



SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN

# SITE-SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN

(Revision 5)

Rehabilitation Project of Dzirula - Kharagauli - Moliti - Pona - Chumateleti  
Secondary Road,  
LOT 2: Moliti – Chumateleti Section from km 24+620 to km 50+244

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**1. ABBREVIATIONS AND ACRONYMS**

<b>Abbreviation / Acronym</b>	<b>Description</b>
ADB	Asian Development Bank
EPC	Engineer, Procure, Construct
MRDI	Ministry of Regional Development and Infrastructure
RD	Roads Department
CLIENT	Ministry of Regional Development and Infrastructure(Roads Department)
CONTRACTOR	“AKKORD ” ICIC
CONTRACT	AGREEMENT made the 4th day of December, 2018, between the Roads Department of the Ministry of Regional Development and infrastructure of Georgia (hereinafter "the Employer"), of the one part. and "Akkord" ICIC
IEE	environmental impact assessment
EMP	Environmental management plan
CSC	Construction Supervision Consultant
EHS	Environment, Health and Safety
EMoP	Environmental Monitoring Plan



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### 2. INTRODUCTION

Georgia is located at the center of the East-West (between the Black Sea and the Caspian Sea) and North-South (between Russia and Turkey) transits. The road network has a great importance for the country's development which in turn implies the improvement of the roads connecting the regions and cities.

Since 2005, Georgia has revised the set of regulations and legislations/normative acts on many aspects of transport related infrastructure and services to facilitate rapid development of country's transport sector. Increased economic activity, following these implemented reforms, has led to more intensive use of the sector, mainly to international transport communications. Increased demand was noticed in all modes of international transportation, including road transport, however the improvement of overall national mobility is not as apparent as in international sections of the road network. E.g. secondary and local roads do not meet the demand of the economy.

The Kharagauli area has been identified by the Government of Georgia as a region that is isolated due to the poor transport connections. The road is no longer fully and efficiently functioning neither as a local road nor as a strategic alternative road for long distance transit traffic.

An implementation of the rehabilitation project for local importance road is planned on the initiative of the Government of Georgia and by the financial assistance of the Asian Development Bank, in particular, it is planned the rehabilitation of 50 km section of the road, that will start in the West of E60 road from Dzirula, Zestafoni region, passing Kharagauli, Moliti, Pona and ending in Chumateleti, where will be again connected to E 60 road at the East.

The rehabilitation project of Dzirula-Kharagauli-Moliti-Fonna-Chumateti road will improve the internal connection and reliability of transport network and create an alternate route in relation to E60 main road and railway. As a result of the road rehabilitation and improvement, the transport network of the country, the road communication and reliability will be improved. Because the road represents the alternative of the route and railroad, this will increase the mobility of local population, promote the development of local production, improve the transportation conditions of passengers, promote the road and railway integration, will facilitate in raising of investments for this area and tourism development as well, as visitors will be able to enter Borjomi-Kharagauli National Park via this road (under construction) and not any more via the damaged road at South entrance. It also will improve the mobility of municipality population.

Due to project implementation plans, the road is divided into 2 sections, each of approximately 25 km. The first Lot represents the 25,62km section from Moliti to Chumateleti. The second Lot represents the 25,62km section from Moliti to Chumateleti which will be done by ICIC Company "Akkord".



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According to the Presidential Order N287 of 27 May 2011, the Dzirula-Kharagauli-Multi-Puna-Chumatieti road (SH-55) is classified as the road of interstate importance. In accordance with the classification defined by legislation, the roads belong to interstate ones if they interconnect the capital cities or autonomous republics or regional administrative centers or connect important industrial and cultural centers or an international importance mainroads.

The road construction project has undertaken the Environmental Impact Assessment Procedure, discussing the results of expected impacts on Environment and its components (due to road construction-rehabilitation) and their mitigation measures.

### 3. PROJECT OVERVIEW

This SEMP prepared for LOT2 Multi-Pona-Chumatieti roadsection (km 24+620 to km 50+244).

The project road is 50.4 km west to east secondary road, which starts from E60 junction in Dzirula, Zestafoni municipality and ends at a connection of E60 in Chumateleti, which belongs to Surami municipality. The most part of the project road is within Imereti Region with a few kilometers within Shida Kartli Region, in a gorge encircled by mountains both the northern and southern sides. After implementation of the rehabilitation, the road will enhance the connection possibility to a number of towns and villages located at the foothills of the mountains and can act as an alternate route to parallel segments of E-60 main road.

The project road will connect the Kharagauli municipality to E60 main road/highway, which represents the country's main international transport artery. In the past, the project road was a part of the highway connecting East Georgia to West one, until the construction of the new road section and tunnel between Dzirula and Chumateleti was not completed in 1982, but even after that, the project road served as the alternative route of the East-West Transport Corridor.

The project road starts at the west end with an elevation of around 210 m, with its peak at 950 m at km 45 after Phona village and connects again at E60 in Chumateleti at elevation 720 m. From west to east the road traverses primarily rural and agricultural setting, with the main urban town of Kharagauli at km 11.

The road has significantly deteriorated during the last 10 years and currently less than 100 vehicles per day moving in some sections east of Kharagauli. Many sections are now irreparable and impassable during rain and snow. The road can no longer fully and efficiently function in neither as a local road nor as a strategic alternative route for traffic. As a result, the population of Kharagauli municipality has to walk long distances to use the railway station, which is the only regular transport for winter season. 30% of the population is unemployed. The rehabilitation of the road infrastructure is one of the most important demands for the local society.

The following measures are planned within the road rehabilitation works:



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-Rehabilitation of the project road and arrangement of the pavement from Dzurila up to Moliti in accordance with the State standards of Georgian roads (SST Roads 2009), geometric and structural requirements according to the speed of 40km.

- Replacing or repair of 13 bridges,
- Arrangement of 101 round culverts/pipes and other drainage structures.
- Construction of roadside culverts and other drainage facilities
- Arrangement of retaining walls and river bank protection structures as required.
- Set up appropriate road signs and marks.

#### 4. OVERVIEW OF THE SEMP

During the project IEE preparation likely environmental impacts of the project were identified and mitigation measures suggested corresponding to the impacts discussed within the IEE report.

The Environmental Management Plan (EMP), which is a part of IEE, is more general and broad and includes all possible impacts during the implementation of the project. Consequently, before the construction begins, the Contractor is obliged to develop a Site Specific Environmental Management Plan (SSEMP). The Company "Akkord studied all the above mentioned documents and prepared the Specific Environmental Management Plan (SEMP), to ensure maximal mitigation of potential environmental impact during construction works of Moliti-Chumateleti Project (Lot 2).

The mentioned SSEMP has been prepared by Environmental Protection Department of the Company „Akkord” and covers camp site construction and the road and bridges construction site areas. The main objective of the plan is to document, that during the implementation of the project, the environmental performance indicator will be relevant to the requirements envisaged in environmental protection documentations.

The proposed plan includes the following issues:

- Introduction & Overview of the Specific EMP
- Definition of Project Boundaries;
- Sensitive Receptors and Environmental Values;
- Construction Activities;
- Risks Assessment;
- Environmental Protection Management Measures;
- Site Plan;
- Environmental Monitoring Plan.



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The SSEMP identifies persons who will be responsible for supervising the performance of obligations given in IEE and SEMP during the construction works. It also includes a Risk Assessment matrix for area of the road with mitigation measures corresponding to specific activities. The proposed Specific EMP will be supplemented by a number of additional location specific and topic specific environmental management plans as required by the contract specification:

### Location Specific EMPs:

- Workshop Management Plan
- Concrete Batching Plant Management Plan

### Topic Specific EMPs:

- Soil Management Plan;
- Water Management Plan;
- Dust Management Plan;
- Noise & Vibration Management Plan;
- Waste Management Plan;
- Spoil Management Plan;
- Spill Prevention Management Plan;
- Borrow Pit Management Plan;
- Flora and Fauna Management Plan;
- Cultural and Archaeological Management Plan; and
- Grievance Redress Mechanism

Besides the above mentioned issues, a number of additional specific issues related to the management of environmental objects will be discussed in accordance with the specifications of contract, such as:

- Fertile Layer of Soil;
- Water Bodies;
- Dust;
- Noise and Vibration;
- Bulk rocks/embankments;



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- Spill Prevention;
- Flora and Fauna;
- Cultural and Historical Heritage Monuments
- Social Issues (Grievance Redress Mechanism

The project IEE identified likely environmental impacts of the construction of the project and suggested outline mitigation measures corresponding to the impacts both within the report and as part of the outline SEMP. The contract specification also requires numerous environmental impact mitigation activities.

The present SEMP provided below covers:

- Camp Management Plan (covering the camp area construction);
- Road and Bridge Construction Management Plan (covering the road and bridges construction site areas).

All the construction works carried out by Construction Company “Akkord” will be relevant to the Specific Environmental Management Plan and consider the regular monitoring, as described by dust, water, noise and vibration management plans.

The potential impact mitigation measures will also be undertaken to prevent the adverse impact on the environment as much as possible, and where it is impossible, the impacts should be minimized by mitigation measures. The mitigation measures given in SEMP are specifically foreseen for the site and relevant and practical as well. Each topic discusses a map, a potential impact matrix and proposed mitigation measures. The risk assessment matrix has been developed to determine the supposed additional threats and appropriate mitigation measures on each issue.

In the framework of the possibilities, the measures described in matrixes refer to the specific addresses of the attached mapping. The obligations of implementation and monitoring of mitigation measures during construction phase are described as well.

### 5. DEFINITION OF BOUNDARIES

Multi-Pona-Chumateleti road section is located in Kharagauli and Khashuri municipalites. The length of the road is 25,620 km most of which coincides with the existing road.

The road mostly goes to the West along the river Chckerimla and Dzirula. Besides, a large part of the road passes along the Georgian Railway, the rehabilitation and construction of which is currently ongoing.

The whole section of the road passes through the foothills of the Borjomi-Kharagauli National Parksurrounded by mountains.

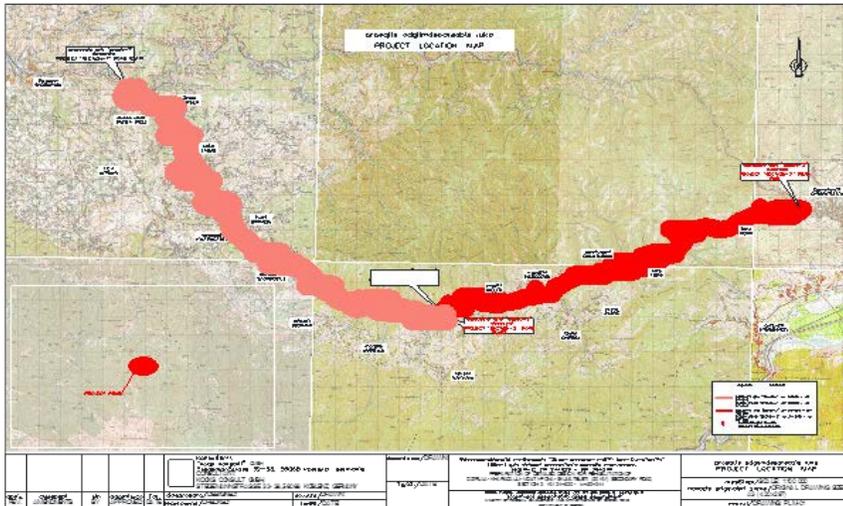
The surrounding environment of the road is represented by rural and agricultural landscapes, except Kharagauli, where the majority of the population is settled and commercial establishments are functioning.

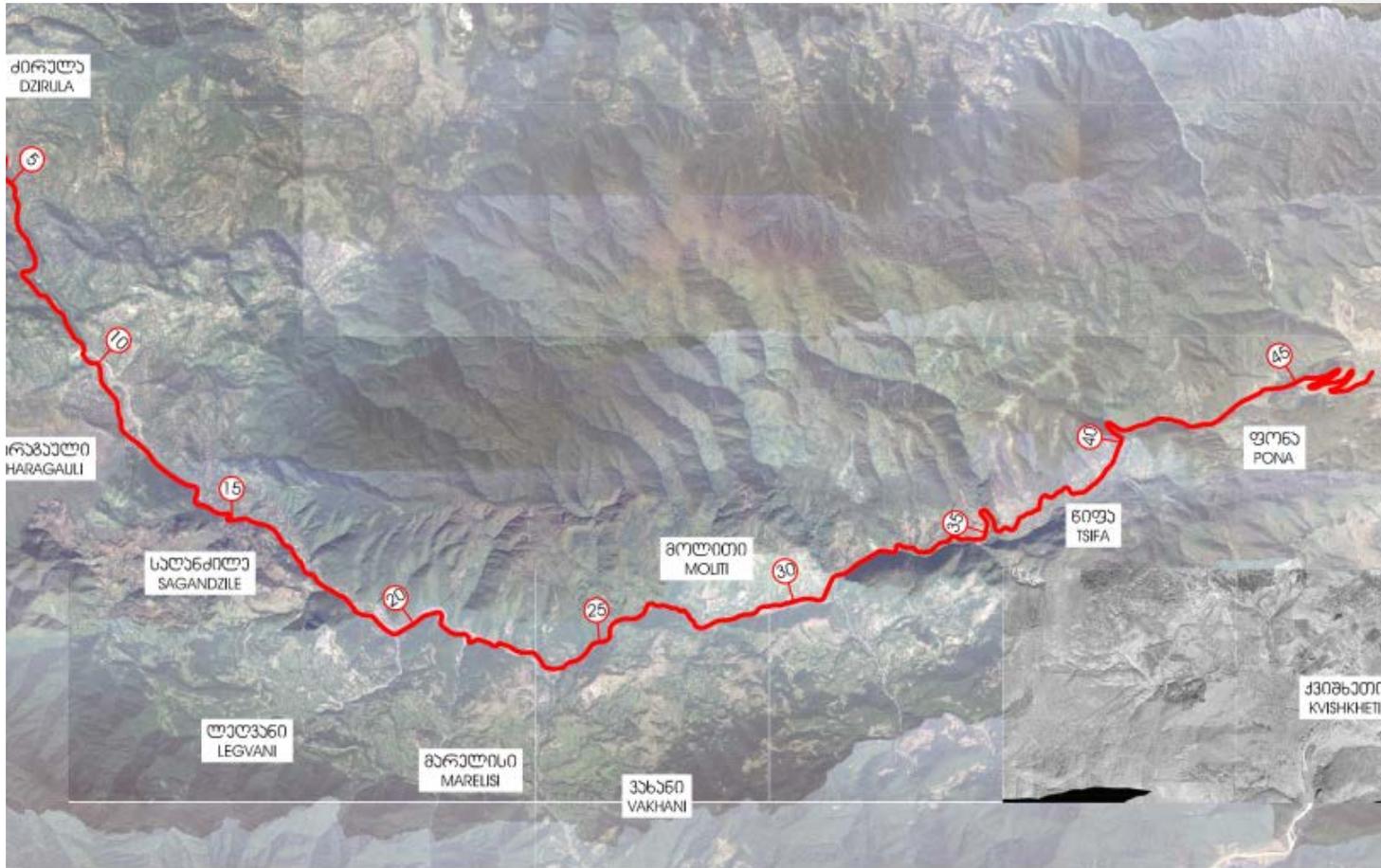
There are different communications on the existing road:

- 1) SOCAR Gas Pipeline -from km1+800 to km 12+00;
- 2) Water pipe(110mm) of the United Water Supply Company - from km11+00 to km 19+00;
- 3) Silknet owned cable – from km11+00 to km 24+620;
- 4) Power supply air lines of Energo-Pro Georgia-from 9+00 to km 19+00;

With the common decision of the owners of communications and the employer, the mentioned communications will be taken out step by step by ICIC Company”Akkord” taking into account the designs provided by the owners of the communications and technical conditions as well.

The lower sections of the road (from km 2 + 700 to km 3 + 000 on the left side and from km 2 + 500 to km 5 + 000 on the right side) are bordered by the household plots and the agricultural land plots belonging to the population; from km 0 to 2 + 500 the road is bordered by the river Dzirula and from km 2 + 500 to km 24 + 620 by the river Chkerimela and on the sections from km 0 to 150 and from km 19+000 to +22 000on the left side the road is bordered by the mountain slopes covered with the forest vegetation.





The table given below shows the geographical regions crossed by road or where the road goes nearby to them:

N	municipality	Region	Region	Location of Settlements (according road Km)	Distance from settlement
1	Moliti	Kharagauli	Imereti	Km 27-29	
2	Nebodziri			Km 30-31	0.5-2 km
3	Anrula			Km -33-34	0.2-0.5 km
4	Bejatubani			Km 36-37	0.5-2 km
5	Golatubani			Km 38-39	0.2-4 km
6	Tsipa			Km 39-40	0-0,2კმ
7	Fona	Khashuri	Shida Kartli	Km 46-47	0-0,5 კმ
8	Surami(Chumateleti)			Km 49-50	0-2 კმ

## 6. ACCESS ROADS

The access road to the construction square will be the same road the rehabilitation of which is ongoing. The road is in poor condition, which is less likely used by public transport. Due to poor condition, the usage of the road is impossible without minimal rehabilitation, what implies the filling of pits, road surface leveling and restoration of it's carrying capacity. The same road will be used for transportation of materials from quarries, as potential quarries are located nearby.

Flagman assistance will be required to maintain control on sharp turns, traffic flow and heavy equipment operation. Traffic regulation issues will be outlined by the traffic management plan.

## 7. SENSITIVE RECEPTORS AND ENVIRONMENTAL VALUES

Sensitive receptors are those where the occupants are more susceptible to the adverse effects of exposure to contaminants, pollutants and other adverse substances that the activities may generate. Sensitive receptors generally include, but are not limited to, hospitals, schools, day care facilities, elderly housing and convalescent facilities. In project section 2 (east) such facilities along the project road are:

a) Moliti Ambulatory (km 28+473) – This medical facility is located at the western edge of Moliti village and at the left hand side of the road. It is not directly along the edge of the road. A small access way leads from the road into the yard of the ambulatory. There are two doctors that regularly provide medical services – one family doctor and the other a pediatrician and assisted by 2 nurses. Currently, this medical facility can be described as in poor conditions, with no water supply and the building and fence needing repairs;

b) Moliti School (km 29+032) - This school is located 50 meters on the left side of the project road with 2-3 houses in between. Its school yard is fenced all around with a gate. The school also provides up to secondary schooling level to a student population of 71 pupils. It has a total of 30 teachers and 5 non-teaching personnel. The school has two buildings with 20 classrooms, a library and a teacher's room. Power is supplied by JSC Energo-Pro Georgia and water from the village. The students are currently served by 2 school buses to bring them to school.



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Aside from the possible impact due to noise, dust, vehicular emissions during construction and operations of the project, public safety can be a concern when trucks, equipment and construction materials are brought to the sites near these sensitive receptors. Disturbances may occur during treatment period and class hours and traffic safety may be concern with hazards to children as they walk or commute to and from schools.

The sensitive receptors within the given project may be represented by territories and facilities the quality and condition deterioration of which may occur during the construction works. The territories, where the deterioration of the quality of environmental components and adverse impacts occurred due to the existing works and equipments operating in the industrial bases within the project. This includes the population residing in the proximity of the project, hospitals, schools, kindergartens, elderly boarding-houses and rehabilitation medical facilities as well as environmental components.

The facilities existing nearby the project and representing the sensitive receptors are given below:

- Moliti secondary school (km29+025). The school is located on the left side of the project road. There are about 65 pupils, 20 teachers and 5 non-professional staff members in the school.
- Chifa secondary school (km 39+750). This school is located on the right side of the project road. Up to 54 pupils study at school and 22 teachers and 3 non-professional staff is working there.
- Population living near the road.

The following additional safety activities have to be implemented by the contractor under this project: i) to conduct health and safety training for schoolchildren and teachers by CC and SC representatives, ii) to assign flagman outside the school to improve the safety at the start and end of school hours, and iii) to arrange safety signs along the road near the school.

### **Sensitive receptors-Neighboring population, local residential houses and other structures**

Below are given the facilities existing nearby the project, representing the sensitive receptors:

- Population living near the road. (some of them in immediate vicinity of the road)

In addition to the possible negative impacts caused by noise, dust, and traffic emissions during the construction period, the attention should be paid to ensure the safety of people. Near the above mentioned facilities, the movement of trucks, techniques, and equipment and construction materials may cause the discomfort for population, disruption of learning process during lessons and traffic safety problems while children are going to or coming back from school.

Therefore, it is very important to implement adequate mitigation measures as defined in IEE and other documents such as vibration and noise monitoring, relevant traffic management prior to construction and during active construction activities.

Surface Water Bodies( Riv. Chkherimela and riv. Dzirula;)



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Almost entire part of the construction road is going along the beds river Chkhirimela. In some places the construction of retaining walls for river banks is planned. Also, the potential quarries are located in these riverbeds, what makes the impact on the rivers irreversible. In order to reduce the impact during the road construction, the adequate mitigation measures should be implemented that will effectively and maximally reduce the adverse impacts on the rivers.

### **Population and Traffic Safety**

There is a risk of increasing road safety problems despite the intensive transport movement is not mainly noticed on the road. Consequently, a separate road management plan will be developed to ensure the implementation of the road safety measures designed for minimization of the risks in accordance with Public Health and Safety Plan.

### **Environmental Values-Flora and Fauna**

Most species identified along the road are not considered particularly sensitive, but high-conservation plants have been identified in the area of the project implementation, namely two locations of Orchid. Their removal and transfer will be done in accordance with the IEE recommendations. While implementing the project, it is necessary to clean construction site from trees and plants. Prior to removing trees from the environment, the conduction of risk assessment and adequate compensation works is important, that will reduce the adverse impact at a minimum level. Flora and fauna management issues will be outlined in the flora and fauna management plan.

### **Atmosphere**

**Exhaust:** During the implementation of the project, the rise of the volume of substances in the atmospheric air is expected, what will result in deterioration of its quality. Therefore, it is important to carry out the adequate mitigation measures.

**Noise:** Increasing noise is expected during construction works, which is associated with the movement and work of heavy equipment when production bases are functioning. The conduction of mitigation measures will be necessary in order to minimize the voice impact on the environment.

**Dust:** The dust production is expected during construction works while transporting techniques, goods as well when construction bases are functioning, what will cause an adverse impact on environment and population living nearby the project area. In order to reduce the impact, a number of mitigation measures shall be implemented to minimize the impact.

According to contractual requirements baseline and after quarterly parametric measurements of air emissions, water quality, noise and vibration should be carried out. Relevant reports (analyses results) should be filed and kept.

### **Fertile Layer of Soil (Top Soil)**



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Despite the fact that most part of the project road coincides with the existing road and the new unpredictable territories are minimally used during the implementation of the project, the impact on land resources is still possible. The construction is impossible without usage of heavy equipment, what increases the negative impact on the construction site and on fertile layer of the soil in the surrounding areas. Thus, a number of mitigation measures should be implemented during the project, which will minimize this impact.

### Waste

Different types of waste expected during the implementation of project. The proper management and mitigation measures are important in order to reduce the harmful environmental impacts.

## 8. CONSTRUCTION ACTIVITIES

### Construction Site Cleaning

Prior to construction works, the construction site should be cleaned from vegetation and fertile soil. The description of trees-plants existing on the construction site and the appropriate documentation were prepared for the purpose of obtaining the permit for the removal of these trees. The permits will be received from the respective services (National Agency of Property, Forestry Agency) for special cut operations on these territories. The cut down trees should be removed from the construction site and stored in a place that does not hinder construction works, and the threat of their loss or damage is excluded. The cut down trees were transferred to the Forest Agency for their further disposal.

Prior to the commencement of works on the construction site, the fertile layer of the existing land will be removed and will be stored in the pre-selected site, which will be allocated by the municipality, in a manner to avoid quality deterioration. The fertile layer of the removed land will be used to cover the sides of the road or for the purpose of re-vegetation of the adjacent territories. And the excess volume will be transferred to the employer/client.

### Construction of Camp

Within the project, 1 construction camp will be arranged by contractor.

The construction camp is located in Moliti. Its area is 0.5 hectares and represents the nonagricultural land.

Construction of: Replacement or repair of 13 bridges and 107 culverts

- Construction of retaining walls (3.7 km);
- Construction of Lego blocks (0.6 km);
- Construction of gabion walls (2.5 km);
- Installation of appropriate road signs and marks;



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- Arrangement of protection dykes.

Prior to implementation of the above activities, assessment of expected environmental impact will be evaluated and the mitigation measures will be implemented based on the risks.

### **Rehabilitation works**

After completion of the project, the project area and its adjacent territories impacted by the project implementation will be restored and properly organized, namely:

- Disintegration of facilities related to the project and recultivation of their territories;
- Construction site cleaning from all types of waste;
- Placing the fertile layer (topsoil) of removed land within the project and seeding the grass on sideways;
- Planting of new trees in exchange for cut trees during the project;
- Regulation and recultivation of quarries' territories;
- Recultivation of territories used for stockpiling of inert residual/waste stockpiling;

**Selection of Borrow Pits** – Borrow pits should be selected with due regard to the natural geography of the area. The locations of the borrow pits shall be approved by the Engineer and RD, and the Concerned Agencies. No borrow pit shall be located within 500 meters of any protected area.

For road embankment and fill materials for bridge approaches, proper materials should be sourced from borrow pits. Extraction of earth materials result in pits of considerable depths which defaces the natural topography. In some occasions, deep excavations will pose hazard to people and animal that may traverse the area.

The Contractor shall ensure that:

- Pit restoration will follow the completion of works in full compliance all applicable standards and Specifications.
- Arrangements for opening and using material borrow pits will contain enforceable provisions.
- The excavation and restoration of the borrow areas and their surroundings, in an environmentally Sound manner to the satisfaction of the Engineer will be required before final acceptance and payment

Under the terms of contracts.



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- Additional borrow pits will not be opened without the restoration of those areas no longer in use.
- Borrow pits should be reinstated prior to completion of the Project

**Quarries** – Exploitation of materials from quarry sites will entail considerable disturbance of the existing topography. In rivers, gravel materials will be exhumed from the river bed and result in pit excavation. If not controlled properly this will result in changing the flow of the river and subsequently in erosion of the other banks of the river. Operation of quarries by the Contractor will entail excavation of stone and gravel from the natural state followed by crushing to desired sizes with washing. The operation itself generates considerable noise. Crushing in dry condition generates dust while the washing produces silt-laden water which when discharged into the river will increase the turbidity of the water.

Should the Contractor decide to establish his own quarry, he will be responsible for the entire facility with respect to all permitting and environmental requirements. Prior to opening of any quarry or rock crushing facility, the Contractor will require approval from the relevant Concerned Agencies and the Engineer to ensure that land owners are adequately compensated for land use and that the sites are not located in an area likely to cause significant detriment to the local environment. To ensure that this will be the case Contractors should ensure that quarries and crusher plants are:

- Located at least 300 meters from urban areas to prevent noise and dust impacts;
- Located outside of agricultural land; and
- Where possible located on government owned lands.

Further rules to be followed in this context are:

- Silt-laden water should be retained in sedimentation ponds to allow silt materials to settle;
- Water-recycling should be considered to minimize turbidity in receiving waters.
- A due diligence report shall be provided by the Contractor on all quarry sites whether existing or new.

If new, all appropriate permitting etc. required and legislation must be followed.

- Quarry areas shall be reinstated prior to the completion of the project.

**Cut & Fill** – During construction, to implement the designs, cut & fill will have to be performed. Such activities will cause considerable volumes of materials to be hauled from one place to another. The hauling of material will cause some of them to drop onto waterways and cause turbidity problems. Any disposal areas will have to be sited properly and stabilized to prevent erosion. Erosion or washing away of materials can cause silt to reach into the river and subsequently cause turbidity. It is anticipated that excess materials will be generated by cut operations to provide for a wider roadway and safer slopes.



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The Contractor shall ensure that:

- Temporary and permanent storage of materials will be confined to government-owned land and in no Circumstances should be dumped on agricultural or productive lands (without owner's written Permission) or to any watercourse, including irrigation channels.
- As a rule, the Contractor shall reuse any cut material for fill unless deemed unsuitable;
- In the event of any spoil or debris from construction works being deposited in any of the aforementioned areas or any silt washed down to any area, then all such spoil, debris or material and silt shall be immediately removed and the affected land and areas restored to their natural state by the Contractor to the satisfaction of the Engineer.
- Disposal areas should be ascertained by the Contractor prior to cutting or excavations. Since the Surrounding areas are somewhat uninhabited and open spaces, there are a good number of areas where Materials can be deposited for the purpose of shaping and evening out the topography, fortifying Embankments and riverbanks and toe protection of bridge structures.
- Requirement for due diligence will apply to any dump sites and to any materials to be disposed of.
- Any sites proposed for permanent disposal will require prior formal approval.

**Soil and Groundwater Contamination** – Discharges of petroleum products directly onto the ground causes contamination of natural soil and would be treated as hazardous material. When allowed to continue unmitigated such discharges would result in seepage of contaminants into the groundwater and cause groundwater contamination.

To eliminate the risk of ground- and surface water pollution:

- The risk of surface water pollution is minimized by locating storage facilities for fuels and chemicals away from watercourses. In addition such facilities will be bounded and provided with impermeable lining to contain spillage and prevent soil and water contamination. Fuel, chemicals, lubricants, and hazardous wastes must all be stored in appropriate location with secondary containment.
- No baseline measurements on ground water quality are required. To avoid contamination of any watercourse with sewage discharged from the Contractor's camp, a sewerage system will be established as it is described exemplarily in water and soil management plans.

**Contamination Due to Spills or Hazardous Materials** – The road construction works are impossible without the use of chemicals, fuel and oil. The risks of environmental pollution appears in case of the wrong treatment with them. In order to prevent such risks of pollution, the relevant mitigation measures will be



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implemented. Improper handling of hazardous materials (e.g. fuels, chemicals, lubricants and other hazardous materials) can cause them to drop onto the ground which can result to soil contamination. Subsequently, given enough time, these materials can penetrate into the ground and reach the water table and result into groundwater contamination and pollution.

Fuel, chemicals, lubricants, and hazardous wastes must all be stored in appropriate location with secondary containment. The Contractor shall ensure that:

- Any fuel, lubricants, hazardous waste and chemicals (if any), must all be stored in appropriate location with secondary containment and secured by fencing. The storage area shall be located away from any watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks.
- The construction camp maintenance yard shall be constructed on impervious layer with adequate drainage to collect spills; there shall be no vehicle maintenance activities on open ground.
- Filling and refueling shall be strictly controlled and subject to formal procedures. Drip pans shall be placed under all filling and fueling areas. Waste oils shall be stored and disposed of by a licensed contractor.
- All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.
- The contents of any tank or drum shall be clearly marked. Measures shall be taken to ensure that no contaminated discharges enter any soils.
- No bitumen drums or containers, full or used, shall be stored on open ground. They shall only be stored on impervious layer.
- Areas using bitumen shall be constructed on impervious layer to prevent seepage of oils into the soils.
- Should contamination be caused during camp operation, the site will need to be appropriately restored with appropriate testing done for verification, prior to handover to Government or private owner.

**Erosion** – It is important that side slopes or roadside embankments are fully stabilized before the Contractor finally turns over the responsibility to the Client. Any issues arising within one year should be analyzed for proper remediation measures. Issues that will arise will be discussed between the Contractor and the Engineer, as the Client’s representative.

Contracts stipulate that the Contractor shall be liable for a one year defects liability period. During this year the Concerned Agencies should undertake regular observational monitoring of the Project Road to ensure that engineering works and vegetation growth have effectively prevented erosion impacts. If the Concerned Agencies discover any potential issues they shall report their findings to the RD who shall then make the



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Contractor responsible for final improvements. Final payments cannot be made until outstanding issues are resolved.

**9. RISKS ASSESSMENT**

**Risk Scores**

LIKELIHOOD	CONSEQUENCE			
	Catastrophic	Major	Moderate	Minor
Certain	25	15	10	5
Likely	15	9	6	3
Unlikely	10	6	4	2
Rare	5	3	2	1

Risk: High: 15–25

Medium: 6–10

Low: 1–5

**Risk Assessment Matrix including Mitigation Measures**

Construction activity	Hazards	Likelihood1 that the site or sensitive receptors will be affected	Consequence2 of the site or sensitive receptors being affected	Risk score: (consequence x likelihood)	Environmental Mitigation Measures
		Score	Score		
Preparatory works and site clearance	Noise and Vibration Impacts	3	3	9	<ul style="list-style-type: none"> <li>Provide prior information to local population about work activities. Limiting working hours to 7 am – 7 pm, minimize the noise whenever possible</li> <li>Speed limit between 30 km/h within residences;</li> <li>Ensure that all equipment &amp; vehicles used for construction activity are in good condition.</li> <li>Carry out on site noise and vibration monitoring</li> </ul>

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					<ul style="list-style-type: none"> <li>Assess status and condition of residential buildings during the preparatory works</li> <li>Assess execution design of the noise mitigation measures (noise wall, special pavement) using relevant software to verify efficacy of noise mitigation measures prior to start of construction.</li> <li>Relevant road warning signs (Road narrowing, construction activity ahead, etc) will be erected where required</li> </ul>
	Dust Generation	3	3	9	<ul style="list-style-type: none"> <li>Watering unsatisfied /bad condition roads to avoid dust generation while using for transport</li> <li>Speed limit between 30 km/h within residences</li> <li>Clean wheels and undercarriage of haul trucks prior to leaving construction site</li> </ul>
	Damage to existing infrastructure	3	3	9	<ul style="list-style-type: none"> <li>The complete list of the utilities and infrastructure to be relocated or affected is developed</li> <li>The Construction Company will work closely with any utility company having their infrastructure located within the public right-of-way.</li> <li>Before construction is started the Construction Company had notified the utility companies of the proposed work area and requested that they mark the location of any types of equipment in the area.</li> <li>The Construction Company had established the position of existing services such as pipelines, sewers, surface water drains, cables for electricity and</li> </ul>



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				<p>telephones, overhead lines and water mains, before starting any excavation or other work likely to damage them.</p> <ul style="list-style-type: none"> <li>• The Construction Company arranged liaison with the appropriate authorities, the moving of or alterations to services such as pipelines, power and telephone lines, water mains, sewers and surface water drains which are affected by the works. The arrangements for such moving or alteration was subject of the agreement between engineers and the appropriate authorities.</li> <li>• The Construction Company is responsible for any and all damage caused to any utility during construction and will repair them with his equipment or, if the utility company desires, they shall be allowed a free use of his equipment and personnel as required in order to complete repair works.</li> <li>• The construction company is required to carry out pre-construction survey of local access roads which will be used for project implementation, assess their current conditions and in case of damage construction company is responsible for repairing them.</li> </ul>
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	Generation of waste	3	3	9	<ul style="list-style-type: none"> <li>•Wastes produced during the cleaning of constructio site will be managed in accordance with the waste management plan, prepared within the project.The inert waste generated during cleaning the site will be utilized in the backfilling works;</li> <li>•The part of inert wastes that will not be suitable for use will be taken to inert waste disposal place allocated by the municipality;</li> <li>•Municipal waste will be withdrawn within the agreement signed by Kharagauli Cleaning Service;</li> <li>•Hazardous wastes generated during the cleaning of the site will be temporarily disposed in the contractor's warehouse of the hazardous waste and then will be transferred to an appropriate entitled organization for destruction/restoration.</li> </ul>
	Impact on flora (tree cutting)	3	3	9	<ul style="list-style-type: none"> <li>•Pre-entry survey in these sensitive zones prior to construction start up, in order to quantitatively assess the red data species present within the zone and all trees to be felled. Pre-entry survey was conducted in June 2018.</li> <li>•Exact demarcation of those trees that are subject for felling (to exclude cutting of other trees)</li> <li>•Each tree subject for felling is marked, measured and described. The tree felling program is agreed with the Georgian Forest Agency</li> </ul>

Impact on fauna	3	3	9	<ul style="list-style-type: none"> <li>• Visual control – the study of territory during the works of terracing and cutting of the existing slopes, Arrange the access roads and Construction of buildings on the territory of the project (to control whether representatives of fauna (bats, marten present there or not). Selection and assessing of appropriate place for replacement of live organisms.</li> <li>• Attendance of the environmental specialist in the course of works</li> <li>• Safe replacement of revealed live organisms to an alternate safe place (in a pre-arranged artificial housing, which will be closer in maximum to their natural habitat environment)</li> <li>• Monitoring of newly created housing of living organisms;</li> </ul>
Top soil and sub soil removal and management	3	3	9	<ul style="list-style-type: none"> <li>• Contractors will be encouraged to minimize usage of productive agricultural land and convert them to their original state after completion of civil works.</li> <li>• Heavy equipment and vehicles movement/parking on the topsoil will be prohibited.</li> <li>• Embankments will be monitored during construction for signs of erosion; long-term material stockpiles will be covered to prevent wind erosion.</li> <li>• The storage of topsoil in stockpiles, no more than 2m high with side slopes at a maximum angle of 45°. The Construction Company will take into consideration the following:</li> <li>• Segregation of the topsoil from the subsoil stockpiles</li> </ul>

				<ul style="list-style-type: none"> <li>•Dedicated storage locations that prevent the stockpiles being compacted by vehicle movements or contaminated by other materials;</li> <li>•No storage where there is a potential for flooding;</li> <li>•No storage at less than 100 m from river/streams, subject to site-specific topography.</li> <li>•Contractor will protect the stockpiles from flooding and run-off by placing berms or equivalent around the outside where necessary.</li> <li>•Topsoil stockpiles will be monitored and any adverse conditions be identified corrective actions will include: (i) anaerobic conditions - turning the stockpile or creating ventilation holes through the stockpile; and (ii) erosion - temporary protective silt fencing will be erected;</li> <li>•The storage of subsoil in stockpiles, no more than 3m high with side slopes at a maximum angle of 60°, will take into consideration the following:</li> <li>•Dedicated storage locations where the stockpiles will not be compacted by vehicle movements or contaminated by other materials; - Segregation from topsoil stockpiles.</li> <li>•In the event that the subsoil stockpiles experience significant erosion Contractor will institute corrective action such as installing erosion matting over the stockpiles.</li> </ul>
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	Impacts on archaeological sites	3	2	6	<ul style="list-style-type: none"> <li>• Training of employees on cultural heritage to raise awareness and on activities if such is detected;</li> <li>• The planned earthworks will be performed under permanent monitoring by Environmental and Social Issues Field Officer to avoid the damage of archeological monuments revealed during the earthworks</li> <li>• Acting following the plan if the monuments of cultural heritage are discovered lately.</li> <li>• In case of finding any artefacts of potential archaeological value, following steps are taken:             <ul style="list-style-type: none"> <li>• Construction workers are obliged to stop works and immediately report to the Archaeological Supervisor.</li> <li>• Archaeological supervisor reports to the Chief Engineer at site and requests to stop activities at the site of finding.</li> <li>• Archaeological supervisor executes first checking of the finding and the site where finding was made.</li> <li>• In case the finding has no potential archaeological value, the Archaeological Supervisor reports to the Chief Engineer and the works are restarted. Appropriate record regarding the case is made in record book.</li> <li>• In case if the finding is estimated as potential archaeological relic, the Archaeological Supervisor reports to Chief Engineer of the Construction Contractor and to MDF Environmental Specialist (and supervising company / Engineer) requesting to stop</li> </ul> </li> </ul>
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					<p>construction activities and to inform the Ministry of Culture and Sport of Georgia about the incident.</p> <ul style="list-style-type: none"> <li>•Ministry of Culture and Sport Protection will assign expert or group of experts and conduct necessary archaeological works at the site to identify the problem.</li> <li>•In simpler cases, after removal of the movable artifacts, fixing materials and conducting other required works, the experts of the Ministry of Culture and Sport will issue decision on recommencement of stopped construction works.</li> </ul>
	Community safety risks throughout project preparatory works	3	3	9	<ul style="list-style-type: none"> <li>•Planning of traffic movement prior to commencement of works (identifying and studying of roads which should be used for execution of works);</li> <li>•When planning a traffic movement, special attention should be paid to roads, where increase of traffic is anticipated by more than 30% (or where trucks traffic is anticipated to be increased by more than 30%).</li> <li>•Re-planning of the traffic movement in case of need of changes and informing the Client about 3 days earlier;</li> <li>•Minimize contact of pedestrians with construction transport</li> <li>•Liaison with the local communities and responsible persons in order to improve road signs, road visibility area and safety, in total; (Considering their proposals and requirements).</li> </ul>



