Georgia

European Subsidy Program for Environmental Cooperation

IMPROVEMENT OF ENVIRONMENTAL ASSESSMENT (EA) PRACTICE IN GEORGIA THROUGH DEVELOPMENT OF EA IMPLEMENTATION TOOLS

Project Reference: **IMZ/2005029600**
Case Number: **5060.04.0135**

Final Technical Report

May 2006

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ACKNOWLEDGEMENTS

CENN would like to express its gratitude to the State Secretary for Housing, Spatial Planning and the Environment of the Netherlands for expression of interest in assistance of improvement of Environmental Impact Assessment systems in Georgia and provision of funding for the Project. We highly appreciate the kind assistance and valuable comments of the EIA Commission of Netherlands during the project preparation as well as its implementation stage.

We would like also to thank the Ministry of Environment of Georgia, consulting companies, international organizations as well as all stakeholders for their support and assistance in provision of data and information.

Finally, CENN is grateful to partner organizations and environmental NGO colleagues in the Caucasus and abroad who supported our activities in the region.

COVER LETTER

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Mr. Eric van Dorst

Ministry of Housing, Spatial Planning and the Environment (VROM)

Directorate-General for Environmental Protection, Directorate for International Environmental Affairs,

IPC 670, European Environmental Policy Division

The Hague, The Netherlands

N / Our ref : CENN_2006 ??/??

Tbilisi, May 30, 2006

Final Technical Report to:

The European Subsidiary Program for Environmental Cooperation of The State Secretary for Housing, Spatial Planning and the Environment of the Netherlands for the period (01.09.03 – 31.05.04) of the Project :

"Improvement of Environmental Assessment (EA) Practice in Georgia through Development of EA Implementation Tools"

Project Reference: **IMZ/2005029600**
Case Number: **5060.04.0135**

Dear Mr. Eric Van Dorst:

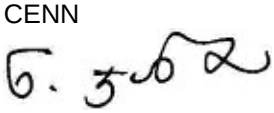
CENN - Caucasus Environmental NGO Network - is pleased to report on the successful completion of the Project (Reference No: IMZ/2005029600) on *Improvement of Environmental Assessment (EA) Practice in Georgia Through Development of EA Implementation Tools"* implemented from November 2004 through March 2006, therefore, meaning accomplishment of objectives, tasks and benchmarks set forth initially in the Project Proposal.

Hereto, we are pleased to provide the final Technical Report outlining project objectives, achieved outcomes and future plans. The Report includes narrative with the emphasis on objectives set forth within the frameworks of the Project and specific outcomes; introduction and description of Environmental Impact Assessment (EIA) website constructed for the Ministry of Environmental Protection and Natural Resources of Georgia (MoE) and developed sectoral EIA guidelines on Waste Management, On Ports and Harbor and Linear Infrastructure. Additional information can be provided upon request.

The Project served as a baseline for establishment of Sensitivity Map of Georgia as the most important tool for improvement of country's EIA system. Therefore, CENN intends to continue with further enhancement and development of this idea.

In this summary, CENN would like to once again outline successful completion of the Project and, therefore, express special acknowledgements to the whole CENN EIA Project Team and representatives of the Georgian Ministry for Environment for their hard work, cooperation and commitment for high performance. Special thanks to Mr. Arend Kolhoff, Project Consultant from the Dutch EIA Commission for his dedication and partnership.

Yours faithfully,
CENN



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INTRODUCTION

The Project on "Improvement of Environmental Assessment (EA) Practice in Georgia through Development of EA Implementation Tools" was funded by the State Secretary for Housing, Spatial Planning and the Environment of the Netherlands through the European Subsidy Program for Environmental Cooperation and was implemented by CENN in close collaboration with the Netherlands Commission for EIA.

The Project was preceded by another project implemented by CENN and aiming at assessing of the effectiveness of EIA system in the South Caucasus countries. This reported project was oriented on improvement of malfeasance identified during the assessment.

The current Project envisaged strengthening of EIA capacity in Georgia through improvement of national EIA legislation and development of relevant application tools. During project implementation phase, core amendments and changes were made to the baseline framework for the EIA system in general and environmental permitting – specifically.

Economic strategy of Georgia is mainly based on maximum use of country's transit resources. Sustainable development principles are rarely considered. Below is provided evidence of the above formulation.

- The Law of Georgia "On Licenses and Permits" dated June 24, 2005 introduced the new type of the permit –"environmental impact permit", instead of "environmental protection permit".[1] Procedures and categorization according to the Law "On Environmental Protection Permit" were abolished.

- Presidential Decree "On the Rules and Conditions of EIA Permitting" dated September 1, 2005 provided amendments according to which activities are reduced from 4 to 3 categories and" Environmental Impact Permit" is issued only for the I category activities by the Ministry of Environmental Protection and Natural Resources of Georgia.

- February 2006 – Georgian Government made additional amendments to the Decree "On the Rules and Conditions of EIA Permitting" significantly affecting the procedures of environmental permitting. The idea of the Decree was to optimize (reduce in number) activities requiring environmental permits. The changes have been made in terms of categorization of activities (from three categories activities were reduced to one category). The Law "On Environmental Impact Permit" is still not adopted and Issuance of the Environmental License is regulated according to the above Decree. The process takes 20 days, which is a very short period for effective decision making.

Given the facts, introduction of tools for effective and timely decision-making in the environmental impact assessment field became even more vital and crucial resulting in extensive and productive cooperation between CENN and the Ministry of Environment, the main Project beneficiary. It is worthwhile mentioning that Project was implemented by mutual efforts of these two agencies.

1. PROJECT DESCRIPTION

At an early stage of project development, the EIA system of Georgia was assessed as inadequate and characterized by a number of drawbacks hindering the country's sustainable development. The shortcomings of the EIA system in the South Caucasus region were identified and documented by the study *Assessment of Effectiveness of EIA System in the South Caucasus States* (09.2003-02.2004) carried out by CENN together with the Netherlands Commission for EIA.

[1] According to the Law of Georgia "On Environmental Protection Permit" dated October 15, 1996, the activities were divided into four categories, depending on its scale, importance and level of impact on the environment. According to this Law different time scales existed for the decision-making: for the I category - 3 months, for the II and III categories – 2 months, and for the IV category 1 month.

The findings of the above mentioned study became the basis for development of Proposals on *Improvement of Environmental Assessment (EA) Practice in Georgia through Development of EA Implementation Tools* and its complementary larger project - *Strengthening of Environmental Assessment (EIA/SEA) System in the South Caucasus Countries*[2].

The reported Project aimed at improvement of EIA practice in Georgia through development of EIA implementation tools – sectoral guidelines for those three sectors, which would be considered as the priority by different EIA stakeholders. The Project also envisaged development of the EIA web-site for the MoE (see http://meia.cenn.org).

1.1 Objectives of the Project

Below are given two main objectives set forth initially in the Project Proposal.

- Creation of special tools - sector guidelines coherent to EU requirements - facilitating enforcement of EA related legislation in Georgia;
- Creation of the EA web-site for the Ministry of Environment to ensure the transparency of EA procedures and facilitate EA related information availability for public;

Development of EIA sectoral guidelines was considered as a very important activity since it has never been implemented before neither in Georgia, nor in the South Caucasus Region. Harmonization of such guidelines with best international practices was both the requirement and the necessity of the project in order to make them as the most effective tool in terms of positive contribution to country's sustainable development and as rational tool in terms of form and application.

