repaired the machinery, but couldn't arrange the problem with demolition waste. Moreover, there weren't enough number of road signs and they weren't installed in a proper way. MDF supervisor was informed concerning the above-mentioned. Constructor took into account 2011.06.27 monitoring remarks, but couldn't solve the problem with installation of road signs.

Pursuant to 2011.07.25 monitoring, contractor installed road signs on the site, but during monitoring of 2011.08.30 still appeared the same deficiencies. It was proved that closed trucks weren't used for transportation of construction materials and waste. MDF supervisor and L.L.C."Sani" representatives were informed about the above-mentioned and they were asked to improve the situation.

In 2011.09.28 it was obvious that contractor remedied part of defects, but transportation of construction materials with open trucks was still noticed. 2011.10.25 monitoring proved that materials has been transported with open trucks. Contractor took into account the rest of remarks. MDF supervisor was informed about the above-mentioned issue again and was asked to avoid similar cases.

Subproject 3: Reconstruction of section km 91- km 103 of the Secondary Road Zugdidi-Jvari-Mestia-Lasdili "

During 2011.04.28 monitoring appeared, that certain part of machinery were in defective condition, namely, oil was leaking. Insulator wasn't arranged under the fuel reservoir that was set for machinery supply and there was no barrier around it. The site wasn't provided with warning signs and contractor couldn't present license for excavation of borrow area on site. Contractor was issued a warning and time to remedy defects.

During 2011.05.23 monitoring appeared, that concrete area was arranged around and under the fuel reservoir. But constructor didn't fulfill the requirements and didn't provide the

flanks(edges) for the mentioned reservoir. Contractor promised to repair machinery in a couple of days and remedy the defects. Contractor presented the license for excavation of borrow area during construction works, but couldn't provide the site with warning road signs. MDF supervisor was informed concerning the deficiencies.

According to 2011.07.26 monitoring, part of defects has been remedied. Drainage was installed on the arranged area around the fuel reservoir. The problem of site provision with road signs was still unsettled. MDF environment specialist and MDF engineer had a meeting with LLC "Archeopolis" representatives and asked them to take into consideration made remarks.

2011.08.30 monitoring revealed that despite arranging drainage on the area around the fuel reservoir, due to negligence, small amount of fuel was spilled. Motor car oil filters were left near the gorge. The problem with road signs was resolved partially. First Deputy of MDF General Director, who had a meeting with head of "Arceopolis" was informed concerning the aforementioned issue.

2011.09.28 monitoring revealed that the problem with road signs was solved. Fuel leakage from the reservoir has stopped, oil filters and all the similar stuff has been collected. Area was cleaned and MDF representative was given a promise to dispose waste from the territory.

2011.10.25 – there weren't enough number of warning road signs and they weren't installed in a proper way. Machinery repair waste wasn't disposed in the vicinity of construction area, oil filters and all the similar stuff collected during the previous monitoring hasn't been disposed from the camp area during 1 month.

Subproject 4: Reconstruction of section km 121-km 125 of the Secondary Road Zugdidi-Jvari-Mestia-Lasdili

2011.03.10 - contractor couldn't present license for excavation of borrow area on site. It should be arranged area around petrol filling appliance, namely arranging barrier and concrete bottom for preventing fuel leakage. Contractor was notified about the above-mentioned.

According to 2011.04.28 monitoring, the defects revealed during the previous monitoring hasn't been remedied and MDF supervisor and head of district were notified regarding the above-mentioned issue.

Due to 2011.05.24 monitoring, constructor kept the promise and presented all natural resource utilization license copies, also sorted out the problem with fuel filling appliance (arranging the flanks/edges are left), but couldn't provide the site with road signs. MDF supervisor and representatives of LLC joint enterprise "Enguri" were notified concerning the above-mentioned.

Due to 2011.06.27 monitoring, constructor partly provided the site with road signs, but didn't keep the promise and didn't arrange concrete flanks/edges to the concrete casted around the fuel filling appliance. Contractor was sent a notification and MDF supervisor was informed about all the above-mentioned.

Due to 2011.07.26 monitoring constructor kept a promise and arranged concrete flanks/edges to the concrete casted around the fuel filling appliance. The problem with road signs provision was partly resolved, but the number of road signs are not enough.

2011.08.30 - the situation is finally improved.

Consultation and Complaints

Periodically consultations with local communities were conducted. No complaints were received during the project implementation period.