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					<ul style="list-style-type: none"> <li>• Relevant road warning signs will be erected near the schools (Children, Appropriate speed limit), also road warning signs (Road narrowing, construction activity ahead, etc) will be erected where required. Sufficient quantity of jersey barriers will be placed along the deep excavations and steep cuts.</li> </ul>
Site establishment and Construction of Camp	Impact on atmospheric air	3	3	9	<ul style="list-style-type: none"> <li>• The technical regulations on exploitation/operation of equipment located in the construction camps will be prepared and agreed with the Ministry of Environment Protection and Natural Resources</li> <li>• Vehicle maintenance and control procedures will be established to ensure compliance of the machinery emissions with standards.</li> <li>• Regular maintenance of diesel engines will be undertaken to ensure that emissions are minimized.</li> <li>• All equipment used on site will be regularly maintained so as to be in good working order at all times to minimize potentially polluting exhaust emissions.</li> <li>• Vehicle refueling will be undertaken so as to avoid fugitive emissions of volatile organic compounds through the use of fuel nozzles and pumps and enclosed tanks (no open containers will be used to stored fuel).</li> <li>• Materials will be transported to site in off peak hours. Materials transported to site will be covered/wetted down to reduce dust.</li> </ul>



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					<ul style="list-style-type: none"> <li>• The construction site will be watered as appropriate.</li> <li>• All vehicles will be checked and repaired in case of need to eliminate increased emission due to damaged parts.</li> </ul>
	Generating noise and vibration	3	3	9	<ul style="list-style-type: none"> <li>• The Construction Company has to provide prior information to local population about work activities</li> <li>• Limit working hours to 7 am – 7 pm, minimize the noise whenever possible</li> <li>• Ensure that all equipment &amp; vehicles used for construction activity are in good condition.</li> <li>• Carry out on site noise and vibration monitoring</li> <li>• The Construction Company has to apply good equipment maintenance practice:</li> <li>• Prevent work of engines in idling regime</li> <li>• Prohibit usage of vehicle horns where not necessary</li> <li>• Manage optimal combination of simultaneously working machinery</li> <li>• Do not locate high noise machinery, like crushers in residential area</li> <li>• Crushers could be located at a distance exceeding 500m from residential areas.</li> </ul>

	Impact on Water Resources	3	3	9	<ul style="list-style-type: none"> <li>• Technical regulations of water intake and water discharge will be prepared for construction camps and agreed with the Ministry of Environment and Natural Resources Protection of Georgia.</li> <li>• All hazardous liquids such as lubricants, paintetc. will be stored in the designated area at the workshops on an impervious base with run-off collection;</li> <li>• All domestic waste water will be collected in septic tanks and emptied once a week by specialized suctionvehicles according to agreement LTD Georgian Water Company.</li> <li>• Workshop wastewater will be collected in septic Sleeves and after clearing Will be put o5 river acordince with Environmantal reglamant.</li> <li>• The storage of waste or production waste of any kind as well as refueling and parking machinery or vehicles is not permitted within a distance of 100 m of any stream including drainage or irrigation facilities.</li> <li>• Pouring of excess concrete from concrete mixer to un-appointed areas will be strictly prohibited;</li> <li>• Washing of concrete mixer will be restricted by specially appointed area (at the batching plant sedimentation basin).</li> <li>• Work in water will be prohibited for all types of machinery.</li> </ul>
	Safety risk – public and workers	3	3	9	<ul style="list-style-type: none"> <li>• Follow standard and safe procedures for all activities</li> <li>• Ensure that all workers are provided with and use appropriate Personal Protective</li> </ul>



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					<ul style="list-style-type: none"> <li>Equipment – helmets, hand gloves, boots,</li> <li>• Exclude public from the site – enclose construction area, provide warning and sign boards, security personnel</li> <li>• Provide adequate lighting to avoid accidents</li> <li>• Provide relevant information signs at the site</li> <li>• Maintain accidents records and report</li> </ul>
<p>Road construction works:</p> <p>Road, bridges, culverts and gabions construction works</p>	Air pollution	3	3	9	<ul style="list-style-type: none"> <li>• Vehicle maintenance and control procedures will be established to ensure compliance of the machinery emissions with standards.</li> <li>• Regular maintenance of diesel engines will be undertaken to ensure that emissions are minimized.</li> <li>• All equipment used on site will be regularly maintained so as to be in good working order at all times to minimize potentially polluting exhaust emissions.</li> <li>• Vehicle refueling will be undertaken so as to avoid fugitive emissions of volatile organic compounds through the use of fuel nozzles and pumps and enclosed tanks (no open containers will be used to stored fuel).</li> <li>• Materials will be transported to site in off peak hours. Materials transported to site will be covered/wetted down to reduce dust.</li> <li>• The construction site will be watered as appropriate.</li> <li>• All vehicles will be checked and repaired in case of need to</li> </ul>

					eliminate increased emission due to damaged parts
	Generating noise and vibration	3	3	9	<ul style="list-style-type: none"> <li>• Limit works will be restricted to between 07: 00 a.m.– 21: 00 p.m. within a 500 m distance of the adjoining settlements as per Georgian legislation;</li> <li>• Regular meetings will be held with local communities to inform the public of the works programmer, and to receive complaints;</li> <li>• Conduct noise monitoring according to Noise &amp; Vibration MP;</li> <li>• Accumulation of high number of heavy equipment within residential area will be forbidden;</li> <li>• All equipment will pass through regular technical inspection to be sure that muffles are meet necessary requirements.</li> <li>• Carry out on site noise and vibration monitoring</li> </ul>
	River bank erosion	5	3	15	<ul style="list-style-type: none"> <li>• All operation of vehicles in the river will be prevented and if there is no alternative, inspection of vehicles will be required to ensure that there is no leakage of fuel and lubricating material on a daily basis.</li> <li>• The Construction Company will ensure the proper handling of lubricants, fuel and solvents. Fuel and lubricant storage tanks will not be located within 50m of any watercourse, well or dry gorges. All tanks will be placed in a bund of at least 110% of the tank's maximum capacity. If more than one tank is stored within the bund, the system must be capable of storing 110%</li> </ul>



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					<p>of the biggest container's capacity or 25% of their total capacity, whichever is greater. The bund will be impermeable (e.g. concrete-lined), without drainage points or other breaches. Accumulated rainwater in bunds will be pumped out of the bund to either drains or the ground if uncontaminated. If contaminated it will be treated as oily water and disposed of appropriately. In case of fuel spillage, the spilled fuel will be recollected and contaminated bund treated by the absorbents: sawdust, sand or straw.</p> <ul style="list-style-type: none"> <li>• All fuel / hydrocarbon dispensing nozzles will be of a drip control design and securely locked when not in use.</li> <li>• No fuel storage or refueling of vehicles or equipment will be allowed within 100 m of any watercourse, water body, well, dry gorge or within any designated wetland area or aquifer.</li> <li>• Vehicles will not be left without supervision during refueling process. All refueling operations on the working sites will use absorbent pads and/or straw to minimize spills, which will be put in place prior to the commencement of refueling operations.</li> <li>• Ground water and surface water pollution risk will be reduced or eliminated in case of immediate removal of polluted ground. Soiled ground and absorbents will be removed, stored and treated as hazardous waste.</li> </ul>
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					<ul style="list-style-type: none"> <li>• In case of significant spill authorized and responsible person will be informed, works will be stopped till the elimination of pollution.</li> <li>• Refueling process will always be carried out with the correct equipment (i.e. nozzles of the appropriate size), and only by suitably trained and experienced refueling operators. Fuel supply equipment will be regularly revised to prevent leakage due to inappropriate condition of refueling equipment.</li> <li>• Equipment and storages will be isolated and guarded to prevent pollution due to cases of stealing or vandalism.</li> <li>• All mobile plant, including but not limited to cranes, compressors, generators, bulldozers, excavators etc. and storage tanks should be maintained and operated such that all leaks and spills of materials should be minimized.</li> <li>• Daily plant checks (Vehicle Maintenance Procedure) will be undertaken to ensure no leaks or other problems are apparent. Vehicle maintenance, cleaning, degreasing etc. will be undertaken in designated areas of hard-standing, not over made unstable ground (embankments etc.).</li> <li>• Water Tankers with sprinklers or bowser will be used for watering roads and machinery maintenance.</li> <li>• Maintenance points will not be located within 50m of any watercourse, well or dry gorge. The storage of potentially polluting materials, refueling</li> </ul>
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					<p>and maintenance of mobile plant within 50m of all watercourses/water bodies, dry riverbeds and within designated wetlands and aquifers will be prohibited.</p> <ul style="list-style-type: none"> <li>• Erosion control measures will be applied during construction activities to prevent increased runoff into the watercourses.</li> <li>• Contractor will plan all excavations, topsoil and subsoil storage so as to reduce to a minimum any runoff. Contractors will be required to organize and cover material storage areas and to isolate wash down. Where any area of the spread is at risk from silt pollution washing off into a watercourse of water body, effective measures will be put in place to ensure that such pollution does not occur.</li> <li>• concrete will not be allowed to enter any watercourse, pond or ditch.</li> <li>• Near the rivers bed in the vicinity of no more than 100 m. radius will be installed temporary fuel tank. The tank will be placed in a covered area, and located and designed in way to allow collection of accidental spilled liquid contaminants.</li> <li>• Asphalt pavement activities will be conducted in dry days to avoid run off in the river</li> <li>• Erosion control and pollution prevention measures will be planned Wet cement and/or</li> <li>• for the site of crossing the dry gorge with seasonal stream, in the area of planned bridge. Slope landscaping and vegetation will</li> </ul>
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					<p>be envisaged and in addition installation of temporary berms and sediment traps will be required, in case if during construction erosion will be stimulated.</p> <ul style="list-style-type: none"> <li>• Proper organization and design of the drainage channels and oil/grease separating simple water-treatment installations will be installed.</li> <li>• Natural oil separator drainage system will be installed where it is considered appropriate and the contractor will elaborate this system.</li> <li>• The Construction Contractor will take all measures to protect vegetation cover located on slopes near the riverbeds. This approach will contribute to minimization of river bank erosion risk.</li> <li>• All construction activities near the riverbed will be planned during the low water season period in the rivers and will be planned in such a manner that all works related to construction of embankment are completed in one low flow season.</li> <li>• All the activities which require technical intervention in the riverbed will be planned out of spawning period (March/August).</li> <li>• The river bed that is to be used for construction and included in construction Right of Way (RoW) will be kept at a minimum. Any construction activity or movement of machinery and personal beyond the demarcated construction RoW will be prohibited.</li> </ul>
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					<ul style="list-style-type: none"> <li>• Riparian habitat in the construction zone will be preserved as far as possible to ensure connectivity is restored as fast as possible after construction and to retain habitat for species in the river.</li> <li>• Disposal of any construction or construction related waste in the river bed will not be allowed.</li> <li>• Construction techniques will produce the minimal possible amount of sediment into the river. A coffer dam may be the most appropriate technique in this case and prior to construction the Contractor will develop a Method Statement for the construction works which will include mitigation and monitoring requirements as appropriate.</li> <li>• Sediment will be mitigated by use of silt curtains or other appropriate sediment control measure during construction.</li> </ul>
	Soil pollution	3	3	9	<ul style="list-style-type: none"> <li>• Inspection of vehicles will be required to ensure that there is no leakage of fuel and lubricating materials into the soil.</li> <li>• Contractors will ensure the proper handling and storage of lubricants, fuel and solvents to prevent any leakage of these materials into the soil.</li> <li>• All tanks will be placed in a bund of at least 110% of the tank's maximum capacity. If more than one tank is stored within the bund, the system must be capable of storing 110% of the biggest container's capacity or 25% of their total capacity, whichever is greater. The bund will be impermeable (e.g. concrete-lined), without drainage points</li> </ul>

				<p>or other breaches. Accumulated rainwater in bunds v be pumped out of the bund to either drains or the ground if uncontaminated. In case of fuel spillage the spilled fuel will be recollected and contaminated bund treated by the absorbents: sawdust, sand or straw.</p> <ul style="list-style-type: none"> <li>• All fuel / hydrocarbon dispensing nozzles will to be of a drip control design and securely locked when not in use.</li> <li>• Vehicles will not be left without supervision during refueling process. All refueling operations on the working sites will use absorbent pads and/or straw to minimize spills, which will be put in place prior to the commencement of refueling operations.</li> <li>• In case of soil pollution soiled ground and absorbents will be removed, stored and treated as hazardous waste.</li> <li>• In case of significant spill authorized and responsible person will be informed, works will be stopped till the elimination of pollution. Refueling process will always be carried out with the correct equipment (i.e. nozzles of the appropriate size), and only by suitably trained and experienced refueling operators. Fuel supply equipment will be regularly revised to prevent leakage due to inappropriate condition of refueling equipment.</li> <li>• Equipment and storages will be isolated and guarded to prevent pollution due to cases of stealing or vandalism.</li> </ul>
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				<ul style="list-style-type: none"> <li>• All mobile plant, including but not limited to cranes, compressors, generators, bulldozers, excavators etc. and storage tanks will be maintained and operated such that all leaks and spills of materials will be minimized.</li> <li>• Daily plant checks (Vehicle Maintenance Procedure) will be undertaken to ensure no leaks or other problems are apparent. Vehicle maintenance, cleaning, degreasing etc. will be undertaken in designated areas of hard-standing, not over made unstable ground (embankments etc.). Water Tanks with sprinklers will envisage for watering roads and machinery maintenance.</li> <li>• Contractor will plan all excavations, topsoil and subsoil storage so as to reduce to a minimum any runoff.</li> </ul>
	Slope erosion	3	3	<ul style="list-style-type: none"> <li>• Construction activities that increase the potential for erosion from the slope sides and/or sediment mobilization in watercourses;</li> <li>• Straw bale barriers in locations requiring small volumes of sediment interception;</li> <li>• Temporary erosion control measures will be left in place until the slopes are stabilized. The purpose of temporary erosion control measures is to:               <ul style="list-style-type: none"> <li>• Interrupt surface water run-off;</li> <li>• Slow the velocity of water runoff to the extent practical;</li> <li>• Divert water off exposed check dam areas;</li> </ul> </li> </ul>



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					<ul style="list-style-type: none"> <li>Prevent and minimize sediment transportation off the construction sites..</li> </ul>
	Traffic Disruption, mud on roads	3	3	9	<ul style="list-style-type: none"> <li>To avoid/minimize traffic disruption traffic management schemes will be applied</li> <li>The Construction Company has to work in close cooperation with Road Department and Patrol Police Department to regulate traffic on the project site.</li> <li>Road vehicles shall have small turning radius, equipped with sound signals and light signals, which will be in good operating conditions.</li> <li>Parking place will be fenced with barriers and equipped with red signals of emergency stop during the day and with red signal floodlight at night.</li> <li>Flagmen will be provided with special uniforms and special footwear.</li> <li>It is required to observe overall safety measures such as fencing of work site, various safety activities.</li> <li>Alternate access will be provided for vehicles and pedestrians. Appropriate lighting and signs will be employed.</li> </ul>
Reinstatement	Poor landscaping	3	3	6	<ul style="list-style-type: none"> <li>Topsoil removed from the construction sites will be used for reinstatement of the topsoil on the embankments or in the adjacent construction corridor affected by the project activities.</li> <li>Topsoil will be reinstated separately from subsoil, with care taken to avoid mixing of the materials. The topsoil reinstatement will be sufficient</li> </ul>

					<p>to restore the fertile depth to the initial conditions as judged by the topsoil strip during visual observation and comparison of the reinstated site and adjacent land.</p> <ul style="list-style-type: none"> <li>When replacing the topsoil Contractor will program the works such that the areas farthest away from the stockpiles are reinstated first with reinstatement getting progressively closer to the stockpiles, thus reducing the number of vehicle movements over the reinstated topsoil.</li> <li>The reinstated topsoil will then be harrowed, where practical, to protect the stability and promote vegetative growth.</li> </ul>
	Noise Impacts on nearby Population	3	3	9	<ul style="list-style-type: none"> <li>Provide prior information to local people about work</li> <li>Limiting working hours to 8 am – 6 pm, minimize the noise whenever possible</li> <li>Speed limit between 30 km/h within residences</li> <li>Ensure that all equipment &amp; vehicles used for construction activity are in good condition</li> </ul>
	Vibration concerns from local community	3	3	9	<ul style="list-style-type: none"> <li>Provide prior information to local people about work</li> <li>Limiting working hours to 8 am – 6 pm, minimize the noise whenever possible</li> <li>Speed limit between 30 km/h within residences</li> <li>Ensure that all equipment &amp; vehicles used for construction activity are in good condition</li> <li>Carry out routine monitoring of vibration on site</li> </ul>



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	Dust Generation	3	3	9	<ul style="list-style-type: none"> <li>Watering unsatisfied /bad condition roads to avoid dust generation while using for transport of soil</li> <li>Speed limit between 30 km/h within residences</li> <li>Clean wheels and undercarriage of haul trucks prior to leaving construction site</li> </ul>
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**10. ENVIRONMENTAL MANAGEMENT MEASURES**

This chapter details the institutional arrangements to ensure that the environmental due diligence has comprehensively considered both the national and ADB requirements for environmental protection, has identified all likely environmental impacts and proposed appropriate mitigation measures, and has the systems in place to ensure that effective procedures for environmental monitoring and control of the project impacts and mitigation measures are implemented throughout the life of the project.

The environmental impacts associated with project have been detailed in EIA . Mitigation measures required to address the impacts identified in the EIA have been summarized in each of the relevant sections covering the physical, biological and socio-economic environment affected by the project (chapter 6).

The impacts identified and the specific mitigation measures proposed to address them have been consolidated into the Risk Matrixes for project .

**Implementation arrangements and responsibilities**

The main institutions that will be involved in implementation of the SSEMP and monitoring are the Construction Company, executing agency (EA), the Supervision Consultant (SC), the and to a lesser extent the Ministry of Environmental Protection and Agriculture and Municipal Authorities. EA and SC are responsible for ensuring monitoring of the project implementation at the construction stage, and RD for monitoring at the road operation stage. Ministry of Environmental Protection and Agriculture has the authority for periodic audits but should not be considered as a party responsible for monitoring.

The RD's Environmental and Social Specialists responsibilities in respect of implementation of the SSEMP are as follows:

- Ensure that all relevant EMP requirements (including environmental designs and mitigation measures) are duly incorporated into the project bidding documents.
- Ensure that Contractor obtains necessary permits and/or clearance, as required, from MEPA and other relevant government agencies. All necessary regulatory clearances should be obtained before commencing any civil work on the project.
- Ensure that contractors have access to the EMP and IEE report.

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- Ensure that contractors understand their responsibilities to mitigate environmental problems associated with their construction activities and facilitate training of their staff in implementation of the EMP.
- Approve the Site-Specific Environmental Management Plan (SSEMP) prepared by the Contractor before he takes possession of construction site.
- Monitor the contractor's implementation of the SSEMP in accordance with the environmental monitoring plan.
- Prepare and submit semi-annual Environmental Monitoring Reports to ADB.
- In case unpredicted environmental impacts occur during the project implementation, prepare and implement as necessary an environmental emergency program in consultation with MEPA, any other relevant government agencies, and ADB.
  - Ensure that Contractor hires specialized companies to manage asbestos waste disposal and safe operations on dismantling, transportation and storage of oil contaminated equipment of gas filling stations. The other choice is to request Construction Contractor to hire the mentioned waste and pollution Management Company and to insert this requirement in Civil Works Contract.

Supervisor company (SC) is responsible for checking and verifying the documents developed and submitted by the construction contractor, ensuring compliance of the requirements of the contract with the requirements of Georgian and the lender's legal regulations; providing construction contractor with assistance /consultation during project implementation.

The supervisor company (SC) of works commissioned by ADB is also responsible to establish strong field presence in the Project area and keep a close eye on the course of works. Along with ensuring consistency with the design and ensuring quality of works, the supervisor is mandated to track implementation of EMP by the contractor, reveal any deviations from the prescribed actions. The SC will include fulltime site-based national environmental specialist to assist the EA supervise and monitor implementation of the EMP during construction.

A Non Compliance Notice will be issued to the contractor if the SC requires action to be taken. The contractor will be required to prepare a corrective action plan which is to be implemented by a date agreed with the SC. Non-compliance will be ranked according to the following criteria:

- Non Compliance Level I: A situation that is not consistent with requirements of the EMP, but not believed to represent an immediate or severe social or environmental risk. Repeated Level I concerns may become Level II concerns if left unattended.
- Non Compliance Level II: A situation that has not yet resulted in clearly identified damage or irreversible impact, but which demonstrates potential significance. Level II requires expeditious corrective action and site-specific attention to prevent severe effects. Repeated Level II concerns may become Level III concerns if left unattended.



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- Non Compliance Level III: A critical situation that will result in significant social or environmental damage occurring or a reasonable expectation of very severe impending damage. Intentional disregard of Non Compliance Notices or specific prohibitions is also classified as a Level III concern.

Construction contractor is obligated to follow this SSEMP and good construction practice. In order to meet this obligation, a contractor shall establish environmental management team and procedures. The Contractor will appoint a full time Environmental Manager (EM) to be a senior member of the construction management team based on site for the duration of the contract. The EM shall have a university degree (preferably at Masters Level) in Environmental Science or related discipline and have at least 5 years work experience in environmental management of infrastructure projects. In case if according to CW Contract, the engagement of specialized waste and pollution Management Company is responsibility of Contractor, they will ensure financing and arrangement of related contracts and supervise the activities of waste operator. Key responsibilities of the Contractor (through the EM) are as follows:

- (Preparing the Site-specific environmental management plan (SSEMP) for approval by the Employer (EA) prior to the Contractors taking possession of the construction site (see below).
- Ensuring the SSEMP is implemented effectively throughout the construction period.
- Coordinating community relations issues through acting as the Contractor's community relations focal point (proactive community consultation, complaints investigation and grievance resolution)
- Establishing and maintaining site records of:
  - Weekly site inspections using checklists based on SSEMP,
  - Environmental accidents/incidents including resolution activities
  - Environmental monitoring data,
  - Non-compliance notifications issued by the SC
  - Corrective action plans issued to the SC in response to non-compliance notices.
  - Community relations activities including maintaining complaints register
  - Monitoring reports
  - Routine reporting of SSEMP compliance and community liaison activities (see below).
  - Ad-hoc reporting to the Employer's Engineer of environmental incidents/spillages including actions taken to resolve issues
- Safety incidents, including near misses

### Site Induction

Following approval of the SSEMP by the EA, the Contractor will be required to attend a site induction meeting with the SC's International Environmental Specialist whereby the SSEMP is confirmed with the Contractor to ensure that all compliance conditions are clearly understood. Following confirmation of the



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SSEMP with the Contractor the SC's International Environmental Specialist advises the SC Team Leader that the Contractor is now cleared to take possession of the Site and may commence moving equipment to the Site. The Contractor will be responsible for ensuring that all sub-contractors abide by the conditions of the SSEMP.

### Reporting

Monthly/quartile environmental monitoring reports should be prepared and submitted by the CC. Quarterly project progress reports also should have a section on environmental safeguard compliance. The report will contain the following sections.

- Details of any environmental incidents
- Status of all non-conformance identified during audits and inspections that are identified by noncompliance notices.
- Complaints from the public and proactive community relations activities
- Monthly Accident Report
- Waste volumes, types and disposal
- Details of any contaminated areas that have been identified and rehabilitated.
- Details of any archaeological discoveries.
- Details of any ecological issues.
- Other relevant environmental issues.
- Action plan for corrective measures

The Contractor will have a duty to immediately report to the SC if any serious environmental breach has occurred during construction e.g. clearing of sensitive areas, serious oil spills etc. The SC provides EA with monthly reports including review of the environmental and social aspects of the Contractor's performance, as well as HSE issues. In case of any serious accident or repeated violation requiring immediate reaction of the EA and authorities, SC sends appropriate notice to EA immediately.

RD as the Executing Agency will submit quartile environmental monitoring reports to ADB reflecting project progress and compliance with the safeguards requirements. The quartile reports will include information reflected under the SC monthly reports and short explanatory note of RD specialists.

ADB's responsibilities in regard to implementation of environmental safeguards requirements for the project include: undertaking of occasional auditing of the SSEMP implementation and due diligence as part of an overall project review mission; and if required, provide advice to DI in carrying out its responsibilities to implement the SSEMP for the project.



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### 11. ENVIRONMENTAL MONITORING MATRIX

Environmental monitoring matrix is developed based on Environmental Monitoring Plan from the Technical Specification document for the modernization of Rehabilitation Project of Dzirula - Kharagauli - Moliti - Pona - Chumateleti Secondary Road, Moliti-Chumateleti Road Section- from km24+620 to km50+244.



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**Environmental Monitoring Matrix: Construction Phase**

Object of monitoring	Control/Sampling Point	Technique	Frequency/Time	Target	Entity responsible for Monitoring
Possession of official approval or valid operating license and permits	Supplier of materials (asphalt, cement and gravel)	Inspection	Before an agreement for the supply of materials is formalized	Existence of relevant documentations	Supervising Agency
Truck loads covered/wetted Air pollution due to the dust and fumes related to the Material Transport	Construction site and access road	Supervision	Daily Unannounced inspections during work hours	Assure compliance with HSE requirements. Ensure safety, and minimize traffic disruption	Constructing Contractor, RD, Supervising Agency
Top-soil storage reinstatement, Erosion control Landscape destruction Visual impacts	Construction site	Supervision	Daily (Unannounced inspections during work hours); From top-soil stripping – to completion of the works	Assure compliance with construction standards, environmental norms and EMP provisions	Constructing Contractor, RD, Supervising Agency
Rivers Visual Inspection Turbidity	Within Rivers Upstream and downstream of worksite and at worksite	Observation  Instrumental measurement of water turbidity, COD, BOD, TPH upstream and downstream	To be conducted prior to construction, periodically during construction (once per week for Turbidity) and following construction completion in the river.	Assure that turbidity is not excessively higher during construction than natural levels in the river. Confirm that other parameter levels have not been exceeded and to confirm that mitigation measures are	Constructing Contractor, RD, Supervising Agency, MEPA



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				working or need adapting	
Noise and vibration levels (refer to dedicated Noise and Vibration Monitoring Plans for further detail)	Construction Site  Near the sensitive receptors: residential buildings and school	Inspection, compliance monitoring (equipment in use approved, engine maintenance, usage of mufflers, night time work limitations and other provisions of EMP), monitoring of noise continuously at a representative residence near construction activities, noise and vibration measurement by special device	Periodic (as detailed in noise and vibration monitoring plan)	Assure compliance with HSE requirements, good condition of standard construction machinery and limiting the works near settlements  Compliance with the noise and vibration standards  Compliance with the recommendations adopted by the additional studies on assessment and prevention of vibration impacts on the structural integrity of buildings.  <b>Admissible thresholds:</b> Noise – 55dBA <b>(Daytime)</b> – 45 dBA	Constructing Contractor, RD, Supervising Agency, MEPA

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				(Night time) Vibration 74 dBV (Daytime)	
Vibration <b>Admissible thresholds:</b> Vibration 74 dBV (Daytime)	Construction site Near the sensitive receptors: residential Buildings and school.	Supervision (refer to dedicated Noise and Vibration Monitoring Plans for further detail)	Unannounced Inspections (as outlined in noise monitoring plan); following complaints	Assure compliance with HSE requirements.	Constructing Contractor, Supervising Agency,
Dust and Air pollution (solid particles, suspended solids, flying heavy metal particles) (dust, CO) Criteria: MAC for dust 0.15mg/m3 For cement dust – 0.5mg/m3 And MAC for CO ),5 mg/m3	Near the sensitive receptors: residential buildings and school  Along the whole alignment of the road	Visually and instrumentally (dust, CO)	Daily  During material delivery and periodically (weekly) in dry periods during construction	Assure compliance with HSE requirement, assure compliance with environmental norms and EMP provisions	Constructing Contractor, RD, Supervising Agency
Traffic safety/ Vehicle/ pedestrian access Visibility/ appropriate signs	Construction site	Observation	Once per week in the evening	Assure compliance	Constructing Contractor, RD, Supervising Agency



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Material and waste storage, handling, use Water and soil quality (suspended solids, oils, etc.)	Material and waste storage sites; Run off from site; material storage areas; wash down areas	Observation  Instrumental measurement of water turbidity, COD, BOD, TPH upstream and downstream	During material delivery and periodically during construction (average 1/week), especially during precipitation (rain/snow/ etc.). Quarterly during construction	Assure pollution abatement; Assure compliance with construction standards, environmental norms and EMP provisions	Constructing Contractor, RD, Supervising Agency – instrumental
Waste Management	All construction sites, Camps	Observation	Once per week	Assure pollution Abatement, Assure compliance with, construction standards, environmental norms and EMP provisions	Constructing Contractor, RD, Supervising Agency
Equipment maintenance and Fueling Water and soil quality (suspended solids, oils, fuel, etc)	Refueling and equipment maintenance Facilities, Run off from site, material storage areas	Observation	During material delivery and periodically during construction (average 1/week), especially during precipitation (rain/Snow/ etc).	Assure pollution abatement	Constructing Contractor, RD, Supervising Agency,
Impacts on archaeological sites	All earthwork sites	Observation	Permanent/daily	Assure cultural heritage protection	Archaeologist from MoCS

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and remnants					Constructing Contractor, Supervising Agency,
biological recontamination during earthworks near pestholes of soil infections (e.g. anthrax);	All earthwork sites	Observation	Permanent/daily	Assure health protection	Constructing Contractor, RD, Supervising Agency, Veterinary Department of the MEPA
Protection of infrastructure elements	Crossings of power lines, pipelines;	Observation	During construction activities at the sites of concern	Assure infrastructure protection	Constructing Contractor, RD, Supervising Agency,
Offset tree planting Program	TBD	Observation	During Construction period	Assure offset of damage to flora and landscape	Constructing Contractor, RD, Supervising Agency, MEPA
Reinstatement of work sites	work sites, road alignment, used quarries, camp sites	Observation	During Construction period, after completion of works at concrete site	Reinstatement of work sites not taken by Row	Constructing Contractor, RD, Supervising Agency,
Disposal of construction wastes	work sites, road alignment, used quarries, camp	Observation	During Construction period, after completion of	Ensure pollution prevention and landscape protection;	Constructing Contractor, RD,



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	sites		works at concrete site		Supervising Agency,
Personal Protective equipment. HSE issues Organization of traffic by-pass	Construction site	Inspection	Unannounced (Daily) inspections during works	Assure compliance with HSE requirements	Constructing Contractor, RD, Supervising Agency,

## 12. GRIEVANCE REDRESS MECHANISM

During implementation of the Project, several issues related to environmental hazards and disputes on entitlement processes may occur due to the Project activities. For example, intensive schedule of construction activities; inappropriate timing of construction vehicle flow; waste; noise and air pollution from construction activities; ecological disturbances; cultural conflicts between migrant workers, are some of the environmental and social issues that are likely to arise.

According to the existing legal and administrative system in Georgia, there are several entities responsible for addressing environmental complaints of population and interested parties. The administrative bodies directly responsible for environmental protection within the project area are MEPA and Kharagauli Municipality. The affected population and stakeholders may send their grievances related to the project-induced environmental impacts directly to the mentioned administrative bodies responsible for environmental protection.

1. RD, as EA will deliver grievances to relevant authorities, in case if such grievances are sent to RD.
2. The official administrative bodies are obliged to respond to the grievances that have been received from population or other interested parties in accordance with the requirements of the Administrative Code of Georgia. However, the described system is not flexible and convenient for affected persons and does not provide efficient pre-litigation mechanisms for grievance resolution.
3. In accordance with the ADB SPS 2009 requirements, a Grievance Redress mechanism will be set up for the Project to deal with both the environmental and social issues of the Project. RD as the Executive
4. Agency (EA) has overall responsibility for project implementation and environmental compliance. RD as the EA will facilitate the grievance resolution by implementing a project-specific Grievance Redress.
5. Process (GRP). Besides that, the requirements of the new accountability policy related to grievances of the adversely affected people should be implemented. Accountability is a mechanism adopted by ADB in 2012, a whereby people adversely affected by ADB-financed projects can express their grievances; seek solutions; and report alleged violations of ADB's operational policies and procedures, including safeguard policies. The accountability mechanism replaced ADB's Inspection Function (1995). ADB's accountability mechanism comprises two separate but related functions: (i) consultation, led by ADB's special project facilitator, to assist people adversely affected by ADB-assisted projects in finding solutions to their problems; and (ii) providing a process through which those affected by projects can file requests for compliance review by ADB's Compliance Review Panel.
6. RD will facilitate the establishment of a Grievance Redress Committee (GRC) and Grievance Focal Points (GFPs) prior to the CW Contractor's mobilization to the construction site. The functions of the GRC and GFPs are to address concerns and grievances of the local communities and affected parties as necessary.
7. The GRC will comprise representatives from local authorities, affected parties, and other reputed NGOs or persons, as mutually agreed with the local authorities and affected persons. It will also comprise the Contractor's Environmental Specialist, Supervising Company's (SC) Environmental Specialist and EA Safeguards/Environmental specialist. The role of the GRC is to address the Project related grievances of the affected parties that are unable to be resolved satisfactorily through the initial stages of the Grievance.

8. Redress Mechanism (GRM).
9. EA will assist residents of affected territories (Kharagauli municipality) and affected community to identify local representatives to act as Grievance Focal Points (GFP).
10. GFPs are designated personnel from within the community who will be responsible for: i) acting as community representatives in formal meetings between the project team (contractor, SC, EA) and the local community he/she represents ii) communicating community members' grievances and concerns to the contractor during project implementation.
11. The sufficient number of GFPs for the project is –1persons.
  - (i) Affected person will lodge their environmental complaint/grievance with their respective Community's nominated GFP.
  - (ii) The GFP will deliver the individual's complaint to the Contractor and SC's Environmental Specialist.
  - (iii) The Contractor and SC will record the complaint in the Environmental Complaints Register (ECR) in the presence of the GFP.
  - (iv) The GFP will discuss the complaint with the Contractor and SC's Environmental Specialist and try to resolve it;
  - (v) If the Complaint is not resolved within 2 weeks the GFP will present the complaint to the Grievance Redress Committee (GRC).
  - (vi) As soon as the grievance/application is accepted, it is registered at the Fund chancellery. The concerned person will be given the document proving the submission of the grievance/application. From the chancellery, the grievance/application will be sent to the Executive Director, who, in 5 working days, will send it to the Department of Environment Protection and Resettlement (hereinafter referred to as "The Department).
  - (vii) Within 3 working days of the registration of the grievance/application in the e-database, the Department will send the notification (letter and/or e-mail) to the applicant informing him that the grievance/application is accepted for further response. The applicant is also informed about the contact information. .
  - (viii) Within 15 working days of the registration of the grievance/application in the e-database, the Department:
    - a) Will identify the need for submitting any additional information and/or documents by the applicant (hereinafter referred to as "The concerned person") of the grievance/application. In case additional information and/or documents are needed, a written notification will be sent to the concerned person about filling the gap. If the gap is not filled within the specified time, the Fund is authorized to abandon the grievance/application without resolving it, or resolve it and make a relevant decision.

b) Will obtain relevant and necessary information from the Fund structural departments or project partners.

c) Will fix the date of the hearing of the issue by the Grievance Redress Committee. If necessary, it will duly inform the applicant of the grievance/application.

d) Will update the status of the grievance/application in the database.

(ix) The grievance/application will be considered by the Grievance Redress Committee (hereinafter referred to as “The Committee”).

(x) The sessions of the Committee are held at least once a month. Any grievance/application must be considered at the Fund chancellery within two months of the grievance/application registration at the chancellery.

(xi) The Committee final decision is made by the majority of members attending the session. If necessary, a concerned person may be invited to the session to submit the evidence(s) regarding his case.

(xii) The Committee protocol is signed by the Committee members within 5 days of making a decision. At the request of the International Finance Institution, it is sent the protocol of the session.

(xiii) Within 3 working days of signing the protocol, a notification (regarding the decision) is sent to the concerned person. The final decision must describe the schedule of realizing the decision.

(xiv) The term of realization depends on concrete cases, but it must not exceed 100 working days. The Department will also undertake the monitoring of the realization process.

(xv) EA will also keep track of the status of all complaints through the Monthly Environmental Monitoring Report submitted by the Contractor to the SC and will ensure that they are resolved in a timely manner.

## CAMP, WORKSHOP AND PLANT LOCATION SPECIFIC MANAGEMENT PLAN

Rehabilitation Project of Dzirula - Kharagauli - Moliti - Pona –  
Chumateleti Secondary Road,

LOT 2: Moliti – Phona-Chumateleti Road Section – from km 24+620 to km  
50+244

EMPLOYER

~~Georgia~~ Roads Department, ~~the~~ Ministry of ~~Regional~~  
Development and ~~Infrastructure~~ of Georgia



ENGINEER

~~Authorized representative of:~~ JV  
Pyunghwa Engineering Consultants  
Ltd ~~and~~ /Yooshin Engineering ~~Corporation~~ ~~and~~/  
Roads ~~Rehabilitation~~ and ~~M~~modernization  
Supervision Direction Ltd

CONTRACTOR

“AKKORD” ICIC



PREPARED BY: AKKORD ICIC, June -2020

APPROVED BY: Roads Department of Georgia:

June 2020



1. Armature workshop- in Chumateleti. The factory is located on private land, whose cadaster code is: Area Total: Destination- The reinforcement (cutting and bending) of the reinforcement required for reinforced concrete work is done in this workshop.
2. Auto atelier and car park – Near The Chumateleti, Near the 48 pickets of the construction road; The atelier located on private land, which has been leased by the company. Whose cadastre code is: Area Total: Destination-;
3. Concrete workshop - located on private land in Molity, whose cadaster code is: Area Total: Destination-

#### **Concrete Plant Management**

The concrete plant is where aggregate materials from the quarry are mixed with cement prior to loading to the transport vehicle to take it to site. Generally, the resulting emissions are:

- Noise from concrete mixer;
- Dust generated during material unloading to bunker;
- Exhaust emission during operation of mixing equipment and numerous haul trucks transporting materials; and
- Wash water laden with concrete/cement silt mixed with plasticizers.

Due to the above reasons, similar mitigation measures will be followed in setting up the contractor concrete plant as will be followed in setting up. An additional measure taken to enhance environmental protection is that wash water will be collected in a dedicated impervious concrete basin for preliminary sedimentation, from where it will be periodically removed and disposed in accordance to Georgian legislation .

Despite the contractor camps will not include any construction-related infrastructure but some specific considerations and mitigation measures will be followed;

- Fence will be erected ;
- The camp area will be secure and guarded;
- The camp area will be properly graveled to avoid any mud;
- The entrance of Contractor Camp will be provided with flagmen;
- Local road inspections and cleaning will be carried out;
- All roads and access roads will be watered by sprinkler trucks during dry weather three times a day (morning at 9 o'clock, afternoon at 12 o'clock and evening at 6 o'clock) or as needed according to the local conditions;
- All type of waste will be transported from the camp's periodically by LTD Dasuftavebal of Khashuri and will be disposed and utilized in accordance with Georgian legislation (Waste Management Code of Georgia 2014);
- Weekly waste inspections will be made outside the camp fence;
- It will be strictly prohibited to create an additional noise within residential and other sensitive areas (e.g. use of horns);

- Maximum noise levels at the camp boundary will not exceed 70 dBA and this limit will be strictly followed;
- First aid boxes and Eye wash station/bottles will be placed at the appropriate locations and shown on the camp general plan;
- Control of drugs and alcohol abuse is permanently implemented;
- Smoking areas will be arranged to avoid camp site pollution with cigarette remains;
- In order to increase the awareness of the employees, will be developed the Code of Social Behavior and trainings will be conducted

Domestic waste generate in the camp site will be collected daily from each facilities and will be stored in special wastebaskets (please see details in Waste Management Plan). Accordance to agreement with LTD “San – Dasuftaveba of Khashuri all such type of waste will be transported from the camp periodically (as required) and will be disposed and utilized in ac Fire Fighting Equipment

The camp territory will be provided with all necessary firefighting equipment including a full fire alarm system according to agreement with LTD Saxanzro Usaftrxoebal of Khashuri .