Since the Ministry of Environment was identified as the final beneficiary of project outcomes, the CENN EIA Team set as a task to closely cooperate with MoE to solicit maximum feedback from this governmental institution and have as much input as possible from their side.

As mentioned above, the reported project was implemented in parallel with another CENN project oriented to draft new EIA law for Georgia and to develop EIA watchdog campaign in the Region. Therefore, the guidelines drafted within the frameworks of this Project had to be in correlation with the above described processes.

Finally, approach of this Project and understanding of the EIA Team was that it would serve as a baseline, i.e. pilot project for further enhancement and long-term activities from the EIA viewpoint in the Region.

2. METHODOLOGY

Main objectives of the Project – development of sectoral guidelines and elaboration of EIA web-site for MoE – as well as principles of sharing international experience and involvement of the Georgian Ministry of Environment to the maximum extent was successfully accomplished. Below is given a brief step-by-step description of methodology used during project implementation phase.

(a) Development of the Guidelines:

- Prioritization of sectors through stakeholders meeting at the MoE

[2] "*Strengthening of Environmental Assessment (EIA/SEA) System in the South Caucasus Countries"* implemented by CENN with financial support of the Bank Netherlands Partnership Program (BNPP) and executed by the World Bank

- Revision and analysis of national legislation, effective national and international laws and regulations.

- Revision of EU guidelines and similar studies carried out in different countries including the countries with economy in transition.

- Incorporation of comments and suggestions provided by local practitioners and international consultants into the final guidelines.

(b) Development of the EA web-site for MoE

- Developing contents and final design of EIA web-site together with the Ministry.

- Elaborating the contents of the web-site taking orientation to achieve maximum transparency, publicity and easy access to the EIA information.

3. PROJECT ACTIVITIES

As a consequence of close cooperation of project implementation team with the Ministry of Environment as well as with other relevant authorities of Georgia and full commitment and support of MoE provided to CENN, the Organization had overall success to implement the activities envisaged within the frameworks of the Project. Below are given description of performed activities.

3.1 Elaboration of Sectoral Guidelines

Identification of priority areas was the first step to be made to develop sectoral guidelines. At an early stage of project implementation, CENN organized a *stakeholders' meeting* at the Ministry of Environment (see Annex 1). The presentation covered project plans, outcomes and the process of identification of above mentioned priority areas itself.

Intensive discussions and facilitated brainstorming finally revealed the following sectors: (a) Wastes and Landfills; (b) Ports and Harbors; and (c) Linear Infrastructure (Highways). (See Annex 2.)

The next phase was to develop and further enhance the guidelines. A lawyer at CENN was responsible for revision and consolidation of EA/sector guidance materials. The first draft guideline was written in coherence and adherence to the effective national legislation requirements with maximum adjustment to best international practices (EU) as well as with consideration of experience of neighboring countries such as Turkey. (This latter was very successful in achieving improvement of EIA system during the past years.).

Soon after completion of work on draft documents, they were then passed to the field experts (practitioners) for further comments and recommendations. Upon the comments have been received, they were finalized by the CENN lawyer, therefore, incorporated into the guidelines. Pre-final documents were ready for further elaboration.

The final comments to the produced guidelines were provided by Mr. Arend Kolhoff, Project Consultant from the Dutch EIA Commission. The comments were analyzed again leading to final product, i.e. sectoral guidelines. The three documents were developed in both Georgian and English languages and submitted to the Ministry of Environment for consideration in further effective operations.

It is worthwhile to note that EIA guidelines, reflecting the national EIA regulations, have to be in full correspondence with the Georgian Legislation. As it was mentioned before, the Project implementation went through frequent amendments to the national legislation consequently affecting the whole EIA structure and tendencies. Therefore, there is an assumption that the work performed by CENN might be adjusted to the requirements of a new Law "On Environmental Impact Permit" not yet adopted.

3.2 Creation of the EIA Web Site for the Ministry of Environmental Protection and Natural Resources of Georgia

In order to ensure transparency, publicity and availability of EA procedures, CENN set as an objective to create a specific web-site for the Ministry of Environment that would be dedicated to the EIA issues specifically. The website was developed based on thorough research and in close cooperation (meaning substantial contributions) with the Ministry of Environment.

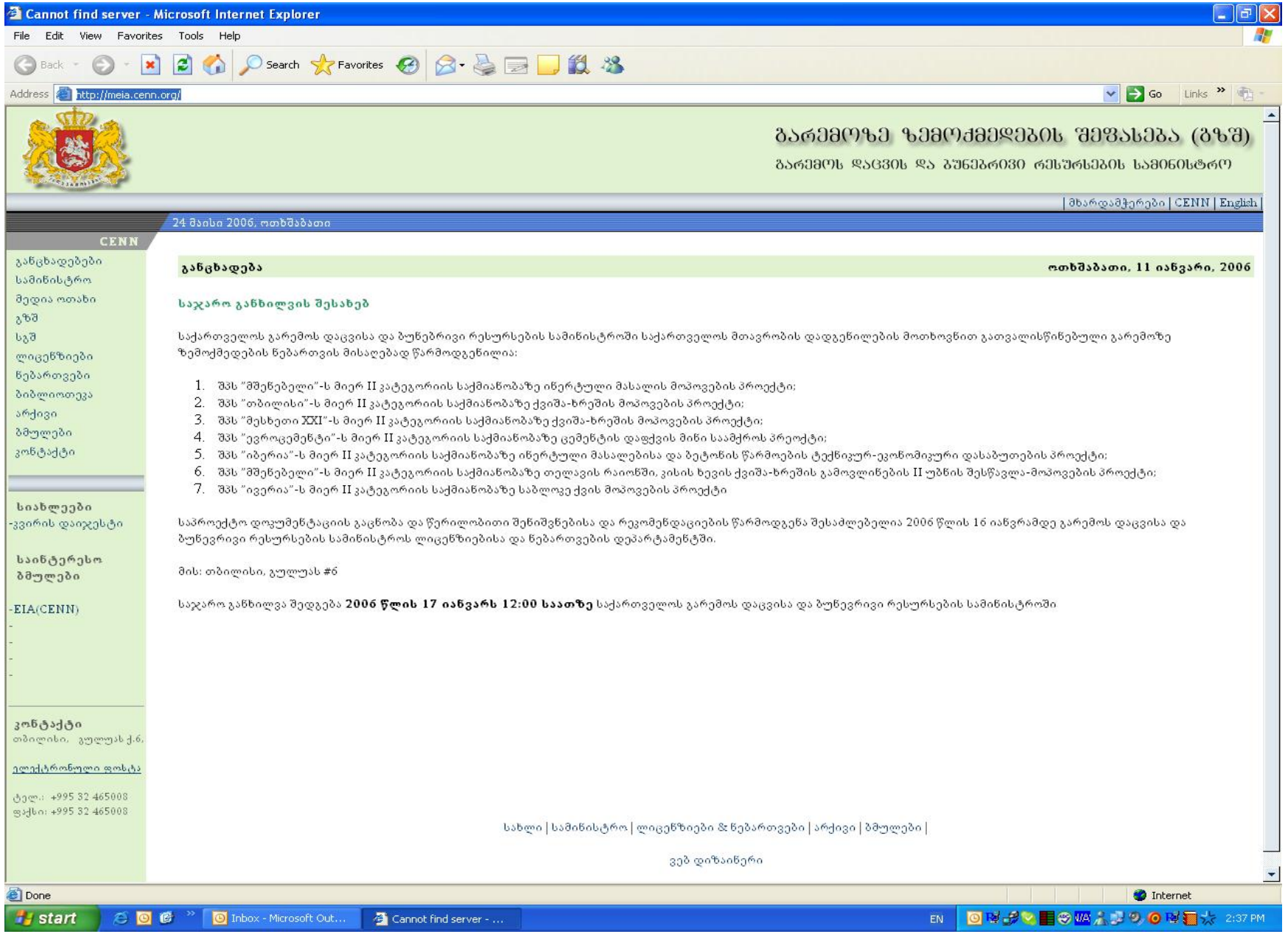
The very first step to develop the EIA Web-site was identification of basic needs in public outreach towards EIA in close cooperation with the Ministry (specifically with the Department of Ecological Expertise) and other stakeholders (NGOs, experts). Therefore, Georgian team at CENN started with collection of information continuing further and more enhanced research through internet regarding all related topics and among them EU Directives, best international practices, SEA issues as well as national legislation.

