

**Advice for guidelines for environmental impact assessment (first phase) of the Baku-Tbilisi-Ceyhan
Main Export oil pipeline in Georgia**

8 June 2001

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commission for environmental impact assessment

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subject Advice for guidelines for
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Export oil pipeline in Georgia

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Utrecht,
8 June 2001

Excellency,

At your request the Dutch Minister of the Environment Jan Pronk has asked the Dutch Commission for Environmental Impact Assessment (MER) to assist you with the environmental and social aspects of the "Baku - Tbilisi - Ceyhan Main Export oil pipeline project" in Georgia.

A working group (see for the composition Appendix 3) of the aforementioned Commission was then assigned to advise you on these matters, applying the Dutch standards.

The working group visited Tbilisi from 7 till 15 May of this year and had intensive contacts with a large number of ministries, institutions, international organisations, GIOC, NGO's, the British Petroleum Company and the Royal Netherlands Consulate in Georgia.

During our meeting you asked the working group to assist you with the following actions:

- setting up guidelines for a study on route selection as part of the Environmental Impact Assessment study (EIA);
- to review, the aforementioned study based upon your approved guidelines;
- setting up the guidelines of the second part of the EIA, the study on environmental and social impact assessment;
- to review, the second part EIA based upon your approved guidelines.

I hereby send you the guidelines for the study on route selection (first phase EIA).

Please let us know if you have questions and inform us about your approval of these guidelines in order for us to proceed as quick as possible with the setting up of the guidelines for the second part of the EIA.

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Finally, I would like to inform you that we are willing to assist with the review of the monitoring & evaluation of the project. In accordance with you, the 'filling-in' of our assistance should be discussed in more detail.

With warm regards,



Dick de Zeeuw,
Chairman of the working group

**Advice for guidelines for environmental impact assessment
(first phase) of the Baku-Tbilisi-Ceyhan Main Export
oil pipeline in Georgia**


Advice submitted to the Minister for Environment, by a working group of the
Commission for Environmental Impact Assessment in the Netherlands.

the technical secretary



A. Kolhoff

the chairman



D. de Zeeuw

Utrecht, 8 June 2001



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Acronyms and abbreviations

BP	British Petroleum
BTC-project	Baku-Tbilisi-Ceyhan project
EIA	Environmental Impact Assessment
HGA	Host Government Agreement
IGA	Intergovernmental Agreement
IUCN	International Union for the Conservation of Nature and natural Resources
NGO	Non Governmental Organisation
ROW	Right of Way

1. INTRODUCTION

1.1 Setting of the project

The Baku–Tbilisi–Ceyhan Main Export oil pipeline project is considered a major system for transporting crude oil from Azerbaijan (and in future, also from Kazakhstan) to the Mediterranean sea coast of Turkey. This pipeline crosses the territories of Azerbaijan, Georgia and Turkey. Starting point is the Sangachal terminal (Azerbaijan) and target point is Ceyhan terminal (Turkey). Total length of the pipeline is 1700 – 1750 km, section in Azerbaijan 468 km, Georgian section 200 – 250 km and the Turkish section is 1037 km, see appendix 4 for a map.

An Inter-governmental Agreement (IGA) between Georgia, the Azerbaijan Republic and the Republic of Turkey has been signed in which the transportation of petroleum via the territories of the Azerbaijan republic, Georgia and the Republic of Turkey through the Baku-Tbilisi-Ceyhan (BTC) Main Export pipeline has been agreed.

On 28th April 2000 the working groups of Georgia, Azerbaijan and Turkey initiated the Georgian Host Government Agreement (HGA) on the BTC-project. This Agreement has been ratified by the Parliament of Georgia on May 31, 2000. The HGA defines the environmental standards and norms of this project. It has been stated that environmental standards of the Netherlands and Austria and the EC Directive 85/337/EEC will be applied.

