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ENVIRONMENTAL IMPACT ASSESSMENT REPORT

THE *DURRES – MORINE* CORRIDOR
Milot - Rrëshen Section

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0. EXECUTIVE SUMMARY

0.1. INTRODUCTION

0.1.1. This section provides an Executive Summary of the Environmental Assessment (EA) for the proposed World Bank financed Milot-Rreshen road project (the Project) which consists of construction of a new highway from Fushë-Milot to Rreshen along the River Mat and River Fan valleys. The document can be used as a stand-alone for the EIA Non-Technical Summary.

0.1.2. The document provides a general summary of the findings in the following Project Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP), including legal and policy framework and applicable environmental standards, environmental baseline major potential adverse impacts to the physical, ecological and socio-economic environments in the Project area, analysis of alternatives, mitigation measures, public consultation programmes, and environmental management plan for the Project.

Project Background

0.1.3. The World Bank Project forms part of the proposed Durres-Morine Road Corridor and is located between Fushë-Milot, where it connects with the recently constructed Fushë Kruje to Milot national road SH.1, and Rreshen. It will replace part of the existing national road SH.30. The other road sections included in the proposed Durres-Morine Road Corridor are from: Rreshen to Kalimash (about 50 km) and Kalimash to Morine (about 27 km). The Rreshen to Kalimash Section is currently the subject of a feasibility study and will likely be financed by international donors. This section will likely include a degree of tunnelling. The remaining section from Kalimash to Morine will likely be financed by the Albanian Government. All road sections were included in the framework environmental impact assessment (EIA) study completed by Tecnic/Mott MacDonald in November 2003. This framework EIA did not identify any critical environmental issues in the overall Durres-Morine Road Corridor programme that would cause the project to be terminated or altered in a significant way. The major issue involved proper disposal of materials generated with the tunnelling activities. The World Bank had reviewed this framework EIA and found it to be acceptable and of good quality.

0.1.4. An independent consultant (Scott Wilson) reviewed the Technic/Mott MacDonald framework EIA study, and prepared a scheme specific draft EIA and Resettlement Action Plan (RAP) for the Milot to Rreshen section of the Durres-Morine Corridor Project. This specific EIA was based upon a preliminary engineering design produced by ITP during 2004. The detailed engineering design for the revised alignment has been completed by ITP during 2005. The first draft EIA and RAP reports were pre-appraised by the World Bank during 2004. As a result of the appraisal, the road alignment was revised to utilise the disused railway alignment following a 'Decision' by the Council of Ministers. The EIA document contained herein has been prepared by the Environmental Unit of the General Roads Directorate and is an updating of the specific EIA prepared by the consultant. This EIA reflects the revised alignment and has been prepared in accordance with the World Bank requirements. The final draft of EIA together with EMP and RAP will be submitted to the Bank for its appraisal.

0.1.5. The Project is classified as a Category A project since it involves major highway construction on a new alignment. The construction of the highway would result in increased noise, motor vehicle air emissions, occupation of fertile agricultural land, disturbance to the ecosystem, visual and induced impacts to river valleys, community severance and soil erosion.

Legislation Regarding the EA

0.1.6. Regulatory, policy and administrative requirements for environmental assessment of development projects in Albania were followed during the preparation and evaluation of EA, as were the Bank's safeguard policies. Major laws and regulations applied to the EA are as follows:

- Law No. 8934 on Environmental Protection;
- Law No. 8990 on Environmental Impact Assessment;
- Law No. 8093 on Water Resources 1996 as amended by Law Nos. 8375, 8605 and 8736;
- Law No. 8897 on Protection of Air from Pollution;
- Law No. 8561 on Expropriations and Temporary Taking of Property for a Public Interest;
- Law No. 7623 on Forests and Forest Policing 1992 and as amended by (Articles 63 & 64 only) by Law No. 7839 on Exploitation of Forests; and
- Law No. 7866 on Referenda (including specific environment issues).

0.2. ROUTE DESCRIPTION

0.2.1. The proposed road starts from its intersection point with the SH.1 national road with the provision of a T-junction approximately 2.2km south of the new River Mat Bridge. The road then heads north-eastwards passing to the south of the village of Fushë-Milot across flat terrain which is subject to flooding from the River Mat. Afterwards the route of the road enters the southern edge of the River Mat floodplain before crossing above the existing railway and former national road SH.1 to the west of Milot. From this point the road descends in height to meet the route of the disused railway.

0.2.2. Following the disused railway, the road passes the town of Milot on the north western edge of the settlement heading in a north-easterly direction along the edge of the River Mat valley. After approximately 2.5 km the railway alignment passes around a headland and is very close to the river. As a result a short section of the road will have to be constructed within the southern edge of the River Mat floodplain. The road continues to follow the railway alignment heading eastwards until approximately km 10. At this location, a junction (Skuraj junction) will be provided to connect the proposed road with the existing national road SH.6, which connects to Burreli, Klos and Bulqiza.

0.2.3. After the junction, the route turns towards a more northerly direction and crosses over the River Mat with a multi-span span bridge. Following the disused railway alignment, the proposed road continues along the eastern side of the River Fan valley, passing through a small settlement (Fangu village), followed by the abandoned Rubik Station and marshalling yard area until the route meets up with the existing national road SH.30 at approximately km 19 opposite Rubik. From this point the proposed road maintains the alignment of the disused railway but it also needs to incorporate the existing road for approximately 1km.

0.2.4. Approaching km 20 the proposed road will divert from the existing road and cross the River Fan before turning eastwards along the northern edge of the river valley. The route passes close to the villages of Munazi and Vau i Shkjezës, crossing agricultural land and vineyards along the edge of the valley. The road continues to follow the alignment of the disused railway crossing over two watercourses flowing into the River Fan. Approaching Km 26 the route crosses over the River Fan to the southern side of the valley. From this location, the Government of Albania proposes to continue with the following "Rreshen to Reps" section.

0.3. BASELINE ENVIRONMENT

Physical Setting

0.3.1. The Project area has a typical Mediterranean climate: hot and dry summers with wet and cold winters accompanied by high intensity winds. The average annual temperature is 15°C and the average summer temperature reaches 26–29°C. Average annual precipitation is approximately 980 mm, concentrated mostly in late autumn and winter. During the spring and summer time the winds normally blow from the south-west, whilst in the winter the winds' direction is from the north-east. The terrain configuration is initially a flat expansive area of floodplain changing to river valley, with steep valley sides, for the remainder of the Project. Land levels range from approximately 2m above sea level in the floodplain to 70m above sea level close to Rreshen.

Ecosystem

0.3.2. The ecosystem in the Project area, within the low-lying flood plains in the Mat and Fan river valley areas, includes important fertile agricultural soils. The Project sits within two river valleys. The River Mat is one of the biggest and most important rivers in Albania. The water-collecting area of the river is in the north of the central highland area. The river's source is at the top of the Kaptina Mountain, at about 1,872m above sea level. River Mat's secondary branch – according to the area and the scale of water levels – is the River Fan. The Fan itself results from the convergence of two river branches – the Big Fan and the Little Fan close to Rreshen. The source of the Big Fan is from Qafa e Malit at a height of 1,397 m above sea level.

0.3.3. Between Milot and Rreshen, in the valleys of the Rivers Mat and Fan, the main vegetation is comprised of oak pines, forsythia and juniper. Flora is represented by agricultural plant elements cultivated by the farmers in the floodplain and in the valleys. Plants are represented mainly by grains, leguminous vegetation, as well as forage crops, such as lucerne fields, loliums and alfalfa.

0.3.4. There is little information available on the distribution and numbers of protected species on the proposed route. Mammal species recorded in the higher mountainous areas include bears, wolves, lynx, jackals, chamois, roe deer, wild boars, foxes and rabbits. Typical birds spotted in the Project area include Heron, Kestrel, Rock Partridge, Collared Dove, House martin, Pied wagtail, Magpie, Hooded crow, Raven, Wren, Blackcap, Black Redstart and Wheatear. Reptiles recorded include Water Snakes, Wall Lizards, Green Lizards, Turtles and amphibians include Marsh Frog, Common Toad, Common Tree Frog and Salamander.

0.3.5. There aren't any Natural Habitats or Protected Nature Sites within the project area. In addition there aren't any protected species within Albania, although any animals, birds, reptiles or amphibians which reside within Protected Sites are themselves considered to be protected.

Noise Baseline and Sensitive Receptors

0.3.6. Along the proposed alignment, a total of 9 villages or towns are close to the route and are considered as sensitive or otherwise vulnerable to changes in the environment which surrounds them, such as air pollution, increased noise, construction dust, etc. These sensitive receptors are located between about 30m up to 1 km from the road centre line to the nearest points in these sensitive receptors. No precise measurements are available for the route but there are not anticipated to be any sites where noise levels approach those that present a significant nuisance to local residents, or that present any sort of threat to health. The reason that noise levels along the route are generally low relates to the current low level of traffic.

Groundwater Quality

0.3.7. The proposed road will intersect with several major surface water bodies including the Mat and Fan rivers, as well as several other smaller water bodies. At the present time, there isn't any information on the condition of the groundwater in the area of the Project. However in the event of a pollution incident involving spillage of any type of chemicals or fluids into the ground, during the construction phase, which is detrimental to the water resources and environmentally sensitive receptors, then groundwater sampling will be carried out to ascertain the groundwater condition. This should be carried out as part of the monitoring programme.

Air Quality

0.3.8. There is no air quality information available which is specific to the proposed route. The proposed alignment is currently subject to air quality impacts from existing roads and it is to be expected that concentrations of normal exhaust gases along the proposed road would be significantly lower than accepted European levels due to the low traffic volumes on the route.

Cultural Heritage and Undiscovered Archaeology

0.3.9. There is the potential to find tumuli, buried artefacts, especially metal, from about 2000 BC, Roman artefacts and evidence of settled communities from about 165 B.C. Byzantine settlements from about 395 A.D and Ottoman settlements from the early 1500's. The location of the route in the floodplain means the footprint has a high potential for containing buried, and as yet undiscovered, archaeological resources.

0.3.10. A principal item of cultural heritage close to the route is the magnificent XII Century Byzantine Church and associated monastery at Rubik, which dates back to 1162. This church is located on a small rocky hill overlooking the town and the Fan River. Rubik church is considered to be one of the most precious monuments in the inventory of Albanian cultural heritage, as it is among the most ancient cultural objects in the Balkans. The church is undergoing a period of restoration.

Socio-economic Baseline

0.3.11. The route passes through the Mirdita District. The District has an area of 867 km^2. It has five communes, two municipalities and 80 villages. Rreshen is the administrative centre of Mirdita District. The population of the Mirdita District has fallen in the last 12 years (1989 – 2001 census data) by a very significant 26.5% (from over 50,000 people to less than 38,000). This represents a substantial demographic shift that would have had a significant impact on the socio-economic structure of the district as well. The main cause of the fall in population will have been the closure of the mines leading to outwards migration as people have moved to find new employment. In addition, after the communist regime fell many Albanians emigrated out of Albania, mainly the young males.

0.3.12. Most of the population of Albania is still employed in the agricultural sector (over 50%). In Mirdita District it is estimated that 63% to 78% of the working population is involved in agriculture. But the agricultural sector has a very low earning potential, with as little as US$16.00 per month. The agricultural sector faces many problems in promoting earnings from agriculture. Not least is the availability of irrigation water, which has been exacerbated by the fragmentation of the farming sector by government led agricultural reform programmes in the 1990s, which has lead to smaller farms operated by individual land owners. Access to land that is suitable for irrigation is equally problematic, making the fields and hay meadows in the valley floors and on the small terraced areas of the higher mountains very important.

Traffic and Road Safety

0.3.13. Traffic is composed of three segments of freight and passenger demands and these are: Domestic demand, International demand and Transit demand

0.3.14. Domestic demand is formed by the flows generated and attracted from the transport zones internal to Albania. International demand includes the flows generated by internal zones and attracted from foreign countries (exports or outgoing visitors) and by flows generated by foreign countries and attracted by Albania (imports or incoming visitors). Transit demand consists of flows of freight and passengers generated and attracted by foreign countries that travel through the Albanian network.

0.3.15. Surveys and analyses were made of existing traffic and the forecasts made for future traffic demands for the 'do nothing' and the proposed route scenarios using the program 'TransCAD'. The following table shows the average annual daily traffic (AADT) for 2003 and projected for years 2009, 2014 and 2023.

Average Annual Daily Traffic (AADT) figures projected for the Milot – Rreshen road link

Scenario	AADT All vehicle modes (Number of HGVs in parenthesis)			
	2003	2009	2014	2023
Do Nothing	1,360 (100)	2,100 (147)	2,827 (189)	5,113 (282)
Proposed Scheme	1,360 (100)	2,647 (181)	3,570 (240)	6,514 (384)

0.3.16. The current traffic demand in Albania follows patterns that the existing infrastructure was never intended to service. Roads and bridges are often too narrow, rough, lack adequate signing and are unsafe. Official fatality rates in Albania are widely estimated to be under-reported and yet are already recognised to be amongst the highest across European countries. The issue of road safety and the need for adequate road maintenance is a significant priority particularly in the light of official statistics which indicate levels of road traffic to be increasing at a rate of over 10% per annum.

0.3.17. A project providing technical assistance to the Directorate of Road Safety and Traffic, has just been completed. The project objective was to address the technical issues of road safety with the aim of reducing the number of traffic accidents. Importantly, the project has begun to address the lack of institutional capacity identified by the Government's own Action Plan for Road Safety, particularly in the implementation of road and vehicle safety legislation.

0.4. ENVIRONMENTAL IMPACTS

Natural Soils and Agricultural Soils

0.4.1. The proposed road could have an impact on soil erosion, particularly where increased cuttings and embankments are required. This erosion would lead to loss of land for production, loss of habitat, increased flood risk (by more rapid and higher levels of runoff), undermining of the road and increased siltation of the River Mat and the River Fan. This would have to be mitigated through proper engineering, the use of gabions (stackable wire cages filled with stone rubble) in

appropriate places and the rapid replanting of bare soil with grasses and other ground cover, as set out in the Environmental Mitigation Plan.

0.4.2. The location of the road in the river valley floodplain can result in erosion on the opposite river bank. The design must be reviewed and updated if necessary to include mitigation measures (such as gabions) to protect the opposite bank and prevent this impact being significant.

0.4.3. There is likely to be contaminated land within the vicinity of the abandoned copper processing plant a Rubik. However the revised route of the proposed road onto the disused railway alignment should ensure that the construction works do not encounter the contaminated materials. Nevertheless, the Contractor and Supervision Consultant should be aware of the potential problem and if any contaminated material is identified during the construction in this area, construction workers must be provided with the appropriate protective equipment (i.e. face and nose masks, eye goggles, industrial rubber gloves etc.). The contaminated soil should be removed and deposited in a sealed pit in an area agreed with the Local Authority.

Air Quality and Noise

0.4.4. Locating construction compounds away from sensitive receptors and standard good site management practices, as detailed in the Environmental Management Plan, will be required to keep the impact on air quality and noise to a minimum level during construction. Due to the low predicted increases in the level of traffic on the road the predicted increase in noise and decrease in air quality are not considered to be significant.

Climate

0.4.5. The proposed road scheme is not predicted to have a significant impact on climate.

Surface and Groundwater

0.4.6. The impacts on water quality during construction are likely to be low, provided good site management practices are adopted.

0.4.7. During operation the traffic volumes will generally be low and the drainage design would allow for surface water to run off over the verge of the road. This would allow some treatment of pollutants in the soil, and because there will be high levels of dilution in the rivers the concentrations of pollutants due to the road runoff would normally be undetectable.

0.4.8. The pollution risk from accidental spillage may increase slightly due to the higher volumes of traffic. Therefore the emergency services should assess their potential for dealing with any accidental spillage and for containing the hazardous material before collecting and removal to a safe waste disposal point.

0.4.9. Where the soft verge is limited (or non-existent) then drains must be installed and directed to a specific discharge point. This should be designed to ensure that erosion around the discharge point does not take place. It should also be designed to ensure that the flood risk presented by the receiving body of water is not increased, which might require attenuation ponds to be constructed.

Hydrology

0.4.10. During the public consultation in Fushë Milot, the residents expressed their concerns regarding their perceived increase in the risk of flooding for their village, when the River Mat is in flood, due to the poor condition of the flood protective bund adjacent to Fushë Milot. The reason for the perceived increase in risk of flooding is because the previous alternative (No. 2) actually

made provision for strengthening the flood protection because the road embankment followed the edge of the floodplain and would have provided increased protection. The proposed alignment does not provide this protection. On the other hand it doesn't actually change the 'status quo' of the situation. But the residents' concerns have been addressed by the GRD and provision to improve the situation is to be provided by the Ministry of Agriculture. This is discussed in more detail in the "Mitigation" section (paragraphs 0.5.4 and 0.5.5).

Flora and Fauna

0.4.11. The scheme is unlikely to have a significant impact on flora and fauna . The construction of the road will be scheduled to prevent the destruction of habitats used by nesting birds in the breeding season (March & April). Construction compounds will be located in areas already affected by the military works or close to urban-style areas in order to minimise the impact on flora and fauna. The compounds shall be fenced to minimise intrusion into adjacent habitats. During operation, the risk of traffic hitting wild fauna will be reduced through the use of traffic warning signs where deemed necessary.

Landscape

0.4.12. The construction of the scheme is likely to have a significant impact on the landscape. However, it will be possible to reduce the severity of the impact through the adoption of measures set out in the Environmental Management Plan, and any remaining impacts will be of limited duration.

0.4.13. The proposed overpass at Milot can be expected to have a visual impact on the residents of Milot and the character of the surrounding area. The severity of the impact on residents will have been reduced to some extent by giving them advanced notice of the proposals through the public consultation. The visual impact was not identified as an important concern at the consultation.

0.4.14. The current problems of illegal dumping of waste adjacent to roads could increase significantly once the proposed road is constructed. Increased enforcement of illegal dumping would be required to mitigate the potential impact, and prevent it having an adverse impact on the landscape.

Land Use

0.4.15. The construction of the scheme may have a minor beneficial effect on the land value of the potentially contaminated land adjacent to the copper-processing complex in Rubik.

0.4.16. The scheme would result in the irreversible loss of high quality agricultural land on the low flood plain fields south of Fushë-Milot and on the edge of the Mat and Fan river valleys. The loss of agricultural land would be mitigated through compensation as part of the expropriation and resettlement plan.

0.4.17. Residential and commercial properties that would be destroyed by the scheme would be compensated as part of the expropriation and resettlement plan.

Social and Economic

0.4.18. The operation of the road can be expected to have a significant beneficial effect on the economy of the area through increased access to markets, enhanced agricultural production and secondary processing of materials, increased tourism and associated services, leading to an increase in employment. Improved access to health services and other facilities would have positive effect on social welfare.

0.4.19. The proposed scheme can be expected to lead to increased residential and commercial development adjacent to the road. If development takes place on valuable agricultural land along the route, the scheme could have a moderately significant impact on these resources. Enhanced enforcement is required to reduce the high levels of illegal construction and protect this land and prevent the scheme leading to an increase in unlicensed quarrying and illegal waste dumping.

National and Cultural Heritage

0.4.20. The potential impact on undiscovered archaeology at the construction stage would be mitigated through employing an archaeologist to supervise any works in sensitive areas. If any archaeology were found then the construction works would be stopped and the appropriate authority informed. The scheme is not predicted to have any impact on built heritage.

0.4.21. The impact on social culture depends on the values of the communities affected. There may be a slow decline in traditional lifestyles and cultural values, but the local population may wish to embrace the potential changes and improve their quality of life through modernisation.

0.5. MITIGATION

0.5.1. For the adverse environmental impacts of the Project, the EA team has developed a series of measures to avoid, minimise, mitigate or otherwise compensate the adverse impact from the project. These mitigation measures are summarised below.

Design Phase

0.5.2. Design consultant has completed the detailed design stage of the Fushë-Milot to Rreshen section. But the design needs to be revisited at certain locations in order to address issues which were raised during the public consultations. In particular the section of the proposed road between Km 19 and Km 20 needs some additional junctions in order to connect with the existing road. Similarly the design for the sections of the road which pass through the villages of Fangu, Munazi and Vau i Shkjezës needs to be revisited in order to make provision for access to the villages from the proposed road.

0.5.3. In order to mitigate the impact of the proposed road on the landscape, the design documentation should be revisited to make provision in the contract documentation for placing of topsoil, grass seeding and landscape planting of trees and shrubs on earthwork embankments wherever possible.

Hydrology (Flood Protection)

0.5.4. As mentioned in the "Environmental Impacts" section, the concerns of the Fushë Milot residents regarding the perceived increase in the risk of flooding for their village if the proposed road is constructed will be addressed by the Ministry of Agriculture (MOA). The MOA, together with the District Administration Agency of Lezha, has agreed a programme for engaging consultants to design the protection requirements, allocation of funds from the State budget and engagement of Works Contractors to rehabilitate the protection embankments.

0.5.5. Initially urgent repairs to the northern protective flood embankment will be carried out before the end of 2006. This will be followed in early 2007 with rehabilitation works for the full length of the southern protective bund (adjacent to Fushë Milot).

Construction Phase

Soil Erosion

0.5.6. Prevention of embankment erosion shall be undertaken to ensure that all necessary actions are incorporated to ensure embankment stabilisation. Slopes of road embankments will be seeded with a fast growing crop and a native seed mix immediately after fill placement to prevent scour and to encourage stabilisation.

0.5.7. Construction in erosion and flood prone areas will be restricted to the dry season. Discharge zones from drainage structures will be furnished with rip-rap to reduce erosion when required. Down drains/chutes will be lined with rip-rap/masonry or concrete to prevent erosion. Side slopes will be adjusted to a gradient to be determined as necessary to reduce erosion potential.

0.5.8. Prior to the use of a disposal site, a bank will be constructed at the lower end of the site to prevent the flush of the spoiled materials in the piles into nearby rivers or farmland. Interception ditches will be built at the upper side of the site to divert the runoff away from the site. Measures will be taken to ensure waste material is not dumped in streams or at the riverside.

Surface and Groundwater

0.5.9. Side ditches will be constructed prior to road construction, to prevent the road run off flowing into streams, canals or farmland. Temporary canals will be provided to replace any existing canals to be temporarily occupied. Where the site run off is to be discharged to a river, the rate of discharge will be controlled so that it does not cause localised flooding in the watercourse.

0.5.10. Stockpiles of the construction materials, such as asphalt, oil and chemicals shall not be located near to any surface watercourses, lakes or water wells. The site run off discharged from construction yard activities will be treated in accordance with their source. The water coming from washing of the machines and from the equipment requires sedimentation treatment in a settling tank for coarse particles and oil interceptors to allow the fine particles and the oils to then be eliminated. The water coming from washing of the aggregates and from the production of conglomerates will be treated by sedimentation in tanks and then used again or sent to another place

Air Pollution

0.5.11. Construction activities can cause dispersion of dust into the atmosphere and a reduction in local air quality through emissions of poorly operated or maintained machinery. In order to mitigate this impact the following measures will be adopted. Water sprinkling to limit the dust emissions in areas near the construction materials and non-asphalt roads. Covering the surfaces with plastic covers during storage and transportation of materials. Periodical cleaning of the construction yard and relevant access roads. Installation and utilisation of filters in concrete-batching plants to eliminate concrete dust. Efficient use of modern construction machinery to minimise emissions.

Noise

0.5.12. The construction schedule will be carefully developed for the section near sensitive receptors (schools, hospitals, residences, animals, etc.) to minimise the impact of noise. As a surfaced or unsurfaced road is already available throughout the entire proposed scheme length, temporary access roads will not cause any additional problems for the residents close to the construction site. The transportation of construction materials on the existing roads will be carefully scheduled to avoid any disturbance to the local traffic. At night, construction vehicles will be requested to operate at low speeds and the use of horns will be banned. Operation of noisy

equipment will be prohibited from 22.00 – 6.00 each day, unless agreed by the Supervision Consultant.

Flora and Fauna

0.5.13. Any land temporarily occupied by the project should be re-cultivated immediately after the construction. The topsoil layer shall be removed before construction of the earthworks commences for re-use prior to landscaping. Topsoil shall wherever practicable be used immediately after its stripping and if not shall be stored in stockpile heights not exceeding 2m and in addition shall not be stockpiled for more than two years. Topsoil shall not be unnecessarily trafficked either before stripping or when in a stockpile. Stockpiles shall not be surcharged or otherwise loaded and multiple handling shall be kept to a minimum. Furthermore topsoil shall not be excavated from stockpiles, whether on site or imported which have been exposed to a cumulative rainfall exceeding 100mm over the preceding 28 days. A survey of the remaining trees on the route of the road should be carried out prior to construction starting.

0.5.14. The contractors will be required to arrange with the Prefect of Lezha Circle for the location of their construction sites, camps and temporary access roads to keep these away from sensitive areas whenever possible. The construction of the camps will be controlled to minimise damage to soil and vegetation.

Landscape and Land Use

0.5.15. Fencing walls will be constructed around the construction sites near to sites of landscape sensitivity. The solid waste from construction and domestic sources will be disposed of regularly in engineered and designated facilities identified by the contractor. Random dumping of solid waste will be strictly banned. The material storage and mixing stations will be located at least 6 metres from the river edge and where they will not be visible from major public areas. In addition the perimeter of these areas should be trenched as well.

0.5.16. The existing roads will be used as much as possible to access construction sites. If not possible, the access roads will be selected in places that would minimise the damage to vegetation and to scenic sites.

Natural and Cultural Heritage

0.5.17. The areas of archaeological significance are at a sufficient distance from the proposed road, therefore specific archaeological protection measures are not required. During excavation in known areas of archaeological significance and areas of archaeological potential, Albanian and World Bank "chance find" procedures will be followed which includes the requirement that a watching brief is undertaken by an archaeologist.

Roads Used for Access to the Construction Sites

0.5.18. A provision will be included in the tender documents for the Contractor to carry out any necessary repairs to the existing roads used for access to the site. An initial assessment of the condition of the access roads that will be needed during construction shall be made. Then following completion of the Works, a further inspection shall be made of those same roads to determination any necessary repairs by the Contractor to return the road to its original condition.

Operation Phase

Soils

0.5.19. On completion of the road, visual inspections of all the structures along the alignment, will be undertaken by the GRD's Environmental Department to ensure that the road structures are not causing erosion, and to identify the requirements for and to carry out any remedial work.

Landscape and Land Use

0.5.20. The construction of housing within the 44m right of way of the new road is prohibited. All construction is subject to licensing by the district, as the responsible unit of local government.

Surface and Groundwater

0.5.21. The use of sustainable drainage systems, such as retention basins with reedbeds should be considered in future. These can reduce flood risk through the storage and controlled release of storm water runoff. They can also improve the water quality of road runoff prior to discharge into watercourses.

Flora and Fauna

0.5.22. Once the road is completed and in operation, the route will be monitored by the GRD to detect evidence of areas of significant wild fauna movements and then appropriate warning traffic signs will be provided on the approaches to these areas to alert the drivers of the presence of wildlife and so protect the species.

0.6. ANALYSIS OF ALTERNATIVES

Alternatives Considered

0.6.1. Three alternative routes have been considered during the feasibility and design preparation stages. **Alternative 1** would follow the existing national road SH.30 from Milot through Rubik to Rreshen. **Alternative 2** would leave the national road SH.1 approximately 1.5 km south of the new River Mat Bridge and follow the existing national road SH.6 from Milot to Skuraj junction, then a rural road parallel to the abandoned railway on the east side of the Fan river valley. Then north of Rubik this alternative joins the alignment of Alternative 1 to Rreshen (SH.30). **Alternative 3** would leave the national road SH.1 approximately 2.2 km south of the new River Mat Bridge to Milot. Then from Milot the alternative follows the alignment of the abandoned railway to Rreshen.

Assessment of Alternatives

0.6.2. An assessment of the environmental impacts of the alternative routes has been carried out. Alternative 1 is broadly similar in environmental terms to the "Do Nothing" situation since it involves upgrading and minor re-alignment of the existing road. Alternative 2 would introduce a second road into the River Fan valley from Skuraj junction to Rubik. However the environmental impacts of the alternative are not considered to be significant and would be mitigated by improved access to markets for the residents of the area and also by tree and shrub planting on the road embankments. Alternative 3 is similar to alternative 2 in that it introduces a second road into the River Fan valley between Skuraj junction and Rreshen. The main environmental impact of Alternative 3 would be on the residents of Milot where the road is approximately 14 metres above the surrounding land in order to pass over the existing road and railway to the west of Milot. However the route is passing through an industrial area at this location and therefore the impact can be mitigated by landscaping the road embankment with trees and shrubs. All three alternatives are considered to be "Environmentally Acceptable".

Preferred Alternative

0.6.3. Since all three routes are considered to be environmentally acceptable, other factors have influenced the selection of the preferred route. The Government of Albania's desire to allow for a future upgrading of the road to a dual carriageway standard and the fact that the abandoned railway land was not being productively used has led to the alternative route which follows the disused railway (Alternative 3) being adopted as the preferred option.

0.7. ENVIRONMENTAL MANAGEMENT PLAN

Objectives

0.7.1. The EMP provides a framework for the implementation of mitigation measures and environmental management and monitoring during the Project implementation. As such, it represents the commitment of the Government for environmental protection, pollution control and impact minimisation. More specifically, the EMP is to:

- Set out the legal and policy framework as well as applicable environmental standards with which the Project will be compliance;
- Identify and design with sufficient details and specifics of mitigation measures for adverse impacts of the Project;
- Specify institutional roles and responsibilities for mitigation measures implementation and environmental management during Project; and
- Outline the requirements for environmental monitoring programmes and reporting needs;
- Provide a document, which may be used as a stand-alone document during Project implementation for Project supervision.

Management and Supervision Organisations

0.7.2. Ministry of Environment, Forests and Water Administration (MEFWA) would propose to the Council of Ministers (CoM) the activities concerning the monitoring in order to involve the specialists of the Environmental Inspectorate. A multi-disciplinary team would be constituted that would demonstrate it has the equipment and qualified personnel to elaborate and carry out the monitoring.

0.7.3. According to the Monitoring Plan, the contractor would have the task of preparing the detailed Monitoring Plan that would be developed in accordance with GRD and MEFWA. GRD will have the responsibility to co-ordinate and to control the monitoring activities with the assistance of the Supervision Consultant.

Environmental Monitoring

0.7.4. GRD will have to constitute a group of technicians that will control the elaboration of the Plan and the execution of the measures (Environmental Department). The GRD's environmental specialist will support this group.

0.7.5. The EMP includes environmental monitoring programmes for both construction and operation phases. The parameters to be monitored include soil erosion, noise, dust, degradation of water quality, stream sedimentation and solid waste disposal. During the construction phase, environmental monitoring will be conducted in two approaches: daily and routine monitoring consisting of mainly visual observations and limited equipment measurements such as hand-held

noise meters; and periodic monitoring by professionals using standard methods recognised by regulatory authorities.

0.7.6. Monitoring reports will be compiled by the GRD at intervals of once every three to four months, summarising the findings of the monitoring. The reports will be submitted to Ministry of Public Works, Transport and Telecommunications as well as relevant agencies and the World Bank. During the operation phase, noise levels should be monitored by GRD once a month for the first six months and once every six months thereafter. Soil erosion will be monitored once every six months.

0.7.7. After the road has been constructed, GRD will commence a programme of traffic counts in order to determine the lowest monthly flow, the highest monthly flow and an average monthly flow. When the traffic flow pattern has been established, GRD will carry out air quality monitoring during each of the aforementioned months, in order to establish the air quality during low flow/high flow/average flow conditions.

Institutional Strengthening

0.7.8. An Environmental Unit was established within the GRD in early 2004. The Unit comprises two members who were selected from the GRD staff because they were considered to have the most relevant academic background with respect to environmental issues. The head of the unit had previously addressed the environmental issues for the GRD. His academic studies included subjects such as geology, hydrology, geography, air and noise pollution and palaeontology. The second team member is an Environmental Specialist with a degree in geography.

0.7.9. Since the formation of the Environmental Unit in 2004, it has been increasingly more active, with developing skills, and is now fully responsible for providing the GRD's input regarding environmental issues for road projects which are currently being prepared by external consultants. The staff is regularly involved in attending public consultations or preparing/reviewing EIAs, in accordance with Albanian or other Donor's environmental policies, for the road schemes under the responsibility of the GRD.

0.7.10. Appropriate staff training would be beneficial for the unit staff to ensure that they are up-to-date regarding EU environmental requirements and to ensure that the unit is able to assist the Environment Inspectorate with monitoring the implementation of the mitigation measures, environmental management and resettlement plan.

Estimated Cost for Environmental Mitigation

BASELINE	CONSTRUCTION	OPERATION
$18,000	$262,000	$10,000
	TOTAL est. costs	**$290,000**

0.8. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

0.8.1. Two rounds of public consultation have been carried out during the EA. The first round was held during 2004 after preparation of detailed design of the initial road alignment by ITP, following the feasibility study carried out by Technic/Mott MacDonald.

0.8.2. Since that series of consultations, the road alignment has been significantly relocated at the start and end of the road section. However the section from Milot to Rubik is essentially the same

alignment, although marginally relocated sideways. For this reason, the earlier public consultation records for the meetings held in Milot and Rubik are still relevant and are included in EA report.

0.8.3. The second round of public consultation meetings has specifically addressed those realigned sections at the start (Fushë-Milot) and end (Munazi to Rreshen) of the road section. Public meetings were held in Fushë-Milot on 22nd January 2006 and in Vau i Shkjezës on 19th February 2006.

0.8.4. Of the environmental concerns, there were two main issues. These are pertinent to the location of public consultations held. The first issue was referred to by the residents of Fushë-Milot and relates to the poor condition of the flood bund, which should protect the village from flooding. The latest proposal has relocated the road to the south of the Fushë-Milot and as a result the protective flood bund is not strengthened by the project. The local authority representatives present during the public consultation have raised the awareness of the relevant ministries (Min. of Interior and Min. of Agriculture) to the public's concerns. The Ministry of Agriculture has determined a programme for carrying out repairs to both the northern and southern flood protective embankments during 2006 and early 2007 respectively (see paragraphs 0.5.4 and 0.5.5).

0.8.5. The residents of Rubik, Fierza, Vau i Shkjezës and Rrethi i Epërm referred to the second issue. Their concerns relate to the works which have been carried out by the Albanian army during 2004 near Rubik and Fierza and in 2005 near of Vau i Shkjezës and Rrethi i Epërm. In both cases the army have deposited the excavated material in the river floodplain. The residents' anxiety is connected with the fact that at both locations the deposited material has caused erosion of the opposite riverbank. The material also increases the risk of flooding due to the restriction of the valley width. This issue has been addressed as a result of the public's concern and the EMP makes a provision for the surplus material to be extracted from the river by the works contractors and re-used wherever possible as bulk fill for the earthworks.

0.8.6. In compliance with EIA process requirements of Albanian legislation and the World Bank's policies, the completed EIA and RAP will be disclosed in suitable public places along the route of the road, such as local authority offices etc., and at the GRD office in Tirana.

0.9. CONCLUSIONS

0.9.1. The Milot to Rreshen road will play an important role in promoting regional economic development, improving access to market and services, the standard of living, and assisting in poverty alleviation for the settlements within the Mat and Fan river valleys. The section also forms an important segment of the proposed major transportation route 'Durres to Morine', linking the Port of Durres with the Kosovo border.

0.9.2. The construction and operation of the road will result in a number of adverse impacts to the physical and socio-economic environment in the Project region. These impacts include damages to the ecosystem, permanent occupation of land, vegetation and agriculture, increased soil erosion, increased noise and air emissions along the highway alignment, community severance and relocations. Although most of these impacts are considered to be slight.

0.9.3. However, with the mitigation measures designed specifically for the adverse impacts, the impacts will be prevented, reduced, minimised or otherwise compensated. Furthermore, an environmental management system involving environmental management and supervision, environmental monitoring, institutional strengthening and personnel training will be established to ensure the environmental performance of the Project. The appropriate implementation of the mitigation measures, as well as the environmental management plan, will reduce the adverse impacts to acceptable levels. The Project is considered to be environmentally acceptable if the mitigation measures and EMP are implemented effectively.

1. INTRODUCTION

1.1. The Durrës-Kukës-Morinë Road is one of the Albanian Government's main priorities, in so far as road infrastructure is concerned, as it represents a significant artery in the country's development. Its significance was particularly enhanced after 1999, when Kosovo was freed of the Serb regime that governed it. In addition, this road segment is particularly vital for the development of the north-eastern regions of Albania, which are some of the country's poorest and particularly lacking in road infrastructure. Therefore, the design and construction of this road segment is not only necessary and important, but also extremely urgent.

1.2. In accordance with World Bank safeguard policies and procedures (OP/BP/GP 4.01 Environmental Assessment), the project falls within an "A" category rating and a detailed environment assessment (EA) must be prepared accordingly. The project is likely to have significant adverse environmental impacts, such as the increased flood risk upstream and downstream of the proposed highway embankment between the Fushë Kruje to Lezha highway and Milot. Furthermore, the scheme would affect a broader area than the physical alignment of the scheme, and without mitigation the scheme would have an adverse impact on the surrounding environment, including the high quality landscape, water quality, air quality and noise environment.

1.3. A detailed EA is therefore required to examine the project's potential negative and positive impacts and recommend any measures needed to prevent, minimise, mitigate or compensate for those adverse impacts and improve environmental performance.

1.4. This Environmental Impact Assessment Report has taken into account the previous EIA Report prepared by Tecnic/Mott MacDonald and reviewed and updated by Scott Wilson. However since the previous EIA report was reviewed by Scott Wilson, there has been a significant change to the road alignment. In general, the road alignment now follows the route of the disused railway between Milot and Rreshen. In particular this significantly changes the location of the road between Rubik and Rreshen, with the route of the road now moved from the southern side of the River Fan to the northern side. In addition, at the commencement of the scheme, close to Fushë-Milot, the route of the road has been significantly altered since the previous Environmental Assessment.

1.5. In view of these significant changes to the alignment of the road at the start and ending of the project, sections of this report have been subdivided into three parts to assist in identifying the impact of the change in alignment. The report therefore identifies the three sections as follows:

(1) Fushë-Milot to Milot Section – significant change in alignment since previous report published.

(2) Milot to Rubik Section – slight adjustment to road alignment (original route ran parallel with the railway, now the alignment utilises the disused railway).

(3) Rubik to Rreshen Section – significant change to the road alignment (route of the road now on the opposite side of the river).

1.6. This environmental study has been drafted by the General Roads Directorate of the Ministry of Public Works, Transport and Telecommunications. The aim of the study is to analyse both the positive and negative environmental factors, identify alleviation measures for the reduction of negative impacts. Its main objective is the improvement of ecological and regenerative values of the particular territory that the road passes through.

1.7. The study identifies the positive and negative impacts on both the natural and human environments, and taking into consideration the risk values, it ascertains protective measures for

the environment. The reduction of negative impacts on the environment has been intertwined with important positive ones, in particular as direct compensation to the community.

1.8. So as to have as much information as possible on the environment, field trips and fieldwork were carried out, which included habitat confirmation, data collection on the surrounding flora and fauna, sample collection in the territory earmarked for construction of this segment, meetings with local experts and basic information, such as publications on several issues with regard to this area.

2. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1 Policy

2.1.1. During the last decade the government began developing a framework to reverse the environmental degradation that had arisen from previous industrialisation under the socialist regime, which neglected the protection of the environment almost entirely. Environmental management and protection is clearly part of the Constitution that requires the Republic to:

"maintain a healthy and ecologically suitable environment for the present and future generations".