Involvement of MoE representatives was highly appreciated by CENN. Permanent "dialogue" with the affiliated people from the Ministry and regular exchange of information regarding the issue made the Team able to define the most important topics to be covered by such new web-site (below please see the Main Page). When developing the contents and agreeing the final design of the site, CENN had been orienting on achievement of maximum transparency, publicity and access to EIA-related information. Therefore, basic components of this new EIA website are *public hearing announcements, planned activities, databases for issued licenses and permits* as well as *contacts of responsible persons.* After several discussion meetings, presentations provided by EIA Team with justifications for each item covered by the web-site, the two organizations (CENN and MoE) agreed on the above contents of the new EIA web-link to the main web-site of the Ministry. The website is bi-lingual (Georgian and English). Its official presentation was given in January 2006 at the Ministry of Environment and afterwards handed over with the copyright.

Below are given specific topics outlined in this new web resource:

- *Announcements on planned public hearings* that could be described as the main topic communicated at the web-site's home page.
- *Media Room*, which contains EA news releases and media briefs; information on planned briefings and conferences, major publications and photo gallery.
- *EIA,* which contains useful information on EIA; application forms for EIA report submission, news releases and contacts.
- *SEA*, which contains information on SEA, news, ongoing projects and contact information.
- *Licenses and Permits*, containing data base of the issued licenses and permits.
- *Library*, containing data base of EIA reports issued since 1997 up to date.
- *Archive*, containing all outdated announcements.
- *Links*, illustrating date base of useful EIA links.
- *Guidelines*, supposed to contain the three guidelines after their approval.

The web-site could be visited at: http://meia.cenn.org.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გარემოს დაცვის და ბუნებრივი რესურსების სამინისტრო
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24 მაისი 2006, ოთხშაბათი
CENN
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განცხადება
ოთხშაბათი, 11 იანვარი, 2006
საჯარო განხილვის შესახებ
საქართველოს გარემოს დაცვისა და ბუნებრივი რესურსების სამინისტროში საქართველოს მთავრობის დადგენილების მოთხოვნით გათვალისწინებული გარემოზე ზემოქმედების წებართვის მისაღებად წარმოდგენილია:
1. შპს "მშენებელი"-ს მიერ II კატეგორიის საქმიანობაზე იწერტული მასალის მოპოვების პროექტი;
2. შპს "თბილისი"-ს მიერ II კატეგორიის საქმიანობაზე ქვიშა-ხრეშის მოპოვების პროექტი;
3. შპს "მესხეთი XXI"-ს მიერ II კატეგორიის საქმიანობაზე ქვიშა-ხრეშის მოპოვების პროექტი;
4. შპს "ევროცემენტი"-ს მიერ II კატეგორიის საქმიანობაზე ცემენტის დაფქვის მიწი საამქროს პროექტი;
5. შპს "იბერია"-ს მიერ II კატეგორიის საქმიანობაზე იწერტული მასალებისა და ბეტონის წარმოების ტექნიკურ-ეკონომიკური დასაბუთების პროექტი;
6. შპს "მშენებელი"-ს მიერ II კატეგორიის საქმიანობაზე თელავის რაიონში, კისის ხევის ქვიშა-ხრეშის გამოვლინების II უბნის შესწავლა-მოპოვების პროექტი;
7. შპს "ივერია"-ს მიერ II კატეგორიის საქმიანობაზე საბლოვე ქვის მოპოვების პროექტი
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4. PROJECT ACHIEVEMENTS

As described in the Project Proposal under the *Intended Deliverables of the Project* section, there were two major components – sectoral guidelines and EIA web-site – considered as effective and feasible for contributing to improvement of then current insufficient EA practices in Georgia and to guarantee the success of the whole project in the end. Now, when the Project Activity is completed, we can report on specific achievements and positive outcomes such as:

- Elaborated sectoral guidelines on (i) Wastes and Landfills; (ii) Ports and Harbors; and (iii) Linear Infrastructure drafted in English and Georgian languages;
- Created EA web-site for the Ministry of Environmental Protection and Natural Resources of Georgia
- The opportunities for harmonization of national legislations with EU directives studied and relevant recommendations developed

5. FUTURE PERSPECTIVES

As a result of activities and work performed within the frameworks of the Project, specific needs and plans were identified to further improve the EIA system in Georgia. The findings served as a basis for the elaboration of project proposal on the development of *multi component tool* for effective EA decision-making, which was eventually submitted to the donor. This given project envisages development of **Sensitivity Map of Georgia** to be applied in environmental permitting process. The proposed project was elaborated again in close cooperation with the Georgian Ministry of Environment and particularly with active involvement of Department for Licenses and Permits and Department for Cartography and Geodesy. The willingness of MoE to accomplish the project as well as actual needs are documented in the *Support Letter* of Mr. Giorgi Papuashvili, the Minister of Environment of Georgia (see Annex 3).

ANNEX 1

MEETING AT THE MINISTRY OF ENVIORNNMTAL PROTECTION AND NATUREAL RESOURCES OF GEORGIA

List of participants at the presentation of EIA project at the MOE, March 17, 2005

Agenda

Duration (minuts)	Activities
15	Introduction, Presentation Objectives
10	Introduction of Participants
35	International experience in EIA practice
10	Assessment of Effectiveness of EIA System (Based on the results of conducted study)
20	CENN Environmental Assessment Program
25	Public participation and monitoring
25	Prioritization of Sectors for the Development of EIA guidelines

Materials distributed:

1. Presentation handouts
2. Project short description
3. Environmental legislation
4. Assessment of effectiveness of EIA system in Georgia

List of Participants

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22.	Mariam Tevzadze	CENN – Caucasus Environmnetal NGO Network	(995 32) 75 19 03 / 04	
23.	Irina Kitiashvili	CENN – Caucasus Environmnetal NGO Network	(995 32) 75 19 03 / 04	

GOVERNMENT OF GEORGIA

MINISTRY OF ENVIRONMENT PROTECTION AND NATURAL RESOURCES OF GEORGIA

EIA GUIDELINES FOR CONSTRUCTION OF MOTORWAYS WAYS AND STATE HIGHWAYS

1. INTRODUCTION

Why this Guideline?

The Ministry of Environment (from now on "the Ministry") has expressed its wish to develop sectoral guidelines for the purpose of clarifying procedures for certain types of EIAs. This Guideline provides details on an appropriate approach to the execution of a proper EIA for construction of motorways, expressways and state highways. It is hoped that the Guideline will aid in ensuring that EIA reports for these kinds of projects are complete, well-written and useful to decision-makers, and that the process is efficient and sound.