This advice focuses on that part of the BTC-project that crosses the territories of Georgia. The exact pipeline route through Georgia is not yet determined, therefore the length of the Georgian section differs between 200 and 250 km.

1.2 Request for advice

According to the Georgian law an EIA must be executed. Based upon an approved EIA study the Environmental license will be issued by the Ministry of Environment.

This advice is the result of co-operation between the Government of Georgia and the Government of the Netherlands. The Georgian Minister of Environment has requested assistance from the Dutch Minister of Environment, with a thorough implementation of EIA for the BTC-project. By letter dated 5 September the Dutch Minister of Environment requested the Netherlands Commission for EIA to advise on EIA to be executed for the BTC-project, see Appendix 1 for the request.

This advice is prepared by a joint Netherlands/Georgian working group of experts of the Netherlands Commission for EIA. For the composition of the working group is referred to in Appendix 2. The Netherlands experts visited Georgia from 7 – 15 May 2001 to draft this advice jointly with the experts from Georgia. For the programme of the visit see Appendix 3.

1.3 Justification of the approach

In this section is described which approach has been followed by the Commission in order to assist the Georgian government. To get a better understanding of this approach, a brief overview of the strategy to determine the route followed by the proponent is presented.

Strategy for routing by the company:

1. A number of corridors between Azerbaijan and Turkey have been identified, studied and compared. The corridor which is known as the southern corridor has been selected. This so-called "corridor of interest" is a 10 km wide corridor, see appendix 5 for a map. An EIA for the selection of this "corridor of interest" has not been executed.

2. A 500 meter wide corridor, the so-called "preferred corridor" will be determined within the 10 km wide corridor. This "preferred corridor" has not been selected on the basis of an EIA.

3. A 100 meter wide corridor, the so-called "specified corridor" will be determined within the 500 meter wide "preferred corridor". The selection is not subject to EIA.

4. The 22 meter wide right of way will be determined within the 100 meter wide corridor. An EIA as well as a monitoring plan are planned to be executed for the preparation, construction and operation of the pipeline. Separately a risk assessment study, an oil spillage plan and an abandonment plan will be executed.

With regard to this strategy the Commission would like to make the following remarks:

Ad1) It has come to the Commission's attention that the selection of the southern 'corridor of interest' has not been made based upon an EIA study. The Commission is of the opinion that the selection of this corridor should have been executed based upon an EIA. Because the added value of an EIA for such a selection is considerable, it would have offered the opportunity of a transparent comparison of the impacts of the four different corridors of interest. However, due to the fact the present 10 km wide corridor of interest has been approved in the HGA the execution of an EIA for the selection of the "corridor of interest" is not realistic anymore. This means that this corridor is the starting point for the Commission, apart from limited adaptations which are allowed according to the HGA. In this advice the Commission will only ask for a justification of the selection of this corridor, see section 3.

Ad 2) The Commission has noticed that the 500 meter wide corridor has been drawn on a map. The study which forms the basis for this selection does not exist as far as the Commission knows. Therefore, the Commission recommends to execute an EIA for selection of the 500 meter wide corridor for the following reasons. Primarily, an EIA offers the opportunity to make the process transparent. Secondly, for a number of aspects, such as ecology and cultural heritage, the added value of an EIA for this selection process is considerable due to the fact that it offers the opportunity to avoid the most sensitive habitats / sites.

Ad 3 and 4) The Commission is of the opinion that no EIA is required for the determination of the 100 meter wide "specified corridor" within the 500 meter wide "preferred corridor". The added value of an EIA for this selection is limited. For the next step an EIA at project level has been planned for the right of way and the necessity of an EIA for this step is underlined by the Commission.

Summarising, this means that the Commission recommends to execute an EIA in two phases:

- EIA phase 1: Objective; (i) justification of the 10 km wide "corridor of interest" and; (ii) determination of the (most environmental friendly) 500 meter "preferred corridor" on basis of a comparison of the impacts of potential routes within the 10 km wide "corridor of interest".
- EIA phase 2: Objective: (i) description of the most environmental friendly alternative and, mitigating and compensating measures; (ii) description of the environmental and socio-economic impacts of the pipeline during preparation-, construction-, reinstatement- and operation & maintenance phase and (iii) description of environmental management in an EMP.