Fire Fighting Equipment will be put on each construction site campsite or any other facilities related to the works and under the control of contractor or its Subcontractors As a minimum following guideline will be adhered to:

- Each vehicle or mobile construction equipment will be equipped with a proper fire extinguisher;
- Fuel stations will be equipped with fire extinguishers suitable under local and international standards to extinguish fires class B;
- At each storage area and warehouse, suitable fire extinguishers will be put in place, depending on the classification of the stored material;
- All kitchen/cooking facilities will be equipped with CO<sub>2</sub> fire extinguishers. Additionally fire blankets will be put in place next to the stove/cooking rings;
- Office space and camp living areas will be equipped with firefighting equipment. As a general rule the maximum distance of firefighting points should not exceed 50m;
- Firefighting inspection by the local fire department will be carried out. Additional requirements determined during this inspection will be adhered to.

After completion of the project, the areas used within the project will be restored. Re-cultivation activities will be comprised of technical re-cultivation and biological re-cultivation. The re-cultivation plan will be implemented in accordance with Regulation #424 on “Approval of the Rules for Removal, Storage and Use of Topsoil and Re-cultivation”. The spoil disposal site will be re-instated upon completion of works at the site. The re-cultivation activities will be consequently implemented after the filling of each spoil disposal site pit.

All types of temporary infrastructure and equipment/machinery will be removed from the sites. All types of waste (construction waste, household waste, hazardous waste, sewage etc.) will be collected and transported from the area by contracted licensed companies. After the sites are cleared the compaction of the territory and topsoil spreading, compaction and molding will be commenced. The topsoil needed for the re-cultivation activities will be removed from the storage areas (indicated above) and spread over the territory.

The aim of the biological re-cultivation will be to recover the soil and vegetation cover to preconstruction condition. Biological re-cultivation activities will comprise of Grass Seeding, Turfing and Tree Planting.

**Medical Aid**

All accidents that involve personal injury, no matter how small, must be reported to the supervisor. Upon initial engagement, or when relocating from one site to another, make sure you know the locations of the medical facility, the nearest telephone, your Site First Aider and the nearest first aid box.

- Always obtain treatment from the medical facility or from the Site First Aider following an accident, when feeling unwell or develop unusual symptoms;
- Always wash the infected area with clean water for at least 10 minutes and remove any contaminated clothing after accidental contact with a chemical;
- Always use the eyewash solution for at least 10 minutes following chemical contamination

of

the eyes;

- Always get medical treatment as soon as possible after washing off any contamination;
- Always go into the fresh air immediately if you feel in any way unwell when working with chemicals.

It is the duty of all supervisors to ensure that proper accident report forms are completed in the event of a personal injury, no matter how minor the injury appears to be.

In order to supply all workers with adequate medical services, a medical container will be installed in Camp and doctor will be appointed. All employees will be provided appropriate services by the Camp doctor, with a minimum monthly health check. In case of unexpected accidents in all sites, plants and workshop areas, injured worker will be immediately delivered to camp doctor’s room and will be provided with necessary medical help. During the most serious situation injured worker will be delivered to LTD “Khashuri Health Center Clinic”

**Personal Protective Equipment and Work Practice Controls**

In addition to regular PPE for workers engaged in various tasks (fall protection, hard hats, hearing protection), employees will also provide:

- Gloves: Gloves should be worn at all times while on-site. The type of glove worn should be appropriate to the task. If gloves are not typically required for the task, then any type of glove is acceptable, including latex gloves. Employees should avoid sharing gloves.
- Eye protection: Eye protection should be worn at all times while on-site.

**Damage to Local Land and Property**

To avoid any conflicts between construction workers and nearby communities with respect to social amenities, the contractor will provide hired workers with facilities such as health care, eating space, and praying places within the work camp. Whenever possible, contractor will employ local labor to benefit local communities and to promote the overall acceptance of the project. Additionally grievance redress mechanism will be established for handling and resolution of communities ‘grievances arising from the construction

processes (please see Grievance Redress Mechanism chapter below). Avenues for dialogues and consultations will be provided at all times to deal with community issues.

Communication of Camp residents with local communities can lead to rising of the risk of distribution of AIDS, STD and some other infection diseases. Number of measures for such situation avoidance will be implemented by the contractor.

- training of all construction workers in basic sanitation and health care issues and general health and safety matters;
- clean drinking water to all workers;
- adequate protection to the general public, including safety barriers and marking of entrance prohibited areas;
- staff visits to the nearby villages in non-work hours strictly prohibited;
- adequate drainage throughout the camps so that stagnant water bodies and puddles do not form;
- Sanitary latrines and garbage bins in construction site, which will be periodically cleared by the LTD “San – Dasuftaveba of Khashuri” to prevent outbreak of diseases. Where feasible the contractor will arrange the temporary integration of waste collection from work sites into existing waste collection systems and disposal facilities of nearby communities (please see Waste Management Plan);
- regular (monthly) health check of all workers by Camp doctor;
- Awareness campaign on the avoidance of HIV/AIDS and STD involving both the local community and the construction workers and liaison with local health authorities. Monitor the incidence of HIV/AIDS as part of the scope of the contractor.

#### **Accommodation**

There are about 120 workers, 15 foremen, 10-20 topographers are accommodated in the Camp. Possibly the number will increased with activation of construction process. About 5% of accommodated in the Camp persons (including Engineer personnel) are foreigners and 95% are representatives of Georgia. However about 95% of the Project personnel are residents of Georgia. Gender composition is 3% of women and 97% of men.

The dormitory for accommodation of workers inside the Camp area will be provided in accordance with SanPiN 4719-88 requirements. Each room will be separately connected to the Main corridor. The dormitories will be provided with toilets, sinks and shower cabins located at the end of the corridor at each block. Two-three (maximum 4) workers will be accommodated at each room with provision of 6 m<sup>2</sup> for each. Height of the rooms will be 2.5 m minimum with width of 2.2 m minimum. All staff will be provided with breakfast, lunch and dinner and receive clean work clothes on a daily basis. The Camp doctor carries out monthly health checks on all staff. All accommodation containers are provided with necessary equipment such as air conditioner, water dispenser, refrigerator, furniture etc. The accommodation is regularly cleaned by dedicated cleaning staff.

#### **Drug and Alcohol Abuse Policy**

This policy aims to:

1. Raise awareness of the risks of alcohol and other drug related problems;
2. Promote the health and wellbeing of employees;

3. Minimized problems at work arising from the effects of alcohol and other drugs;
4. Identify employees with possible alcohol and drug related problems at an early stage;
5. Offer employees with alcohol and other drug related problems referral to an appropriate source for intervention and treatment if necessary

Policy Statement:

- This policy applies equally to all staff
- All (the organization) premises are alcohol and drug free during working hours
- Employees shall be alcohol and drug free while on duty
- After work functions and other social events are outside the remit of this policy;

Early recognition of individual alcohol and drug problems is a shared responsibility of all employees, staff and management. It is recognized that this is a complex and difficult issue and that supervisors and managers need training and support to recognize problems and deal with them effectively.

The Employer will provide access to professional services, including training to assist staff in this regard. Identifying the Problem Employees are encouraged to seek assistance on a voluntary basis. However, a problem may become apparent due to the observances of a colleague or manager/supervisor. NO ONE characteristic identifies someone with an alcohol and drug related problem but the following MAY be indicators especially if occurring in combination or over a period of time.

- Absenteeism
- Accidents and unusual incidents
- Fluctuating work performance
- Fluctuations in concentration and energy
- Late returns to work
- Unpredictable mood changes
- Poor co-operation with colleagues
- Unkempt appearance
- Frequent borrowing of money
- Hand tremor
- Smelling of Alcohol
- Excessive sweating

- Unreliability
- Aggression or irritability
- Confusion or drowsiness

#### **Procedure**

- Observation of behavior and keeping a note of incidents may lead you to believe that there is a problem. Signs, as those mentioned above, may be evident but do not automatically assume that the problem is drink/drug related but if problems persist, it should be further looked into.
- Where a supervisor/manager identifies a work performance or behavior indicator of a possible alcohol and drug related problem (see below), he/she should raise this with the staff member and make them aware of the availability of support services
- The manager should only deal with work-related issues and not try to diagnose the personal problem

#### **Responsibilities**

No one must drink alcohol or use drugs at this workplace, except:

For legitimate medical reasons: Every person must notify your supervisor if prescribed medication is likely to affect your behavior and therefore work health and safety. Your supervisor may assign other duties while you're taking the medication

The manager/supervisor at this workplace must, if they have reasonable grounds for believing that a person are incapable of safely performing duties or may be a risk to others due to the effects of drugs or alcohol, arrange for you to be removed safely from the workplace.

Each person must ensure that they are not, by the consumption of drugs or alcohol, in such a condition as to endanger their own safety or that of others at this workplace. This includes not coming to work if, after drinking or using drugs in its social time, every person ability to work safely is still impaired. If he/she come to work, he/she must report to his/her supervisor, who may assign his/her other duties or arrange to be removed safely from the workplace.

#### **Managing drugs and alcohol**

Employer (HSM) will identify all workplace factors that may influence someone to turn to drugs or alcohol, and use the hazard management process to eliminate drug or alcohol use or control the risks from them.

#### **Disciplinary action**

If anyone is found to breach this policy, management will giving a formal warning, followed by encouraging them to get treatment, suspension, and finally, dismissal.

#### **Testing**

Employer is entitled to conduct periodic check of alcohol and drugs. If implore decide to introduce a testing program, it must include details about it in this policy. This includes:

The practicalities of testing: who will do it, when and how it will be done, and what type of procedure will be used;

The procedures for the action you will take for a positive test result

Acknowledge that people have the legal right to refuse to be tested, unless specified in legislation or in their contract or employment agreement.

### **Emergency Response Management**

Upon declaration of a project emergency, the alarm and assembly procedure will be implemented immediately:

Alarm: In the event of an emergency the plant alarm will sound. All personnel will proceed to pre-designated assembly areas;

Following the announcement of an alarm, radio traffic will be confined to emergency communications only;

Telephone lines will be used only by those authorized to use them for the purpose of dealing with the emergency;

Assembly: Upon receiving instructions to assemble, all craft employees will secure their work area and walk in a calm, orderly manner to the assembly area. Securing a work area includes but is not limited to the following:

- All motorized equipment, welding equipment, and burning equipment will be shut down;
- All gas, diesel, propane, electrical, open flame and other powered equipment will be shut down immediately;
- All electrically powered tools will be disconnected from their power source;
- All Foremen will wait for their employees in the assembly areas. Foremen will ensure all employees working in remote areas and in confined spaces have been alerted and have proceeded to the assembly area;
- Foremen will conduct a roll call of their employees. If any employees are found to be missing, the Site Manager will be informed immediately of the employee's name, file number, and last known location of the employee;
- The Office Manager or his designated representative will call the roll of all salaried employees and visitors. If any employee is found to be missing, his name, file number, and last known location will be reported immediately to the Site Manager;
- No attempt will be made to locate missing employees until: a search is authorized by the Site Manager;
- it is determined that a search and rescue party can be reasonably protected during such a search;

- Emergency medical personnel will assemble in the First-Aid Room ready for any duties that might be assigned.

### **Three Strikes Discipline System**

Contractor will be used the three strike system with the all workers. Workers can earn one strike at a time or earn all three at once depending on the condition. EPM and HSE are the only ones who can give strikes to workers. In situations where workers choose not to adhere to guidelines of SSEMP, (for example not wearing PPE, spilling oil, throwing litter, going to nearby village in non-work hours etc.) discipline will be done using the following three strike method:

- 1<sup>st</sup> STRIKE: When a worker is issued a strike, the EPM will give a verbal warning explanation to the workers. The EPM will review the situation, discuss other actions the worker could have taken, and clearly communicate what the next course of action will be if the worker chooses to disobedience again. The worker will get an official vocal warning, noted in EPM’s records.
- 2<sup>nd</sup> STRIKE: When a worker is issued a second strike, the EPM will give a written warning to the workers.
- 3<sup>rd</sup> STRIKE: When a worker is issued a third strike, the EPM will inform the accountant and the worker will lose 50% salary for that month.

### **Reinstatement of Temporary Acquired Land**

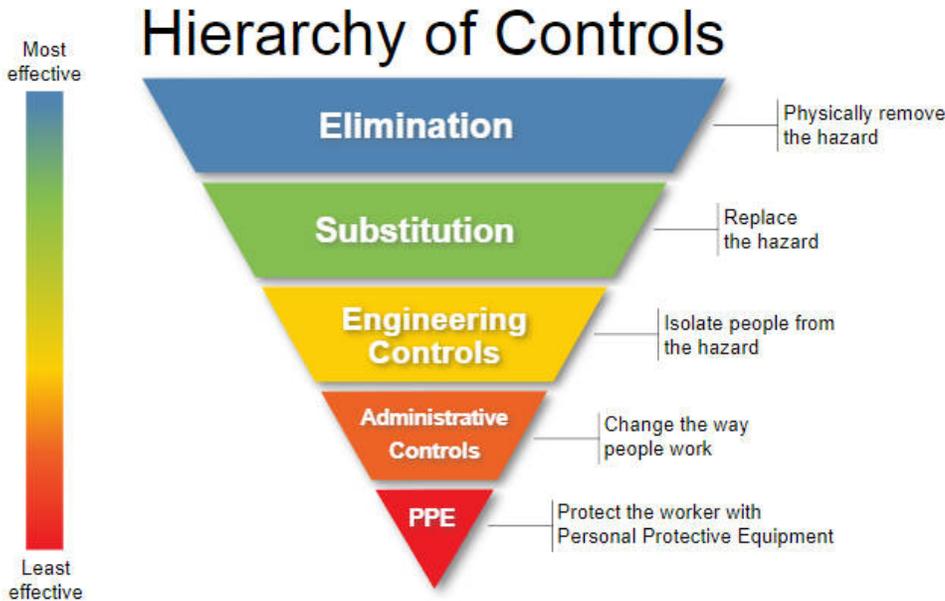
At the end of the project and expiration of the land lease agreement, the camp site will be dismantled. All Contractor’s equipment and structures will be removed from the site. No waste dumps or un-pumped sewage reservoirs will be left on the former site. Landscaping and respreading of the topsoil over the site will be undertaken to ensure that the site will be left in an aesthetically acceptable condition.

### **(COVID-19) prevention procedure and administrative management**

This plan was preceded by a detailed risk assessment process. The results were compared with the April 4, 2020 Order of the Minister of IDPs from the Occupied Territories, Labor, Health and Social Affairs of Georgia, 101-149 / O “On the Approval of Recommendations on the Prevention of the Spread of New Coronavirus (COVID-19) at Work “The General Recommendations for Infectious Diseases (COVID-19) developed with the new coronavirus (SARS, SARS-CoVCoV-2) developed and it was found that the work performed by the contractor was at the average risk of infecting employees with COVID-19;

Moderate risk of infection includes workplaces where employees are required to have frequent and / or close contact (less than 2 meters). Given this level of risk, the company will develop control mechanisms outlined in the plan and try to reduce the risk level to a low risk level. Risk control mechanisms have been developed in accordance with the internationally recognized and

recommended hierarchy of control mechanisms recommended by the Department of Labor There are five key stages in the Hierarchy of risk control



From the hierarchy indicated in the international norms of threats and risks, the first two stages - exclusion" and "replacement" in the conditions of the global pandemic in relation to the disease is impossible. Therefore, in order to manage the risks of the spread of COVID-19, Sisi LA Ltd. uses the remaining three steps: "Hazard Isolation," "Procedures," and "Individual Protection Measures."

**Isolation of danger. Hygienic and technical control measures**

**1. Physical isolation of persons at risk of spreading the virus from other employees:**

he risk group includes all employees and visitors, if:

- They have left the countries where the virus has spread in the last 14 days;
- were declared a quarantine zone In the territorial units of Georgia, or had contact with persons living in these units (or were temporarily present);

- have been in close contact with the person / persons carrying the coronavirus for the last 14 days (they must undergo self-isolation / quarantine in accordance with the rules established by the state);

- Symptoms characteristic of a respiratory infection (cough, fever, wheezing, difficulty breathing, general weakness, etc.);

- Individuals at high risk of COVID-19 infection and complications: those over 70 years of age, as well as those with chronic diseases (cardiovascular disease, diabetes, bronchial asthma, and other respiratory diseases).

- The personnel will be interviewed according to the questionnaire given in Annex 1. All persons authorized to enter the facility are required to fill out a questionnaire and if there is a positive answer to any of the questions - do not allow this person to enter the company's territory (work space).

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## 2. In case of detection of a person representing a risk group

As a result of completing the questionnaire provided in Annex 1, the person / persons identified will immediately leave the area of the building and be transferred to a special testing facility, from which the special machine and staff will be called.

## 3. Remote temperature measurement(Thermo screening)

- All persons entering the company's territory (work space) are required to measure the temperature with a thermometer at work and register the data in the appropriate journal. If temperatures above 37 degrees are detected, it should not be allowed in the work area.
- The project security officer / security guard is responsible on termoscreening. Also, he should provide first aid Team / person with medication (first aid kit).Team / person with medication (first aid kit);

## 4. Complete and regular disinfection of the company's work space

- Regularly, every working day, disinfection will be carried out twice, wet cleaning in all areas of the enterprise, as well as disinfection of the company's work spaces.
- The shopping carts and carts, door handles and all the places where the hand touches are intensive will also be cleaned.
- Complete disinfection will be performed every 10-14 working days;

## 5. Ventilation / ventilation of the workspace

In the office of the contractor, through the ventilation system in residential, work, leisure and communal facilities, there will be periodic ventilation of the entire working space during lunch

or breaks, in places where natural ventilation is possible, doors / windows will be opened and air will be ventilated.

## 6. Access to disinfectants

The company's work areas will be available for deodorants, hand sanitizers, gloves, masks.

## 7. Waste management

Medical waste bins / bins (necessarily closed) will be placed on the facilities, in the designated areas, with the appropriate warning sign "Only for medical waste" where used gloves and gloves will be placed. Medical waste will be disposed of at the request of the Waste Management Code by the appropriate person.

## 7. Dining space

Near the dining area is a hand sanitizer disinfectant / pulverizer. Manual hand washing instructions should be posted and disposable hand wipes should be placed. Keep food at a distance of 2 meters while eating.

### Administrative control measures

- Immediately approve a plan for readiness and response to infectious disease.
- The plan will be shared with all members of the management. Introduce the requirements and recommendations outlined in the plan to all employees in the form of instructions.
- To constantly update the work practice and specifics in terms of minimizing the gathering of employees and close contact.
- Review the existing layout of workspaces and employees. Provide a minimum distance of 2 meters between employees' workplaces, or arrange transparent barriers between employees.
- Prohibit the gathering of more than 5 people at a time in gathering places (dining room, changing rooms, etc.).
- Mandatory rules for the conduct of employees in the current emergency situation have been developed;
- Mandatory / informative signs should be placed throughout the work space
- In the work area (corridors, doors, stairwells, entrances, etc.) there should be mandatory / informative indications that remind employees of the following issues:
  - Rules for the use of personal protective equipment and its removal
  - Rules of personal hygiene (hand washing and disinfection)

- Distance (maintaining a distance of at least 2 meters with other employees);
- Prohibition of physical contact (scrolling, kissing, shaking hands, etc.);
- Contact information (who should be contacted in case of symptoms);

### Individual protection measures

Provide the necessary personal protective equipment - gloves, disposable gloves, hand sanitizer. These facilities will be located in several accessible areas of the area, which will be known to all employees and will be marked with an appropriate indicator.

- In carrying out the instructions, all employees should be familiar with the rules of proper use of these personal protective equipment.

### Appendix - 1

#### Binding questionnaire.

If you have any positive answers to any of the questions below, Must immediately

Let the company manager know!

1. Have you been abroad for the last 14 days?
2. Have you been to the municipalities where quarantine has been declared for the last 14 days?
3. Have you been in close contact with a person / persons carrying coronavirus for the past 14 days?
4. Do you have any symptoms characteristic of a respiratory infection (cough, fever, wheezing, difficulty breathing, general weakness, etc.)?
5. Are you at high risk for COVID-19 infection and complications: over 70, and / or chronic diseases (cardiovascular disease, diabetes, bronchial asthma, and other respiratory illnesses)?



Moliti – Phona-Chumateleti Road Section

**CAMP, WORKSHOP AND PLANT MANAGEMENT PLAN**

**Camp Management plan**

Area of Mitigation	Actions / Mitigation Measures	Location	Time Frame	Responsibility
Pollution prevention  in accordance with IFC / EU / WHO standarts and Georgian legislation	No construction camp, workshop, or storage facility will be located within 100 m of streams	Construction Camp	At all times	Project manager / EPM
	All waste water will be collected in septic tank and emptied by specialized suction vehicles of LTD “Georgian Water Company Khashuri Service Center”	Construction Camp	Septic tanks emptied as required	Camp manager / EPM
	Regular transportation and utilization of domestic waste from camp territory will be provided according to agreement with LTD “San – Dasuftaveba Of Khashuri”	Construction Camp	At all times	Camp manager / EPM
	Domestic waste will be regularly and frequently transported to official dump site to avoid waste dispersal by wind	Construction Camp	At all times	Camp manager / EPM
	Waste collection bins and containers with appropriate size will be provided at each structure	Construction Camp	At all times	Camp manager / EPM
	Waste containers located outside the buildings will be provided with lids	Construction Camp	At all times	Camp manager / EPM
	Sewage system will be inspected and necessary maintenance will be undertaken	Construction Camp	Daily	Camp manager / EPM
	Number of septic tanks will be provided for collection of	Construction Camp	At all times	Camp manager / EPM

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Sew all septic tanks will be located in the appropriate distance (at least 100 m away) from any water course ages from offices, canteen and residential dormitories			
Regular septic tanks pumping, transportation and treatment of waste water (as per Georgian legislation) from camp territory will be provided according to agreement with “Georgian Water Company “ Khashrui Service Center	Construction Camp	Septic tanks emptied as required	Camp manager / EPM
Waste inspections will be made outside the camp fence	Construction Camp	As required	Camp manager / EPM
All valves and trigger guns will be resistant to unauthorized interference and vandalism, and will be turned off and securely locked when not in used	Construction Camp	At all times	Camp manager / EPM
Any spilled materials and contaminated earth will be collected and disposed in accordance with Georgian legislation	Construction Camp	As necessary	EPM
All open burning is prohibited	All locations	At all times	All staff
All construction vehicles and machinery will be kept in good working order and engines turned off when not in use	Construction Camp	At all times	Driver / Head mechanic
The storage of all fuels will be prohibited in Camp area. All these activities will be carried out in Plant Yard area	Construction Camp	At all times	Camp manager / EPM
The storage of all hazardous liquids such as lubricants, paint etc. will be prohibited in Camp area. All these issues will be carried out in Plant Yard area	Construction Camp	At all times	Camp manager / EPM



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	The discharge of oil and fuel onto open soils is prohibited	Construction Camp	At all times	EMP
	Site run-off will be collected in the drainage system and disposed of by the third party contractor	Construction Camp	At start of work, with regular emptying	EMP
Damage to habitats and ecosystems	In case of any wild animals will be noted on the camp territory it will be caught and release to closest habitat	Construction Camp	At all times	EMP & Camp manager
	Hunting, trapping and holding of wild animals at the camp area will be forbidden	Construction Camp	At all times	EMP & Camp manager
Public safety & prevention of disturbance	Public access will be prohibited using fencing and security;	Construction Camp	At all times	Head of security
	Limit works will be restricted to between 07: 00 a.m.– 21: 00 p.m. within a 500 m distance of the adjoining settlements as per Georgian legislation	Contractor Camp & all construction sites	At all times	Project Manager
	Accumulation of high number of heavy equipment within residential area will be forbidden	Construction Camp	At all times	EPM & HSM
	It will be strictly prohibited to create an additional noise within residential and other sensitive areas	All residential areas	At all times	EPM & HSM
	All roads and access roads will be watered by sprinkler trucks	Contractor Camp & all construction sites	During dry weather three times a day	EPM & HSM
	Noise levels at the camp will not exceed 70 dBA and this limit will be strictly followed	Contractor Camp & other residential areas	At all times	EPM



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	The entrance of Contractor Camp will be provided with flagmen	Construction Camp	At all times	Camp manager & HSM
	All equipment such as generators will be operated in sound deadening enclosures	Construction Camp	At all times	EPM
Staff health and safety in accordance with BCH 8-89 2.7	Water provided to all staff will be obtained from Camp well (water quality meets the national drinking water standards)	All construction sites	At all times	Camp manager
	Each power generator will be placed on bounded concrete base (to avoid leaks of fuel and oil)	Construction Camp	At all times	EMP, HSM & Camp manager
	The propane balloons will be prohibited in camp area as per safety procedure to avoid overheating and risk of explosion	Construction Camp	At all times	EMP, HSM & Camp manager
	All staff will be trained for fire safety measures according to agreement with LTD Saxandzro Usaftrxoebal of Khashuri.	Construction Camp	Every 3 months	HSM
	All staff will be trained about AIDS and construction work safety	Construction Camp	Every 3 months	HSM
	All staff will be trained about First aids and Personal safety issues.			
	All staff will be provided with two sets of work clothes	Construction Camp	At the start of service	HSM
	All staff will be provided with personal protective equipment (PPE)	All construction sites	At the start of service / as necessary	HSM
	Adequate traffic signs and warning notices will be provided on site and at dangerous areas	All Sites, main roads	Weekly check	HSM

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		and access roads		
Adequate firefighting equipment will be provided on site and checked weekly	Construction Camp & all sites	Weekly check	HSM	
<ul style="list-style-type: none"> <li>• Buckets of sand &amp; Spades</li> <li>• Foam Extinguishers</li> <li>• Fire blanket in kitchen area</li> </ul>				
All employees will be provided appropriate services by the Camp doctor, with a minimum monthly health check	Construction Camp	Upon starting services and once a month	HSM	
All employees will be provided with breakfast, lunch and dinner every day	Construction Camp	Daily	Camp Manager	
All workers' uniforms will be laundered on a daily basis	Construction Camp	Daily	HSM & Camp manager	
All workers' uniform about location of First Aids boxes and Eye wash station/bottles	Construction Camp	At the beginning of the work	HSM	
All workers' uniform about location of Smoking areas and Cigarette smoking is prohibited except for specially allotted places	Construction Camp	At the beginning of the work	HSM	
Eye wash station/bottles will be placed at the appropriate locations and shown on the camp general plan;	Construction Camp	At the beginning of the work	HSM	
All workers that coming distant places will be provided with a fitted container for living	Construction Camp	At all times	Camp Manager	



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	All containers will be provided with the necessary equipment: <ul style="list-style-type: none"> <li>• Air conditioner</li> <li>• Water Dispenser</li> <li>• Refrigerator</li> <li>• Office furniture etc.</li> </ul>	Construction Camp	At all times	HSM
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**Workshop Management Plan**

Area of Mitigation	Actions / Mitigation Measures	Location	Time Frame	Responsibility
Pollution prevention  in accordance with IFC / EU / WHO standarts and Georgian legislation	No construction camp, workshop, or storage facility will be located within 100 m of streams	workshop	At all times	Project manager / EPM
	All wash water will be collected in septic tank and emptied by specialized suction vehicles of LTD “Georgian Water Company”	workshop	Septic tanks emptied as required	Workshop manager / EPM
	All fuels will be stored in the designated area of Fuel station (shown in figure 4b) and will be banded in concrete with a capacity of 110 % of the fuel tanks	workshop	At all times	Workshop / EPM
	All hazardous liquids such as lubricants, oil drums, paint etc. will be stored in the designated area at the workshops (shown in figure 4b) on an impervious base with run-off collection	workshop	At all times	Camp manager / EPM
	Oil filling and refueling will be strictly controlled and is permitted only at the fuel filling station and workshops.	workshop	At all times	Camp manager / EPM
	All valves and trigger guns will be resistant to unauthorized interference and vandalism, and will be turned off and securely locked when not in used	workshop	At all times	Camp manager / EPM
	Any spilled materials and contaminated earth will be collected and disposed of as per Georgian legislation	workshop	As necessary	EPM

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	Solid hazardous materials will be stored in the designated secure area at the workshops.	workshop	At all times	Camp manager / EPM
	Bitumen will be stored in the designated area (shown in figure 5b) and will be bundled in concrete to a volume of 110%	Asphalt plant	At all times	Plant operator /EPM
	All open burning is prohibited	All locations	At all times	All staff
	All construction vehicles and machinery will be kept in good working order and engines turned off when not in use	workshop	At all times	Camp manager / EPM
	All vehicles, machinery, and plant will be provided with oxygen indicator for limited exhaust emissions	workshop	At all times	Head mechanic
	The storage of waste or production waste of any kind as well as re-fuelling and parking machinery or vehicles is not permitted within a distance of 100 m of any stream including drainage or irrigation facilities	workshop	At all times	EPM
	The discharge of oil and fuel onto open soils is prohibited	All locations	At all times	EPM
	Site run-off will be collected in the drainage system shown in figure 4b and disposed of by the third party contractor	workshop	At start of work, with regular emptying	EPM
	No workshop & plant may discharge effluent water to any watercourse; except crushing and asphalt plants only concrete plant will be produced additional concrete water and therefor impervious concrete basins will be constructed for receiving such waters (please see details in Plant Operation Management Plan)	workshop	At start of work, with regular emptying	EPM
Public safety & prevention of disturbance	Public access will be prohibited using fencing and security	workshop	At all times	Head of security
	All equipment such as generators etc. will be operated in sound deadening enclosures	workshop	At all times	EPM
	All roads and access roads will be watered by sprinkler trucks during dry weather or as needed according to the local conditions	workshop	Three times a day	EPM
	Noise and vibration control will be carried out	workshop	As required	EPM
	Hours of working will be limited 40 hours a week according to Georgian legislation	workshop	At all times	Project Manager



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	Local communities and organization will be informed of the construction schedule and any noisy activities on a regular basis via workshops and other liaison	workshop	As necessary	EPM & Workshop Manager
Staff health and safety in accordance with BCH 8-89 2.7	Water provided to all staff will be obtained from camp and workshop wells (water quality meets the national drinking water standards)	workshop	At all times	Camp manager
	All staff will be trained for fire safety measures according to agreement with LTD Saxandzro Usafirtxoebal of Khashuri.	workshop	Every 3 months	HSM
	The propane balloons will be allocated outside the workshop as per safety procedure to avoid overheating and risk of explosion	workshop	At all times	EPM & HSM
	The roof at the location of propane balloons area will be provided to protect propane balloons from direct sunbeams	workshop	At all times	EPM & HSM
	Protection walls at the location propane balloons area will be provided to avoid fire dispersing in case of explosion	workshop	At all times	EPM & HSM
	All staff will be trained about AIDS and construction work safety	workshop	Every 3 months	EPM
	All staff will be provided with two sets of work clothes	workshop	At the start of service	Camp manager & HSM
	All staff will be provided with personal protective equipment (PPE)	All construction areas	At the start of service / as necessary	EPM
	Adequate traffic signs and warning notices will be provided on site and at dangerous areas	All sites, main roads and access roads	Weekly check	HSM
	Adequate fire fighting equipment will be provided on site (shown in figure 4b) and checked weekly <ul style="list-style-type: none"> <li>• Buckets of sand &amp; Spades</li> <li>• Foam Extinguishers</li> <li>• Fire blanket in kitchen area</li> </ul>	All sites, main roads and access roads	Weekly check	HSM
All employees will be provided appropriate services by the Camp doctor, with a minimum monthly health check	Construction Camp	Upon starting services and once a month	HSM	

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	During the massive serious illnesses or injures all employees will be taking to the Xashuri's Clinic	14 Tsereteli st. Kxaragauli Aza Furtseladze	As necessary	HSM& Camp Doctor
	All employees will be provided with breakfast, lunch and dinner every day	Construction Camp	Daily	HSM & Camp manager
	All workers' uniforms will be laundered on a daily basis	Construction Camp	Daily	HSM & Camp manager
	All workers that coming distant places will be provided with a fitted container for living	Construction Camp	At all times	HSM & Camp manager
	All containers will be provided with the necessary equipment: <ul style="list-style-type: none"> <li>• Air conditioner</li> <li>• Water Dispenser</li> <li>• Refrigerator</li> <li>• Office furniture etc.</li> </ul>	Construction Camp	At all times	HSM & Camp manager

Plant operation Management Plan

Area of Mitigation	Actions / Mitigation Measures	Location	Time Frame	Responsibility
Pollution prevention	All plants will be installed in a distance of 100 meters from any stream, river or lake including drainage or irrigation facilities	Plant Yard	Start of operations	Project manager / EPM
in accordance with IFC / EU / WHO standarts	The bitumen and chemical storage area will be located away From any watercourse and the base and bund walls will be impermeable and sufficient capacity to contain 110% of the volume of tanks. The storage area is shown in Figure 5b	Plant Yard	Start of operations	Project manager / EPM
	All sands and aggregate for concrete and asphalt batching will be kept damp or covered	Plant Yard	Dry periods only	EPM

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and Georgian legislation	Air quality monitoring, noise and vibration monitoring will be carried out	Plant Yard	As required	EPM
	All open burning is prohibited	All locations	At all times	All staff
	Plants areas will be watered during the dry summer season to minimize dust	Plant Yard	Three times a day /as necessary	EPM
	The plant area will be graveled for reduction of dust mission	Plant Yard	Start of operations	Project manager / EPM
	At the end of the project materials stockpiles, plant equipment and other facilities will be removed from the site and landscaping will be undertaken	Plant Yard	End of the project	EPM
	No plant may discharge effluent water to any watercourse; impervious concrete basins will be constructed for receiving Such waters.	Plant Yard	At start of work, with regular emptying	EPM
	Fencing will be erected as per figure 5b to protect the private lands from operations at the plant area	Plant Yard	Start of operations	Project manager / EPM
Staff health and safety in accordance with BCH 8-89 2.7	All staff at Asphalt, Concrete and Crusher Plants will be supplied with dust masks and ear defenders	Plant Yard	At all times	HSM
	The Asphalt, Concrete and Crushing plants will be provided With adequate firefighting equipment according to agreement with LTD —Saxandzro Usaftrxoebal of Khashuri .	Plant Yard	At all times	HSM



**SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN**

Moliti – Phona-Chumateleti Road Section

**ROAD, REINFORCED CONCRETE, RATAINING WALLS, GABIONS  
AND BRIGES CONSTRUCTION WORKS MANAGEMENT PLAN**

**Rehabilitation Project of Dzirula - Kharagauli - Moliti - Pona –  
Chumateleti Secondary Road,**

**LOT 2: Moliti – Phona-ChumateletiRoad Section- from km 24+620 to km  
50+244**

**EMPLOYER**

**Georgia Roads Department Ministry of  
Regional Development and Infrastructure**



**ENGINEER**

**Authorized representative of: JV  
Pyunghwa Engineering Consultants  
Ltd/Yooshin Engineering Corporation/  
Roads Rehabilitation and modernization  
Supervision Direction Ltd**

**CONTRACTOR**

**“AKKORD ” ICIC**



**PREPARED BY: AKKORD ICIC, June 2020**

**APPROVED BY: Roads Department of Georgia;**

**2020**

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	<b>SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN</b>	
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Moliti – Phona-Chumateleti Road Section

**Earthworks**

Along the road corridor soil will have to be removed from the surface, and then large volumes of fill will be deposited at various locations in order to raise the elevation of the alignment and to provide an acceptable gradient which conforms to established standards. Roadway fill will entail obtaining suitable materials conforming to specifications, hauling it to the site and compact it to the specified requirements. The overall total of the earthworks is 645896 cubic meters, and the total asphalt requirement is 70000 t.

To minimize negative environmental impacts due to the earthworks, the following mitigation measures have been developed and will be implemented according matrix provided below:

- Excavated materials suitable for fill will be transported to and placed, compacted and graded in requisite quantities in fill and back fill areas within the limits of the work;
- Earthwork operation to be suspended when the wind speed exceeds 20km/hr in areas within 500 m of any community;
- All stockpiles will be adequately wetted, or covered with plastic, or provided with wind shield to reduce dust emission;
- Excavated material unsuitable for filling will be hauled away to spoil areas, dumped and graded, all as approved by the Engineer;
- Speed limits and defensive driving policies will be strictly implemented;
- Regular maintenance of vehicles and equipment will be conducted to keep emissions in check;
- Stockpile height will be limited to 3 m to avoid wind erosion and dust emission. Stockpiles will compacted if long term storage is likely;
- For avoidance of unexpected soil compaction, loss of agricultural lands and additional damage to the rural roads by heavy equipment of Contractor, all haul trucks drivers would be obligated to use only chosen roads that mentioned above for material transportation.
- Excess and unsuitable materials (if any appear) will be immediately removed from the site;
- All Contractor equipment is maintained on a weekly basis to avoid soil pollution through any fuel or lubricant spillage. In case of any spill, the polluted soil will be immediately removed and disposed of according to Georgian legislation (please see Waste Management Plant);
- Oil changes are only permitted within workshop areas;
- The discharge of oil and fuel onto open soils is prohibited;

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### Moliti – Phona-Chumateleti Road Section

- Fuelling, oiling or lubricating of any machinery will be restricted to stationary and or mobile filling stations and will exclusively be carried out by using suitable taps and nozzles;
- Where the ground is contaminated with cement slurry, oil, tar or any material harmful to plant life, soil will be excavated to a depth of 1.0 m and removed off site;
- Regular routine maintenance of access roads will be undertaken during project construction activity (according to requirements). Final reinstatement of all roads up to the pre-project conditions will be carried out at the project completion.

### Road Construction Management

The key steps for road construction are as follows:

1. Preparation of embankment
2. Subgrade
3. Subbase
4. Base
5. Bitumen road base
6. Binder course
7. Wearing course
8. Line painting and road furniture

The potential impacts of the above activities will be identified as generation of dust, generation of noise and vibration, and damage to surrounding land. Due to the above reasons, a number of specific considerations and mitigation measures will be followed to minimize impact to surrounding environment and further summarised in the SSEMP matrix and risk assessment matrix.

- Noise and vibration control will be carried out by Laboratory LTD “Greentecs” (please see Noise & Vibration Management Plan);
- During construction all noise volume will be restricted to the national standards (please see Noise & Vibration Management Plan for further details);
- In construction periods the project area which is close to sensitive receptors will be provided with animal crossing sign boards in appropriate sections for passage of cattle, sheep and other animals ;
- Adequate traffic signs and warning notices will be provided on site and dangerous areas ;
- Fencing and access control will be installed at all work sites where practicable ;
- The storage of waste of any kind as well as parking machinery or vehicles is not permitted within a distance of 100 m of any stream (including drainage or irrigation facilities);



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### Moliti – Phona-Chumateleti Road Section

- Speed limits and defensive driving policies will be strictly implemented;
- All construction roads and access roads will be provided with traffic and warning signs;
- Regular maintenance of vehicles and equipment will be conducted to keep emissions in check;
- Pouring of excess concrete from concrete mixer to un-appointed areas will be strictly prohibited;
- Washing of concrete mixer will be restricted by specially appointed area (at the batching plant sedimentation basin);
- Where the ground is contaminated with cement slurry, oil, tar or any material harmful to plant life, soil will be excavated to a depth of 1.0 m and removed off site;
- In the event of any spoil or debris being deposited on any adjacent land, the material will be immediately removed and the area restored;
- Existing top soil will be stripped to a minimum depth of 50 cm and stored in stockpiles not exceeding 3 m height for use during reinstatement;
- Stockpiles will not be surcharged and multiple handling will be kept to a minimum;
- Blowing of horn will be prohibited within the construction zones except under the emergency conditions;
- Local communities and organization will be informed of the construction schedule and any noisy activities on a regular base;
- Working hours will be limited 40 hours per week according to Georgian legislation;
- All unpaved roads and access roads will be watered by sprinkler trucks during dryweather three times a day (morning at 9 o'clock, afternoon at 12 o'clock and evening at 6 o'clock) or as needed according to local conditions;
- Trees and bushes outside the construction width but within the road reserve will be generally preserved from damage; cutting down of trees will not take place without the prior approval of the relevant Local Authorities.
- Work at water crossings should start only after the Method Statement has been approved by the SE and Client

#### Culvert Construction Management

The key steps for bridge construction are as follows:

1. staking out and excavation
2. Rock fill and gravel bedding



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### Moliti – Phona-Chumateleti Road Section

3. Placing the pipes
4. Sealing joints and waterproofing
5. Backfilling and compaction
6. Inlet and outlet foundations and concreting of apron slabs
7. Construction of inlet and outlet wing walls

All culverts will be constructed with due consideration for environmental impact avoidance. Provisions for environmental protection and mitigation measures during culvert construction will be as follows:

To avoid pollution of water canals construction works will be mainly in dry summer season;

- All solid waste and contaminated earth generated during construction will be removed from the site and disposed of according to the Waste Management Plan;
- During construction all noise volume will be restricted to the national standards (please see Noise & Vibration Management Plan);
- The discharge of oil, bitumen mastic and fuel onto open soils is prohibited;
- Scrap metal waste will be collected on site by workers and stored in the designated storage container at the contractor Plant Yard;
- Collected waste will be delivered by LTD San – Dasuftaveba Kharagauli/Khashuri and disposed in accordance with Georgian legislation (Waste Management Code of Georgia 2994) ;
- Construction waste will be reused on site if possible. If reuse is not possible the waste will be disposed of as domestic, metal or hazardous waste.