What are the target groups for this Guideline?

The Guideline is aimed specifically for the Ministry and public and consultants for carrying out EIAs.

The legislation for EIA and how it applies to motorway, expressway and state highway construction

The approach to EIA is described in Law on Licensing and Permits (2005), amendments to the Presidential Decree "On the Rules and Conditions of EIA Permitting Presidential Decree "(February 2006)[1].

Why is EIA important in the decision-making process for motorways, expressways and state highway construction?

The environmental impacts that may be expected from the construction of any roadways may be expected to be wide-reaching, and severe in some cases. The nature of this type of project, often referred to as a "linear" project because of its long, relatively thin trajectory, is such that it may pass through a variety of landscape types, urban and rural, causing differing environmental and social issues as it is built. Linear projects therefore have unique characteristics associated with them, and as such have certain aspects in the associated EIA which need to be addressed in particular. These include especially biodiversity issues, as the linear projects cuts a swathe through these varying landscape types and possibly breaks off migratory routes and habitat destruction for certain species. Visual impact also comes strongly into play with such a project. Social issues are also important, and linear projects such as a highway often cause "induced development", or development that occurs as a direct result of the project being built; the convenience and business opportunities that arise from the new highway's existence encourage more people to move into the area and the development of new businesses and residential areas. In the following chapter, specific issues to be addressed for a highway project are addressed in more detail.

Note to the Concerned Individual in the Public

In general, the public has the right to be informed about the proposed project and EIA procedure - and also has the right to express its concerns at various intervals during the EIA process in a public forum. If you are concerned about the impacts of a certain project, watch the newspapers at both local and

[1] Law on Environmental Permits 1996 , I category activity is required to have detailed Environmental Impact Assessment performed for the construction of motorways, expressways and state highways and associated bridges and tunnels

national levels for announcements regarding information sessions and/or public meetings. Opinions about a given project may also be requested in writing by the officials overseeing the EIA process in your area.

The Approach and the EIA Team

The general approach that should be taken before embarking on the EIA process is as follows:

- setting **clear targets** for the EIA report;
- setting up an **interdisciplinary team** with the necessary expertise to undertake the given project;
- ensuring that good **collaboration** exists between the involved authorities;
- enabling effective **feedback** to be made by setting up appropriate forums for this purpose;
- providing sufficient **time and resources** to carry out public participation, and
- ensuring that the results of the evaluation are taken into consideration in the **final decision**.

The members of an EIA team to conduct an EIA for a given motorway/expressway/state highway project should include at least the following general expertise:

- General EA experience;
- Environmental experience;

As well as the following more specific expertise:

- Experience with EIAs of roads and highways and/or other corridor projects;
- Terrestrial ecology (wildlife, plant and conservation ecology);
- Hydrology, sediment and erosion control;
- Social assessment and public participation.

Screening

Regional highways, as listed in Annex II, would go through a screening process to determine whether a full EIA is directly required.

According to the EIA legislation, the construction of any motorway, expressway or state highway requires a full EIA[2]. As a result, the screening process will not be a focus of this document. The translated EU document entitled “Guidance on EIA: Screening” (June 2001) is suggested as an excellent reference for any screening that should be undertaken for any proposed project.

Scoping

The user of this guideline is referred to the translated EU document entitled “Guidance on EIA: Scoping” (June 2001) as an excellent reference for any scoping that is undertaken for the given road project.

[2] Involved Governmental bodies for Construction of motorway, expressway or state highway are the Ministry of Economical Development of Georgia and the Ministry of Environmental Protection and Natural Resources of Georgia.

2. IMPACTS

Direct Impacts

Direct impacts of road and highway projects result from construction, maintenance, and traffic use (World Bank, 1999). The most significant construction-related impacts are those related to clearing, grading or roadbed construction, including:

- loss of forest and other vegetative cover;
- obstruction of other land uses;
- modification of natural drainage patterns;
- changes in groundwater levels;
- landslides, erosion, stream and lake sedimentation;
- degradation of scenery/views or destruction of cultural sites; and
- interference with movements of wildlife, livestock, and local residents.

Many of these impacts can arise not only at the construction site, but also at facilities serving the project, such as quarries; borrow pits and materials storage areas. In addition, adverse environmental and socio-cultural impacts can occur in both construction and maintenance projects as a result of air and soil pollution from asphalt plants, dust, noise from construction equipment and blasting; use of pesticides; fuel and oil spills; trash and garbage; and, on large projects, the presence of a non-resident labor force. Direct road and highway use impacts may include:

- increased demand for motor fuels;
- accidents with and/or displacement of non-motorized methods of transport;
- increased air pollution, noise, roadside litter; injury or death to animals and people attempting to cross roadways;
- health risk and environmental damage from accidents involving hazardous materials in transit, and
- water pollution from spills or accumulated contaminants on road surfaces.

Indirect Impacts

A wide variety of indirect negative impacts have been attributed to road and highway construction or improvement. These indirect impacts are primarily socio-cultural and include:

- visual degradation resulting from roadside billboards;
- impacts of unplanned land development induced by the project;
- disruption of local land ownership by speculation;
- construction of new secondary roads;
- greater human access to wild lands and other natural areas; and
- labor force migration and displacement of subsistence economies.

3. SPECIAL ISSUES TO BE AWARE OF WHEN CONDUCTING AN EIA FOR A HIGHWAY PROJECT

Induced Development

Many of the direct impacts on natural systems, historical and cultural resources and right-of-way land uses can be avoided through appropriate route selection; however, it is more difficult to manage the impacts of new development and penetration into natural areas that may be induced by road construction. Often this task falls to agencies uninvolved in the project's preparation; if they are at the local government level, they may not be prepared to cope with induced development. New industry

tends to locate where land is available and infrastructure exists; highway corridors are logical choices. Roadside commercial development takes place in response to speculation that improved access and greater visibility will bring more customers. Urban sprawl is a phenomenon of larger scale. In the absence of an overall plan, it consists of the expansion of urban areas outward along transportation corridors through industrial, commercial and residential developments.

Because of its unplanned nature, induced development proceeds without comprehensive consideration of impacts. Other infrastructure, especially that needed for waste management, may not exist and social services may become overloaded. The land tenure of low-income landholders and indigenous peoples may be threatened by abrupt increases in local land values. Natural resources that had been protected from unplanned exploitation as a result of their inaccessibility may become accessible and thus unprotected; in general, natural systems, visual amenities and historic and cultural resources may be disturbed. These individual developments also generate traffic, possibly overloading the very roads and highways that led to their existence in the first place.

Project design should avoid involuntary resettlement, especially where vulnerable minorities are involved. During project identification and preparation in these cases, the advice of social scientists and direct consultation with local ethnic and/or religious leaders are essential as the basis for planning. The affected groups should be encouraged to participate in the resettlement process. Replacement land of equal productive potential, ideally within areas of traditional occupancy, is also required.

Where projects require the acquisition of land from indigenous territories, the indigenous people affected should be compensated in kind or in cash at replacement value for the expropriated assets. In other cases, the peoples concerned may want the benefits of ongoing participation in the design, operation and profits of the activity. Depending upon circumstances, it may be wise to lease rather than acquire land outright from indigenous peoples.