The Commission will assist in the execution of these two phases of EIA and will therefore produce the following four consecutive advices:

- Advice for guidelines concerning an EIA for phase 1: Routing of the 500 meter preferred corridor for the BTC project (Planning: advice submitted 8 June 2001).
- Advice in which the findings of the review of the EIA report for phase 1 will be presented (Planning: advice prepared, August / September 2001).
- Advice for guidelines concerning an EIA for phase 2: Pipeline project preparation, construction, reinstatement and operation. Including guidelines for the risk assessment, monitoring study and the oil spillage plan (Planning: advice prepared, September 2001).
- Advice in which the findings of the review of the EIA report for phase 2 will be presented (Planning: advice prepared, November / December 2001).

It should be clear that here (in this report), only the first advice will be outlined. The other three advices will be prepared and submitted separately, see planning.

Finally, the Commission would like to stress the importance of simultaneous elaboration of the EIA (phase 2) and the detailed design study by the study teams in order to have an optimal mutual advantage of each others work.

1.4 Scope of the work

According to the HGA the following studies and plans have to be executed:

- Environmental Impact Assessment study;
- Risk assessment study;
- Monitoring plan;
- Oil spillage plan;
- Abandonment plan.

The Commission is of the opinion that a number of these studies/plans should be combined into one study because this improves both the transparency of the information towards the decision maker and the public, and the relationship between proponent and the authorities. Furthermore, an Environmental Management plan and an Hazards and operation study (HAZOP study) are not requested according to the HGA. Therefore, the Commission recommends the following:

Environmental Impact Assessment, consisting of two phases:

- EIA study (first phase), including a qualitative risk assessment;
- EIA study (second phase), including:
 - o HAZOP study and a quantitative risk assessment;
 - o monitoring plan;
 - o oil spillage plan;
 - o Environmental Management plan.

In the advice regarding guidelines for the second phase EIA which will be prepared by the Commission, guidelines for the above mentioned components of the EIA will be provided.

An Abandonment plan is asked for in the HGA. The Commission is of the opinion that responsibility for abandonment can be arranged in the license. Preparation of an Abandonment plan (how abandonment should be implemented) is not effective due to the fact that techniques for abandonment will change the next 40 – 60 years (the planned lifetime of the pipeline).

1.5 Links between BTC-project and Sha Deniz gas pipeline project

The proponent British Petroleum (BP) is investigating the construction of a gas pipeline from the Azerbaijan Republic to the Republic of Turkey through Georgia. An HGA between the three countries is planned to be signed in June 2001. The Government of Georgia as well as the proponent are planning to construct the gas pipe line in the same corridor as the oil pipeline. The Commission recommends the execution of one EIA for both projects for the following reasons:

- The risks of hazards will increase and cumulative impacts might occur as a result of those hazards. A worst case scenario should be described.
- The public can be informed and consulted simultaneously about the two projects and this will avoid a lot of confusion and lack of confidence amongst the people in the corridor.

Box 1: An overview of some additional potential environmental / socio-economic consequences of the construction of a Gas pipeline next to the Oil pipeline is presented as background information

- The distance of the centre of the gas pipeline to the centre of the oil pipeline depends on engineering and can be 5 to 10 meter. The width of the right of way for the construction and the work strips varies accordingly.
- Additional hazards might occur in case the gas pipeline will be filled with gas and pressurised during the construction of the oil pipeline.
- A new risk assessment has to be undertaken for the combined effect in the event of a disaster of one of the pipelines, the oil- as well the gas pipeline.
- An advantage might be that the pump station can possibly be powered by gas avoiding overhead power lines. However, emissions via the exhausts of the drivers will increase.
- Social impacts of doubling the personnel of the construction crews has to be determined;
- Road damage will rise by additional transport of the materials and construction transports. Proposals concerning additional work to reinforce existing roads can be expected;
- A positive economic effect for the local people due to an increase in spending money for lodging, food and employment of labour along the route.