ANNEX A: Implementation Report on the EIA/IEE Mitigation Requirements

No	Issue	Location	Recommended Measures	Implementation/ Compliances	Comments
Construction					
	<p>Erosion from road cuts and fills and sedimentation of natural drainage ways.</p> <p>Nature of impact: long-term.</p> <p>Change of relief, drainage patterns, land clearance, may cause gradual but stable intensification of erosion</p>	<p>Construction site</p> <p>RoW</p>	<p>Installation of long-term drainage systems and anti-erosion structures.</p> <ul style="list-style-type: none"> • reinstatement of relief, soil and vegetation cover • Installation of long-term drainage system and permanent monitoring. • Installation of sedimentation basins, seeding or planting of erodible surfaces as soon as possible • Increase the number of drain outlets. • Place drain outlets so as to avoid cascade effect. • Line receiving surface with stones, concrete. • Long-term monitoring and maintenance 	<p>Mitigation measures have been daily implemented.</p>	<p>Satisfactory</p>
	<p>Erosion stimulated from fresh road cuts and fills and temporary sedimentation of natural drainage ways.</p> <p>Nature of impact: immediate;</p> <p>Fresh road cuts may immediately trigger intensive erosion during construction and drastic increase of sedimentation</p>	<p>Construction site</p> <p>RoW</p>	<p>Mitigation strategy: prevention through implementing temporary anti-erosion measures – temporary drainage, biomatting or geotextile cover, berms etc.</p> <ul style="list-style-type: none"> • Limitation of earth moving to dry periods. • Protection of most susceptible soil surfaces with mulch. • Protection of drainage channels with berms, straw or fabric barriers. • Installation of sedimentation basins 	<p>If needed, mitigation measures have been implemented during construction works.</p>	<p>Satisfactory</p>
	<p>Erosion of lands below the road bed receiving concentrated outflow from covered or open drains</p>	<p>Construction site</p>	<ul style="list-style-type: none"> • Increase the number of drain outlets. • Place drain outlets to avoid cascade effect. • Line receiving surface with stones, concrete. 	<p>If needed, mitigation measures have been implemented during construction works.</p>	<p>Satisfactory</p>

No	Issue	Location	Recommended Measures	Implementation/ Compliances	Comments
	Topsoil losses due to improper storage and handling	Construction site	<p>Topsoil Protection</p> <p>The topsoil will not be handled by Contractor when the following conditions are observed:</p> <ul style="list-style-type: none"> • The topsoil is frozen; • The site is experiencing persistent rainfall; • The topsoil is saturated; or • Handling will damage the structure of the topsoil. <ul style="list-style-type: none"> • Keep topsoil storage standards 	Due to the location where construction works were being undertaken no topsoil stripping and storage was required.	Satisfactory
	<p>Increased suspended sediment in streams affected by erosion at construction sites and fresh road cuts, fills and waste dumps. Declined water quality and increased sedimentation</p> <p>Character of impact: immediate;</p> <p>Fresh road cuts may immediately trigger intensive erosion during construction and drastic increase of sedimentation</p>	Construction site	<p>Mitigation strategy: prevention through implementing temporary anti-erosion measures – temporary drainage, temporary sediment catchments etc.</p> <ul style="list-style-type: none"> • Protect susceptible surfaces with fabric, • Establishment of retention ponds to reduce sediment loads before water enters streams 	If needed, recommended mitigation measures have been implemented during construction works.	Satisfactory
	Soil and water contamination during construction by oil, grease, fuel and paint	Construction site	<ul style="list-style-type: none"> • Collect and recycle lubricants. Store the lubricants and fuel residue in special room. Use impermeable tray for placing lubricant containers. • Avoid accidental spills through good practice. • Avoid refueling near watercourses; Ensure proper maintenance of equipment and fueling of the vehicles and 	Recommended mitigation measures have been implemented during construction works	Satisfactory

No	Issue	Location	Recommended Measures	Implementation/ Compliances	Comments
			<p>machinery.</p> <ul style="list-style-type: none"> • Check vehicles (leaking of fuel etc.) • Organize and cover material storage areas; • Isolate concrete, earthwork and other works from water courses by using sealed formwork; • Isolate wash down areas of cement and gravel trucks and other equipment from water courses by selecting areas for washing that are not free draining directly or indirectly into water courses; 		
	<p>Poor sanitation and solid waste disposal in construction camp and work sites (sewerage, sanitation, waste management)</p>	<p>Construction site</p>	<p>Provide adequately located and maintained waste disposal facilities (containers).</p> <p>Contract municipal waste operators for disposing the household waste, garbage and small amounts of nonhazardous construction waste etc.</p>	<p>Mitigation measures have been daily implemented.</p> <p>The waste disposal facilities were adequately provided at construction camps and work sites.</p>	<p>Satisfactory</p>
	<p>Construction wastes. Disposal of excess soil and rock.</p> <p>Certain part of the cut material (soil and rocks) should be disposed of</p> <p>Demolition of old pavement</p>	<p>Construction site</p> <p>Asphalt and rocks demolition area;</p> <p>Landfill</p>	<p>Assess and, if required, develop a spoil and rock disposal plan</p> <p>Provide for disposal facilities agreed with Regional Services of MoE</p> <p>Transport any further material to the nearest spoil disposal sites agreed with the regional services of MoE and/or municipal services. The main purpose is not to damage valuable landscapes or soil deposits and other ecological sensitivities. For the rock disposal licensed landfill can be used. All waste from the</p>	<p>As far as licensed landfill doesn't exist in the region, waste was disposed on the basis of verbal agreement with Municipality. None of contractors presented written consent of the Municipality.</p>	<p>Satisfactory</p>