Rehabilitation or replacement of bridges and culverts, Construction of side drains and other drainage structures; provision of retaining walls where necessary are manly parts of construction works.

As the alignment runs close to the riverbed at several location attention has to be paid to existing and further possible development of erosive processes to prevent potential damage to the road. It is proposed to stop the erosion process by the construction of retaining structures, which serve as protection against further erosion and allow the reinstatement of the eroded side slope.

The retaining walls can be constructed as cement concrete walls, as masonry walls or with gabions. If the wall face will be frequently exposed and or submerged in water a cement concrete structure is the preferred solution. In cases where the wall is only seasonal affected by water a gabion wall construction may be acceptable.

Existing or potential locations of riverbank erosions have been identified and investigations carried out. Within the design process, measures are proposed and structures designed to prevent further



Moliti – Phona-Chumateleti Road Section

erosion. For the study road section the MSE systems with green face and with concrete face have been proposed and designed for higher cut sections where a conventional reinforced concrete wall is not feasible. For cut sections with low height Gabion walls are designed to retain and stabilize the new slope.

- For the new cut sections for slope stabilization and protection, retaining measures and river bank protection, four structures have been designed which are used all along the study road section at the relevant locations.
- Reinforced concrete retaining wall
- Concrete block wall
- Gabion wall
- Mechanical stabilized earth MSE wall with concrete or green face

On the downhill side retaining structures are mainly placed to prevent river bank erosion and/or allow reinstatement of road edge or widening to required width.

In the following typical cross sections with the designed measures at the uphill side and downhill side are presented.

**Rock/ Stone Fall**

Along road stretches where the uphill slopes are formed by rock material, stones and boulders have been observed on the road and accumulated at the road side or road side ditch. Solid and weathered rocks located on nearly vertical slopes have at several places developed stone falls. This has been observed at several locations on slope surfaces with high inclination.

At locations where a new slope will be cut, the cut face is designed to move away from the road. This together with benching will reduce and limit potential stone fall and increase the stability of the slope.

At several locations the existing physical conditions do not allow a movement of the road away from the rock faces with falling stones.

As cutting back of the rock faces with very high and nearly vertical slopes will be very costly and locally not feasible two options for these relevant road sections to handle the rock/stone falls remain:

- installing wire nets to prevent loose stones falling onto the road
- “Do-nothing” option, clear the fallen stones of the road when necessary as a road Maintenance task

Wire mesh protection systems should be installed at high risk areas only along the road alignment where rock fall is posing a direct danger to road users. The design and type of netting/cables has to be determined in detail on each location taking into consideration the specifics of the area.

The installations of wire nets will be a costly measure with follow up monitoring and maintenance. Therefore, the provision of wire mesh protection system will be limited and only used when the above described measures of cutting back the slope are not feasible.



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Areas are presently identified where wire netting to prevent stone fall is required. During the ongoing detail design phase the requirement of wire netting will be verified based on the proposed works.

The feasibility study had identified nineteen (19) bridges along the 50km Project road. Out of these 12 situated are in the present section 2 (east) of the road. Bridge rehabilitation was considered where the existing bridge condition is adequate to ensure that no major bridge maintenance works would be required during the road design life. In the present Section 2 east, however, none of the bridges was deemed in serviceable condition and thus all were recommended for replacement.

The drainage structures along the project road were inspected and records were taken of the following characteristics:

- Type of culvert (small bridge, pipe, box, arch);
- Geometrical data (length, height, width, diameter, etc.);
- General structural condition of barrel, headwalls, wing walls, and inlet/outlet structures;
- General hydraulic condition;
- Design and finalization of different types of roadside channels;

All sixty-nine (69) existing culverts inspected in section 2 of the Project road will have to be replaced. To ensure safe drainage in the future a total of one hundred and eight (108) new culverts will be needed in this section, Of the 108 new culverts one hundred and two (102) will be pipe culverts which are generally be built from pre-cast elements and then hauled to the site while the six (6) new box culverts will be cast in situ.

Construction of bridges, concrete walls, gabions and ect. Need to be considered carefully. That can contaminate the water and harm aquatic organisms. With these infrastructural works, the associated impacts to be considered are as follows:

- Excavation methodologies should be done to minimize stockpiling near flowing water;
- Temporary rock protection should be provided to prevent soil materials to be washed away.
- When casting structural elements on site, spillage into the water should be prevented by installing proper measures to catch any spill;
- Structural elements should be casted far from the river to prevent concrete mix from getting into the water.

**Bridge Construction Management**

The key steps for bridge construction are as follows:

1. Stake out
2. Drilling piles
3. Reinforcement and concreting piles and abutments
4. Backfilling

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5. Reinforcement and concreting for cross heads and side walls

6. Placing the precast beams etc.

All bridges will be constructed with due consideration for environmental impact avoidance. Provisions for environmental protection and mitigation measures during bridge construction will be as follows:

- Construction will be minimized on bridge sites during spawning season ;
- Construction on Rivers will only take place during period of low flow (June-August);
- Water quality monitoring will be undertaken as required (please see Water Management Plan);
- Removal of vegetation under the bridges will be minimized;
- Waste water will not be discharged to the rivers. Vehicle movement on river banks will be minimized;
- All solid waste and contaminated earth generated during construction will be removed from the site and disposed from according to the Waste Management Plan;
- During construction all noise volume will be restricted to the national standards (please see Noise & Vibration Management Plan);
- To avoid from unexpected accidents bridge construction areas will be provided with traffic and warning signs.
- Work at water crossings should start only after the Method Statement has been approved by the SE and Client

### Culvert Construction Management

The key steps for bridge construction are as follows:

1. Staking out and excavation
2. Rock fill and gravel bedding
3. Placing the pipes
4. Sealing joints and waterproofing
5. Backfilling and compaction
6. Inlet and outlet foundations and concreting of apron slabs
7. Construction of inlet and outlet wing walls

All culverts will be constructed with due consideration for environmental impact avoidance. Provisions for environmental protection and mitigation measures during culvert construction will be as follows:

To avoid pollution of water canals construction works will be mainly in dry summer season;

- All solid waste and contaminated earth generated during construction will be removed from the site and disposed of according to the Waste Management Plan;



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- During construction all noise volume will be restricted to the national standards (please see Noise & Vibration Management Plan);
- The discharge of oil, bitumen mastic and fuel onto open soils is prohibited;
- Scrap metal waste will be collected on site by workers and stored in the designated storage container at the contractor Plant Yard;
- Collected waste will be delivered by LTD San – Dasuftaveba Khashuri and disposed in accordance with Georgian legislation (Waste Management Code of Georgia 2994) ;
- Construction waste will be reused on site if possible. If reuse is not possible the waste will be disposed of as domestic, metal or hazardous waste.



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**ROUD, CULVERTS, BRIDGES , AND GABIONS CONSTRUCTION WORKS MANAGEMENT PLAN**

Area of Mitigation	Actions / Mitigation Measures	Location	Time Frame	Responsibility
<b><u>Road &amp; Bridge Construction Management Plan</u></b>				
Public safety & prevention of disturbance	All roads impacted by construction activities will be watered by sprinkler trucks	Construction areas & access roads	Dry periods only (three times a day )	Site foreman
	The project road will be provided with animal crossing sign boards at appropriate places for passage of cattle, sheep and other animals	Appropriate areas of project road	Construction period	Site foreman
	To avoid from unexpected accidents culvert & bridge construction areas will be provided with traffic and warning signs in appropriate sections	Culvert, bridge & tunnel construction areas	Construction period	HSM and Site foreman
	Fencing and access control will be installed at all work sites where practicable.	All working areas that are close to public areas	Construction period	HSM and Site foreman
	In the event of any spoil or debris being deposited on any adjacent land, the material will be immediately removed and the area restored to the satisfaction of the Engineer	All location	At all time	HSM and Site foreman
	All trucks leaving borrow pits will be covered with tarpaulins or water spray	All borrow pits	At all time	Head driver
	Noise monitoring will be carried out.	Monitoring stations	As required	EPM
	Regular meetings will be held with local communities to inform the public of the works programmer, and to receive complaints	Local villages	Every 6 months or as required	EPM
Pollution prevention in accordance with IFC / EU / WHO standarts and Georgian legislation	The storage of waste of any kind as well as parking machinery or vehicles is not permitted within a distance of 100 m of any stream or wetlands(including drainage or irrigation facilities)	All watercourses or drainage ditches	Construction period	EMP and Site foreman
	Construction of bridges will only take place during period of low flow to minimize pollution	All rivers	June, July and August	Site foreman



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Protection of ecological resources	Construction will be avoided on bridge sites during fish spawning seasons	Bridges	March and October	EPM and Site foreman
	Habitat destruction will be minimized during operations	All location	Construction period	EPM
	Trees and bushes outside the construction width but within the road reserve will be generally preserved from damages	All location	At all time	Site foreman / EPM
	Cutting down of trees will not be take place without the prior approval of the relevant Local Authorities	All location	At all time	Site foreman / EPM
	All solid waste and contaminated earth generated during construction will be removed from the site and disposed of (please see Waste Management Plan)	All location	At all time	Site foreman / EPM
Erosion prevention / landscape protection	Aggregates will only be removed from approved borrow areas	Borrow pits	Construction period	Site foreman / EPM
	Existing top soil will be stripped to a minimum depth of 50 cm and stored in stockpiles not exceeding 3 m height for use during reinstatement	Road alignment and borrow pits	Construction period	Site foreman / EPM
	Stockpiles will not be surcharged and multiple handling will be kept to a minimum	All location	At all time	Site foreman
	Excavated top soil will be reused on the new embankment or on the median, and remaining materials will be spread over otherwise disturbed ground	All location	At all time	Site foreman
	After completion of extraction all borrow pits will be reinstated	Borrow pits	End of project	EPM
	All temporarily acquired land will be rehabilitated	All construction area	End of project	EPM
	Discharge zones from drainage structures will be furnished with riprap or silting basins to reduce erosion	Completed roads	End of project	EPM and Site foreman
Preservation of cultural / archaeological features	If chance finds are uncovered work will be stopped and appropriate measures will be taken (please see Cultural/Archaeological Management Plan)	All location	Construction period	Site foreman



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**ROAD CONSTRUCTION WORKS MANAGEMENT PLAN**

Public safety & prevention of disturbance	All roads impacted by construction activities will be watered by sprinkler trucks	Construction areas & access roads	Dry periods only (three times a day )	Site foreman
	The project road will be provided with animal crossing sign boards at appropriate places for passage of cattle, sheep and other animals (see figure 6, for location of crossing points)	Appropriate areas of project road	Construction period	Site foreman
	Local communities will be informed of blasting timetable in advance and will be provided adequate notice of when blasts are required outside of the planned schedule	Construction areas	Construction period	Site foreman
	To avoid from unexpected accidents culvert, bridge & tunnels construction areas will be provided with traffic and warning signs in appropriate sections	Culvert, bridge, gabions & walls construction areas	Construction period	HSM and Site foreman
	Fencing and access control will be installed at all work sites where practicable.	All working areas that are close to public areas	Construction period	HSM and Site foreman
	In the event of any spoil or debris being deposited on any adjacent land, the material will be immediately removed and the area restored to the satisfaction of the Engineer	All location	At all time	HSM and Site foreman
	All trucks leaving borrow pits will be covered with tarpaulins or water spray	All borrow pits	At all time	Head driver
	Noise monitoring will be carried out.	Monitoring stations	As required	EPM
	Regular meetings will be held with local communities to inform the public of the works programmer, and to receive complaints	Local villages	Every 6 months or as required	EPM
Pollution prevention in accordance with IFC / EU /	The storage of waste of any kind as well as parking machinery or vehicles is not permitted within a distance of 100 m of any stream or wetlands(including drainage or irrigation facilities)	All watercourses or drainage ditches	Construction period	EMP and Site foreman
	Construction of bridges will only take place during period of low flow to minimize pollution	All rivers	June, July and August	Site foreman



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Moliti – Phona-Chumateleti Road Section

WHO standarts and Georgian legistlation				
Protection of ecological resources	Construction will be avoided on bridge sites during fish spawning seasons	Bridges	March and October	EPM and Site foreman
	Habitat destruction will be minimized during operations	All location	Construction period	EPM
	Trees and bushes outside the construction width but within the road reserve will be generally preserved from damages	All location	At all time	Site foreman / EPM
	Cutting down of trees will not be take place without the prior approval of the relevant Local Authorities	All location	At all time	Site foreman / EPM
	All solid waste and contaminated earth generated during construction will be removed from the site and disposed of (please see Waste Management Plan)	All location	At all time	Site foreman / EPM
Erosion prevention / Landscape protection	Aggregates will only be removed from approved borrow areas	Borrow pits	Construction period	Site foreman / EPM
	Existing top soil will be stripped to a minimum depth of 50 cm and stored in stockpiles not exceeding 3 m height for use during reinstatement	Road alignment and borrow pits	Construction period	Site foreman / EPM
	Stockpiles will not be surcharged and multiple handling will be kept to a minimum	All location	At all time	Site foreman
	Excavated top soil will be reused on the new embankment or on the median, and remaining materials will be spread over otherwise disturbed ground	All location	At all time	Site foreman
	After completion of extraction all borrow pits will be reinstated	Borrow pits	End of project	EPM
	All temporarily acquired land will be rehabilitated	All construction area	End of project	EPM
	Discharge zones from drainage structures will be furnished with riprap or silting basins to reduce erosion	Completed roads	End of project	EPM and Site foreman



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Preservation of cultural / archaeological features	If chance finds are uncovered work will be stopped and appropriate measures will be taken (please see Cultural/Archaeological Management Plan)	All location	Construction period	Site foreman
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Moliti – Phona-Chumateleti Road Section

**TOPIC SPECIFIC SOIL MANAGEMENT PLAN**

**Rehabilitation Project of Dzirula - Kharagauli - Moliti - Pona –  
Chumateleti Secondary Road,**

**LOT 2: Moliti – Phona-Chumateleti Road Section- from km 24+620 to km  
50+244**

**EMPLOYER**                      Georgia Roads Department Ministry of  
Regional Development and Infrastructure



**ENGINEER**                      Authorized representative of: JV  
Pyunghwa Engineering Consultants  
Ltd/Yooshin Engineering Corporation/  
Roads Rehabilitation and modernization  
Supervision Direction Ltd

**CONTRACTOR**                      “AKKORD ” ICIC



**PREPARED BY:** AKKORD ICIC, June 2020

**APPROVED BY:** Roads Department of Georgia:

*2020*

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**Soil management**

During the project, 6400 cubic meters of top soil should be cut. Soil management activities intend to minimize effects of wind and water erosion on stockpiles, measures to minimize loss of fertility of topsoil, timeframes, haul routes and disposal sites. Existing top soil will be stripped to a depth as directed by the Engineer from all areas of cutting and from all areas to be covered by embankment or by other areas of fill. The topsoil will remove and/or overburden from quarries, borrow pits, spoil and stockpile areas. The Engineer will direct whether topsoil will be stripped and stockpiled separately or will be excavated and taken to spoil areas together with overburden.

The purpose of the plan is to avoid soil erosion and siltation of adjoining land through development and implementation of an effective soil management techniques covering earthworks, exploitation and reinstatement of borrow pits and quarries, haul roads, disposal of surplus materials, stripping and preserving existing topsoil, and measures to restrict the movement of heavy earthmoving plant within the limits of the site.

**Construction Activities**

Land disturbance activities will include;

- vegetation clearing;
- topsoil stripping;
- subsoil removal;
- stockpiling and rehabilitation.

The main actions to be implemented to minimise impacts to land generated from construction activities are outlined below. The main objective of these actions is to leave disturbed areas to as near as practical to pre-existing environmental conditions by:

- Avoiding, minimising or mitigating impacts to soils;
- Maintaining topsoil quantity and quality;
- Restoring land use and capability;
- Returning the land to a stable landform (i.e. no subsidence or major erosion) with no greater management inputs than that required prior to land disturbance.

**Vegetation Clearing**

All grass and other herbaceous vegetation will be cut to a height of between 50 mm and 75 mm and the arising removed off site. The main objectives during vegetation clearing are to:

- Ensure the minimum amount of vegetation is cleared for construction;
- Ensure vegetation clearing is progressive;

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### Moliti – Phona-Chumateleti Road Section

- Ensure cleared vegetation is appropriately managed.

Provisions for environmental protection and mitigation measures during vegetation clearing will be as follows:

- Vegetation clearing will be minimised, where practicable, to reduce the potential for soil erosion and exposure of dispersive soils, particularly when clearing is timed for seasons with higher rainfall;
- Vegetation clearing will be undertaken progressively and only to the extent necessary to construct the infrastructure;
- Cleared vegetation will be stockpiled separately with a distinct break of at least 1m between the undisturbed vegetation and soil stockpiles, and in a manner that facilitates re-spreading or salvaging and does not impede vehicle, stock or wildlife movements.

Topsoil Stripping Along the road corridor top soil will have to be removed from the surface, and then large volumes of fill will be deposited at various locations in order to raise the elevation of the alignment and to provide an acceptable gradient which conforms to established standards. Stripped topsoil will be stockpiled and stored appropriately for application to the embankment slopes. The main objectives during topsoil stripping are to:

- Ensure topsoil is segregated from other materials;
- Ensure topsoil is not damaged during storage and following reinstatement. The following actions will be implemented during topsoil stripping, although site specific stripping requirements, as per baseline surveys, will be implemented where necessary in precedence to those outlined below:
- Prior to removal of topsoil, trial holes will be excavated of a depth sufficient to enable the Engineer to measure the depth of topsoil;
- Excavated top soil will be reused on the new embankments remaining materials may be spread;
- Topsoil will be stripped, loaded, transported and deposited in stockpile areas directed by the Engineer for use in the side slope backfill and other areas;
- Topsoil will not be unnecessarily trafficked either before stripping or when in a stockpile;
- Where topsoil has been stockpiled separately it will be pushed back and spread over the quarry, borrow pit, spoil or stockpile area after landscaping;
- Topsoil (50 cm or so) will be kept and refilled after excavation activity is over to minimize the impact on productive agricultural lands or/and pastures;

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- Any excess displaced spoil will be prevented from mixing with topsoil to avoid the negative effects of soil inversion and additional soil storage space will be provided to stockpile the spoil separately;
- Subsoil will be removed and stockpiled separately from topsoil to prevent blending with topsoil and, ideally, stockpiles will be located close to where they are sourced;
- Care will be taken during stripping, stockpiling and/or re-spreading to ensure that structural degradation of the soil is avoided and that excessive compaction does not occur;
- On completion of work in any quarry, borrow pit, spoil or stockpile area the overburden and/or topsoil which has not been used in the works will be pushed back, spread and landscaped over the area of the quarry, borrow pit, spoil or stockpile area.
- Avoid movement of the heavy equipment and vehicles on the topsoil during topsoil stripping activity.
- Topsoil stockpiles should not be placed under high power overhead lines.

**Subsoil Management**

The main objectives during subsoil management are to:

- Prevent contamination of topsoil;
- Prevent degradation of the subsoil structure;
- Ensure reinstatement in the correct location and in the correct order;
- Ensure effective management of unused subsoil.

The following actions will be implemented in the removal of subsoil, although site specific requirements, as per baseline surveys, will be implemented where necessary in precedence to those outlined below:

- Subsoil will be removed and stockpiled separately from topsoil to prevent blending with topsoil and, ideally, stockpiles will be located close to where they are sourced;
- Different subsoil horizons will be stockpiled separately and additional subsoil storage areas will be provided, where required;
- Saline sub-soils, where encountered, will be replaced at depth and covered with topsoil except in areas where there is little topsoil or there is evidence of existing salinization, in which case topsoil may be imported to facilitate re-vegetation;
- Each separate subsoil stockpile will be reinstated to replicate the original soil profile prior to disturbance.

**Stockpile Management**

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The excavated material will be stockpiled for re-use on an adjacent area. The main objectives during stockpiling are to:

- Minimise damage to topsoil and stockpiled material;
- Ensure stockpiles in the correct location and in the correct order;
- Ensure stockpiles have minimal impact on surrounding environmental values.
- Provisions for environmental protection and mitigation measures during stockpiling will be as follows:
  - Top soil from all disturbed areas will be striped and stockpiled;
  - Stockpiles will be allocated in at least 100 m distance from any water course;
  - Height of stockpiles will not exceed 3 m;
  - Stockpiles will be located out of the wind or will be provided with windbreaks;
  - Stockpiles will be protected from run-on water by installing water diversion structures upslope;
  - Sediment fences will be placed immediately downslope to protect other lands and waterways from pollution;
  - Stockpiles will not be surcharged and multiple handling will be kept to a minimum;
  - Stabilized if they are expected to be in-situ for extended periods and receive extended periods of potentially erosive rain they will be stabilized (ex. covered, grassed, etc);
  - If excavated materials potentially contain acid sulphate or other contamination, these will be treated in accordance with Waste Management Plan;
  - Gaps will be left every 50m to allow for drainage, and permit the movement of vehicles and wildlife;
  - Stockpiles will be placed away from discharge zones;
  - Topsoil stockpiles will be clearly sign-posted for easy identification and to avoid any inadvertent losses.
  - Topsoil stockpiles should not be placed under high power overhead lines.

**Soil Erosion Management**

Erosion is the detachment and movement of soil or rock by water, wind, or other factors such as ice and gravitational creep. Whilst erosion is a natural process, man-made disturbances can result in accelerated erosion and cause rapid detrimental effects to the receiving environment. Land clearing, earthworks, and alterations to hydrology can cause gross loss of soil resulting in sediment accumulation in undesirable places (e.g. drainage lines, waterways, other land), and water pollution. Water erosion of land form dependent upon a number of factors including:



**SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN**

Moliti – Phona-Chumateleti Road Section

- Climate, in particular rain fall frequency, intensity, and duration;
- Topography, including slope and hydrological conditions of the land form(run-on and run-off); and
- Soil readability and cover.

The main techniques utilized for erosion control are minimizing the period of exposure- i.e. only clearing that which needs to be cleared and rehabilitating such areas as quickly as possible.

Other techniques include providing temporary cover in the form of mulch, or applying specific chemicals as soil stabilizers. These may include products that effectively glue the soil surface, or cause the fines to coagulate, effectively increasing their size and making them less erodible and quicker to settle.

**Retaining of Vegetation**

Cleared vegetation can be retained for uses such as erosion control and rehabilitation. Consultation on proper re-use of the cut arboreal vegetation will be conducted with local Reforestation Department of Georgia. Trees and shrubs mulched in sit maybe retained as oil blanket to protect from erosion until grading and topsoil stripping occurs. In surface water crossings, vegetation clearing will be delayed until immediately before trenching (as far as practical) so as to reduce the potential for stream bank destabilization from rainfall event sit the catchment.

**Landslide Management**

The top cover of soil on the slopes around the Project facilities is mainly sand and fine clay. Any excavation work during the construction activities, whether permanent or temporary, would lead to loss of soil. Excavated material collected during boring of the tunnels may be used during construction of the road. Erosion of soil can occur from removal of vegetation cover, runoff from unprotected excavated areas, muck disposal sites and quarry sites. Excavations on slopes would also decrease its stability. Given the topography of the area, unprotected excavations on sloping grounds may lead to landslides, especially during the rainy season. Major landslides will disturb the slopes of the area and may also alter the bed of streams and rivers.

The proposed mitigation measures include:

- Vegetation loss will be limited to demarcated construction area;
- Areas such as muck disposal area, batching plant, labor camp and quarry sites after the closure will be covered with grass and shrubs;
- Slope stabilization measures will be adopted such as adequate vertical and horizontal drains, drainage along roadsides, cross drainage and retaining walls;
- Slope movements will be monitored around excavation work areas.

**Access Roads Management**

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## SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN

### Moliti – Phona-Chumateleti Road Section

The construction and usage of access roads will be required to construct the project road. From an erosion and sediment control perspective, the following principles will be considered in the construction of access roads:

- The catchment area above the road or track maybe reduced by locating the road along a ridge or as high as possible on side slopes;
- Unformed road sand tracks will have at least as light cross-section al grade to allow free surface drainage and to avoid excessive on ding in wheel tracks;
- The number of water course and drainage line crossings will be minimized;
- Areas of riparian vegetation will be avoided where possible, and maintain buffer strips between the road and any watercourse;
- Where provision of access in gullies or creeks causes disturbance of vegetation, revegetation and stabilization work will be undertaken;
- All temporary associated disturbed areas by construction tracks will be stabilized/or re-vegetated when construction is completed;
- Disturbance to soil and vegetation will be minimized.



**SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN**

Moliti – Phona-Chumateleti Road Section  
**Soil Management Plan**

Area of Mitigation	Actions / Mitigation Measures	Location	Time Frame	Responsibility
Erosion prevention / Landscape protection	Topsoil will be stripped, loaded, transported and deposited in stockpile areas directed by the Engineer for use in the side slope backfill and other areas	All locations	Construction period	Site foreman/ EPM
	Existing top soil will be stripped to a minimum depth of 50 cm and stored in stockpiles not exceeding 3 m height for use during reinstatement	Road alignment and borrow pits	Construction period	Site foreman/ EPM
	Topsoil (50 cm or so) will be kept and refilled after excavation activity is over to minimize the impact on productive agricultural lands or/and pastures	Road alignment and borrow pits	Construction period	Site foreman
	Stockpiles will not be surcharged and multiple handling will be kept to a minimum	All locations	At all time	Site foreman
	Stockpiles will be protected from run-on water by installing water diversion structures upslope	All locations	At all time	Site foreman
	Sediment fences will be placed immediately downslope to protect other lands and waterways from pollution	All locations	At all time	Site foreman/ EPM
	Stockpiles will be allocated in at least 100 m distance from any water course	All locations		HSM and Site foreman
	Care will be taken during stripping, stockpiling and/or spreading to ensure that structural degradation of the soil is avoided and that excessive compaction does not occur	Road alignment and borrow pits	At all time	Site foreman/ EPM
	Excavated top soil will be reused on the new embankment or on the median, and remaining materials will be spread over otherwise disturbed ground	All locations	At all time	Site foreman

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**SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN**

**Moliti – Phona-Chumateleti Road Section**

	Topsoil will not be unnecessarily trafficked either before stripping or when in a stockpile	All locations	At all time	Site foreman
	Vegetation clearing will be minimized, where practicable, to reduce the potential for soil erosion and exposure of dispersive soils, particularly when clearing is timed for seasons with higher rainfall	All locations	At all time	Site foreman
	Cleared vegetation will be stockpiled separately with a distinct break of at least 1m between the undisturbed vegetation and soil stockpiles, and in a manner that facilitates re-spreading or salvaging and does not impede vehicle, stock or wildlife movements	All locations	Construction period	Site foreman
	The number of watercourse and drainage line crossings will be minimized	All locations	Prior to the start of material haulage	Site foreman
	Areas of riparian vegetation will be avoided where possible, and maintain buffer strips between the road and any watercourse	Construction area	Prior to the start of material haulage	Head driver/ Site foreman
	All temporary construction tracks and associated disturbed areas will be stabilized /or re-vegetated when construction is completed	All locations	After completion of works	Site foreman
	Any excess or unsuitable spoil from the site will be removed or managed to avoid erosion	All locations	Construction period	Site foreman
	All temporary drainage structures will be removed when no longer required	All locations	After completion of works	Site foreman
Pollution prevention in accordance with	The discharge of oil and fuel onto open soils is prohibited	All locations	At all time	Head driver
	In the event of any spoil or debris being deposited on any adjacent land, the material will be immediately removed and the area restored to the satisfaction of the Engineer	All locations	At all time	Site foreman/ EPM

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**SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN**

Moliti – Phona-Chumateleti Road Section

IFC / EU / WHO standarts and Georgian legislation	Washing of vehicles and equipment in rivers and/or wetland areas will be prohibited	All locations	At all time	Head driver
	All hazardous liquids such as lubricants, oil drums, paint etc. will be stored in the designated area at the workshops (shown in fig Site run-off will be collected in the drainage system and emptied by specialized suction vehicles of LTD “Georgian Water Company “on an impervious base with run-off collection	Workshop	Construction period	Camp Manage / EPM
	Site run-off will be collected in the drainage system and emptied by specialized suction vehicles of LTD “Georgian Water Company”	Construction camp	Septic tanks emptied as required	Camp Manage / EPM



**SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN**

**TOPIC SPECIFIC WATER MANAGEMENT PLAN**

**Rehabilitation Project of Dzirula - Kharagauli - Moliti - Pona – Chumateleti  
Secondary Road,**

**LOT 2: Moliti – Phona-Chumateleti Road Section- from km 24+620 to km 50+244**

**EMPLOYER Georgia Roads Department Ministry of  
Regional Development and Infrastructure**



**ENGINEER Authorized representative of: JV  
Pyunghwa Engineering Consultants  
Ltd/Yooshin Engineering Corporation/  
Roads Rehabilitation and modernization  
Supervision Direction Ltd**

**CONTRACTOR “AKKORD ” ICIC**



**PREPARED BY: AKKORD ICIC, June 2020**

**APPROVED BY: Roads Department of Georgia:**

**2020**

The project road alignment runs close to Dzirula and Chkerimela rivers in most part of the low elevation regions. Thus, care should be exercised as any contaminants discharged along the road may result in contamination of the river.

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Earthworks when not performed properly may result in soil and debris dropping into the river and increasing turbidity of the water. Also tributaries to the river will have to be equally protected from any contamination.

**Project Potential Impacts on Water Quality**

**Surface Water Contamination** – The Contractor’s work activities and facilities are the primary source of potential contamination. Discharges directly into the water or indirectly onto the ground that will finally find their pathways into the river will be the causes of contamination.

**Adverse Climatic Conditions** – Water crossing structures should sufficiently function well in adverse weather condition. Hence, design should adapt the possible and practical worst case scenario.

**Bridge Construction** – Bridge structural design should be made to provide sufficient service life.

**Drainage** – Proper drainage design is important to maintain the structural integrity of the road and this would mean adaptable to worsening weather condition.

**Water Contamination Issues at Construction Camps and Storage Areas** - Waste water that will be generated at work camps due to large numbers of people staying whether short-term or long term will contaminate the immediate surroundings which can harm both people and the ecosystem if no treatment is provided prior to discharge.

**Water Quality Standards**

**Table 3: Georgian Standards for Surface Water Quality**

N	Parameter	Allowed concentrations	Unit
<b>General Parameters</b>			
1	ph	6.5-8.5	-
2	Turbidity	-	NTU
3	Total suspended solid	-	Mg/l
4	Total dissolved Solids	1000	Mg/l
5	Hardness	-	mgeqv./l
6	BODS	6	Mg/l
7	COD	30	Mg/l
8	Chloride	350	Mg/l
9	Alkalinity	-	Mg/l
<b>Major ions</b>			
10	Sodium	200	Mg/l
11	Calcium	180	Mg/l
12	Potassium	-	Mg/l
13	Sulphate	500	Mg/l
<b>Microbiology</b>			
14	Total coliforms	-	in 1 dm3
15	E-coli	5000	in 1 dm3
16	Fecal streptococci	-	in 1 dm3



## SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN

Metals (Total)			
17	Iron – Fe	0.3	Mg/l
18	Zinc - Zn	1	Mg/l
19	Cadmium - Cd	0.001	Mg/l
20	Copper - Cu	1	Mg/l
21	Nickel-Ni	0.1	Mg/l
22	Arsenic - As	0.05	Mg/l
23	Lead – Pb	0.05	Mg/l
24	Chrome - Cr	0.5	Mg/l
25	Manganese-Mn	0.1	Mg/l
26	Mercury	0.0005	Mg/l
27	Aluminum – Al	0.5	Mg/l
28	Antimony - Sb	0.05	Mg/l
29	Barium - Ba	0.1	Mg/l
30	Boron - B	0.5	Mg/l
31	Selenium - Se	0.01	Mg/l

Source: Maximum Admissible Concentrations of the harmful substances in surface water are provided in the Environmental Quality Norms approved by the Order #297N Ministry of Labour, Health and Social Protection, (16.08.2001) (as amended by the Order No 38/n of the same Ministry of 24.02.2003)

For most parts of the road, the river runs parallel to the road and in a number of places, the river will be crossed by bridges that will be constructed or rehabilitated. Gullies with perennial or seasonal stream flows will also be crossed by box culvert. Drainage works to capture runoff will also have to be constructed along the road to safely channel them to outfalls onto the river. With these infrastructural works, the associated impacts to be considered are as follows.

### Project Potential Impacts by Bridges and Waterways

In the case of bridge rehabilitation, certain components will have to be demolished and such activities would result to bridge fragments to dropping into the water. Bridge foundation will entail coffer-damming or diversion of water flow. Such activities will entail filling around the area to be excavated. Soil disturbances and earthworks will cause loose soil materials to be washed away by the flow and result in turbid water. Likewise, to enable casting of concrete, dropping of any material debris into the water can be a major cause of water contamination dewatering activities will have to be done which can also cause the water to be turbid. Concreting of bridge piers and casting or setting out of bridge girders and decks will entail formworks and supports to be erected, and actual pouring of concrete. The Recommended Mitigation Measures and Monitoring Activities are:

No pillars are drilled into the river for bridge construction. Bridges will be constructed by slabs only. Therefore generation of turbidity plumes and sedimentation which could impact aquatic organisms can be excluded. No impacts are expected on River ecology.

The Contractor shall ensure provision/or performance of the following:

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## SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN

- Implementation of additional measures to catch debris from falling into the river;
- Structural elements should be casted far from the river to prevent concrete mix from getting into the water

To prevent contamination of the above water courses, a number of site-specific mitigation measures have been developed and will be implemented according to the matrix provided below:

- The campsite will be supplied with drinking water on a daily basis via existing well in camp (water quality meets the national drinking water standards );
- No construction camp, workshop, or storage facility will be located within 100 m of streams;
- If the stream is within 100 m and downstream of the project facilities or construction site, temporary dykes will be installed to prevent any potential impact from spill and run-off;
- Spill prevention trays will be provided and used at refueling locations; The run off from maintenance workshops will be collected by impervious channels and be passed through oil water separators (OWS) before final disposal.
- Separate impervious pits (with concrete walls and proper shed) will be built at Plant Yard for temporary handling and storage of contaminated soil and water if encountered during construction such as sludge from OWS;
- The disposal site for contaminated soil will be chosen in accordance with the requirements of the Georgian Legislation;
- All fuel storage tanks and lubricating oil drums will be kept in secondary containment impervious pits with impervious shed walls;
- On-site maintenance of construction vehicles and equipment will be avoided, as far as possible;
- Regular inspections will be carried out to detect leakages in construction vehicles and equipment;
- Spill control kit (shovels, plastic bags and absorbent materials) will be available near fuel and oil storage areas, vehicular parking and vehicular maintenance areas as well as at construction sites;
- The bottom of any soak pit or septic tank will be constructed at least 100 meters away from springs and water bores;
- Aggregate excavation will not take place inside the river banks;
- To avoid contamination of any watercourse with sewage discharged from the Contractor's camp a sewerage collection system will be in place .
- Wastewater collected from each building will pass through the system of preliminary sedimentation reservoirs before the discharge into concrete septic tanks, and periodically removed by the LTD Khashuri Service Center of Georgian Water Company using suction tankers ;

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<b>SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN</b>	
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- For proper water pollution regulation and management, water quality monitoring will be undertaken as required. In accordance with the agreement with the Ltd “Greentecs” - water quality testing (as required) will be conducted;
- Record of spills and volume of removed contaminated soil will be maintained;
- Record of remedial measures taken will be maintained;
- Silt traps will be used to prevent contamination of river and streams.

	<b>SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN</b>	
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**Water Management Plan**

<b>Area of Mitigation</b>	<b>Actions / Mitigation Measures</b>	<b>Location</b>	<b>Time Frame</b>	<b>Responsibility</b>
Pollution prevention in accordance IFC / EU / WHO standarts and Georgian legislation	No construction camp, workshop, or storage facility will be located within 100 m of streams	All locations	Construction period	Camp manager / Site foreman
	Aggregate excavation will not take place within the River banks	borrow pits	At all time	Site foreman/EPM
	Pouring of excess concrete from concrete mixer to unpainted areas will be strictly prohibited	All locations	At all time	Site foreman/EPM
	Washing of concrete mixer will be restricted by specially appointed area (at the batching plant sedimentation basin)	Plant Yard	At all time	Plant Yard Manager /EPM
	All hazardous liquids such as lubricants, paint etc. will be stored in the designated area at the workshops (shown in figure 4b) on an impervious base with run-off collection	Plant Yard	At all time	Workshop Manager /EPM
	All domestic waste water will be collected in septic tanks and emptied once a week by specialized suction vehicle of LTD Xaragauli and Khashuri Tskalil	Construction Camp & Plant Yard	As required	Camp manager / EPM
	Workshop wastewater will be collected in septic tanks and emptied by specialized suction vehicle of Ltd "Georgian Water Company"	Workshop	As required	Camp manager
	The storage of waste or production waste of any kind as well as re-fuelling and parking machinery or vehicles is not permitted within a distance of 100 m of any stream including drainage or irrigation facilities	All locations	Construction period	Camp manager and Site foreman

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	Oil filling and refueling will be strictly controlled and is permitted only at the fuel filling station and workshops	Fuel Filling Station & Workshop	At all time	Workshop Manager /EPM
	Spill control kit (shovels, plastic bags and absorbent materials) will be available near fuel and oil storage areas, vehicular parking and vehicular maintenance areas as well as at construction sites	Fuel Filling Station & Workshop	At all time	Workshop Manager /EPM
	All valves and trigger guns will be resistant to unauthorized interference and vandalism, and will be turned off and securely locked when not in used	All locations	At all time	Site foreman/EPM
	Separate impervious pits (with concrete walls and propertyed) will be built for temporary handling and storage of contaminated soil and water if encountered during construction such as sludge from OWS	Construction Camp	Construction period	Camp manager
	Any spilled materials and contaminated earth will be collected and disposed of according to agreement with LTD San – Dasuftaveba Kharagauli	All locations	As required	Site foreman/EPM
	Construction will be avoided on bridge sites during spawning seasons	All locations	March and October	EPM and Site foreman
	Water quality monitoring will take place at the locations shown in Attachment N3.	Monitoring stations	As required	EPM
Staff health and safety	Contractor’s camp will be supplied adequate amount and required quality of drinking water via existing well in camp (water quality meets the national drinking water standards)	Construction Camp	Construction period	Camp manager

**APPENDIX N1 - Map of Water sampling places**

## " Water sampling places"





## TOPIC SPECIFIC DUST MANAGEMENT PLAN

Rehabilitation Project of Dzirula - Kharagauli - Moliti - Pona – Chumateleti  
Secondary Road,

LOT 2: Moliti – Phona-Chumateleti oad Section- from km 24+620 to km 50+244

**EMPLOYER** Georgia Roads Department Ministry of  
Regional Development and Infrastructure



**ENGINEER** Authorized representative of: JV  
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Roads Rehabilitation and modernization  
Supervision Direction Ltd

**CONTRACTOR** “AKKORD ” ICIC



PREPARED BY: AKKORD ICIC, June 2020

APPROVED BY: Roads Department of Georgia:

*2020*

### Air Quality Standards

Table 1: Georgian Standards for Ambient Air Quality

Pollutants	Maximum permissible concentrations (mg/m <sup>3</sup> ) average time	
	Maximal concentration for 30 minutes	Average daily concentration
Nitrogen Dioxide	0.085	0.04
Sulfur Dioxide (SO <sub>2</sub> )	0.5	0.05
Carbon Oxide	5.0	3.0
Inorganic Dust	0.3	

Source: Law of Georgia on Public Health, the environmental qualitative norms are approved by Decrees of the Minister of Labor, Health and Social Affairs of Georgia (Decrees Nos. 297/N of 16.08.2001, including the changes made to it by further decrees of the Ministry Nos. 38/N of 02.24.2003, 251/N of 09.15.2006, 351/N of 12.17.2007). and rule for calculation of index of pollution of atmospheric air with hazardous pollution (#89, 23 October 2001) Minister of Environment Protection and Natural Resources

**Dust Management**

One of the main sources of air pollution during road construction is dust. Dust annoys local householders and business (shops, restaurants), can damages crops, lead to increasing of road accidents, and impact on water ecology, etc. For these reasons, dust suppressing measures will be strictly complied with. During the construction phase of the project, dust generation is likely to come from activities such as:

- vegetation clearing;
- light / heavy vehicle movements;
- haul roads, track and access construction;
- drilling and blasting; and
- earth moving

Potential impacts include:

- reduced visual amenity;
- smothering of surrounding vegetation;
- adverse impact and disturbance to fauna;
- risk to human health; and
- nuisance.