2. PROBLEM ANALYSIS AND OBJECTIVES

The purpose of describing the problem analysis and objectives is to assess if the proposed programme does solve the observed problems and to assess if the programme objectives will be achieved.

2.1 Problem analysis

The rationale of the project should be described. This means that a guaranteed supply of oil from Baku for the capacity and lifetime of the oil pipeline (about 40 years) should be explained.

2.2 Project objectives

The objectives of the BTC-project for Georgia should be described.

3. LEGAL AND INSTITUTIONAL SETTING

The purpose of describing legislation, regulations and policies is: (i) to check if the routing of the pipeline is compatible with the legal and political context and (ii) to get insight in the opportunities and constraints concerning the development of alternatives.

3.1 National policy

The National policy regarding nature conservation, cultural heritage and environmental pollution in the affected area should be described.

3.2 EIA legislation and regulations

In view of the national EIA regulations of Georgia an EIA is mandatory for the BTC-project. The EIA procedure for the BTC project should be explained and the link with the HGA concerning EIA should become clear.

3.3 Host Government Agreement

The Commission is of the opinion that the selection of the 10 km wide "corridor of interest" should be justified. This means that a brief overview should be provided of the alternative corridors which have been considered, the criteria applied for comparison of the corridors and finally the selection process that resulted in the presently selected "corridor of interest".

The HGA defines the environmental standards and norms of this project. It has been stated that environmental standards of the Netherlands and Austria and the EC Directive 85/337/EEC will be applied. All relevant standards which are mentioned in the HGA should be described in the EIA because the EIA will become a public document.

The Commission is of the opinion that the proposed time frame of starting the implementation of the project in 2000 is unrealistic. The limited time for consultation and approval of the EIA study might hamper the quality of this study. Given the set time frame in the HGA for the required procedures which are necessary for approval it is hardly possible to start the construction of the project prior to February 2002. The Commission recommends to invest sufficient time in an adequate implementation of the studies and communication with all stakeholders including the public in order to guarantee well informed decision making.

3.4 BP policy

The policy of the BP company regarding all aspects of the BTC-project should be elaborated.

4. PUBLIC CONSULTATION

The EIA should describe what is stated about public consultation in the HGA.

Informing and consulting the population living along and in the 10 km pipeline corridor is of the utmost importance for social, political and safety reasons. World wide experience shows that informing people in time, and correctly as well as compensating those affected reasonably for their losses results in increasing support for such a project. Support of the people for the project is important because it decreases the chances for theft and sabotage of the pipeline. Therefore the following information should be considered:

- Ethnic structure and historical peculiarities of population, living along the corridor.
- Complete and objective information towards the local population by the government and the company about (i) the project and the impacts and (ii) their rights and obligations.

Box 1: Explanation:

It should be considered, that there are 5 ethnic groups living along the pipeline corridor: Azerians, Georgians, Greeks, Osethians and Armenians. All of them use their own native language for communication inside the ethnic group and have very poor knowledge of the Georgian language (except Georgians and Osethians). So, for them it is too difficult to use Georgian written data, which is why they are practically isolated from the environment, as well as from each other. Furthermore, each ethnic group is served as a repository and representative of their own national culture and history. Historical complications of their relationship in the past still exist in their consciousness. Even now they build relationship with other ethnic groups, in a close or far neighbourhood, based on a more negative than positive history. Because of compulsory, informative isolation of local communities (local ethnic groups), they have to get or pick up the information from so - called "non formal sources". This information is wrong in most instances or, at least, perverted. They have limited or no objective, correct and complete information about projects taking place in their region. This might create ground for the raising negative political interests by some politically - oriented groups of people.