2.1.2. In addition, the Constitution requires natural resources to be rationally exploited in accordance with sustainability principles.[1]

2.1.3. The most up to date policy on the environment is in the 2002 Law No 8934[2] where Chapter II, Environmental Policies, sets out governmental policy on:

- environment state policy – sets the position of the environment in the constitution, the place of national sector strategies and local plans as part of the environmental policy and defines the bodies who are to administrate the policy
- environment strategies and programmes – states a National Environment Action Plan (NEAP) is to be produced every ten years and that an annual environmental report on the implementation of the NEAP is to be produced for the Council of Ministers
- environment local plans – requires local government to develop local Environmental Action Plans (EAPs) using national bodies to provide technical support and data, for local government to engage the public, NGOs and business in development of the plans and mayors to report to district councils on the implementation of the plans at the end of each year.

2.1.4. Specific statements on the protection of environmental aspects are included in Chapter III, Utilisation and Protection of the Environmental Components. These include the need for equal protection of all resources; the need for development activities (including agriculture and waste management) not to pollute the land, air or water; sets out criteria to define how water resources are used; bans import or use of ozone depleting substances; protects biodiversity and the built environment; places limits on residues; controls dangerous substances; and sets out tariffs and environment taxes.

2.1.5. The GoA published the first National Environmental Action Plan (NEAP) in 1993 that set environmental goals and an action plan for the country. The first State of the Environment report was produced in 1994 and a second was produced in 1998. The State of the Environment report for 1999/2000 has been produced but not published – although this is anticipated to be published soon. The delay has been caused by the changes in the institutional set up of the Ministry of Environment, Forests and Water Administration (MEFWA) that replaced the National

[1] UNEP : Post conflict Environmental Assessment in Albania, 2000
[2] Law Nr 8934, on Environment Protection 5/09/2002.

Environmental Agency (NEA). The poor delivery of the annual report on implementation of the NEAP is due to lack of resources and institutional changes that have been going on in the last three years.

2.2. Legislative Background

2.2.1. The legislation governing environmental protection is being strengthened relatively rapidly in Albania. The first Law on Environmental Protection was enacted in 1993 and amended in 1998 and 2001. That law states in Chapter II, Environmental Impact Assessment, Article 7 that:

"all the activities of natural and legal persons, native or foreign, who exercise their activities in the territory of the Republic of Albania, shall be subject to environmental impact assessments".

2.2.2. Article 8 gives in general terms the types of activities for which the authorities shall require an Environmental Impact Assessment (EIA) to be conducted. Article 9 specifies the responsible authority to be the Committee of Environmental Protection, and its regional activities. The law does not specify individual stages for the EIA process.

2.2.3. More recently Law No. 8934 on Environmental Protection was enacted. This abrogated all previous environmental protection laws and has ten principal areas of governance:

- Environmental Policy
- Utilisation and Protection of Environmental Components
- Environmental Impact Assessment
- Permission for the Activities that Impact the Environment
- Prevention and Limitation of the Environment's Pollution
- Monitoring and Data
- Environmental Control
- Environment State Bodies Duties
- Public Role
- Sanctions

2.2.4. Law No. 8934 states that environmental protection is the obligation of all states, judiciary and individuals with activities in Albania. Article 34 requires any person or state organisation to obtain permission from the responsible bodies (MEFWA) in order to carry out any specific works in Albania that has an impact on the environment. In order to obtain this permission an environment impact assessment is to be conducted.

2.2.5. Until recently there has been no legally defined process for the development of EIA's. A law on Environmental Impact Assessment was drafted in 1995 that hitherto was never adopted by GoA. This draft law has been used on occasion as the guideline on EIA procedures in Albania. However, Law No. 8990 on Environmental Impact Assessment was passed on 3/01/2003 and now defines all the procedures for the preparation and submission for approval of EIAs in Albania. The law also defines what level of EIA has to be conducted for the various types of development.

2.2.6. Law No.8990 aims to secure to provide:

a) A general integrated estimation of environmental impacts of the projects or activities which will be realised thus preventing and attenuating the negative effects on the environment in time.

b) An impartial and administrating evaluation process with the participation of central and local institutions, public institutions and non-profit organisations for the environment, project promoter, environmental specialists and juridical people specialised in environmental issues.

2.2.7. For this project, article 26 of law no.8990 requires public participation in the process of Environmental Impact Assessment in line with the requirements of the new environmental legislation and the relevant EU directives. Public participation commences with the project concept and throughout the process of formulation, review, approval and implementation. Public participation has to include:

- information of the public on the project;
- debates and consultations on the project;
- participation in decision making of the environmental organisations for the project; and
- evaluation of the public comments, which are reflected in the project content and in the decision-making text.

2.2.8. The project cannot be submitted for Environmental Impact Assessment procedures if the proposer has not consulted the public and has not reflected its comments and suggestions in the documents submitted for review. Also the project shall not receive the environmental licence if there has been no public participation in the course of the process of the EIA and if this participation is not reflected in the documents submitted for asking for environmental permit.

2.2.9. In the consultations with the public, the proposer has to commit experts that have prepared the technical project and the experts that prepare the EIA report and who prepare the necessary materials for consultations with the public in a form understandable for the public and clarify the matters for which there is public interest.

2.2.10. In order to ensure public participation the environmental regional agencies perform the following tasks:

- Instruct the proposer in meeting the legal requirements for public participation;
- Follow from close and participate in the consultations with the public;
- Communicate with organisations at local level that have a stake in the project;
- Assist local government in organising public debate on the project; and
- Ensure participation of the representatives of the public and local media in decision-making for the project for which they are responsible for issuing the consent or environmental authorisation.

2.2.11. For the organisation of the public consultations, the environmental regional agency has instructed the proposer to develop a programme with specific requests and operational deadlines. The programme has to include the identification of stakeholders and the methods that will be used for public participation and why exactly those methods have been selected. The stakeholders that have to be included in the process of EIA are:

- Environmental Authorities;
- Representatives of local government entities (municipalities, regions, communes);
- Representatives of health entities;
- Authorities responsible for land use (territorial adjustment, town planning, regional departments of forests and pastures);
- Representatives of tourism, industry, energy, transport entities;
- Representatives of educational entities etc. NGOs;

- Representatives of business organisation associations; and
- Representatives of the media.

2.2.12. In co-operation with the Min. of Environment the proposer (GRD) decided on the dates for the consultation. The draft EIA report was made available to the participants from the Ministry that licences the project, the territorial adjustment and tourism entities, local government units. The proposer notifies the participants 10 days in advance for the day, time and location of the consultation meeting.

2.2.13. To construct any road project of national significance, an environmental permit (license) must be obtained from the Ministry of Environment. In order to obtain this for this project, the applicant (GRD) shall prepare and submit to the Regional Environmental Agency (REA) of the region where the project will be implemented (in this project's case the 'Lezha Office') the following documentation:

a. legal documentation which shall include:
   - court decision for the registration of requester as a physical or legal person;
   - property title or contract for the use of immovable property without which the activity can not be exercised;
   - certificates from the state entities, which allow for the use of the territory for project implementation purposes or exercise of the activity.

b. technical documentation which includes documents that describe the project or activity:
   - project features: description of the main processes, technology, capacities, raw material, intermediate and final products;
   - work program for the construction and utilization
   - other activities that might be required as a result of the project (for e.g. new roads, access to water etc.)
   - project location: design, maps and pictures etc.
   - existing plans for the use of the project territory.

c. summary of the EIA report for the projects of attachment 2 of the law " On environmental impact assessment", which includes:
   - project scope
   - detailed description
   - data about the existing environment of the project area and its vicinities
   - detailed description of all installations, which are part of the project or which will be used in the course of its implementation
   - construction plan and the deadlines for its implementation
   - description of engineering works, which are built or expanded and potential works for the implementation the project
   - potential impact on the environment and proposed measures for mitigation and prevention
   - program for the monitoring of the impact of the project in the environment
   - ensuring consistency of the project with the plans for territorial adjustment and plans for the economic development of the area where the project is envisaged to be implemented;
   - summary of the consultations with the LG entities, public, environmental NGOs and their opinions
   - rehabilitation measures in case of pollution or adverse impact on the environment, and the cost
   - copy of the license of the physical or legal person that has prepared the report of the EIA.

d. detailed report of the EIA for projects which are part of attachment 1 of law " On environmental impact assessment" , which includes in addition to the data of the summary of the report, the following:
   - procedures and reasons for selecting the project implementation site, description of at least two other options;
   - the degree of its direct and indirect impact on the environment;
   - potential dangers of the alternative options on health and environment
   - risks for accidents of important impact on health and environment, and the measures that will be taken for preventing them
   - cross border impact if any
   - the plan of measures of technical nature to prevent and mitigate adverse impacts on the environment
   - detailed description for the sustainable use of energy, natural and mineral resources
   - plan of expected consultations and discussions with local government entities, public and environmental NGOs in the course of planning, review and implementation of the project.

e. the report of the EIA shall be developed by licensed experts and selected by the requester of the environmental permit.

Review of the Application and Grant of Environmental Permit

2.2.14. Upon receipt of the documentation from the GRD, the REA will review the contents and seek clarification from the GRD, if necessary. The REA will then add their comments, and subject to approval, will submit the project documentation to the Ministry of Environment within 20 days of receipt of the application. The Ministry of Environment then has a maximum of 3 months in which to circulate the project application for review by the other ministries and to either grant an Environmental Permit for the Project or to reject the application.

World Bank Procedures for EIA

2.2.15. Since this project is to be financed through a World Bank (IDA/IBRD) Credit, then the Albanian legislation defers to the World Bank's policies and requirements for an EIA. Therefore in accordance with World Bank safeguard policies and procedures (OP/BP/GP 4.01 Environmental Assessment), this project falls within an "A" category rating and a detailed environment assessment (EA) must be prepared according to the Bank's requirements. In accordance with these requirements the Project EIA Report will be disclosed to the public after approval by the World Bank. The document will be disclosed in Milot, Rubik and Rreshen Municipality offices and also in the GRD Headquarters in Tirana. At this time a 'Public Notification' will be placed in a national newspaper indicating where the document is available for public review and the name of the person responsible for providing clarification if necessary.

2.2.16. A series of other enabling legislation is under preparation to support Law No. 8934 on Environment Protection and include:

- pollution control
- protection of habitats and biodiversity
- waste management
- setting environment standards
- monitoring requirements
- protection of values of cultural, scientific, religious and social heritage

2.2.17. Other legislation exists that has an impact on the environment and these include:
Law No. 8093 on Water Resources 1996 as amended by Law Nos. 8375, 8605 and 8736 – regulates the exploitation of gravel from the bed of rivers, streams etc.

2.2.18. Law No 8897, dated 16.05.2002 on "Protection of Air from Pollution".
Law No. 8561 on Expropriations and Temporary Taking of Property for a Public Interest 12/22/1999 – defines land expropriation procedures and compensation levels.

2.2.19. Law No. 7623 on Forests and Forest Policing 1992 and as amended (Articles 63 & 64 only) by Law No. 7839 – define exploitation of forests. Under this legislation, a developer has to plant three new trees for each tree destroyed by the development.

2.2.20. In extreme instances, the public have the right to demand partial or national referendums on specific environment issues under Law No. 7866 On Referenda 6/10/1994.

2.2.21. Law No. 8561, 22/12/1999, states that private persons have rights with respect to private property they own and that the right of public property is exercised only for a public interest and cannot be realised and protected in another manner. It further states that the rights of the owners of properties are protected and that the rights of third parties to those properties are devalued as a result of expropriation.

2.2.22. In the case of expropriation by the state for public interest the competent minister (Minister of Transport and Telecommunications in this case) appoints a special commission to adequately administer the expropriation and sets the value of the properties to be expropriated. The expropriation decisions of the Minister are submitted to CoM for its decision with the property owners having a right of appeal but the appeal may not delay the expropriation.

2.3 Institutional Regulatory Framework

2.3.1. The National Environment Agency (NEA) was established in 1998[3]. In 2002, the new law defined the Ministry of the Environment, which is required to provide centralised control of the environment on behalf of the MEFWA (Article 67).

2.3.2. Article 64 sets out that the MEFWA is supported by:

- Regional Environment Agencies, of which there are 12
- Environmental Inspectorate
- Environmental bodies (to be implementing institutes under MEFWA, such as the Environment Institute that is responsible for monitoring)
- Local government bodies and other inter-ministerial bodies as set up from time to time.

2.3.3. MEFWA's draft environmental policies set out pollution restriction norms and co-ordinates with executing agencies how environmental policies are implemented in the field. As commonly occurs in countries with high levels of poverty, environmental protection is afforded low priority in budgetary terms within government (only 0.01% of the national budget assigned in 2000)[4]. The result is that implementation and enforcement of environmental policy and regulations is weak due to inadequate staff resources, equipment and facilities.

[3] The Albanian Statistical Yearbook 1991-1999, Instat.
[4] UNEP : Post conflict Environmental Assessment in Albania, 2000

2.3.4. Financing the MEFWA is supposed to come in part from licence fees and other sources of funding as set out in the Law No. 8934 on Environmental Protection[5].

2.3.5. MEFWA is responsible for environmental protection and was created by Law No. 8934. NEA, the forerunner of MEFWA, was established through Law No. 7664 on Environmental Protection. Law No. 7664 was based on the European Directive 85/337/EEC and was further amended by Law Nos. 8364 and 8825. Law No. 8990 on Environmental Impact Assessment now details the procedures and fees for preparing Environmental Impact Assessment. Law No. 8934, 5/09/2002 abrogated Law Nos. 7664, 8364 and 8825.

2.3.6. MEFWA has overall responsibility for the environment and it does this through its six Directorates and twelve Regional Environmental Agencies (REAs).

2.3.7. MEFWA Directorates are:

- Directorate of Environmental protection
- Directorate of Air and Water Quality and Waste Management
- Directorate of Project Implementation
- Directorate of Human Resources and Services
- Directorate of Environmental Impact Assessment; and
- Directorate of Law and Foreign Co-operation

2.3.8. MEFWA has a REA located in each Prefecture and one in Tirana. MEFWA is responsible for the implementation of permits, licences and penalties legislated under Law No. 8934. However, at the time of writing of this report MEFWA had not developed the regulations for the implementation of Law No. 8934 and in many instances Albanian environmental standards are not yet developed for the transport sector such as for air, noise and water.

2.3.9. In addition to the duties set out directly for MEFWA, it would appear that a number of other state organisations have a role in monitoring and protection of flora and fauna and include:

- National Museum of Natural Sciences
- Research Institute of Forestry, Pastures and Meadows
- Research Institute of Fisheries
- Institute of Biological Research
- Ministry of Agriculture and Food (responsible for control of forestry)
- Despite of this plethora of institutes responsible for monitoring there have been few actual studies conducted in the field into the status of flora and fauna in Albania. This is primarily due to budget restrictions.

2.3.10. Other implementing agencies that have environmental roles are:

- Ministry of Public Works, Transport and Telecommunications (MPWTT) with responsibility for water supplies etc.
- Ministry of Economy and Energy (MEE)

[5] Article 25 - Tariffs and Environmental Taxes; Article 82 – Sanctions;" and Article 87 - Environment Fund".

- Ministry of Health (MoH) and Institute of Public Health - responsible for monitoring potable water quality and air quality
- Hydro-meteorological Institute – collection of meteorological data and responsibility for monitoring water and air quality.
- National Territory Adjustment Council (NTAC) – responsible for issuing construction permits with conditions that could include requirements for environmental protection.

2.4 The Rights of the Citizen

2.4.1. Law No. 8934 on Environmental Protection sets out the role and rights of the public in environmental matters. Chapter X, Public Role, includes statutes on the following:

- public's right to get environmental data
- public participation in decision taking on environmental issues
- the role of NGOs in the protection of the environment
- the role of business and other professional organisations in the protection of the environment
- the right for private persons to demand the protection of the environment by authorised bodies and the right to take to court any organisation or person who causes damages to the environment, or risks causing damage to the environment.

3. PROJECT DESCRIPTION

3.1 FUSHË-MILOT TO MILOT SECTION

3.1.1. A study was commissioned to assess the environmental impact of the construction of the realigned 4.2km road section between its connection with the SH.1 *Tirana-Shkodra* national road, close to Fushë-Milot, and the town of Milot. (See Key Map in Appendix 5).

3.1.2. The road starts from its intersection point with the SH.1 national road with the provision of a T-junction approximately 2.2km south of the new River Mat Bridge. The road then heads north-eastwards passing to the south of the village of Fushë-Milot across flat terrain which is subject to flooding from the River Mat. Afterwards the route of the road enters the southern edge of the River Mat floodplain on an embankment height of 5m before rising to 14m in height and crossing above the existing railway and former national road SH.1 to the west of Milot. From this point the road descends in height to meet the route of the disused railway and pass to the north of the town of Milot.

3.1.3. Outside the required area of land that this road segment will be built upon, there are meadows, grazing pastures and arable land, which will not be affected, nor damaged by the construction of this road segment. However concerns were raised by the local residents, during the public consultation process, regarding the possibility that the construction of the road on embankment across the flat land to the south of Fushë-Milot could increase the flood level when this occurs due to the embankment trapping the water to the south of the village. This is discussed in more detail in the *Environmental Impacts* section.

3.1.4. The road goes through Milot's south-western lowlands and fields of the farmers who inhabit this area. The land required for the construction of the road is mainly flat arable land of the first

category of a sedimentary type, light and rich in nourishing elements. The total area the road occupies is 12,781 m2.

3.1.5. The main construction phases are as follows:

- Excavation of topsoil to a depth of 30-50cm;
- Filling and compacting the earthworks in required layers;
- Constructing structures;
- Placing of asphalt road pavement; and
- Installing road signs and markings.

3.1.6. The proposed top width of the highway is 11.1m with embankment side slopes of 1:1.5 and generally drainage ditches on either side of the road embankment.

3.1.7. The proposed road separates from the Fushë Krujë to Lezhë national road 2.2km before the new bridge over the River Mat, with an at-grade T-junction intersection, and passes to the south of Fushë-Milot . This intersection has been designed with all the necessary elements.

3.1.8. From the junction the proposed road will be constructed on an embankment of height between 2.0 and 2.5m and will traverse meadowlands containing a lot of urban-type constructions and intersection of many existing drainage and irrigation channels of the Miloti plain field, of which the biggest one is the high waters channel of the Laç-Milot region, crossed by a 3x18.4m structure.

3.1.9. The proposed road intersects the existing Milot-Lezhë road in the vicinity of the railway/roadway bridges near the Milot railway station and crosses over the road and railway with a 4x29m span bridge, which is 14m above the general ground level. A connection with the existing road has been designed for this intersection utilising a 'half-cloverleaf' type junction to suit the specific conditions of the location. This junction provides access to the town of Milot.

3.1.10. Along this road segment, which traverses an agricultural area with an existing irrigation and drainage system on low embankment, the project has foreseen the construction of 15 new minor structures and two major bridges. The latter are a 3x18.4m span bridge at km 2+417 crossing the high waters channel coming from Laç and a 4x29.0m span Milot overpass at km 3+980, crossing the greater irrigation channel, the railway and the Milot-Lezhë road.

MINOR STRUCTURES

3.1.11. The minor structures consist of:

- 4No. pipe culverts of diameter d=1.25m in the irrigation channels at km 0+050, 0+427, 1+260 and 2+166;
- 2No. pipe culverts of diameter d=1.50m in the smaller drainage channels at km 2+478 and 2+705;
- 1No. 2m x 2m and 1No. 2m x 1m box culverts, respectively in the greater drainage channel before the high waters channel at km 2+398 and in the road channel at the start of the 5m x 6m overpass at km 1+864;
- 3No. 3m x 3m box culverts in the greater drainage channels at km 0+438, 0+894, 1+271 and 2+270;
- 2No. 3m x 2m box culverts in the drainage-and-irrigation channels at km 0+894 and 1+820;

- Two underpasses, (a) one 5m x 6m at km 1+864 in the Fushë-Milot to Laç road, which presently functions as a national road and (b) one 4m x 4m at km 3+100 over the road leading to the riverbed.

3.1.12. All these minor structures have been proposed as new construction, the diameter d=1.25m and d=1.50m pipe culverts have been designed for use of precast elements, while the headwalls at the inlet and outlet points as well as the manholes have been designed as monolithic reinforced concrete.

3.1.13. The box culverts and the overpasses have been designed as monolithic reinforced concrete structures.

BRIDGE OVER THE HIGH WATERS CHANNEL AT KM 2+417

3.1.14. This bridge has been designed with three spans connected by 18.4m long precast reinforced concrete beams and monolithic deck and transverse beams. The substructure has been designed with piles of dia.=1.2m and using (rigid) caps for all piles (for piers and abutments). The piles have been designed as embedded into gravel (bearing layer). Two of the abutment wing walls have been designed as reinforced concrete cantilevers, which are connected to the pile cap in the abutment. The pile type is foreseen as drilled using a crane and rotary drill in conjunction with steel casings. The erection of the beams can be accomplished from the ground below.

3.1.15. In summary the three-span bridge will have two abutments and two piers constructed in concrete. Due to the poor strength of the underlying ground, the bridge foundations will need to be supported on concrete piles. The piles will be constructed by boring into the ground until the ground becomes strong enough to support the bridge. During this operation, the soils will be prevented from falling into the borehole by a steel tube. The tube is then filled with concrete before being withdrawn from the ground. After construction of the abutments and piers, high-strength precast concrete beams will be lifted on top of them and a concrete deck will then be constructed supported by the beams. Following this, a waterproof layer will be placed on the concrete deck before the asphalt road pavement is laid across the bridge. The width of the bridge is sufficient for two lanes of traffic (one in each direction).

MILOT OVERPASS AT KM 3+980

3.1.16. This overpass has been designed with 4 spans connected by 29m long precast prestressed concrete beams and monolithic reinforced concrete deck and transverse beams. The beams have been designed with Rck-400 concrete. The cross-section of the overpass will consist of two lanes (one per direction). Longitudinally, this overpass has been designed so that it can function to carry traffic and at the same time ensure:

- The normal flow of the irrigation channel waters; and
- Crossing of the Milot-Lezhë railway and road.

3.1.17. Its elevation has been designed such that it allows a safe clearance height for the Milot-Lezhë Road to pass underneath. The sub-structure has been designed with deep foundations supported by three 2x4 groups of piles of dia.=1.2m embedded in gravel (bearing layer). The abutment on the Milot side has been designed as a massive concrete structure. The drills used for the boreholes shall work in conjunction with steel casings.

3.1.18. Piles, piers and caps shall be made of Rck 300 concrete. The reinforcing steel shall be of 4,000 kg/cm^2 design yield stress.

3.1.19. In summary the four-span bridge will have two abutments and three piers constructed in concrete. One bridge span will cross above the existing road, one above the railway line to Lezha,

one over the irrigation canal and one over the intermediate ground, between canal and railway. Due to the poor strength of the underlying ground, the bridge foundations will need to be supported on concrete piles. The piles will be constructed by boring into the ground until the ground becomes strong enough to support the bridge. During this operation, the soils will be prevented from falling into the borehole by a steel tube. The tube is then filled with concrete before being withdrawn from the ground. After construction of the abutments and piers, high-strength precast concrete beams will be lifted on top of them and a concrete deck will then be constructed supported by the beams. Following this, a waterproof layer will be placed on the concrete deck before the asphalt road pavement is laid across the bridge. The width of the bridge is sufficient for two lanes of traffic (one in each direction).

ROAD LAYERS and GEOMETRY

3.1.20. At the present stage of the detailed design project, the road pavement asphalt layers are proposed as:

- 3 cm asphalt concrete, as wearing course;
- 4 cm asphalt concrete, as binder course; and
- 8 cm bituminous asphalt conglomerate, base course.

3.1.21. The respective base and sub base layers are proposed to be:

- 15 cm stabiliser, fine crushed stones, standard chart, size 0-20 mm (Elastic modulus E = 1,200 Mpa), and
- 20 cm crushed stones 0-40 mm (E_{min} =1,000 Mpa)

3.1.22. The highway geometrical parameters are:

- Design speed V = 90(80) km/h
- Minimum radius 300/250 m
- Maximum gradients 5 (7)%

EROSION CONTROL

3.1.23. Since a section of the road lies within the river floodplain, erosion control for the riverside of the road embankment is proposed. The proposed measures consist in reinforcement of the embankment slope with a concrete lining layer 20 cm thick. This layer coats the fill slopes up to 1.0 m above the predicted quota of maximum water level, for a 100-year return period water flow.

3.1.24. The lining layer is anchored to a longitudinal gabion key with a 1x1m cross section at the base of the fill slope. In order to protect the embankment from scouring at the base, the project has foreseen the construction of a ditch with a trapezoidal cross section, upper base of length B=7.5m, lower base of length b=3.0m and height h=3.0m. The ditch shall be filled with massive cobble rocks of diameter d > 0.60m (70% of the cross section) and crushed stones of diameter d<0.60m (30% of the cross section).

3.2 MILOT TO RUBIK SECTION

3.2.1. This part of the report reviews the section of road from Milot to Rubik. There has been a minor realignment of this 16.0km section since the previous EIA Report was prepared by Scott Wilson. Previously the route of the road ran adjacent to the disused railway alignment throughout this section. But in order to reduce the construction costs, the Government of Albania permitted the road alignment to be concurrent with the railway route and to actually incorporate the disused railway embankment within the proposed road embankment.

3.2.2. From the previous section after crossing above the existing railway and former national road SH.1 to the west of Milot, the road descends in height to meet the route of the disused railway and passes the town of Milot on the north western edge of the settlement heading in a north-easterly direction along the edge of the River Mat valley. After approximately 2.5 km the railway alignment passes around a headland and is very close to the river. As a result of the constraints of the valley side slope and the existing road, a half-kilometre section of the proposed road (approx. km 6+500 to km 7+000) will have to be constructed within the southern edge of the River Mat floodplain.

3.2.3. The proposed road continues to follow the railway alignment heading eastwards until approximately km 10+000. At this location, a junction (Skuraj junction) will be provided to connect the proposed road with the existing national road SH.6 which connects to Burreli, Klos and Bulqiza. After the junction the route turns towards a more northerly direction and crosses over the River Mat with a 4x30m span bridge.

3.2.4. Following the disused railway alignment, the proposed road continues along the eastern side of the River Fan valley passing through a small settlement (Fangu village). After a further 1 km the road passes a section where the Albanian army has carried out an 'advance earthworks' contract over a length of approximately 0.5 km opposite the village of Fierza. In 2004 the military excavated a rock escarpment to the profile required for the original design at that time. This means that the base of rock cutting slope is approximately 15m from the edge of the realigned road. In addition the military did not remove the excavated material from the vicinity but actually dumped the material into the River Fan floodplain. It is estimated that some 150,000 m^3 of excavated material has been deposited into the river valley. But this quantity will be checked during the small site investigation which is to be undertaken by GRD during April 2006. This is discussed in more detail in the *Environmental Impacts* section.

3.2.5. The road continues along the disused railway alignment passing the abandoned Rubik Station and marshalling yard area (approx. km17+000) along the eastern edge of the river valley until it meets up with the existing national road SH.30 at approximately km 19+000 opposite Rubik. From this point the proposed road maintains the alignment of the disused railway but it also needs to incorporate the existing road for approximately 1km. Approaching km 20 the proposed road will divert from the existing road and cross the River Fan before turning eastwards along the northern edge of the river valley. The remainder of the route is described in section 3.3.

3.2.6. The main construction phases of this section are as follows:

- Excavation of topsoil to a depth of 30-50cm where necessary;
- Filling and compacting the earthworks in required layers and benching into the sides of the existing railway embankment;
- Constructing structures;
- Placing of asphalt road pavement; and
- Installing road signs and markings.

3.2.7. The proposed top width of the highway is 11.1m with embankment side slopes of 1:1.5 and generally a drainage ditch on the southern or eastern side of the road embankment.

MINOR STRUCTURES

3.2.8. The numerous minor structures within this section consist of:

- 10 No. pipe culverts of diameter d=1.00m in drainage ditches;
- 12 No. pipe culverts of diameter d=1.50m in drainage ditches;
- 10 No. 2m x 2m, 1 No. 2m x 2.5m and 1 No. 2m x 3m box culverts in drainage ditches;
- 1 No. 3m x 2m and 3 No. 3m x 3m box culverts in drainage ditches;
- 1 No. 4m x 3m box culvert in drainage ditch; and
- 1 No. 5m x 2m, 1 No. 5m x 2.5m, 5 No. 5m x 3m, 1 No. 5m x 3.3m and 2 No. 5m x 4m box culverts in the drainage ditches.

3.2.9. All these minor structures have been proposed as new construction, the diameter d=1.00m and d=1.50m pipe culverts have been designed for use of precast elements, while the headwalls at the inlet and outlet points as well as the manholes have been designed as monolithic reinforced concrete.

3.2.10. The box culverts have been designed as monolithic reinforced concrete structures.

BRIDGE AT KM 8+585

3.2.11. The existing bridge with a span of 10m will be extended to suit the roadway width. The two abutments will be extended and a monolithic slab of L=10.0m cast over the entire width. The substructure has been designed with spread-footings on to the gravel (bearing layer).

3.2.12. In summary the existing two abutments of the single-span bridge will have additional concrete sections constructed alongside and attached to the existing abutments. In this area the ground beneath the bridge is better and therefore the bridge foundations can be constructed directly on the ground. After extension of the existing abutments is completed, a new bridge deck will then be constructed between the abutments. Following this, a waterproof layer will be placed on the concrete deck before the asphalt road pavement is laid across the bridge. The width of the bridge is sufficient for two lanes of traffic (one in each direction).

BRIDGE OVER RIVER MAT AT KM 10+200

3.2.13. This bridge has been designed with 4 spans connected by 30m long precast prestressed concrete beams and monolithic reinforced concrete deck and transverse beams. The beams have been designed with Rck-400 concrete. The cross-section of the bridge deck will consist of two lanes (one per direction).

3.2.14. Its elevation has been designed such that it allows a safe clearance height above the River Mat's one hundred-year flood level. The sub-structure has been designed with foundations supported by four 1x3 groups of piles of dia.=1.5m embedded into the non-depository flych stratum. The abutment on the Milot side has been designed as a massive concrete structure. The drills used for the boreholes shall work in conjunction with steel casings.

3.2.15. Piles, piers, abutments and caps shall be made of class 300 concrete. The reinforcing steel shall be of 4,000 kg/cm^2 design yield stress.

3.2.16. In summary the four-span bridge will have two abutments and three piers constructed in concrete. Due to the poor strength of the underlying ground, the bridge foundations will need to be supported on concrete piles. The piles will be constructed by boring into the ground until the ground becomes strong enough to support the bridge. During this operation, the soils will be prevented from falling into the borehole by a steel tube. The tube is then filled with concrete before being withdrawn from the ground. After construction of the abutments and piers, high-strength precast concrete beams will be lifted on top of them and a concrete deck will then be constructed supported by the beams. Following this, a waterproof layer will be placed on the concrete deck

before the asphalt road pavement is laid across the bridge. The width of the bridge is sufficient for two lanes of traffic (one in each direction).

BRIDGES AT KM 14+150 and KM 15+445

3.2.17. The design provides for extending these two existing 2x10m bridges using the precast railway deck slabs, which have been removed from other existing railway bridges of similar span. The existing substructure (abutments and pier) will be extended in concrete with spread-footing foundations.

3.2.18. In summary, for both two-span bridges, the existing two abutments and single pier of each bridge will have additional concrete sections constructed alongside and attached to the existing abutments and pier. In this area the ground beneath both bridges is better and therefore all the bridge foundations can be constructed directly on the ground. After extension of the existing abutments and piers is completed, the existing bridge decks will then be extended utilising the concrete slabs that will have been removed from other similarly constructed bridges. Following this, a waterproof layer will be placed on the concrete decks before the asphalt road pavement is laid across the bridges. The width of both bridges is sufficient for two lanes of traffic (one in each direction).

BRIDGES AT KM 17+080 and OVER EXISTING ROAD AT KM 19+420

3.2.19. The design provides for extending the two existing overpasses (1x8m span) using monolithic structures similar to the existing ones. The substructures have been designed with reinforced concrete abutments and spread-footing foundations.

3.2.20. The structural concrete shall be class 300 and the reinforcing steel shall be of 4,000 kg/cm^2 design yield stress.

BRIDGE AT KM 17+760

3.2.21. This bridge has been designed as a replacement for the existing 3x10m bridge. The construction of the bridge foresees the demolition of all the components of the existing bridge down to the existing ground level. The superstructure shall consist of precast prestressed reinforced concrete beams. The substructure shall be made of reinforced concrete abutments on spread-footing foundations. It is anticipated that the beams shall be fabricated at the site and their erection can be carried out from ground level.

3.2.22. The structural concrete shall be class 300 and the reinforcing steel shall be of 4,000 kg/cm^2 design yield stress.

ROAD LAYERS and GEOMETRY

3.2.23. The road pavement layers and the highway geometrical parameters are the same as proposed for the previous section.

EROSION CONTROL

3.2.24. Since a section of the road (approx. Km 6+500 to Km 7+000) lies within the river floodplain, erosion control for the riverside of the road embankment is proposed. The proposed measures consist in reinforcement of the embankment slope with a concrete lining layer 20 cm thick. This layer coats the fill slopes up to 1.0 m above the predicted quota of maximum water level, for a 100-year return period water flow.

3.2.25. The lining layer is anchored to a longitudinal gabion key with a 1x1m cross section at the base of the fill slope. In order to protect the embankment from scouring at the base, the project has foreseen the construction of a cobble stone filled area extending approximately 12m from the base of the embankment into the river. At this location, a 5m deep trench will be excavated and backfilled with massive cobble rocks of diameter d > 0.60m (70% of the cross section) and crushed stones of diameter d<0.60m (30% of the cross section).

3.3 RUBIK TO RRESHEN SECTION

3.3.1. Since the previous Environmental Assessment review, undertaken by Scott Wilson, the alignment of this section of the road has altered significantly. The previous alignment followed the line of the existing national road SH.30 with substantial upgrading. But the revised alignment follows the route of the disused railway, which is on the opposite side of the River Fan. Construction of this section of the proposed road is well advanced due to the excavation of the required cuttings and placing of the earthworks undertaken by the Albanian army during 2005. Working space remains for the construction of the bridges.

3.3.2. After crossing the River Fan (from the previous section) the road turns eastwards along the northern edge of the river valley. The route passes close to the villages of Munazi and Vau i Shkjezës, crossing agricultural land and vineyards along the edge of the valley. The existing railway bridge at Km 20 is unable to be used for the road alignment due to the poor condition of the concrete. A new 7x30m span bridge will need to be constructed alongside the existing bridge. However this requirement will assist the successful works contractor with access to the construction works from the national road.

3.3.3. The road continues along the alignment of the disused railway crossing over two watercourses flowing into the River Fan. The first is close to Munazi requiring a 2x30m span bridge and the second is at Km 25, which requires a single 30m span bridge. Approaching Km 26 the disused railway crosses over the River Fan to the southern side of the valley. In this case the proposals incorporate the existing bridge into the scheme by undertaking widening of the bridge.

3.3.4. From this location, the Government of Albania proposes to continue with the following Rreshen to Reps section. However if there is delay to the start of construction of the next section, a temporary connection to the existing national road may be required.

3.3.5. The main remaining construction phases of this section are as follows:

- Installation of drainage systems;
- Constructing structures;
- Placing of asphalt road pavement; and
- Installing road signs and markings.

3.3.6. The proposed top width of the highway is 11.1m. The embankment side slopes are 1:1.5 and a drainage ditch will generally be required on both sides of the road alignment to collect the water run-off.

MINOR STRUCTURES

3.3.7. The numerous minor structures within this section consist of:

- 1 No. pipe culvert of diameter d=1.50m in drainage ditch;

- 2 No. 2m x 1m and 18 No. 2m x 2m box culverts in drainage ditches;
- 1 No. 3m x 3m box culvert in drainage ditch;
- 1 No. Twin 3.5m x 5m box culvert in drainage ditch;
- 1 No. 4m x 3m box culvert in drainage ditch; and
- 1 No. 5m x 3m and 1 No. 5m x 5m box culverts in the drainage ditches.

3.3.8. All these minor structures have been proposed as new construction, the diameter d=1.50m pipe culvert has been designed for use of precast elements, while the headwalls at the inlet and outlet points as well as the manholes have been designed as monolithic reinforced concrete.

3.3.9. The box culverts have been designed as monolithic reinforced concrete structures.

BRIDGE OVER RIVER FAN AT KM 19+925

3.3.10. This new bridge has been designed with 7 x 30m spans connected by precast prestressed concrete beams and monolithic reinforced concrete deck and transverse beams. The beams have been designed with Rck-400 concrete. The cross-section of the bridge deck will consist of two lanes (one per direction).

3.3.11. Its elevation has been designed such that it is consistent with the original railway structure, which unfortunately cannot be reused due to the poor condition of the concrete. The sub-structure of reinforced concrete abutments and piers has been designed with foundations supported by 3x4 groups and 2x4 groups, respectively, of bored piles of dia.=1.2m. The drills used for the boreholes shall work in conjunction with steel casings.

3.3.12. Piles, abutments, piers and caps shall be made of class 300 concrete. The reinforcing steel shall be of 4,000 kg/cm^2 design yield stress.

3.3.13. In summary, since the concrete used to build the existing bridge is now in a poor condition, a new bridge will be constructed alongside the existing bridge. The new seven-span bridge will have two abutments and six piers constructed in concrete. Due to the poor strength of the underlying ground, the bridge foundations will need to be supported on concrete piles. The piles will be constructed by boring into the ground until the ground becomes strong enough to support the bridge. During this operation, the soils will be prevented from falling into the borehole by a steel tube. The tube is then filled with concrete before being withdrawn from the ground. After construction of the abutments and piers, high-strength precast concrete beams will be lifted on top of them and a concrete deck will then be constructed supported by the beams. Following this, a waterproof layer will be placed on the concrete deck before the asphalt road pavement is laid across the bridge. The width of the bridge is sufficient for two lanes of traffic (one in each direction).

BRIDGE NEAR MUNAZI AT KM 20+978

3.3.14. This bridge has been designed with 2 x 30m spans using precast reinforced concrete beams and monolithic deck and transverse beams. The sub-structure of reinforced concrete abutments and piers has been designed with foundations supported by 3x4 groups and 2x4 groups, respectively, of bored piles of dia.=1.2m embedded into rock. The drills used for the boreholes shall work in conjunction with steel casings.

3.3.15. Piles, abutments, piers and caps shall be made of class 300 concrete. The reinforcing steel shall be of 4,000 kg/cm^2 design yield stress.

3.3.16. In summary the two-span bridge will have two abutments and one pier constructed in concrete. Due to the poor strength of the underlying ground, the bridge foundations will need to be

supported on concrete piles. The piles will be constructed by boring into the ground until the ground becomes strong enough to support the bridge. During this operation, the soils will be prevented from falling into the borehole by a steel tube. The tube is then filled with concrete before being withdrawn from the ground. After construction of the abutments and piers, high-strength precast concrete beams will be lifted on top of them and a concrete deck will then be constructed supported by the beams. Following this, a waterproof layer will be placed on the concrete deck before the asphalt road pavement is laid across the bridge. The width of the bridge is sufficient for two lanes of traffic (one in each direction).

BRIDGES AT KM 22+660 and 25+382

3.3.17. The design provides for extending these two existing 1x15m span bridges using the precast railway deck slabs, which have been removed from the existing 3x15m railway bridge at Km 25+100 after inspection and repair if needed. The existing abutments will be extended in reinforced concrete constructed on the existing foundations as well as on spread-footing foundations for the extended part of the structure.

3.3.18. The structural concrete shall be class 300 and the reinforcing steel shall be of 4,000 kg/cm^2 design yield stress.