Objectives:



**SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN**

- Take all reasonable and practicable measures to ensure the prevention or minimization of dust from all project construction related activities;
- Comply with limits set by the National Environment Protection (Ambient Air Quality) Measure and;
- Ensure that nuisance dust levels and potential health hazards are not experienced by neighboring land users.

To achieve the above objectives, 'best practice' dust management procedures, entailing the following will be implemented:

- A 'clearing' policy will be adopted to ensure that vegetation is cleared only when and where necessary. In instances where the clearing of extensive areas is unavoidable, additional dust suppression techniques will be employed to ensure stabilization of the cleared surfaces. When clearing:
  - where practicable vegetation salvaged from the site to be cleared (taking care to limit the amount of soil disturbance) and retained;
  - topsoil will be removed to the maximum depth practicable and consistent with best operational practice;
  - if the quantity of salvageable topsoil is insufficient for rehabilitation requirements, alternate cover such as detrital/gravel material will be used in site rehabilitation;
  - where practicable, topsoil will be directly transferred to exposed surfaces requiring rehabilitation and covered with salvaged vegetative material;
  - where direct transfer of topsoil is not possible, it will be stock piled and stabilized with previously salvaged vegetation; and
  - topsoil stockpiles will be further stabilized by encouraging native vegetation to establish and, if necessary, appropriate stabilizing emulsion will be applied to supplement these measures.
- As practicable and consistent with operational requirements, disturbed areas will be progressively rehabilitated, to reduce the potential for windborne dust generation;
- For reduction of dust emission all unpaved access roads as well as project service road will be watered three times every day (morning at 9 o'clock, afternoon at 12 o'clock and evening at 6 o'clock) during construction activity as conditions require;
- Areas involving materials handling will be sprayed with water as conditions require;
- Haul trucks will be restricted to selected access roads to avoid sensitive areas as much as possible. Truck drivers will follow strict speed limit control (via installation of GPS control to every Contractor's truck);

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**SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN**

- Any blasting required to facilitate construction will be conducted only under favorable wind and weather conditions, and the blasting site will be dampened with water sprays;
- Routine housekeeping practices will be employed to ensure that spillages and other materials that could contribute to dust generation do not accumulate within the project site;
- Routine maintenance of machinery will be carried out to ensure efficient operation (to minimize exhaust particulate emissions);
- In the event that dust levels exceed acceptable limits, dust suppression measures will be immediately reviewed and more stringent measures implemented as appropriate. Such measures could include the cessation of activities in the event of extreme adverse
- All personnel (including contractors) will be informed of their responsibilities and the importance of minimizing ambient dust levels during site inductions;
- Any complaints received will be registered and will trigger a review of the relevant dust management procedure/s by the site Environmental Protection Manager as a basis for development and implementation of appropriate modified practice/s.

Additionally, for reduction of dust emission haul trucks will be restricted to selected access roads to avoid sensitive areas as much as possible. Truck drivers will follow strict speed limit control (via installation of GPS control to every Contractor's truck). The precise schedule of work for water trucks will depend on the season of the year and include intensification of water spraying during dry summer months and decreasing within rain seasons. To avoid dust generation and dropping of material during transportation, all trucks will be covered with tarpaulins.

To avoid dust emission from materials stockpiles all materials from borrow pits will be directly transported to the construction sites and trucks will empty only within the right of way (RoW). No material stockpiles will be permitted outside the borrow area or RoW. Materials from quarry will be transported directly to the Crushing Plant area and storage there on officially permitted site.

For reduction of dust emissions within the plant and camp areas, the Asphalt, Concrete and Crushing Plants, Workshop and truck parking site will be gravelled. Contactor's personnel at the Plants will be supplied with disposable dust masks, and the plant equipment itself will be fitted with dust suppression equipment.

The HSE managers of the sites will be responsible for instructing workers and drivers and control the application of the DMP.

**Exhaust and Odor Control**

All equipment used by "Akoord" ICIC is in compliance with international standards – ISO 9001-2008 (Euro 4 and 5). These regulations pertain to low volume of exhaust and odor emissions. To keep the equipment quality at the same level the regular maintenance will be undertaken.

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For proper air pollution regulation and management, monitoring of air quality will be undertaken as required. In accordance to the agreement with Laboratory LTD “Greentecs” air quality testing (as required) will be conducted at the locations shown in Figure 1

	<b>SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN</b>	
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**Dust Management Plan**

Area of Mitigation	Actions / Mitigation Measures	Location	Time Frame	Responsibility
Pollution prevention in accordance with IFC / EU / WHO standarts and Georgian legistlation	All trucks leaving borrow pits will have properly fitting side and tail boards and be covered with tarpaulins extending at least 300 mm over the edges of the side and tail boards	All borrow pits	At all times	Drivers / EPM
	All sands and aggregate for concrete and asphalt batching will be kept damp or covered	All borrow pits and storage areas	At all times	Site foreman
	All roads impacted by construction activities will be watered by sprinkler	Construction areas & access roads	Dry periods only (3 times a day)	Site foreman
	Every vehicle will be inspected and maintained on a regular basis	Workshop	Once a week	Head mechanic
	All open burning is prohibited	All locations	At all times	All staff / EPM
	Stockpiles of materials will be covered with tarpaulins or sprayed with water	All locations	Dry and windy periods only (once per day)	Site foreman
	Stockpiles of materials or debris will be dampened prior to their movement	Stockpiles	Dry and windy periods only (once per day)	Site foreman / EPM
	Materials having the potential to produce dust will not be loaded to a level higher than the side and tail boards	Stockpiles	At all time	Drivers / EPM

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	<b>SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN</b>	
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	Air quality monitoring will take place at the locations shown in figure 1	Monitoring stations	As required	EPM
Public safety & prevention of disturbance	Dust generating operations will not be permitted within 200 m of residential areas	All locations	At all times	EPM
	Engines will be turned off when not in use agreement with LTD Saxandzro Usaftrxoeba of Khashuri.	All locations	At all times	Head mechanic

APPENDIX 1: Maps of places for dust sampling

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## "Air quality monitoring stations"



SSEMP for Dzirulia- Moliti Road Sector- from km 0+000 to km 24+620

## TOPIC SPECIFIC NOISE AND VIBRATION MANAGEMENT PLAN

Rehabilitation Project of Dzirula - Kharagauli - Moliti - Pona –  
Chumateleti Secondary Road,  
LOT 2: Moliti – Phona-Chumateleti Road Section- from km 24+620 to  
km 50+244

**EMPLOYER** Georgia Roads Department Ministry of  
Regional Development and Infrastructure



**ENGINEER** Authorized representative of: JV  
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Roads Rehabilitation and modernization  
Supervision Direction Ltd

**CONTRACTOR** “AKKORD” ICIC



PREPARED BY: AKKORD ICIC, June 2020

APPROVED BY: Roads Department of Georgia:

2020

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**SSEMP for Dzirulia- Moliti Road Sector- from km 0+000 to km 24+620**

**1. Introduction**

This management plan defines the measures to control and limit noise emissions and vibration levels, at residential properties and other sensitive receptors in the vicinity of the Project.

This Specific Noise and Vibration Management Plan incorporates the measures proposed and procedures for the management of noise and vibration arising from the construction of the project in accordance Environmental Standarts.

Describes the noise and vibration control measures for all work activities associated with the construction. Plan addresses the impact of noise and vibration and the control measures employed to mitigate the risks. These are supported through monitoring procedures to identify both elevated levels and review complaints should they arise. The complaints management procedure including the management responsibilities are also addressed.

**Noise & Vibration Standards**

**Table 1: Georgian Standards for Noise Levels**

Time	Daytime (07 am – 11 pm )	Nighttime (11 pm – 07 am )
The average allowed level of noise (DCB)	55	45
The maximum allowed norms of noise (DCB)	70	60
Source: Affirmation the norms over the qualitative norms of the environment Decree # 297/N Ministry of Health, Labor and Social Affairs 16.08.2001		

**Table 2: Georgian General Admissible Vibration Values in Residential Houses, Hospitals and Rest Houses**

Average Geometric Frequencies of Octave Zones (Hz)	Allowable Values X0,Y0, Z0			
	Vibro-acceleration		Vibro-speed	
	m/sec <sup>2</sup>	dB	m/sec 10 <sup>-4</sup> dB	dB
2	4	72	3,2	76
4	4,5	73	1,8	71
8	5,6	75	1,1	67
16	11,0	81	1,1	67
31,5	22,00	87	1,1	67

**SSEMP for Dzirulia- Moliti Road Sector- from km 0+000 to km 24+620**

63	45,00	93	1,1	67
Corrected and equivalent corrected values and their levels	4,0	72	1,1	67
Source: Sanitary Norms 2001				

**Noise Management**

The potential noise related issue during construction of the project is disturbance to surrounding communities of the Project. Noise and vibration can damage hearing (of workers and public), alter the communication and perception of alarms and warning signals, and cause severe irritation to communities surrounding the construction areas. The noise during the construction phase greatly depends on the stage of construction work and equipment used at the site. The construction activities can be divided into the following phases:

- Site clearing and preparation;
- Delivery of equipment and materials to the site;
- Excavation and tunnel construction;
- Piling and concrete placement;
- Erection of bridges, and
- Finishing.

The main sources of noise and vibration during construction of the project are as follows:

- Construction machinery;
- Drilling activities;
- Haulage activities;
- Concrete mixing and aggregate production systems;
- Vehicular movement; and
- Plant Yard.

Contractor has therefore will be planned a number of actions to minimize the impact to the local people as well as to its own personnel;

- Construction activities along those sections of project road which will pass within or in direct proximity (in 250 m distance) of residential areas will be stopped between 6 p.m. and 8 a.m.;

**SSEMP for Dzirulia- Moliti Road Sector- from km 0+000 to km 24+620**

- Prior of start of work on activities that may result in excessive noise, such as jackhammer, tractor, dozer, grader and bored piling the community will be informed about the activity is imminent and the likely duration of the activity;
- Equipment under use will be regularly maintained, tuned, and provided with mufflers to minimize noise levels;
- Equipment emitting excessive noise in comparison with other similar equipment will not be allowed to operate;
- All construction equipment will meet international safety standards with effective silencing systems. To keep the equipment quality at the same level the regular maintenance will be undertaken; Equipment under use will be regularly maintained, tuned, and provided with mufflers to minimize noise levels;
- Equipment in poor state of maintenance, particularly without effective noise control will be checked to determine if it can be improved, and replaced with less noisy equipment as soon as practicable;
- Blowing of horn will be prohibited within the construction zones except under emergency conditions;
- Close liaison with the community and regular monitoring of the noise levels in the community are key to successfully implementation of the above mitigation measures. Specifically, the communities will be informed of all major construction activities at least three days in advance. Noise control measures will be discussed with the community through informal and formal meetings;
- Noise levels will be monitored as required in the community in order to take timely corrective measures, if needed;
- Ear defenders will be purchased and distributed to contractor personnel working at noisy locations;

Regular noise monitoring will be conducted at locations indicated in the project EIA or others as required. Noise levels will be monitored as required near the residential buildings in the community in order to take timely corrective measures, if needed and would be sent to engineer as a part of monthly monitoring report.

Noise Monitoring will be conducted in 2 locations indicated in the project EIA or others as required. Noise levels will be monitored as required near the residential buildings in the community in order to take timely corrective measures, if needed.

**Vibration Management**

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**SSEMP for Dzirulia- Moliti Road Sector- from km 0+000 to km 24+620**

The Project road is traversing several villages (e.g. Moliti (Nebodziri); Tsipa (Golatabani) and Chumateleti) Buildings within these settlements are located close to the road and during construction phase they might be effected by vibration to a certain degree.

The effects of vibration on structures depends on the construction machinery and equipment (emission source) and on the structural conditions of the potentially affected building structures (receptors). Road construction and rehabilitation will inevitably generate temporarily elevated levels of vibration. Given the nature of the Project road the speed of construction traffic will be very limited. Therefore and also considering the type and scale of proposed interventions, it is not expected that vibration resulting from construction operations will be a major issue of concern in terms of nuisance for people or physical damage on structures such as cracking of floor slabs, foundations, cracked plaster or cracked tile etc. However, in order to be on the sure side a vibration assessment for evaluating possible impacts from construction machinery has been undertaken which includes an impact assessment and mitigation measures.

As a result of the vibration assessment the 7m contour line from the future road was identified as the impact corridor within which the determined PPV threshold value of 6.5 mm/sec might be exceeded. For protecting the buildings from vibration impacts mitigation measures were developed which are described in the following table and included in the EMP.

Mitigation measures are also assigned to 8 fragile residential buildings which are outside the 7 m contour line but because of their fragility are of special concern regarding vibration impacts. The buildings are listed in the EMP.

As regards the operational phase vibration effects of the Project are considered to be of minor importance only provided that routine maintenance will be undertaken.

During the implementation of the project temporarily elevated vibration levels will inevitably occur due to individual operations and the use of heavy equipment. The most sensitive receptors in this regard are

- Moliti (Nebodziri);
- Tsipa (Golatabani) and
- Chumateleti

Possible exceedance of the determined threshold of 6,5 mm/sec at which impacts to building structures might occur. Using regular construction machinery including the vibration roller this value is anticipated to occur within a distance of 7 m to the future road edge or less.

**SSEMP for Dzirulia- Moliti Road Sector- from km 0+000 to km 24+620**

For pile driving at bridges the impact corridor is enhanced to 18 m in section 2 (soil class 3). Possible impact to 8 identified fragile residential buildings outside the 7 m contour line.

Buildings are:

- building 34 – km 29+600, right side, 7.3 m distance from future road edge
- building 63 – km 38+670, right side, 8.2 m distance from future road edge
- building 67 – km 38+840, right side, 11.5 m distance from future road edge
- building 74 – km 39+220, right side, 10.1 m distance from future road edge
- building 81 – km 39+730, right side, 13 m distance from future road edge
- building 90 – km 39+900, right side, 13.7 m distance from future road edge
- building 107 – km 43+740, right side, 12.0 m distance from future road edge
- building 114 – km 43+420, left side, 12.2 m distance from future road edge

Based on the conducted Vibration Impact Assessment the following mitigation measures were developed:

The Contractor submit to the Engineer for review and approval a written Construction Vibration Management Plan (CVMP) detailing the procedures for vibration monitoring and control. The CVMP plan include the requirement for trial construction sections to determine the likely magnitude of vibrations at defined distances from a vibration source. These programs would be reviewed and approved by the Engineer to ensure compliance with contractual specifications, including the EMP.

The maximum permissible vibration limit set at 6.5 mm/s must not be exceeded within the defined contour (7m from the road edge) where houses may be at potential risk of damages. Where the results of the vibration monitoring, or from a trial construction section, show that the specified construction vibration limit is reached at a particular location, the Contractor would be directed by the Engineer.

To suspend the construction activities that generate the excessive vibration at such location, and with the approval of the Engineer take mitigation actions necessary to keep the construction vibration within the specified limit.

In addition to above specific requirements, the contractor will be required to adopt the following specific mitigation measures:

- Vehicles and mechanical plant will be maintained in a good and effective working order and operated in a manner to minimize noise emissions. The contractor will ensure that all plant complies with the relevant statutory requirements;
- Site vehicles will be equipped with broadband, non-tonal reversing alarms;
- Compressor, generator and engine compartment doors will be kept closed and plant

**SSEMP for Dzirulia- Moliti Road Sector- from km 0+000 to km 24+620**

- turned off when not in use;
- All pneumatic tools will be fitted with silencers/mufflers;
- Care would be taken when unloading vehicles to avoid un-necessary noise;
- The use of particularly noisy plant will be limited, i.e. avoiding use of particularly noisy plant early in the morning;
- Restrict the number of plant items in use at any one time;
- Plant maintenance operations will be undertaken at distance from noise-sensitive receptors;
- Reduce the speed of vehicle movements;
- Ensure that operations are designed to be undertaken with any directional noise emissions pointing away from noise-sensitive receptors;
- Vehicles should be prohibited from waiting within the site with their engines running or alternatively, located in waiting areas away from sensitive receptors;

**SSEMP for Dzirulia- Moliti Road Sector- from km 0+000 to km 24+620**

- In accordance with the agreement with the Environmental Agency of Georgia vibration level testing (as required) will be carried out at the locations
- shown in the map;

Vibration levels will be monitored as required in the community in order to take timely corrective measures, if needed.

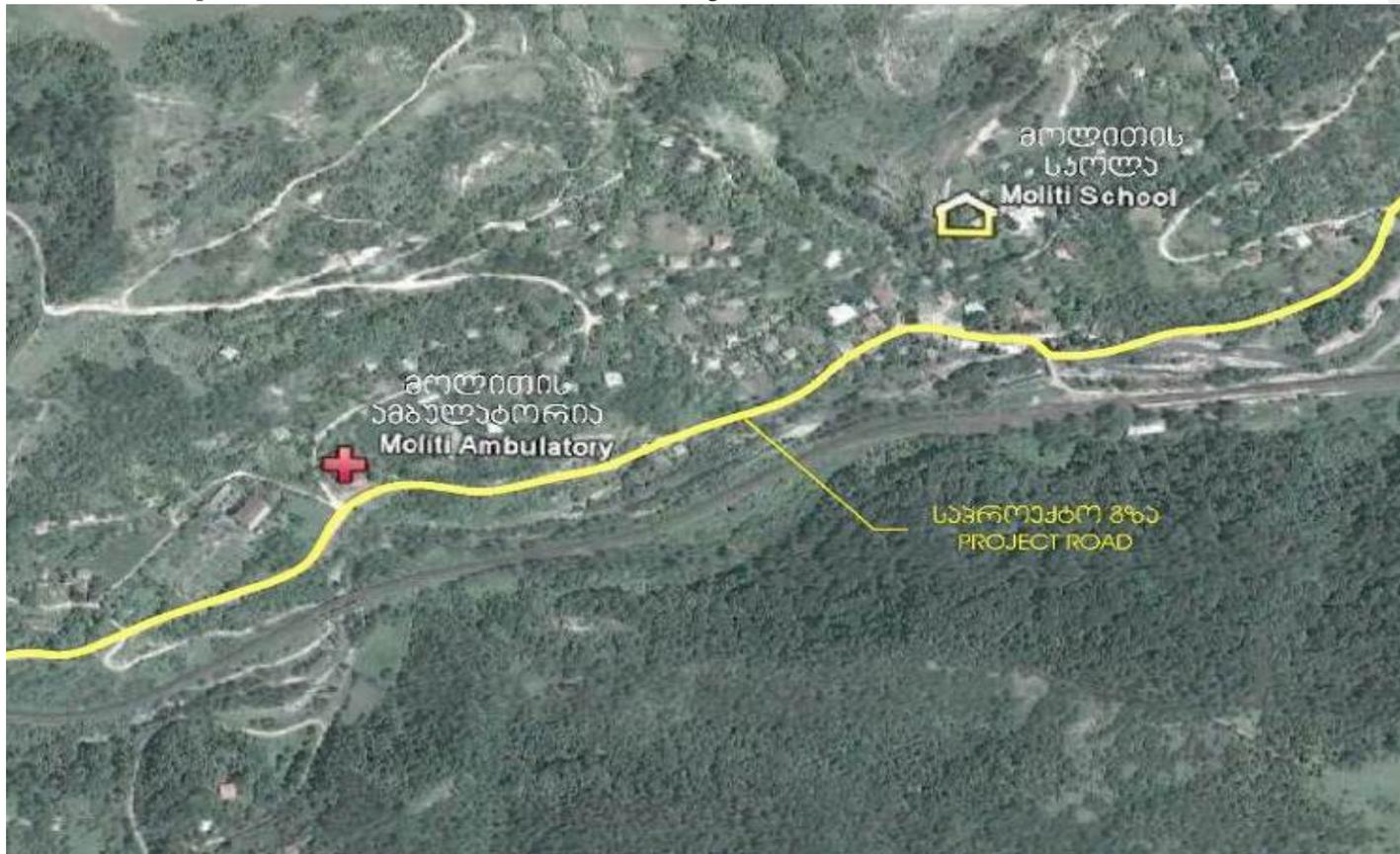
**SSEMP for Dzirulia- Moliti Road Sector- from km 0+000 to km 24+620**

**Noise & Vibration Management Plan**

<b>Area of Mitigation</b>	<b>Actions / Mitigation Measures</b>	<b>Location</b>	<b>Time Frame</b>	<b>Responsibility</b>
Prevention of disturbance to public / staff health and safety	Ear defenders will be purchased and distributed to Polatyol personnel working at noisy locations. Wearing ear defenders will be mandatory	All sites with noisy operations	At all times	HSM & EPM
	Blasting will be scheduled during the day only	All locations	At all times	Site foreman/EPM
	Blowing of horn will be prohibited within the construction zones except under emergency conditions	All locations	During the project implementation	Site foreman/EPM
	Limit works will be restricted to between 07: 00 a.m.– 21: 00 p.m. within a 500 m distance of the adjoining settlements as per Georgian legislation	Throughout the project corridor	During the project implementation	Site foreman/EPM
	All construction vehicles will be meet ISO 9001 – 2008 (Euro 4 and 5) standards and will be fitted with modern noise suppression equipment	Not applicable	At all times	Head mechanic
	Local communities and organizations will be informed of the construction schedule and any noisy activities on a regular basis via workshops and other liaison activities	Local communities	As required	HSM & EPM
	All idle mechanical equipment will be switched off	All construction areas	Construction period	All site staff/ EPM
	During construction all noise volume will be restricted to the national standards via regular monitoring and feedback. The monitoring stations are shown in figures map.	Monitoring stations	As required	EPM
	Noise mufflers of all vehicles will be maintained and checked	All locations	Once a week	Head mechanic

**SSEMP for Dzirulia- Moliti Road Sector- from km 0+000 to km 24+620**

APPENDIX 1: Map of location Noise and Vibration level measuring sites



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# "Noise measurement place"





## TOPIC SPECIFIC WASTE MANAGEMENT PLAN

Rehabilitation Project of Dzirula - Kharagauli - Moliti - Pona – Chumateleti  
Secondary Road,

LOT 2: Moliti – Phona-Chumateleti Road Section- from km 24+620 to km 50+244

EMPLOYER

~~Georgia~~ Roads Department, ~~the~~ Ministry of  
Regional -Development and -Infrastructure of Georgia



ENGINEER

~~Authorized representative of:~~ JV Pyunghwa  
Engineering Consultants Ltd ~~and~~ /Yooshin  
Engineering —Corporation ~~and~~ /Roads  
Rehabilitation and ~~M~~modernization  
Supervision Direction Ltd

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CONTRACTOR

“AKKORD ” ICIC



PREPARED BY: AKKORD ICIC, May 2020

APPROVED BY: Roads Department of Georgia:



## SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN

2020

### Introduction

According to GEO legislation (Waste Management Code-2014) Contractor is obliged to prepare waste management plan and submit to the MoEPA for approval. (Waste management plan had Agreed by ministry-The agreement document accompanies the plan).

The Waste Management Plan has been developed in line with the requirements of the applicable legislation in Georgia in the field of waste management and represents the plan of the management of waste generated in the project implementation process. The plan is a live document and can be adjusted according to the need. It includes issuers related to the rights and duties of persons involved in the identification, classification, collection, treatment, transfer, transportation and management chain of waste generated during the implementation of the project in accordance with the requirements of environmental norms and rules. Main tasks for waste management are:

- Ensuring identification of generated waste (in particular, determining and classification of waste list according to species and characteristics)
- Determining the number, species and composition of waste generated during the company's activity as defined by the waste list;
- Determination of measures to be taken for prevention and restoration of waste in case of especially hazardous wastes;
- Ensuring the separated collection of generated waste, during which the dissemination of waste, loss, creation of emergency situations should be excluded;
- Determining the methods and conditions of temporary storage of waste;
- Ensuring the provision of waste transportation conditions, determination of measures to ensure the conditions for their temporary placement, in order to exclude the harmful effects of waste on the environment and human health;
- Ensuring the use of environmental and human health-safe methods during the neutralization, processing or utilization of waste;
- Reduction of the volume of waste;
- Recycling of waste;
- Defining the personnel responsibility for waste management;
- Determination of safe dealing with waste;
- Ensuring accounting of industrial and household waste;
- Determination of waste control methods.

Compliance with the instructions in the document is mandatory for the head and ordinary workers of all structural units of the object.

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## SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN

### Goals and objectives of waste management plan

The Waste Management Plan aims to ensure the disposal of hazardous and non-hazardous wastes produced in the operation of the enterprise in accordance with the requirements of the applicable legislation of Georgia, resulting in the elimination or minimization of the environment (soil, water objects, and atmospheric air) waste.

The present waste management plan is a highly detailed, but still frame document. Certain details will be specified in the inventory documentation (eg.: the identity of persons responsible for waste management, the list of waste operators with which the relevant contracts for waste disposal shall be concluded and etc.)

The present waste management plan establishes the rules for collecting, transporting, disposing, decontamination and utilization of industrial and household waste generated during the operation of companies in compliance with the requirements of environmental, sanitary-hygienic and epidemiological norms and regulations.

Main tasks for waste management are:

- Ensuring the waste identification according to their types;
- Ensuring the separated collection of waste, protection of the conditions for their temporary placement in order to exclude the harmful effects of the environment on the environment and human health;
- Ensuring the waste transportation conditions which shall exclude any dissemination of waste, loss, creation of emergency situations, damage to environment and human health;
- Ensuring the use of environmental and human health-safe methods during the neutralization, processing or utilization of waste;
- Reduction of the volume of waste;
- Recycling of waste;
- Defining personnel responsibility for waste management;
- Ensuring accounting of industrial and household waste;

This plan covers all types of company's planned activities in all the facilities generating the waste, both during normal operating conditions as well as the emergency situation.

The terms and obligations provided for in the plan are mandatory for all contractors of the Company "Akord" ICIC.

### Waste management hierarchy and principles

The waste management policy and the legislation on waste management in Georgia is based on the following hierarchy of waste management:

- Prevention
- Prepare for reuse;
- Recycling;
- Other type of restoration, including energy recovery;
- Placement.



## SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN

In determining specific liabilities in respect of waste management hierarchies it should be taken into consideration:

- Ecological benefits;
- Technical feasibility with the use of the best available equipment;
- Economic expediency.

Waste management should be performed without environmental and human health threats, namely in the manner that waste management can not endanger water, air, soil, flora and fauna; not cause damage by noise and smell; not adversely affect the whole territory of the country, especially on the protected area and cultural heritage.

Waste management should be carried out according to the following principles:

- "Principle for the Preliminary Security" - measures should be taken to prevent the threats cause by environmental waste, even if scientifically verified data exists.
- Principle "Pollutant pays: the waste generator or waste owner is obliged to pay for the waste management-related costs;
- "Proximity Principle" - waste should be processed at the nearest facility designated for processing of waste, taking into consideration environmental and economic efficiency;
- Self-sustaining principle" – there should be developed and functioned the integrated and adequate network of municipal waste disposal and restoration facilities.

### Waste management model

Waste management uses the model of waste management hierarchy, which involves optimal prioritizing of different activities in waste management.

As a general rule, it is recognized that the best option is to always avoid waste generation, which results in minimizing its quantity and risk. Reuse of waste is better than recycling and restore of the energy from waste, and the disposal of waste in landfill is the last solution.

### Description of the waste generated during the project implementation

Production of following wastes is expected during implementation of the project:

- Hazardous waste;
- Non-hazardous wastes;
  - Inert waste
  - Municipal waste

### Inert waste:

- Inert wastes generated during the road expansion in the project area,
- Other waste - gravel and stone pieces;
- Dust and flourish waste;

Which will be collected in the territory of the enterprise and subsequently removed according to the waste derivative by the appropriate municipality.

### Hazardous waste:

- Residual paint and varnish containing organic solvents or other hazardous substances;



## SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN

- Printer toner / ink waste containing hazardous substances;
- Mineral non-chlorinated hydraulic oils;
- Adhesive and sealing materials that contain organic solvents or other hazardous substances;
- Mineral non- chlorinated oils and oily lubricants of the engine and gear boxes;
- Other insulating and heat exchangers;
- Packaging materials containing the hazardous chemicals and / or contaminated with hazardous chemical substances;
- Absorbers, filtration materials (including the oil filters that are not considered in other categories), cleaning pieces and protective clothing contaminated with hazardous chemical substances;
- Oil filters;
- Shafts containing asbestos;
- Brake fluids;
- Oil-containing waste;

### **Non-hazardous waste**

- Plastic packaging materials;
- Wooden wrapping materials;
- Metal packaging materials;
- Glass packaging materials;
- Textile wrapping materials;
- Tires subject to destruction;
- Non-ferrous metal;
- Ferrous metal;
- Other batteries and accumulators;
- Silt originated as a result of wastewater treatment in the settled areas (base);
- Mixed municipal waste

### **Municipal waste**

Household waste and food waste, paper and cardboard wastes, waste of polyethylene bags, glass, plastic and other wastes, waste after sweeping the territory, fallen leaves.

### **Types of waste and approximate quantities produced during the implementation process**

Types of the approximate volume of wastes in the process of implementation of the planned activity are given in the Table N1



**SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN**



**SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN**

Waste Code	Name	Hazardous (yes/no)	Characteristic of hazard	Approximate amount of waste generated during construction			Approximate amount of waste generated during operation	Disposal/recovery operations	Code of Basel Convention
				2020	2021	2022			
08 01 11*	Waste paint and varnish containing organic solvents or other dangerous chemical substances	Yes	H 6	10-20 kg	20-30 kg	1-5 kg	Wastes shall be transferred to the properly licensed company, which will be specified after identification of a construction contractor/putting the HPP into operation.	Y9	
16 06 01*	Lead batteries	Yes	H 15	4-6 unit	5-7 unit	3 – 5 unit	Wastes shall be transferred to the properly licensed company, which occupation is processing such waste. Company will be specified after identification of a construction contractor/putting the HPP into operation	Y31	
16 01 03	End-of-life tyres	No	-	8-10 unit	10-12 unit	8-10 unit	Wastes shall be transferred to the properly licensed company, which occupation is processing such waste. Company will be specified after identification of a construction contractor/putting the HPP into operation	-	
16 01 07*	Oil filters	Yes	H 15	8-10 unit	10-15 unit	8-10 unit	Wastes shall be transferred to the properly licensed company, which will be specified after identification of a construction contractor/putting the HPP into operation.	Y31	
16 01 17 16 01 18	Ferrous metal Non-ferrous metal	No	-	0,1-0,2 t	0,2-0,5 t	0,2-0,5 t	Delivered to the scrap collecting points Company will be specified after identification of a construction contractor/putting the HPP into operation.	Y17	
20 03 01	Mixed municipal waste	No	-	56 m <sup>3</sup>	56 m <sup>3</sup>	14 m <sup>3</sup>	Household waste will be collected into the properly marked, closed containers. Household waste accumulated on the construction sites will be removed on the local landfill.	-	

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 SHINAVI TIKHETI INVESTITSIA KORPORATSIIYA	<b>SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN</b>	
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17 05 05*	Dredging spoil containing dangerous substances (soil and ground polluted by oil hydrocarbons)	Yes	H 15	Prediction is impossible. Depend on the scale of spill			Wastes shall be transferred to the properly licensed company, which will be specified after identification of a construction contractor/putting the HPP into operation.	Y9
11 01 13*	Degreasing wastes containing dangerous substances	Yes	H 6	30-50 l	50-80 l	400-800 l	Wastes shall be transferred to the properly licensed company, which will be specified after identification of a construction contractor/putting the HPP into operation	Y9
17 02 01	Wood	No	-	Will be specified by taxation	-	20-30 m <sup>3</sup>	Waste will be disposed on the area indicated by the LEPL National Forestry Agency and shall be transferred to this body for further management.	-
16 01 08*	Components containing mercury	Yes	H 6	2-5 unit	10-20 unit	15-20 unit	Wastes shall be transferred to the properly licensed company, which will be specified after identification of a construction contractor/putting the HPP into operation.	Y29
15 02 02*	Fabrics polluted by oil products (wiping cloths and protective clothing)	Yes	H 15	10-15 kg	15-20 kg	15-20 kg	Wastes shall be transferred to the properly licensed company, which will be specified after identification of a construction contractor/putting the HPP into operation	Y9
16 01 19	Plastic	No	-	40-50 kg	20-30 kg	40-50 kg	Polyethylene waste will be collected in specially marked, closed containers and will be removed on Mestia or Zugdudi landfills.	Y17
08 03 17*	Waste printing toner containing dangerous substances	Yes	H 6	15-20 unit	15-20 unit	20-30 unit	Waste shall be transferred to a supplier for further processing/recovery	Y31
17 05 06	Dredging spoil other than those mentioned 17 05 05 (soil extracted during earth work and arrangement of foundations)	No	-	6-8 thousand m <sup>3</sup>	1-2 thousand m <sup>3</sup>	-	Part of dredging spoil excavated during the earth works will be used for filling foundations of hydro technical structures, improvement of roadbeds and for other works. The other part will be disposed on the spoil grounds.	-



## SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN

### Description of waste management process

#### Measures for prevention and restoration of waste:

Following types of waste prevention and restoration will be considered in the process of enterprise Activity,

- Any type of building material, items or substance will be brought into the territory of the facility in the amount that is required for proper conduction of the construction / technological process. No long-term storage of materials on the territories will be admitted;
- Most of the materials needed for construction materials, constructions, and technological processes will be brought in the finished form (eg. inert materials, etc.);
- In procuring the materials and substances needed for construction materials, constructions, technological processes, the preference will be given to environmental safe and quality product. Products will be checked for compliance with international standards;
- Preference will be given to reusable or recyclable, biologically degrading or environmentally safe substances, materials and chemical compounds;
- Residual waste will be used again (eg: metal structures, polyethylene materials, etc.). Gradually, it will be introduced separated collection of waste according to their type and level of danger: containers with the corresponding inscriptions will be placed on the territory of the enterprise (at the areas of expected generation of waste);
- Groundwater polluted with oil products, gravel, various materials will be collected in the relevant containers and temporarily placed in the hazardous waste warehouse for utilization before transfer to the relevant contractor;
- Oils generated as a result of change of vehicle oil and technical oil - prior to transferring to the relevant permit issuing organization – will be stored in the metal barrels and warehouse;
- Absorbers, filter materials (including oil filters that are not considered in other categories), cleaning pieces and protective clothing that are contaminated with hazardous substances - will be temporarily stored in the appropriate containers, hazardous wastes warehouse before the delivery to the organization permit issuing organization;
- Printer toner, laser cartridges will be returned to the supplier for re-deployment / destruction;
- The brushes containing asbestos will be collected and packaged in plastic containers or polyethylene bags so as to prevent dissemination of the asbestos dust in the open atmosphere. The waste relevantly packed and marked will be placed in the municipal landfill of the waste origin relevant municipality in the box that is especially reserved for such a waste.
- Brake liquids - used liquids will be placed in the metal container and stored in the warehouse before transferring to the permit issuing organization;
- In the warehouse of wastes before handing over to the organization;
- Tires to be disposed will be collected in the territory of the enterprise before handing over to the permit issuing organization;



## SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN

- Wooden packaging material - will be deposited in the territory designated for this purpose before its delivery to the physical persons;
- Textile wrapping material - will be placed in the appropriate containers before removal to the municipal landfill;
- Plastic packaging material - will be stored in the appropriate containers before placing it in plastic delivery point;
- Metal wrapping materials - will be stored in the appropriate containers before delivery to the scrap metal point;
- Glass packaging materials - will be stored in the appropriate containers before delivery to the glass delivery point;
- Non-ferrous metal - will be stored in the appropriate area before delivery to the scrap metal point;
- Other batteries and accumulators - will be placed in a metal containers and stored in the warehouse handing over to the permit issuing organization;
- Ferrous metal - will be stored in the appropriate area before delivery to the scrap metal point;
- Residual paint and varnish containing organic solvents or other hazardous substances - will be placed in a metal containers and stored in the warehouse handing over to the permit issuing organization;
- Printer toner / ink waste containing hazardous substances - will be placed in a metal containers and stored in the warehouse before handing over to the permit issuing organization;
- Adhesive and sealing materials containing organic solvents or other hazardous substances - will be placed in a metal containers and stored in the warehouse before handing over to the permit issuing organization;
- Packaging materials containing the hazardous chemical substances and / or contaminated with hazardous chemical substances - will be placed in a metal containers and stored in the warehouse before handing over to the permit issuing organization;
- Oil filters - will be placed in a metal containers before handing over to the permit issuing organization;
- Household storage and food waste, paper and cardboard waste, waste plastic bags, glass, plastic and regular waste, fallen leaves will be placed in the household waste containers in the territory and periodically removed by the municipal cleaning services according to the place of their generation (on the basis of the contract executed with the municipality of the waste generation area)

Following shall be prohibited:

- Placement of hazardous wastes in the containers for solid waste;
- Collection and store of liquid hazardous waste in open areas unprotected from atmospheric sediments;
- Burning of rubber or other waste;
- Discharging oil and lubricating materials in the river or sewage systems;
- Mechanical impact on batteries, cartridges.

### Allocation of responsibilities for fulfillment of the requirements of the plan

#### **Project's Manager Responsibility**

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## SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN

- Approval of waste management plan;
- Approval of waste inventory sheet;
- Provision with equipment, resources and inventory necessary for waste management;
- Control of fulfillment of the environmental legislation requirements of Georgia in the waste management process arising in the activity of the facility

### **Responsibility of the head of the enterprise**

- Agreement – resolution of the Waste Management Plan;
- Agreement – resolution of waste inventory sheet;
- Provision with equipment, resources and inventory necessary for waste management (solicitation And assistance);
- Control over the activities of the persons involved in the waste management process arising in the Enterprise's operation.

### **Responsibility for the person in charge of waste management (HSE)**

- Organizing waste management process;
- Prepare and update the company's waste management plan;
- Implementation of internal control over fulfillment of Georgian legislation requirements in waste management
- Monitoring the process of removal, placement and / or restoration by the subcontractor organization;
- Determination of the risk of waste;
- Creating an inventory statement;
- Monitoring and control of waste management process; registration of the removed waste;
- Approval of the request for removal of waste;
- Knowledge and protection of waste management rules by the personnel involved in waste management;
- Supply of personnel with the means of safe handling of waste;
- Preparing the information about the collection and storage of waste;
- Trainings for the staff member (on waste management issues);

### **Responsibility of staff involved in waste management**

- Waste collection, storage and placement;
- Making the relevant request on waste removal.