The only way to avoid such kind of complications is to consider all kinds of peculiarities of ethnic groups and create a well organised informational broadcasting system, which constitutes to a very important part of communication - building process on a different level between:

The Commission recommends:

- Information should be revealed through the communication by BP and GIOC with the local community on 3 mentioned levels: local government, local NGO and local villagers. Communication and consultations with local government or NGO only, is not sufficient due to the lack of communication between people and government, and also between people and NGO. They should receive the necessary information directly from company and national government representatives. Only in this case this information will be authentic for them.

- To start informing and consulting the public when the 500 meter corridor has been determined upon the EIA-first phase. Consultation of the local villagers about the project should be done in one shift per village. Villages that will be affected directly should be visited to inform people about e.g. compensation.
- The own languages should be used during public meetings: Azerian, Georgian, Armenian and Russian for Greeks.
- Information about local demand for labour employment during the different phases of the project should be provided.

5. METHODOLOGY FOR DETERMINATION OF THE PREFERRED ROUTE

In this chapter a step by step approach is provided for the determination of the 500 meter "preferred corridor" in the EIA study (first phase). This is a selection process in which for each of the distinguished aspects the areas sensitive for passage of the pipeline must be identified. The following steps can be considered:

- Step 1: Project activities which could cause significant negative environmental and socio-economic impacts should be determined, see chapter 6.
- Step 2: Identify base line information (current situation and future development) for each of the distinguished aspects. This information should be mapped, see chapter 7.
- Step 3: For the distinguished aspects the sensitivity for impacts of the activities due to passage should be assessed and mapped. The categories of sensitivity should be justified, see chapter 8.
- Step 4: For the sensitive areas alternative routes should be elaborated at a scale of 1:10.000, see chapter 9.
- Step 5: Mitigating measures to minimise the negative impacts of the preferred route and the determined alternative routes should be described as part of such an alternative, see chapter 10.
- Step 6: The alternative routes including the mitigating measures should be compared based upon the impacts and costs, see chapter 11.

6. THE INTENDED ACTIVITY

The purpose of describing the intended activity is to enable determination of the impacts and the mitigating measures.

6.1 Technical aspects of the project

The following technical aspects should be described:

- length and design capacity of the pipeline;
- number and location of pump stations, custody transfer stations, scraper stations and block valve stations.

It should be described and justified how the pipeline will be constructed: under ground or above the ground or a combination of those options. In case these options are both considered as realistic they should be dealt with as two alternatives.

6.2 The main project activities

The project activities for the following phase should be described: preparation, construction, reinstatement and operation & maintenance.

6.3 Selection of activities for routing

Based upon the comprehensive list of activities, asked for in the previous section, those activities should be selected that might have significant negative impacts on the current natural and socio-economic environment within the "corridor of interest". The selection should be justified. The 10 km "corridor of interest" is geographically heterogeneous and therefore the sensitivity of the various sections for impacts of the activities might differ. Therefore, it is likely that a different set of activities should be selected in order to determine the routing of the 500 meter wide "preferred corridor".

7. THE CURRENT ENVIRONMENTAL AND SOCIO-ECONOMIC SITUATION

The purpose of describing the current environmental and socio-economic environment is to increase the possibility of an environmental sensitivity assessment related to the impacts caused by the project.

The current situation of the natural and socio-economic environment in the 10 km wide "corridor of interest" should be described for a great number of aspects which are mentioned in this chapter. For a number of aspects the future developments should also be described. The information asked for should be mapped for each aspect. This information is required to assess the sensitivity of the aspects in the corridor for the impacts caused by the project.

Explanation:

P = present situation; this means that information should be described for the present situation;

F = future situation; this means that information should be described for the future situation;

. = means no information asked for.

P/F - Geology / geomorphology; A geological map should be prepared providing information about seismic active areas; geological faults. Slope stability and erosion risk should be determined in order to study the risk of natural and man induced landslides.