3.3.19. In summary, for both these single-span bridges, the existing two abutments of each bridge will have additional concrete sections constructed alongside and attached to the existing abutments. In this area the ground beneath both bridges is better and therefore all the bridge foundations can be constructed directly on the ground. After extension of the existing abutments is completed, the existing bridge decks will then be extended utilising the concrete slabs that will have been removed from other similarly constructed bridges. Following this, a waterproof layer will be placed on the concrete decks before the asphalt road pavement is laid across the bridges. The width of both bridges is sufficient for two lanes of traffic (one in each direction).

BRIDGE AT KM 24+991

3.3.20. At this location, a new bridge will be constructed in place of the existing bridge, which will have to be demolished down to the existing ground level. The new bridge has been designed with 1 x 30m span using precast reinforced concrete beams and monolithic deck. The substructure of reinforced concrete abutments has been designed with spread-footing foundations embedded on rock. It is anticipated that the beams shall be fabricated at the site and their erection can be carried out from ground level.

3.3.21. The structural concrete shall be class 300 and the reinforcing steel shall be of 4,000 kg/cm^2 design yield stress.

BRIDGE OVER RIVER FAN AT KM 25+685

3.3.22. This bridge has been designed to incorporate the existing structure, which is in reasonably good condition. The existing bridge has 9 x 23.6m spans. The structure shall be extended using similar precast reinforced concrete beams and monolithic deck. The extended substructure has been designed with bored piles of dia.=1.2m. The drills used for the boreholes shall work in conjunction with steel casings. The abutment extensions shall be constructed in reinforced concrete and the extended piers shall consist of two columns. The nearest to the existing structure shall be dia.=1.2m and the one farthest away shall be dia.=2.0m in order to obtain a symmetrical section along that part of the structure. The reinforced concrete pier caps, pile caps and monolithic deck of the new structure shall be anchored to the existing matching components. It is anticipated that the beams shall be fabricated at the site and their erection can be carried out from the ground below.

3.3.23. The structural concrete shall be class 300 and the reinforcing steel shall be of 4,000 kg/cm^2 design yield stress.

3.3.24. In summary for the nine-span bridge, the existing two abutments and eight piers will have additional concrete sections constructed alongside and attached to the existing abutments and piers. Due to the poor strength of the underlying ground, the extended bridge foundations will need to be supported on concrete piles. The piles will be constructed by boring into the ground until the ground becomes strong enough to support the bridge. During this operation, the soils will be prevented from falling into the borehole by a steel tube. The tube is then filled with concrete before being withdrawn from the ground. After construction of the extensions to the abutments and piers, high-strength precast concrete beams will be lifted on top of the extended sections and a new concrete deck will then be constructed supported by the beams. The new concrete bridge deck will be firmly attached to the existing bridge deck to prevent any differential movement. Following this, a waterproof layer will be placed across the whole concrete deck before the asphalt road pavement is laid across the bridge. The width of the extended bridge will be sufficient for two lanes of traffic (one in each direction).

ROAD LAYERS and GEOMETRY

3.3.25. The road pavement layers and the highway geometrical parameters are the same as proposed for the previous sections.

4. ENVIRONMENTAL BASELINE

INHERITED PROBLEMS

4.0.1. Since 1966 the largest Chemical-Metallurgical industry in Albania was located in the Borough of Milot. The Chemical-Metallurgical Works had a degrading impact on the entire area, which can be seen clearly in the demarcation line. Its effects were visible, hence the agricultural system there has profited by way of reimbursement for the damage inflicted upon the agricultural system of the area.

4.0.2. It is hazardous to this day, despite the fact that it is not working, but rather because of the pollution it has created through the decades, and the technological deposits. These are a serious threat for the area.

4.0.3. According to UNEP, the United Nations Environmental Programme, this area is considered an environmental hot-spot. Deposits, which are in large quantities, in the form of raw materials, technological waste, hazardous substances, such as Natrium Fluorosilicate, Vanadium Oxide, asbestos and other substances considered to be hazardous in large quantities (around 700,000 tonnes), hazardous elements such as arsenic, copper, lead etc.

4.0.4. Existing environmental impacts worth noting are the following:

- Loss and fragmentation of natural habitats, their degradation and impoverishment;
- Intensive and uncontrolled taking of gravel along the river, its use in the vicinity of waters;
- Loss of forests in the river valley due to illegal logging;
- Pollution of urban centres by sewage;
- Effects of wastes from the former copper industry, deposited as solid wastes to a quantity of 3 million tonnes and which are made up of dangerous elements.

4.1 GEOLOGY, GEOMORPHOLOGY, SOIL & HYDROLOGY

GEOLOGY AND GEOMORPHOLOGY

4.1.1. The sections below provide a general background to the geological and geomorphological setting of the Milot to Rreshen section identifying some particular issues that should be considered.

Tectonic Zones

4.1.2. The study area can be divided into two main tectonic zones – these are areas where significant faulting and earthquakes occur due to the collision of the Arabo-African and European continental plates[6]. These tectonic zones are areas where crustal movements take place. This results in numerous faults and frequent earthquakes as these plates adjust their position.

4.1.3. The two tectonic zones are the Krasta Zone, from Milot until Fangu, and the Mirdita Zone, from Fangu until Rreshen.

Krasta Zone

4.1.4. The western end of the section crosses this zone from Milot to Fangu village (approx. 10km in the River Mat valley). However, over most of this length the bedrock is covered by recent (Quaternary) alluvial deposits.

4.1.5. The Krasta Zone represents a basinal zone between the 'external' Kruja Zone, which is present to the northwest and the southwest, and the 'internal' Mirdita Zone to the east. There is a distinctive NNW to SSE alignment of the Krasta Zone that is sub-parallel to the coastline. Overall the width of the Krasta Zone rarely exceeds 10km.

4.1.6. It has three main components:

- Maastrichtian to Eocene (i.e. Upper Cretaceous to Lower Tertiary) - Flysch deposits
- Senomian to Maastrichtian (Upper Cretaceous) - Limestones
- Albian to Cenomanian (Upper Cretaceous) – Flysch deposits

4.1.7. The Krasta Zone has been subject to major tectonic deformation.

Mirdita Zone

4.1.8. The eastern end of the section is within the Mirdita Zone. This is characterised by transitions through Jurassic neritic (i.e. continental shelf) to pelagic (open sea) facies and the occurrence of significant ophiolites. These are basic and ultrabasic lavas and intrusions. Some metamorphic equivalents may also be present. Therefore the depositional environment of the Mirdita Zone was an oceanic basin with ophiolite development.

4.1.9. The Mirdita Zone overthrusts the Krasta Zone to the west.

[6] "Geology of Albania". Selam Meco, Shyqyri Aliaj. 2000.

Stratigraphy

4.1.10. A summary of the stratigraphy of the study area is presented in Table 4.1.1 below.

Table 4.1.1 : Stratigraphy of the Study Area

Tectonic Zone	Age	Units	Comments
All Zones	Recent	Alluvial Plain Deposits	Comprise alluvial fine grained clays and silt
		River Valley Deposits	Dominated by sands, gravels, cobble and boulders
		Landslide and colluvial Deposits	Often extensive and variable in content depending on the nature of the mass wasting processes
	Quaternary	Fluvial Terraces	Developed in predominately bedded sand and gravels but with local argillaceous materials as well
		Colluvial Terraces	Tend to more variable and less structures than the fluvial terraces. Complex mix of colluvial fans, river terrace deposits and landslide debris
	Upper Tertiary	Neogene and Oligocene	Some conglomerate or cemented sandstones, but primarily argillaceous rock types.
Krasta Zone	Lower Tertiary	Flysch	Argillaceous rocks, impure sandstones and local breccia. Beds typically <1m thick
	Upper Cretaceous	Limestones and other sedimentary units including sandstones and conglomerates Flysch	Argillaceous rocks, impure sandstones

Tectonic Zone	Age	Units	Comments
Mirdita Zone	Upper Cretaceous	Neritic Limestone	Up to 150m thick
	Jurassic	Younger Upper Jurassic sedimentary series Upper Jurssic gabbro, gabbro-norite and plagio-grantic rocks Lower Jurassic ultra-basic and ultra-mafic rocks	Sandstone and marl units each 10m-50m thick Iherzolite types in the west Harzburgite types in the east
	Lower Lias to Upper Triassic	Neritic Limestones	
	Lower to Middle Triassic	Volcano-sedimentary Series	'Hanbulog' nodular limestone series

Structure

4.1.11. The Krasta Zone is very complicated with the presence of over thrusts, tectonic windows and nappes. On the western flanks of the zone are steep mountain fronts that for the study area have relief ranging from 10 m AOD on the plains up to 500 m AOD within the 10 km wide zone. Cretaceous carbonate rocks are primarily present on these western slopes with younger Eocene flysch deposits on the gentler eastern flanks of the zone.

4.1.12. Initially, the Jurassic and older rocks of the Mirdita Zone were uplifted during the Cretaceous and the associated folding was completed by the end of the Maastrichtian. However, subsequent powerful earth movements at the end of the Eocene (Lower Tertiary) caused the over thrusting of the Krasta Zone. This caused the Mirdita Zone to generally move towards the Krasta Zone. Structures are typically oriented north-northwest to south-southeast.

4.1.13. Normal faulting is dominant and has been developed further by neotectonic activity through the Upper Tertiary and Quaternary, which has formed horst / graben structures.
The ophiolites in this region have been recorded as up to 14 km thick

Seismicity

4.1.14. Albania is affected by intense microseismic activity and small-scale earthquakes are quite common. Larger magnitude earthquakes are relatively rare although they do occur.

4.1.15. Over the past 2,200 years Albania has had 15 recorded major earthquakes. Some 55 relatively severe earthquakes have been recorded. The majority of these high intensity earthquakes in the study area have taken place close to the western boundary of the Krasta Zone, where there is reaction between the Adria microplate and the Albanian orogen. Foci are concentrated along active faults and fault zones.

4.1.16. Of particular note in the study area were the Shkodar earthquake of 1 June 1905 where 200 people were killed and 500 injured, with over 1,500 homes ruined (Kociaj & Sulstrarova 1980), and the Durres earthquake of 17 December 1926 where many homes were destroyed in Durres and the surrounding area[7].

[7] UNDP (2003) Disaster Risk Assessment in Albania, Executive summary Report.

4.1.17. The maximum magnitude (Richter Scale Magnitudes) of any expected earthquake should be in the order of 5.5 to 7.5 M in the Krasta Zone. This area is a magnitude-8 zone according to the Mercalli Scale (Seismic Map Issued by Ministerial council No. 371 date 20.12.1979).

Slope Stability

4.1.18. The relative relief is often in excess of 500 m with major river valleys developed that are antecedent to the geological structure in the east / west valleys with a north northwest / south southwest structural trend.

4.1.19. Cretaceous rocks are quite obvious on the western part of this zone, and being calcareous dominant are often white / light grey in colour and with rather limited vegetation. The natural slopes and particularly rock cuttings are susceptible to rock fall and even rockslides locally. Much of this instability is possible caused by the ongoing marginal river erosion and the seismic activity in this area.

4.1.20. On the eastern flanks are the more argillaceous flysch deposits. Quite complex fold structures are often exposed in failure scars or river valley sides where soil development has been limited. Major instability is however, rather limited outside engineered cuttings. Erosion in gullies is the more dominant mass wasting process. Sub-grade conditions are likely to be quite poor and variable in the Krasta Zone flysch.

4.1.21. The predominately basic and ultra basic country rocks that form the Jurassic ophiolites and harzburgites of the Mirdita Zone are highly susceptible to weathering, debris slides and gully erosion. These significant hazards are promoted by the active incision occurring in the river valleys, and rainfall and snowfall events on the valley side slopes.

4.1.22. The existing road is mainly along the lower valley side slopes of the lower Fan and Mat Rivers. These rivers have a significant influence on the geomorphological hazards that affect the road alignment. Side slopes are generally steep (>35 degrees), so that cuts are required up to 10 m high in the valley side spurs. These are locally affected by instability that can cause larger debris slides from the slopes above the cuttings. Also stream channels have to be crossed at regular intervals in small bridges or culverts. In addition there is the threat of the river eroding and undermining the existing road side slopes.

SOILS

4.1.23. The higher topography (where slopes are generally relatively steep to very steep) has thin, poorly developed soil horizons. The thickness of the soil horizon in these areas varies from about 1 metre to as little as five centimetres. In areas of fracturing where weathering has taken place to significant depths there can be localised development of soil to depths of more than 3 metres – but these are limited in extent. Soils in the higher regions are generally not well developed and often would be more accurately defined as a well weathered bedrock material, rather than a developed soil. In many places soils are entirely absent and bedrock is exposed at the surface.

4.1.24. Areas which have important agricultural soils are the low lying flood plains in the Mat and Fan River Valleys. These valley soils can be very limited in area (individual fields are frequently less than 0.2 ha in area, and even larger areas of flatter land are often less than 2 ha in area).

Contaminated Soils

4.1.25. The method of assessment used by Scott Wilson was the hazard-pathway-receptor methodology, which is used to identify significant pollutant linkages. The following definitions apply:

- Hazard: source of contamination
- Pathway: the means by which the hazardous contamination can come into contact with the receptor; and
- Receptor: the entity which is vulnerable to harm from the hazard.

4.1.26. Potential areas of contamination identified during field visits are located as follows:

— Rubik (on the left bank, opposite the Byzantine Church is an area of abandoned industrial workings which might be contaminated).

— Rubik (there is a copper mine on the opposite side of the river; but there could be associated spoil dumps along the road in the area that were not detected during field surveys)

— Milot (petrol station on the left bank which might be contaminated)

— Milot (industrial workings, including a bitumen factory, adjacent to the railway on the line of the proposed route which might be contaminated)

4.1.27. The land (soil) in the vicinity of the abandoned mines is likely to be contaminated to varying degrees. These contaminated sites are limited in extent but are likely to be severe where they do exist. Dust blows from the infrastructure of the abandoned mines – this dust will also contain contamination to varying levels.

4.1.28. Heavy metals have been detected in a very limited survey of soils around Rubik copper mine as follows[8]:

- Copper 1,696 mg/kg, chromium 492 mg/kg and lead of 99 mg/kg.

4.1.29. The New Dutch List[9] has action levels at which remediation is recommended be implemented as follows:

- Copper 190 mg/kg, chromium 380 mg/kg and lead 530 mg/kg.

4.1.30. This confirms that soils in the proximity of the old mines are likely to be severely contaminated with heavy metals. Other contaminants associated with the industrial workings may include asbestos from buildings, hydrocarbons, and organic compounds such as solvents and PCBs (from electrical transformers). The hazard ranking for these sections of route is high.

HYDROLOGY

4.1.31. The River Mat is one of the biggest and most important rivers in Albania. The water-collecting area of the river is in the north of the central highland area. River Mat's secondary branch – according to the area and the scale of water levels – is the River Fan. The water-collecting area of the River Mat, prior to the River Fan joining it, is 1,330 km^2 whereas the Fan's is 1,076 km^2. From the confluence of the two rivers to the Adriatic, the water-collecting area increases to 2,441 km^2.

4.1.32. The River Mat's source is at the top of the Kaptina Mountain (Martanesh), at about 1,872m above sea level. The area of the Mat water-collecting basin from its source to Klos appears to be highland-like with deep and narrow valleys. Later, the relief softens in particular on the right-hand side slope because of the terraces, which continue all the way to Ulza. Past Ulza, the Mat Valley becomes narrow once more and it unites with the River Fan about 25m above sea-level. From the

[8] UNEP Balkans Post-Conflict Environmental Assessment, Analytical Results of UNEP Field Samples from Industrial Hot Spots. 2000.
[9] The Ministry of Housing, Spatial Planning and Environment, Netherlands

new road bridge over the River Mat, west of Milot, up to where the river runs into the sea the valley of the River Mat widens extensively, as the river goes through an expansive flat area.

4.1.33. The River Fan, which is the most important branch of the River Mat, is created by two river branches joining up – the Big Fan and the Little Fan about 70m above sea-level. The Big Fan has a water-collecting area of 542km^2 and a length of 76.9 km. Its source is from Qafa e Malit at a height of 1,397 m above sea level. The main streams which run into the Big Fan are the Shpëdhasa and the Dibri Streams. The Little Fan's water-collecting area is 415km^2, 45 km long. Its source is in Rune at a height of 1,856m above sea level. The streams running into it are the Sefta e Spaçit, Big Semja and Little Smeja. The Big and Little Fan join up near the town of Rrëshen, thus forming the River Fan.

4.1.34. During the past few years, the quality of the waters of this area has improved as the industries that were here in the past are no longer in operation.

4.1.35. The River Mat is a really important river, which plays an important role not only in the economy of Albania in general, but more particularly in the construction industry. 23 gravel producing plants have been installed on the River Mat – they have various producing capacities and function regularly. These granular materials are widely used by the construction industry in Albania. This area has good processing and transport facilities. It is also in close proximity to some of the most developed and heavily populated areas: Tirana, Durrës and Lezha. Many projects have been implemented in this area, in particular projects such as road construction, railways, hydro-electric power stations etc.

4.1.36. There are at present large deposits in the valley of this river. According to geological studies, the layers of deposits come to a total of 230 million m^3. Dependent on the area, the layers vary from a thickness of 6 m to 24 m with an average annual flow of 500,000m^3. The river bed has granulo-metric ingredients which surpass the world's best crushing plants. There are exactly 18 ingredients and it is Albania's biggest supplier for the construction industry.

4.1.37. The width of the river varies from 170 m to 1,000 m. According to surveys, the largest quantity of solids is brought by the River Fan and that recently they have increased due to the illegal logging of forests and mountainsides, coupled with the loss of the green cover due to massive erosion, which is also visible in the percentage increase in gravel impurity.

4.1.38. The largest drinking water aquifer, which is in Fushë-Kuqe, supplies not only the Laç area, but the entire Durrës Region by way of a large water treatment plant which is installed there.

Groundwater

4.1.39. The geology of the area creates three distinctive groundwater systems, which are:

- Recent formations with high porosity and permeability (gravels in valley floors).
- Karstic hard rock formations with high yields where springs or boreholes intersect karstified layers.
- Bedrock formations with poor fracture permeability and low yields.

4.1.40. The Recent formations (alluvium and colluvium) provide high yielding aquifers in the valley floors. This occurs as follows:

- in the lower Fan/Mat valley from Milot to Rreshen (alluvium in the valley floor).

- Aquifers in the Recent formations will be limited in extent laterally away from the centre line of each valley, due to the hard rock formations outcropping the valley sides. The extent of the aquifers up and down the river valleys will depend on the nature of the bedrock surface. In places bedrock is exposed at the surface, and where this occurs aquifer connectivity is disrupted. As such, Recent aquifers are limited in extent and not continuous.
- An assessment of the quality of the aquifers has not been feasible in this study. The depth to groundwater will generally be small (from less than 1 metre to a few metres). These aquifers are vulnerable to contamination from surface sources. Therefore, the quality will be good as long as mine drainage, runoff from contaminated mine workings and waste dumps (including domestic waste dumps on the outskirts of towns) and sewage has not contaminated the aquifer.

4.1.41. The main karstic formations will be the dolomite of the Krasta Zone. These could provide significant quantities of water from boreholes drilled into karstic formations. Karstic formations develop in rocks that can be dissolved by water as the water moves through small fractures. Over time significant karstic features develop along the original fracture lines – storage and transmitting very significant amounts of water. Karstic formations are only found in the dolomitic formations. The most significant area of exposed dolomite is at Fangu.

4.1.42. It is worth noting that the larger springs in the region that flow in excess of 1,000 l/s are often associated with fault zones along the boundary of dolomitic formations. The depth to groundwater in karstic formations can be very variable, and it is possible to have flowing artesian conditions – although this is not reported to be the case in the study area. Recharge to the karst formations is estimated to be between 650mm and 1000mm per year.

4.1.43. In some areas of significant faulting there might be fracture zones that will permit the deep movement of groundwater and it is possible that such groundwater could be discharged as heavily mineralised (normally hyperalkaline, and sometimes hot water) springs. This is commonly found in such geology in other parts of the world. Such springs can be very important sources of irrigation and drinking water in areas where water resources are scarce. However, whilst mineralised springs exist in the Fan catchment area, none are within 1 kilometre of the proposed road.

4.2 CLIMATE, AIR QUALITY AND NOISE

CLIMATE

4.2.1. The geographical position of the area and that of the Mat river valley is favoured by a Mediterranean climate, accompanied by a continental one further up the valley towards the east and north-east.

4.2.2. The area of the project has a typical Mediterranean climate: hot and dry summers with wet and cold winters accompanied by high intensity winds.

a) Winds :

Average speed: from 1.8 m/sec - to 2.2 m/sec
Minimum speed: from 1.4 m/sec - to 1.6 m/sec
Maximum speed: from 2.2 m/sec - to 2.4 m/sec

The winds' predominant direction:
During the spring and summer time the winds normally blow from the south-west to the north-east, whilst in the winter the winds' direction is from the north-east.

b) Hours of Sunshine :

Ave hours of Sunshine: 2500 hours/year
December is the month with the lowest number of sunny days, whilst July is the month with the highest number of sunny days.

c) Temperatures and air humidity:

The average annual temperature is 15°C
- during the winter period the average temperature reaches 12–14°C
- the average spring temperature reaches 18–20°C
- the average summer temperature reaches 26–29°C
- the average autumn temperature reaches 18–21°C

- the lowest temperature has been recorded in January with –8°C and the highest temperature has been recorded in August at around +36°C.

The relative humidity is around 70 %.

d) Precipitation:

The average annual rainfall is about 980 mm/year.
The largest amount of precipitation falls during the month of November with 170 – 175 mm
The lowest amount of precipitation falls during the month of July with 40 – 42 mm.

The largest amount of precipitation during a 24 hour-period has reached 187 mm.

The seasonal precipitation is identified below:
- during winter about 340 mm/year
- during spring about 225 mm/year
- during summer about 90 mm/year
- during autumn about 315 mm/year

e) Snowfall

The project area experiences little snow each year. However further north and eastwards (especially the central highland massifs) the region has average annual snowfall depths between 26cm and 100cm.

Snow falls generally between November and March and the main snow melt occurs in spring – bringing with it the highest river flows and flood risks to the Mat and Fan river valleys.

AIR QUALITY

4.2.3. There is no air quality information available which is specific to the proposed route. The proposed alignment is currently subject to air quality impacts from existing roads. However during 2005 air quality was measured in areas throughout Albania by the Directorate for Prevention of

Environmental Contamination (part of MEFWA). The closest area to this project is in the northern region. The results of the survey for this region are reproduced in the following table 4.2.1.

Table 4.2.1 Results of Air Quality Monitoring during 2005

Air Pollutant	PM_{10} ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)	Pb ($\mu g/m^3$)	Ozone ($\mu g/m^3$)
Northern Area (Albania)	107	12	18	0.3	94
Ave. All Areas (Albania)	125	10	29	0.28	97
Albanian Standard	70	60	50	1	120
EU Standard	50	50	40	0.5	110

4.2.4. From the above table it can be observed that amongst the pollutants measured, only Particulate Matter (PM_{10}) is higher than the EU or Albanian standards. This is probably due to the low number of vehicles on the roads in Albania.

4.2.5. The effect of topography is unlikely to be a significant issue in predicting pollutant concentrations along the route. Emissions from road vehicles decrease with distance from the road. An equation describing the characteristic decrease in pollutant concentrations with increasing distance from the road was derived from calculations using an atmospheric dispersion model developed at TRL (DMRB[10] for the UK). From this equation, it can be demonstrated that after reaching a distance of 168m from the road, the contribution of traffic to pollutant concentrations is basically zero. Hence any properties over 200m from a road are unlikely to experience an increase in air pollution due to the road traffic.

4.2.6. Pollutants from cars emitted to the atmosphere are:

- Carbon dioxide (CO_2)
- Carbon monoxide (CO)
- Hydrocarbons
- Oxides of nitrogen and sulphur (NO_x and SO_x)
- Particulates (exceptionally small solid matter – the reference size is PM10 which are particles less than 10 microns in diameter)

4.2.7. The pollutants with an impact on human health are NO_x, hydrocarbons (through photochemical reactions producing toxic chemicals as by-products), PM_{10} particles which penetrate lung tissue and cause lung problems, CO which makes people drowsy and can lead to death in extreme concentrations due to a reduction in the ability to absorb oxygen in the lungs (never found in an open atmosphere such as a road).

[10] The Department of Transport, Design Manual for Roads and Bridges, Volume 11, Section 3 Part 1: Air Quality. May 1999.

4.2.8. Air quality standards for the UK, which are the same as EU standards, are indicated in the DMRB[11] as:

- CO Running 8-hour mean concentration should not exceed 10 mg/m^3.
- NO_2 Hourly average concentration should not exceed 200 µg/m^3 more than 18 times a year. Annual mean concentration should not exceed 40 µg/m^3.
- PM_{10} 24-hour mean concentration should not exceed 50 µg/m^3 more than 35 times a year. Annual mean concentration should not exceed 40 µg/m^3.

4.2.9. As stated above, these figures are for the UK, which is very much more heavily populated with vehicles and industry than the routes in Albania. However, the vehicles in the UK are regulated far more stringently and the efficiency of motors is much greater than in Albania where at the present time vehicle pollution is unregulated. Thus the unit emissions from cars are much lower in the UK than in Albania. Nevertheless, it is to be expected that concentrations of these parameters along the proposed road would be significantly lower than the levels quoted for the UK due to the much lower traffic volumes on the route.

NOISE

4.2.10. The World Health Organisation definition of noise nuisance is 'A feeling of displeasure evoked by noise'. The nuisance caused by noise mainly affects people in their homes or when they are in the streets. However, areas of open space that are also used for recreational purposes can also suffer from noise pollution[12]. One of the most significant impacts caused by traffic is noise exposure of people living in the settlements in the vicinity of a road alignment. Surveys in the EU reveal that a great part of the population feels annoyed from noise caused by road traffic[13].

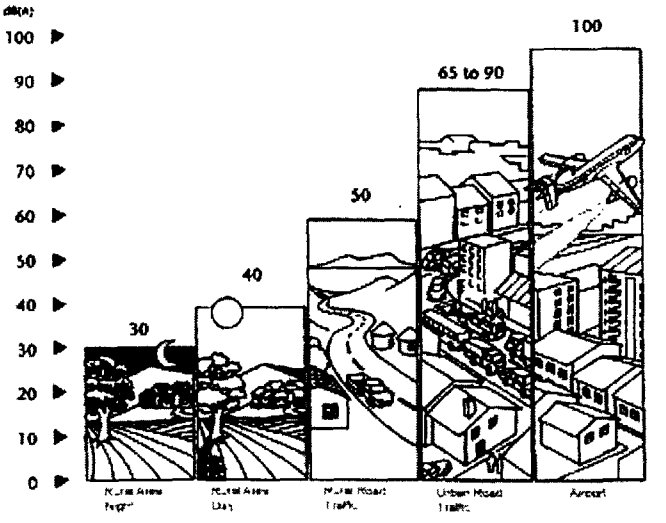
4.2.11. The unit for noise levels is decibel (dB) which is based on a logarithmic scale. This means that for example a doubling in source intensity (e.g. doubled traffic load) will show up as an increase of +3 dB. On the other hand, from the receptor's side, the subjective impression of a human being that noise has doubled requires an increase of about +10 dB. Generally changes of less than 1 dB are not considered significant.

4.2.12. Basically noise impact problems caused by traffic using the road can be solved by mitigation measures that can be used in the road design, construction and operational phases. These measures do not refer only to designing of the roads but also to designing of the areas in the vicinity of the considered road.

4.2.13. Since human beings have a sensitivity to sound which depends on the frequency, there is the convention to use a frequency adjustment curve (curve A) to get a measure for the frequency independent noise level (indicated as dB(A)).

[11] The Department of Transport, Design Manual for Roads and Bridges, Volume 11, Section 3 Part 1: Air Quality. May 1999.
[12] The Department of Transport, DMRB, Volume 11, Section 3 Part 7: Traffic Noise and Vibration. August 1994.
[13] Noise exposure and noise stress can cause a variety of diseases in human beings, like e.g. circulatory troubles, hardness of hearing, or nervous system troubles. Recent medical investigations even show correlation of noise impact with cardiac infarction.

Figure 4.1. Average levels of traffic noise



4.2.14. Examples for noise levels of common environmental sounds are:

• Emergency siren at three metres	140 dB(A)
• Aeroplane take-off at 100 metres	110 - 120 dB(A)
• Jackhammer	90 - 110 dB(A)
• Crowded restaurant (inside)	65 - 75 dB(A)
• Busy office (inside)	60 - 65 dB(A)
• Normal conversation	40 - 60 dB(A)
• Quiet living room	30 - 40 dB(A)
• Quiet bedroom at night	20 - 30 dB(A)
• Quiet garden	30 dB(A)

4.2.15. To establish a noise level, when only one source of noise is concerned, is a relatively simple task, such as, for instance, establishing of the traffic noise at a road. However, when the noise originates from several sources then the task is much more complex. A large number of different noise sources contribute to the extent of ambient noise level.

4.2.16. Ambient noise is a result of the combination of the different noise sources: business operation of a company, traffic noise, birds singing, gurgling of water and similar. Specific noise is a noise from a source, which can be analysed. The remaining noise, apart from the specific noise, is classified as ambient noise.

4.2.17. This terminology originates from the ISO 1996 Standard, which is generally in use. There are a lot of different methods for determination of the specific noise. However the main method of determining the level of remaining noise is based on simultaneous and connected tests carried out at several points in the vicinity of the source of the noise.

4.2.18. The sources of noise from a traffic stream can be separated into two components. The first is generated by the engine, exhaust system and transmission and is the dominant noise source when traffic is not freely flowing particularly from heavy vehicles which contribute a significant proportion of low frequency noise. Noise levels will vary primarily according to engine speed rather than vehicle speed. The second noise source component is generated from the interaction of tyres with the road surface and is the dominant noise source under free flow traffic conditions at moderate to high road speeds and contributes a significant proportion of high frequency noise.

Noise levels will vary depending on vehicle speed, the road surface and whether the surface is wet or dry.

4.2.19. A number of other factors influence how much effect a sound will have on a potentially affected receptor. These include:

- Geometric dispersion: as one gets further away from a sound source the sound power from the source is spread over a larger and larger area. The rate at which this happens is approximately 3 dB per doubling of distance for very large sound sources such as roads;
- Obstruction to the propagation path from the noise source to the receiver such as a large building or topographic features. The degree of attenuation depends upon the geometry of the obstruction and the frequency characteristics of the sound source;
- The type of ground over which sound is passing can have a substantial influence on the noise level at the receiver e.g. crops, trees etc.;
- Meteorological characteristics such as wind speed and direction can affect noise levels; and
- Ambient or background noise levels.

4.2.20. There are no ambient noise standards for Albania and no background noise measurements were made during this study. However the objective of a noise assessment is to establish the magnitude and significance of noise changes for all areas where existing traffic is likely to be increased by 25% or reduced by at least 20% (equivalent to a change in noise levels of 1dB(A)). For properties which are more than 300m from the edge of the proposed road, the varying effects of wind and temperature render forecasting of noise levels difficult in most circumstances.

4.2.21. Noise levels along the route are generally low and this relates to the current low level of traffic. In addition, the existing national road SH.30 already exists within the Mat and Fan river valleys, and the proposed road would remove traffic from the existing road and divert it onto the new road. Therefore apart from some generated traffic movements, there would not be a substantial increase in the traffic flow along the river valley. So there are not anticipated to be any sites where noise levels approach those that present a significant nuisance to local residents, or that present any sort of threat to health.

4.3 FLORA, FAUNA AND LANDSCAPE

4.3.1. Based upon (i) observations on the environmental situation in general, and biodiversity in particular, (ii) the Environmental Impact Assessment Reports for several projects and activities carried out in the area, and (iii) other sources, we note the following:

4.3.2. The project that will be implemented in this area does not effect the flora and fauna, since there are no major protected areas directly affected by the route.

4.3.3. The valley area rises from only 2m above sea level in the floodplain to 70 m above sea level at Rreshen.

FLORA

4.3.4. Albania is suffering very high levels of degradation of flora, with some species being driven to extinction through uncontrolled logging and the collection of medicinal herbs. This is reported to have been especially severe since the collapse of the communist regime. Low oak is a species reported to be at risk and this species is observed over some of the route.

4.3.5. There are four main natural vegetation zones in Albania (labelled for ease of reference Zones 1 to 4):

- Zone 1: a coastal belt of maquis and agricultural land;
- Zone 2: a broad Mediterranean deciduous forest zone;
- Zone 3: central European montane forest
- Zone 4: a subalpine and alpine zone.

4.3.6. The proposed section crosses through Zone 1. Between Milot and Rreshen in the valleys of the River Fan and River Mat the main vegetation is comprised of oak pines, forsythia, juniper. Compared to the vegetation beyond Rreshen the oaks are no longer found to the same degree and the heather *Erica arborea* is more common. The valley sides contain typical maquis vegetation. The shrub layer includes tree heather, *Erica arborea* on the lowest slopes, box, *Buxus sempervirens,* strawberry tree, *Arbutus unedo* and juniper, *Juniperus communis. Prunus sp* and *Salix sp* are found in many of the cultivated areas, the latter often near streams and rivers.

4.3.7. Flora is represented by agricultural plant elements cultivated by the farmers in the Fushë-Milot area and in the valley close to the villages of Munazi, Vau i Shkjezës and Rrethi i Epërm. The plants refer to agricultural vegetation, represented mainly by grains, leguminous vegetation, as well as the forage crops, represented by lucerne fields, loliums, alfalfa etc. The indigenous vegetation in area of Fushë-Milot is generally represented by twich grass plants.

4.3.8. Low vegetation on both slopes of river Fan's valley include some medical plants etero-oil and tanifere and other plants such as: Raspberry, Strawberry, Hermanius, Plenera, Mendra, Water menthus, Red drizzle, Podidge and Wild Rose.

FAUNA

Mammals

4.3.9. There is little information available on the distribution and numbers of protected species on the proposed route. The most recent published data on fauna[14] provides information in a general sense. This report states that Albania has an important diversity of animals in a European and global sense, with 20 species (or 25%) of the mammals in Albania belonging to the list of globally endangered species. It is estimated that almost half of all mammal species in Albania are now under threat of extinction in the country. This is due to human pressures leading to destruction of habitat, fragmentation of habitat, overgrazing, hunting, illegal forestry and the impoverishment of habitats due to poor management.

4.3.10. Albania has important populations of large mammals including the bear (*Ursus arctos*), the wolf (*Canis Lupus*), the lynx (*Lynx lynx*), the jackal (*Canis aureus*), the chamois (*Rupicapra rupicapra*), roe deer (*Capreolus capreolus*) and wild boar (*Sus scrofa*).

4.3.11. The Albanian statistical yearbook produces some information on populations of mammals[15]. The precision quoted leads one to doubt the accuracy of the data presented (it is not possible to know precisely how many foxes or rabbits live in Albania). However, it is known that by 1998 in the mountains of Albania wolves had increased from around 400 to an estimated total of around 2,500 while there are an estimated 600 bears. However, the yearbook also quotes substantial decreases in the population of some species (e.g. around 600 wolf and 13,000 fox) between 1998 and 1999.

[14] State of the Environment Report 1997-1998, National Environmental Agency, Tirana.
[15] The Albanian Statistical Yearbook, 1991-1999, Instat, Tirana.

The information therefore presents information that is difficult to rely on totally. If the decreases quoted from 1998 to 1999 are correct then some species are being decimated.

Fish

4.3.12. Most fishing in Albania is not controlled, leading to degradation of fishing stocks through inappropriate fishing (e.g. during breeding seasons) and over fishing. Most inland fishing is carried out on the lakes (natural and the hydroelectric power lakes). Fish in these lakes include carp, trout and eel. The spotted lake trout and carp are in particular danger of over fishing and attempts to improve levels of stock by seeding lakes with spawn were not proving very successful in 1998[16].

4.3.13. The presence of migratory salmonids (especially), resident salmonids and cyprinids in the rivers of the region will be dictated by the degree of pollution at the most downstream reaches and also the barriers caused by dams. The collapse of the mining industry has resulted in many of the mines on the route options being abandoned, with no management of tailings and the runoff from the obviously badly contaminated factory/smelter sites. This runoff does enter the rivers and affects the ecology of the rivers in a significant manner. Therefore, whilst it might be anticipated that mammals such as otters could be found in the rivers it is likely that their presence will have been affected by the pollution arising from these abandoned mining sites.

Birds

4.3.14. There are about 330 recorded species of bird in Albania. The record of species is not complete due to the lack of competent observers in the country. However, it is noted that there has been a significant reduction in the number of nesting birds and in the number of over-wintering species. Certainly during Scott Wilson's study it was notable that the number of birds (in total numbers) and the range of species observed was very limited and much lower than expected for the diversity of habitats traversed.

4.3.15. Albania provides habitats for 120 species that are classified as being vulnerable in Europe. Among these are Redbeak Gull, Bearded Vulture, Imperial Eagle and the White-tailed Owl. Golden Eagle, Ravens and other raptors are well recorded in the mountains. Birds are particularly vulnerable to loss of habitats as this can affect their breeding locations, their feeding areas and their over-wintering areas (all of which can be different).

4.3.16. Bird species identified by Scott Wilson's study in April 2003 included:

- Heron, Ardea cinera
- Kestrel, Falco tinnunculus
- Rock Partridge, *Alectoris graeca*
- Collared Dove, Streptopelia decaocto
- Hoopoe, Upupa epops
- House martin, Delichon urbica
- Pied wagtail, Motacilla alba yarrellii
- Magpie, Pica pica
- Hooded crow, Corvus corone cornix
- Raven, Corvus corax

[16] State of the Environment Report 1997-1998, National Environmental Agency, Tirana.

- Wren, Troglodytes troglodytes
- Blackcap, Sylvia atricapilla
- Black Redstart, Phoenicurus ochrurus
- Wheatear, Oenanthe oenanthe
- Robin, Erithacus rubecula
- Blackbird, Turdus merula
- Blue tit, Parus caerulus
- Great tit, *Parus major*
- House sparrow, Passer domesticus
- Chaffinch, Fringilla coelebs
- Goldfinch, Carduelis carduelis
- Feral Pigeon, *Columba sp*

Reptiles and Amphibians

4.3.17. Reptiles identified in the area of the proposed road include:

- Water Snakes
- Wall Lizards
- Green Lizards
- Turtles

4.3.18. Amphibians presently residing in the drainage ditches and irrigation canals in the Fushë-Milot area include:

- Marsh Frog (Rana ridibunda Pall),
- Common Toad (Bufo bufo),
- Common Tree Frog (Hyla arborea)
- Salamander

4.3.19. There aren't any Natural Habitats or Protected Nature Sites within the project area. In addition there aren't any protected species within Albania, although any animals, birds, reptiles or amphibians which reside within Protected Sites are themselves considered to be protected.

LANDSCAPE

4.3.20. The 26km section commences at Fushë-Milot and the route runs to the side of the Mat and then the Fan Rivers up and until Rreshen. This valley is picturesque and the small town of Rubik has a very attractive Byzantine church located high above the river and town. The route provides very scenic vistas, which contributes to a good journey ambience for travellers. The landscape around the towns has been degraded by poor waste management, illegal dumping of waste at the roadside, and the deterioration of the mining industry. The baseline landscape is considered in terms of Landscape Resources and Visual Receptors.

Landscape Resources

4.3.21. Albania does not yet have designated areas of landscape or townscape value. Table 4.3.1 provides a brief description of the Landscape Character Areas (a geographical area...with a distinct pattern of combination of elements that occur consistently[17]) identified within the vicinity of the route. The main settlements are Milot, Rubik and Rreshen (not immediately on the route but adjacent to the route). There are numerous minor settlements along the Mat River and Fan River valleys and in places these link together as pastoral settlements.