### **Method of collecting of waste**

The waste will be collected in the enterprise using the container system. It shall be ensured the collection of hazardous, non-hazardous and inert wastes separately according to the categories, to facilitate their further specific processing.

Particular attention will be paid to the separation of hazardous waste from other wastes. It shall be managed the classification of waste, inventory, attachment of labels, waste separation and their placement in the containers.

Special containers will be located close to the waste generating area.



## SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN

Special bins will be placed in the facility where waste separation will be possible (from 2019)

Discharge (transportation to the warehouse) will take place according to the necessity (at least once a week; hazardous wastes, household waste - twice a week).

Before removal of waste or disposal and/or restore thereof the waste will be stored in the manner that excludes any accidental spillage, land or groundwater pollution, accidental collision, contact with air contact with air using secondary package or/and caps, containers corrosion or deprecation due to the environment factors or otherwise; it will be selected specific waste resistant containers;

Hazardous waste will be placed in the hazardous wastes warehouse where any contact from the part of unauthorized persons will be prevented (stealing, contact with animals).

Containers of wastes will be of adequate size, shape, composition and content of hazard;

There will be used the containers that are in good condition and have caps to be closed. The compatibility of the waste to be placed in the shall be taken into account in order to prevent any reaction of the waste with the container and spillage

All kinds of hazardous waste will be strictly separated from the rest of the waste.

One type of hazardous wastes will be placed in one container.

Solid and liquid wastes will not be mixed.

### General requirements for safe treatment of wastes

- Personnel engaged in waste management (collecting, storing, transporting, receiving / handing over) will be trained in labor protection and professional safety issues;
- Personnel will be provided with special uniforms, shoes and individual protection means. In case of necessity, the personnel clothing is subject to special processing, especially after the operation related with hazardous wastes;
- Personnel should be able to provide first aid in case of intoxication or injury during working with waste;
- A person who has not been trained and has not special uniform, also who shows the sign of illness will not be admitted to work;
- Placement of wastes more than the established norm is not allowed at the waste collection site. Disposal of wastes near the spark and heat generated sources is not allowed;
- In case of placement of several types of wastes their compatibility will be considered;
- In the waste storage areas it is forbidden to keep foreign objects, personal clothing, uniforms, individual protection means, also taking food is strictly forbidden;
- When working with waste, it is necessary the strict adherence to personal hygiene rules; one has wash hands after the work is finished;
- In case of signs of poisoning, the work should be stopped and the person should visit the nearest medical point and notify the structural unit of the case.
- The sites for collection of fire-hazardous waste will be equipped with fire extinguishing means. Smoking and use of open fire is strictly prohibited in these places;
- Staff should know the properties of waste and firefighting rules. Flammable, easily flammable or fuels can be extinguished by fire extinguishers, sand or asbestos tissue;



## SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN

- Extinguishing the flammable solvents is not permitted by water.

### **Training activities for staff working for waste management:**

- All employees, dealing with waste will pass the special training in the following fields:
- Rules and procedures of appropriate segregation;
- Treatment of waste (using personal protection means), including collection of waste in the office;
- Waste treatment;
- Waste storage;

The system of caring liability and the procedure for correct execution of documentation.

### **Waste disposal**

A special storehouse (temporary warehouse) will be arranged on the territory for temporary disposal of hazardous wastes; it will be properly marked and will be protected from the impact of atmospheric sediments and infringements.

Shelves and rack storage will be arranged for waste disposal. Waste disposal will be made with special markings. Removal of wastes from a temporary storage warehouse will be carried out in accordance with accumulation by the contractors with appropriate permit.

Contractor signs contract with Ltd „Geo Technology“ -for hazardous waste disposal.

### **Waste Transfer**

Non-hazardous and hazardous wastes shall be transferred only to persons who have the permit or /or registration for environmental impact or the restoration or disposal of waste.

Transfer of waste will be duly formalized in the form of "waste transfer" (this form will be filled in case of removing the non-hazardous wastes as well, if the municipality / municipal cleaning service does not carry out this service). In each case, the following information shall be filed:

- Date and time of transfer;
- Description of waste, with indication of number;
- Information about the manufacturer of waste;
- Information on waste carrier;
- Information on waste recipients;
- The signature of the manufacturer, the carrier and the recipient.

The completed form of waste transfer shall be attached to the shipping bill from the waste origination facility to the place of processing, placement or restoration. Each form must indicate the following: waste description, composition, production process, type of package, total quantity of waste and other necessary information.

### **Waste Transfer Form**

The waste transfer form will be filled in three copies. The form of waste transfers will be signed by the authorized persons and the subcontractor, which manages the waste removal; the upper copy (the first copies) remains on the site and stored in the archive; the rest two copies will be taken by the carrier to the place where of processing, disposal or restoration, where they are signed by the responsible person (with



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indication that the wastes have been delivered to the place of destination); after that, the second copy will remain on the site of processing or disposal and the third copy will be delivered by the carrier who will immediately transmit it to the waste generator or at the time of removal of the waste hand over to the waste generator; after that, the third copy will remain in the place of generation and stored together with the first copy.

Waste delivery completed forms will be kept during the entire period of the contract. Responsible person is obliged not to issue waste and not to sign to the form of transfer of waste, if he believes that the wastes have not reached the destination.

The municipal cleaning service will remove the municipal waste. Generated waste will be transferred to persons with the environmental impact permit for restoration or placement.

In order to optimally plan the waste management, the organizations with the appropriate permits are being investigated. Eventually, the companies that will be able to sign the contract and provide optimal ecological and economic effect will be selected.

### Waste transportation

The company will transport waste in accordance with the GOG Resolution #143 on "Approval of Waste Transportation Rules", namely:

1) Waste shall be transported on the basis of a written agreement between the company and the waste carrier or by the company itself taking into account the specific characteristics of the carriage:

- Special measures for processing the transport means will be specified (if necessary)
- Escorting the transport means will be ensured (if necessary);
- Drivers and support staff will be provided with individual protection means (if required)
- Neutralization of hazardous waste and risks will take place (if necessary)
- Waste shall be transported by technically organized, equipped transport means with appropriate documentation.
- At transportation of hazardous wastes it will be completed "Hazardous Waste Information Paper" and "Transportation of Hazardous Wastes"
- It will be ensured cooling of the means of transportation for the wastes sensitive to temperature and adequate protection from the atmospheric sediment;
- It shall avoided the transportation of incompatible wastes by the same means of transportation;
- In case of force-majeure circumstances during the transportation of hazardous waste the Situation will be immediately notified to the Emergency Situations Management Agency (112) of the MIA;
- During the transportation of hazardous wastes it will be used a qualified driver service, which will have a certificate for special driving training;

Following types of risks shall be taken into account during the transportation of waste:

- Car Accidents;
- Spitting and falling of the cargo;
- Inadequate loading of the car;

In order to prevent the above mentioned, the following shall be carried out:

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- Vehicles systematic inspection for technical suitability and following the speed limits by the driver;
- Check the leak tightness of waste containers;
- At loading the vehicle its loading capacity should be taken into account in order to avoid overloading of vehicles;
- The transport means have attached to the body a fluid-proof geo-membrane that provides retention of waste at breakdown or spillage.

In spite of taking into consideration the above mentioned safety measures, if the environment is contaminated as a result of the accident, the driver will contact the management of the company, which shall carry out the relevant measures in the territory with the help of the rescue team.

### Waste control methods

In the course of the activity process it will be allocated the relevant personnel with competent knowledge, which will be regularly trained and tested. The mentioned persons will manage the relevant log and make records in it. The volume of generated, accumulated and disposed waste will be documented.

A person responsible for waste management will systematically control:

- Suitable for the waste collection packages;
- The existence of marking on the packages;
- Condition of sites/warehouse for temporary placement of the wastes;
- Quantity of accumulated wastes and compliance with established standards;
- Periodicity of waste removal from the structural unit territory;
- Observation of the requirements of ecological safety and safety techniques

### Solid Waste Management

Generation of three types of solid wastes are expected during the project– hazardous, inert and domestic waste:

- Hazardous waste, such as used tires, used oil, used batteries, paint and other chemicals is generated by the workshops, asphalt plant and other construction related areas.
- Domestic waste includes normal wastes from residential areas, offices, and kitchens.
- Inert waste from cleaners of site and cutting ground works.

Hazardous waste is stored in the dedicated hazardous waste storage area, which is bonded and impervious. According to the agreement with LTD “Medical Technology” hazardous waste is collected as required and transported for disposal in accordance with Georgian legislation (Waste Management Code of Georgia 2014). Domestic waste is placed in dedicated bins around the site on a daily basis. These bins are emptied daily into larger 300 litre containers, which are then emptied as required by LTD Xashuri DasufTaveba (see Appendix 2). Final disposal is to Xashuri official landfill.

Inert waste will be placed - at the place allocated for the disposal of especially inert waste by the municipality appropriate to the place of waste generation or there will be used for filling the queries during rehabilitation.



**SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN**

Training is also provided to site staff to raise awareness on waste management and to train workers to separate hazardous and domestic waste in different containers, construction sites and keep working places clean.

**Liquid Waste Management**

Generation of two types of waste water is expected during the project – technical waste water and domestic sewage / wastewater.

- Technical waste water is generated as a result of cleaning and washing equipment and trucks, and effluents from the concrete and crushing plants. This water is contaminated with lubricants, high levels of sediment, and other pollutants, and cannot be treated as domestic sewage.
- As described in the Water Management Plan, technical water is collected in impervious concrete basins, and is sucked into tankers for future disposal as hazardous waste as required in accordance with the agreement with LTD “Georgian Water Company” (see Attachment N3).
- Wastewater from toilets, showers, kitchens and domestic areas is passing through the preliminary sedimentation and then discharge into concrete septic tanks. Suction vehicles empty the tanks periodically as necessary. Used oil and hydraulic oil will be collected in used oil tank which placed in workshop and bounded in concrete to a volume of 110%.

All hazardous liquids acids, paints etc. will be store in designated storage room of workshop and banded in concrete to a volume of 110%.

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**Waste Management Plan**

Area of Mitigation	Actions / Mitigation Measures	Location	Time Frame	Responsibility
Pollution prevention in accordance with Georgian Legislation	All domestic waste water will be collected in septic tanks and emptied by specialized suction vehicle	Construction Camp & Plant Yard	Septic tanks emptied once a week	Camp Manager & Plant Yard Manager / EPM
	All hazardous liquids such as lubricants, paint etc. will be stored in the designated area at the workshops and will be disposed by LTD "Georgian Water Company"	Plant Yard	As required	Plant Yard Manager / EPM
	Solid hazardous materials will be stored in the designated secure area at the workshops and will be disposed by LTD "Medical Tecnology"	Plant Yard	As required	Plant Yard Manager / EPM
	Any spilled materials and contaminated earth will be collected and disposed of to the special landfill	All locations	As necessary	EPM
	All open burning is prohibited	All locations	At all time	All staff
	The storage of waste or production waste of any is not permitted within a distance of 100 m of any stream including drainage or irrigation facilities	Construction Camp	At all time	Camp Manager / EPM
	The discharge of oil and fuel onto open soils is prohibited	Workshop	At all time	Plant Yard Manager / EPM

Workshop wastewater will be collected in concrete tanks and emptied by specialized suction vehicle	Workshop	Once a week	Plant Yard Manager / EPM
Domestic solid waste will be: collected from small containers by cleaners and stored in 300 l containers transported using designated closed truck by LTD “Georgian Water Company and disposed of Khashuri official landfill domestic waste produced on site will be transported to the camp on a daily basis	All locations	As required	Camp Manager & Plant Yard Manager / EPM
Scrap metal waste will be: collected on site by workers and stored in the designated storage container at the contractor Plant Yard Collected waste will be delivered to the official landfill using the dump truck	All locations	As necessary (when storage container is full)	As necessary (when storage container is full)
No plant may discharge effluent water to any watercourse; impervious concrete basins will be constructed for receiving such waters.	Plant Yard	At start of work, with regular emptying	Plant Yard Manager & EMP
Construction waste will be: Reused on site if possible if reuse is not possible the waste will be disposed of as domestic, metal or hazardous waste	Construction sites	As necessary	Camp manager & Plant Yard Manager



**SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN**



## TOPIC -SPECIFIC SPOIL MANAGEMENT PLAN

Rehabilitation Project of Dzirula - Kharagauli - Moliti - Pona – Chumateleti  
Secondary Road,

LOT 2: Moliti – Phona-Chumateleti Road Section- from km 24+620 to km 50+244

**EMPLOYER** Georgia Roads Department Ministry of  
Regional Development and Infrastructure



**ENGINEER** Authorized representative of: JV  
Pyunghwa Engineering Consultants  
Ltd/Yooshin Engineering Corporation/  
Roads Rehabilitation and modernization  
Supervision Direction Ltd

**CONTRACTOR** “AKKORD ” ICIC



PREPARED BY: AKKORD ICIC, June 2020

APPROVED BY: Roads Department of Georgia:

*2020*

Cut & Fill Requirements

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During construction, to implement the designs, cut & fill will have to be performed. Such activities will cause considerable volumes of materials to be hauled from one place to another. The hauling of material will cause some of them to drop onto waterways and cause turbidity problems. Any disposal areas will have to be sited properly and stabilized to prevent erosion. Erosion or washing away of materials can cause silt to reach into the river and subsequently cause turbidity. It is anticipated that excess materials will be generated by cut operations to provide for a wider roadway and safer slopes Spoil Management

The one of the main impacts of road construction will be generation spoil. Overall construction of cutting slope over surface road or bridge may be considered preferable as it reduces land acquisition, is less intrusive on the vista, does not impact flora and fauna and avoids issues such as noise and fragmentation of land. There is a possibility of soil erosion and adverse aesthetic impact if spoils from tunnel excavation are not properly placed and rehabilitated. An estimate of soil and rock to be excavated, and thus disposed of properly, should be completed. It is estimated that 250000 cubic meter of spoil will be generated. Part of the material may be used for road construction. The remaining material may have to permanently dispose of at a suitable location. In adequate management and disposal of waste from road can lead to deterioration of soil, contamination of water bodies, and habitat destruction with consequent negative impacts on the flora and fauna, and generation of dust.

**Objectives**

The objectives of the spoil management are to:

- Temporary and permanent storage of materials will be confined to government-owned land and in no circumstances should be dumped on agricultural or productive lands (without owner’s written permission) or to any watercourse, including irrigation channels;
- As a rule, the Contractor shall reuse any cut material for fill unless deemed unsuitable;
- In the event of any spoil or debris from construction works being deposited in any of the aforementioned areas or any silt washed down to any area, then all such spoil, debris or material and silt shall be immediately removed and the affected land and areas restored to their natural state by the Contractor to the satisfaction of the Engineer.
- Disposal areas should be ascertained by the Contractor prior to cutting or excavations. Since the surrounding areas are somewhat uninhabited and open spaces, there are a good number of areas where materials can be deposited for the purpose of shaping and evening out the topography, fortifying embankments and riverbanks and toe protection of bridge structures.
- Requirement for due diligence will apply to any dump sites and to any materials to be disposed of.
- Any sites proposed for permanent disposal will require prior formal approval.
- Manage spoil generated during the project in accordance with preferred waste management hierarchy of avoidance, minimization, reuse, recycling and finally disposal;
- Where possible ensure all clean and/or treated spoil will be reused or recycled;
- minimize off-site disposal of spoil;
- Minimize spoil removal and associated impacts on stakeholders, community and the environment;



## SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN

- Minimize the impact of erosion and sedimentation from construction activities associated with the project;
- Ensure all sediment and erosion controls are implemented on site in accordance with best practice environmental management;
- Provide an organized, integrated and systematic approach to effectively address spoil management issues during the project; and
- Provide staff with an increased level of understanding and awareness of spoil and fill management issues.

### Spoil types

**Spoil** is defined as any earthen material that is surplus to requirements or unsuitable for reuse in fill and embankments (such as unsuitable rock and soil material) or material that is contaminated. This plan has been prepared to facilitate the beneficial reuse of all material, ensuring that none is disposed off-site, except if unsuitable for reuse.

**Fill** is defined as earthen material excavated from one location along the corridor (for example, for a detention basin or cut excavations) and relocated elsewhere as compacted fill.

Cut and fill material will generally not be stockpiled, but will be removed from the excavation site and transported directly to the construction face for immediate reuse as compacted fill. Unsuitable excavated material will primarily be transported to identified locations within the road corridor for reuse or, if space is not available, will be stored temporarily off-site for reuse later..

**Select** material is defined as earthen material of comparatively higher quality, necessary for engineered backfill and incorporation in upper earthworks layers as part of the overall pavement design. Typically on the project this will include high strength sandstone and low/medium strength clay stones, siltstones and sandstones. Wherever possible, select material will be sourced on site, and stockpiled as necessary until incorporated in the works.

**Unsuitable** (non-contaminated) material on the project is generally composed of silt, sandy, gravely and organic clays; sandy silts; clayey, silt and gravely sands and carbonaceous rock.

This material will be reused on the project in the following ways:

- widen embankments where possible;
- land contouring;
- landscaping mounds;
- landscape treatments; and
- Noise mounds (if required).

**Topsoil** will be stripped and recovered for reuse in landscaping and revegetation. On average, the top 50 cm of topsoil will be collected for future use.

### Spoil generating activities

Spoil generated by construction will primarily come from excavation works. The spoil is expected to vary in content with silt, sandy, gravely and organic clays; sandy silts; clayey, silt and gravely sands and carbonaceous rock. The activities associated with the generation and management of spoil and fill materials are:

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## SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN

- clearing of vegetation;
- selection of material;
- clearing of topsoil;
- excavation of earthen material;
- blasting of earthen material;
- transport of earthen material;
- storage/stockpiling of spoil, topsoil and mulch; and
- Reuse of spoil, topsoil and mulch.

### Potential environment aspect & impact

- Vegetation clearing/disturbance – Water pollution due to sediment runoff from spoil excavation and excess spoil storage;
- Removal, stockpiling and re-spreading of road construction soils – general earthwork activities – Weed infestation from dispersion of seeds, etc. during clearing and access upgrading activities;
- Site establishment - site compounds, access points and access routes – Water and air pollution due to dust generated from stockpiles;
- Adjustments of existing public utilities – Flora and fauna damage due to sediment runoff from spoil excavation;
- Operation of site compound – Water, soil and air pollution from inappropriate storage, handling and disposal of spoil;
- Haulage of spoil – Mud-tracking during haulage operations;
- Blasting – Noise & vibration impacts from blasting.

The following actions and mitigation measures will be implemented during spoil management although site specific stripping requirements, as per baseline surveys, will be implemented where necessary in precedence to those outlined below:

- The disposal site for the spoil will be discussed with the local municipality and a mutually agreed location will be identified;
- The permanent disposal site or temporary storage will not be located will within 250 m of a streambed, house, or any other building or site where people assemble;
- Slope stabilization measures such as adequate vertical and horizontal drains, drainage along roadsides, cross drainage and retaining walls will be adopted;
- Height of stockpiles will not exceed 3 m;
- Any excess displaced spoil will be prevented from mixing with topsoil to avoid the negative effects of soil inversion and additional soil storage space will be provided to stockpile the spoil separately;
- On completion of work in any quarry, borrow pit, spoil or stockpile area the overburden and/or topsoil which has not been used in the works will be pushed back, spread and landscaped over the area of the quarry, borrow pit, spoil or stockpile area;



	<b>SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN</b>	
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- Maximize reuse of un-suitable spoil as backfill materials in preference to disposal to landfill;
- All material excavated from the construction must be re-used or recycled where suitable and if cost-effective to do so. Re-use of material generated from construction is to be maximized in preference to any import of fill;
- Unsuitable fill material is to be used for non-structural purposes (including landscaping) on the project;
- Cover all trucks transporting spoil to offsite locations and check tailgates are secured before leaving the site;
- Ensure dust associated with spoil generation, handling and disposal or reuse is managed in accordance with mitigation measures outlined in the Dust Management Plan;
- Ensure noise and vibration associated with spoil generation, handling and disposal or reuse is managed in accordance with mitigation measures outlined in the Noise and Vibration Management Plan;
- Ensure waste associated with spoil generation, handling and disposal or reuse is managed in accordance with mitigation measures outlined in the Waste Management Plan;
- Spoil will not be unnecessarily trafficked either before stripping or when in a stockpile.

**SSEMP for Dzirulia- Moliti Road Sector- from km 0+000 to km 24+620**

**Spoil Management Plan**

<b>Area of Mitigation</b>	<b>Actions / Mitigation Measures</b>	<b>Location</b>	<b>Time Frame</b>	<b>Responsibility</b>
Erosion prevention /Landscape protection in accordance with IFC / EU / WHO standarts and Georgian legislation	The disposal site for the spoil will be discussed with the local municipality and a mutually agreed location will be identified	Not applicable	Construction period	Project Manager / EPM
	The permanent disposal site or temporary storage will not be located will within 250 m of a streambed, house, or any other building or site where people assemble	All locations	Construction period	Site foreman / EPM
	Topsoil will be stripped, loaded, transported and deposited in stockpile areas directed by the Engineer for use in the side slope backfill and other areas	Stockpile areas	Construction period	Site foreman / EPM
	Slope stabilization measures such as adequate vertical and horizontal drains, drainage along roadsides, cross drainage and retaining walls will be adopted	Stockpile areas	Construction period	Site foreman / EPM
	Any excess displaced spoil will be prevented from mixing with topsoil to avoid the negative effects of soil inversion and additional soil storage space will be provided to stockpile the spoil separately	Stockpile areas	Construction period	Site foreman / EPM
	Existing top soil will be stripped to a minimum depth of 50 cm and stored in stockpiles not exceeding 3 m height for use during reinstatement	Road alignment and borrow pits	Construction period	Site foreman / EPM
	Topsoil (50 cm or so) will be kept and refilled after excavation activity is over to minimize the impact on productive agricultural lands or/and pastures	Road alignment and borrow pits	Construction period	Site foreman / EPM
	Stockpiles will not be surcharged and multiple handling will be kept to a minimum	All locations	At all times	Site foreman

**SSEMP for Dzirulia- Moliti Road Sector- from km 0+000 to km 24+620**

Stockpiles will be protected from run-on water by installing water diversion structures upslope	All locations	At all times	Site foreman
Sediment fences will be placed immediately downslope to protect other lands and waterways from pollution	All locations	At all times	Site foreman
Stockpiles will be allocated in at least 100 m distance from any water course	All locations	At all times	Site foreman / EPM
Care will be taken during stripping, stockpiling and/or respreading to ensure that structural degradation of the soil is avoided and that excessive compaction does not occur	Road alignment and borrow pits	At all times	Site foreman / EPM
Excavated top soil will be reused on the new embankment or on the median, and remaining materials will be spread over otherwise disturbed ground	All locations	At all times	Site foreman
Topsoil will not be unnecessarily trafficked either before stripping or when in a stockpile	All locations	At all times	Site foreman
Vegetation clearing will be minimized, where practicable, to reduce the potential for soil erosion and exposure of dispersive soils, particularly when clearing is timed for seasons with higher rainfall	All locations	At all times	Site foreman
Cleared vegetation will be stockpiled separately with a distinct break of at least 1m between the undisturbed vegetation and soil stockpiles, and in a manner that facilitates re-spreading or salvaging and does not impede vehicle, stock or wildlife movements	All locations	Construction period	Site foreman
The number of watercourse and drainage line crossings will be minimized	All locations	Prior to the start of material haulage	Site foreman
Areas of riparian vegetation will be avoided where possible,	Construction site	Prior to the start of material haulage	Head driver/ Site foreman

**SSEMP for Dzirulia- Moliti Road Sector- from km 0+000 to km 24+620**

	and maintain buffer strips between the road and any watercourse			
	All temporary construction tracks and associated disturbed areas will be stabilized /or re-vegetated when construction is completed	All locations	After completion of works	Site foreman
Pollution prevention in accordance with IFC / EU / WHO standarts and Georgian legislation	The discharge of oil and fuel onto open soils is prohibited	All locations	At all times	Head driver
	Cover all trucks transporting spoil to offsite locations and check tailgates are secured before leaving the site	All locations	At all times	Head driver
	In the event of any spoil or debris being deposited on any adjacent land, the material will be immediately removed and the area restored to the satisfaction of the Engineer	All locations	At all times	Site foreman /EPM
	Washing of vehicles and equipment in rivers and/or wetland areas will be prohibited	All locations	At all times	Head driver
	All hazardous liquids such as lubricants, oil drums, paint etc. will be stored in the designated area at the workshops on an impervious base with run-off collection	Workshop	Construction period	Camp Manager & EPM
	Site run-off will be collected in the drainage system and emptied by specialized suction vehicles of LTD “Georgian Water Company”	Construction Camp	As required	Camp Manager / EPM

Appendix N1 -Inert waste disposal site map

Appendix N2 - Letter about Agreement on the Recultivation Project from Environment and Agriculture Ministry;



SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN

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N 8990/01  
12/09/2019

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ზ ა ტ ო ნ ო მ ა ზ ა პ ი რ,

თ ე კ ე ბ ი წ რ ი ლ ის (AG-1482 22.08.2019) პ ა ს უ ხ ა დ, რ ო მ ლ ი თ ა ე წ ა რ მ ი ა დ ე გ ნ ი ლ ი ა ძ ი რ უ ლ ა -  
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დ ა ვ ე თ :

1.ღ ი ა ს ა ე კ ი ო ს ა ზ ო ვ ა დ ე ბ ა „ს ა მ შ ე ნ ე ბ ლ ო -ს ა მ რ ე წ ე ლ ო ს ა ი ნ ვ ე ს ტ ი ე თ კ ო რ პ ო რ ა ც ი ა  
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დ ა მ ა ტ ე ბ ი თ გ ა ე ნ ო მ ბ ე თ, რ ო მ „ს ა ი ა დ ა ვ ის ნ ა ყ ი თ ე თ რ ი ფ ე ნ ის მ ო ხ ს ნ ის, შ ე ნ ა ხ ე ს, გ ა მ ა ე ნ ე ბ ის ა  
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„შეთანხმებულია“

საქართველოს გარემოს დაცვისა და სოფლის მეურნეობის სამინისტროს გარემოსა და კლიმატის ცვლილების დეპარტამენტის უფროსი ნინო თხილავა

*ნ. თხილავა*  
12.09.2019 წ.

„გამტკიცებ“

ღსს სამშენებლო-სამრეწველო საინვესტიციო კორპორაცია აკკორდ-ის წარმომადგენლობა (ფილიალი) საქართველოში აკკორდ ჯორჯია (ს/კ 202458295)

დირექტორი: მასპირ აბდულლაევ  
პ.ნ 4691142  
*მასპირ აბდულლაევ*  
22.09.2019 წ.

ღსს „სამშენებლო-სამრეწველო საინვესტიციო კორპორაცია აკკორდ-ის წარმომადგენლობა (ფილიალი) საქართველოში აკკორდ ჯორჯიას“ მიერ, მირულა-ხარაგაული-მოლითი-ფონა-ჩუმათელეთის საავტომობილო გზის მოლითი-ჩუმათელეთის კმ.24-620 - კმ.50+244 მონაკვეთის სარეაბილიტაციო სამუშაოების ჩატარების შედეგად წარმოქმნილი სამშენებლო ნარჩენების განთავსების ტერიტორიის (სოფ: ჩუმათელეთი) რეკულტივაცია /აღდგენის

პროექტი



შემსრულებელი: *დავით მურადაშვილი* დავით მურადაშვილი

თბილისი 2019



## TOPIC SPECIFIC SPILL PREVENTION MANAGEMENT PLAN

Rehabilitation Project of Dzirula - Kharagauli - Moliti - Pona – Chumateleti  
Secondary Road,

LOT 2: Moliti – Phona-Chumateleti Road Section- from km 24+620 to km 50+244

**EMPLOYER** Georgia Roads Department Ministry of  
Regional Development and Infrastructure



**ENGINEER** Authorized representative of: JV  
Pyunghwa Engineering Consultants  
Ltd/Yooshin Engineering Corporation/  
Roads Rehabilitation and modernization  
Supervision Direction Ltd

**CONTRACTOR** “AKKORD ” ICIC



PREPARED BY: AKKORD ICIC, June 2020

APPROVED BY: Roads Department of Georgia:

2020



## SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN

This Spill Prevention Management Plan (SPMP) has been developed to address the general requirements for management of unplanned spills of dangerous or hazardous materials during the Project life cycle. Several activities associated with the Project (during the construction, operational and decommissioning/closure phases) require specific management to ensure that activities are appropriately controlled to prevent and mitigate unwanted outcomes. These may include spillages related to:

- Hydrocarbons (including diesel, petrol, greases, oils and other lubricants);
- Drilling chemicals;
- Hazardous chemicals (paints, etc.); and
- Waste water, including sewage.

The following SPMP presents a procedural framework for reducing the potential for spills, responding to such events and for monitoring operations to confirm that preventative measures are in place and followed. Furthermore, the procedures within include plans for addressing training, resources, responsibilities, communication and all other aspects required to effectively respond to such events.

### Objectives

The objectives of this SPMP are as follows:

- Protect the communities and the environment through the development of spill response and containment strategies and capabilities;
- Structure a process to identify the sources of potential land contamination associated with construction and operational phases of the project;
- Categorize potential spill hazards;
- Structure a process for rapid and efficient response to and manage hazardous material spills during the construction, operational and decommissioning and closure phases of the project;
- Identify and document management measures to prevent, control and mitigate spill events during all phases of the project and at all operations and facilities associated with the project;
- Assign responsibilities for implementing the management measures; and
- Describe verification, monitoring and reporting measures.

### Purpose & Scope

The construction, operation and decommissioning and closure phases of the project will include activities that has the potential to result in spills to the environment. The SPMP is aimed at defining –

- A proactive hazard identification so as to prevent (or lower the likelihood) of spill events; and
- The response process and responsibilities for managing these situations, thus reducing

### Likelihood and severity of inadequate management

This SPMP is considered to be a —live! document and will need to be amended periodically in light of operational changes, learning experienced during its implementation and other activities that can affect the risk profiles.

### Spill Hazard Identification

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“Akkord” ICIC will maintain a register of spill hazards associated with all activities during all phases (construction, operation and decommissioning/closure) of the project.

All construction workers will undertake spill hazard identification studies to identify spill hazards associated with their operations/activities. The spill hazard identification study will include:

- Approximate storage volumes for all hazardous materials/chemicals;
- Identification of storage and transfer locations for the various hazardous materials/chemicals; and
- The environmental and social risks associated with each hazardous material/chemical. These are to be obtained from each material / chemical’s Material Safety Data Sheet (MSDS), which must be delivered with each hazardous material / chemical assignment.

Moreover, the study will include an up-to-date plan or map of the project site and the locations of all managed chemical products. Part of the process of developing the detailed spill hazard identification will be to assess the risk of spills. Risk will be evaluated based on:

- The likelihood of a spill occurring during handling and transfer methods;
- The presence of secondary containment;
- The state of the hazardous material/chemical product (solid/liquid);
- The preventative measures designed and in-place so as to prevent/contain spill events;

And

- The potential impacts of a spill based on:
- The toxicity of the hazardous material/chemical (obtained from the MSD sheets);
- The potential for a spill to reach surface- and groundwater sources;
- The potential volumes available for spills; and
- The potential of a spill to affect human health.

### **Preliminary List of Hazardous Chemicals**

Preliminary lists of potentially hazardous materials/chemicals that will be used during all phases of the project include:

- Waste water, including sewage;
- Paints (antirust, primer, auto lacquer, synthetic, enamel, metal, spray, floor and wall paints);
- Degreasers;
- Hydraulic, transmission and engine oil (new and used);
- Assorted lubricants;
- Petrol;
- Diesel oil;
- Drilling chemicals and
- Hydrogen peroxide (used for drilling).

MSD sheets associated with each of these hazardous materials / chemicals should be made available with each consignment, and MSDS sheets for all such hazardous materials / chemicals should be clearly displayed in each hazardous materials / chemicals store.

### **Spill Prevention Measures**



## SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN

The following proactive measures will be adopted so as to prevent the likelihood of spill event:

- Training of “Akkord” ICIC” staff and subcontractors regarding proper methods for transporting, transferring and handling substances that have the potential impact to human health or the environment;
- Institution of a preventative maintenance program including inspection schedules to confirm and maintain the mechanical integrity and operability of pressure tanks, piping systems, relief and vent valves systems, containment infrastructure, shutdown systems, controls, pumps and associated process equipment;
- Implementation of Standard Operation Procedures (SOPs) for handling materials including refueling vehicles, the use of diesel as oil blankets, the use of diesel tanks, the use and handling of processing chemicals, and managing secondary containment areas;
- Provision of secondary containment, drip trays or other overflow and drop containment measures, for hazardous materials containers at connection points or other possible overflow points. Identification and provision of all equipment necessary to handle, transfer or transport materials properly;
- Use of transfer equipment that is compatible with and suitable for the characteristics of the materials transferred and designed to ensure safe transfer;
- Use of dripless hose connections for vehicle tank and fixed connections with storage tanks;
- Installation of gauges on tanks to measure volume inside;
- The run off from maintenance workshops will be collected by impervious channels and be passed through oil water separators (OWS) before final disposal. The sludge and oil collected at the OWS will be disposed of properly;
- Separate impervious pits (with concrete walls and proper shed) will be built at camp sites for temporary handling and storage of contaminated soil and water if encountered during construction such as sludge from OWS;
- If the stream is within 250 m and downstream of the project facilities or construction site, temporary dykes will be installed to prevent any potential impact from spill and run-off;
- Spill prevention trays will be provided and used at refueling locations;
- All fuel storage tanks and lubricating oil drums will be kept in secondary containment impervious pits with impervious shed walls ;
- Regular inspections will be carried out to detect leakages in construction vehicles and equipment;
- Spill control kit (shovels, plastic bags and absorbent materials) will be available near fuel and oil storage areas, vehicular parking and vehicular maintenance areas as well asat construction sites;
- The bottom of any soak pit or septic tank will be constructed at least 100 meters away from springs and water bores;
- Silt traps will be used to prevent contamination of river and streams;
- Review of all potential pollutants characteristics prior to introduction to site and establishment of proper storage, handling and transportation procedures and spill risk analysis;



**SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN**

- Material Safety Data Sheets (MSDS) for all contaminants on-site will be readily available. These will include human health effects of chemicals handled and will be included in the required chemical environmental and safety training for all employees handling or otherwise exposed to the contaminants;
- Record of spills and volume of removed contaminated soil will be maintained;
- Record of remedial measures taken will be maintained.

**Spill Control and Countermeasures**

The following spill control and countermeasures will be followed in the event of a spill incident:

- Maintenance of updated emergency contact information list at all spill response kits locations;
- Document availability of all spill response equipment that is capable of handling a large spill;
- Document availability of specific personal protective equipment and the necessary training needed to respond to different potential spills;
- Maintenance of spill response kits on all project fuel and lubrication sites and vehicles;
- Maintenance of spill response guidelines at all spill response kit locations;
- Maintenance of an up-to-date plan of the Project site showing the location of all contaminants, spill response kits and other response equipment;
- Maintenance of an updated table of all contaminants on-site and recommended spill response procedures;
- First-aid training for all relevant construction personnel.

**Transportation of Hazardous Materials and Chemicals**

The transportation of certain substances (diesel) presents the potential for spills due to traffic accidents or other accidents or incidents en-route to or from the project site. Precautions that will be followed include:

“Akkord” ICIC will use transportation vehicles and tanks suitable for the materials and transportation routes used. These vehicles and tanks will be maintained in adequate condition to insure proper handling and safety of chemicals;

- Truck drivers will be required to notify the site of their departure time and arrival time and maintain a log of travel;
- All vehicles will be equipped with spill response kits appropriate to the materials being transported. The Contractor will be required to maintain these in good condition and working order;
- Drivers will be trained in spill and emergency response and will have a means of communicating with the site, their administrative offices and emergency personnel for the entire transportation route;
- Up-to-date emergency contact information and monitoring sheets and manifests documenting the volume phase and characteristics of the chemical being transported will be carried with each shipment.

**Spill Emergency Procedures**

In the event of a hazardous spill onsite, the following emergency procedures must be implemented:

- Personnel in the immediate vicinity of the hazardous spill, including the designated evacuation personnel must be immediately notified;

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**SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN**

- The risk of explosion (if known) must be communicated to the Project Manager and Health and Safety Manager onsite;
- Vehicle ignition or any power supply where the hazardous spill occurred must be immediately switched off;
- If possible, all drains and valves in the vicinity of the hazardous spill must be closed.
- The application and use of hazardous spill kits must be used **ONLY** by those trained to do so;
- The appropriate hazardous spill response and clean-up contractor must be notified and all contaminated material as a result of the spill must be suitably disposed of off-site according to Georgian legislations.

**Training**

Chemical environmental and safety, spill response and first aid training will be delivered to all relevant employees. Training will be provided within one month of an employee's start-date. Chemical environmental and safety and first aid training will be provided by certified instructors. Spill response training will be provided by a competent persons and environmental, health and safety staff as necessary. Key personnel will be identified to receive

Preliminary hazard analysis training. The training will be conducted on a regular basis. The frequency and timing of training is at the discretion of the Project Manager, Health and Safety Manager and Environmental Protection Manager, but is recommended to take place at least once every three months.

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**SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN**

**Spill Prevention Management Plan**

Area of Mitigation	Actions / Mitigation Measures	Location	Time Frame	Responsibility
Pollution prevention in accordance with IFC / EU / WHO standarts and Georgian legislation	No construction camp, workshop, or storage facility will be located within 100 m of streams	All locations	Construction period	Camp manager / Site foreman
	Aggregate excavation will not take place within the river banks	Borrow pits	At all time	Site foreman / EPM
	Pouring of excess concrete from concrete mixer to unappointed areas will be strictly prohibited	All locations	At all time	Site foreman /EPM
	Washing of concrete mixer will be restricted by specially appointed area (at the batching plant sedimentation basin)	Plant Yard	At all time	Plant Yard Manager /EPM
	All hazardous liquids such as lubricants, paint etc. will be stored in the designated area at the workshops (shown in figure 4b) on an impervious base with run-off collection	Plant Yard	At all time	Workshop Manager /EPM
	All domestic waste water will be collected in septic tanks and emptied as required by specialized suction vehicle of LTD “Georgian Water Company”	Construction Camp	As required	Camp Manager / EPM
	Workshop wastewater will be collected in septic tanks and emptied by specialized suction vehicle of LTD “Georgian Water Company”	Workshop	As required	Camp manager
	The storage of waste or production waste of any kind as well as re-fuelling and parking machinery or vehicles is not	All locations	Construction period	Camp manager



**SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN**

	permitted within a distance of 100 m of any stream including drainage or irrigation facilities			and Site foreman
	Oil filling and refuelling will be strictly controlled and is permitted only at the fuel filling station and workshops	Fuel Filling Station & Workshop	At all time	Workshop Manager /EPM
	Spill control kit (shovels, plastic bags and absorbent materials) will be available near fuel and oil storage areas, vehicular parking and vehicular maintenance areas as well as at construction sites	Fuel Filling Station & Workshop	At all time	Workshop Manager /EPM)
	All valves and trigger guns will be resistant to unauthorized interference and vandalism, and will be turned off and securely locked when not in used	All locations	At all time	Site foreman /EPM
	Separate impervious pits (with concrete walls and proper shed) will be built for temporary handling and storage of contaminated soil and water if encountered during construction such as sludge from OW	Plant Yard	Construction period	Workshop Manager / EPM
	Any spilled materials and contaminated earth will be collected and disposed of according to agreement with LTD “Georgian Water Company”	All locations	At all time	Site foreman /EPM
	Construction will be avoided on bridge sites during spawning seasons	All locations	March and April	EPM and Site foreman
	Water quality monitoring will take place at the locations	Monitoring stations	As required	EPM
Staff health and safety	Contractor’s camp will be supplied adequate amount and required quality of drinking water via existing well in camp (water quality meets the national drinking water standards)	Construction Camp	Construction period	Camp manager



**SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN**

	Training of staff and subcontractors regarding proper methods for transporting, transferring and handling substances that have the potential impact to human health or the environment	Construction Camp	Every 3 months	HSE Manager/EMP
	All vehicles will be equipped with spill response kits appropriate to the materials being transported. “Akkord” ICIC will be required to maintain these in good condition and working order	All locations	Construction period	HSE Manager/Site Manager
	The appropriate hazardous spill response and clean-up contractor must be notified and all contaminated material as a result of the spill must be suitably disposed of off-site according to Georgian legislations	All locations	Construction period	HSE Manager/Site Manager

SSEMP for Dzirulia- Moliti Road Sector- from km 0+000 to km 24+620

## TOPIC SPECIFIC BORROW PIT MANAGEMENT PLAN

Rehabilitation Project of Dzirula - Kharagauli - Moliti - Pona –  
Chumateleti Secondary Road,  
LOT 2: Moliti – Phona-Chumateleti Road Section- from km 24+620 to  
km 50+244

**EMPLOYER** Georgia Roads Department Ministry of  
Regional Development and Infrastructure



**ENGINEER** Authorized representative of: JV  
Pyunghwa Engineering Consultants  
Ltd/Yooshin Engineering Corporation/  
Roads Rehabilitation and modernization  
Supervision Direction Ltd

**CONTRACTOR** “AKKORD ” ICIC



PREPARED BY: AKKORD ICIC, May 2020

APPROVED BY: Roads Department of Georgia:

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**SSEMP for Dzirulia- Moliti Road Sector- from km 0+000 to km 24+620**

**Brief summary of legislative base**

The mining of minerals and subsoil extraction conditions are - regulated by the following legislative and normative acts:

- 1) Law of Georgia on Licenses and Permits;
- 2) The Law of Georgia on the "Subsoil"
- 3) The Law of Georgia on Fees for Use of Natural Resources
- 4) Resolution of the Government of Georgia N136 "On Approval of Regulations on the Rules and Conditions of Issuing License of Minerals"
- 5) and others

Subsoil of Georgia is state property. Any action, which overtly or covertly infringes the right of state ownership of subsoil shall be prohibited and such transactions shall be invalid. The right of ownership of land shall not mean and shall not grant the right of ownership of subsoil.