P/. - Hydrology; All rivers to be crossed should be determined and categorised.

P/. - Landscape: Landscape units and characteristics should be described.

P/. - Soils: A soil map should be prepared. In particular peat soils and marshy areas should be determined due to the fact that these soils compared to sand / clay soils in general cause significantly more severe negative impacts.

P/F - Settlements, industrial – and other activities: All settlements, villages, industrial areas and other areas where people are living or working should be identified. Future developments should be described.

P/F - Land use; A distinction should be made between the following types of present land use: forests, grazing land / pasture, arable agriculture (orchards and annual cropping land). Considerable changes of land use in future should be determined.

P/. - Land ownership: A distinction should be made between private land, community owned or used land, and state land.

P/. - Cultural heritage: All known archaeological and cultural historical sites should be located. A brief investigation should be made of those areas with likely archaeological remnants.

P/F - Mining and mineral resources: Mining activities and mineral resources which are extracted presently or could become exploited in future should be determined.

P/F - Ecology;

- Protected areas: All protected nature reserves which are located in the 10 km wide corridor or in an area of at least 10 km adjacent to both sides of the corridor must be identified, described and valued briefly. Protected areas outside the corridor should be identified because these areas might be of importance for animals living in an extensive

habitat or migrating between the different areas. If required other areas more than 10 km from the corridor should be identified as well¹.

- Areas that are planned to become a nature reserve or have the potential value to become a nature reserve in future should be treated as a protected area as described above².
- For the valuation of the areas which are not or not yet protected by law use should be made of the following criteria:
 - Areas with high biodiversity level (species richness);
 - Areas with high level of endemism;
 - Areas that are the best representative of the type of ecosystem (habitat);
 - Areas with critical ecological value: migratory routs (including wintering & resting areas); breeding areas; feeding areas; drinking areas; nest sites; areas with high density (single species and multiple species model); areas with isolated populations;
 - Areas important to maintain the threatened species population (Georgian, red data book, IUCN red list, CMS appendix I and II).
- Ecosystems provide (free) services. Those services that might be affected by the project should be described.

P/F - Infrastructure/roads: All roads in the area of the corridor and in the area of the adjacent corridor should be determined. The suitability of all those roads for use by the project should be identified.

¹ Within the range of 10 km zone, the following reserves are situated: the Gardabani reserve (IUCN IV category), that is set directly near the 10 km zone, at the bank of Mtkvari (Kura) River and represents riparian forest, which is significant as wintering and resting sites for waterfowls, including the species form the IUCN Red List and CMS Appendices I and II. In addition, there occurs still one out of three populations of *Cervus elapus maral* - the only riparian population in Georgia.

The 10 km zone also bounds with the National park of Borjomi-Kharagauli (IUCN _ II category) and passes through the multiple use zones, which as well belongs to the category of protected areas (IUCN _VI category), according to the Georgian Legislation. Partial changes of ecosystems are allowed in the territory; however the types of construction that are permitted are not clearly identified.

It should be mentioned that the present 10 km wide "corridor of interest" nowhere crosses the reserves available (except the multiple use zone of National park of Borjomi-Kharagauli, where some activities (e.g. constructions) are allowed. The corridor crosses the territory of the potentially Ktsia-Tabatskuri reserve, which is planned to be created.

² The territory considered for creation of Ktsia-Tabatskuri reserve (IUCN- IV category) lies within the 10 km wide corridor. This area is important as resting site for migratory water birds. It is also intended to create the Tetrobi Reserve (IUCN – IV Category) that is noteworthy for the occurrence of its flora and the local endemic plant species.

8. ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACTS

The purpose is: (i) to identify and assess the scope and significance of potential impacts; and (ii) to describe the sensitivity of the natural and socio-economic environment for these impacts.