Table 4.3.1 Landscape Character Areas

Landscape Character Area	Brief Description	Sensitivity
Fushë-Milot River Terrace	Agricultural land and orchards	Low
Milot	Residential and commercial properties. Industrial works.	Medium
Rubik	Residential and commercial properties, disused copper mines and associated works. Attractive Byzantine church.	Medium
Minor settlements along the Mat River and Fan River valleys	Small settlements and scattered dwellings. Mainly single and two-storey residential buildings. Scenic vistas.	High

Visual Receptors

4.3.22. Table 4.3.2 identifies the individual receptors, for whom views of the proposed road may be possible, and allocates them to receptor groups according to their sensitivity. Those receptors located at some distance from the route are considered to be of lower sensitivity than those adjacent to the alignment.

Table 4.3.2 Visual Receptors

Visual Receptor	Sensitivity
Residents of Milot	Medium
Residents of small settlements and scattered dwellings	High
Residents of Rubik	Medium
Visitors to Rubik Church	High
Road users on opposite bank of the River Mat	Low

[17] Guidelines for Landscape and Visual Assessment 1st edition (1995), (edited by Scott Wilson) and 2nd edition (2002) The Landscape Institute and the Institute of Environmental Management and Assessment

Land Use

4.3.23. The main economic activity in the region is agriculture, with many individual families or small communities entirely dependent on agriculture for their livelihood. In relatively flat areas (Mat and Fan River Valleys) the land use is usually used as arable fields, grape vines and hay meadows.

4.3.24. There is residential and commercial land use in the main towns (Milot, Rubik and Rreshen) and scattered settlements along the route. There are also active and redundant industrial areas in Rubik and Milot.

4.3.25. Much of the remaining land could be classified as wilderness areas (i.e. natural vegetation on steep sided mountains and hills). The wilderness areas are used for forestry and grazing by roaming livestock, where the topography allows animals to move.

4.4 SOCIO-ECONOMICS, NATIONAL AND CULTURAL HERITAGE

SOCIO-ECONOMICS[18]

Introduction

4.4.1. The following is an extract from the World Bank report "Albania – Filling the Vulnerability Gap"[19], it is provided in full as it clearly states the position of the country in terms of basic infrastructure.

> *"The country's level of economic development and its physical and social infrastructure are akin to those of the poorest and least-developed areas in Africa and Latin America. This condition not only classifies Albania as the most backward country in Europe in relative and absolute terms, but it highlights the enormous development gap that separates it from the rest of Europe, particularly the European Union, which Albania aspires to join.*
>
> *It is perhaps the countries physical infrastructure that most vividly conveys to the observer the anomaly of this country, so centrally positioned in southern Europe. The road system is suitable only for a pre-industrial country, except in the capital city of Tirana and its surroundings.*
>
> *Other essential infrastructure systems and the services dependant on them are equally minimal: from water supply, power and transportation lines, to telephone and communication systems, to airports and port facilities".*

Population

4.4.2. The population in Albania has an average life expectancy of over 70 years – having increased from a life expectancy of 54 years in 1950. The crude increase in population (taken as the net percentage increase in population) is about 1.2%. Oddly, it is reported that over 40% more male babies died than female babies in 2001 and overall 37% more males died than females. This ratio has been preserved generally since 1993 – with a significant increase in reported male deaths (56% more male deaths than females) in 1997[20].

[18] Data taken largely from "The Population in Albania 2001" published by Instat.
[19] World Bank Technical Paper No 460. Albania – Filling the Vulnerability Gap. Gloria La Cava, Rafaella Y. Nanetti, 2000.
[20] Instat Statistical Yearbook 1993 - 2001

4.4.3. The route passes through the Mirdita District. The District has an area of 867 km^2. It has five communes, two municipalities and 80 villages. The population is ethnic Albanian and is mostly Catholic (some Muslims, Romas and Evgjits live in Mirdita as well). Since the mines closed the main economic activity has centred on small scale agriculture and forestry. Rreshen is the administrative centre of Mirdita District.[21]

4.4.4. A commune normally is made up of several villages, governed by a chief who is elected for three year terms by the commune residents.

4.4.5. The population of the Mirdita District has fallen in the last 12 years (1989 – 2001 census data) by a very significant 26.5% (from over 50,000 people to less than 38,000). This represents a substantial demographic shift that would have had a significant impact on the socio-economic structure of the district as well.

4.4.6. The main cause of the fall in population will have been the closure of the mines leading to outwards migration as people have moved to find new employment. In addition, after the communist regime fell many Albanians emigrated out of Albania, mainly the young males.

4.4.7. Despite the outward migration of young males, the Mirdita district has a population with a significant proportion of young people (children), estimated to be between 31% and 40% of the total population. In the District 21% - 30% of the total population has a household with more than 6 residents.

4.4.8. The literacy rate improved dramatically in Albania since 1989. In 2001 less than 2% of the population over 6 years were illiterate in Mirdita District.

Employment

4.4.9. Most of the population of Albania is still employed in the agricultural sector (over 50%). In Mirdita District it is estimated that 63% to 78% of the working population is involved in agriculture.

4.4.10. Given that the unemployment rate in the districts is high, between 25% and 34% of the economically active population was unemployed at the time of the census in 2001, which implies that there are few people working outside of the agricultural sector.

4.4.11. The decline in the mining industry has been the main cause of the unemployment according to interviews with local residents in Rreshen. This is substantiated in the World Bank report on poverty in Albania which states that 38% of the workforce in Rreshen is unemployed, as a result of the closure of the mining industry in the town and the surrounding area.

4.4.12. The agricultural sector has a very low earning potential, with as little as US$60.00 per month. The agricultural sector faces a great many problems in promoting earnings from agriculture.

4.4.13. Not least is the availability of irrigation water, which has been exacerbated by the fragmentation of the farming sector by government led agricultural reform programmes in the 1990s, which has lead to smaller farms operated by individual land owners. Access to land that is suitable for irrigation is equally problematic, making the fields and hay meadows in the valley floors and on the small piedmont areas of the higher mountains very important.

4.4.14. However, market related problems abound as well. It is understood that access to markets is hampered in many areas by a lack of adequate roads to get products to markets. As a result of many of the products being consumed locally, marketing is often done on the side of whatever

[21] World Bank Technical Paper No 520 – "Poverty in Albania - A Qualitative Assessment". H. de Soto et al., 2002.

road system exists. As Tirana and Durres continue to grow, and as the access to this market remains poor, the demand for good agricultural produce (vegetables, cereals, fruit and meat) will be high. The key for Albanian agriculture will be to satisfy this demand with local produce and not from imports from Italy and other European nations.

Housing

4.4.15. Only 8% of the housing in Albania pre-dates 1945, which make the remaining old houses potentially important cultural heritage items. Of these older buildings the vast majority were built of stone or brick, having one or two floors.

4.4.16. In rural areas, 15% have water supplied inside the house, 43% outside the house, 21% from a well or water tank and 20% do not have a water supply. This is significant along the route as many springs are found and there are significant number of small aqueducts taking water from springs towards habitation and fields.

Industries

4.4.17. The route has little significant impact upon industrial development although the main towns were based on some type of industrial activity. The main economic activities are:

- small holder (even subsistence level) farming;
- "uncontrolled" forestry; and
- mining (largely abandoned).

NATIONAL AND CULTURAL HERITAGE

Cultural Heritage and Undiscovered Archaeology

4.4.18. Archaeological finds in the region show that the inhabitants have lived here since the Stone Age (4500-2500 BC). There is the potential to find tumuli, buried artefacts, especially metal, from about 2000 BC. Roman artefacts and evidence of settled communities from about 165 B.C. Byzantine settlements from about 395 A.D and Ottoman settlements from the early 1500's. The location of the route in the floodplain means the footprint has a high potential for containing buried, and as yet undiscovered, archaeological resources.

Built Heritage

4.4.19. A principal item of cultural heritage close to the route is the magnificent XII Century Byzantine Church and associated monastery at Rubik, which dates back to 1162. This church is located on a small rocky hill overlooking the town and the Fan River. Rubik church is considered to be one of the most precious monuments in the inventory of Albanian cultural heritage, as it is among the most ancient cultural objects in the Balkans. The church is undergoing a period of restoration.

4.5 TRAFFIC AND ROAD SAFETY

TRAFFIC

4.5.1. Traffic is composed of three segments of freight and passenger demands and these are:

- Domestic demand

- International demand
- Transit demand

4.5.2. Domestic demand is formed by the flows generated and attracted from the transport zones internal to Albania. International demand includes the flows generated by internal zones and attracted from foreign countries (exports or outgoing visitors) and by flows generated by foreign countries and attracted by Albania (imports or incoming visitors).

4.5.3. Transit demand consists of flows of freight and passengers generated and attracted by foreign countries that travel through the Albanian network. Different methodologies are used for estimating and projecting the demand on segments over a 20 year period.

4.5.4. Domestic demand generally follows the economic behaviour of the transport zones in terms of transport attraction and generation of freight and passengers. Usually domestic demand is related to the GDP and population of each zone. In this case it is assumed an identical GDP development for all internal transport zones. Domestic demand projections are calculated using three relationships according to the three main vehicle types considered:

- Cars
- Buses
- Trucks

4.5.5. The analytical form of these relationships allows for establishing the growth factors for the three vehicle classes, once population and GDP are projected.

4.5.6. International demand of freight is related to foreign trade development with existing and potential foreign partners. An analysis of foreign trade has been carried out establishing the global relationship between GDP and merchandise foreign trade. Merchandise foreign trade shares to GDP have been established over time in order to project total imports and exports in value.

4.5.7. Surveys and analyses were made of existing traffic and the forecasts made for future traffic demands for the 'do nothing' and the proposed route scenarios using the program 'TransCAD'. Table 4.5.1 shows the average annual daily traffic (AADT) for 2003 and projected for years 2009, 2014 and 2023.

Table 4.5.1: Average Annual Daily Traffic (AADT) figures projected for the Milot – Rreshen road link

Scenario	AADT All vehicle modes (Number of HGVs in parenthesis)			
	2003	2009	2014	2023
Do Nothing	1,360 (100)	2,100 (147)	2,827 (189)	5,113 (282)
Proposed Scheme	1,360 (100)	2,647 (181)	3,570 (240)	6,514 (384)

ROAD SAFETY

4.5.8. The current traffic demand in Albania follows patterns that the existing infrastructure was never intended to service. Roads and bridges are often too narrow, rough, lack adequate signing and are unsafe.

4.5.9. In 1999, SweRoad wrote[22]:

> *'The road network including streets in towns is generally in a bad shape. The roads are too narrow with a rough surface and often lacking road signs and railings. Barriers are often missing or badly damaged. Less than one-third of the roads have asphalt surface and a number of individual roads have deteriorated beyond repair. Many of the rural roads are passable only to four-wheel drive vehicles during the dry season.'*

4.5.10. Official fatality rates in Albania are widely estimated to be under-reported and yet are already recognised to be amongst the highest across European countries. The issue of road safety and the need for adequate road maintenance is a significant priority particularly in the light of official statistics which indicate levels of road traffic to be increasing at a rate of over 10% per annum. The economic rationale underlying the project is provided by the fact that traffic accidents cost Albania approximately 1–3 % of its GDP.

4.5.11. A project providing technical assistance to the Directorate of Road Safety and Traffic, has just been completed. The project objective was to address the technical issues of road safety with the aim of reducing the number of traffic accidents. Importantly, the project has begun to address the lack of institutional capacity identified by the Government's own Action Plan for Road Safety, particularly in the implementation of road and vehicle safety legislation. It is now important that this foundation for safer roads is now built upon in future projects and by the Government of Albania.

4.5.12. The Road Safety Project had the following principal objectives:

- Foster greater awareness of road safety issues at all levels.
- Provide technical assistance and training to the Directorate of Road Safety and Traffic in its role as the co-ordinator of road safety initiatives in Albania.
- Develop institutional capacity within the General Roads Directorate to conduct road safety initiatives and remedial measures.
- Provide technical assistance and training to implementing agencies such as the traffic police, emergency services and the local governing units who have obligations under Albanian law.

4.5.13. Participatory approaches were fostered during the project and included the formation of three local community-based associations to formulate road safety initiatives as a pilot study.

5. ENVIRONMENTAL IMPACT

5.0.1. This section of the report predicts and assesses the project's likely positive and negative environmental impacts to the extent possible. It also identifies proposed mitigation measures to be adopted during both the construction and operational phase. The section has been sub-divided into five parts. The first section identifies potential environmental impacts relevant to all sections of the proposed road between Fushë-Milot and Rreshen. The following three sections correlate with the three project descriptions identified in section 3 and assess any environmental impacts specific

[22] Albanian National Road Plan, Existing Conditions, SweRoad, 1999

to those sections of road alignment together with proposed mitigation measures. The final section indicates proposed mitigation measures applicable to all sections.

5.1 FUSHË-MILOT TO RRESHEN (ALL SECTIONS)

Construction Camps, Borrow Pits and Quarries

5.1.1. The most immediate impact will be the construction of camps for workers and batching plants along the route. Potential camp sites together with comments on the key environmental issues that would need addressing at each site are provided in Table 5.1.1 These are indicative only; the precise sites chosen for construction would require negotiation and agreement with local landowners and authorities.

Table 5.1.1: Possible Construction Camp Locations

Construction Camp	Location	Approximate Chainage (km)	Potential Impacts and Issues
LOT 1	Close to Milot	4.0	Adjacent to River Mat – serious flooding risk, pollution control, waste management. Possible flat land area currently used for commercial activities.
LOT 2	Close to Rubik	17.0	Adjacent to River Fan – flooding risk, pollution control, waste management. Possible flat land area originally Rubik railway station (now disused).
LOT 3	Close to Munazi	21.0	Adjacent to River Fan – flooding risk, pollution control, waste management. Possible flat land area close to Munazi village.

5.1.2. Borrow pits may be permitted to provide fill materials for road bases and are constructed to obtain subsoil or aggregate (from river beds in the project area). The locations of these will depend on the selected contractors initially utilising the excavated materials which the Albanian army has deposited into the River Fan floodplain. If this previously excavated material is insufficient for the Contractor's requirements, then alternative borrow pits will be considered. Each contractor is responsible for deciding which borrow pits to use, but the following key impacts are identified with borrow pits:

- Permanent visual and physical impact on the area
- Loss of habitat
- Loss of vegetation
- Loss of agricultural land
- Siltation risk if in river bed
- Pollution risk if in river bed

5.1.3. Borrow pits might represent opportunities for re-use as follows:

- Excavated material is already available within the river floodplain, close to Fangu and Vau i Shkjezës, and this material has to be reused by the contractors before the use of other material is considered. This has resulted from the rock excavation carried out by the military, under instruction from the Ministry of Defence, which has been deposited within the river flood plain. (See further details within section 5.3)
- Sites for waste management (on a limited scale) to dispose of waste where not in river beds, especially if groundwater is deep or a non-significant resource as in most of the area. Dilute and disperse approach to leachate would have to be accepted.
- If flooded can provide new wetland habitat (especially if on side of river courses).
- Locations to discharge road drainage into, with wetland establishment can produce natural vegetated treatment system (provided measures are taken to protect groundwater).
- Source of building materials for local peoples.

5.1.4. Quarries are more substantial and are developed to obtain hard rock materials. These have the same types of impact as borrow pits, but those impacts are often of a higher magnitude. As quarries are often larger in size than borrow pits, fewer quarries are likely to be required. The opportunities for establishing wetland systems in quarries are much lower. The establishment of new quarries will not be required and would not be accepted. Therefore existing quarries will be used, where necessary, and the quarry owner(s) will be required to demonstrate that they have a current valid operating permit during the time of the Works Contract. Confirmation that the operating permit is valid will be a requirement of the Supervision Consultant.

5.1.5. However as stated above, there is a substantial quantity of locally available material, which the Albanian army has deposited in the River Fan's floodplain opposite the village of Fierza and Vau i Shkjezës. See section 5.3 for details (and Photos. 4 and 5 in Appendix 6).

5.1.6. There is a potential for the construction contractor to own his own asphalt and concrete batching plants, since it is highly likely that an international contractor will be engaged on one or more of the construction contracts. In this case the contractor will be required to excavate trenches around the batching sites in order to collect any spillages and allow disposal of any such material in a licensed tip.

SOILS

Natural and Agricultural Soils

5.1.7. The impact on soils as such will generally be limited, but as soil of suitable quality for agriculture is a valuable commodity even the loss of minor quantities due to bad construction practice, as set out below, or poor design leading to erosion, could have significant impacts on local habitants.

Construction

5.1.8. Soil will be disturbed where the road has to be widened and on any new alignment. Any topsoil of value will be lost if it is not stripped, stored and reused appropriately.

5.1.9. Soil horizons, which are thin or almost non-existent must be treated with great care – as disturbance to this soil layer will result in rapid erosion of the slopes. This will affect the road stability, silting up of rivers and streams, landscape value, and in extreme cases it can reduce the

economic productivity of entire areas of land and lead to a reduction in the biodiversity of affected regions.

5.1.10. Soil will be subject to erosion where

- Ground cover is removed and inadequately re-established
- runoff from the road scheme is concentrated onto areas where insufficient protection has been provided to the soils.
- cuts or embankments are completed with improper drainage or at too steep an angle (thus encouraging the mass wastage of materials as the slopes achieve a more natural slope angle).

5.1.11. The Environmental Management Plan (EMP) includes strict measures for managing the wastage of soil.

Operation

5.1.12. The chemical quality of soil can be impacted by road schemes where contaminants from vehicle exhausts settle onto border areas. This leads to increases in heavy metal concentrations which can be taken up into vegetation growing in affected soils. This is a potential risk to human health if crops or vegetables are grown for human consumption close to the road verge – particularly if they are grown for personal consumption, thus increasing the long term exposure to the heavy metals. However, research has shown that this increase in heavy metals (eg. lead) is generally limited to a narrow border along the edge of the road and concentrations rapidly fall away with distance from the hard shoulder. This should reduce the potential long term impact on neighbouring fields if the Albanian standard of 44m right of way is maintained.

Contaminated Soils

Construction

5.1.13. There is likely to be contaminated land within the vicinity of the abandoned copper processing plant a Rubik. However the revised route of the proposed road onto the disused railway alignment should ensure that the construction works do not encounter the contaminated materials. Nevertheless, the Contractor and Supervision Consultant should be aware of the potential problem and if any contaminated material is identified during the construction in this area, construction workers must be provided with the appropriate safety equipment. The contaminated soil should be removed and deposited in a sealed pit in an area agreed with the Local Authority.

Operation

5.1.14. During operation of the road, contamination of the adjacent land is a risk that could occur following a serious road accident. This could occur if a heavy goods vehicle carrying hazardous materials overturns as a result of the accident. If such an occurrence happens, the attending emergency services should notify the Maintaining Road Authority (GRD) to carry out containment of the spillage and removal and disposal of the contaminated soils to a suitable licensed site.

HYDROLOGY

Surface Water

Construction

5.1.15. The potential impacts and resulting effects on surface water during construction comprise:

- Construction earthworks and construction site drainage which could give rise to changes in runoff, peak flows or low flows;
- Construction dewatering which could temporarily alter local flow regimes;
- Incorrect storage of contractors' plant/fuel storage and site activities which could lead to the accidental spillages of liquids or contaminated runoff, and the subsequent deterioration in surface water quality;
- Construction works which could cause temporary obstruction of watercourse channels (i.e. arterial drainage) and floodplains leading to flooding;
- Construction works in the river which could give rise to local increases in sediment loads resulting in temporary deterioration of water quality; and
- Storage of contaminated material from topsoil stripping, bored piles and utility works, which could leach contaminants into runoff and cause subsequent deterioration in surface water quality.

5.1.16. These impacts apply to most major construction activities. While they have potential to give rise to significant effects they can be avoided by adopting good site management practices, as set out in the Environmental Management Plan, Section 6. With these measures in place any effects relating to these impacts are anticipated to be at most minor in severity.

5.1.17. The potential for increased sediment loads, due to embankment and bridge works adjacent to the rivers and their tributaries, could give rise to effects of moderate severity, such effects should be avoided through the use of standard construction practices, as set out in the environmental management plan, Section 6, together with silt curtains and coffer dams. With these in place the effects would be reduced to minor.

5.1.18. There are a number of bridge constructions, which have to be constructed within the rivers or other watercourses. These bridge constructions should be controlled in order to reduce the risk of contamination of the surface water especially during the fish-spawning season, which for both the Mat and Fan rivers is considered to be during May and June.

Operation

5.1.19. The uncontrolled discharge of road run off has the potential to impact the local water environment both in terms of quantity, though localised and downstream flooding and of quality through pollution. Typical pollutants associated with road run off include:

- Hydrocarbons such as fuel and polycyclic aromatic hydrocarbons (PAHs) (EC Groundwater Directive List 1 substance) from wear and tear of the road surface, from tyres, from lubricants leaking from vehicles and from unburned fuels.
- Heavy metals including cadmium (EC Groundwater Directive List 1 substance) and copper, zinc and iron (EC Groundwater Directive List II substances) derived from unburned fuels, corrosion products from vehicles, from wear and tear of tyres and the road surfacing. Some heavy metals are largely insoluble (eg. copper) and some are soluble (eg. zinc).
- Suspended solids (including insoluble heavy metals as colloidal materials).
- De-icing agents (road salting – likely to be significant on this project).
- Herbicides and pesticides used to clear out drainage runs (considered to be insignificant on this project).
- Nutrients (concentrations of nutrients are reported to be very low and are not considered significant).

5.1.20. The worst contamination occurs in the first flush of runoff from roads after a period of dry weather, or after salting of roads in winter has taken place. The level of contamination in road runoff is directly related to the traffic volume. The AADT values for this project are relatively small and it is anticipated that contamination in road runoff will be very low as a result. This will rapidly be diluted in receiving bodies to insignificant (even undetectable levels) or will be attenuated in the soil horizons of the hard shoulders either side of the road where most road drainage will leave the carriageway. Therefore contaminated runoff into the watercourses is unlikely to affect agricultural production either locally or further downstream.

5.1.21. The proposed road drainage system will generally be natural runoff to road verges (the soft grassed edge of a road). Where drainage is concentrated into point discharges it is likely that dilution from high rainfall and rapidly flowing rivers will dilute contamination relatively quickly. The pollution risk from accidental spillage may increase moderately as although the method of drainage would be the same as on the existing road, the higher volumes of traffic and faster traffic speeds would increase the risk of accidental spillage. This could potentially have a major adverse impact on surface water quality.

5.1.22. Where drainage of roads leads to concentration of water from a large area of carriageway and this is discharged into streams or small rivers this could have a significant adverse impact on the flood risk to downstream locations.

5.1.23. Road drainage and traffic safety is intimately related. Good surface drainage and rapid removal of storm water require adequate cross-slopes and longitudinal drainage. The road drainage on the existing roads is very poor so a new or rehabilitated road with properly designed and built drainage would enhance the infrastructure and the safety of the travelling public and users. Well-designed cross-drainage structures limit ponding against embankments and ensure rapid removal of storm water from the road vicinity. Most of this water will arise from upstream land areas.

5.1.24. The embankment height calculation for the proposed road scheme has been based on the assumption of normal flow[23]. This is reasonable though the roughness factor used to allow for friction and other basic data are not stated in the supporting documentation. It is not therefore possible to verify the assumptions underlying these calculations, nor has it been possible to determine what freeboard, if any, has been allowed in the embankment height above the flood level. Freeboard is essential to allow for uncertainties in the calculations as well as wave action.

Groundwater

Construction

5.1.25. The following activities during construction could have a detrimental affect on the groundwater system:

- Stripping of natural vegetation which could decrease the permeable areas through which groundwater recharge takes place;
- Construction activities which could result in temporary interception or loss of perched water table and associated seepage zones;
- Spillages of contaminated liquids or runoff, or the interception, disturbance and mobilisation of pollutants in existing areas of contaminated ground could lead to a deterioration in ground water quality; and

[23] ITP-Infratransproject (2004) Climatic, hydrologic and Hydraulic Calculations of the 'Milot-Rreshen' Highway

- Ground investigation drilling, could lead to the interception, disturbance and mobilisation of pollutants in existing areas of contaminated ground;

5.1.26. These impacts apply to most major construction activities. While they have potential to give rise to significant effects they can be avoided by adopting good site management practices, as set out in the monitoring plan, Section 6. With these measures in place any effects relating to these impacts are anticipated to be at most minor in severity.

5.1.27. The construction of large embankments will affect the flows of groundwater through alluvial gravels on the flood plain. If not addressed this may cause ponding on the up gradient side of the highway embankment, which would have implications for the agricultural land on that side of the embankment. The public consultation questionnaire responses indicated that there are important groundwater resources that could be affected by the proposed alignment. The embankment construction may alter near surface groundwater flows and cause ponding on the surface behind the embankment. However the road design proposes to incorporate and extend the existing drainage culverts which currently pass beneath the disused railway embankment, which should reduce this risk to a minimum.

Operation

5.1.28. Road drainage impacts surface and groundwater resources. The public consultation identified a number of locally important springs along the alignment that may be affected by the scheme. The proposed drainage measures and emergency response procedures can be expected to prevent the road having a significant impact on the quality of water in the springs.

CLIMATE

5.1.29. A new road will have insignificant impact on climate locally. However, by reducing the mileage that vehicles travel, and making the journey less arduous for engines should lead to a reduction in the amount of ozone depleting or greenhouse gas emissions. This will benefit the global climate change, but to a degree that cannot be quantified by this study and which would be almost insignificant in global terms. Thus the proposed road scheme is not predicted to have a significant impact on climate.

AIR QUALITY

Construction

5.1.30. The construction activities can cause dispersion of dust in the atmosphere and a significant reduction in local air quality mainly due to dust from the passage of vehicles over unpaved surfaces and through emissions from poorly operated or maintained machinery. These impacts can be reduced to minor levels through the adoption of good site management practices, such as watering of surfaces during dry weather spells.

Operation

5.1.31. The key pollutants associated with the local air quality impact of road traffic are total nitrogen oxides (NO_x), nitrogen dioxide (NO_2), particles (as PM_{10}), lead (Pb) and unburnt hydrocarbons (THC). In terms of health impact, the key pollutants in the EU are normally considered to be THC, CO, NO_x, and PM_{10} whose rates of emission are legally restricted in many countries. However in Albania lead is also a potential key pollutant at the present time since many of the vehicles using the road network of an older nature and as a consequence are still using leaded petrol. NO_x and lead can affect sensitive vegetation directly if the crop is grown too close to the roadside. In addition NO_x can contribute to regional acid deposition. In addition to these

pollutants, motor vehicles also emit carbon dioxide (CO_2), which is a main contributor to global warming. Carbon Monoxide is unlikely to be of concern if both NO_2 and PM_{10} are shown to have no significant impact.

5.1.32. Calculations presented below are traffic-derived contributions of NO_2, PM_{10} and to ambient air quality concentrations (in $\mu g/m^3$) for four assessment years (2003, 2009, 2014 and 2023).

Methodology

5.1.33. As it was not possible to source any appropriate background ambient air quality monitoring data for the study area, results provided enable a purely comparative assessment between the do-minimum scenario and the proposed road.

5.1.34. The previous Scott Wilson report provided an assessment of traffic-related emissions. Contribution of these emissions to local ambient air quality along the route has been limited to pollutant quantification at 50 m intervals up to a distance of 200 m from the roadside.

5.1.35. The methodology employed involved processing traffic data (flows, vehicle composition in terms of percentage heavy duty vehicles and speeds) using the 1994 Version of the UK Highways Agency's Design Manual for Roads and Bridges (DMRB) methodology.

5.1.36. For both light and heavy-duty vehicle flows, DMRB provides flow factors corresponding to assessment years and emissions factors to account for pollutant species, speed and distance from the roadside for each assessment case. DMRB functions are applicable to peak hour flows, therefore annual average daily traffic (AADT) data were adjusted accordingly.

5.1.37. The 1994 version of DMRB was used as emissions factors therein are more representative of the Albanian vehicle fleet than those within the 2003 version DMRB which pertain to the current UK vehicle fleet with its more modern technology and use of more efficient fuel types. No reduction in emissions factors was assumed for future years, as at present no legislation exists for emissions control of the Albanian vehicle fleet.

Results

5.1.38. Data displayed in Table 5.1.2 on the next page are estimated traffic-derived contributions to ambient level of NO_x, PM_{10} and THC for the Do-minimum and the proposed road in each assessment year for the Milot – Rreshen section. Contributory concentrations from the road in each case have been calculated at four 50m intervals from the roadside, up to a distance of 200m.

5.1.39. In addition at the present time in Albania leaded petrol is still very much in use. According to current UK regulations, the lead annual average concentration should not exceed $0.5\mu g/m^3$ until 2009 when this will be reduced to $0.25\mu g/m^3$. From experience in the UK over the ten year period during which leaded petrol was phased out and unleaded, together with lead replacement, petrol was introduced, the typical annual mean concentration of lead of $1.5\mu g/m^3$ close to urban roads fell to $0.2\mu g/m^3$. This change can be expected to happen in Albania over the next decade, if not sooner, as the vehicle fleet is upgraded and unleaded/lead replacement fuel replaces leaded fuel. The UK figures have been provided in Table 5.1.2 for an indication of the reduction likely during the period 2003 to 2014.

5.1.40. The current EU air quality limit values for both annual mean NO_2 and annual mean PM_{10} for the protection of human health are $40\mu g/m^3$. Any link that contributes more than 25% of the limit value ($10\mu g/m^3$) to ambient pollutant concentrations at a distance of 50m from the roadside may be considered significant and worthy of further, more detailed assessment.

5.1.41. Using the definition stated above, the Milot – Rreshen section does not exhibit a significant contribution to ambient levels of NO_2. Neither does the road section exhibit a significant contribution to ambient levels of PM_{10} for any of the assessment years. In addition the levels of PM_{10} and NO_2 do not exceed the EU limit value concentrations for any assessment year.

Table 5.1.2: Milot – Rreshen link (Vehicle Emissions)

Assess -ment Year	Option	NO_2 contribution from link ($\mu g/m^3$)				PM_{10} contribution from link ($\mu g/m^3$)				THC contribution from link ($\mu g/m^3$)				Pb ($\mu g/m^3$)
		50 m	100 m	150 m	200 m	50 m	100 m	150 m	200 m	50 m	100 m	150 m	200 m	50 m
2003	Do-minimum	7	3	1	1	1	0	0	0	1	0	0	0	1.5
	With Scheme	6	2	1	1	1	0	0	0	1	0	0	0	1.5
2009	Do-minimum	7	3	1	1	1	0	0	0	1	0	0	0	
	With Scheme	7	3	1	1	1	0	0	0	1	0	0	0	
2014	Do-minimum	8	3	1	1	1	0	0	0	1	0	0	0	0.2
	With Scheme	8	3	1	1	1	0	0	0	1	0	0	0	0.2
2023	Do-minimum	12	4	2	1	1	0	0	0	2	1	0	0	
	With Scheme	13	4	2	1	1	0	0	0	2	1	0	0	

Conclusions and Recommendations

5.1.42. Local air quality is generally degraded by the construction of a road as all vehicles emit pollutants as exhaust fumes. In Albania, lead-free petrol is not widely available and the maintenance of vehicles is frequently not conducted in accordance with manufacturers' recommendations. As a result, the exhaust emissions from vehicles include significant quantities of unburned fuel (THC) and particulate matter (PM_{10}). Dealing with such problems is a national issue that requires implementation of standards and regulations, and the requirement for lead-free fuels to be more widely used. The Government is now increasing taxation on leaded fuel to encourage the use of unleaded fuels, which should assist with reducing this impact.

5.1.43. Reductions in air quality can be minimised by roads that reduce engine strain and which maintain speeds relatively constantly with little stop-start or idling vehicle movements. However, a good road may attract more traffic that would reduce the air quality simply by adding more exhaust emissions.

5.1.44. In summary, the proposal is not predicted to have a significant impact on air quality, as levels of PM_{10} and NO_2 are not expected to exceed the EU limit value concentrations in any assessment year. In addition lead concentrations adjacent to all roads in Albania should reduce to meet the EU standards over the next few years as leaded fuel is replaced by unleaded or lead replacement fuels.

NOISE

Construction

5.1.45. Significant noise generating construction activities include piling, compaction using vibratory rollers, formation of sub base, roadbase surfacing and associated drainage works. These impacts apply to most major road construction activities. While they have potential to give rise to significant effects they can be reduced by adopting good site management practices. Impacts can be reduced substantially by locating construction camps away from sensitive receptors, particularly the more heavily populated areas such as Milot and Rubik. With these measures in place any effects relating to these impacts are anticipated to be at most minor in severity.

Operation

5.1.46. It is not possible to make a quantitative prediction of the increase in sound associated with road vehicle traffic based upon Average Annual Daily Traffic (AADT) flow data in isolation from the environment factors listed in Section 4.2. However, the links for which AADT data is available cover significant lengths of road, which have widely varying environmental factors that cannot be taken into account in detail.

5.1.47. Nevertheless an indication of the impact of the roads under operational conditions can be made by comparing predicted traffic levels with the "do-nothing" base case for each design year. This allows an absolute assessment to be made as to whether the various links for each alternative will experience increases in road noise compared to what might happen even if no work is carried out, and the degree of any increase in noise levels. The assessment does not account for increases in road noise simply due to predicted growth under the "do-nothing" case.

5.1.48. Guidance contained within the Design Manual for Roads and Bridges[24], suggests that an increase in traffic flow by 25% is approximately equivalent to a change in noise levels of 1dB(A)[25]. Furthermore, a change of 3dB(A) is the minimum level perceptible under normal conditions and would be regarded as a slight adverse impact. A change of 10dB(A) corresponds roughly to a halving or doubling of the loudness of a sound and would be regarded as a substantial adverse impact.

5.1.49. Based upon the above assumptions and the AADT data, for the Milot – Rreshen section the worst case scenario would be a doubling of traffic along the proposed road. This has happened on other national roads within Albania after a road has been improved. However even with a doubling of traffic, the noise levels would only increase by 3dB(A).

5.1.50. Noise associated with traffic is generally considered to be a fairly constant impact, although this is not going to be the case on these roads where traffic volumes are low enough to cause significant interruptions in traffic flow when no noise will be generated. Furthermore at night traffic volumes are anticipated to be much lower.

5.1.51. The World Bank has developed noise values, which should not be exceeded to protect a range of receptors. These noise levels are presented as average noise levels (denoted as L_{eq}).

Table 5.1.3: World Bank Recommended Noise Levels (L_{eq} as dB(A))

Receptor	Daytime	Night time
Residential, Institutional (hospitals) and educational (schools)	55	45

[24] Design Manual for Roads and Bridges, Volume 11. Environmental Assessment. DETR. HMSO, London (1993).

[25] dB(A) refers to decibels measured on a sound level meter incorporating a frequency weighting, which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness.

Industrial/Commercial areas	70	70

5.1.52. Noise data is not available for the road, but using guideline values "freeway" traffic generates noise levels of about 70dB(A). This is for a free flowing road in developed countries with high volumes of traffic. It is likely that for the volumes of traffic for this section that the noise levels will be between 40 and 60 dB(A). It is reasonable to assume that at night the lower traffic volumes will generate noise levels similar to a quiet residential area (i.e. about 40 dB(A)). With increasing traffic levels and higher road speeds the noise levels will increase.

5.1.53. The proposed road scheme might experience significant increases in noise along the Mat and Fan River valleys where the generally flat gradient will encourage higher speeds on the constructed road. However it is anticipated that the proposed scheme would have ambient noise levels related to road traffic of between 40 and 60 dB(A).

5.1.54. The proposed scheme could potentially have a significant adverse impact on noise levels in the adjacent towns and settlements. The most significant impact would be in Milot due to the larger number of potential receptors. This area is likely to require mitigation through the enforcement of speed limits. Close to Rubik it may be more appropriate to construct a noise bund alongside the road to mitigate the impact on the residents.

FLORA AND FAUNA

Construction

5.1.55. Impacts on flora would occur as a result of topsoil stripping, the construction of work camps, batching plants, borrow pits and quarries. Since the route of the road generally utilises the disused railway alignment, the impact on the flora has been minimised.

5.1.56. Most fauna will move away from the road during construction. A new road can sever habitats. This is most significant if the habitat is restricted in size and the road causes one or both parts of the affected habitat to become non-viable on their own. Identifying such small pockets of habitat requires an in-depth understanding of the ecological status of the route. This is missing in Albania and the project area. As such, identifying habitats that must be avoided will be difficult. However, since much of the 26km section from Milot to Rreshen utilises the disused railway alignment, the majority of the land take and disturbance impact will have already occurred. Furthermore, the Mat and Fan Rivers are already likely to sever the habitat of larger mammals, and having a parallel road will not have a significant additional impact. The route passes through large expanses of similar habitats and so any severance issues are likely to be insignificant.

5.1.57. Road construction can have a significant impact on breeding birds. Best practice would require that destruction of habitat should be scheduled to ensure nesting birds are not disturbed. This will be most important where the alignment is routed through hedges alongside fields or through natural woodlands. Commercial forestry areas tend to have low biodiversity and provide limited opportunities for nesting birds. Again the use of the existing railway alignment reduces this impact to insignificant.

5.1.58. However in order to **mitigate** the impact of the proposed road on the landscape, the design documentation should be revisited to make provision in the Bill of Quantities and on the drawings for placing of topsoil, grass seeding and landscape planting of trees and shrubs on earthwork embankments wherever possible.

Operation

5.1.59. The proposed road would result in higher traffic speeds and an increased volume of traffic. This could have a moderate adverse impact on wild fauna, due to the increased risk of vehicles hitting animals as they cross the road, especially during the night. Traffic signs can be used to alert drivers to areas where this is likely to occur, thereby reducing the risk of animals being hit. ITP have undertaken a traffic safety study to identify areas of risk and incorporate appropriate measures in to the traffic signs design.

5.1.60. The release of polluted discharge from the road or an increase in the sediment load due to embankment erosion could have an adverse impact on the water quality of the adjacent watercourses, see Hydrology Section on Water Quality for further details. A reduction in water quality would have an adverse impact on fish and other aquatic species. Appropriate highway drainage is required to mitigate the potential for adverse impacts.

5.1.61. Higher noise levels along the proposed road scheme can be expected to result in a minor increase in the disturbance of birds. This impact is not predicted to be significant.

LANDSCAPE

5.1.62. Landscape value is a difficult aspect to quantify, as different cultures will place different importance on landscape. In Albania the recognition of landscape as an asset worth preserving is generally low to non-existent. If the value is difficult to quantify then assessing the impact is similarly difficult. The method of landscape and visual assessment used is based upon the general approach provide by the Institute of Environmental Assessment and Management and the Landscape Institute[26].

Construction

5.1.63. Reconstruction or new construction will produce visual impacts on the landscape. These can be reduced by sound engineering practices, such as not wasting excavated material along the side of the roads and by the early establishment of vegetation on embankments and cuttings. Construction activities should be sited as far as possible from sensitive receptors, such as the residents of Milot and Rubik. It is not possible to specify a distance, it will be easier to locate facilities away from sensitive receptors in the scattered settlements than in the built up areas such as Milot. In some locations this may not be possible, and although the impact would be significant it would be short term. The existing vegetation should be retained wherever possible to screen sensitive receptors, further details are provided in the Environmental Management Plan, Section 6.

5.1.64. Measures to reduce the impact on landscape resources and visual receptors during construction are set out in the Environmental Management Plan, and residual impacts will be of limited duration.

Operation

5.1.65. As much of the route is on an existing disused railway alignment and as many of the sensitive receptors identified, such as visitors to Rubik Church, would only be subject to long distance views of the proposed road the landscape would not be significantly affected. The residential and commercial properties adjacent to the route are likely to be significantly affected, and consideration should be given to using planting along the route to screen these properties.

[26] Guidelines for Landscape and Visual Assessment 1st edition (1995), (edited by Scott Wilson) and 2nd edition (2002) The Landscape Institute and the Institute of Environmental Management and Assessment.