No	Issue	Location	Recommended Measures	Implementation/ Compliances	Comments
			<p>construction site will be disposed of in accordance with the local environmental regulations and on the sites approved by the environmental authority.</p> <p>The demolished asphalt and rocks should be reused.</p>		
	<p>Noise pollution from vehicle operation during construction in the populated areas traversed by the highway, Local noise.</p>	<p>Construction site</p>	<p>Install and maintain mufflers on equipment.</p> <p>Routine maintenance shall be done to a high standard to ensure that vehicles are safe and that emissions and noise are minimized. All the plants used on site will be regularly maintained so as to be in good working order at all times to minimize noise.</p> <p>Prohibit night works near the settlements</p>	<p>Transportation routes were planned in consultation with Municipality and Police.</p> <p>No parking is allowed on the roads, to avoid disturbing traffic movement.</p> <p>Information on works was provided to local residents prior to start of works.</p> <p>No nighttime transportation and construction activities were carried out.</p>	<p>Satisfactory</p>
	<p>Air pollution from vehicle operations during construction in the populated areas traversed by the highway, Local dust</p>	<p>Construction site Access roads</p>	<ul style="list-style-type: none"> • Require adherence to engine maintenance schedules and standards (or use alternative fuels) to reduce air pollution. • Periodically water down or lightly oil temporary roads. • Enhance public transportation and traffic management capability. <p>Cover trucks carrying cement and/or gravel;</p> <p>Wet or cover trucks carrying</p>	<p>Tarpaulins were used to cover loose material that was transported to and from the site by trucks.</p> <p>Dust generation was controlled while unloading the loose material at the</p>	<p>Satisfactory</p>

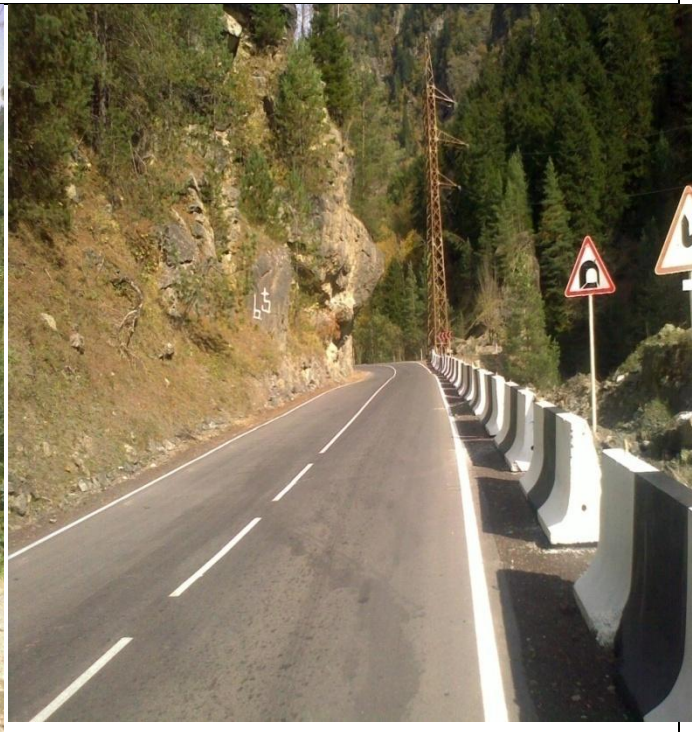
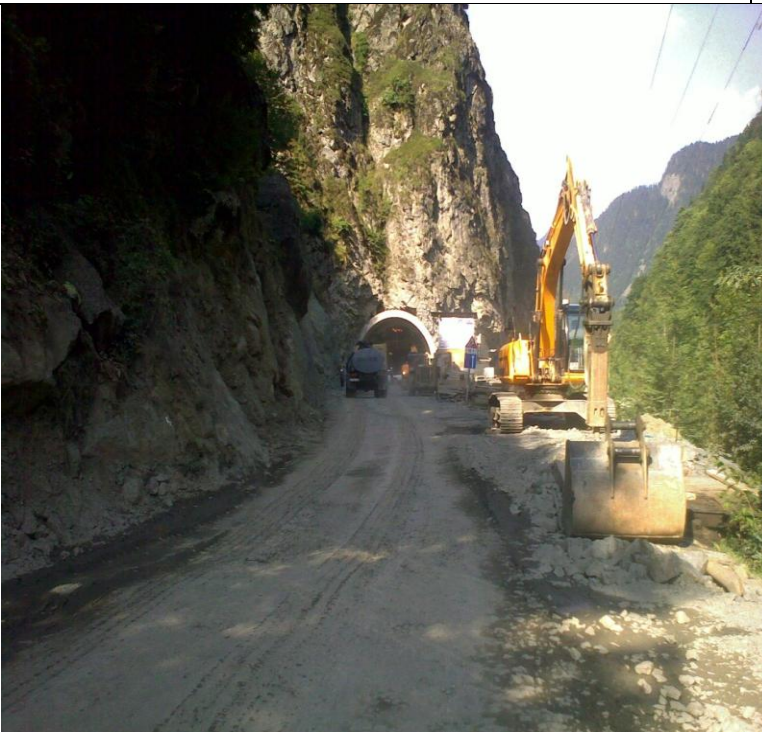
No	Issue	Location	Recommended Measures	Implementation/ Compliances	Comments
			stone/ sand/ gravel; Haul materials in off peak traffic hours.	site by sprinkling water. The dust was controlled through watering down the roads in the populated area where driving can easily generate dust. Access to site was restricted.	
	Infrastructure. The main infrastructure elements that could be affected are the power transmission lines, water supply systems and irrigation pipes and channels.	Construction site	Protection of infrastructure. Replace the affected infrastructure elements Permanent monitoring during construction. Full reinstatement in case of damage	No damages of main infrastructure elements have been observed during civil works.	Satisfactory
	Construction Camp Site The potential impacts related to the construction and operation of the camp can be summarized as follows: <ul style="list-style-type: none">• Clearance of vegetation cover during camp construction• Potential damage of topsoil• Contamination related to fuel storage and fuelling operations• Sewerage related contamination• Waste management	Construction site	<ul style="list-style-type: none"> • Proper waste management. • Pollution prevention strategies: proper organization of fueling, waste management; • Proper storage of topsoil 	Contractor provided workers with required accommodation. No new camps / accommodation were built to avoid impact on environment.	Satisfactory
	Creation of temporary breeding habitats for mosquito vectors of disease e.g. sunny, stagnant pools of water. Creation of stagnant	Construction site	Remove all created pools till spring-time. Reinstatement relief and landscape.	There was no need to remove the pools. The relief and landscape was restored before	Satisfactory