Subsoil blocks that have been or may be made allocated for use, shall represent objects of use of subsoil. The use of subsoil in Georgia shall be subject to the payment of fees. Subsoil shall be allocated for use only on the basis of an appropriate permit (license). Matters related to licensing of the use of subsoil are regulated by the Law of Georgia 'On Licenses and Permits', the Law of Georgia 'On Oil and Gas', by the present Law and relevant subordinate normative acts.

A subsoil user may be individual or legal entity, the surface land mining users exercise all rights listed in license and take on the responsibility to comply its terms and conditions.

The extraction of minerals in accordance with the legislation of Georgia shall be allowed only on the basis of the license. The license is issued by the auction.

The license applicant in order to obtain the license submits to the license issuer documents (application) required by the law.

After submission of the application by the license applicant, the issuer of the license provides the preparation of the Geo-Information Package. The geo-information package includes: drafting the optimal area (mining and land allotment) for use of the earth under the aforementioned territory; Relevant topographical map and information package related to the licensing object (which also contains engineering-geological conclusions, information on quantitative, qualitative and time-specific norms of usage of subsoil).

On the basis of the recommendations and conclusions indicated in the Geo-information package, the issuer of License makes preliminary inquiries on the risks associated to the extraction of minerals and agrees the license issue advisability with the owners of the facilities located near the licensing object and local municipality. In case of positive responses to the practicability of a license, the license issuer puts up a license object to the auction.

Information about auction is published in the media, and in case the auction is held electronically - on the website of the Agency or on the Internet - [www.eauction.ge](http://www.eauction.ge), no later than one month before the auction is held.

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**SSEMP for Dzirulia- Moliti Road Sector- from km 0+000 to km 24+620**

All license applicants who are eligible to participate in the auction will meet the licensing conditions established by law and are obliged to satisfy the requirements of the license issuer and / or the Government of Georgia.

After the announcement of the auction, the license applicant shall submit the documents requested by the law to participate in the auction. The starting price of licensing bid is fixed with license issuer on the basis of law on "Licenses and Permits"

After the award of the auction, the license issuer shall issue a normative act which certifies the fact of issuing the license and determines the licensing conditions.

**Rights of subsoil users**

Subsoil users shall be entitled to:

- Use mineral resources within the boundaries of a mining allotment that has been allocated in accordance with the license;
- Carry out economic operations in a form that is acceptable for him/her/it within the allocated land allotment, for the purposes defined by the license, unless this contravenes the current legislation;
- Use extracted mineral resources and waste from the treatment of such mineral resources, unless it is restricted by the license;
- Carry out subsoil surveys at their own expense and without an additional license, within the boundaries of the mining allotment allocated by the license;
- Address an administrative body issuing a license with a request to change conditions defined by the license, if a substantially different situation has arisen.

**Obligations of subsoil users**

Subsoil users are obligated to:

- Use subsoil only for purposes defined by a license;
- Ensure the rational and complex use of mineral resources, and the protection of the environment and subsoil;
- Strictly adhere to the safety rules for the execution of works;
- Ensure the protection of subsoil, ambient air, waters, lands, forests, protected areas, historical and cultural monuments, and buildings and structures of various designation from harmful effects during the execution of works related to the use of subsoil, in accordance with the established standards;
- Carry out complex subsoil surveys, and ensure the maintenance and storage of relevant geological, mine-surveys and other documentation;
- Submit to the Unified State Fund for Subsoil any documents on explored and extracted reserves, and reserves remaining in subsoil, components contained in mineral resources, as well as on other facilities for the use of subsoil;

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- Ensure the preservation (conservation) of exploratory mining tunnels and boreholes in such condition so as to enable their further use, and eliminate those that are worthless for use in the prescribed manner;
- Suspend works during the use of subsoil in the case rare properties with scientific or aesthetic value are revealed, and immediately inform the relevant public authorities thereof;
- Protect and, where necessary, bring land plots that have been damaged during the use of subsoil, to a safe and usable condition in the manner prescribed by the legislation of Georgia;
- Comply with other requirements established by the legislation of Georgia.

**License terms:**

Besides the licensing conditions established by the relevant legislative acts of Georgia, the applicant is entitled to licensing conditions specified in the Geo Information Pack as well as in the resolution for the issuance of License.

- The holder of license for extraction of minerals is obliged to submit to license issuer relevant plan for the use of the minerals for the approval. (Indicating the volume to be developed annually).
- To extract minerals in accordance with the preliminary developed plan for the extraction minerals
- The license holder must follow the regulations - on observing the license terms related to the usage of entrails of the earth, technological schemes for the processing of mining and the development of mining work plans and statistical observation forms (№1-01, 1- 02, 1-03 and 1-04),
- The license holder shall report the license issuer annually from 1 April to 1 May the license observance terms;
- The license holder shall fulfill the requirements established by the legislation, including the requirements of "Environmental Protection" and "Law on Fees for Use of Natural Resources" and "Law on subsoil" and the relevant subordinated regulations.

**Conditions for Extracting of minerals required for the project**

To explore the natural resources for road construction and obtains permits for its extraction is crucial for project implementation. To follow the terms for protection of environment is significant as well. Obtaining of permits for extracting of minerals (inert materials) required for the project will be done following the active legislation of Georgia. Specifically, the Project EIA Report reviewed the sources of the construction materials required for the project However, the specified quarries are now outdated, expired or exhausted.

Based on the above, the contractor has surveyed places of potential extraction of inert materials and has started passing of necessary procedures required for obtaining permit for extracting minerals from those places.

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Following the award of permits (licenses) on the extraction of minerals, the Contractor shall provide extraction of mineral deposits in accordance with environmental legislation and requirements. In particular,

- Plans for development will be submitted to the license issuer for approval within 1 month after the license is obtained;
- Design documentation of licensed will be prepared and approved by the Contractor;
- Extraction of minerals will follow the regulations - on observing the license terms related to the usage of entrails of the earth, technological schemes for the processing of mining and the development of mining work plans and statistical observation forms - (№1-01, 1- 02, 1-03 and 1-04), therefore
- The Contractor will report the license issuer annually from 1 April to 1 May the license observance terms;
- The Contractor will fulfill the requirements established by the legislation, including the requirements of "Environmental Protection" and "Law on Fees for Use of Natural Resources" and "Law on subsoil" and the relevant subordinated regulations.
- The Contractor will implement mitigation measures that will minimize impact on natural and social environment due to extracting of minerals;
- If required, following the completion of mining, the Contractor will arrange quarries (river bed) reclaim (mine quarry).
- Before the processing of the quarry will be prepared the processing projects of quarry, where the following issues will be considered: reinstatement of the pit, side cuts and walls; soil stability and other safety hazards issues.
- Careers will be processed in accordance with the norms specified in the project;
- Career Processing Project is presented to the Engineer
- Prepare their recultivation plans before restoration of quarries and boilers;
- The recultivation plans will agree by the Ministry of Environment Protection and Agriculture;

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**Borrow Pits Management Plan**

<b>Area of Mitigation</b>	<b>Actions / Mitigation Measures</b>	<b>Location</b>	<b>Time Frame</b>	<b>Responsibility</b>
Pollution prevention in accordance with IFC / EU / WHO standarts and Georgian legislation	All trucks leaving borrow pits will have properly fitting side and tail boards and be covered with tarpaulins extending at least 300 mm over the edges of the side and tail boards	All borrow pits	At all times	Drivers / EPM
	All roads impacted by construction activities will be watered by sprinkler	Construction areas & access roads	Dry periods only (3 times a day)	Site foreman
	Every vehicle will be inspected and maintained on a regular basis	Workshop	Once a week	Head mechanic
	Stockpiles of materials will be covered with tarpaulins or sprayed with water	All locations	Dry and windy periods only (once per day)	Site foreman
	Stockpiles of materials or debris will be dampened prior to their movement	Stockpiles	Dry and windy periods only (once per day)	Site foreman / EPM
	Materials having the potential to produce dust will not be loaded to a level higher than the side and tail boards	Stockpiles	At all time	Drivers / EPM
	Air quality monitoring will take place at the locations shown in figure 9, 10, 11 & 12	Monitoring stations	As required	EPM
Public safety & prevention of	Dust generating operations will not be permitted within 200 m of residential areas	All locations	At all times	EPM

**SSEMP for Dzirulia- Moliti Road Sector- from km 0+000 to km 24+620**

disturbance	Training of staff and subcontractors regarding proper methods for transporting, transferring and handling substances that have the potential impact to human health or the environment	Construction Camp	Every 3 months	EPM
	All vehicles will be equipped with spill response kits appropriate to the materials being transported. Contractor will be required to maintain these in good condition and working order	All locations	Construction period	Site foreman / EPM
Fauna and Flora	Training of personnel on issues for protection of surface water objects;		Every 3 months	EPM
	To meet the environmental and safety requirements specified for the vehicles used in construction, will be carried out control to restrain in maximum the risks of spill of fuel and oil;		Construction period	EPM
	The planned earthworks will be performed under strict control to avoid the change/degradation of hydrological parameters while excavation of earth up to the level of groundwater.	All locations	Construction period	EPM
	will be prohibited disposal of wastes in the vicinity of surface water courses (100m) and filling of vehicles with fuel and oils;	All locations	Construction period	EPM
	Will be categorically forbidden to throw any kind of material into the water;	All locations	Construction period	EPM
	While extracting the minerals from the quarry, water removal will avoid impact and damage of water organisms	All Carier	Construction period	Site foreman / EPM

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	Prohibition of washing of cars in the surface water sources;	All locations	Construction period	EPM
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SSEMP of Moliti – Phona-Chumateleti Road Section

## TOPIC SPECIFIC FLORA AND FAUNA MANAGEMENT PLAN

Rehabilitation Project of Dzirula - Kharagauli - Moliti - Pona - Chumateleti  
Secondary Road, LOT 2: Moliti – Phona-Chumateleti Road Section- from km  
24+620 to km 50+244

EMPLOYER

Georgia Roads Department Ministry of  
Regional Development and Infrastructure



ENGINEER

Authorized representative of: JV Pyunghwa  
Engineering Consultants Ltd/Yooshin Engineering  
Corporation/ Roads Rehabilitation and modernization  
Supervision Direction Ltd

CONTRACTOR

“AKKORD ” ICIC

PREPARED BY: AKKORD ICIC, June 2020

APPROVED BY: Roads Department of Georgia:

2020

## **SSEMP of Moliti – Phona-Chumateleti Road Section**

### **Potential Impacts**

The project road alignment is mainly consists of mountainous valleys with large trees and bushes of heights greater than 2 m. The construction phase impact will be local and temporary. The main effects of site clearance/preparation and movement of equipment include loss of habitat. The ecological receptors most affected include those that have limited mobility such as terrestrial flora, reptiles and amphibians. Loss of habitat can also affect more mobile species which lose breeding, nesting and feeding sites. The spread of invasive plant species is facilitated by disturbances such as site clearance and this result in a risk to the native, endemic and relict flora.

The removal of vegetation, including up-rooting of shrubs and cutting of trees, will result in loss of plants, contributing to a decline in their numbers, as well as loss of habitat for species of mammals, birds, insects and herpetofauna that they provide. Fauna with limited mobility, such as reptiles, are at a greater risk of direct mortality due to Project related activities such as movement of equipment. Site clearance may also result in loss of some pools and small, stagnant water bodies which are important habitat for invertebrate species such as the Fen Raft Spider. However, extensive loss of aquatic habitat due to site clearance and preparation is not a risk.

Site clearance/preparation and movement of equipment results in the removal of top soil which can negative influence several soil functions which are relevant in nature and environmental protection, e.g. carbon storage, and a decrease in biological activity. The Project is not expected to alter aquatic habitat, therefore, there is lower risk from site clearance/preparation and movement of equipment impacting aquatic ecology. Site clearance/preparation will also result in habitat fragmentation. This will cause a disturbance in the connectivity of habitat. Individuals belonging to species with limited ranges will be most affected, especially species with limited mobility who will be unable to re-locate.

### **Flora**

Georgia, which is rich in biodiversity is located in the South Caucasus, which enters in the world's 25 most biodiversity regions. Flora and Fauna of Georgia are distinguished by the abundance of endemic, subendemic and relict species. With Actual Biodiversity Index and Average Biodiversity Index, Georgia holds the first place in Europe and 36th in the world.

The part of the project is located in the "Humid subtropical zone of the Kolkheti lowland" partially crossing the "Humid mountainous forest of Western Georgia", what contributes to the diversity of the biological environment of the region.

A great variety of plant and plant societies spread in Georgia in the given region are caused by the three biogeographical zones in the BKHNP area to the south of the road under construction and the adjacent surroundings. These regions are the Colchic and Eastern Caucasus, the Asia Minor (Anatolian) and the Asia Anterior (Iranian) zones. Colchic relict and endemic species are grown in this area (*Rhododendron ponticum*, *Laurocerasus officinalis*, *Staphylea colchica*), also the rare species of flora is characteristic for southern Georgia (*Celtis caucasica*, *Papaver pseudoorientalis*).

Flora of the region is represented by more than 2000 flowering plants. BKHNP is known throughout the Caucasus with the largest groves of Fir-tree (*Picea orientalis*) and Pine tree (*Pinus kochiana*). The main types of trees in the forest ecosystem are hornbeam-oak wood (*Quercus iberica*), bot beech (*Fagus orientalis*), bot pine (*Pinus kochiana*), Sochi (*Picea orientalis*) and the Caucasian bot fir-tree (*Abies nordmanniana*). Some of these species were noticed along the road route.

### **SSEMP of Moliti – Phona-Chumateleti Road Section**

The species included in the Red List of Georgia still exist in BKHNP: *Ostrya carpinifolia*, *Cactis caucasica*, *Pyrus georgica*, *P. salicifolia*, *Staphylea pinnata*, *S. colchica* and Caucasian oak (*Quercus macranthera*).

Nearby the project road, on the northern side of the forest areas, mainly in the upper part of the mountainous, there are spreaded mostly Georgian Oak (*Quercus iberica*), Bot hornbeam(*Carpinus caucasica*) and Bot beech(*Fagus orientalis*). The deforested area is noticed near the road and the bushes of different varieties are found in the formed line, such as the *Paliurus spina christi*, the *Spiraea hypericifolia*, the *Carpinus orientalis*.

In 2017, there were observed the several places along the road and the orchid species were noticed and described as well. Namely the *Orchis simia*, *Orchis purpurea* subsp. *Caucasica*.

Nonetheless the “Red List” of Georgia includes only forest plants and herbaceous plants are not included(the species found along the road), almost all species spread in Georgia are considered as species under danger due to increased anthropogenic impact. Among the main factors that threaten the orchid species are the road and pipeline constructions along with pasture trampling, pollution, land degradation, climate change and other factors.

Based on the above mentioned, the best experience will be used. The location of the orchid detection will be fixed and they will be replanted in the safe place in the spring of 2019.

### **Fauna**

During the investigation, there were found wild animals in the surrounding forest areas of the road and they are not distinguished by great diversity. Among the mammals are mostly found Foxes (*Vulpes vulpes*), Jackal(*Canis aureus*), Zoo badger (*Meles meles*), Weasel(*Mustela nivalis*), Forest cat (*Felis silvestris*), Squirrels (*Sciurus anomalus*), Rabbits (*Lepus europaeus*) and some small mammals(*Apodemus fulvipectus*), a small Field mouse(*Apodemus uralensis*), Zoo vole(*Terricola major*), Water vole(*Arvicola terrestris*), Caucasian zoo mole(*Talpa caucasica*); Bat family(zoo chiroptera): *Pipistrellus pipistrellus*, Transcaucasian *Myotis brandti*, *Myotis mystacinus*, *Myotis nattereri*.

According to information from other sources, In Autumn, in the forests near the project implementation area there were found the species of birds such as: Rook(*Corvus frugilegus*), Gray crow(*Corvus corone*), Azure tit(*Parus sp.*), Black bunting(*Emberiza melanocephala*), Field sparrow( *Passer montanus*), Wild pigeons (*Columba livia*), Chaffinch (*Fringilla coelebs*), Field lark(*Alauda arvensis*), Magpie(*Pica pica*), Blackbird(*Turtus merula*), Wren (*Troglodytes troglodytes*).

From the Reptiles we should mention: glass snake (*Pseudopus apodus*), Wester constrictor(*Eryx jaculus*), Grass snake(*Natrix natrix*), Coluber shmidt(*Coluber najadum*), Slow-worm (*Anguis fragilis*), Caucasian lizard(*Laudakia caucasica*), Green toad(*Bufo viridis*), Marsh frog(*Rana ridibunda*), small Azian brown frog(*Rana macrocnemis*), Green tree frog(*Hyla arborea*).

The invertebrates characteresed the area are: Nematoda, Arachnida, Oligochaeta, Blattodea, Lepidoptera, Orthoptera, Beetles (Coleoptera), Bees, Wasps and Ants, Hymenoptera, Diptera, Mosquitos, Praying mantis (Mantodea).

The invertebrates characteresed the area are: Nematoda, Arachnida, Oligoqetebi (Oligochaeta), Blattodea, Lepidoptera, Orthoptera, Coleoptera, Coleoptera, Bees, Ants, (Hymenoptera), orfrTianebi (Diptera), mosquito, chocolates (Mantodea).

In the Borjomi-Kharagauli National Park there are 55 species of mammals, 95 species of birds, 17 species of reptile and 9 species of amphibian. In the territory of the BKHNP are found many species listed in the “Red List” of Georgia: bobcat, noble deer, eagle, grouse, some species of bats, Eurasian otter, Caucasian viper and Transcaucasian long-nosed viper. Caucasian Salamander and the Caucasian Crusade (*Pelobates or Anisoplia farraria* Erichson

### **SSEMP of Moliti – Phona-Chumateleti Road Section**

The above mentioned species have not been identified in the area of the project implementation. However, as the BKHNP is located near the Project Implementation area (in some parts the min distance is 1.3 km), it is not excluded a meeting of these species during construction works. Therefore the mitigation measures should be conducted for negative impacts on biodiversity and living organisms.

#### **Species influenced by impact living in water and nearby, within the project area**

The implementation of the project does not affect any protected area. No impact is expected on the migration route of the endangered or protected species, as the road already exists on above mentioned territory and only its rehabilitation is stipulated. Accordingly, no additional physical impediment will be created. In addition, the route goes along the river, which itself represents a natural barrier to terrestrial animals. Besides the project (rehabilitation) road follows the River Chkhirimela from the left side and to the right side of the river goes the railway line linking East-west Georgia.

As mentioned in previous construction studies of the project area and its proximity in the Borjomi-Kharagauli National Park, the living species have not been identified, however, there will be used the best practice methods during the implementation of the project to reduce the impact on living organisms and we will be discussed all the possible impacts and their mitigation measures.

#### **Avoidance of environmental impacts caused by pollution incidents.**

Water pollution prevention measures:

- Use of relevant infrastructure during the implementation of the project, which ensures the water runoff collection and clearing before discharging in water facilities/bodies;
- Supervision of the environmental and technical safety requirements for transport vehicles used within the project to eliminate fuel and oil spill risks from vehicles (Equipping technical equipment with drop-collecting devices)
- Removal of fertile and bottom layer of the soil (in case of existence) and arrangement of drainage layer on the territory of the manufacturing camp at the initial stage of construction works to prevent contamination of surface water bodies with drainage wastewater. Thus the probability of contamination by drainage water will be reduced to a minimum
- It is categorically prohibited to throw any kind of material into the water;
- Proper management of waste (in terms of preventing access of waste into water by disposal the waste far away from water bodies and timely removal from the site);
- Prohibition of washing machines in the surface water bodies;
- Prohibition of vehicle maintenance and fuel/oil service on sites outside the territory;
- Wastewater quality control implementation;

#### **Prevention measures of atmospheric pollution (noise, vibration, exhaust)**

- Increase awareness of project employees regarding reduction of emissions in atmospheric air; Teaching, providing information;
- Control the techniques and transport means used in construction works to satisfy environmental and technical safety requirements;
- An active reduction of dust levels by means of traffic speed reduction and watering the roads;
- To cover the vehicles with the special cover during transportation of the easily dusting cargo;
- Use of high-quality fuel and modern equipment-installations;
- Control the noise and vibration levels;

#### **Prevention measures of environmental pollution by chemicals and Pesticides:**

### **SSEMP of Moliti – Phona-Chumateleti Road Section**

- Wastewater control to avoid discharging of oil-products and other chemical substances into a water;
- Proper management of waste (in terms of preventing access of waste into water by disposal the waste far away from water bodies and timely removal from the site).

#### **Reducing the impact to a minimum on Nesting birds**

- Within the bounds of possibility, removal of vegetation and dismantling of existing structures, when the birds do not have the multiplication season (from March to September) or the existence of nests in the area will be checked before beginning of works;

#### **Reduction of food extraction area:**

- Creating an alternative area of food extraction, by planting new trees instead of cutted ones
- Keeping large size trees as much as possible;

#### **Impact prevention measures for bats:**

- Trees should be cut during the interval from November to February. However, if the bats are found in the cutted trees, there should be taken immediate measures of their relocation to a safe place;
- In case of cutting trees in other seasons, works will be carried out by the permanent supervision of the environmental specialist and in case of necessity the relevant specialists will be involved as well;

#### **Impact mitigation measures on Otters**

- The Environmental Specialist will examine the existence of potential nests or animal resting-places in the area of the planned works within the 30-meter perimeter from the river and will check the other signs of otter existence as well, such as fecals, food waste, etc.
- Work on 30 meters perimeter from the river should be done during the day light, as the otters are less active during the day.
- All methods of manufacturing works

#### **Impact reduction measures for other living organisms:**

The working brigades will be trained to study the rules of acting with alive organisms in case of meeting with them. They will get a warning, that it is impermisabe to kill, frighten or pursuit etc. the representatives of fauna. The workers will be informed how to give the opportunity to alive organisms for safely leaving the area of works and in extreme cases their concern should be reflected in providing the safe corridor for them within the construction territory.

#### **Flora**

Near the project road on the north side, in the forested areas are situated mainly at the upper regions of the mountainous areas where the vegetation were mainly Oak (*Quercus iberica*), Hornbeam (*Carpinus caucasica*), Beech (*Fagus orientalis*). Near the road, trees were already cleared in the past and the vegetation in the strip were mainly replaced by shrubs such as *Paliurus spina christi*, *Spiraea hypericifolia*, *Carpinus orientalis*.

During the implementation of the project, it is necessary to clean the construction site from the trees . It is important to assess the risks before removing them from the environment and to take adequate remedial actions that minimize the negative impacts. The project will have an impact on agricultural plots, within the alleyway section of the bypass section and along the existing tree plantation.

In the summer of 2019, were studied and described trees on the construction site, on which the impact is expected. The study revealed that the area covered by timber resources is 69394 sq. m. Along the section of road under construction, there are adult deciduous trees, including hornbeam, lime, poplar, maple, and more. 2208 trees will be cut down for the project. Species composition and number of cuttings by species are given in Table 1;

### SSEMP of Moliti – Phona-Chumateleti Road Section

During the site survey on May 2017 the study team recorded several localities along the road with orchid species, namely *Orchis simia* and *Orchis purpurea* subsp. *Caucasica*. To date, the Red List of Georgia only covers woody plants and the draft Red List for herbaceous species does not include these species. Both species are included in the II Appendix of CITES, but that Convention regulates international trade only. There is thus no legal requirement to protect these species; practically, however, almost all native species distributed in Georgia are considered as threatened due to increasing anthropogenic impacts. Among the major factors leading to habitat destruction and endangering orchid species are overgrazing, pollution, road and pipeline constructions, deforestation, land degradation, urbanization, climate change, etc. On larger infrastructure projects in Georgia (such as the BP gas pipeline for example) orchids are considered as plants of high conservation value and therefore transplanted prior to the start of construction. Same is proposed for the present case. To facilitate the implementation of such protective measures the study team recorded the coordinates of all localities where these plants were spotted by GPS and made an estimate of their numbers at each site. In the present section 2 (east) of the project route 29 localities with orchids were identified (see following table) and probably even more specimens may be found at the site in another year.

**Table N1**

N	Territorial authority of Forest Fund Management	Forest district	Forestry	Block number	Plot N	Area, m <sup>2</sup>	Quantity wood resource, subject of inventory, with 8 cm and larger inventory diameter, pcs	Amount of wood resource, m <sup>3</sup>	Note:
1	Imereti Office of the National Forestry Agency	Kharagauli forest district	Tsipa forestry	Block N18; Block N26;	Plot N38 Plot N38	1026	Hornbeam-18 ; Oak -10; Alder -15; Chinese ash -4; Fig - 2; Plum -3; Willow - 3 ; Acacia- 8; Cherry plum -4; Wild apple - 2; Medlar -2; Elm -; Hawthorn -2; Pine-1; Crab-apple-2;	4,078; 6,368; 3,836; 0,38; 0,044; 0,128; 0,091; 0,801; 0,46; 0,368; 0,058; 0,02; 0,058; 0,31; 0,568	
<b>In total:</b>						<b>1026</b>	<b>74</b>	<b>17,228</b>	

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2	Imereti Office of the National Forestry Agency	Kharagauli forest district	Tsipa forestry	Block N20; Block N21;	Plot N34; Plot N29	1968	Hornbeam-18; Oak- 2; Maple- 2; Alder-10; Chinese ash-1; Fig-2; Plum-3; Acacia-6; Cherry plum-4; Wild apple-2; Mulberry-1; Crab-apple-4; Beech-;	2,031; 0,708; 1,298; 1,847; 0,107; 0,116; 0,212; 0,359; 0,919; 1,048; 0,022; 0,912; 1,39	
<b>In total:</b>						<b>1968</b>	<b>56</b>	<b>10,969</b>	
3	Imereti Office of the National Forestry Agency	Kharagauli forest district	Tsipa forestry	Block N26;	Plot N35; 39; 42; 43	3635	Hornbeam-35; Oak-4; Alder-19; Hazelnut-12; Persimmon-2; Mulberry -1; Maple-5; Crab-apple-5; Beech-3; Pine-33; Aspen-4; Elm-1; Hawthorn -1; Ash-3; Apple-10; Acacia-24; Cherry plum-9; Sweet cherry-1; Chinese ash-7; Plum-4; Willow-2; Quince-1;	3,716; 0,876; 2,01; 0,373; 0,121; 0,022; 0,802; 0,198; 0,384; 12,318; 1,779; 0,02 0,022; 0,174; 1,254; 1,64; 1,477; 0,035; 0,23; 0,293; 0,205; 0,45	
<b>In total:</b>						<b>3635</b>	<b>186</b>	<b>28,194</b>	

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4	Imereti Office of the National Forestry Agency	Kharagauli forest district	Moliti forestry	Block N40;	Plot N18,19,20,21	3841	Hornbeam-32; Oak-6; Maple-7; Alder-23; Linden-1; Elm-2; Hawthorn -1; Pine-1; Crab-apple-2; Beech-1; Persimmon-4; Mulberry-2; Hazelnut-4; Quince-1; Chinese ash-3; Fig-2; Plum-2; Willow-1; Acacia-6; Cherry plum-4;	6,527; 2,92; 2,336; 5,713; 0,063; 0,083; 0,022; 0,123; 0,316; 1,39; 0,742; 0,982; 0,098; 0,058; 0,22; 0,08; 0,068; 2,11; 1,317; 0,549	
<b>In total:</b>						<b>3841</b>	<b>108</b>	<b>26,699</b>	
5	Imereti Office of the National Forestry Agency	Kharagauli forest district	Moliti forestry	Block N46;	Plot N69.77,78,79;	2993	Hornbeam-26; Oak-6; Maple -6; Alder-23; Linden-3; Elm-1; Ash-1; Crab-apple-1; Persimmon-2; Hazelnut-3, Chinese ash-1; Fig-2; Plum-1; Willow-1; Acacia-9; Cherry plum-3;	4,304; 3,14; 3,11; 10,096; 1,23; 0,063; 0,021; 0,14; 0,052; 0,077; 0,107; 0,058; 0,15; 3,94 5,174; 0,412	
<b>In total:</b>						<b>2993</b>	<b>88</b>	<b>32,074</b>	

**SSEMP of Moliti – Phona-Chumateleti Road Section**

6	Imereti Office of the National Forestry Agency	Kharagauli forest district	Zvare forestry	Block N2;	Plot N7; 17;	1847	Hornbeam-35; Oak-5; Alder-22; Hazelnut-11; Persimmon-4; Mulberry-2; Maple-5; Crab-apple-2; Beech-2; Elm-4; Hawthorn -1; Ash-2; Acacia-20; Cherry plum-9; Chinese ash-4; Linden-2; Willow-1; Dogwood-1;	2,326; 0,722; 1,816; 0,543; 0,344; 0,332; 0,602; 0,176; 0,348; 0,623; 0,058; 0,076; 1,375; 1,295; 0,217; 0,183; 0,021; 0,052	
<b>In total:</b>						<b>1847</b>	<b>132</b>	<b>11,109</b>	
7	Shida Kartli Office of the National Forestry Agency	Khashuri forest district	Surami forestry	Block N12-ის მიმდებარე	Former kolkhoz forest	1335	Hornbeam-26; Oak-3; Alder-15; Hazelnut-8; Persimmon-1; Mulberry-1; Maple-4; Crab-apple-4; Beech-3; Pine-25; Aspen-3; Elm-1; Hawthorn -1; Ash-8; Apple-5; Acacia-20; Cherry plum-8; Sweet cherry-1; Chinese ash-4; Plum-3;	2,768; 0,878; 1,14; 0,244; 0,101; 0,118; 1,136; 0,744; 0,678; 10,754; 0,617; 0,02; 0,058; 0,3165; 0,479; 2,19; 1,421; 0,02; 0,26; 0,156; 0,422; 0,058	

**SSEMP of Moliti – Phona-Chumateleti Road Section**

							Willow-2; Quince-1;		
<b>In total:</b>						<b>1335</b>	<b>142</b>	<b>24,578</b>	
8	Shida Kartli Office of the National Forestry Agency	Khashuri forest district	Surami forestry	Block N12	Plot N14,17,19 .21	721	Hornbeam- 16; Oak-3; Maple-2; Alder-8; Chinese ash- 1; Fig-1; Plum-3; Acacia-6; Cherry plum- 4; Medlar-1; Mulberry-1; Crab-apple-5;	2,606; 2,08; 1,27 1,412; 0,107; 0,058; 0,252; 0,52; 0,294; 0,14 0,45; 1,222	
<b>In total:</b>						<b>721</b>	<b>51</b>	<b>10,153</b>	
9	Shida Kartli Office of the National Forestry Agency	Khashuri forest district	Surami forestry	Block N13	Plot N1;	661	Hornbeam- 39; Oak-6; Maple-13; Alder-8; Linden-1; Chinese ash- 2; Fig-1; Plum-4; Cherry plum- 3; Mulberry-1; Acacia-7; ბალახის- 1; Aspen-1; Elm-1; Ash-2; Pine-2; Crab-apple-2; Beech-2;	5,565; 9,636; 3,822; 2,836; 2,28; 0,214; 0,022; 0,336; 0,556; 0,96; 0,627; 0,23; 0,15; 1,13; 0,122; 1,2; 0,708; 1,77	
<b>In total:</b>						<b>661</b>	<b>86</b>	<b>32,164</b>	

**SSEMP of Moliti – Phona-Chumateleti Road Section**

10	Imereti Office of the National Forestry Agency	Kharagauli forest district	Tsipi forestry	Block N18	Plot N42,45,47, 49, 50, 51, 52;	3972	Hornbeam-38; Oak-5; Maple-13; Alder-8; Linden-1; Chinese ash-1; Fig-2; Plum-2; Willow-2; Acacia-8; ჭყბლო-4; Mulberry-1; Hazelnut-7; Aspen-3; Elm-2; Hawthorn -1; Ash-2; Pine-2; Crab-apple-4; Beech-6;	7,211; 3,166; 3,336' 1,392; 0,92; 0,17 0,116; 0,36; 0,54; 1,13; 0,533; 1,67; 0,624; 4,05; 0,183; 0,118; 1,01; 0,323; 1,356; 0,21	
<b>In total:</b>						<b>3972</b>	<b>107</b>	<b>24,368</b>	
11	Imereti Office of the National Forestry Agency	Kharagauli forest district	Tsipi forestry	Block N19	Plot N25,29,32,33, 33, 35; 36	3763	Hornbeam-40; Oak-12; Maple-13; Alder-11; Linden-1; Chinese ash-1; Willow-1; Acacia-9; Cherry plum-7; Hazelnut-8; Aspen-2; Hawthorn -1; Pine-2; Crab-apple-3; Beech-4;	6,445; 7,286; 3,62; 1,355; 1,13; 0,06; 0,101; 1,207; 0,876; 0,73; 1,49; 0,45; 0,62; 0,686; 0,414	
<b>In total:</b>						<b>3763</b>	<b>115</b>	<b>26,47</b>	
12	Imereti Office of the National	Kharagauli forest district	Tsipi forestry	Block N20	Plot N1, 16, 23, 28, 31, 39;	5121	Hornbeam-64; Oak-13;	14,907; 8,482; 10,91;	

**SSEMP of Moliti – Phona-Chumateleti Road Section**

	Forestry Agency						Maple-15; 4,491; Alder-31; 2,09; Linden-2; 0,567; Chinese ash-3; 0,066; 3; 0,504; Fig-3; 0,232; Plum-2; 0,63; Dogwood-3; 4,112; Willow-2; 2,98; Acacia-22; 0,422; Cherry plum-10; 1,18; 0,562; Persimmon-2; 8,333; Mulberry-1; 0,31; Hazelnut-8; 1,41; Aspen-3; 1,534; Elm-1; 2,65; Hawthorn -2; 4,944; Ash-4; 5,72; Pine-4; Crab-apple-8; Beech-5;	
<b>In total:</b>						<b>5121</b>	<b>208</b>	<b>76,79</b>
13	Imereti Office of the National Forestry Agency	Kharagauli forest district	Tsipi forestry	Block N21	Plot N25,26,30, 33,34,35, 46,47,48,49,52,	14087	Hornbeam-67; 7,222; 3,076; Oak-13; 3,558; Alder-29; 0,533; Hazelnut-16; 0,261; Persimmon-4; 0,058; Mulberry-1; 1,91; Maple-17; 0,98; Crab-apple-8; 0,854; Beech-6; 23,152; Pine-58; 8,366; Aspen-9; 0,183; Elm-2; 0,428; Hawthorn -2; 0,505; Ash-8; 1,916; Apple-15; 4,584; Acacia-46; 2,259; Cherry plum-19; 0,8; 0,805; Sweet cherry-2; 0,633; 0,653; Chinese ash-12; 1,018; 0,31	

**SSEMP of Moliti – Phona-Chumateleti Road Section**

							Plum-6; Willow-3; Quince-3; Pear-1;		
<b>In total:</b>						<b>14087</b>	<b>341</b>	<b>64,064</b>	
<b>14</b>	Imereti Office of the National Forestry Agency	Kharagauli forest district	Tsipi forestry	Block N27	Plot N7,12,13, 14;	4508	Hornbeam-42; Oak-10; Maple-7; Alder-8; Linden-1; Chinese ash-1; Fig-2; Plum-2; Cherry plum-8; Acacia-10; Willow-1; Persimmon-3; Hazelnut-7; Aspen-4; Elm-1; Hawthorn -1; Ash-2; Pine-4; Crab-apple-3; Beech-6;	8,991; 9,632; 1,052; 2,852; 0,92; 0,06; 0,568; 0,38; 2,49; 0,987; 0,087; 0,073; 0,265; 6,141; 0,31; 0,118; 0,87 1,245; 1,388; 0,29	
<b>In total</b>						<b>4508</b>	<b>121</b>	<b>38,716</b>	
<b>15</b>	Imereti Office of the National Forestry Agency	Kharagauli forest district	Moliti forestry	Block N48	Plot N51,52, 53, 54, 56, 58, 59, 60, 62, 66	6334	Hornbeam-58; Oak-7; Maple-8; Alder-35; Linden-1; Elm-1; Chinese ash-2; Ash-2; Pine- 3; Crab-apple-5; Beech-1; Persimmon-4; Mulberry-1; Hazelnut-3;	8,597; 3,074; 2,138; 13,416; 0,12; 2,64; 0,065; 0,153; 1,02; 0,686; 1,11 0,531; 0,45; 0,077; 0,017; 0,068;	

**SSEMP of Moliti – Phona-ChumateletiRoad Section**

							Medlar-2; Caper-4; Cherry-2; Fig-2; Plum-3; Dogwood-1; Willow-1; Acacia-13; Cherry plum-4; Sweet cherry-3;	0,08; 0,08; 0,514; 0,048; 0,84; 5,297; 0,38; 0,806;	
<b>In total:</b>						<b>6334</b>	<b>166</b>	<b>42,236</b>	
16	Imereti Office of the National Forestry Agency	Kharagauli forest district	Moliti forestry	Block N49	Plot N31, 32, 34, 35, 36, 27, 38;	7248	Hornbeam-80; Oak-6; Maple-10; Alder-47; Linden-2; Elm-1; Hawthorn -2; Ash-3; Crab-apple-12; Beech-4; Persimmon-6; Hazelnut-8; Pear-1; Quince-3; Chinese ash-3; Fig-4; Plum-2; Dogwood-1; Willow-1; Acacia-18; Cherry plum-10; Apple-3;	9,536; 2,022; 2,522; 13,513; 0,89; 3,37; 0,76; 0,641; 2,992; 1,008; 0,972; 0,224; 0,31; 1,018; 0,167; 0,604; 0,08; 0,032; 2,43; 12, 301; 1,919; 0,187	
<b>In total:</b>						<b>7248</b>	<b>227</b>	<b>55.068</b>	
<b>Total exclude area</b>	69394 m <sup>2</sup>								
<b>Total number of trees,</b>	2208 pieces								

**SSEMP of Moliti – Phona-Chumateleti Road Section**

removable from the environment	
Total amount of wood resource, removable from the	520,88 m <sup>3</sup>

SSEMP of Moliti – Phona-Chumateleti Road Section

Table N 2: Localities with Orchids as Recorded in Project Road Section 2 (east)

Site No.	Eastings	Northings	Numbers at site	LHS	RHS
1	377288	4653955	> 10	x	
2	377287	4654008	2		x
3	377203	4654055	> 10	x	
4	377204	4654054	> 10	x	
5	376601	4653920	2		x
6	377159	4654302	> 10		x
7	376532	4654130	> 10		x
8	376397	4654084	> 10		x
9	376209	4654046	> 10		x
10	376225	4654012	4	x	
11	376234	4653968	> 10		x
12	375882	4653872	4		x
13	375854	4653864	3	x	
14	375705	4653732	> 10		x
15	375660	4653813	> 10		x
16	375661	4653814	> 10	x	
17	375414	4653733	> 10	x	
18	375357	4653571	1	x	
19	374115	4653028	1	x	
20	373615	4653191	2		x
21	373479	4653219	1	x	
22	372733	4652999	1	x	
23	377288	4653955	> 10	x	
24	377287	4654008	2		x
25	377203	4654055	> 10	x	
26	377204	4654054	> 10	x	
27	376601	4653920	2		x

### SSEMP of Moluti – Phona-Chumateleti Road Section

On 5 February of 2020 approvals are obtained from the National Agency and Forestry Agency on removal of trees existing on the construction site (Attachment N1). Cut trees shall be removed from the construction site and stored in such place, where they do not impede the construction works, and the risk of their loss or destruction would be avoided. Further management of these cut trees will be conducted in accordance with the recommendations, indicated in the permits.