LAND USE

Construction

5.1.66. Where the road passes over contaminated land associated with historic land use (mining) then the road might provide limited opportunities to improve the land value. It is beyond the scope of this project to remediate all contaminated land along the route, but areas of contaminated land that could affect the health of construction staff and users of the road should be made safe. This could include providing measures to stop the contamination from entering rivers.

Operation

5.1.67. The scheme would result in the loss of agricultural land on the low flood plain fields alongside the Mat and Fan Rivers from Milot to Rreshen, although this is generally limited as in many areas the road is cut into the hillsides and slopes steeply down to the river below. The ponding of groundwater behind the proposed embankment could result in further loss, or lowering in the quality of, agricultural land.

5.1.68. Given the lack of suitable land for agricultural activity loss of such land through inappropriate road alignments would need to be minimised, and compensation provided as part of the resettlement plan.

5.1.69. Where the road passes through settled areas, such as Milot and smaller scattered settlements, residential and commercial properties would be destroyed. This would result in a significant adverse impact and would require compensation to be provided to affected parties.

SOCIO-ECONOMICS

Population and Economy

Construction

5.1.70. Social impacts from construction camps being located close to remote communities can be significant, especially if the workforce is not from the same cultural background as the resident community. Importing diseases can be problematic, especially HIV, although this is not considered a significant risk in this region.

Operation

5.1.71. The opening of a road has secondary impacts on the local population and economy. These can be negative (e.g. erosion due to poor construction) or positive (opening up markets to rural economic activities and improving access to services such as education and health facilities).

5.1.72. Although some negative impacts associated with construction and operation of the road can be engineered out through careful design, other negative impacts require other authorities to enforce regulations or improve their management (e.g. waste management activities – stopping illegal logging or hunting). The roads can be expected to exacerbate existing detrimental environmental problems, such as increased waste generation from roadside development leading to further illegal dumping of waste, which has been observed around all the towns along the route. The road itself can make it easier for regulators to visit areas where such illegal activity takes place.

Induced Development

5.1.73. The route has existing settlements, which are suffering significant unemployment so a new road along this route should bring benefits by opening markets to agriculture and possibly encouraging new commercial activities (e.g. local tourism into the area from Tirana).

5.1.74. The proposed road would improve access to markets, reducing the cost of producing and transporting products, thereby stimulating agricultural production. It may also encourage secondary processing of agricultural products, increasing the value and marketability of products. It would also improve social welfare by improving access to health services and other facilities. Research has indicated that most Albanians in rural areas consider the current lack of transport infrastructure as being one of the key reasons for rural poverty[27]. Some have suggested that the provision of this and other essential services will reduce the high level of out-migration from these areas.

5.1.75. The effects induced by the new road can be summarised as follows:

- Increase of economy activities for existing population
- Agriculture production increase because of "reduced distance" to markets
- Service production increase for traffic increasing
- Service production increase for agricultural production increasing
- Increased number of cultivated areas along the new road

5.1.76. The construction of a new road is normally accompanied by increased residential and commercial development adjacent to the road. Ribbon development alongside the road could lead to the loss of valuable agricultural land and forestry land. Enhanced enforcement would be required to reduce the current high level of illegal construction.

5.1.77. The road would bring detrimental impacts, such as increased waste generation from roadside development leading to poor waste management, as observed around all the towns along the route.

5.1.78. An improved road would increase the potential to bring remediation or rehabilitation of the abandoned mines in Rubik and Rreshen.

NATIONAL AND CULTURAL HERITAGE

Cultural Heritage and Undiscovered Archaeology

5.1.79. The primary impact on sites of cultural heritage is negative where the site is not recognised as being important and is destroyed, or which has to be excavated and then covered by the road alignment. Current best practice among archaeologists is to leave sites of interest undisturbed until properly planned and funded excavations are carried out. Road works can place time constraints on excavations that make planning and execution of archaeological excavation problematic, this frequently leads to poor recovery and losses of artefacts and (as a result) knowledge. Construction work generally has a negative impact on archaeological sites, although the Environmental Mitigation Plan (Section 6) sets out measures to prevent these impacts. Chance find procedures shall include: (a) no moving or removal of any artefacts by workers, (b) immediately stop work and notify official from Institute of Archaeology, (c) only continue work after official government approval.

5.1.80. Excavations in the river valleys should take place with care and under the supervision of an archaeologist to ensure that no tumuli are disturbed, and to ensure that any fields in the valley floors do not contain relicts of significance. This supervision should focus on the sections where the alignment does not follow the existing disused railway, as the potential for archaeological finds will be lower where the railway route is being upgraded and excavation and digging in new ground will be limited.

[27] World Bank Technical Paper No 520 – "Poverty in Albania - A Qualitative Assessment". H. de Soto et al., 2002.

5.1.81. The impact on social culture is more difficult to assess. Many ancient social systems are considered of value by modern society, but frequently those living under the old social system want nothing more than to improve their circumstances in a manner that might alter the socio-cultural setting. Quantifying this impact is difficult to do.

Built Heritage

5.1.82. Rubik Church is on the other side of the river to the route, so will not be physically damaged by any new road works, but care must be taken to minimise impacts on the setting of the Church. As the road is some distance from the Church and on the opposite side of the river impacts are expected to be minimal.

5.1.83. A new or an improved road into an area can improve access to sites of cultural importance. This would be a benefit to those wishing to visit the sites and have been prevented from doing so because of problems with transport in the past. It will also benefit those who live in the area through increased potential for revenue generation from provision of services to the visitors.

5.2 FUSHË-MILOT TO MILOT SECTION

SOIL

Construction

5.2.1. The construction of this road segment will result in the irreversible loss of an occupied area of fertile agricultural/arable land in the area of Fushë-Milot village.

5.2.2. However, apart from the occupation of the arable land required for construction, the construction of this road segment across an area of flat land has a negligible impact on the land. There is no evidence that the construction of the road will increase the risk of erosion. The road project, as designed, includes for the excavation of the topsoil, which will be conserved and correctly stored for reuse on the road embankments to provide for grass seeding and tree and shrub planting for landscaping.

5.2.3. In addition, some sporadic constructions will be affected, primarily buildings for residence and/or working environments, which have been identified in total along with the fruit trees and are included in the "Resettlement Action Plan".

HYDROLOGY

Construction and Operation

5.2.4. During the public consultation for this section of the road from Fushë-Milot to Milot, which was held in Milot on 22nd January 2006, the main concern of the local residents regarding the change in road alignment since the previous consultation during 2004 was a perceived increase in the risk of flooding and higher flood levels in the vicinity of Fushë-Milot. The reason for this concern has arisen because the existing protective flood embankment for Fushë-Milot which runs along the southern edge of the River Mat is in very poor condition with substantial erosion of the top of the embankment in places. The lack of maintenance of the protective bund has increased the risk of the river overtopping the protective bund during flood.

5.2.5. The original alignment proposed during 2004 for this section of road followed the alignment of the southern edge of the river and thereby incorporated the protective bund into the construction of the road. During the previous consultation, the local residents expressed their satisfaction that

the proposed road would strengthen the protective flood bund providing the residents of Fushë-Milot and the floodplain area to the south with greater protection from the risk of flooding.

5.2.6. On the other hand, the revised road alignment passes to the south of Fushë-Milot and does not incorporate the protective flood bund. In consequence the poorly-maintained protective embankment would not be repaired and strengthened. In addition some of the local residents expressed a preference for the first alternative because they considered that with the new road alignment, if the flood waters do breach the poorly-maintained bund then the construction of the road embankment to the south of Fushë-Milot would trap the flood water around the village and substantially increase the height of the flood water in the area. However this latter concern has been addressed by the road designer.

5.2.7. The designer's hydrologists carried out an analysis of flood risk and although detailed modelling was not carried out their analysis appears to be based on all the historic flooding information that is available. The designer has included culverts which allow the flood water to pass through the road embankment and assist in equalising the flood levels on either side of the embankment. The inclusion of these cross culverts should reduce the risk of raising the flood water level.

5.2.8. Furthermore, the design of the flood protection embankment has been studied and developed over many years as part of the ongoing Government Flood Protection Programme. Parts of the protective flood bunds, on both sides of the River Mat, further upstream near Milot have already been repaired and strengthened. These earlier works were referred to by the local residents during the consultation. As a consequence the local government officials present during the meeting agreed to take up the matter with the Ministry of Interior and to try to resolve the issue in a manner agreeable to all parties concerned.

5.2.9. In view of the above concern, the World Bank requested MPWTT and GRD to provide an action plan and time table for the strengthening of the current flood protection embankments, on both sides of the River Mat, between Milot and the north-south national road SH.1. In response to this request, a joint team of experts from the Ministry of Agriculture (MOA), the District Agency responsible for administering the flood protection embankments, representatives from Milot Commune and the PIU inspected the area on 27th April 2006. The team inspected the full length of both existing embankments, discussed the problems and prepared a brief report to the Minister of Agriculture concerning the actions required to resolve the concerns of the Milot Commune.

5.2.10. Both the Ministers of MOA and MPWTT had agreed on the report and the respective actions to be undertaken with an agreed timetable for implementation of the flood strengthening works. The Ministers have addressed a letter to the World Bank office in Tirana to confirm that they intend to carry out the following actions and timetable.

5.2.11. **Strengthening of the northern embankment** – from the site inspection, it became obvious that the northern flood protection embankment is severely damaged and needs urgent repair. The present condition of the embankment is such that the river currently overtops the damaged sections during normal high river levels, when the hydroelectric power plant releases the water further upstream. In view of this, a consultant will be engaged to undertake a detailed design, by the end of June, for repair of the damaged sections of embankment (total length 400m). For the period from July to December 2006, the GoA will allocate from the State budget extra funds to cover the works for strengthening the northern embankment according to the detailed design.

5.2.12. The District Administrative Agency of Lezha will rehabilitate the damaged sections of the northern flood protective embankment, using the available budgeted funds (Lek 5 million) before the end of 2006.

5.2.13. **Strengthening of the southern embankment** – at the request of Milot Commune, a preliminary study will be carried before the end of June 2006 for the rehabilitation/strengthening of the existing southern embankment, taking into consideration the proposal of the local community. These proposals include a realignment of the flood protective embankment to provide protection to areas which are currently inside the floodplain, but are currently utilised. This will be followed by the engagement of a consultant to undertake the detailed design of the full length of the protective embankment, based on the conclusions of the above preliminary study. The GoA will then allocate funds from the State budget for 2007 to cover the construction works for strengthening (and realigning if agreed necessary) according to the detailed design.

5.2.14. In addition, since the section of the road approaching Milot lies within the river floodplain, erosion control is proposed for the side of the road embankment closest to the river. These proposed measures consist in reinforcement of the embankment slope with a concrete lining layer 20 cm thick. This layer coats the fill slopes up to 1.0 m above the predicted quota of maximum water level, for a 100-year return period water flow.

5.2.15. The lining layer is anchored to a longitudinal gabion key with a 1x1m cross section at the base of the fill slope. In order to protect the embankment from scouring at the base, the project has foreseen the construction of a ditch with a trapezoidal cross section, upper base of length B=7.5m, lower base of length b=3.0m and height h=3.0m. The ditch shall be filled with massive cobble rocks of diameter d > 0.60m (70% of the cross section) and crushed stones of diameter d<0.60m (30% of the cross section).

FLORA

Construction

5.2.16. The construction of this road segment will result in the necessity for cutting down some of the fruit trees, recently planted by the inhabitants of this area. However this can be **mitigated** by the inclusion of tree planting along the road embankment in this area. The design documentation should be revisited to make provision in the Bill of Quantities and on the drawings for placing of topsoil, grass seeding and landscape planting of trees and shrubs on earthwork embankments wherever possible.

LANDSCAPE

Operation

5.2.17. The proposed 5m high embankment, as it passes through the River Mat floodplain, will be a little out of scale in this low-lying area, although there are existing road and railway embankments on both sides of the River Mat.

5.2.18. The proposed viaduct overpass at Milot can be expected to have an adverse impact on the residents of Milot and the landscape character of the surrounding area. Although the structure would pass through an industrial area, the height of the structure, which is 14m above the surrounding ground, would not be in keeping with the low lying character of this area and would be out of scale with the surrounding single and two-storey dwellings. This structure would be highly visible from the large number of dwellings on the hill in Milot. The residents of Milot were invited to comment on the potential impact of the overpass and did not express any major concerns, due to the low sensitivity of these receptors the scheme is not anticipated to have a significant impact on landscape.

5.3 MILOT TO RUBIK SECTION

HYDROLOGY

Construction

5.3.1. During the previous public consultation for the Milot to Rreshen road, which was held in Rreshen on 27 March 2004, local authority representatives and residents from the Fierza and Rubik voiced their concern regarding the detrimental impact on Fierza village and Rubik town as a result of the Albanian army tipping the excavated rock material into the River Fan's floodplain opposite the village during early 2004. During flood conditions, the dumped material in the floodplain diverts the floodwater towards the village of Fierza causing erosion of the river bank and increasing the risk of damage to the properties on the edge of the floodplain (see photo. 7 in Appendix 6). In addition the large quantity of material within the floodplain reduces the effective cross-sectional area of the valley adjacent to Fierza and as a consequence there is a greater risk of raising the flood level to the detriment of the village and also in Rubik.

5.3.2. A small-scale site investigation, instigated by the World Bank, has been carried out in April 2006. The site investigation indicates that the material, which has been dumped in the river floodplain, is suitable for road embankment construction provided that the contractors select the material during excavation, in order to exclude the materials which have become contaminated with organic materials. However this 'unsuitable' material can be used in the landscaping areas on each side of the Milot grade-separated interchange before covering with topsoil.

5.3.3. The contract documents for all three Works Contracts shall be revised to include a necessity for the Works Contractors to remove the material from the river valley and re-use it for any embankment construction within their section.. In addition, the contract documents for Lot 2: Skuraj to Rubik shall be revised to include a requirement for the successful Contractor to grant access to the other two Works Contractors to collect the material from the river floodplain opposite Fierza (assuming that different contractors will be engaged for each Lot). Also the contract documents for each 'Lot' shall be revised to advise the contractors that they will be required to carefully select the material, to exclude any material contaminated with organic materials and the contract documents for Lot 1: Fushë Milot to Skuraj shall instruct the Contractor to utilise the material so contaminated within the Milot junction landscaping area.

5.3.4. The section of the road from approx. Km 6+500 to Km 7+000 lies within the river floodplain and erosion control is proposed for the side of the road embankment closest to the river. These proposed measures consist in reinforcement of the embankment slope with a concrete lining layer 20 cm thick. This layer coats the fill slopes up to 1.0 m above the predicted quota of maximum water level, for a 100-year return period water flow.

5.3.5. The lining layer is anchored to a longitudinal gabion key with a 1x1m cross section at the base of the fill slope. In order to protect the embankment from scouring at the base, the project has foreseen the construction of a cobble stone filled area extending approximately 12m from the base of the embankment into the river. At this location, a 5m deep trench will be excavated and backfilled with massive cobble rocks of diameter d > 0.60m (70% of the cross section) and crushed stones of diameter d<0.60m (30% of the cross section).

5.3.6. The GRD has completed an independent review of the works completed in this section by the Albanian army in 2004 during a study undertaken in 2006. The review was conducted as a small site investigation of the works including: an appraisal of bulk natural materials used; measurements of achieved compaction and strength of embankments; some limited contamination testing; assessment of quality and quantity of excavated material, tipped into the river floodplain, for reuse within the Works; and an appraisal of slope stability and slope protection alternatives in

the embankments and cuttings. The report will be made available to contractors and is considered to present valuable background information.

5.3.7. The report highlights a number of deficiencies which are to be remedied by the Contractor for Lot 2 and these are included as preliminary works in a separate BoQ item in the construction contract. The actual extent of preliminary works shall be confirmed on site and is to be completed ahead of any new construction which may be affected, in full compliance with the aims and requirements of the Conditions of Contract including EMP. In summary, the following actions are considered necessary and are to be addressed in the construction phase:

- Introduction of cut-off drainage channels at the top of cutting slopes;
- Repair to damaged benching on cutting slopes (see photo. 6 in Appendix 6);
- Installation of protective rock netting or anchors;
- Construction of cascade barriers to reduce erosion;
- Construction of gabions to reduce erosion to river banks; and
- Removal of excavated material deposited in the river.

5.3.8. However the report does highlight the limited extent that has been possible to cover in the time available. Its contents must therefore be considered only indicative of actual conditions and the Contractor for Lot 2 is required to satisfy himself of conditions on site. Should further works be uncovered which are deemed to be unsatisfactory and this further remediation work is subsequently approved by the Engineer then the additional work shall be deemed "as-found" and, in accordance with the Conditions of Contract, be planned and executed within the existing programme of construction.

5.4 RUBIK TO RRESHEN SECTION

HYDROLOGY

Design

5.4.1. A public consultation for this realigned section of the road from Rubik to Rreshen was held in Vau i Shkjezës (Rubik Municipality) on 19th February 2006. At the meeting the Mayor of Rubik Municipality requested the road designer to make a provision for connections from Rubik, Munazi and Vau i Shkjezës to the new road. In addition he requested connections with parallel roads. In particular this was making reference to the location of the proposed road between Km 19+000 and Km 19+700 where the proposed road severs the existing road at several locations but doesn't propose any connections or make any provision for access to the severed sections.

5.4.2. As **mitigation**, this problem has been addressed by the General Roads Directorate in consultation with the road design consultant ITP. The design consultant has now been instructed to revise the contract drawings to ensure that all severed sections of the existing roads (national or otherwise), together with private accesses, are provided with proper safe access to the proposed road.

Construction

5.4.3. During the same public consultation, several residents from the villages of Vau i Shkjezës and Rrethi i Epërm voiced their concern regarding the detrimental impact on the river as a result of the Albanian army tipping surplus excavated material into the River Fan's floodplain in the vicinity of the two villages during 2005. During flood conditions, the dumped material in the floodplain

diverts the floodwater towards the village of Rrethi i Epërm causing erosion of the river bank and increasing the risk of damage to the properties on the edge of the floodplain. Many residents asked about compensation for the damage caused already.

5.4.4. In order to **mitigate** this environmental impact, the contract documents for Lot 3: Rubik to Rreshen Works Contracts shall include a necessity for the Works Contractor to remove the surplus material from the river valley. The documents shall provide for the contractor to re-use it for any embankment construction, which may still be required or to deposit the removed surplus in a location agreed with the local authorities as stated to the residents during the consultation.

5.4.5. Similar to the report in the previous section, the GRD has completed an independent review of the works completed in this section by the Albanian army in 2005 during a study undertaken in 2006. The review was conducted as a small site investigation of the works including: an appraisal of bulk natural materials used; measurements of achieved compaction and strength of embankments; some limited contamination testing; assessment of quality and quantity of excavated material, tipped into the river floodplain, for reuse within the Works; and an appraisal of slope stability and slope protection alternatives in the embankments and cuttings. The report will be made available to contractors and is considered to present valuable background information.

5.4.6. The report highlights a number of deficiencies which are to be remedied by the Contractor for Lot 3 and these are included as preliminary works in a separate BoQ item in the construction contract. The actual extent of preliminary works shall be confirmed on site and is to be completed ahead of any new construction which may be affected, in full compliance with the aims and requirements of the Conditions of Contract including EMP. In summary, the following actions are considered necessary and are to be addressed in the construction phase:

- Introduction of cut-off drainage channels at the top of cutting slopes;
- Repair to damaged benching on cutting slopes;
- Installation of protective rock netting or anchors;
- Construction of cascade barriers to reduce erosion;
- Construction of gabions to reduce erosion to river banks; and
- Removal of excavated material deposited in the river.

5.4.7. However the report does highlight the limited extent that has been possible to cover in the time available. Its contents must therefore be considered only indicative of actual conditions and the Contractor for Lot 3 is required to satisfy himself of conditions on site. Should further works be uncovered which are deemed to be unsatisfactory and this further remediation work is subsequently approved by the Engineer then the additional work shall be deemed "as-found" and, in accordance with the Conditions of Contract, be planned and executed within the existing programme of construction.

5.5 MITIGATION MEASURES (APPLICABLE TO ALL SECTIONS)

5.5.1. This section describes the proposed mitigation measures for both the construction and operational phase. Mitigation measures are proposed for the impacts to the following components:

- Soil
- Surface and groundwater
- Air quality
- Noise

- Flora and fauna
- Landscape and land use
- National and cultural heritage
- Roads used for access to the construction site

Detailed Design Phase

5.5.2. The road design consultant ITP has completed the detailed design stage of the Fushë-Milot to Rreshen section. Since most of the proposed road alignment now follows the alignment of the disused railway, this has assisted the road designer in meeting the suggested requirements previously included in the Scott Wilson EIA Report based on the original alignment.

5.5.3. However the design needs to be revisited at certain locations in order to address issues which were raised during the public consultations. In particular the section of the proposed road between Km 19 and Km 20 needs some additional junctions in order to connect with the existing road.

5.5.4. Similarly the design for the sections of the road which pass through the village of Fangu (around Km 13) and the villages of Munazi and Vau i Shkjezës (approx. Km 21 to Km 24) needs to be revisited in order to make provision for access to the villages from the proposed road. Again this was raised during the public consultation held in Vau i Shkjezës.

5.5.5. In order to **mitigate** the impact of the proposed road on the landscape, the design documentation shall now be revised by the design consultant ITP to make provision in the Bill of Quantities and on the drawings for placing of topsoil, grass seeding and landscape planting of trees and shrubs on earthwork embankments wherever possible. Especially at Fushë-Milot, Milot and Munazi to Vau i Shkjezës sections.

Construction Phase

5.5.6. Environmental impacts during the construction phase are to be minimised by the implementation of the Environmental Management Plan (EMP), as described on Chapter 6. All construction works should be carried out according to this EMP. The mitigation measures required to reduce the impact on the various environmental issues to be incorporated in the EMP are detailed below.

(i) Soil Erosion

5.5.7. ***Embankment & Erosion Prevention:*** shall be undertaken to ensure that all necessary actions are incorporated to ensure embankment stabilisation, including the selection of least erodable material, use of gabions and rip-rap, and good compaction, particularly around bridges and culverts. The re-vegetation will be completed as soon as possible following fill placement to facilitate regeneration of a stabilising ground cover. Trenching will be required where necessary to ensure successful establishment of vegetation.

5.5.8. Slopes of road embankments will be seeded with a fast growing crop and a native seed mix immediately after fill placement to prevent scour and to encourage stabilisation.

5.5.9. Embankment slopes and road cuttings will be stabilised by re-vegetation with grazing resistant plant species, and the use of fibre mats, rip-rap, rock gabions, or other appropriate technologies.

5.5.10. Discharge zones from drainage structures will be furnished with rip-rap to reduce erosion when required, particularly in instances in which drainage structures are installed and/or road formation levels are raised and create bare slopes that require stabilisation before the onset of the rainy season.

5.5.11. Down drains/chutes will be lined with rip-rap/masonry or concrete to prevent erosion. Side slopes will be adjusted to a gradient to be determined as necessary to reduce erosion potential or, if steeper, stabilised, covered with riprap or other material to prevent soil erosion.

5.5.12. Construction in erosion and flood prone areas will be restricted to the dry season.

5.5.13. ***Temporary protection and restoration of Borrow Pits:*** Borrow pit operation, if permitted, will create exposed soil slopes, which can result in severe soil erosion during heavy rainfall. Drainage interception ditches will be built surrounding the borrow pits to prevent surface run off from the hills causing erosion during flash floods. While Borrow Pits have potential to give rise to significant effects they can be avoided by adopting good site management practices, as set out in the Environmental Management Plan, Section 6. With these measures in place any effects relating to these impacts are anticipated to be at most minor in severity. Pit restoration will follow the completion of works in full compliance to all applicable standards and specifications, namely the EU Landfill Directive and Supervision Consultants specifications, as outlined below.

5.5.14. The excavation and restoration of the borrow pit areas and their surroundings, in an environmentally sound manner to the satisfaction of the GRD or the construction Supervision Consultant (SC) acting on behalf of the GRD, will be required before final acceptance and payment under the terms of contracts. Topsoil from the opening of the borrow pits will be saved and reused to re-vegetate the pits to the satisfaction of the SC. Additional borrow pits will not be opened without the restoration of those areas no longer in use.

5.5.15. ***Temporary protection at disposal sites:*** Prior to the use of a disposal site, a bank will be constructed at the lower end of the site to prevent the flush of the spoiled materials in the piles into nearby rivers or farmland. Interception ditches will be built at the upper side of the site to divert the runoff away from the site. Measures will be taken to ensure waste material is not dumped in streams or at the riverside.

5.5.16. ***Mining/Quarry Activities:*** Only licensed quarrying operations will be used for material sources. If licensed quarries are not available the contractors may be made responsible for setting up their dedicated crusher plants at approved quarry sites. Selections of quarries used for the purposes of the Project should require the approval of the SC.

5.5.17. ***Remediation of contaminated soils:*** Although it is estimated to be a very low possibility, if contaminated soils are encountered, especially close to the abandoned copper processing plant at Rubik, the Contractor shall provide his labourers working in the vicinity of the contamination with protective devices (i.e. face and nose masks, eye goggles, industrial rubber gloves etc.). The contaminated soil should be removed and deposited in a sealed pit in an area agreed with the Local Authority.

(ii) Surface and Groundwater

5.5.18. Stockpiles of the construction materials, such as asphalt, oil and chemicals shall not be located near to any surface watercourses, fish ponds, lakes or water wells. The stockpiles will be located on sealed surfaces, covered with canvas sheets or a more permanent roof and surrounded by a bund to prevent runoff of spillages. Stockpiles should be protected to prevent vandalism and theft that can lead to spillages etc.

5.5.19. Side ditches will be constructed prior to road construction, to prevent the road run off flowing into streams, canals or farmland.

5.5.20. Temporary canals will be provided to replace any existing canals to be temporarily occupied.

5.5.21. Retention walls and/or interception ditches will be provided at the riverside when construction is undertaken near the river.

5.5.22. During the phases of concrete casting, necessary for the construction of structures (piles, plinths, abutment walls), in order to avoid the dispersion of water and concrete in the soil and in the groundwater, some measures will be adopted, such as the positioning of sheet protection to contain the casting.

5.5.23. The site run off discharged from construction yard activities will be treated in accordance with their type.

5.5.24. The water coming from washing of the machines and from the equipment will be treated by sedimentation in a settling tank for coarse particles and oil interceptors to allow the fine particles and the oils to be then eliminated.

5.5.25. The water coming from washing of the aggregates and from the production of conglomerates will be treated by sedimentation in tanks and then used again or sent to another place

5.5.26. Where the site run off is to be discharged to a river, the rate of discharge will be controlled so that it does not cause localised flooding in the watercourse.

5.5.27. In the event of a serious spillage of chemicals or fluids during construction, a programme of surface and groundwater measurements will be established by the Contractor. The groundwater sampling should take in situ measurements of pH, turbidity and electrical conductivity. The groundwater water samples taken should be of a sufficient amount to permit analyses for major cations and anions, BOD, COD, heavy metals, oil and grease or hexane solubles. The samples should be taken by a technically able person and analysed at an UCAS accredited laboratory.

(iii) Air Pollution

5.5.28. The construction activities can cause dispersion of dust in the atmosphere and a reduction in local air quality through emissions of poorly operated or maintained machinery. In order to mitigate this impact the following measures should be adopted:

- Water sprinkling to limit the dust emissions in the area near the construction materials and non-asphalted roads. This system is preferential to the utilisation of chemical treatments, which could have negative effects on the flora and on the fauna and could contaminate the treated materials.
- Covering the surfaces with plastic covers during storage and transportation of materials
- Planting of trees / shrubs near the construction yard. Hedges will be located near particularly sensitive receptors.
- Periodical cleaning of the construction yard and relevant access roads

- Installation and utilisation of filters in the concreting plant to eliminate concrete dust In the absence of Albanian Standards for this process, UK standards provide a reasonable alternative. Filtered emissions can be expected to be below 10mg/m3[28].
- Efficient use of modern construction machinery to minimise emissions. For each item of plant used in the works, the values quoted in the relevant EC Directive/UK statutory instrument, where appropriate, should not be exceeded (e.g. S.I1984/1992, 1985/1968, 1987/1730, 1988/361, 1989/1127). Vehicles and mechanical plant used for the purpose of the works shall be fitted with effective exhaust silencers and maintained in good and efficient working order and operated in such a manner as to minimise noise emissions.

(iv) Noise

5.5.29. The construction schedule will be carefully developed for the section near sensitive receptors (schools, hospitals, residences, animals, etc.) to minimise the impact of noise. If necessary, temporary facilities to reduce noise, such as wood acoustic insulation barriers, will be installed.

5.5.30. As a road (unsurfaced in sections) is already available throughout the entire proposed scheme length, temporary access roads will not cause any additional problems for the residents close to the construction site. The transportation of construction materials on the existing roads will be carefully scheduled to avoid any disturbance to the local traffic. At night, construction vehicles will be requested to operate at low speeds and the use of horns will be banned.

5.5.31. The operation of noisy equipment will be prohibited from 22.00 – 6.00 each day, unless agreed by the Supervision Consultant.

(v) Flora and Fauna

5.5.32. The topsoil layer shall be removed before construction of the earthworks commences for re-use prior to landscaping. Topsoil shall wherever practicable be used immediately after its stripping and if not shall be stored in stockpile heights not exceeding 2m and in addition shall not be stockpiled for more than two years. Topsoil shall not be unnecessarily trafficked either before stripping or when in a stockpile. Stockpiles shall not be surcharged or otherwise loaded and multiple handling shall be kept to a minimum. Furthermore topsoil shall not be excavated from stockpiles, whether on site or imported which have been exposed to a cumulative rainfall exceeding 100mm over the preceding 28 days.

5.5.33. Any land temporarily occupied by the project shall be re-cultivated or rehabilitated immediately after the construction. When the construction activities at the site terminate, the soil will be returned to cover the temporarily occupied land and then landscaped and planted to rehabilitate the habitat.

5.5.34. A survey of the remaining trees on the route of the road should be carried out prior to construction starting to identify those that are to be protected during construction activities.

5.5.35. The contractors will be required to liaise with the Prefect of Lezha Circle to locate construction sites, camps and temporary access roads. The construction of the camps will be controlled to minimise damage to soil and vegetation.

5.5.36. In order to protect the habitats adjacent to the route alignment, the area of construction should be delineated and a line/protection zone should be defined to protect the habitats outside of the immediate construction area.

[28] UK Draft Process Guidance Note 3/1 (2003).

5.5.37. The construction activities will be carefully scheduled to avoid disturbing fauna activities. Vegetation that is likely to be used by nesting birds that is to be directly impacted on by the construction activities should be surveyed prior to construction starting, identified and removed during the non-breeding season.

(vi) Landscape and Land Use

5.5.38. Fencing walls will be constructed around the construction sites near to sites of landscape sensitivity. These will be landscaped with vegetation or other means to minimise the visual impacts created by the construction sites.

5.5.39. The solid waste from construction and domestic sources will be disposed of regularly in engineered and designated facilities identified by the contractor. Random dumping of solid waste will be strictly banned

5.5.40. The material storage and mixing stations will be located at least 6 metres from the river side and landscape sites, and where they will not be visible from major public areas.

5.5.41. The existing roads will be used as much as possible to access construction sites. If not possible, the access roads will be selected in places that would minimise the damage to vegetation and to scenic sites.

5.5.42. Measures will be undertaken to minimise erosion, and the visual impacts that this has, as discussed earlier.

(vii) National and Cultural Heritage

5.5.43. The areas of archaeological significance are at a sufficient distance from the proposed road, therefore specific archaeological protection measures are not required. However if during the excavations some archaeological remains are found, works will immediately be stopped, no one is allowed to move or remove any items and the local competent authority will be informed. The works will resume only after appropriate measures have been taken as requested by the appropriate authority and confirmation has been received from them that works can continue. During excavation in known areas of archaeological significance and areas of archaeological potential a watching brief shall be undertaken by an official government or government approved archaeologist.

(viii) Roads Used for Access to the Construction Site

5.5.44. A provision will be included in the tender documents for the Contractor to carry out any necessary repairs to the existing roads used for access to the site. Prior to commencement of the Works, the SC and the Contractor shall jointly carry out an assessment of the access roads that will be needed during construction and they shall jointly determine the condition of those existing roads, which are to be used by the Contractor. Following completion of the Works, a further joint inspection shall be made of those same roads to determination the road condition after the construction period. The Contractor shall then be required to carry out the necessary repairs to return the road to its original condition.

5.5.45. The tender documents shall also stipulate the need for the SC and Contractor to jointly assess the need for traffic management and whether detours, and their maintenance, will be required during the construction period.

(ix) Stakeholder Involvement

5.5.46. A stakeholder team should be established, the members of which would have the responsibility of informing and consulting with the local population prior to and during the construction phase. One of the roles of this stakeholder team should be to identify through consultation with the local population, the areas of significant cultural heritage that will require protection during construction. It would be advisable to introduce a 24hour hotline with logging of calls and a list of actions to be taken.

Operation phase

5.5.47. Remedial and rehabilitation works would be undertaken after the construction phase to restore, wherever possible, the environment which has been affected by the road construction. Certain measures are required to ensure continued best environmental practice in the post construction operation of the road. The following sections detail the mitigation measures required post construction.

(i) Soils

5.5.48. On completion of the road, visual inspections of all the structures along the alignment, including bridges, embankments and culverts would be undertaken to ensure that the road structures are not causing erosion, and to identify the requirements for and to carry out any remedial work. This would minimise the potential future impact of loss of soils and the associated landscape impacts caused by erosion.

(ii) Landscape and Land Use

5.5.49. All housing and other properties, with the exception of authorised service stations and rest facilities, should have access via side roads. The construction of housing within the 44m right of way of the new road will be prohibited. All construction is subject to licensing by the district, as the responsible unit of local government. GRD will make representations to the local authorities of the Lezha and Rreshen districts to implement these requirements and would use their influence to ensure that they are implemented.

(iii) Surface and Groundwater

5.5.50. The use of sustainable drainage systems, such as retention basins with reedbeds should be considered in the future. These can reduce flood risk through the storage and controlled release of storm water runoff. They can also improve the water quality of road runoff prior to discharge into watercourses.

(iv) Flora and Fauna

5.5.51. Appropriate traffic signs should be provided in areas of significant wild fauna movements to alert the drivers of the presence of wildlife and so protect the species.

6. ANALYSIS OF ALTERNATIVES

6.1. ALTERNATIVES CONSIDERED

6.1.1. The Milot to Rreshen road section was considered by TECNIC, during their feasibility study of the Durres to Morine road corridor, to be a section of their preferred alternative (Alternative 3). But in addition, this section also has a common alignment as part of Alternative 2, which utilises

the existing road network. This was a consideration by the World Bank when selecting the section for Bank funding.

6.1.2. At the feasibility stage, the Milot to Rreshen section was considered by TECNIC to be best served by upgrading the existing road alignment. This alignment is considered to be **Alternative 1** for this environmental assessment. During the design process by ITP, and with regard to the requirements of the Government of Albania (GoA), a second alignment was considered preferable to provide for the possibility of upgrading the road to a dual carriageway in the future. Thus **Alternative 2** is on the opposite side of the Mat and Fan rivers from alternative 1, until north of Rubik, where the two routes have the same alignment. However during 2004 when the World Bank was considering the financing of the Milot to Rreshen road scheme, this alternative alignment was considered to be too expensive, since the alignment had a flowing alignment to permit future upgrading to dual carriageway. At that stage it was considered that, in order to meet the requirements of the GoA for future upgrading, the road alignment should utilise the abandoned railway alignment between Milot and Rreshen. Also at the commencement of the route the alignment should commence further south on the existing north-south road SH.1 and pass to the south of Fushë Milot. This is considered to be **Alternative 3**.

6.1.3. Hence the following three alternative routes have been assessed regarding their environmental impact on the area between Milot and Rreshen:

Alternative 1 : Pllana (north of Milot) – Fierza – Rubik – Perlalaj – Rethi i Epërm – Rreshen (Existing road SH.30)

6.1.4. This alternative follows the route of the national road SH.30, which runs from Pllana on the north side of the River Mat (opposite Milot), then turning northwards to follow the western edge of the River Fan valley, passing through Fierza village and Rubik. After Rubik, the road crosses the River Fan to follow initially the eastern edge of the valley through Perlalaj (Rethi i Eperm) and then, as the road turns eastwards, the southern edge. The road passes through Rethi i Epërm before reaching Rreshen.

Alternative 2 : Fushë Milot – Milot – Skuraj Junction – Fangu – Perlalaj – Rethi i Epërm – Rreshen

6.1.5. This alternative initially follows the route of the existing link road. It departs from the existing north-south national road SH.1 approximately 1.5 km south of the new River Mat Bridge and runs through Fushë Milot before diverting from the link road and heading directly to Milot. After passing along the northern edge of Milot, the alternative follows the existing national road SH.6 until the national road turns south-eastwards towards Skuraj. At this location, the alternative route turns northwards and follows the alignment of a rural road along the eastern edge of the River Fan valley, running parallel with the abandoned railway line. The Alternative passes through Fangu village and the disused copper works opposite Rubik. Just to the north of this point, Alternative 2 joins the route of Alternative 1 and continues to follow the national road SH.30 passing through Perlalaj and Rethi i Epërm to reach Rreshen.

Alternative 3 : Fushë Milot (south of) – Milot – Skuraj Junction – Fangu – Perlalaj – Munazi – Vau i Shkjezës – Rreshen

6.1.6. This alternative departs from the existing north-south national road SH.1 approximately 2.2 km south of the new River Mat Bridge and runs to the south of Fushë Milot village, crossing the existing link road and then passing into the southern edge of the River Mat floodplain to reach Milot. From Milot to Rreshen, the alternative follows, and incorporates, the abandoned railway alignment. Again the route passes along the northern edge of Milot, but then the alternative follows the abandoned railway, running parallel with the existing national road SH.6 until the national road turns south-eastwards towards Skuraj. At this location, the alternative route turns

northwards and follows the railway alignment along the eastern edge of the River Fan valley. The alternative passes through Fangu village and the disused copper works opposite Rubik. Just to the north of this point, Alternative 3 joins the route of Alternatives 1and 2 to pass Perlalaj (Rethi i Epërm).

6.1.7. After the village of Perlalaj, Alternative 3 diverts from Alternatives 1 and 2 and crosses the River Fan to follow the abandoned railway alignment along the northern edge of the Fan river valley. The route of the alternative passes by the villages of Munazi and Vau i Shkjezës before crossing the River Fan to the southern side of the valley, where it is at the same location as Alternatives 1 and 2.

6.1.8. The three Alternatives are shown in Appendix 5, Map 2.

6.2. ASSESSMENT OF ALTERNATIVES

6.2.1. An assessment of the impacts of the alternative routes has been carried out through the use of a matrix as set out below. Each environmental asset has been qualitatively assessed as to whether the considered alternative route would have a significant benefit, some benefit, neutral impact, some negative impacts or significant negative impacts.