No	Issue	Location	Recommended Measures	Implementation/ Compliances	Comments
	water bodies in borrows pits, quarries, etc. suited to mosquito breeding and other disease vectors.			completion of construction works.	
	Health hazards by noise, air emissions and dust raised and blown by vehicles during construction activities.	Construction site; Access roads	Dust control by application of watering. Use as minimum as 2 browsers; Noise control, installation of mufflers on equipment, daytime works;	Mitigation measures have been daily implemented.	Satisfactory
	Impacts on archaeological sites and remnants	Construction site	Permanent monitoring during land clearance and excavation activities. Stoppage and suspension of construction activities in case of archaeological findings. Completion of required archaeological works before restarting construction activities. Conservation of remnants	During construction works no findings were discovered.	Satisfactory
	biological recontamination during earthworks near pest-holes of soil infections (e.g. anthrax);	Construction site	Permanent monitoring during land clearance and excavation activities. Stoppage and suspension of construction activities in case of burial site findings. Notification to the local division of Veterinary Department. Veterinary clearance before start up.	No risks of biological recontamination were observed during earth works.	Satisfactory
	Hazardous driving conditions where construction interferes with pre-existing roads	Construction site	Include in the design for proper markings and safety signs on roads, including lights. Instruct the drivers.	The proper markings and safety signs were provided on the roads during construction works. The drivers have been instructed about	Satisfactory

No	Issue	Location	Recommended Measures	Implementation/ Compliances	Comments
				transportation rules and speed limitation.	

ANNEX B: PICTURES

Rehabilitation of section km 74 – km 80 of the Secondary Road Zugdidi-Jvari-Mestia-Lasdili



Reconstruction of section km 89 (Tunnel and Gallery) of the Secondary Road Zugdidi-Jvari-Mestia-Lasdili



Reconstruction of section km 91- km 103 of the Secondary Road Zugdidi-Jvari-Mestia-Lasdili



Reconstruction of section km 91- km 103 of the Secondary Road Zugdidi-Jvari-Mestia-Lasdili



Reconstruction of section km 91- km 103 of the Secondary Road Zugdidi-Jvari-Mestia-Lasdili



Reconstruction of section km 121-km 125 of the Secondary Road Zugdidi-Jvari-Mestia-Lasdili



Reconstruction of section km 121-km 125 of the Secondary Road Zugdidi-Jvari-Mestia-Lasdili