Loss of Agricultural Land

High-quality agricultural land, relatively level and well-drained, provides an ideal alignment for roads. The loss of land to the right-of-way itself may be relatively insignificant and is usually taken into account in deciding whether or not to proceed with a project. However, the phenomenon of induced development (as above), along with higher land values along roads, can lead to conversion of large tracts of agricultural land which were not considered in planning. Such conversions may result in negative impacts on national programs for sustainable agriculture and food self-sufficiency, as well as on the conditions of the local agricultural economy.

Deterioration or Loss of Ecologically Sensitive Areas

Road construction through woodlands, parks, natural forests and other undeveloped rural areas leads to their conversion to other land uses, unless there is popular local support for conservation or preservation combined with effective management and law enforcement. A list of protected areas is given in the Georgian legislation in Annex V.

Interference with Customary Local Transportation Methods

Pedestrians and sometimes animal drawn vehicles are important types of traffic on roadways, especially local roads and roads leading to major market towns. Upgrading of unpaved rural roads to paved standards that does not take into account the volume of such traffic will lead to unacceptable levels of accidents and displacement of slower modes of transport. An adequate number of safe crossings and separate or some form of right-of-way for slow traffic should be incorporated into road and highway projects if there is existing or possible future demand for non-motorized modes of transportation in the area.

National/Global Implications

Road and highway construction may increase demand for motor vehicles, fuels and lubricants. If these must be imported, balance of payments problems may be made worse. Local and regional air

quality may deteriorate, and contributions toward national greenhouse gas emissions will increase. The EA should address these implications in project alternatives.

Alternative Development and Mitigation Measures

There are no alternatives to roads that fulfill the functions of providing relatively fast, cheap land transportation. Air, rail, and water transport are more likely to complement than to substitute for roads or highways. Alternatives to construction of new roads or expansion of existing ones which deserve consideration in transportation planning from an environmental point of view include improvements in traffic management and public transportation on existing roads, rail systems for freight or passengers, and increased investment in non-motorized transportation.

Alternatives that should be investigated in planning and designing an individual project include alignments to avoid valuable or sensitive resources, such as those listed in Annex V, and alignments that do not provide access to wild lands or other areas which should remain in their natural state.

What follows (Table) is a table with environmental impacts and possible mitigation methods for road projects, and a table with a sample mitigation program for road projects.

Table 1 Likely impacts of construction of motorways, expressways and state highways and possible mitigation measures

Activity	Type of Activities	Likely Impacts	Possible Mitigation Measures
Earth Work	• culverts and bridges • embankments • compaction of fills and surfaces • provision of lighting • tunneling and excavation • weed control and landscaping • soil stabilization • clearing land, including farm land • reclamation of land, wetlands • alteration of stream flows	• sedimentation, flooding, erosion • barriers to fish and wildlife migration • vibrations, noise, dust emissions • visual segregation • relocation of landowners • construction noise and vibration • storm water runoff • changes in air quality • severance of access • loss of flora and fauna • changes in water quality and availability	• replacement of wetlands at suitable locations • alternate spawning grounds for fish and migration pathways for wildlife • noise barriers, building insulation, vegetation • architectural improvements, landscaping • improved housing and business premises • time restrictions (e.g. no night work) • detention ponds, wetlands construction and development • travel demand management, lead-free petrol, alternate access • wastewater and storm water runoff management
Structures	• Construction/establishment/erection of: • culverts and bridges • storm water drains and channels • fences and noise barriers • pedestrian and bicycle facilities • constructional and operational waste disposal systems • tunnels and viaducts • light poles and power line supports • under- or above-ground fuel storage tanks	• sedimentation, flooding, erosion • changes in ground- and surface water quality • visual intrusion • safety, visual obstruction, segregation • soil and groundwater contamination • hazardous waste-related health issues • access constraints • safety issues • changes in land use and property	• flood plain establishment, dams, vegetation planning • water treatment and charging ponds • architectural improvements and landscaping • access control and proper sign boarding • use of anti-corrosives and geo-textiles • proper site selection and site preparation following hazardous materials transport rules • landscaping

Activity	Type of Activities	Likely Impacts	Possible Mitigation Measures
		values	• underground power lines, aesthetic cable support
Production of Construction and Maintenance Material	• mining and quarrying • laying asphalt and concrete structures • recycling pavement material • clearing of forest or other vegetation	• erosion, noise, movements of delivery/pickup trucks • hazardous waste production • air quality changes, odors • loss of vegetation and biodiversity	• proper site selection • production control and waste disposal • emissions control • replanting
Paving	• compacting subsoil and surface structure • pavement making	• noise, vibration and dust emissions • polluted surface runoff • safety issues	• control on use of machinery and working hours • use of non-polluting materials, maintenance of roads and pavements
Operation and control	• construction of overhead transmission lines • set-up of traffic signals and traffic signs	• changes in land use and land development • visual obstruction safety • air pollution and noise emissions • generation of waste materials • provision of jobs	• proper siting • proper corridor delineation and right-of-way control • low emission and low noise vehicle usage; lead-free fuel • waste disposal and recycling sites; education, training and public awareness raising
Economic	• land development • employment • use of scarce resources	• possible increase or decrease in property values • changes in income and housing needs • transport needs changes • changes in local and regional population levels	• stricter implementation of zoning regulation • investment opportunities, increased housing, security and traffic management

Table 3 Sample mitigation programme for road projects

	Mitigating Measure	Time or Cost Requirements
Land Use and Siting		
Alignment crosses 12 km of semi-arid steppe	Minimize construction corridor, strictly monitor construction, restore disturbed lands with native vegetation and monitor for restoration for 5 years	etermined
Taking of 2.4 hectares of residential area, including land owners and squatters	Purchase of replacement land and resettlement of affected people	To be determined
Reduction in local property values	Monetary compensation	To be determined
Noise		
Impact of road noise on village	Plant 30 m tree buffer strips between road and village	To be determined
Surface Hydrology		
Storm water management	Design culverts and drainage facilities for 100 year storm	To be determined
Air Quality		
Dust during construction	Implement agreed dust control measures such as wetting dirt roads, truck washing for trucks exiting site, and monitoring dust emissions	To be determined

4. MANAGEMENT AND TRAINING

Road maintenance tends to be a weak area in the transportation sector. Inadequate maintenance or improper practices (with respect to chemical use, waste disposal, etc.) may lead directly to environmental impact if vegetation, aesthetics, quality of runoff water, functioning of drains, or accident frequency are affected. Indirectly, deterioration because of inadequate maintenance will contribute to a situation that will eventually demand rehabilitation work, which has potentially greater impacts. Management systems and training are necessary in the maintenance area.

Staff in road agencies may need training in good practice to control negative impacts of road construction, maintenance and operation. They may also need training in monitoring and inspecting road projects for environmental impacts and for implementation of mitigating measures. Equipment, vehicles, and operational budgets may be lacking, and standards may be not be adequately implemented, e.g. for air, noise and/or water pollution. It may be necessary to develop pragmatically defined standards, and to create a special monitoring unit.

5. MONITORING

The monitoring of immediate and longer-term induced impacts and their mitigation will fall within the jurisdiction of regional development authorities, the Ministry of Agriculture and others, according to the nature and scope of development that is induced by, or planned in parallel with, road and highway construction. If planned and integral to the project, the corresponding sections will indicate the kind of monitoring needed, e.g. land settlement or forest exploitation. If not integral to a road or transportation sector operation, certain impacts may be sufficiently important to justify companion planning and development steps, with their own monitoring functions.