Table 6.1: Analysis of Environmental Impact of Alternatives

Environmental Aspect	**Do Nothing** – (national road SH.30 remains as now between Milot and Rreshen)	**Alternative 1** – (rehabilitation of national road SH.30 between Milot and Rreshen)	**Alternative 2** – (runs parallel with abandoned railway and rehabilitates parts of SH.6 and SH.30)	**Alternative 3** – (new road follows, and incorporates, abandoned railway between Milot and Rreshen)
Topsoil Loss	No change to current situation – no loss of topsoil in agricultural lands	Slight change to current situation – small loss of topsoil in agricultural lands as road is widened	Slight change to current situation – small loss of topsoil in agricultural lands as existing roads are widened	Largest volume of topsoil and subsoil has to be stripped due to road alignment crossing fertile river floodplain near Fushë Milot.
Contaminated Land	No change to current situation	No change to current situation	Contaminated land could possibly be encountered at Rubik where the road alignment is close to a disused copper processing plant. Slight risk of workers requiring protective clothing etc. if contaminated land is encountered during road construction.	Contaminated land could possibly be encountered at Rubik where the road alignment is close to a disused copper processing plant. However risk is reduced due to use of railway alignment. Very slight risk of workers requiring protective clothing etc. if contaminated land is encountered during road construction.
Air Quality	No change to current situation	Little difference to current situation – marginal improvement due to better alignment and slightly increased travel speeds probably outweighed by increase in traffic volumes when whole Durres-Morine corridor completed.	Little difference to current situation – marginal improvement due to better alignment and slightly increased travel speeds probably outweighed by increase in traffic volumes when whole Durres-Morine corridor completed. Some towns/villages benefit from traffic removal, such as Fierza and Rubik. But others suffer an increase with introduction of more traffic, such as Fangu.	Little difference to current situation – marginal improvement due to better alignment and slightly increased travel speeds probably outweighed by increase in traffic volumes when whole Durres-Morine corridor completed. Some towns/villages benefit from traffic removal, such as Fierza, Rubik and Reth i Epërm. But others suffer an increase with introduction of more traffic, such as Fangu, Munazi and Vau I Shkjezës.
Noise	No change to current situation.	Slight increase in traffic when whole Durres-Morine corridor completed would increase sound levels but not considered major issue.	Slight increase in traffic when whole Durres-Morine corridor completed would increase sound levels but not considered major issue. Some towns/villages benefit from traffic removal, such as Fierza and Rubik. But others suffer an increase with introduction of more traffic, such as Fangu.	Slight increase in traffic when whole Durres-Morine corridor completed would increase sound levels but not considered major issue. Some towns/villages benefit from traffic removal, such as Fierza, Rubik and Reth i Epërm. But others suffer an increase with introduction of more traffic, such as Fangu, Munazi and Vau i Shkjezës.

Environmental Aspect	**Do Nothing** – (national road SH.30 remains as now between Milot and Rreshen)	**Alternative 1** – (rehabilitation of national road SH.30 between Milot and Rreshen)	**Alternative 2** – (runs parallel with abandoned railway and rehabilitates parts of SH.6 and SH.30)	**Alternative 3** – (new road follows, and incorporates, abandoned railway between Milot and Rreshen)
Climate (not a significant issue – relates to emission of greenhouse gases)	Worst case as existing roads cause traffic to drive least efficiently. However will improve as Albanian vehicle fleet is upgraded to later models.	Less impact due to improved road alignment allowing traffic to drive more efficiently. Also will improve as Albanian vehicle fleet is upgraded to later models.	Less impact due to improved road alignment allowing traffic to drive more efficiently. Also will improve as Albanian vehicle fleet is upgraded to later models.	Less impact due to improved road alignment allowing traffic to drive more efficiently. Also will improve as Albanian vehicle fleet is upgraded to later models.
Surface and Groundwater	Erosion and siltation continue unabated.	Improved situation as erosion control measures implemented. through the road improvement.	Improved situation as erosion control measures implemented. through the road improvement.	Improved situation as erosion control measures implemented. through road improvement. Provided that the surplus excavated material deposited in the river by the Albanian army is removed from the floodplain.
Road Drainage	Risks to environment from spillages continue as now as majority of drainage is natural runoff to road verge.	Risks to environment from spillages continue as now as majority of drainage is natural runoff to road verge. Slightly improved road alignment will encourage faster road speeds – thus increasing the risk of accidents involving HGVs and so increase the risk of pollution through spillages.	Risks to environment from spillages reduced because although majority of drainage is natural runoff to road verges, this is then collected in ditches alongside the road embankment. However, improved road alignment will encourage faster road speeds – thus increasing the risk of accidents involving HGVs and so increase the risk of pollution through spillages. But the drainage ditches will permit some control of run-off by the emergency services if a spillage occurs.	Risks to environment from spillages reduced because although majority of drainage is natural runoff to road verges, this is then collected in ditches alongside the road embankment. However, improved road alignment will encourage faster road speeds – thus increasing the risk of accidents involving HGVs and so increase the risk of pollution through spillages. But the drainage ditches will permit some control of run-off by the emergency services if a spillage occurs.

Environmental Aspect	**Do Nothing** – (national road SH.30 remains as now between Milot and Rreshen)	**Alternative 1** – (rehabilitation of national road SH.30 between Milot and Rreshen)	**Alternative 2** – (runs parallel with abandoned railway and rehabilitates parts of SH.6 and SH.30)	**Alternative 3** – (new road follows, and incorporates, abandoned railway between Milot and Rreshen)
Flora and Fauna	No change to impact on flora	No significant impact – minor loss of flora due to road widening.	No significant impact – minor loss of flora due to widening of existing roads.	No significant impact – minor loss of flora due to widening of existing railway embankment. Some flora will be lost where new road alignment is to be constructed across the floodplain at Fushë Milot.
	No change to impact on fauna	No significant impact on fauna	No significant impact on fauna. Although increased traffic speeds could result in increased deaths of nocturnal fauna.	No significant impact on fauna. Although increased traffic speeds could result in increased deaths of nocturnal fauna.
Landscape	No change to existing impact. Impact on landscape is noticeable – but not extreme.	No significant change to existing impact – some increased areas of embankments and cuttings required to accommodate wider carriageway – but mitigated against by planting etc.	Moderate increase to existing impact – due to presence of two roads in the river valleys. However the impact of the second road although causing some increase in areas of embankments and cuttings, required to accommodate wider carriageway, – these can be mitigated against by planting of trees, shrubs etc. on the road embankments.	Moderate increase to existing impact – due to presence of two roads in the river valleys. However the impact of the second road although causing some increase in areas of embankments and cuttings, required to accommodate wider carriageway, – these can be mitigated against by planting of trees, shrubs etc. on the road embankments. In addition, the impact of the road across the floodplain at Fushë Milot will be significant. There will also be an adverse impact on the residents of Milot and the landscape character of the surrounding area where the road embankment will be 14m above the existing ground in order to pass over the existing road and railway.

Environmental Aspect	**Do Nothing** – (national road SH.30 remains as now between Milot and Rreshen)	**Alternative 1** – (rehabilitation of national road SH.30 between Milot and Rreshen)	**Alternative 2** – (runs parallel with abandoned railway and rehabilitates parts of SH.6 and SH.30)	**Alternative 3** – (new road follows, and incorporates, abandoned railway between Milot and Rreshen)
Land Use	No change to current situation. Poor access to markets continues, potentially restricting agricultural economy.	Improved access to markets – minor increase in land take for the widening and small realignments of the carriageway.	Improved access to markets – moderate increase in land take for the new road due to widening and realignment of the existing roads.	Improved access to markets – significant increase in land take for the new road due to widening of the railway embankment to accommodate the road width. Also the new road alignment across the river floodplain at Fushë Milot will require the loss of fertile agricultural land.
Population and Economy	No significant change	Improved access to markets – but no increase in number of communities exposed to markets..	Improved access to markets – very small increase in number of communities exposed to markets due to road passing on opposite side of the river from the existing road over some sections of the route.	Improved access to markets – small increase in number of communities exposed to markets due to road passing on opposite side of the river from the existing road.
National & Cultural Heritage	No change to current situation – neutral impact	No significant impact.	No significant impact	No significant impact
Protected Areas	No routes pass through protected areas – no difference between "Do Nothing" and any of the three alternatives			

6.3. CUMULATIVE ASSESSMENT

6.3.1. The report has assessed the three alternatives in the previous table. A summary of the environmental impacts compared with the "Do Nothing" situation is provided in the following paragraphs.

6.3.2. **Alternative 1** is broadly similar in environmental terms to the "Do Nothing" situation, since they use the same road. The upgrading and minor re-alignment of existing road would cause a slight loss of topsoil, flora and land. However these losses would be compensated by the improved access to markets for the residents in the area. The increase in areas of embankments or cuttings in order to accommodate the wider road would be mitigated by tree and shrub planting on the slopes. There would be an increased risk to the water courses fed by the road drainage due to potential spillages following an accident because of the slightly increased speed of the traffic. Air quality and noise levels would not significantly alter although traffic volumes are likely to increase as the road scheme between Durres and Morine is improved and completed. This route is therefore considered to be "Environmentally Acceptable".

6.3.3. When compared with the "Do Nothing" situation, **Alternative 2** can be summarised as follows. Since the alternative route would require the upgrading and widening of the existing roads (national or rural) this would cause a slight loss of topsoil and flora. Also there would be a moderate increase to the impact of the roads on the landscape due to the introduction of a second major road into the river valley (upgraded from a rural road). However these losses and impacts would be compensated by the improved access to markets for the residents in the area. Also the impact of the second road could be mitigated by tree and shrub planting on the embankment slopes. An increase in traffic speeds could increase the number of fatalities of nocturnal animals, but this is not considered to be significant. There would be a reduced risk to the water courses fed by the road drainage due to potential spillages following an accident because the run off the road is generally collected in ditches alongside the road embankment, which would facilitate the emergency services in containing the spillage. Air quality and noise levels would not significantly alter although traffic volumes are likely to increase as the road scheme between Durres and Morine is improved and completed. Some towns/villages benefit from traffic removal (Fierza & Rubik), whereas others suffer an increase (Fangu). Overall therefore this route is considered to be "Environmentally Acceptable".

6.3.4. **Alternative 3** would cause more topsoil and subsoil to be stripped and loss of flora than either of the other alternatives due to the route crossing the fertile river floodplain near Fushë Milot. Also there would be a moderate increase to the impact of the roads on the landscape due to the introduction of a second major road into the river valley (upgraded from the abandoned railway embankment). However the impact would be compensated by the improved access to markets for the residents in the area. In particular this alternative would have an adverse impact on the residents of Milot. On the western edge of Milot, in order to pass over the existing road and railway which are already raised above the surrounding land to place them above the flood water level, the alternative requires a bridge and the approach embankments to be 14 m in height. The residents of Milot did not raise this as a significant issue during the public consultations. They consider that the benefits the improved road will bring to the area outweigh the environmental impact. In order to mitigate this visual impact on the Milot landscape tree and shrub planting would be provided on the embankment slopes. An increase in traffic speeds could increase the number of fatalities of nocturnal animals, but this is not considered to be significant. There would be a reduced risk to the water courses fed by the road drainage due to potential spillages following an accident because the run off the road is generally collected in ditches alongside the road embankment, which would facilitate the emergency services in containing the spillage. Air quality and noise levels would not significantly alter although traffic volumes are likely to increase as the road scheme between Durres and Morine is improved and

completed. Some towns/villages benefit from traffic removal (Fierza, Rubik & Reth i Epërm), whereas others suffer an increase (Fangu, Munazi & Vau i Shkjezës). Overall therefore this route is considered to be "Environmentally Acceptable".

6.4. SELECTED ALTERNATIVE

6.4.1. Since all three of the alternatives are considered to be "Environmentally Acceptable", other factors have influenced the selected route. As stated at the beginning of this section, the GoA's desire to allow for a future upgrading of the road to a dual carriageway standard and the fact that the abandoned railway land was not being productively used has led to the alternative route which follows the disused railway (Alternative 3) being adopted as the preferred option.

7. ENVIRONMENTAL MANAGEMENT PLAN

7.0.1. The Environmental Management Plan (EMP) presents a set of mitigation, monitoring and institutional measures to be adopted during the construction and operational phases to eliminate or reduce adverse environmental and social impacts arising from the construction of the Milot to Rreshen section of the Durres – Morine Road Corridor.

7.0.2. The EMP mainly consists of the following components:

- Environmental mitigation measures, are a series of specific measures developed on the basis of the understanding of future impacts of the road's construction and operation. The mitigation measures are designed to mitigate these potentially negative impacts and reduce them to acceptable levels as can be defined by applicable standards, where appropriate;

- Environmental monitoring plan, will be very important for environmental supervision and management and will be carried out periodically to monitor specific components and provide data quantifying the level of impacts;

- Institutional arrangements, to include the definition of the responsibilities for the implementation and monitoring of the mitigation measures as defined.

7.1 Environmental Mitigation Measures

7.1.1. To reduce the levels of negative environmental impacts mitigation measures have been identified. Mitigation measures will be implemented during the construction and operation phases. Measures such as construction camps will be indicated. The following components of mitigation are foreseen:

Construction Phase

- Materials Supply
- Materials Transport
- Noise and Dust
- Traffic Disruption
- Vehicular/Pedestrian Safety
- Disposal of Construction Waste
- Solid Waste and Sediments in Drains
- Water Pollution
- Soil Erosion
- Flora & Fauna

- Archaeological Discoveries
- Siting of Construction Camps and Related Facilities

Operation Phase

- Maintenance of the Road
- Road Safety

Construction Phase

- *Materials Supply:* Contractors will be required to use or buy material from existing asphalt plants, stone quarries and borrow pits operating with valid environmental and other permits and licenses. Appropriate provisions to this effect will be made in the contract documents as follows.

- *Mining/Quarry Activities.* Contracts shall specify that only licensed quarrying operations are to be used for material sources. If licensed quarries are not available the contractors may be made responsible for setting up their dedicated crusher plants at approved quarry sites. Selections of quarries for the purposes of the Project will require the approval of the environmental authority.

- *Asphalt Plants.* Contract provisions shall require that asphalt and hot-mix plants will be located at least 500 metres away from the nearest sensitive receptor (e.g., school or hospital) and subject to licensing and approval of the environmental authority, and that operators are required to install emission controls in accordance with the local environmental regulations. It should be clear that the stipulations apply to all such facilities, including those that are privately negotiated.

- *Borrow Pit Restoration Requirements.* Contracts will ensure enforceable provisions stating that: (i) Only existing borrow areas approved by the environmental authority will be used for the project; (ii) Pits management, (including restoration if it will follow the completion of certain works) shall be in full compliance with all applicable environmental standards and specifications; (iii) The excavation and restoration of borrow areas and their surroundings, in an environmentally sound manner to the satisfaction of the GRD (or RRDs), or the construction Supervision Consultant (SC), acting on behalf of the road owner, will be required before final acceptance and payment under the terms of contracts; (iv) Borrow pit areas will be graded to ensure drainage and visual uniformity or to create permanent tanks/dams; (v) Topsoil from the opening of borrow pits will be saved and reused to re-vegetate the pits to the satisfaction of the SC. Additional borrow pits, if necessary, will not be opened without the restoration of those areas no longer in use, and without the approval of the environmental authority.

- *Materials Transport:* Truck operators will be required to cover or wet truck loads, avoid hauling materials, on public roads, during the morning peak traffic hour (8:00am to 9:00am), and use alternative routes wherever possible to minimise traffic congestion. The contractor will be required to prepare and submit to the works supervisor a traffic management plan showing routes and times to be used for materials delivery off and on site. No material transport will be allowed until the traffic management plan is approved.

- *Noise and dust:* Construction contractors will be required to limit activities to daylight working hours (not between 11 p.m. and 7 a.m. or as agreed with the public and

authorities) and use equipment with noise mufflers. Construction site and materials storage sites will be watered as appropriate to control dust.

- *Traffic Disruptions and vehicular/pedestrian safety:* Contractors will prepare a traffic management plan with appropriate measures to redirect traffic.

- *Disposal of construction waste:* Milled asphalt and demolition debris from the construction site will be disposed of in accordance with the local environmental regulations and at sites approved by the environmental authority.

- *Solid wastes and sediments in drains:* Solid waste clean up will be entrusted to licensed operators, with provisions in their contract documents to carry out visual inspections for toxic materials before handling, segregate waste fractions as necessary, use safety measures while handling and transporting the wastes, and disposal at authorised dump sites with approval of the local authorities.

- *Water pollution:* Contractors will be required to properly organise and cover material storage areas; isolate concrete, asphalt and other works from any watercourse by using sealed formwork; isolate wash down areas of concrete and asphalt trucks and other equipment from watercourse by selecting areas for washing that are not free draining directly or indirectly into any watercourse. Contractors will further ensure proper handling of lubricants, fuel, and solvents by secured storage; ensure proper loading of fuel and maintenance of equipment; collect all waste and dispose to permitted waste recovery facility.

- *Siting of Construction Camps and Related Facilities:* Project contract specifications shall stipulate that the siting, construction and environmental restoration of facilities for the housing of construction personnel, the storage of equipment and vehicles, labour camps and similar facilities must be conducted to the satisfaction of, and are subject to the approval of, the SC. It should be clear that the stipulations apply to all such facilities, including those that are privately negotiated.

Operation Phase

- *Road Maintenance* The Albanian Government has concluded that a Road Maintenance Project should be prepared. In actual fact, this project is already operational for a large proportion of the road network. though the new maintenance system will allow the GRD to extend these improvements to the entire road network.

- *Road Safety* A Road Safety Auditing Programme has commenced. As part of the road safety component of the RMP, a road safety audit was carried out on the previous design as part of the training of the GRD and some local consultants in the skills of undertaking safety audits. Further safety auditing will take place during the construction and operational phase to ensure their success and implementation.

- The Road Safety Programme will incorporate auditing during the following remaining phases:

- At the conclusion of construction and the beginning of the operation of the road, the safety expert will inspect the road to ensure that safety elements have been incorporated and applied. In addition, s/he will recommend other administrative measures, such as speed limits. S/he will submit an auditing report confirming the road approval, and his/her recommendations for administrative measures to be undertaken during the operational phase.

- Approximately two years following the commencement of the operational phase, the safety expert will inspect the road and review safety procedures with the authorities and the police. S/he will prepare an auditing report and will recommend further measures for the improvement of safety if necessary.

7.1.2. The environmental mitigation plan, Table 7.2 provides a synthesis of the impacts and relevant mitigation measures for the phases of construction and operation. The description of measures is detailed in Section 5.5.

7.2 Mitigation Programme

7.2.1. For each environmental aspect a mitigation programme has been prepared, which includes the costs and responsibilities. Levels of impacts should be rather low and expensive interventions not necessary. These measures should be included in the construction contract.

Costs

7.2.2. The cost for the execution of the monitoring surveys includes both the tests and the reports. It is about $290,000 according to the previous Scott Wilson report. In Table 7.1 the costs for each single phase are reported.

Table 7.1: Estimated Mitigation Costs

BASELINE	CONSTRUCTION	OPERATION
$18,000	$262,000	$10,000
	TOTAL costs	**$290,000**

7.3 Institutional Arrangements and Strengthening

7.3.1. The level of detail of EMP is strictly correlated to the detail level of the feasibility study. However as a result of drafting this EIA, the consultant responsible for the detailed design will review the contract documentation and revise/strengthen where necessary to include the mitigation measures foreseen during the preparation of the EIA. As the monitoring plan is correlated to the mitigation measures, we think that this plan will have to be examined closely during the following phases of the project. According to the present Monitoring Plan, the contractor would have the task of preparing the detailed Monitoring Plan that would be developed in accordance with GRD and MEFWA. GRD will have the responsibility to co-ordinate and to control the monitoring activities, together with the Environmental Inspectorate.

7.3.2. In early March 2004 an Environmental Unit was established within the GRD. Prior to this time, environmental issues requiring GRD's attention were reviewed by a civil engineer in the Expropriation Department. Due to a lack of fully experienced environmentalists, together with limited available funding, the new Environmental Unit was initially composed of two personnel selected from the GRD staff. The civil engineer, who had carried out the previous environmental reviews, was chosen to be the head of the unit. The head of the unit has previous experience with international and foreign aid projects. Studies for his degree included geology, hydrology, geography, air and noise pollution, palaeontology and chemistry. In addition, since establishment of the Environmental Unit, he has attended several training courses on environmental issues in Denmark and attended a workshop in Tirana concerning "Strategic Environmental Assessment" and also gained additional knowledge from the internet.

7.3.3. The other person appointed to the Environmental Unit is an Environmental Specialist. This assistant has a degree in Geography and her studies have included geology, hydrology, climatology, diversity of flora and fauna, demography, morphology and agriculture. In 2005, both members of staff have been granted a certificate by the Ministry of Environment, which provides them with a licence to undertake EIAs, including preparation of reports, environmental auditing and to be called as an expert for the evaluation of an EIA report or any audit's conclusions. In addition the head of the Environmental Unit is a member of the Technical Interministerial Group, which acts as a technical Secretariat for the Steering Committee established by the Minister of Transport for monitoring of the study "Integrated Coastal Development Study and Plan of the Southern Albanian Region" financed by the World Bank.

7.3.4. Since the formation of the Environmental Unit in early 2004, the unit has been increasingly more active, with developing skills, and is now fully responsible for providing the GRD's input regarding environmental issues for road projects which are currently being prepared by external consultants. The staff has "self-trained" concerning the requirements of Albanian environmental legislation. Also the staff is regularly involved in attending public consultations or preparing/reviewing EIAs, in accordance with Albanian or other Donor's environmental policies, for such road schemes as Fier-Tepelene, Gjirokastra Bypass, Tepelene Bypass and most recently the public consultations for the two realigned sections of this project: Fushë Milot to Milot and Rubik to Rreshen.

7.3.5. Further appropriate staff training would be beneficial to ensure that the unit staff is up-to-date in environmental issues and EU requirements, so that the GRD's Environmental Unit is able to assist the Environmental Inspectorate with monitoring the implementation of the mitigation measures, environmental management and resettlement plan.

7.3.6. MEFWA would propose to the Council of Ministers (CoM) the activities concerning the monitoring in order to involve the specialists of the Environmental Inspectorate (see Articles 60 and 61, Law No. 8934 of 9/5/2002). A multi-disciplinary team would be constituted that would demonstrate it has the equipment and qualified personnel to elaborate and carry out the monitoring.

Table 7.2: ENVIRONMENTAL MITIGATION PLAN

Phase	Issue	Mitigating Measure	Cost		Institutional Responsibility		Comments
			Install	Operate	Install	Operate	
Construction	*Material Supply*	*Material Supply*					
	(a) Asphalt Plant -dust -worker health/safety	(a) Requirement for official approval or a valid operating license from National Environmental Agency of Albania (NEAA) specified in bid document	(a) NA	(a) NA	(a) Asphalt Plant Owner	(a) Asphalt Plant Owner	
	(b) Stone Quarry -dust -worker health/safety	(b) See (a)	(b) NA	(b) NA	(b) Stone Quarry Owner	(b) Stone Quarry Owner	
	(c) Sand/Gravel -disturbance to river bed / water quality/ ecosystem	(c) See (a)	(c) NA	(c) NA	(c) Sand/Gravel Contractor	(c) Sand/Gravel Contractor	
	(d) Borrow pits	(d) See (a) plus borrow pit areas to be restored at end of Contract	(d) NA	(d) NA	(d) Construction Contractor	(d) Construction Contractor	(d) to be specified in bid documents
	Material Transport	*Material Transport*					
	(a) Asphalt -dust/fumes	(a) Asphalt -cover truck load	(a) NA	(a) NA	(a) Truck operator	(a) Truck operator	
	(b) Stone -dust	(b) Stone -wet or cover truck load	(b) NA	(b) NA	(b) Truck operator	(b) Truck operator	(a), (b), (c), (d) to be specified in bid documents
	(c) Sand/Gravel -dust	(c) Sand/Gravel -wet or cover truck load	(c) NA	(c) NA	(c) Truck operator	(c) Truck operator	
	(d) Traffic Management -noise and vehicular exhaust, road congestion	(d) Haul material at off-peak traffic hours Use routes to minimize major traffic sites	(d) NA	(d) Minimal	(d) Truck operator	(d) Truck operator	

Phase	Issue	Mitigating Measure	Cost		Institutional Responsibility		Comments
			Install	Operate	Install	Operate	
Construction	*Erosion Protection* (a) Risk of erosion (along embankments adjacent to the proposed road and the opposite riverbank).	*Erosion Protection* (a) Groynes or Gabions should be used.	(a) NA	(a) NA	(a) Construction Contractor	(a) Construction Contractor	(a) to be specified in bid documents
	Soil Protection (a) Loss of topsoil and erosion of bare ground	*Soil Protection* (a) Careful storage of topsoil for re-use and rapid re-establishment of base areas of ground	(a) NA	(a) NA	(a) Construction Contractor	(a) Construction Contractor	(a) to be specified in bid documents
	(b) Loss of agricultural soil through ponding behind the flood prevention embankment	(b) Embankment to incorporate flood relief outlets (with flap valves if necessary)	(b) NA	(b)NA	(b) Construction Contractor	(b) Construction Contractor	(b) to be specified in bid documents
	Cultural Heritage (a) Archaeological finds	(a) Archaeological supervision during construction. In the even of a find stop work, notify archaeological authority and follow their directions. No artefacts are to be moved or removed until government officially approves it.	(a) NA	(a) NA	(a) Construction Contractor	(a) Construction Contractor	(a) to be specified in bid documents

Phase	Issue	Mitigating Measure	Cost		Institutional Responsibility		Comments
			Install	Operate	Install	Operate	
Construction	*Construction Site*	*Construction Site*	(a) NA	(a) NA	(a) Construction Contractor	(a) Construction Contractor	
	(a) Noise	(a) Limit activities to reasonable hrs (not between 11 PM and 7 AM or as agreed by Supervision Consultant)	(b) YES	(b) YES	(b) Construction Contractor	(b) Construction Contractor	
	(b) Dust	(b) Water construction site and materials storage sites as appropriate (during dry, windy conditions)	(c) NA	(c) NA	(c) Construction Contractor	(c) Construction Contractor	(a), (b), (c), (d) (e) and (f) to be specified in bid documents
	(c) Traffic Disruption (during construction activity)	(c) Appropriate measures to redirect traffic that are easily seen or easy to follow including preparation of a traffic management plan	(d) YES	(d) YES	(d) Construction Contractor	(d) Construction Contractor	
	(d) Vehicular/pedestrian safety (off hours when there is no construction activity)	(d) Appropriate lighting and well defined safety signs included in traffic management plan	(e) YES	(e) YES	(e) Construction Contractor	(e) Construction Contractor	
	(e) Water Pollution from Improper Materials Storage/Management	(e) Cover material storage areas Construct channels to direct runoff to sewage system or appropriate treatment facility					
	f) Sediment runoff	(f) provide sediment fence, straw bales or other sediment traps	(f) YES	(f) YES	(f) Construction Contractor	(f) Construction Contractor	

Phase	Issue	Mitigating Measure	Cost		Institutional Responsibility		Comments
			Install	Operate	Install	Operate	
Construction	*Construction Site*	*Construction Site*					
	(g) Protection of water resources	(g) Take measures (diversion ditches, etc.) to prevent the direct entry of water from construction sites into streams, canals, lakes, wells and aquifers; provide detention basins, where needed	(g) YES	(g) YES	(g) Construction Contractor	(g) Construction Contractor	(g), (h), (i) and (j) to be specified in bid documents
	(h) Archaeological finds	(h) Notify archaeological authority and follow their directions	(h) NA	(h) NA	(h) Construction Contractor	(h) Construction Contractor	
	(i) Construction camps Garbage removal Sewage management	(i) Location of construction camps to be approved by local authority and camps to be fenced and screened. Sewage disposal to be to sewer system if available, otherwise to be to constructed cesspools. Garbage disposal to be delivered to authorised tips only.	(i) YES	(i) YES	(i) Construction Contractor	(i) Construction Contractor	
	(j) Bridge Construction over rivers and watercourses - Water pollution risk from bridge construction during fish spawning season	(j) Construct bridges within rivers out of fish breeding season	(j) NA	(j) NA	(j) Construction Contractor	(j) Construction Contractor	
	Waste Disposal						
	(a) Construction debris (concrete, asphalt, fuels, paints, contaminated soil)	(a) Dispose of in approved locality and cover with inert material.	(a) YES	(a) NA	(a) Construction Contractor	(a) NA	(a) and (b) to be specified in bid documents
	(b) Solid waste	(b) Dispose of in accordance with the directions of the Prefect of Lezha and the Institute of Hygiene and Sanitation.	(b) YES	(b) YES	(b) Construction Contractor	(b) Construction Contractor	

Phase	Issue	Mitigating Measure	Cost		Institutional Responsibility		Comments
			Install	Operate	Install	Operate	
Operation	*Maintenance of Constructed Road* (a) Noise	*Maintenance of Constructed Road* (a) Limit activities to reasonable hours (not between 11 PM and 7 AM except for winter maintenance) or as agreed by Local Authority	(a) NA	(a) Minimal	(a) NA	(a) GRD	(a) to be specified in bid documents
	Road Safety (a) Erosion, rockfall, hazardous conditions	*Road Safety* (a) Install appropriate warning signs (rockfall, landslide, wet or slippery conditions, dangerous curve, animal or pedestrian crossing, school, slow moving vehicles, merge), reflective markers to indicate steep edge, or convex mirrors to see oncoming traffic at blind curves. Locate warnings at points considered appropriate by good engineering practice	(a) YES	(a) Minimal	(a) GRD	(a) GRD	

Phase	Issue	Mitigating Measure	Cost		Institutional Responsibility		Comments
			Install	Operate	Install	Operate	
Prior to Construction of Embank-ment at Fushë-Milot	*Flood Protection* Perceived increased risk of overtopping of the poorly maintained flood protection bunds between Milot and the Milot-Lezha national road (applies to both sides of River Mat).	*Flood Protection* Repair and strengthen (including an increase in height by at least 10cm) the protective flood bunds on both sides of the River Mat between Milot (where flood bunds previously repaired) and the Milot-Lezha national road embankment.	(a) YES	(a) USD 100,000	(a) Ministry of Agriculture (MOA)	(a) Maintain flood protective bunds in future (MoI or Min. of Agric)	(a) MOA has established a programme for repair to flood protection bunds
During Construction	*Material Deposited in Floodplain (Opp. Fierza)* Excavated rock material dumped in floodplain by Albanian army restricting flow of flood waters and increasing risk of flooding for Fierza and Rubik.	*Material Deposited in Floodplain (Opposite Fierza)* Include requirement in contract documents for each Works Contract for Contractor to extract material from river floodplain and re-use in embankment construction for the proposed road.	(a) No additional cost if included in contract documents.	(a) None	(a) Construction Contractors	(a) NA	(a) to be specified in bid documents for Construction Contractors to utilise the material from the floodplain.
	Surplus Material Deposited in Floodplain Surplus excavated material dumped in floodplain by Albanian army restricting flow of flood waters and increasing risk of flooding for Vau i Shkjezës and Rethi i Epërm.	*Surplus Material Deposited in Floodplain* Include requirement in contract documents for Lot 3 Works Contract for Contractor to extract material from river floodplain and re-use in embankment construction or deposit at a location agreed with the local authorities	(a) No additional cost if included in contract documents.	(a) None	(a) Construction Contractor (Lot 3)	(a) NA	a) (Lot3) to be specified in bid documents for Construction Contractor to remove the material from the floodplain.

7.4 Environmental Monitoring Plan

7.4.1. The environmental monitoring plan, Table 7.3 provides an indication of the monitoring procedures for ensuring that the relevant mitigation measures stipulated in Table 7.2 are implemented during the construction and operation phases.

Table 7.3: ENVIRONMENTAL MONITORING PLAN

Phase	What *is to be monitored*	Where	How *is the parameter to be monitored/ type of monitoring equipment*	When *is the parameter to be monitored*	Why *is the parameter to be monitored*	Cost		Responsibility	
						Install	Operate	Install	Operate
Construction									
Material Supply									
(a) Asphalt Plant	(a) [NEAA] approval or valid operating license	(a) NA	(a) GRD Supervision Consultant	(a) At start of contract	(a) Assure plant compliance with environment, health and safety requirements of Albania	(a) NA	(a) NA	(a) Asphalt Plant Owner	(a) Asphalt Plant Owner
(b) Stone Quarry	(b) See (a)	(b) NA	(b) GRD Supervision Consultant	(b) At start of contract	(b), (c) and (d) Assure that contractor has relevant permissions for material extraction	(b) NA	(b) NA	(b) Quarry Owner	(b) Quarry Owner
(c) Sand/Gravel	(c) See (a)	(c) NA	(c) GRD Supervision Consultant	(c) At start of contract		(c) NA	(c) NA	(c) Sand/Gravel Contractor	(c) Sand/Gravel Contractor
(d) Borrow pits	(d) See (a) plus restoration at end of Contract	(d) Borrow pit sites	(d) GRD Supervision Consultant	(d) At any time borrow pits are proposed		(d) NA	(d) NA	(d) Construction Contractor	(d) Construction Contractor
Material Transport									
(a) Asphalt	(a) Truck load covered or wet	(a) Job site	(a) GRD Supervision Consultant	(a) After work starts- several unannounced inspections	(a) Assure Contractor complies with requirement	(a) NA	(a) Small	(a) NA	(a) GRD Regional Maintenance Department + GRD Supervision Consultant

Phase	What *is to be monitored*	Where	How *is the parameter to be monitored/ type of monitoring equipment*	When *is the parameter to be monitored*	Why *is the parameter to be monitored*	Cost		Responsibility	
						Install	Operate	Install	Operate
Construction									
Material Transport									
(b) Stone	(b) Truck load covered or wet	(b) Job site	(b) GRD Supervision Consultant	(b) After work starts- several unannounced inspections	(b) Assure Contractor complies with requirement	(b) NA	(b) Small	(b) NA	(b) See (a)
(c) Sand/Gravel	(c) See (b)	(c) See (b)	(c) See (b)	(c) See (b)	(c) See (b)	(c) NA	(c) Small	(c) NA	(c) See (a)
(d) Traffic Management	(d) Hours and routes selected	(d) See (b)	(d) See (b)	(d) See (b)	(d) See (b)	(d) NA	(d) Small	(d) NA	(d) See (a)
Construction Site									
(a) Noise	(a) Noise levels	(a) At site or nearest homes	(a) Sound level detector (dB[A] meter)	(a) Once/week- (AM-PM) and when locals complain	(a) Ensure noise levels at acceptable level	(a) NA	(a) NA	(a) NEAA	(a) MEFWA + GRD Supervision Consultant
(b) Dust	(b) Air quality (dust)	(b) At site	(b) Visual	(b) During material delivery and construction	(b) Ensure dust levels kept to a minimum	(b) NA	(b) NA	(b) NEAA	(b) See (a)
(c) Traffic Disruption (during construction)	(c) Traffic patterns + preparation of traffic management plan	(c) At or near site	(c) Approval of TMP and observation by GRD Supervision Consultant	(c) TMP as necessary + once/week at peak and non peak periods	(c) Ensure contractor's vehicles not causing congestion	(c) NA	(c) NA	(c) NA	(c) GRD Regional Maintenance Department + GRD Supervision Consultant

Phase	What *is to be monitored*	Where	How *is the parameter to be monitored/ type of monitoring equipment*	When *is the parameter to be monitored*	Why *is the parameter to be monitored*	Cost		Responsibility	
						Install	Operate	Install	Operate
Construction *Construction Site*									
(d) Vehicular/ Pedestrian Safety (after hours when there is no construction activity)	(d) Visibility and appropriateness + traffic management plan	(d) At or near site	(d) Approval of TMP and observation by GRD Supervision Consultant	(d) TMP as necessary + once/week during evening	(d) Ensure contractor's works not causing traffic safety problems	(d) NA	(d) NA	(d) NA	(d) GRD Regional Maintenance Department + GRD Supervision Consultant
(e) Water Pollution (from Improper Materials Storage/ Management)	(e) Water quality (primarily suspended solids)	(e) Runoff from site or materials storage areas	(e) Observation by GRD Supervision Consultant + water sample collected for analysis if necessary	(e) During precipitation (rain, snow etc.) and periodically during storage period	(e) Ensure contractor's works materials not causing water pollution	(e) NA	(e) NA	(e) MEFWA	(e) MEFWA + GRD Supervision Consultant
(f) Sediment runoff	(f) Water quality (primarily suspended solids)	(f) Runoff from site	(f) Observation by GRD Supervision Consultant + water sample collected for analysis if necessary	(f) During occurrence of sediment runoff	(f) Ensure contractor's works not causing water pollution	(f) NA	(f) NA	(f) MEFWA	(f) MEFWA + GRD Supervision Consultant

Phase	What *is to be monitored*	Where	How *is the parameter to be monitored/ type of monitoring equipment*	When *is the parameter to be monitored*	Why *is the parameter to be monitored*	Cost		Responsibility	
						Install	Operate	Install	Operate
Construction									
Construction Site									
(g) Protection of water resources	(g) Water quality of water resource (major cations & anions,BOD, COD, heavy metals, oil and grease)	(g) At resource location	(g) GRD Supervision Consultant to collect water sample for analysis as necessary	(g) Water samples to be taken monthly and analysed by competent laboratory	(g) Ensure water resources not polluted by the works	(g) NA	(g) Small	(g) MEFWA	(g) MEFWA + GRD Supervision Consultant
(h) Archaeo-logical finds	(h) Archaeo-logical finds to be reported	(h) At site	(h) Observation by GRD Supervision Consultant and notification to Archaeology Department	(h) At time of discovery	(h) Archaeological finds to be reported by Contractor	(h) NA	(h) NA	(h) MEFWA	(h) MEFWA + GRD Supervision Consultant
(i) Construction camps	(i) Location of construction camps to approved by Local Authority	(i) At site	(i) GRD Supervision Consultant	(i) At start of contract	(i) Ensure contractor's choice of location for camps is approved by Local Authority	(i) NA	(i) NA	(i) MEFWA	(i) MEFWA + GRD Supervision Consultant

Phase	What *is to be monitored*	Where	How *is the parameter to be monitored/ type of monitoring equipment*	When *is the parameter to be monitored*	Why *is the parameter to be monitored*	Cost		Responsibility	
						Install	Operate	Install	Operate
Construction									
Waste Disposal									
(a) Construct-ion debris (including contaminated soils)	(a) Surplus or unsuitable materials to disposed of in authorised tips	(a) At authorised/ licensed tips	(a) GRD Supervision Consultant	(a) At time of disposal	(a) Ensure correct disposal of waste and hazardous materials	(a) NA	(a) Small	(a) MEFWA	(a) MEFWA + GRD Supervision Consultant
(b) Solid waste	(b) Solid wastes to disposed of to authorised receivers	(b) At authorised/ licensed tips	(b) GRD Supervision Consultant	(b) At time of disposal	(b) Ensure correct disposal of waste materials	(b) NA	(b) Small	(b) MEFWA	(b) MEFWA + GRD Supervision Consultant
Erosion Protection									
(a) Risk of bank erosion	(a) Effectiveness of gabions	(a) Along alignment	(a) GRD Supervision Consultant	(a) 1 – 2 times a year	(a) Ensure gabions are effective	(a) NA	(a) NA	(a) MEFWA	(a) MEFWA + GRD Supervision Consultant
Soil Protection									
(a) Loss of topsoil	(a) Storage/ rapid reestablishment of bare ground	(a) Within construction areas	(a) GRD Supervision Consultant	(a) Several unannounced inspections	(a) Retain topsoil and prevent erosion	(a) NA	(a) Small	(a) MEFWA	(a) MEFWA + GRD Supervision Consultant
(b) Ponding behind embankment	(b) Effectiveness of flood relief outlets	(b) Along embankment	(b) GRD Supervision Consultant	(b) Annually during the wet season	(b) Ensure valves are effective	(b) NA	(b) Small	(b) MEFWA	(b) MEFWA + GRD Supervision Consultant

Phase	What *is to be monitored*	Where	How *is the parameter to be monitored/ type of monitoring equipment*	When *is the parameter to be monitored*	Why *is the parameter to be monitored*	Cost		Responsibility	
						Install	Operate	Install	Operate
Construction *Cultural Heritage*									
(a) Archaeological finds	(a) Any river valley tumuli and relics of significance	(a) Within construction areas	(a) GRD Supervision Consultant	(a) Several unannounced inspections	(a) Ensure finds are reported	(a) NA	(a) Small	(a) The Institute of Monuments	(a) The Institute of Monuments, (a dependency of the Ministry of Culture) + GRD Supervision Consultant
Material Deposited in Floodplain (Opp. Fierza)			(						
(a) Excavated rock material dumped in floodplain by Albanian army restricting flow of flood waters.	(a) Construction Contractors re-use the material from the floodplain for embankment construction.	(a) Material deposited near Fierza to be used where required.	(a) Monitored by Supervision Consultant.	(a) During earthworks phase of construction.	(a) Ensure Construction Contractors utilise the material from the floodplain.	(a) NA - included in cost of Works Contract	(a) NA	(a) Construction Contractors	(a) NA

Phase	What *is to be monitored*	Where	How *is the parameter to be monitored/ type of monitoring equipment*	When *is the parameter to be monitored*	Why *is the parameter to be monitored*	Cost		Responsibility	
						Install	Operate	Install	Operate
Construction *Surplus Material Deposited in Floodplain*									
Surplus excavated material dumped in floodplain by Albanian army restricting flow of flood waters and increasing risk of flooding for Vau i Shkjezës and Rethi i Epërm.	(a) Construction Contractor for Lot 3 to remove and re-use the material from the floodplain for embankment construction or fill material.	(a) Material deposited near Vau i Shkjezës and Rethi i Epërm to used where required.	(a) Monitored by Supervision Consultant.	(a) During earthworks phase of construction.	(a) Ensure Lot 3 Construction Contractor utilises the material from the floodplain.	(a) NA - included in cost of Works Contract	(a) NA	(a) Construction Contractor for Lot 3	(a) NA

Phase	What *is to be monitored*	Where	How *is the parameter to be monitored/ type of monitoring equipment*	When *is the parameter to be monitored*	Why *is the parameter to be monitored*	Cost		Responsibility	
						Install	Operate	Install	Operate
Operation									
Maintenance of Constructed Road									
(a) Noise	(a) Noise levels	(a) At site or nearest homes	(a) Sound level detector (dB[A] meter)	(a) During maintenance activities or when locals complain		(a) NA	(a) NA	(a) MEFWA	(a) MEFWA
Road Safety									
(a) Rock falls, land erosion, hazardous conditions	(a) Condition of hazard signs	(a) Along highway segment included in project	(a) Visual Observation	(a) One - two times/year		(a) NA	(a)NA	(a) NA	(a) GRD Regional Maintenance
Flood Protection									
(a) Risk of overtopping on River Mat flood protective bunds	(a) Condition of embankment	(a) Between Milot and national road SH.1	(a) Visual Observation	(a) One - two times/year during period of high flow	(a) To determine when further maintenance of protective bunds is required	(a) NA	(a) NA	(a) NA	(a) MEFWA + GRD Regional Maintenance

Reporting

7.4.2. The results of the monitoring programme will be included in formal written quarterly reports prepared by the Supervision Consultant and submitted to GRD, MEFWA and World Bank for review until the construction works are completed. The contractor and construction supervision companies will be requested to report their daily measurements and observations for environmental performance on a monthly basis. They will be further requested to report immediately any unexpected environmental pollution or impacts so that GRD and/or contractors can take appropriate actions to mitigate. Reporting of the results of the monitoring programme during operation will become the responsibility of the GRD.