#### **Mitigation Measures:**

All works will be carried out in a manner such that damage or disruption to vegetation is minimized;

- Trees and bushes will be demarcated and cordoned off;
- Cutting down will not be take place without the prior approval of the relevant Local Authorities;
- No ancient trees will cut down or impacted by the construction or operation;
- Trees and shrubs will only be felled or removed if they impinge directly on the permanent works or necessary temporary works;
- Trees and bushes outside the construction width but within the road reserve will be generally preserved from damages;
- Trees immediately adjacent to the required construction corridor will be lopped;
- Habitat destruction will be minimized during construction;
- Construction will be minimized on bridge sites during spawning seasons;
- No excavated soil is to be dumped in the ecologically important areas, all soil will be removed off site;
- Dust pollution will be minimized to reduce the disturbance to animals as far as possible;
- Temporary land take will be minimized in ecologically important areas through minimizing operational area during construction to as narrow as practical ROW;
- Replacement of top soil to restore conditions for biological activity;
- Providing wildlife crossings so that impacts of habitat fragmentation are minimized;
- Hunting and poaching will be prevented to protect species of conservation importance and minimize loss of wildlife;
- Clearance of mature woodland will be minimized as far as possible to prevent the species habitat;
- Contamination of aquatic areas will be prevented to minimize risk of contamination of its food source;
- Use of sites designated for dumping to avoid polluting ecologically important areas such as habitat for wildlife;
- Noise pollution will be minimized to reduce the disturbance to animals as far as possible; Disturbance to pools and small pond habitats will be minimized to preserve the species habitat;

### **SSEMP of Moluti – Phona-Chumateleti Road Section**

- Construction on River bridges will only take place during period of low flow;
- Water quality monitoring will take place as described in the Water Management Plan;
- Final forming and re-vegetation will be completed after regeneration of stabilizing ground cover.

**SSEMP of Moliti – Phona-Chumateleti Road Section**  
**Flora and Fauna Management Plan**

<b>Area of Mitigation</b>	<b>Actions / Mitigation Measures</b>	<b>Location</b>	<b>Time Frame</b>	<b>Responsibility</b>
Protection / restoration of ecological resources	All works will be carried out in a manner such that damage or disruption to vegetation is minimized	All construction area	At all times	HSM & EPM
	Construction will be avoided on bridge sites during spawning seasons	All locations	March and October	Site foreman/EPM
	Contamination of aquatic areas will be prevented to minimize risk of contamination of its food source	All locations	Construction period	Site foreman/EPM
	Disturbance to pools and small pond habitats will be minimized to preserve the species habitat	All locations	Construction period	Site foreman/EPM
	Temporary land take will be minimized in ecologically important areas through minimizing operational area during construction to as narrow as practical ROW	All locations	At all times	Site foreman/EPM
	No excavated soil is to be dumped in ecologically important areas, all soil will be removed off site	All locations	At all times	Site foreman/EPM
	Trees and bushes outside the construction width but within the road reserve will be generally preserved from damages	All locations	Construction period	Site foreman/EPM
	Trees and bushes will be demarcated and cordoned off	Appropriate location	Construction period	EPM /Site foreman
	Cutting down will not be take place without the prior approval of the relevant Local Authorities	All locations	Before construction	EPM /Site foreman
	No ancient trees will cut down or impacted by the construction or operation	All construction area	At all times	EPM
	Trees or shrubs will only be felled or removed if they impinge directly on the permanent works or necessary temporary works	All construction area	At all times	EPM

**SSEMP of Moliti – Phona-Chumateleti Road Section**

	Habitat destruction will be minimized	All construction area	At all times	EPM
	Hunting and poaching will be prevented to protect species of conservation importance and minimize loss of wildlife	All construction area	At all times	EPM /Site foreman
	No excavated soil is to be dumped in the ecologically important areas, all soil will be removed off site	All construction area	Construction period	Site foreman/EPM
	Dust pollution will be minimized to reduce the disturbance to animals as far as possible	All construction area	Construction period	Site foreman/EPM

**APPENDIX 1: License about cutting trees:**

**Attachment N 1 - Localities with Orchids**

SSEMP of Moliti – Phona-Chumateleti Road Section

Localities with Orchids as Recorded in Project Road Section 2 (east)"



1	Y	X	5	Y	X	9	Y	X	13	Y	X	17	Y	X	21	Y	X	25	Y	X
377288		4653955	377159		4654302	376234		4653968	375705		4653732	375357		4653571	372733		4652999	376234		4653968
2	377287	4654008	6	376901	4653920	10	376209	4654046	14	375661	4653814	18	374115	4653028	22	377204	4654054	26	376225	4654012
3	377204	4654054	7	376532	4654130	11	375882	4653872	15	375660	4653813	19	373615	4653191	23	377203	4654055	27	375882	4653872
4	377203	4654055	8	376397	4654084	12	375854	4653864	16	375414	4653733	20	373479	4653219	24	376801	4653920			

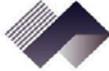


Moliti – Phona-Chumateleti Road Section



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სახელმწიფო ქონების  
ეროვნული სააგენტო



NATIONAL AGENCY  
OF STATE PROPERTY

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საქართველოს საავტომობილო გზების  
დეპარტამენტს

სსიპ - ეროვნულ სატყეო სააგენტოს

სსიპ - სახელმწიფო ქონების ეროვნულ სააგენტოში შემოსული საქართველოს საავტომობილო გზების დეპარტამენტის 17.09.2019წ. N2-12/12872, 22.11.2019წ. N2-12/15836, 24.12.2019წ. NN 2-12/17403, 09.01.2020წ. N2-12/121, სსიპ - ეროვნული სატყეო სააგენტოს 02.12.2019წ. N06/18307 ნერილების პასუხად, რომლებშიც დასმულია საკითხი შიდასახელმწიფოებრივი მნიშვნელობის ძირულა-ხარაგაული-მოლითი-ფონა ჩუმათელეთის საავტომობილო გზის მეორე ლოტის, ძირულა-ხარაგაული-მოლითის მონაკვეთის სარეაბილიტაციო სამუშაოების განხორციელების მიზნით, სახელმწიფო ტყის ფონდში არსებული მიწის ნაკვეთების სახელმწიფო ტყის ფონდიდან ამოციცხვის საკითხს, დანართის სახით წარმოგიდგენთ შესაბამის ინფორმაციას.

საჯარო სექტორთან ურთიერთობის სამსახურის  
უფროსი

ხელმოწერილია/  
შტამბადასმულია  
ელექტრონულად

დავით მიქაძე

	Moliti – Phona-Chumateleti Road Section	
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## TOPIC SPECIFIC CULTURAL & ARCHAEOLOGICAL MANAGEMENT PLAN

Rehabilitation Project of Dzirula - Kharagauli - Moliti - Pona – Chumateleti  
Secondary Road,

LOT 2: Moliti – Phona-Chumateleti Road Section- from km 24+620 to km 50+244

**EMPLOYER** Georgia Roads Department Ministry of  
Regional Development and Infrastructure



**ENGINEER** Authorized representative of: JV Pyunghwa  
Engineering Consultants Ltd/Yooshin  
Engineering Corporation/ Roads  
Rehabilitation and modernization  
Supervision Direction Ltd

**CONTRACTOR** “AKKORD” ICIC



PREPARED BY: AKKORD ICIC, June 2020

APPROVED BY: Roads Department of Georgia:

2020

	Moliti – Phona-Chumateleti Road Section	
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No known historical or archaeological sites exist near or will be impacted by the Project. The new road alignment does not pass near any monuments, and it is not expected that the earthworks along the alignment or at the borrow pits will unearth any archaeological finds.

Despite the above, a chance find procedure has been developed, to ensure that in the unlikely event of the discovery of archaeological remains, those working on site will be able to follow the procedure and ensure preservation of any artefacts.

The potential sites for chance finds include at borrow areas and tunnel construction areas where shovel-excavators will move amount volume of soil. Excavation works will also take place along the project road and along existing channels for installation of culverts.

“Akkord” ICIC will stop works immediately in the event of discovery of archaeological / cultural artefacts or fossils at any of the construction sites. Akkord” ICIC will preserve the archaeological / cultural find and will inform the appropriate authorities at the soonest possible time. All Contractor personnel will be instructed on the procedure of Archaeological Chance Finds every six months.

The Procedure is as follows:

1. If the Contractor’s personnel find fossils, coins, articles of value or antiquity, or structures and other remains or items of potential archaeological interest, they will be placed under the care and authority of Employer;
2. All works at the discovery site will be immediately stopped in accordance with Law of Georgia on Cultural Heritage Protection;
3. The area of discovery will be put under surveillance to protect the finds from any movement or damage;
4. The Contractor’s personnel will immediately inform the Site manager and the Engineer who will issue instructions for dealing with the find. The Engineer will then inform the PIU personnel who will in turn inform the Ministry of Culture of Georgia. The Contractor is obliged to protect the site until the assigned archaeological specialist arrives at site for the investigation;
5. The removal of archaeological finds can only be carried out by the Ministry of Culture of Georgia or with participation of specialists assigned by this organization. Continuation of road construction works will restart only by agreement of the Ministry of Culture of Georgia and with a permission letter from the Engineer.

The procedure is shown in the flow chart overleaf. Additional mitigation measures relating to the preservation of cultural and archaeological items is shown in the matrix below the Chance Find Procedure

flow chart.

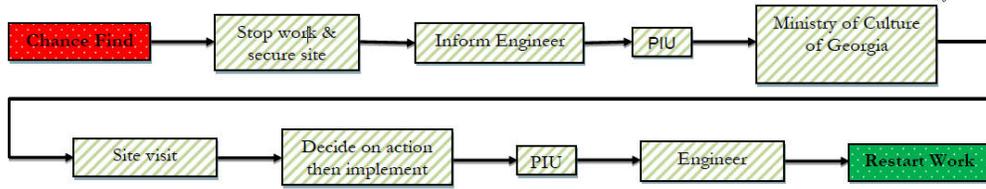


Figure 18: Flow Chart of Chance Find Procedure



Moliti – Phona-Chumateleti Road Section

**CULTURAL & ARCHAEOLOGICAL MAHAGEMENT PLAN**

<b>Area of Mitigation</b>	<b>Actions / Mitigation Measures</b>	<b>Location</b>	<b>Time Frame</b>	<b>Responsibility</b>
Preservation of existing cultural /historical features and preservation of any chance finds	Chance finds will be dealt according to the Chance Find procedure outlined above	All locations	At all time	EPM
	All Contractor personnel will be instructed on the Chance Find procedure	Construction Camp	Every 6 months	EPM
	All works at the discovery site will be immediately stopped as in accordance to Law of Georgia on Cultural Heritage Protection	All areas	As applicable	HSM and EPM
	The area of discovery will be under surveillance of Contractor to protect the finds from any movement or damage and the Contractor’s personnel will immediately inform the Site manager of competence and the Engineer who will issue instructions	All areas	As applicable	EPM
	Continuation of road construction works will start only by resolution of Ministry of Culture of Georgia and permission letter from the Engineer	All areas	As applicable	HSM and EPM



## GRIEVANCE REDRESS MECHANISM

Rehabilitation Project of Dzirula - Kharagauli - Moliti - Pona – Chumateleti  
Secondary Road,

LOT 2: Moliti – Phona-Chumateleti Road Section- from km 24+620 to km 50+244

**EMPLOYER** Georgia Roads Department Ministry of  
Regional Development and Infrastructure



**ENGINEER** Authorized representative of: JV  
Pyunghwa Engineering Consultants  
Ltd/Yooshin Engineering Corporation/  
Roads Rehabilitation and modernization  
Supervision Direction Ltd

**CONTRACTOR** “AKKORD” ICIC



PREPARED BY: AKKORD ICIC, June 2020

APPROVED BY: Roads Department of Georgia:

2020



## SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN

### INTRODUCTION

The objective of this plan is to convince the Client that all Social requirements and obligations, which concerns Social management issues will be fulfilled during the implementation of the future project. The Action plan describes Social mitigation measures and procedures that are used during the working period to ensure compliance with the laws of Georgia and the project EIA requirements. This plan also includes details of audit, monitoring and reporting.

The primary objective of present Action plan to prevent, mitigate and minimize to the best practices social impacts related to project construction activities, and to implement as well various mitigation measures, which are stated in EIA report for project.

Present document defines the methods of minimizing, control and management of adverse impacts on social issues during implementation of the project 1 phase and ways to prevent them.

The requirements set out in the plan are useful for all activities that are implemented within the frames of project and its performance is mandatory for all components of the project.

Issues that can not be regulated by this Action Plan, will be regulated in accordance with the plans developed by the Client and the applicable legislation.

#### **Principles and objectives of the plan**

The plan is based on the following principles:

- Timely inform stakeholders about project relevant issues, especially the affected parties;
- Bilateral consultation with stakeholders;
- Creation of grievance mechanism for effective feedback and problem solving.

The Stakeholder Engagement Plan has been developed to identify all project interested parties and to ensure their engagement in the project implementation process throughout the project implementation period. The plan provides future plans of cooperation with stakeholders during the construction stage.

Stakeholder's engagement includes:

1. Providing in time the relevant information to interested parties in acceptable and understandable formats;
2. Consultations with stakeholders to hear their opinions, concerns, preferences and perceptions of risks related to the project and its implementation, including the design, to mitigate potential negative impacts and enhance the positive impact of the proposed management and monitoring activities;
3. Grievance mechanism to answer the problems and complaints of stakeholders and to manage the problem solving process.

The plan describes:

- Project stakeholders;



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- Strategy, format and timeframe for consultation and information publishing;
- Resources and management structure required to implement the present plan;
- Grievance mechanism for interested parties;
- Reporting mechanism for the activities to be implemented within the publicity of consultation and information.

Timely and constructive consultations with stakeholders at all stages of the project, including the construction stage is the basic requirement.

„Akkord” ICIC will hold consultations and provide information to the stakeholders in the course of construction. In addition, the company at the construction stage will:

- Inform the population affected by the Project on all preparatory and construction works that may affect them. The information will be delivered at least one week before the commencement of such works;
- Provide the affected population with relevant information about the construction process;
- Activate the grievance procedure (see below).

The company's website will be used for provision of information. Will be delivered:

- Description of construction works, with indication of all types of works start and end date;
- Drawing, which will indicate areas affected by works and the following information:
  - Type and duration of expected impacts;
  - All types of impact mitigation measures;
  - Studies and documentation relating to affected population of adjacent areas;
- Photos of the ongoing works at the construction site.

Apart from those who does not have access to the Internet, informative sheets will be used.

If there arises direct impact on the population, meetings will be held with the municipal administration in every three months or more often. Contractor's social service will continue informing the stakeholders through the website, local municipalities and other means. The grievance redress procedure described in Chapter 8 will also work for the life cycle of the project.

### **Public informing**

Stakeholder engagement mechanisms may include informing the local and regional NGOs, press releases in the local and national press, delivery of documentation to head and local offices of environment protection and natural resources agency and to local municipality offices.

Information booklets / sheets will be placed in public places (shops, pharmacies, etc.) to ensure the awareness of the local population. The society will be informed about the 'feedback' mechanism of the company. Information sheets will be distributed, including the contact information and description of procedures of population grievance redress. In addition, the affected population (landowners) will be directly informed



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about expected impacts, proposed mitigation measures and compensations. For these purposes information papers will be distributed on the land acquisition procedures and will be held individual meetings with the affected groups.

Annual report will be available to stakeholders through the website to be aware about the course of construction, stakeholders will be able to get information brochures / sheets as well. In addition, meetings will be held with the authorities of municipality to inform them about the project progress.

The local municipality will act as a coordinating center of feedback from the public. The representative of the Company "Akkord" ICIC will be in permanent contact with local governance and public representatives.

If required, (when increase of impact is anticipated) Information about the place of construction operations, types, start, end and duration will be posted on the project website, the local administration will be notified and will be distributed through informative sheets. The inhabitants living along the construction site will be warned beforehand and will be aware of the planned works (the implementation of which can lead to the change of their normal regime of life or the discomfort of their usual housing and working conditions).

### **Resources and Responsibility**

"Akkord" ICIC will take full responsibility to hold consultations with all project interested parties and will use the existing resources to conduct these consultations in compliance with the relevant standards. Personnel for public relations will be responsible for liaison with local population, for processing complaints and resolving disputes between parties. Responsible person for coordination of stakeholder's engagement works will be:

Name: Oleg Lomidze

Address: Khashuri Municipality. v. Chumateleti. Company's production base;

The company prepared and approved regulation regarding the grievance arising-receiving and redress, which is mandatory for each employee.

### **6Grievance mechanism**

"Akkord" ICIC developed a number of methods for public to apply for complaints / information:

- Interested persons will be able to send their comments, suggestions, complaints and questions on the above e-mail;
- Postal boxes were arranged at the entrances of construction camps and in the administration building of the Kharagauli and Khashuri municipalites.
- Inform on the above mentioned by stickers at the gathering places in the villages of Kharagauli and Khashuri municipalities (in crowded places);
- Information was provided to Kharagauli and Khashuri Municipalites and village attorneys;



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Discontent can be defined as an actual or perceptual problem that can be a precondition of the grievance. As always, the company will try to work actively through the prevention of complaints and communication with the public. These activities are planned to advance the attention of the issues that may be the reason for the grievance. This activity is the responsibility of the Company's Environment and Social Affairs Service.

Aggrieve can be made by any person who thinks that the Project may have a negative impact on the population and the environment, such person may submit comments and recommendations. Any notification or complaint can be done orally, in writing form (also by e-mail) or by filling the grievance form. The grievance form is available on the project web site. And is also described in the grievance mechanism. After filling the grievance form it will be referred to the company's representative whose contact information is given below:

Environmental and Social Affairs Service – Oleg Lomidze - Tel 599801614.

In case of any complaint received from the public, the latter will be processed in several stages. Applications of grievances will be taken into consideration and where applicable, response will be given within 5 or 10 working days, if time is required for gathering of requested information or due to the complexity of grievance, redress will be conveyed within 10-20 days from the date of receipt of complaints.

All complaints will be recorded in the Complaints book in order to ensure that individual complaints are filed, to control and respond to the complaint / grievance process. The book will be used to analyze the frequency of complaints, the most frequent problems and recurrence trends. The book contains:

The date of receipt of the complaint;

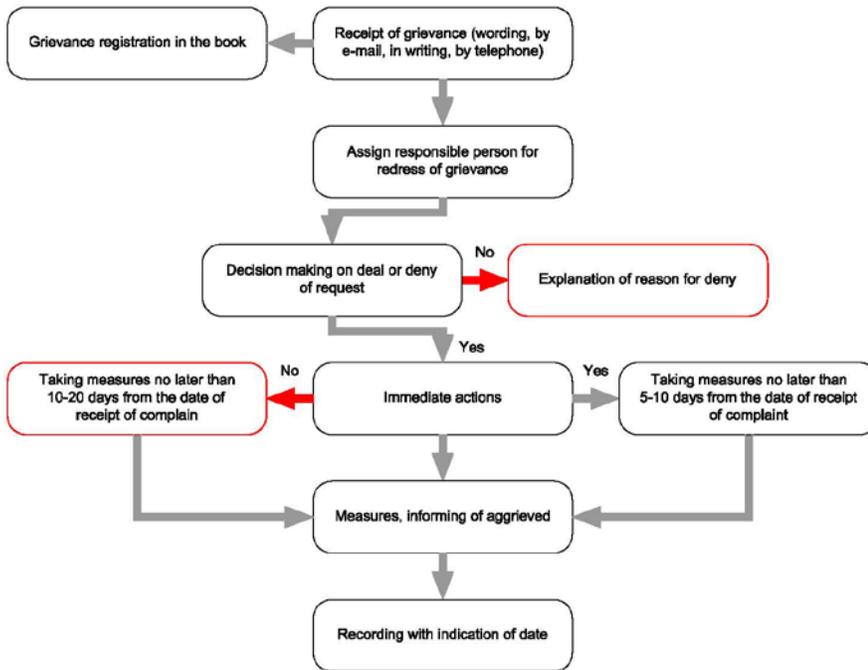
- Individual number;
- Content of the complaint;
- Determining the parties responsible for resolving the issue;
- Start and end dates of the inquiry;
- Results of inquiry;
- Information on the action offered to resolve the matter which was sent to the applicant (if the complaint was not anonymous) and the date of sending the response; the closing date of the complaint;
- The application of the aggrieve satisfaction, the reason for the unsettling of the issue;
- Unresolved complaints - measures to be taken.

Full documentation of the grievance is kept in the folder for 2 years and later it will be archived. The degree and type of complaints will be monitored by Company's Environment and Social Affairs Office.

If the complaint is not satisfied in the above-mentioned period of time, the aggrieved is informed about and following inquiry is completed, he / she will seek to find a negotiated solution. The company's environmental and social affairs service can conduct further monitoring to check that the problem will not be repeated.

The aggrieved will be able to maintain his or her privacy. The name and contact information of the aggrieved person will not be published without their consent and the data will be available only to the group who is directly working on the grievance. If the inquiry process requires transfer of certain information to the third party in order to find way out from the situation created (e.g. when the complaint is caused by certain actions of the Contracting Party), the aggrieved must be informed in the proper manner about, to obtain consent from him/her. If the study group cannot complete the full investigation without exposing the person's data (e.g. if the Court requests a certified document), the study group will talk to the aggrieved person for taking the next steps. The procedure also allows anonymous appeal. In this case the complaint will be reviewed, but the company will not be able to respond to this complaint.

The procedure is graphically displayed on the chart below.



	<b>SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN</b>	
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**1. Plan Implementation timeline**

Measures/Action	Start time	End time	
Provision of immediate receipt of external complaints	Upon starting of project implementation	After 12 months of project completion	
Provision of immediate receipt of internal complaints	Upon starting of project implementation	Before the project ends	
Providing information to the local population	Upon starting of project implementation	Before the project ends	
Engagement of local administration in studying issues	Expected unbiased Complaints Prevention Works.	Before the project ends	
Report preparation	Every quarter	Before the project ends	

**1. Monitoring and reporting**

The Stakeholder Engagement Plan will be periodically renewed and will be revised at the stage of project construction.

Quarterly reports related to incidents/complaints and measures to be taken to redress/to prevent them will be prepared.

Responsibility for reporting will be vested on Environment and Social Services. All records or documents will be available for review by an authorized person.

Effectiveness of stakeholder engagement depends on continuous efforts, ongoing monitoring, conclusions and ability to adapt to changing circumstances, to provide information to stakeholders.

The Company will implement the Stakeholders Engagement Plan, monitor and evaluate its effectiveness. In order to improve the stakeholder engagement process during monitoring, the following indicators will be used:

- The Stakeholder Engagement Plan has been developed and available for the public and their comments;
- The steps taken by the Stakeholder Engagement Program are completed within the scheduled timeframe;
- The number of visitors to the public information center;
- The number of comments and proposals received by the company from the interested parties by means of different types of feedback;
- The number of complaints and claims filed by the stakeholders engaged in the project;
- The number of publications regarding the project implementation through local, regional and national media;



	<b>SITE - SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN</b>	
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- Through which means are received the concerned parties comments / proposals that are considered by the company.
- Main categories of complaints received on behalf of the company (directly or through public information center), such as employment, land use, environmental issues, labor relations and etc;
- The number of complaints resolved within the framework of the established period;
- The number of unresolved complaints.

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**2. Monthly social reporting sheet**

CONTRACTOR: : კონტრაქტორი:		
CONTRACT: ხელშეკრულება:		
PROJECT NAME: პროექტის დასახელება:		
DATE: თარიღი	REPORT N. ანგარიშის N:	
REPORT BY: ანგარიში მომზადებულია:	SIGNATURE:	
<b>Condition of site:</b> <b>საიტის მდგომარეობა</b>	Status სტატუსი	
Grievance board საჩივრების დაფა		
Number of complaints received შემოსული საჩივრების რაოდენობა: მ.შ.		
Related to the noise/dust caused by construction works სამშენებლო სამუშაოების ხმაურთან /მტვერთან დაკავშირებით;		

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Related to Damage of private, legal and government-owned properties კერძო, იურიდიულ ან სახელმწიფო საკუთრებაზე მიყენებული ზიანთან დაკავშირებით:		
Related to Habitants health and safety მოსახლეობის ჯანმრთელობასთან და უსაფრთხოებასთან დაკავშირებით;		
complaints relation to impacts of increased traffic; სატრანსპორტო ნაკადების გაზრდასთან დაკავშირებით:		
Related to the interaction of local habitants and Company workers პროექტში დასაქმებულთა და ადგილობრივ მცხოვრებთა ურთიერთობასთან დაკავშირებით:		
other complaints სხვა სახის საჩივარი		(
<b>Related In the project employed right.</b> პროექტში დასაქმებულთა უფლებებთან დაკავშირებით: მ.შ	<b>სტატუსი/Status</b>	<b>კომენტარი/Comment</b>
Gender related Discrimination: გენდერულ დისკრიმინაციასთან დაკავშირებით:		
With regard to the living conditions of the employee in the project:		

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პროექტში დასაქმებულთა საცხოვრებელ პირობებთან დაკავშირებით		
other complaints სხვა სახის საჩივარი		
Measures to improve the social situation by the contractor კონტრაქტორის მიერ სოციალური მდგომარეობის გაუმჯობესებისათვის გატარებული ღონისძიებები		
Employment in the project პროექტში დასაქმება		
Collective agreement კოლექტიური ხელშეკრულებით		
Indirect employment ირიბი დასაქმება		
<b>Condition of private house holds located near the construction site სამშენებლო მოედანის მიმდებარედ არსებული პირადი მეურნეობების მდგომარეობა</b>	Status/სტატუსი	კომენტარი/Comment
Number of complaints related to deterioration of houses სახლების მდგომარეობის გაუარესებასთან დაკავშირებული საჩივრების რაოდენობა		

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The measures taken გატარებული ღონისძიებები		
<b>კულტურული მემკვიდრეობის ძეგლების მდგომარეობა</b> <b>Cultural Heritage Sites</b>	Status/სტატუსი	კომენტარი/Comment
არსებული კულტურული მემკვიდრეობის ძეგლების მდგომარეობა Situation of existing cultural heritage monuments		
ახლად გამოვლენილი კულტურული მემკვიდრეობის ძეგლები Newly discovered cultural heritage monuments		

## ENVIRONMENTAL MONITORING & REPORTING

Rehabilitation Project of Dzirula - Kharagauli - Moliti - Pona –  
Chumateleti Secondary Road,

LOT 2: Moliti – Phona-Chumateleti Road Section- from km 24+620 to km  
50+244

**EMPLOYER** Georgia Roads Department Ministry of  
Regional Development and Infrastructure



**ENGINEER** Authorized representative of: JV  
Pyunghwa Engineering Consultants  
Ltd/Yooshin Engineering Corporation/  
Roads Rehabilitation and modernization  
Supervision Direction Ltd

**CONTRACTOR** “AKKORD ” ICIC



PREPARED BY: AKKORD ICIC, June 2020

APPROVED BY: Roads Department of Georgia, December 2020

2020

## **SSEMP for Dzirulia- Moliti Road Sector- from km 0+000 to km 24+620**

### **Introduction**

Monitoring is an essential part of the overall environmental management activity, as it provides an indication of how well the mitigation measures are being applied, and how effective the measures are. Monitoring also provides an opportunity to foresee further potential impacts and apply additional mitigation measures if necessary. Two types of monitoring will be carried out:

1. Monitoring during construction period
2. Site audit and checklists

### **1. Instrumental Monitoring**

Laboratory of Ltd “Greentecs” will carry out instrumental monitoring for water quality, air quality, noise and vibration as needed. Methodologies for tests and analysis will be provided alongside the results in all Quarterly Reports. All monitoring results will be compared with the national standards of Georgia.

Total suspended particulates (TSP) will be the main focus of the air quality monitoring program.

Water quality monitoring will be for the following determinants:

- suspended solids (SS)
- biological oxygen demand (BOD)
- dissolved oxygen (DO)
- conductivity
- fecal Coliforms
- Oil and grease.

### **2. Site audits and checklists**

The EPM and HSM will conduct weekly site audits, covering all operational sites. The audits will check on all items and mitigation measures describe in this SSEMP. Attention will be given to both the physical environment and working practices. The compliance audits will employ a check list methodology to enable clear and concise results. Results of the site audits will be included in the quarterly environmental reports. The proposed checklists are provided in the following Section.

“Akkord” ICIC EPM and H SM elaborate recommendations for management to prevent damage of environment, health and genetics in the process of construction and submit reports about environment directly to senior management. EPM manager will be coordinate his activities directly with Client’s EPM manager and to participate in all meetings devoted to environment in the process of project realization.

- “Akkord” ICIC EPM and HSM are obliged:
- To watch efficiency of implementation of Site Specific Environmental Management Plan;
- To check observation of environment regulations in the process of construction personally and through his representatives;

**SSEMP for Dzirulia- Moliti Road Sector- from km 0+000 to km 24+620**

- To provide in the established order timely, complete and authentic information about environment situation to organs executing management of environment protection and supervision of observation of laws in Georgia;
- To control observation of specified technical norms of discharges, disposals and wastes formation for vehicles and other portable units;
- To participate in organization of ecological training and instruction of construction personnel;
- To prepare within specified time reports for Client's HSE Managers;
- Managers about environment situation in the process of construction.

**3. Reporting**

The following reports will be submitted by ““Akkord” ICIC relating to environmental management:

- Monitoring report for air quality, water quality, noise and vibration (as required);
- Quarterly reports on environmental management and protection.

Quarterly reports will cover all aspects of environmental management including instrumental monitoring (as required), site audits, training, and community participation.

**SITE CHECKLISTS**

The EPM will make weekly site check to ensure that the provisions of the EMP are in place and functioning (in the case of infrastructure) and being implemented (in the case of actions/practices). To assist the EPM with his site checks, a checklist has been developed, and is shown overleaf.

The EPM’s quarterly reports will contain summaries of the site checklists, in particular discussing the areas where non-compliances were noted.

**Site Walkover Checklists**

Date of Walkover:	Engineer’s Representative	Engineer’s Reference Number
Time: to	Contractor Representative	Contractor Reference Number
Date		
Weather Conditions:		
Works in progress:		

**SSEMP for Dzirulia- Moliti Road Sector- from km 0+000 to km 24+620**

Environmental Problem	Possible Cause	Proposed Mitigation
Note		
Audit carried out by:		Representative of contractor:

N	Environmental Protection Measure	Implemented		Functioning		Comment
		Yes	No	Yes	No	
Contractor's Camp						
1	Septic tanks installed and emptied according to approved procedures					
2	All waste water is directed to septic tanks or technical water tanks					
3	Site run-off collected in the drainage system and disposed of by the third party contractor					
4	Local communities and organizations informed of the construction schedule and any noisy activities on a regular basis via workshops and other liaison activities					
5	Domestic waste regularly and frequently transported to official dump site to avoid waste dispersal by wind					
6	Waste collection bins and containers with appropriate size provided at each structure					
7	Waste containers located outside the buildings provided with lids					
8	Sewage system inspected and necessary maintenance undertaken					
9	Number of septic tanks provided for collection of sewages from offices, canteen and residential houses					

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10	All septic tanks will be located in the appropriate distance (at least 100 m away) from any water course					
11	Regular septic tanks pumping, transportation and treatment of waste water (as per Georgian legislation) from camp territory is provided					
12	The camp area is secure and guarded					
13	Waste inspections will be made outside the camp fence					
14	All workers' uniforms are laundered on a daily basis					
15	All employees are provided with three meals per day					
16	All employees under the control of the Camp doctor and provided appropriate services and monthly health checks					
17	All areas are clean and tidy, with no litter or waste present except in designated areas					
Plant Yard						
1	The bitumen and chemical storage area is located away from any watercourse and the base and bund walls are impermeable and sufficient capacity to contain 110% of the volume of tanks					
2	Concrete waste from the Concrete plant is stored in the septic tank and emptied by specialized suction vehicles					
3	The plant area is graveled for reduction of dust emission					
4	The plant area is watered for reduction of dust emission					
5	No plant may discharge effluent water to any watercourse; impervious concrete basin will be constructed for receiving such waters					
6	All staff at Concrete and Crusher Plants are supplied with dust masks and ear defenders					

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7	All staff at Concrete and Crusher Plants is wearing their dust masks and ear defenders					
8	All sands and aggregate for concrete and asphalt batching kept damp or covered					
9	The Concrete and Crushing plants are provided with adequate firefighting equipment.					
10	Plant or Equipment causing high vibration levels are of appropriate design, well maintained and correctly operated					
<b>Fuel Station</b>						
1	Oil filling and refueling will be strictly controlled and is permitted only at the fuel filling station and workshops area					
2	Fuel tanks storage area is bounded and impervious bottom and roof is closed					
3	Fuel station provided with adequate fire fighting equipment checked weekly					
4	Fuel Station provided with warning ribbon and warning signs					
5	Fuel station provided with wastebasket					
<b>Workshop and Car Wash</b>						
1	Liquid hazardous materials stored in the designated secure area at the workshops					
2	Solid hazardous materials stored in the designated secure area at the workshops					
3	Containers for waste oils and hydraulic flu Used oil collected in used oil tank bonded in concrete to a volume of 110% and emptied according to approved procedures provided					
4	Workshop provided with drainage					
5	Every vehicle inspected and maintained on a regular basis					
6	All construction vehicles Euro standards and fitted with modern noise suppression equipment					

**SSEMP for Dzirulia- Moliti Road Sector- from km 0+000 to km 24+620**

7	Silencing equipment of all vehicles maintained and checked accordance with approved procedures					
8	The propane balloons will be allocated outside the workshop as per safety procedure to avoid overheating and risk of explosion					
9	The roof at the location area will be provided to protect propane balloons from direct sunbeams					
10	Used oil collected in used oil tank bonded in concrete to a volume of 110% and emptied according to approved procedures					
11	Protection walls at the location area will be provided to avoid fire dispersing in case of explosion					
12	All workers of workshop provided with adequate welding equipment and PPE					
13	All technical water is collected in concrete tank and emptied according to approved procedures					
Road Clearance						
1	Indicate the limits of the RoW with highly visible markers prior to any other site activities					
2	Indicate the internal roads and parking area with highly visible markers					
3	Top soil from all disturbed areas will be striped and stockpiled					
4	Stockpiles will be allocated in at least 100 m distance from any water course					
5	Height of stockpiles will not exceed 3 m					
Public & staff safety						
1	All roads impacted by construction activities will be watered by sprinkler trucks					
2	All excavated areas such as pipe and box culverts will be surrounded with warning belts and warning signs					

**SSEMP for Dzirulia- Moliti Road Sector- from km 0+000 to km 24+620**

3	The project road will be provided with animals crossing sign boards at appropriate places for passage of cattle, sheep and other animals					
4	Limit works to 7a.m.–21p.m. as per Georgian legislation					
5	All staff will be provided with breakfast, lunch and dinner and receive clean work clothes on a daily basis					
6	The Camp doctor carries out monthly health checks on all staff					
7	Contractor's camp will be supplied adequate amount and required quality of drinking water via existing well in camp (water quality meets the national drinking water standards)					
8	All staff will be trained for fire safety measures.					
9	All staff will be trained about AIDS and construction work safety					
10	All staff will be provided with two sets of work clothes					
11	All staff will be provided with personal protective equipment (PPE)					
12	Adequate traffic signs and warning notices will be provided on site and at dangerous areas					
13	Fencing and access control will be installed at all work sites where practicable					
14	Accumulation of high number of heavy equipment within residential area will be forbidden					
15	It will be strictly prohibited to create an additional noise within residential and other sensitive areas					
16	In the event of any spoil or debris being					

**SSEMP for Dzirulia- Moliti Road Sector- from km 0+000 to km 24+620**

	deposited on any adjacent land, the material will be immediately removed and the area restored to the satisfaction of the Engineer					
17	Regular meetings will be held with local communities to inform the public of the works programmer, and to receive complaints					
Project Road						
1	All roads impacted by construction activities watered by sprinkler trucks					
2	The project road is provided with animal crossing points at appropriate places for passage of cattle, sheep and other animals					
3	Culvert and bridge construction areas provided with warning ribbons and warning signs					
4	Fencing and access control installed at all work sites where practicable					
5	The storage of waste of any kind as well as parking machinery or vehicles is not permitted within a distance of 100 m of any stream (including drainage or irrigation facilities)					
6	Adequate traffic signs and warning notices provided on site and dangerous areas					
Borrow areas						
1	Temporary drainage provided at borrow pits and quarries					
2	Within 200 m of the nearest habitation construction work is stopped between 21:00 and 07:00 hours					
3	Aggregates only removed from approved borrow areas					
4	Aggregate extraction is not taking place inside the river bank or watercourse					
5	Stockpiles do not exceed 3 m in height					
6	All vehicles with an open load-carrying					

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	area used for transporting potentially dust producing material properly fitting side and tail boards					
7	During construction all noise volume restricted to the national standards					
8	Materials having the potential to produce dust is not loaded to a level higher than the side and tail boards and covered with clean tarpaulin					
9	All temporarily acquired land is rehabilitated					
10	All spilled materials and contaminated earth collected and disposed accordance with approved procedures					
11	During the delivery and handling of materials provided effective water sprays					
12	Any adjacent areas disturbed due to spoil restored to its original state					
13	River banks protected from material deposits or temporary contractor stockpiles					
14	Access roads to quarry, borrow pits, stock pile areas and traffic operations maintained to approved standards					
15	Nuisances or disturbance arising from the execution of the works controlled to tolerable level according to standards					
<b>Flora and Fauna</b>						
1	Trees and bushes outside the construction width but within the road reserve generally preserved from damages					
2	No ancient trees cut down or impacted by the construction or operation					
3	Cutting down has not taken place without the prior approval of the relevant Local Authorities					
4	Trees or shrubs only felled or removed if they impinge directly on the permanent works or necessary temporary works					

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5	No excavated soil is to be dumped in the ecologically important areas, all soil removed off site					
6	Dust pollution is minimized to reduce the disturbance to animals as far as possible					
7	Clearance of mature woodland is minimized as far as possible to prevent the species habitat					
8	Construction avoided on bridge sites during spawning seasons (indicate yes or no to construction activities on going, providing date)					
9	Hunting and poaching is prevented to protect species of conservation importance and minimize loss of wildlife					
10	Construction on rivers only take place during period of low flow to minimize pollution					
11	Disturbance to pools and small pond habitats is minimized to preserve the species habitat					
12	Re-plantation is carried out in areas that are disturbed by the Project					
13	Noise pollution is minimized to reduce the disturbance to animals as far as possible					