Monitoring of construction impacts and of the timely and correct implementation of required mitigating measures should be carried out according to a site-specific plan, by technical offices having mandate, personnel and the necessary capacities. In general, the most critical project elements to be monitored are:

- the implementation and effectiveness of erosion and sedimentation control measures,
- disposal of debris and wastes,
- management and reclamation of borrow pits, and
- materials handling and storage areas.

Table 3 Sample monitoring programme for road projects

	Monitoring Parameters:	**Monitoring Frequency:**	**Monitoring Locations:**
Baseline			
A baseline monitoring program may be required if existing data is insufficient for decision making; such a program may be more rigorous than the construction and operation monitoring programs.			
Construction Phase			
Air Quality			
Bitumen/asphalt plants	Total Suspended Particulate (TSP), smoke.	Once a week for 3 day. Construction period 2 times a day (am and pm).	Plant sites and vicinity.
Lime mixing plants/unpaved roads	Total Suspended Particulate (TSP).	Random sampling. Every day. Construction period 2 times a day (am and pm).	Plant sites and vicinity, unpaved road sections.

	Monitoring Parameters:	Monitoring Frequency:	Monitoring Locations:
Baseline			
Noise	Noise monitoring will be carried out in each contract section in daytime and at night on a weekly basis at construction sites, quarries, material borrow sits and major construction materials hauling roads. Ad hoc monitoring will also be undertaken.	Once a week for 2 days. 2 times per day (including late evenings and Sundays). Ad hoc monitoring to be undertaken as appropriate.	At all residential and sensitive areas such as schools, hospitals, etc. located within 200m of the construction sites and at material borrow sites, quarries, along haul roads etc.
Vibration	Vibration monitoring will be carried out in each contract section when pile-driving work is scheduled.	At all times when piling is in progress.	At all residential and sensitive areas such as schools, hospitals, etc. located 50 m from the pile driving work site.
Water Quality	Total Suspended Solids (TSS), Conductivity, Chemical Oxygen Demand (COD), Biological Oxygen Demand (BOD5), and Oil and Grease (O&G).	3 times a year with two measurements per day (am and pm).	Rivers and water bodies in the vicinity of construction sites and in particular at crossing locations (bridges etc.)
Operations Phase			
Air Quality	Nitrogen oxides (NOx), Carbon Monoxide (CO), and Total Suspended Particulate (TSP).	2 times a year (Jan and Jul) for 5 consecutive days. Four times a day at 07:00, 10:00, 14:00 and 17:00.	At locations determined as most polluted in residential or populated areas
Noise	Noise monitoring will be carried out in daytime and at night and during weekends. Where appropriate, ad hoc monitoring will also be undertaken.	Four times a year for 2 consecutive days, 4 times per day (including night and on Sundays). Ad hoc monitoring to be undertaken as appropriate.	Sensitive areas
Water Quality	Total Suspended Solids (TSS), Conductivity, Chemical Oxygen Demand (COD), Biological Oxygen Demand (BOD5), and Oil	3 times a year for 1 day. 2 times per day (am and pm).	Rivers and water bodies in the vicinity of construction sites and in particular at crossing locations

	Monitoring Parameters:	Monitoring Frequency:	Monitoring Locations:
Baseline			
	and Grease (O&G).		(bridges etc.)

6. PREPARING THE EIA REPORT

What follows is a suggested format, or Terms of Reference, for the EIA report for a project addressing construction of a motorway, expressway or state highway (World Bank Guidebook for Preparation and Review of EA, 2000).

Executive Summary

The executive summary should be designed to be a consultation document and should be available in the language most used by the project stakeholders. It should contain a concise statement of the project objectives and a brief project description in addition to a description of key project findings and recommendations for environmental management. Ideally it should be non-technical and understandable to most readers.

Policy, Legal, and Administrative Framework

The legal and policy framework should be included along with a brief description of the permitting and licensing procedures applicable to the road project. Summaries of the requirements of any co-financing institutions should also be included. If transboundary impacts are likely, relevant international conventions should be described.

Tables should be used to list applicable standards and note which authorities are responsible for their application. Where there are no relevant local standards, suitable international norms may be used (e.g. World Bank, WHO, etc.).

Project Objectives and Description

This section should describe the need for the project in the context of the local and national situation and strategy. The effect on economic and social development goals of the locality, country and region should be described. If the project is an element of an overall development program in the area, then a description of the other program elements must be presented. A physical and engineering description of the project should be provided.

Baseline Data

This section should include descriptions of the area of influence or study area (which should be determined at initial scoping) and the relevant physical, biological and socioeconomic conditions. The data presented should be relevant to decision-making regarding project location, design, operation, and mitigation measures for adverse impacts. The source, accuracy and reliability of the data should be clearly stated.

Appropriate baseline data is not always readily available. It may be necessary to initiate a monitoring program for collection of baseline data prior to initiating the formal EIA study. Where more detailed information is required (if significant effects on an important natural or cultural resource are anticipated, for example) there will often be previous studies of local conditions prepared for international or other agencies. There may also be unpublished information in government departments, universities, Ph.D. theses, or voluntary groups. These should be investigated and used where relevant, provided that the sources, and any assumptions or uncertainties in the data are documented.

Environmental Impacts

A prediction of the changes in the environment resulting from project construction and operation are to be considered, and an assessment of the impacts on the surrounding physical, biological, and human systems, should be presented. This prediction should include positive as well as negative impacts. Mitigation measures should be identified as well as any negative impacts for which there are no mitigation measures. This section should also identify and estimate the extent and quality of available data, key data gaps, and uncertainties associated with predictions, and specific topics that do not require further attention.

The engineering plans should reflect “best practice” in road alignment and construction to ensure that potential negative environmental impacts are minimized. In addition to the construction site, consideration should also be given to quarries, borrow pits and material storage areas that serve the project.

Among the issues to be investigated are the following:

- *General*: effects on biodiversity caused by facilitation of access to and spontaneous settlements in natural areas; effect on hydrology due to construction of road; impacts on arid and semi-arid lands; impacts on coastal zone management; impacts on land resources caused by clearing, topsoil removal (desertification), grading, filling, and paving.
- *Air quality*: air pollution from asphalt plants; dust; noise from construction equipment and blasting.
- *Land resources*: loss of vegetative cover; foreclosure of other land uses; landslides; erosion; desertification; roadside litter.
- *Hydrology*: modification of natural drainage patterns; changes in groundwater elevation; flash flooding.
- *Water quality*: stream and lake sedimentation; use of pesticides; fuel and oil spills; water pollution from spills or accumulated contaminants on road surfaces.
- *Biological*: interference with movements of wildlife and livestock.
- *Socio-economic/cultural*: interference with movements of people; destruction of important cultural/historic sites; increased demand for motor fuels; accidents with and/or displacement of non-motorized methods of transport; effects to local and regional economy; presence of non-resident labor force; injury or death to people attempting to cross roadways; accidents involving hazardous materials in transit; induced development (“urban sprawl”); increased motorized transportation (with possible increased dependency on imported fuels); impairment of non-motorized transportation economy due to changes in land use and/or increased availability of motorized alternatives.

Analysis of Alternatives

This section should provide a brief description of possible alternatives to the project/project design (including the ‘no action’ alternative). These may include alternative location, site layout, technologies, design options,

and management systems. The reasons why the various alternatives considered were rejected should be documented.