8.1 Impacts

In case construction of the pipeline above the ground, underground or a combination of both are considered as realistic options, these options should be considered as alternatives. Then, this means that an impact assessment must be carried out for both alternatives.

Impacts of the natural and socio-economic environment caused by the project should be described, and divided into two main categories: (i) impacts during preparation, construction and reinstatement and (ii) impacts during operation and maintenance. Moreover, for all impacts should be determined if they are: positive – negative; reversible - irreversible; temporarily – permanent. The impacts should be elaborated for the following aspects which are elaborated already in chapter 7:

Geomorphology;

Hydrology; water pollution; change in discharge of rivers; affection of ground water level;

Soils: soil pollution and soil subsidence;

Ecology: loss of habitat in hectares; direct and indirect loss of habitat quality, e.g increase of poaching due to increase of the accessibility of presently remote mountainous areas and noise hindrance; affection of free services delivered by the ecosystem (the so-called regulation functions or indirect use values of the ecosystem);

Landscape;

Settlements;

Land use;

Cultural heritage: archaeological and cultural historical sites;

Infrastructure;

The consequences of hazards / oils spills have to be considered in the route selection. Therefore a qualitative risk assessment should be executed for the relevant above mentioned aspects, in particular human settlements, industrial areas, hydrology and ecological sensitive areas.

8.2 Impact assessment

The sensitivity for impacts due to passing of the pipeline should be assessed for the above distinguished aspects. First the categories of sensitivity should be justified. Secondly the sensitivity of the aspect for the impacts should be mapped. The resulting maps should be combined and the most sensitive areas will be come determined. It is expected that for certain sections of the map alternative routes can be determined. These alternative routes have to be compared. Based on this information the preferred route can be demarcated.

9. ALTERNATIVE ROUTES

The purpose of developing alternative routes is to make a comparison of the impacts of the different routes possible

For the sensitive areas alternative routes should be elaborated on a scale of 1:10.000. In principle alternative routes should be looked at within the corridor of 10 km. In case of potential alternative routes outside the 10 km corridor this is possible but should be justified.

The Commission recommends that changing of the 10 km corridor should be possible for those areas which are sensitive to the project. One site within the present 10 km corridor has been identified as such already by all involved parties. This area is known as *..... This is an area with high potential for tourism development in the future. The project might hamper these developments. A solution considered is a tunnel of approximate 13 km length. Construction of a tunnel dictates dimensions of at least 5 m wide and 3 m high in order to allow passage of pipes, vehicles, lift equipment and small dedicated construction crews. It is estimated roughly that the tunnel itself will cost 10 to 20 times the laying cost for the cross-country pipeline in the mountains. Tunneling and the subsequent pipeline construction has to be seen as a special project with risks that can influence the total planning of the project. For this area it is advisable to study an alternative route outside the present corridor. The first phase EIA offers a good opportunity to compare all the impacts including the costs of at least the following three alternatives which are recommended to be studied and compared:

- alternative through the recreation area within the corridor;
- alternative of tunneling under the recreation area within the corridor and;
- alternative route or routes outside the corridor.

* Tsikhisdjvari

10. MITIGATING MEASURES

The purpose of this step is to get insight into the opportunities to prevent or reduce negative impacts

In the EIA the mitigating measures should be described to minimise the negative environmental impacts. Mitigating measures should be described:

- briefly for the alternative routes to be studied and;
- more extensively when the preferred route has been selected, preferably in the second phase EIA.

11. COMPARISON OF THE IMPACTS OF THE ALTERNATIVES

The purpose of comparing the impacts of alternatives is to get insight in the differences of the impacts of the alternatives in order to enable the selection of the preferred alternative

Environmental and socio-economic impacts of alternatives must be compared mutually and with the current environmental situation. It is recommended to present the comparison in the form of tables or diagrams.

- Information about safety, risks and hazards during the different phases should be provided.
- Information about compensation to land owners / users should be provided openly.
- Close co-operation of BP with local authorities (for example; police, anti fire service).