Institutional Arrangements

7.4.3. The contractor would have the task of preparing the detailed Monitoring Plan that would be developed in accordance with GRD and MEFWA's requirements. GRD will have the responsibility to coordinate and to control the monitoring activities with the Supervision Consultant. GRD will have to constitute a group of technicians that will control the elaboration of the Plan and the execution of the measures (Environmental Department). The GRD's environmental specialist will support this group. MEFWA would propose to the Council of Ministers (CoM) the activities concerning the monitoring in order to involve the specialists of the Environmental Inspectorate (see Articles 60 and 61, Law No. 8934 of 9/5/2002). A multi-disciplinary team would be constituted that would demonstrate it has the equipment and qualified personnel to elaborate and carry out the monitoring.

Contractor Management

7.4.4. The Contractor would be on the construction site at all times and its activities will be the sources of adverse impacts during the construction phase. Therefore, the Contractor would be the key to environmental control mitigation plan implementation and as such, environmental management for the Contractor will be critical for successful mitigation.

8. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

8.1. Two rounds of public consultation have been carried out during the EA. The first round was held during 2004 after preparation of detailed design of the initial road alignment by ITP, following the feasibility study carried out by Technic/Mott MacDonald. The initial public consultations were organised by the GRD's Environmental Department with the assistance of Scott Wilson. Since that series of consultations, the road alignment has been significantly relocated at the start and end of the Fushë-Milot to Rreshen road section. However the section from Milot to Rubik is essentially the same alignment, although marginally relocated sideways. For this reason, the earlier public consultation records for the meetings held in Milot and Rubik are still relevant and are included in Appendix 3.

8.2. The second round of public consultation meetings has specifically addressed those realigned sections at the start (Fushë-Milot) and end (Munazi to Rreshen) of the road section. Public meetings were held in Fushë-Milot on 22nd January 2006 and in Vau i Shkjezës on 19th February 2006. Records of these meetings are provided in Appendix 3.

8.3. Various methods have been used in public consultation, including public opinion surveys through questionnaires, public meetings at villages and with local people's representatives, and interviews with affected groups and individuals. The people consulted included mainly those who will be affected directly by the project. Relevant government and non-government

organisations and experts on various environmental and socio-economic issues have also been consulted.

8.4. GRD, assisted by Scott Wilson, conducted interviews during June 2003 and the residents of 141 structures along the original route were interviewed. Among the people surveyed, everyone was well aware of the Project due to its high profile resulting from the statement from the Government that this road was of the highest priority for constructing the link to Kosovo. The interviewees were mainly over 30 years old (80.0%) and the majority (65.0%) are Roman Catholic, while the others (35.0%) are Muslim. Religious affiliation does not establish social conflicts but they do influence the way of living. The average family consists of 7 members, 30% 5 members and 6% have 8 to 13 members. Very often different generations live together as large families with children, old aged and unemployed predominating.

8.5. Most have built their own houses themselves. They are owners of the structures surveyed (90%) but their economic status and standard of living are low. Some 25% receive pensions, 22% are employed in business trade, 15% receive a government subsidy, 17% is employed in the private sector, 5% is employed in agriculture, 7% work in the state administration and 8% is unemployed. It appears that the road would provide an opportunity to develop activities, trade and social services but little to develop agricultural activities.

8.6. Of the environmental concerns, there were two main issues. These are pertinent to the location of public consultations held. The first issue was referred to by the residents of Fushë-Milot and relates to the poor condition of the flood bund, which should protect the village from flooding. The original route for this section of the road incorporated the flood bund and provided security to the village residents. But the latest proposal has relocated the road to the south of the Fushë-Milot and as a result the protective flood bund is not strengthened by the project. The local authority representatives present during the public consultation have raised the awareness of the relevant ministries (Min. of Interior and Min. of Agriculture) to the public's concerns. The Ministries have given an undertaking to address the issue and to carry out a programme of repair and strengthening of the protective flood bunds on both sides of the River Mat at this location.

8.7. The residents of Rubik and Fierza, during the earlier round of public consultations, referred to the second main issue. The issue was raised again by the residents of Vau i Shkjezës and Rrethi i Epërm during the public consultation held in February 2006. The residents' concerns relate to the works which have been carried out by the Albanian army during 2004 near Rubik and Fierza and in 2005 near of Vau i Shkjezës and Rrethi i Epërm. In both cases the army have deposited the excavated material in the river floodplain. The residents' anxiety is connected with the fact that at both locations the deposited material has caused erosion of the opposite riverbank. The material also increases the risk of flooding due to the restriction of the valley width.

8.8. The previous issue has been addressed as a result of the public's concern and the EMP makes a provision for the surplus material to be extracted from the river by the works contractors and re-used wherever possible as bulk fill for the earthworks. However many of the residents kept returning to the issue, especially with regard to the need for compensation for the effects of the army's work and the issue of who would be responsible for payment of such compensation.

8.9. The EA team has responded to the public concerns regarding the issue of compensation by holding additional public consultations in Fushë-Milot and Rubik for the purpose of discussing the necessary land acquisition and compensation issues. The GRD's Expropriation Department has prepared a resettlement action plan (RAP), which is published as a separate document.

8.10. In compliance with EIA process requirements of Albanian legislation and the World Bank's policies, the completed EIA and RAP will be disclosed in suitable public places along the route of the road, such as local authority offices etc., and at the GRD office in Tirana. The concerned public can have the access to review the reports at these places. The public consultations and information disclosures are summarised in the tables below.

Table 8.1: Programme of Public Consultations

Substance	By Whom and With Whom	Date	Location	World Bank's Requirement
EA TOR using group discussion	By GRD and Scott Wilson (SW) with the Prefects and Mayors of each involved Town Council; Elders of smaller communities; Businessmen's Associations; Public Representatives; and NGOs.	16.06.2003 17.06.2003 22.07.2003	Shkodra Kukes Rreshen	OP4.01
First draft EA Report, public meetings, group discussion, interviews and questionnaire survey.	By GRD + SW with Local Authority reps. + residents in settlements affected by the proposed road (initial alignment).	27.03.2004 28.03.2004 29.03.2004	Milot Rubik Rreshen	OP4.01
Final draft EA Report, public meetings, group discussion.	By GRD with Local Authority reps. and residents in settlements affected by the proposed road (revised alignment).	22.01.2006 19.02.2006	Fushë-Milot Vau i Shkjezës	OP4.01

Table 8.2: Information Disclosure

Date	Publication (National Newspaper)	Information Released
12.03.2004	"Albania" "Gazetes Shqiptare" "Panorama"	Information Notice for Project Briefing and Public Consultation for Initial Alignment.
14.06.2004	"Albania" "Gazetes Shqiptare" "Panorama"	Information Notice for Disclosure of First Draft EA + RAP Reports (Initial Alignment).
20.01.2006 21.01.2006 22.01.2006	"Koha Jone" "Gazetes Shqiptare" "Panorama"	Information Notice for Project Briefing and Public Consultation for Revised Alignment. (Fushë-Milot area)
17.02.2006 18.02.2006 19.02.2006	"Koha Jone" "Panorama"	Information Notice for Project Briefing and Public Consultation for Revised Alignment. (Vau i Shkjezës area)

9. RESETTLEMENT ACTION PLAN

9.1. A resettlement action plan (RAP) has been prepared and is provided as a separate document to accompany this EIA. The resettlement action plan should be read in conjunction with this report.

10. APPENDICES

APPENDIX 1 – List of EA Report Preparers

- Scott Wilson (Consultants)
- Mr. Genci Dautaj, Director of GRD Environmental Dept.
- Ms. Elfiore Zotaj, GRD Environmental Assistant
- Mr. Steve Kay, Technical Assistant to GRD/PIU

APPENDIX 2 – List of References

- Law No. 8934 on Environmental Protection
- Law No. 8990 on Environmental Impact Assessment
- Law No. 8093 on Water Resources 1996 as amended by Law Nos. 8375, 8605 and 8736
- Law No. 8897 on Protection of Air from Pollution
- Law No. 8561 on Expropriations and Temporary Taking of Property for a Public Interest
- Law No. 7623 on Forests and Forest Policing 1992 and as amended by (Articles 63 & 64 only) by Law No. 7839 on Exploitation of Forests
- Law No. 7866 on Referenda (including specific environment issues)
- UNEP: Post conflict Environmental Assessment in Albania, 2000
- The Albanian Statistical Yearbook 1991-1999, Instat.
- Law No. 8934 on Environmental Protection Article 25 - Tariffs and Environmental Taxes; Article 82 – Sanctions;" and Article 87 - Environment Fund".
- "Geology of Albania". Selam Meco, Shyqyri Aliaj. 2000.
- UNDP (2003) Disaster Risk Assessment in Albania, Executive summary Report.
- UNEP Balkans Post-Conflict Environmental Assessment, Analytical Results of UNEP Field Samples from Industrial Hot Spots. 2000.
- The Ministry of Housing, Spatial Planning and Environment, Netherlands
- The Department of Transport, Design Manual for Roads and Bridges, Volume 11, Section 3 Part 1: Air Quality. May 1999.
- http://www.lhh.org/noise/decibel.htm - as of 6 May 2003
- State of the Environment Report 1997-1998, National Environmental Agency, Tirana.
- Guidelines for Landscape and Visual Assessment 1st edition (1995), (edited by Scott Wilson) and 2nd edition (2002) The Landscape Institute and the Institute of Environmental Management and Assessment
- World Bank Technical Paper No 460. Albania – Filling the Vulnerability Gap. Gloria La Cava, Rafaella Y. Nanetti, 2000.
- Instat Statistical Yearbook 1993 - 2001
- World Bank Technical Paper No 520 – "Poverty in Albania - A Qualitative Assessment". H. de Soto et al., 2002.
- ITP-Infratransproject (2004) Climatic, hydrologic and Hydraulic Calculations of the 'Milot-Rreshen' Highway
- Design Manual for Roads and Bridges, Volume 11. Environmental Assessment. DETR. HMSO, London (1993).
- UK Draft Process Guidance Note 3/1 (2003).

APPENDIX 3 – Record of Consultations

Public Consultation held in Fushë-Milot (dated 22nd January 2006)

The public participation meeting in Fushë-Milot took place at the local college. People had been identified by way of fliers, which had been put up in all parts of the Fushë-Milot area and further out (in all communities interested in and affected by the project).

The following had been sent invitations to take part in the Pubic Participation Session: Officers (Specialists) from local and central institutions and Ministries. These were:
(1) the Ministry of Environment, Forestry and Water Administration; (2) the Ministry of Agriculture, Food and Consumer Protection; (3) the Ministry of Tourism, Culture, Youth and Sports; (4) the Ministry of Interior; (5) the Prefecture and Sub Prefecture, Boroughs and Councils, Regional Agriculture and Food Directorates, citizens, farmers, Specialists of various disciplines, business representatives.

The public consultation session, which commenced at 11:00hrs on 22.01.2006, was opened by the Chairman of the Milot Commune, Mr Vlash Gega. He welcomed all participants and thanked the organisers on behalf of all residents for organising the meeting. He then continued by identifying the purpose of the public consultation session and gave the floor to Mrs Lejla Saraçi, the Director of the Roads Directorate.

Mrs Saraçi gave a detailed overview of the technical, legal and procedural steps undertaken until then by the Roads Directorate on behalf of the Albanian Government and donor institutions, whilst adhering to both Albanian laws and legal acts, and the Donors' regulations and directives.

Mr Genci Dautaj gave a detailed explanation of the purpose of the Public Consultation session. It was agreed that the session would go ahead according to the agenda, which had been put together previously. First, the report and technical explanation of the draft-implementation plan would take place, giving an explanation for the Resettlement Action Plan and expropriation procedures. This would be followed by the presentation of the Environmental Impact Assessment Report and a questions-and-answers session.

Mr Faruk Kaba spoke on behalf of the Drafting Group and gave a detailed explanation the new project of the Fushë-Milot road. The expropriation Expert then presented the Resettlement Plan along with expropriation procedures.

The floor was then given to Mr Vath Kabili, an Expert on Environmental issues, who gave the presentation on the Environmental Impact Assessment Report.

This was followed by the Q&A and discussions' session.

1. Mr Hajdar Shabani (Technician with the Milot Borough)
   After giving an analytical and detailed description of both alternatives, along with a historical overview of climate conditions in the entire area of Fushë-Milot, he reiterated the fear of flooding and, therefore, concluded that the protective river barrier should be built first, followed by the construction of the road. Had no problem with the Environmental Study.

2. Rifat Hysa (Employee of Lezhë District)
   Giving a positive assessment of the Environment Study, he stated that he was for the construction of the road.

3. Xhemal Braja (Construction Specialist)
   The Albanian Government should fund the previous draft project only for these kilometres, whilst the remainder should be financed by the World Bank.

4. Ludovik Kola (Farmer)
   I simply wanted to ask: is the money being lent or given to us?

5. Frank Çeli (Farmer)
   I am for the first alternative.

6. Xhavit Braja (Farmer)
   River protection must be carried out.
   Expropriation to take place as soon as possible.
   I agree with the first alternative.

7. Kol Mëhilli
   Protective river barrier first then the construction of the road. We were impressed with the Environmental Study and are now clear on that issue.

8. Agustin Preçi
   River protection must be carried out.
   We wanted some figures and detailed technical data. The Environmental Study should make the first alternative look better.

9. Hasan Lika
   I agree with it, but only after river protection has been secured and constructed.

10. Agim Kola
    I agree with the previous speaker. I agree with it, but only after river protection has been secured and constructed.

11. Abdi Hyseni
    Agree with the first alternative as it includes protection from the river.

12. Pal Shabani (OAP, 74 years old)
    Agree with the first alternative as it includes protection from the river. River Mat is really dangerous.

13. Hysen Osmani (Director of Local Government, Ministry of Interior)

    I fully agree with the construction of a protective barrier. The Government will do the best it can to achieve this.

14. Asllan Shabani
    Protection from the river is a must. You must appreciate that the entire community is terrified of flooding.

15. Pjetër Preçi
    I am for the first alternative.

It was evident that the participants' main concern related to river issues. More specifically, their general concern circled around constructing some kind of protective river barrier. Mr Kaba intervened on several occasions explaining in detail that the new Project alternative did not interfere with, nor did it increase the risk of floods. In addition, he elaborated that Project designers had followed rigorously all standards and technical norms, along with all obligations as set out by the Roads Directorate – amongst these was also a scenario on water reduction in case of flooding.

At this point, the Chairman of the Borough, after asking if there were any other questions, declared the discussions closed. Copies of the Environmental Report and Draft Project, along with contact details of the Roads Directorate, Expropriation Directorate and Environment Section, were left with the participants in case they wished to learn more about the entire process. In addition, the Borough Chairman appointed one of his employees as a Liaison Officer at the Borough office. The meeting was officially closed at 14:15hrs.

Therefore, despite the confusion and insistence of almost all participants and affected parties either on the first alternative, or on the construction of a protective river barrier to start off with, and then the construction of the road, we are of the opinion that this meeting achieved what it set out to do in the first place.

By way of the Consultation Session residents learned about the procedures of the Expropriation Plan and the Albanian Law on Expropriation. They were assured of preliminary, full and fair compensation for any assets expropriated by the implementation of this Draft Project.

During this session, quite a while was set aside for the detailed explanation of the impact the construction would have on the environment, the measures that would be undertaken during the construction phase for the reduction to a minimum of all non-positive environmental effects for all those affected by the Draft Project.

The session was fruitful as it brought out all problems faced by affected parties and all that they desire.

The only problem identified was the openly expressed concern and anxiety the local Community feels about this alternative, mainly because of the fear of flooding. Psychologically, the first alternative gave them confidence, whilst, if this was not possible, they insisted on constructing a protective river barrier first, then the construction of the road.

List of Attendees at Public Consultation in Fushë-Milot

Nr.	EMER	MBIEMER	PROFESIONI
1	Vlash	Gega	Mayor of Commune, Milot
2	Pal	Dajçi	Area Deputy
3	Njazi	Reçi	Prefect of Circle, Lezhe
4	Hysen	Osmani	Director of Min of Interior
5	Gjergj	Oroshi	Deputy Prefect

6	Lejla	Saraçi	GRD Director General .
7	Alush	Zaçe	GRD Acting Deputy Director
8	Faruk	Kaba	Director of Design Group (ITP)
9	Genc	Dautaj	Chief of Environment Department, GRD
10	Elfiori	Zotaj	Environment Specialist GRD
11	Flora	Çeku	Expropriation Specialist GRD
12	Vath	Kabili	Environment Specialist
13	Ahmet	Kasemi	Farmer
14	Kasem	Shabani	Technical Construction Engineer
15	Asllan	Shabani	Mayor of Fushë-Milot
16	Pjeter	Preçi	Technician
17	Mark	Shijaku	Forest Technician
18	Xhavit	Brahja	Mayor of Council of Commune
19	Paj	Shabani	Farmer
20	Murat	Kuseli	Farmer
21	Tom	Gega	Farmer
22	Petrit	Hoxhi	Farmer
23	Nezit	Habili	Farmer
24	Kol	Mehilli	Farmer
25	Agustin	Preçi	Farmer
26	Frank	Çeli	Farmer
27	Hajdar	Shabani	Surveyor
28	Hasan	Lika	Farmer
29	Agim	Kola	Farmer
30	Abdi	Hyseni	Farmer
31	Sander	Preçi	Farmer
32	Mikel	Kola	Economist
33	Nikoll	Gega	Farmer
34	Luigj	Nikolla	Farmer
35	Murat	Mura	Farmer
36	Kol	Biba	Farmer
37	Murat	Kuseli	Farmer
38	Veli	Veseli	Farmer

39	Pjeter	Gjetani	Farmer
40	Ndue	Gjetani	Farmer
41	Kol	Gjetani	Farmer
42	Shefqet	Kasemi	Farmer
43	Ludovik	Kola	Technical Construction Engineer
44	Arben	Koçini	Farmer
45	Murat	Kuseli	Farmer
46	Artan	Kasmi	Farmer
47	Haki	Veseli	Farmer
48	Idriz	Kasemi	Farmer
49	Saba	Hysa	Farmer
50	Mark		Farmer
51	Hajdar		Farmer
52	Sajmir	Shabani	Farmer
53	Kol		Farmer
54	Islam	Shabani	Farmer

Previous Public Consultation held in Milot (dated 27th March 2004)

According to previous agenda prepared by GRD on March 27, 2004, was performed the first public consultation séance in Milot (according to prior press announcement). This meeting was held in meeting room of high school of Milot (because of this numerous unforeseen population this was held in another room of this school.) Prior to announcements done by the press there were present all representatives of relevant communities and not excluding here concerned persons affected by this project; central and local power experts of different Ministries as Ministry of Environment, Ministry of Agriculture, Ministry of Territory Adjustment and Tourism, Municipalities, Prefecture of Lezha, Prefecture of Districts of Mirdita and Kurbin, Communes and concerned municipalities. Also were present representatives of regional environmental agencies of Lezha, Mirdita and Kurbin, environmental associations of Lezha Mirdita and Kurbin, citizens, farmers, experts of different fields, professors, representatives of any kind of small middle and gross business, etc.

Attached in this appendix are written any relevant detail on participants of this meeting as name, surname, age, profession and contact number. (*There were present 62 persons +8 persons in the podium.)*

The consultation agenda was prepared accordingly to the following plan:

- **Welcome by Chairman of Local Power (Chairman of District)**
- **Presentation on purpose of this meeting and presentation of participants**
- **A specific and illustrative description of purpose of debate on Public Consultations**
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- **A non-technical summarized report of Environmental Study draft (Scott Wilson)**
- **Presentation of EIA draft (Scott Wilson) according to main chapters**
- **Public debate with questions, answers, clarifications etc.**
- **Putting at disposal of participants the technical file, maps and environmental record.**

- **Welcome by Chairman of Local Power (Chairman of District)**
- **Presentation on purpose of this meeting and presentation of participants**

Public consultations started at 11:00am on 27th March 2004 and welcomed by the Chairman of District of Milot, Mr. Vlash Gega, who appreciated such great initiative to organize this meeting in the name of area residents and giving a special thank to Foreign and albanian donators to coordination and realization of such kind of public debate (Consultation) which was performed for the every first time. After he proceeded with presentation of purpose of this meeting and presentation of participants as representatives of central power institutions, local power and environmental agencies.

Consecutive speech was held by representative of General Roads Directorate Mr. Genci Dautaj (Responsible of Environmental Sector) and so on according to agenda.

- **A specific and illustrative description of purpose of debate on Public Consultations**

Mr. Genci Dautaj explained in details for all the participants the purpose of this meeting, clearly underlining the methodology followed by World Bank or relevant donating institutions, and also Albanian Institutions and Agencies toward any kind of investment in infrastructure –in respect to protection of Environment or "EIA" (Environmental Impact Assessment – "EIA").

It was given a simply and understanding view of possible environmental impacts accorded to main notions – flora, fauna, air and water pollution, impacts of hydrograph, hydrology, vegetation etc.-, which are predictable to occur during construction stages and later to road traffic operations. It was briefly explained the EIA study philosophy to avoid the softness and minimization of impacts of pollution in air, adopting and giving exact purpose of undertaking such public consultations.

It was further referred that Albanian Government is the under signed party of many other international and European convents and in this case including Environmental Protection where the most known is the Aarhusit Convent. It was briefly summarized the long experience of developed countries (west patterns) to efforts and studies for avoiding in maximum the environmental pollution to foreseen developments in Albania using the best experience of such patterns and awareness of Communities and residents of this areas in respect to cost of development: environmental impacts and protective measurements.

In this event was also referred improvement of Albanian juridical platform accorded to patterns and EU standards, in implementation and adoption of relevant directives of EU and WB. There were detailed and summarized two fundamental Laws of Environment ("Law for Protection of Environment" No. 8934, dated in 5.09.2002 and Law for "Evaluation of Environmental Impacts" No. 9010, dated in 13,02.2003) and also law on "Expropriates real estate ..." No. 8691, dated in 22.12.1999.

After this summary were invited and encouraged everyone being present and also was open the session of questions and answers. It was agreed to continue the next stage of debate and exactly the one of analysis and technical description of project and technical summary of report since there were no questions held.

- **A technical summarized description of Project and Technical Report**

Representatives of Projecting and Design Company I.T.P. Engineers Olset Haxhiu and Blenard Dyrmishi did introduced the technical Project in details and mostly concentrated in the area where was more concerned the Community (Km 0- Km5).

After this presentation done by representative of GRD Mr. Genci Dautaj, was followed up with listed issues. Firstly it was shown and briefly clarified the reason why was necessary this intervention and regardless of the environmental study performed by Consultant Company "Scott Wilson" especially for road section Milot-Rreshen in frame of Milot-Kukes road corridor, through reference and review of Terms of Reference for this study.

- **Introduction of EIA draft (Environmental Impact Assessment)**

In this way it was given a briefly introduced review of EIA draft, a summary being prepared and selected for the audience by Department of Environment (a copy of which is already delivered for all concerned parties of the area).

- **A non-technical summarized report of Environmental Study draft (Scott Wilson)**

Further was shown the reference of non-technical summarized report of Environmental Study draft EIA, a briefly summary prepared by expert of Environment Rachael Bailey "Scott Wilson" a Consultant Company (a copy of which is already delivered for all concerned parties of the area).

- **Presentation of EIA draft (Scott Wilson) according to main chapters**

After was presented the EIA draft prepared by "Scott Wilson" Consultant Company. During presentation of issues and chapter of this draft was seen as necessary to concentrate more in mitigation potential measures (named in this way as there were no data found) as the most concerned important practice for the attendants. Such measures were explained in details as they were too much captured and understandable from the audience and they were listed in three following stages:

- Preliminary stage of Project
- During constructing stage
- During operating stage

There were given in details all explanations being listed in EIA draft (explaining at the same time aspect meanings, notions or difficult nominations not captured by the audience). Following up by other chapters of this draft was underlined concept of Environmental Management Plan, Environmental Mitigation Measures, Institutional Agreements, Environmental Monitoring Plan etc.

- **Public debate with questions, answers, clarifications etc.**

This is session of questions – answers. Below is given part of such debates following to questions, clarifications and other discussions (a part of discussions, questions, and anticipated debates in respect with technical issues and relevant clarifications of Projecting and Design Company is not included in this session).

Asllan Shabani, chairman of village of Milot:

"Which are the protective measures for Fushë-Milot, up to the river?"

Answer: If you take a second look to the project the answer is there. Nevertheless, the project engineers did explain once again more clearly all-protective measures of lands in Fushe-Milot.

Rifat Hysi, chairman of commune:

He raised up some questions in respect with this great investment for north area as following:

1. "If there is any chance to make possible the link of main road with come other branch roads of this area starting from Fushe-Milot up to town of Milot, as there exist the way to connect this area and exactly some villages or town neighbourhood with the highway?"

2. For how long will be "Liquidation of damages (Liquidation, Expropriates)?"

3. "If will be faced any problem with irrigation system, potable water and waters of wells?"

4. "When does the works recommences and for how long?"

4. "Who will perform the road works?"

Answer:

1. This road is based on advanced European standards and norms and in this way is formed the intersection frequency in respect with new road, so we can't construct enter – link roads for any km of road (based on the old Albanian standards). Nevertheless, the ITP engineers explained in details this fact.
2. Experts of Expropriate Department are still working, and process of Expropriates will be concluded in July – August 2004, if they continue in this way with approval of World Bank credit accordingly with project of Transport. (There were also explained the prospective of Expropriate Law)
3. This answer was given from ITP engineers and it was technically explained the infringement of potable waters system. It was anticipated that this project is more affected to provide the safety of existing irrigation system.
4. Based upon agreements with World Bank the works can recommence on September or October 2004.
5. Albanian government will finance the inception part of project, and World Bank will finance the rest, but by international bid, in both ways the winner will be selected accorded with relevant rules and procedures. In this moment we can´t prejudice that which company will be the winner.

Hajdar Shabani, head of urban planning office of commune in Milot:

1. "How many interchanges will be along the road starting from the trumpet (first interchange in km 0,000) up to exit of Milot?"
2. "If will be destroyed the existing sewage and potable water system?"

Answer:

1. For this area are thought to be constructed only two interchanges as shown in the Project drawing
2. Answer is given from ITP engineers guaranteeing to not destroy such system. Genci has also clarified the following monitoring passage: After approval of EIA final study this will be also approved by Ministry of Environment and Regional Agency of Environment in Lezha. One of fundamental conditions to approve the Form of 3/1 of Urban Planning is the Environmental License issued by the Ministry of Environment together with Regional Agency of District of Lezha. Despite of such monitoring tasks we have in the Department of Environment in GRD (that will be more clearly appropriate to final study of EIA), such tasks are automatically affected by Regional Agency of Environment through Experts in site who will rigorously check and monitor the study results but also the standards based in the Albanian legislation. The entire process will be realised in full

common coordination not only for this aspect but also for other aspects (and all section) that have to do with conclusions issued by EIA study.

Ludovik Kola, a construction expert:

"Why is not planned to construct the road body near by the river in purpose to avoid the risk of lands in Fushe-Milot?" (To not follow the bad example of railway path constructed away of the bad and we can't possess anymore that part of land)

Answer:

It was clarified the hydrodynamic system of river stream in case of interventions done there, technically arguing the reason of not intervention near by the river bad, also is explained the effect of river upstream and downstream, and effect in the opposite river side (Mati river shore). Maybe we can own some land on this side but it will be a disaster for the other river shore.

Ndue Preci, Director of High School, Chairman of an environmental association

After many thanks done on this initiative he appreciated mostly the alternative set for Milot. Among others he estimated that this project gives safety to approx. ¾ of lands in Fushe-Milot, and this kind of issue has a great value for this area. Also Milot is connected closer with all Albania.

He estimated as an expert of the field and after he read the EIA study the non-existence of any further problem in respect with ecosystem.

He mentioned the possibility of a second interchange from Fushë-Milot up to Milot, in order to help the agriculture economy. He continued with possibility to use the pebble area as tourism area from F Milot up to Skurraj t perform 2-3 interchanges in order to have access on some special beautiful areas for the beach.

He considered once more the fact of problems with potable waters system in order to better respect the standards and rules during the performance of works and also total care toward sewage system.

Jakup Kapllani, pensioner

He suggested the need to build up a working group from the Local Power in order to well co-ordinate with GRD team and to review any issue faced in the future. He wanted to ask if there is foreseen any protection for irrigation system?

Answer: In general there is no intersection to irrigation system foreseen by Project, but exists the example of filling out the form of 3/1 of Urban Planning which briefs on the agreement between GRD and Directorate of Water system which will solve the defence of concerns of all farmers in respect with this issue.

Vath Kabili, Regional environmental expert (District of Kurbin)

After mentioning this great chance for his community he mentioned also the fact that the only impact for area of Kurbin will be occupation of agriculture land (approx. at km 1,000 – Km 1,500), but if compared with shortest distance of road construction and most safe defence with all agriculture land surface of Fushë-Milot, the result is positive.

There is any impact in respect with erosion as this is mainly plain area and does not affect any slope area.

Interchanges are the best solutions as they are not affected (in the very worst case once in 100 years of river steams of Mat)

Arbrina Haxhirexha, Expert of Ministry of Environment

She estimated the institutional juridical steps followed after preparation of final EIA report, withdrawing the attention to GRD (Scott Wilson) in order to realize institutional contacts with Ministry of Environment. In respect to EIA draft, she will officially express her opinion addressed to GRD.

Jak Gjini, Head of Regional Environmental Department, District of Lezhë

He mentioned in details the fundamental principles and main philosophy of EIA, offering a large view of area of valley of Mat, knowledge and information for environment and studies already undertaken. In this respect he did critiques for such works performed by the Army without considering any environmental impact (approx. at km 8,500 in the entrance of Fierza).

"Is also foreseen the passage of animals in the highway, considering here different kinds of animals that have a direct connection with river (Road divides the vegetation area with river).

1. If there is done any study on signalling system?
2. If there is foreseen protection against wild nut?"

Answer:

1. Yes, is finalising in parallel with some aspects and signalling system study will be delivered at the end of April, accordingly with agenda.
2. Up to now is not yet mentioned any such fact.

Simon Koka, economist

"Is this the final alternative of this road"

Answer: Yes, this is approved from Technical Council of GRD and also approved by the National Council of Roads.

Sandër Preçi, a vegetation worker :

"If there is foreseen in the project the vegetation of the area?"

Answer: No, there is not any relevant project, maybe Ministry of Agriculture have another exact answer.

Pal Shabani, citizen:

1. "The expropriate stages; which is the relevant documentation required?
2. If there is any possibility to citizen employment during road construction stage, from the relevant company?".

Answer:

1. After being explained in accordance with law of expropriates such relevant stages, it was also clarified that legal documentation of properties presumes the License of Property issued from the Office of Registration for Real Estate near by each district.
2. Of course, therefore the supervisor of works will select the staff for civil work.

Sandër Bitri, employee of taxes and fees:

1. "Best practices followed for land expropriates.
2. If there is foreseen in the project the declaration as a tourism area?"

Answer:

1. Accorded to expropriate law no. 8591, dated in 22-12-1999, and also legal and sub legal acts in power
2. Not yet, up to now, for more this is not under our competence, but under the competence of National Council of Tourism.

Zef Kola, professor:

1. "Number of lanes
2. If there is foreseen during the construction stage of project any air quality norm or level of noises? Measures that foresee their minimising."

Answer:

1. Two lanes
2. We are having another look on the chapter of mitigation measures during the construction stage of road.

At the end of this meeting was put at disposal of attendants all concerned materials, and if required a copy of project or some required part of it; or another copy of inception draft of environmental study or chapters required. Therefore all public was informed even through different media that the complete file of this project was located at the office of Commune Chairman or Vice- Chairman office.

This debate was finalised from the area deputy Mr. Luigj Gjoka, who requested a rapid start of works; and also he suggested applying such issues to relevant bodies, considering also the consultant company who did the environmental study.

The meeting was finished at 16.00

Previous Public Consultation held in Rubik (dated 28th March 2004)

According to previous agenda prepared by GRD on March 27, 2004, was performed the first public consultation séance in Rubik (according to prior press announcement). This meeting was held in meeting room of "ABAT DOCI" centre. Prior to announcements done by the press there were present all representatives of relevant communities and not excluding here concerned persons affected by this project; central and local power experts of different Ministries as Ministry of Environment, Ministry of Agriculture, Ministry of Territory Adjustment and Tourism, Municipalities, Prefecture of Lezha, Prefecture of Districts of Lezhe and Miredita, Communes and concerned municipalities. Also were present representatives of regional environmental agencies of Lezha, Mirdita and Kurbin, environmental associations of Lezha Mirdita and Kurbin, citizens, farmers, experts of different fields, professors, representatives of any kind of small middle and gross business, etc

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- **Welcome by Chairman of Local Power (Chairman of District)**
- **Presentation on purpose of this meeting and presentation of participants**

Public consultations started at 11:15am on 28th March 2004 and welcomed by the Mayor of Rubik, Mr. Mark Ruci, who appreciated such great initiative to organise this meeting in the name of area residents and giving a special thank to Foreign and Albanian donors to co-ordination and realisation of such kind of public debate (Consultation) which was performed for the every first time. After he proceeded with presentation of purpose of this meeting and presentation of participants as representatives of central power institutions, local power and environmental agencies.
Consecutive speech was held by Director General of General Roads Directorate Ms. Majlinda Gjonaj and so on according to agenda.

- **A specific and illustrative description of purpose of debate on Public Consultations**

Mss. Majlinda Gjonaj explained in details for all the participants the purpose of this meeting, clearly underlining the methodology followed by World Bank or relevant donating institutions,

and also Albanian Institutions and Agencies toward any kind of investment in infrastructure –in respect to protection of Environment or "EIA" (Environmental Impact Assessment – "EIA").

It was given a simply and understanding view of possible environmental impacts accorded to main notions – flora, fauna, air and water pollution, impacts of hydraulics, hydrology, vegetation etc.-, which are predictable to occur during construction stages and later to road traffic operations. It was briefly explained the EIA study philosophy to avoid the softness and minimisation of impacts of pollution in air, adopting and giving exact purpose of undertaking such public consultations.

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After this presentation done by representative of GRD Mr. Genci Dautaj, was followed up with listed issues. Firstly it was shown and briefly clarified the reason why was necessary this intervention and regardless of the environmental study performed by Consultant Company "Scott Wilson" especially for road section Milot-Rreshen in frame of Milot-Kukes road corridor, through referee and review of Terms of Reference for this study.

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This is session of questions – answers. Below is given part of such debates following to questions, clarifications and other discussions (a part of discussions, questions, and anticipated debates in respect with technical issues and relevant clarifications of Projecting and Design Company is not included in this session).

Luigj Gjoka, Area Deputy, is asking Director General of GRD Ms. Majlinda Gjonaj:

1. "When is foreseen to end such works?

Ms. Gjonaj: "Such works are foreseen to conclude in 2007".

2. If there is considered the land damage performed by the army, which works have transformed the river into bad river for Fierza village, which caused also erosion at the opposite side of river (Fierza side)?

Ms. Gjonaj: "Rehabilitation of this area will be performed during performance of works, while we will immediately intervene for reparation in respect with opposite part of river. GRD and Minister of Transport have issued the order to suspend the works by the army and we will follow up the development of works in the future, according with mitigation measures plan that will be issued by the final report of EIA.

Mark Ruci, The Mayor,

1. "How will be proceeded, legal basis for land liquidation?

2. If there is considered in this study the level of river, knowing that in 1992, level of river did surpassed the bridge in the enter of town?"

Answer:

1. Legal basis is Law for Expropriates No. 8561, dated in 22-12-1999 relevant legal acts in power
2. Yes !

Sefer Nika, engineer:

1. "I would like to know why is preferred this variant and not the two others?
2. Tax of this road is (Majko tax)... ".

Answer:

1.Mss. Gjonaj: "this is decided from the Technical Council of GRD and also National Council of Roads.

2. Tax of this road known as Majko tax ". (does not exist anymore as problem)

Andon Çupa, municipal advisor

1. "For waste disposal at the side of the river. Something on this topic by department of Environment

2. Is foreseen any flooding by recommencement of such works?".

Answer:

1. The expert of this field promised an urgent solution on this above-mentioned topic.
2. ITP engineers.

Tan Lleshi:

"How will be proceeded with lands which are under erosion of river in respect with areas worked by the army; since1992 did start this erosion".

Answer:

Majlinda Gjonaj,: In this case as mentioned above it will be immediately rehabilitated the respective land after reduce of river level.

Genci Dautaj : Based on the Expropriate Law, paragraph where is mentioned the damage of the third party (indirect) will be compensated for the measurements toward this damage. Next week will be given evidence to this damaged area from the other side of river.

Mark Leka, engineer:

"How is thought to proceed and which are the time limits to perform such expropriates?"