Alignment is often the key factor determining impacts associated with a road project. The alignments considered and the reasons for selection of the final alignment should be clearly presented (including the 'no action' alternative). Additional issues may include increased access to formerly remote areas, and engineering alternatives including type of road surface, drainage management, and river crossing structures. Bridge and tunnel alternatives should also be clearly addressed.

Environmental Management Plan

This section should include details of the management initiatives to be implemented during both the construction and operational phase of the road. The EMP will need to account for monitoring of environmental parameters and the influence of mitigation measures on environmental impacts. It should include the following basic components.

Institutional Component

- Institutional responsibilities for management of roads and the transport sector
- Responsibilities for monitoring, reporting and enforcement
- Identification of any needs for capacity building, training or equipment

Environmental Monitoring Component

Monitoring should address both emission and ambient levels of pollutants where these may be detrimental to human health. Refer to section 3.1.7.

Responsibilities, implementing agencies or consultants, costs and sources of funds should be specified. Costs for EMP implementation typically range between ½ to 5% of project costs, though in some special cases costs may be higher. Higher costs are typically associated with projects involving large-scale resettlement.

The standards, guidelines or targets for performance measurement for the monitoring program should be specified as well. This may include socio-economic measurements in cases where re-settlement is required. Performance standards should be based on national legislation.

Reviewing

The user of this guideline is referred to the translated EU document entitled "Guidance on EIA: Reviewing" (June 2001) as an excellent reference for any reviewing that is undertaken for the given road project. However, the review process should also ensure that the above-listed focal points for a highway project have been addressed in an adequate manner.

Public Consultations

Public consultation is considered to be the cornerstone of the EIA process.

7. MANAGING THE EIA PROCESS FOR MOTORWAYS, EXPRESSWAYS AND STATE HIGHWAY CONSTRUCTION

Proper management of the EIA process is important because of the complex nature of the various involved parties and because of the multi-disciplinary nature of the environmental information involved. To be specific, proper management must take into account the following:

- the multitude of involved actors. These should include:

- the initiator of the plan (the transport authority);
- the environmental authority;
- other departments having an interest in transport infrastructure (e.g. housing, public health, safety);
- the decision-maker who has the competence to approve the final transport infrastructure plan (e.g. Parliament);
- non-governmental organizations (NGOs) and the general public;
- the complex nature of the alternatives and issues considered;
- linkage to planning and other assessments, and
- the need for co-ordination and feed-back to avoid unnecessary delays.

It is, in fact, the overall planning and assessment process which has to be managed. Done well, considerable time and quality gains are possible (DG Transport, 1999).

8. HOW TO MANAGE THE EIA PROCESS?

Division into clear-cut scheduling, roles and responsibilities

Each of the steps of the EIA process (e.g. scoping, impact assessment and review) should be divided into phases with clear tasks, roles and responsibilities. At the end of each phase, intermediate decisions should be made to accept or reject the outcome and to determine the work that still has to be done.

Phasing and structuring the process over time

Each of the steps of the EIA process (e.g. scoping, impact assessment and review) should be divided into phases with clear tasks, roles and responsibilities. At the end of each phase, intermediate decisions should be made to accept or reject the outcome and to determine the work that still has to be done. EIA legislation exists in Georgia and the law does prescribe an EIA procedure. Transparency is greatly enhanced by agreeing a clear procedure at the start of the EIA process. This procedure may specify (i) the initial project description, (ii) the objectives of the EIA process, (iii) the sequential steps of the procedure (i.e. documents and decision points), (iv) the time frame, (v) provisions for consultation and participation, (vi) the actors and their roles. The size of these documents depends on the complexity of the decision-making problem (i.e. the number of environmentally relevant issues) and the degree of openness and transparency. The most complex step is the assessment itself.

Flexibility - ensuring that the EIA process is not too rigidly defined

The EIA process should respond appropriately to the various inputs from consultation and participation. The EIA procedure should therefore be flexible with respect to its phasing and organization. Flexibility can be enhanced in a number of ways:

- anticipating possible outcomes from consultation and public participation;
- communicating frequently, and at an early stage, with interested agencies and groups; listening to signals and clearly explaining the EIA process;
- making short-term or framework contracts with consultants to respond to uncertain outcomes.

Applying management tools - other tools for EIA process management

The initiator may appoint an EIA process manager, who is in charge during the whole EIA process. The following management tools are particularly helpful in the assessment step:

- setting clear targets for the EIA report and its intermediate drafts;
- setting up an inter-disciplinary team of experts (e.g. ecologists), traffic modelers, socio-economic experts, landscape planners, etc.);
- ensuring good collaboration exists between the planning and environmental authorities;
- enabling effective feedback to be made between assessment results and the planning process, for example by:
- drawing up organization charts;
- preparing internal draft plans and assessments which are circulated among those taking part in the planning and assessment work;
- stationing planners and environmental experts in the same location;
- applying team-building techniques;
- providing sufficient time and resources to open up the assessment and planning phase by encouraging external parties and the public to comment on the drafts;
- ensuring that the results of the evaluation are taken into consideration in the final decision.

There are many advantages in setting up informal collaborations between departments in carrying out an EIA. This is particularly true in countries where environment ministries are influential.

9. ROLES AND RESPONSIBILITIES

EIA Planning

The Ministry of Environment (MoE) is responsible for implementation of the EIA process cycle, from scoping to final evaluation and approval.

The MoE is responsible for giving orders for different kinds of studies as required by the screening process. In the first stages, the MoE must decide whether the project purpose and description as submitted in the general format are adequate. If not adequate, it makes the request for any editing required. If it is complete, the MoE calls for state ecological expertise representatives of related institutions and organizations, Ministry officials.

The MoE checks the EIA report submitted by the developer and determines whether it is in accordance with the format that was assigned to the developer, and has a XXXX business day period to do so. It may then assign a period of up to six months to make changes or corrections as required. If the EIA report is in compliance with the format, it is copied for each member of the commission, and mailed with an invitation to the next meeting for the examination of the EIA report by the MoE. The Ministry and Regional Directorate in question must then notify the public through an appropriate medium (internet) that the EIA report appraisal is occurring, and that the report is available for public viewing. The MoE must then make the report available for viewing.

The Ministry then takes into account all the studies brought forth by the project and the history of the meetings of the past months, and issues an EIA Positive or an EIA Negative order with XXXX working days. It notifies the developer, the concerned Regional Directorate and other parties, and the Regional Governorate announces the decision through appropriate media to the concerned public.

For projects that receive either an “EIA Not Required” or an “EIA Positive” order, the Ministry monitors the events that occur during the implementation of the project and ensures that they adhere to what has been agreed upon on in the EIA report; the Ministry may also consult various experts and related institutions as necessary in the matter. The developer in either of these situations is responsible for providing reports on their activities in the construction, operation and post-operation phases, as well as copies of their various permits, to the Ministry. The Ministry forwards these items to the regional governorates so that they can inform the public.

If it is found that the construction has begun on a project without the complete execution of an EIA and without an “EIA Not Required” or an “EIA Positive” order, the works are suspended until one of these two orders comes through. If various conditions were set out in the EIA report or preliminary EIA report that are not met during the execution of the project, a non-extendable period of 60 business days may be granted by the MoE

in order to fulfil the requirements. If after this period is complete the requirements have not been met, the project is suspended by the MoE until the requirements are finally met.