Answer:

On basis of technical report is set expropriate fundamental base and as time limit is foreseen to end up by July, August 2004.

Mark Hasani,

"Is taken any consideration for the climate conditions and which is the level of floodings; flora and fauna?"

Answer:

There is no full data on the first draft, but such data will be inserted in the final report and will be more exact and sufficient data.

Tan Gjergji, economist

"Where is the money taken from "Majko tax"?

Answer:

This is not a problem anymore.

Zef Karagjozi, Fank village chairperson

1. "In which way will be the road linked with village neighbourhoods as this new road divides the village into two parts?
2. How will be further proceeded with irrigation system?".

Answer:

1. After a summary prepared by ITP engineers, is once more clarified that if there is any possibility to not divide all the village into two parts.
2. Project implementation does not interfere with irrigation system, but GRD representatives argued once more the fact of 3/1 relevant form signed between Urban Planning department and Water system Directorate as a guarantee of this problem.

Gjin Buna,

"Is taken any study prior to initiate the stage of expropriates, location of house beside the main road?"

Answer:

It will be reviewed each case and not only this case above mentioned.

Andrea Gega, Village chairman, Rrethi i Epërm,

"How will be the land expropriated? What will happen with third parties?".

Answer:

It will be proceed on basis of Expropriate law, and will be liquidated all third parties based on damage caused.

Niko Sinani,

"What is foreseen to individuals safety in the road?"

Answer:

We are preparing once again the study on traffic safety.

Gjin Qarri, energy expert
"How much is the road width?"

Answer:
It is foreseen to be 7,5 m

Gegë Ndoka,
1."Who is entitled to expropriate, the Ministry or Municipality (Local Power").
2."Is any specific procedure to check the crushed stone materials?"

Answer:

Based on Expropriate Law there is a direct right for the Ministry to perform expropriates procedures as the one of performing such intervention, in our case it will be the Ministry of Transport.

Bardhok Pulaj, Deputy Prefecture of Mirdita

1. "Is foreseen any area vegetation in this project"

2. "How will be proceed up with habitant employment, if there exist any directive of the World Bank to hire the locals?"

Answer:

1. No, this is not included in the project. This issue belongs to Ministry of Agriculture and Forest Directorate
2. We are not aware of the WB procedures.

Nikollë Doçi,

His opinion is to follow up the procedure of visiting each house affected. This is the right procedure that will avoid the problems that can come as misunderstandings for the road defined in this project.

Jak Gjini, Environmental expert at the Regional directorate in Lezha

He clarified once again in details this best alternative offered by the company who is performing the environmental study and especially flora and fauna, land erosion, air quality – expressed in percentage, noise, level of polluted areas, - especially at waste locations, defence of vegetation and green areas during performance of works; putting at disposal the necessary equipment and signalising system in order to protect the individuals and interchange for animals.

At the end of this meeting was put at disposal of attendants all concerned materials, and if required a copy of project or some required part of it; or another copy of inception draft of environmental study or chapters required. Therefore all public was informed even through different media that the complete file of this project was located at the office of City Mayor Mr. Mark Ruci or Vice- Deputy Mayor office.

This debate was finalised from the area deputy Mr. Luigj Gjoka, who requested a rapid start of works; and also he suggested applying such issues to relevant bodies, considering also the consultant company who did the environmental study.

The meeting was finished at 16.00

Public Consultation held in Vau i Shkjezës (dated 19th February 2006)

The Public consultation meeting in Vau i Shkjezes was held in the new 'year-9' school on **19th February 2006**. The people were invited to take part by the announcement written in two national newspapers with considerable editions and by the announcements spread almost in every house of the community (in all interested communities concerning this project).

There were invited to participate in the public consultation:

Specialists of central and local institutions

Ministries of Environment, forests and water administrations

Of agriculture, alimentation and consumer's protection

Tourism, culture, youth and sports

Internal ministry Prefecture and vice prefecture, commune and municipals, citizens, farmers etc .

The public consultation started at 12 15pm on 19.02.2006 and was declared open by the Mayor of Rubik Mr. Mark Ruci who welcomed and thanked all the participants for their participation gave evaluated gratitude in the name of the habitants for the organisation of the meeting . After the presentation and a short summary of the aim of the meeting he gave the word to the Vice-Minister of Public Works, Transport and Telecommunications, Mr. Armand Teliti.

Mr. Teliti expressed special satisfaction for the wide participation of the people despite the bad conditions of the weather and the terrain and also expressed his conviction for a free debate from their side during the public consultation meeting on the study of Environmental Impact Assessment (EIA) for the Rubik-Rreshen road segment related to the Durres Morine corridor. The Albanian government has emphasised that it considers this corridor as its main challenge (for the infrastructure) of its mandate and it has its maximum attention . At all levels from the Prime Minister, Minister and infrastructure specialists during the meeting with the different donors meeting (World Bank, EBRD, EIB etc.) the main focus for transport infrastructure is this corridor.

The Vice-Minister expressed the ideas and the vision of the government for the importance of this road project which covers not only half of the north Albanian but is also of special importance for all Albanians giving powerful impulses and reviving a whole geographical area starting from the Port of Durres and continuing through the whole corridor to Morine and further into Kosovo. Redoubling the profits of this road through the regeneration of the transport of goods, materials, products and passengers not only within the territory but with Kosovo. Beyond Kosovo, we connect to the Central European and Balkan corridors through the highway of Nish in the corridor number X.

Then the Vice-Minister emphasised the government's efforts to secure the financial means to construct the total corridor and the idea of the donors conference meeting to take place during March. The Vice-Minister also expressed the determination of the Ministry that, despite maximum efforts to proceed urgently with the scheme, the government accepted responsibility towards their obligations to the donor institutions in respecting the parameters, standards and their requests for reducing the impacts and environmental and social effects through the affected communities. This would be in compliance with the obligations of the Albanian Environmental Legislation and Covenants that the Government has signed with the European Community for these situations.

At the end of his presentation, Mr. Teliti invited those present to listen attentively and to take part in the debate being free to express their ideas for any disturbance or problem because they will be directly involved, both the consumers and at the same time the road profiteers.

Mr. Genci Dautaj (GRD Director Responsible for Environment) went on by presenting the aim of this public consultation talking about the philosophy of the World Bank, its importance and the prevalence of the environment , social impacts and financial schemes . The World Bank does not want its investments to give the wrong perceptions in the communities involved or influenced during the implementation of the projects and to cause disturbances in the areas in which the projects are invested. The participants were also informed about the Albanian Environmental Legislation and also about the efforts applied for the correct implementation of legal and environmental rules and standards in the road infrastructure.

At the end Mr. Dautaj proposed to follow the agenda determined before the meeting, first to hear a general technical description from the representative of the design consultant and then with representatives undertaking the EIA study and in the end a discussion section, debate, question and answers.

Mr. Faruk Kaba, Director of the design consultant made a wide and detailed description of the project.

Mr. Vath Kabili presented the environmental influence evaluation study (EIA environmental impact assessment).

Mrs. Elfiroe Zotaj, an environmental specialist, emphasised specifically the protective measures foreseen in the environmental management plan and their materialisation through a monitoring plan during the constructive and operative phase. Another safety measure will be the moment of taking permission from the Ministry of Environment where noted down all the protective measures obliged to be implemented .

In the Second part were discussions, debate, question and answers .

Mark Ruci (Mayor of Rubik Municipality)

Because there has been good understanding from the side of the affected community during the military workings, from the other side we have come across problems we didn't think existed. I have reviewed the environmental study presented and I think that all of us despite the scale of the understanding 100% of the study in general gained new knowledge and we all understand one thing: The construction will not go on without environmental treatment. For this reason this public consultation for EIA has special importance in explaining the environmental and social impact and the prevention or attenuating measures taking into consideration from the moment of starting the works and afterwards.

Profiting from this public debate I am submitting some moments to discuss issues which I have compiled considering the interest of the community.

I require a technical solution with entrance/exit road (and connections with parallel roads) for Rubik, Munaz and Vau Shkjeze.

I want to know the real value of compensation for all kinds of real estate) agriculture, land, objects, houses), what documentation needs to prepared?

How to act with indirect problems at the other side of the river

How to act with the expropriation in Perlalaj Rubik.

Answer from (G. Dautaj, GRD)

For this question there will be taken official answers from the GRD (Technical Department) within a month (in competence of the environmental sector and this request will have a studied response).

For this documentation and the expropriation procedures, even though the social impact is affected in this study, a further public consultation for expropriation and resettlement action plan RAP will be held within the month of March. This public consultation will address the resettlement plan and discuss in a detailed way all problems, situations, procedures and calculations. I might inform you that the expropriation file is being completed according to the Albanian legislation and will be presented to the Ministry of Transport. In the meantime, following some assistance from the World Bank's Social Impact Specialist, the GRD will compile the resettlement plan according to the formalities and standards of the World Bank and this plan will be presented to the public and on this occasion I invite you all to take part in the debate.

The concentration and the impact in the air quality for all factors will be not affecting inhabitants life.

The zones of the villages Munaz and Vau i Shkezit have a characteristic position. There should be taken urgent measures from the competent organisations for the release of the situation (made clear by the authorities and from part of the World Bank specialists mission in the terrain) belonging to the damages caused up to now and the GRD has taken measures to identify and to reflect them in the RAP presentation and also the appropriate rehabilitation – expropriation measures. Any concern about real estate and for agricultural land will be included in the expropriation file from the Directorate of Expropriation . For this part will be acted like in all the section. Every real estate property affected or influenced by the project will be compensated according to the Albanian legislation issue of expropriation and in accordance with the resettlement action plan (RAP) for the scheme.

Ndue Buba (farmer of the village Munaze)

How much is the cost of the expropriation?

How many trees have been settled for expropriation?

Answer by GRD Environmental Director

The answer is almost the same as the above explanation. This was emphasised even by the Mayor of the Municipality Mr. Ruçi . For further details we will wait for the answers compiled by the RAP which will be offered by the expropriation specialists .

In this moment Mr. Jak Gjini (Director of the Environment Regional Agency of the Lezhe District) makes an effort to direct the participants to debate environmental impacts which is the principal aim of this meeting. He describes in a practical way the philosophy of EIA and later he explained in a detailed way the main moments of EIA evaluating, not only for this study but also the previous ones from Scott Wilson, assuring the community of the necessary measures and technical requirements from the contractor's side for any possible environmental impact (soils, air pollution, dust, water, landscape, flora and fauna) based on the EIA conclusions . The environmental authority of the area guaranteed that all proposed and described measures included in the project for attenuating, neutralisation and minimising of effects and non positive environmental impacts will be rightly implemented in collaboration and co-ordination with the environment inspectors and environmental section within GRD. He also mentioned the conclusions and recommendations of EIA and the environmental management plan are

contractor's obligations, because if the contractor fails to carry out the proposed attenuation measures' based on the Albanian Environmental Legislation there will be sanctions and legal restrictions on him, until the recuperation and complete rehabilitation.

Gjon Pjetri (vice prefect of the district Lezhe , for the district of Mirdite)

I appreciate this form of public debate and the study of EIA . I would suggest to make high protective bunds in the places where the streams that furnish the river Fan where the water passes. **Answer**

Nikoll Ndoj (farmer of the village Vau – Shkjeze)

Who will compensate the land taken by Military and the vineyards ruined?

River protection is necessary

Answer

The compensation of all damages mentioned above will be made from the State budget according to the expropriation law for public interest and as I mentioned above based on the World Bank manuals, formats and standards for the resettlement action plan (RAP). More in detail for this problem will be discussed next time in the public consultation for the RAP.

As answered by the Mayor of the Municipality there will be taken the necessary measures from the responsible administrative structures of GRD.

Andrea Gega (Chief of the village Rrethi i Eperm)

Who is responsible for the military works?

To make the river protection because the land is very important to us and we do not possess much.

Answer (GRD)

It is not in our competence to give an answer today.

As I answered before the GRD responsible administrative structures will take the necessary measures.

Mark Simoni

Where are foreseen under and over passages?

The irrigation system is broken who will fix it?

Answer (GRD)

As I answered above GRD's official responsive answers based on rules and technical standards will be explained to you. For every damage caused there will be rehabilitation through the co-ordination of work to the local power. (In this moment the Mayor of the Municipality explained that the municipality has started working for the improvement and rehabilitation of the irrigation system and to reinstate it to its previous functional system and which is also approved by some of the participants.

Ndue Nikolla

To reconsider the damage of the railway pipe culvert by the military workings.

Answer

The project will take care of that

Vasil Njuma

My house is ruined by the military workings with rollers.

Who will compensate me and when?

Answer (GRD)

Every damage will be compensated from the State budget and through the RAP (resettlement action plan) scheme.

Gjin Ftoi (farmer of the village Rreth i Eperm)

Military has damaged us with the workings, who will compensate us?

Answer (GRD)

Once more we explain to you that every damage will be compensated from the State budget and through the RAP (resettlement action plan) scheme according to the World Bank model. I remind you that for these aspects you should come to the Public Consultation and see the RAP scheme later in March.

Paulin Simoni (Farmer of the village Vau – Shjeze)

Where will you throw the excess material because the military has thrown it into the river and has damaged our land?

Answer

The answer is given by the Mayor who explains that the Municipality of Rubik, in co-ordination with GRD, the Regional Environmental Agency and the responsible local authorities will identify a special place for the deposition of the surplus material. In no way will be left in the river .

Pal Nikolli (farmer of the village Rreth i Eperm)

After he expressed his respect and evaluation for the environment influence evaluation, he asked to be the compensation of the lands or to make river bunds not to overflow.

Gjon Simoni (farmer of the village Vau – Shkjeze)

River protection is necessary

When will be the compensation?

Answer (GRD)

Probably around the month of July. You will get a better answer when the RAP Public Consultation takes place.

Prenk Simoni (farmer of the village Vau – Shkjeze)

Who will compensate the damage the military caused?

Answer (GRD)

As mentioned above the compensation will be made from the state budget.

Bashk Gjergji (farmer of the village Munaze)

Are there foreseen passages and over passages so that we can have the possibility to work the land.

Answer (GRD)

You will get the exact answer in the next meeting of RAP

Zef Fusha (farmer of the village Fank)

When will the passages and over passages be constructed for my village?

Will the watering system be fixed again?

Answer (GRD)

Same answer as stated earlier.

Pjeter Dropi

When will the newspaper publications come out and will our names be in the list?

Answer (GRD)

Around the month of May of this year, but you will get informed during the presentation of the RAP during the public consultation.

Sander Ndoi

How will the damage caused by military be compensated?

Answer (GRD)

Same answer as given earlier.

Mr. Mark Ruçi takes the floor again reminding the participants in debate not to repeat the same questions or problems asking for their understanding and he assures them that everything related to the expropriation, compensation and damages will be publicly presented in the scheme of the RAP through a special public consultation. If anyone has any question or clarifications and discussions related to the environmental study he may talk .

As none of the participants had any argument to discuss the meeting was considered closed by the Mayor of Municipality Mr. Ruçi. The GRD Directorate representatives left some copies of the study and the project and it was agreed that for any additional comments everyone is free to ask the GRD directly or through the specialist of the municipality Mr. Artan Osmani.

At 14:45 the meeting was considered closed

In this public consultation it was clearly explained the aim of this meeting for all those persons involved by the project. The Environmental Impact Assessment was presented in detail. Although the impact to this study of EIA from the side of the community did not have many reactions in the specific debate sense, the debate was held domestically. Despite the evidence, psychological and releasing impact that there will be no more workings "military" or "civil" are taken the preliminary preventive attenuate and minimising measures of the environmental or social impact, from their side there is now a good understanding. All problems and troubles caused by the military workings will be reported in a written way to the office – holders of GRD despite the presence of the Vice-Minister to take the preventive measures for solving and rehabilitation of the situation.

List of Attendees at Public Consultation in Vau i Shkjezës

	Name	Surname	Profession(Function)
1	Armand	Teliti	Vice Minister of MPWTT
2	Mark	Ruçi	Mayor of Rubik
3	Gjon	Pjetri	Vice Prefect of the District Lezhe
4	Faruk	Kaba	Director of Design Group (ITP)
5	Genci	Dautaj	Chief of Environment Department, GRD
6	Flora	Cejku	Expropriation Specialist GRD
7	Elfiori	Zotaj	Environment Specialist (GRD)
8	Jak	Gjini	Director of Environment Regional Agency, Lezhe District
9	Mark	Gjoka	Farmer
10	Ndue	Buba	Farmer
11	Nikoll	Ndoi	Construction workers
12	Valentin	Ftoi	Construction workers
13	Preng	Simon	Construction workers
14	Gjon	Simon	Farmer
15	Valentin	Gega	Electrician
16	Dritan	Oroshi	Bricklayer
17	Aldo	Ndoj	Bricklayer
18	Gjin	Gjoka	Student
19	Ded	Nikolli	Electrician
20	Nik simon	Nikolli	Worker
21	Gjet	Nikolla	Pensioner
22	Zef	Simon	Farmer
23	Dod	Ruci	Farmer
24	Preng	Leka	Farmer
25	Skender	Ndoi	Pensioner
26	Bujar	Leka	Farmer
27	Paulin	Gjoka	Farmer
28	Kastriot	Gjoka	Farmer
29	Ndue	Simoni	Farmer
30	Agron	Leka	Farmer

31	Mark	Nikolli	Driver
32	Zef	Simoni	Farmer
33	Gjin	Gjoka	Shoe maker
34	Flora	Ftoi	Driver
35	Marie	Simon	Electrician
36	Dritan	Ndoi	Worker
37	Lek	Dedaj	Driver
38	Pjeter	Gega	Farmer
39	Bashk	Dedaj	Farmer
40	Andon	Gjet	Farmer
41	Mark	Gjergji	Farmer
42	Gjin	Gjergji	Farmer
43	Preng	Ndue	Farmer
44	Zef	Ndue	Driver
45	Gjovalin	Pjetri	Farmer
46	Andrea	Ndoj	Farmer
47	Gjovalin	Gega	Chief of the village Rrethi I Epërm
48	Pjeter	Ndoi	Driver
49	Pjeter	Lleshi	Pensioner
50	Pjetr	Pjetri	Construction Engineer
51	Gasper	Topollaj	Legal Economist

APPENDIX 4 – List of Associated Reports

(i) Durres-Morine Road Corridor: Feasibility Study & Environmental Impact Assessment – Final Report. November 2003 (Prepared by TECNIC / Mott MacDonald)

(ii) Milot to Rreshen EIA Review and Update Report. July 2004 (Prepared by Scott Wilson)

(iii) Durres – Morine Resettlement Action Plan Report. May 2004 (Prepared by Scott Wilson)

APPENDIX 5 – Maps

Map 1: Indicating Location of Milot to Rreshen Road Section

Map 2: Indicating Location of Alternative Routes Considered

APPENDIX 6 – Photographs

Photo. 1 View across meadowland from national road SH.1 towards Milot (South of Fushë Milot)

Photo. 2 Old bridge across River Mat intersected by disused railway route

Photo. 3 View of River Mat valley (from Km 9+500) looking westwards

Photo. 4 View of River Mat (Railway bridge at Km 10+200) River Fan valley in distance

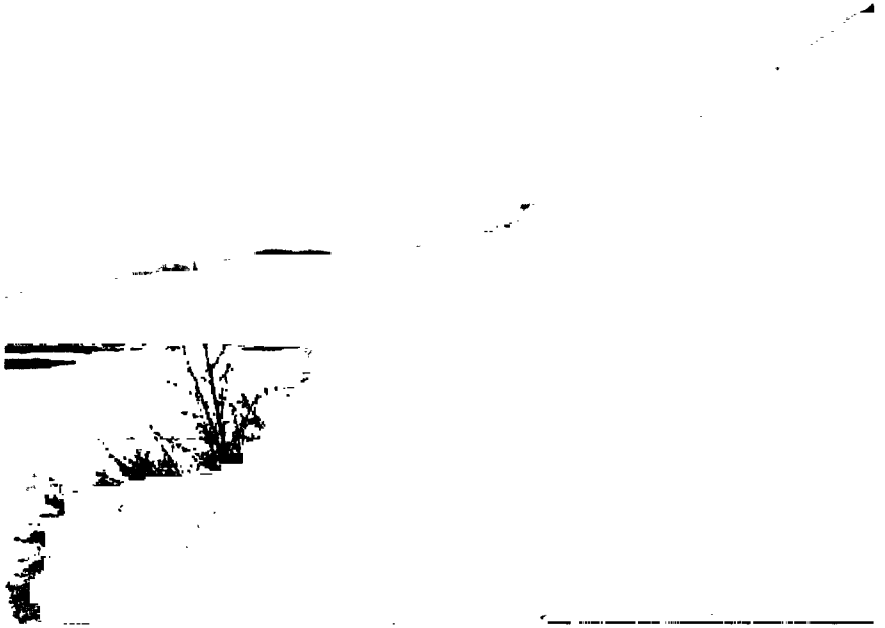


Photo. 5 Military works at Km.12 (Fangu Village in distance)

Photo. 6 Military works + railway embankment through Fangu Village

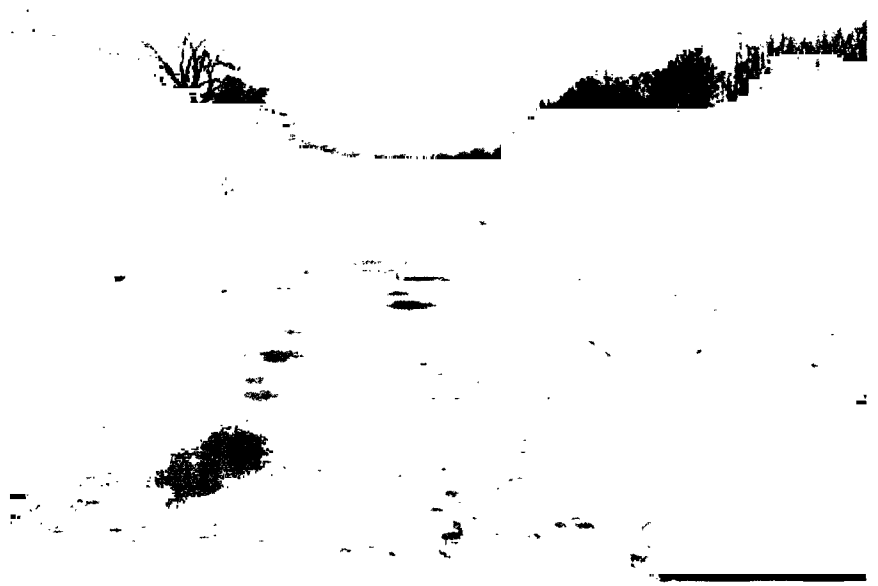


Photo. 7 Military works + railway in cutting through Fangu Village

Photo. 8 Excavated material tipped in river by military works

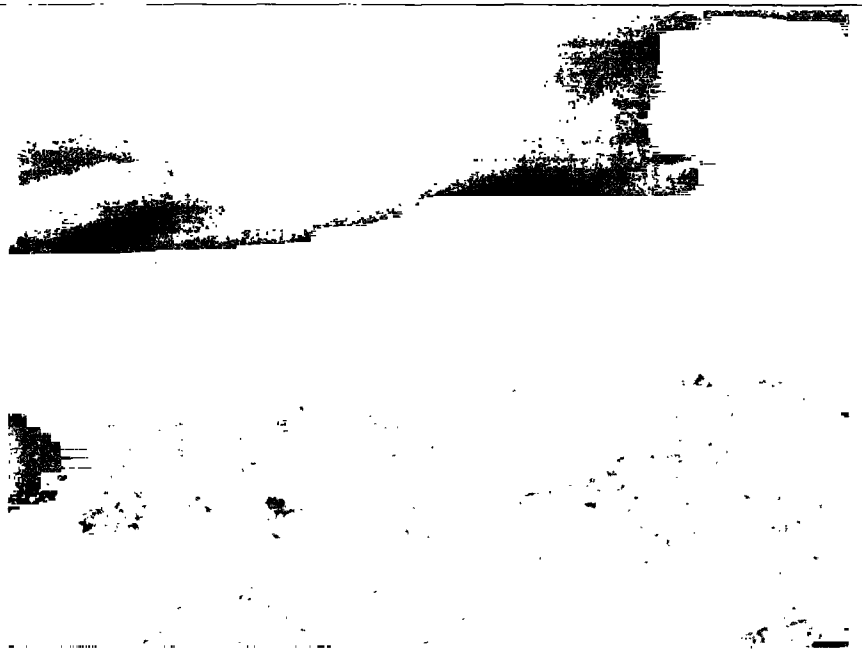


Photo. 9 Excavated material tipped in river by military works

Photo. 10 Military works - Excavated rock cutting Km.14

Photo. 11 Excavated material placed on opposite river bank by Military to reduce erosion effect

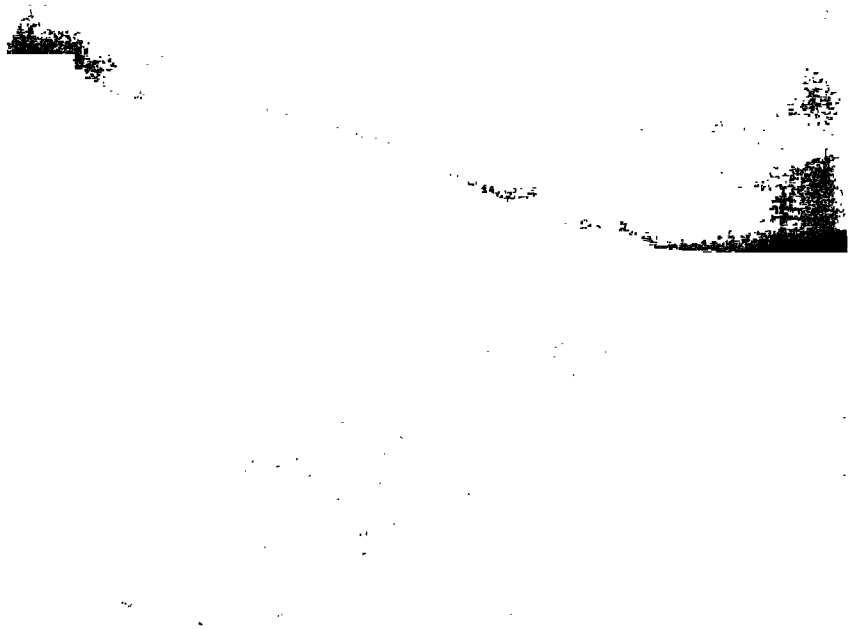


Photo. 12 Disused Railway and Rural Road (opposite Rubik)

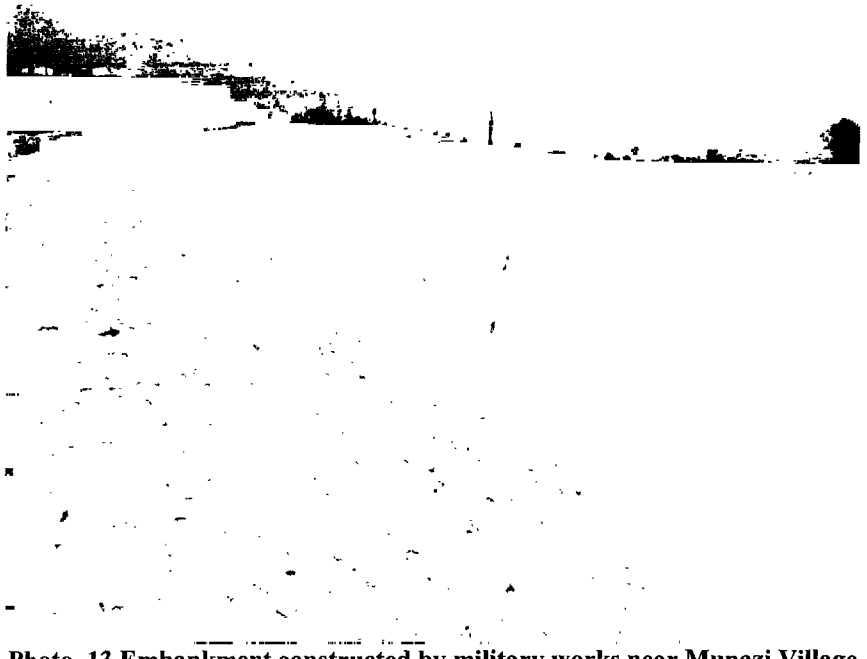


Photo. 13 Embankment constructed by military works near Munazi Village

Photo. 14 Embankment constructed by military works adjacent to Munazi

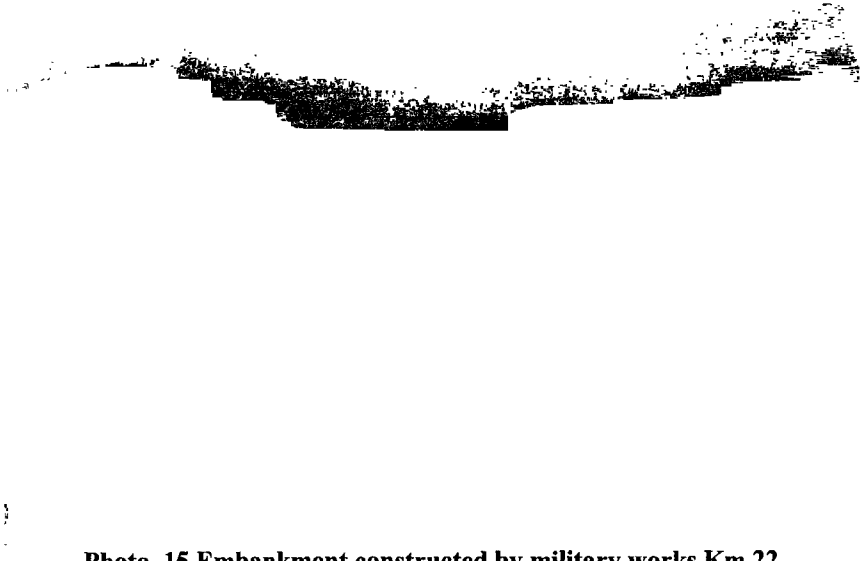


Photo. 15 Embankment constructed by military works Km 22

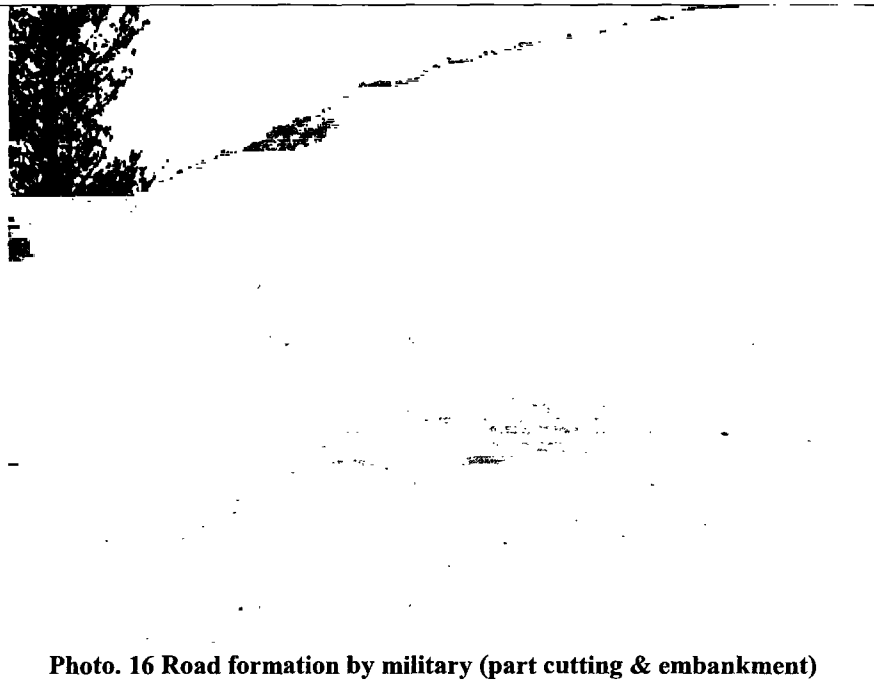
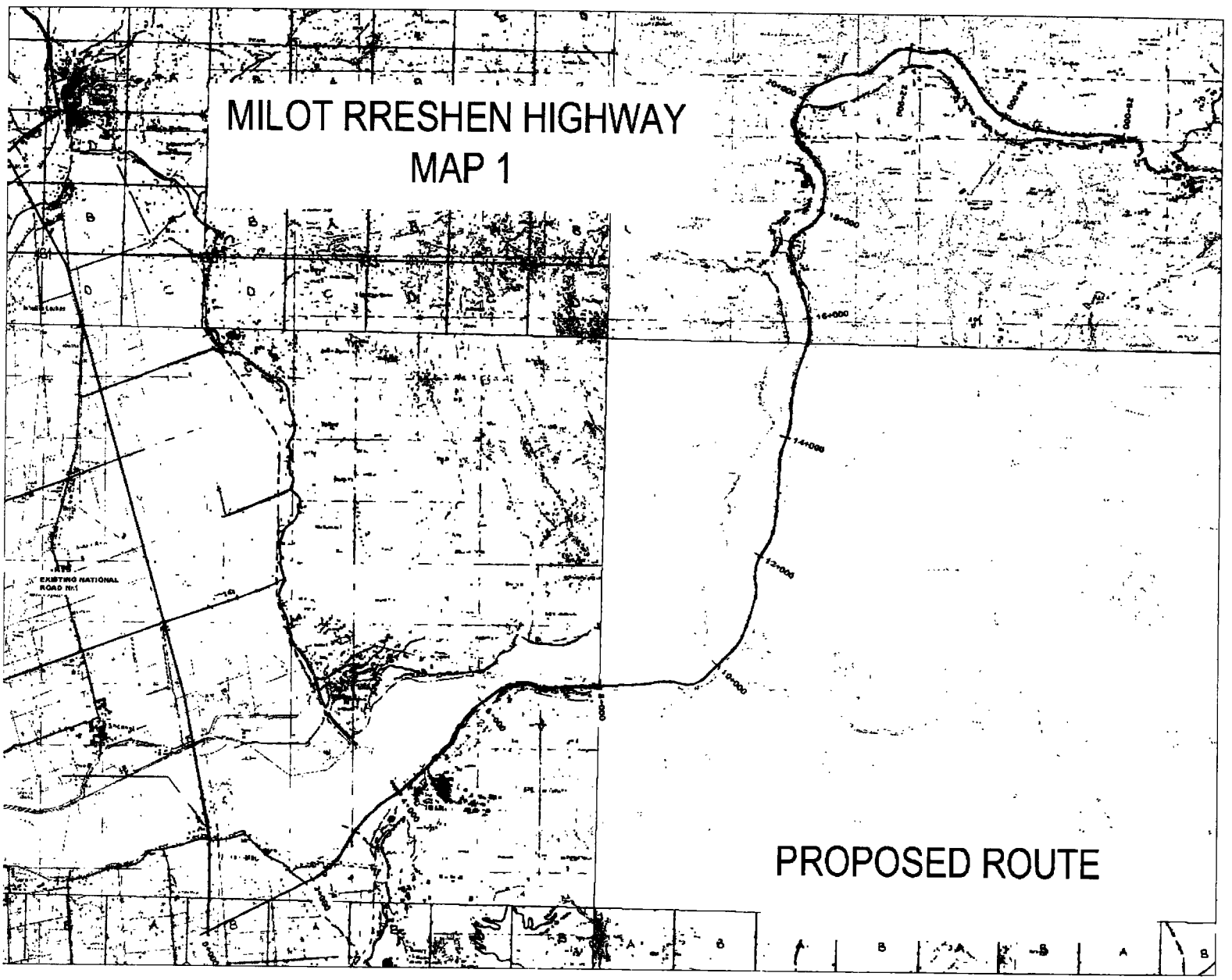
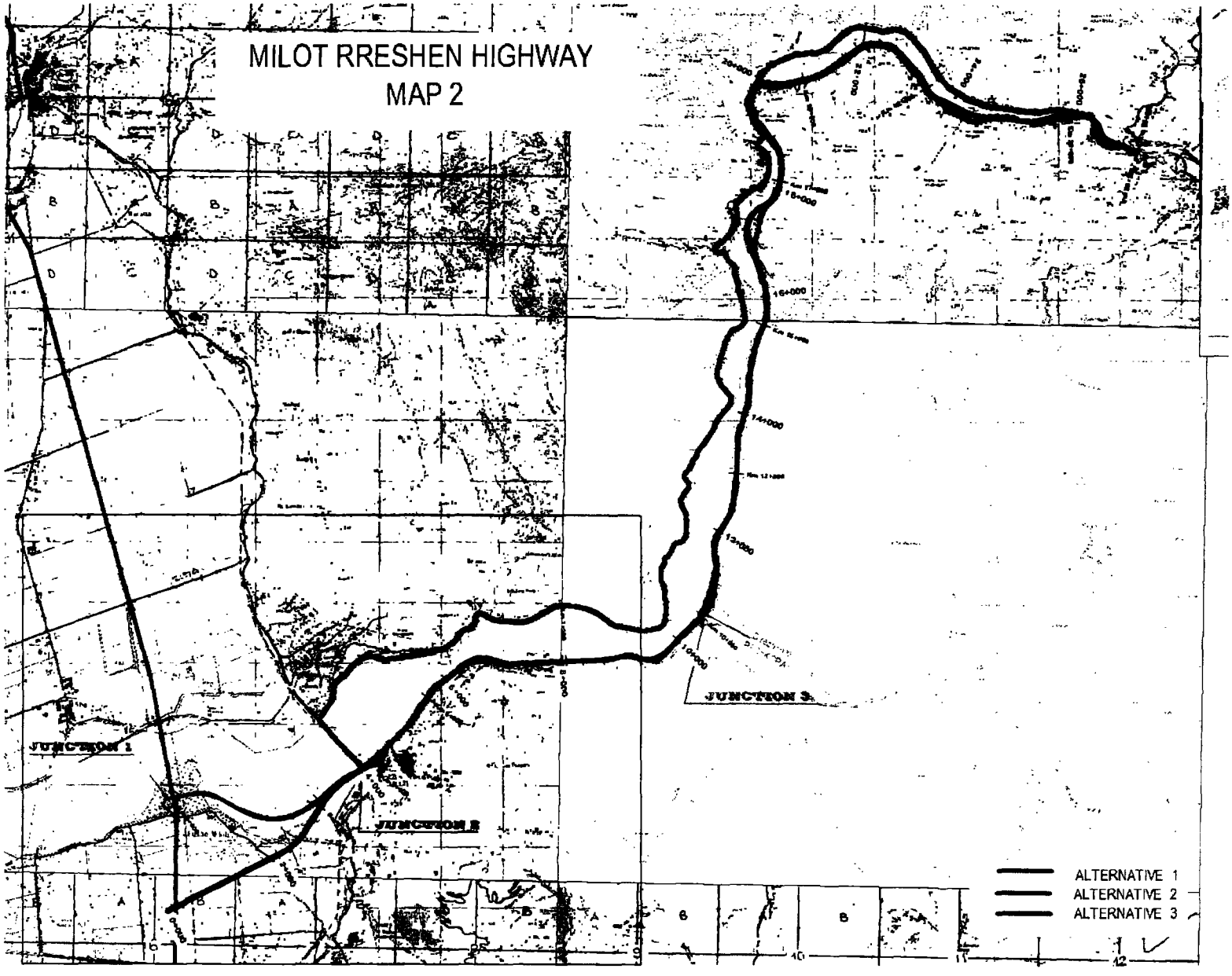


Photo. 16 Road formation by military (part cutting & embankment)


MILOT RRESHEN HIGHWAY
MAP 1
EXISTING NATIONAL ROAD No1
PROPOSED ROUTE


MILOT RRESHEN HIGHWAY
MAP 2
JUNCTION 1
JUNCTION 2
JUNCTION 3
ALTERNATIVE 1
ALTERNATIVE 2
ALTERNATIVE 3