A number of other items are generally the responsibility of the MoE:

- Extra time can be appended to any of the periods mentioned with good reason and with Ministry permission.
- Changes in project ownership require the new owner to take over all responsibilities from the previous owner in terms of the EIA.
- In case of disputes, the Ministry always has the final word.
- The Ministry is permitted to carry out many kinds of educational and public-awareness activities in the field of EIA in cooperation with other organizations, at local, national or international levels.
- Regarding military projects, EIAs are carried out in cooperation with the organization in question along with the Ministry.
- For applications involving several projects, the Ministry may decide that a single EIA report or EIA preliminary report is required as opposed to multiple reports.
- The Ministry may issue communiqués regarding the EIA regulation when necessary.
- Items submitted before the enforcement date of the new regulation abide by the rules set out in the old legislation.

The Proponent

The project developer or proponent is responsible for preparing whatever kind of EIA study is ordered by the Ministry. It may hire a consultant in order to achieve this purpose.

Initially it is responsible for filing an application to execute the project in the general format specified in Annex III. If the MoE requests changes or editing the developer must finish this, and, when the MoE deems the application appropriate for further development, the developer must provide sufficient copies of the application to MoE.

The location of the public participation meetings must be convenient for interested parties' purposes and is assigned by the developer and the regional governor's office working together. Any costs associated with any such meetings are the responsibility of the developer. The developer is responsible for advertising the location, date, time and subject of public participation meetings at least five days in advance in a medium that is determined by the MoE.

During the scoping meeting, the most important environmental impacts to address are identified and the specific contents to be included in the format are determined. The commission also decides which professional branches will also take part in the preparation of the EIA report. It is the responsibility of the proponent to take all the advice of the Commission and the MoE into account in its EIA study.

The EIA format is valid for one year's time, and it is the responsibility of the proponent to complete the report within this period. During the review phase, the commission may ask the developer for detailed information on what measurements and analyses were performed, and in doubt the site may be visited, samples re-taken, or other expert advice sought. Expenses are the responsibility of the developer.

On completion of the review phase, and receipt of the report from the Commission on the EIA report, the developer has a 30-day period to correct the EIA report to reflect the judgments of the review meeting and re-submit it. As well, the developer must submit a signed document stating that the project and the final EIA report and annexes are his/her responsibility.

The Consultant

The responsibility of any consultant hired by the proponent is to undertake the tasks described above in a competent and objective manner.

The Public

At three points in the EIA process (two if no pre-EIA is involved), the public has the chance to participate in the process and thus aid in decision-making. It is the responsibility of the public to know its rights in this respect and add its voice to the process. The specific points that the public could participate in the gathering of environmental and social information in this process, in the absence of a pre-EIA, are 1) with the initial announcement of the intention to undertake an EIA for the given project in a public forum, and 2) with the completion of the EIA report and its available viewing at the MoE or at the regional directorate. At the end of the process, the EIA Positive or Negative Order shall be announced by the governorship to the public.

10. PUBLIC CONSULTATIONS

What is a public consultation?

Public consultations are considered to be the cornerstone of the EIA process. The public participation meeting is held to obtain the views of interested parties regarding the project. The concerned public is invited, through the medium of an announcement in a medium – usually one local and one national newspaper – that is determined by the MoE and that is specific to each particular project. At such a gathering, public views are invited after a presentation by the developer on the purpose and planning for the project.

What is required by law?

At present, the EIA legislation should call for public consultations for projects which fall into the classification I, such as motorways, expressways and state highways. The first of these, a public presentation and meeting, takes place before the scoping meeting, and the second, invited public viewing of the final EIA report and written comments, takes place before the reviewing of the EIA report takes place. According to Article 15, EIA Positive or EIA Negative Orders are announced, and the public is free to react to these announcements.

How should a public consultation for a project dealing with motorways undertaken?

I - Determine the specific purpose and objectives that public involvement is to accomplish for the project. For example, what information does the transport agency want to collect from the public or to communicate to the public? What potential or actual conflicts between the agency and public groups or individuals may need to be resolved?

II -Identify the public which either might be interested in participating or whose participation is necessary in order to achieve the objectives. Which groups or types of people are of interest? What are their demographic characteristics, how many might be expected to participate, what are the relationships between groups, etc.?

III -Select a technique (or techniques) for interacting with the public which will achieve the objectives. Selection criteria include:(1) type and size of concerned public, (2) agency resources in terms of money and staff expertise, and (3) time available to plan and implement the technique.

IV -Select suitable notification technique(s) for reaching the desired public with the desired information. Selection criteria are similar to those used for interaction criteria in III above.

V -Determine if the public needs assistance to be able to interact with the transport agency. Select assistance techniques.

VI -identify how the results of the public involvement are to be specifically incorporated into project development, in particular how they are to be used either in the course of environmental studies or in the final decision making at the end of environmental studies.

VII -Determine how the techniques are to be evaluated.

Who should be present at a public consultation for a project dealing with motorways?

There are a few individuals and organizations that *must* be present at a public consultation for any kind of EIA public consultation. These are as follow:

- representatives of the MoE;
- the particular EIA experts (or assigned substitutes) for the given project;
- the developer and its consultant, and the associated Highway Directorates, and
- representatives of the regions.

Members of the public are also necessarily invited to any public consultation through the announcement of the public consultation through at least one local and one national newspaper.

However, specific to projects dealing with motorways, it is also desirable to invite NGOs dealing with transport and the environment, other transport organizations, the Chamber of Commerce of the given area (and one from national level depending on the significance of the motorway proposed), the universities, and other groups that may be deemed appropriate given the particular circumstances.

GOVERNMENT OF GEORGIA

MINISTRY OF ENVIRONMENT PROTECTION AND NATURAL RESOURCES OF GEORGIA

EIA GUIDELINES FOR WASTES

1. INTRODUCTION

Why this Guideline?

Essentially EIA is a process by which essential information about the environment is fed into the decision-making process. It is not a decision-making procedure in itself. It is strictly a tool to be used during the decision-making process.

The Ministry of Environment Protection and Natural Resources (from now on the "Ministry") has expressed its wish to develop sectoral guidelines for the purpose of clarifying procedures for certain types of EIAs. This Guideline provides details on an appropriate approach to the execution of a proper EIA for all kind of waste disposal facilities. It is hoped that the Guideline will aid in ensuring that EIA reports for these kinds of projects are complete, well-written and useful to decision-makers, and that the process is efficient and sound.

What are the target groups for this Guideline?

The Guideline is aimed for the Ministry experts and the public.

The Georgian legislation for EIA and how it applies to waste disposal facilities

The Georgian approach to EIA is described in Georgian Law on Environmental Permits where I category activity is required to have detailed Environmental Impact Assessment. Issues related to waste handling and disposal facilities are under the category I. Georgia still has not enacted the Law on Wastes and it creates many discrepancies in legislative system of Georgia. Still legislation is pending and needs constant updates. (The legislation is in constant updates and needs follow up)

Why is EIA important in the decision-making process for waste disposal facility?

Uncollected solid waste represents a public nuisance. Human and ecosystem health are at risk when exposed to all kind of wastes, which makes its proper treatment and disposal a priority.

These wastes may clog sewers and open drains, encroach on roadways, diminish landscape aesthetics, and cause unpleasant odors and irritating dusts. Generally, a waste project should include the improvement of waste collection, thus lessening the quantity of uncollected waste. If a project is not appropriately designed to fit in with the needs and behavioral patterns of local residents, it could result in increasing impacts related to uncollected waste.

Note to the Concerned Individual in the Public: what are my rights?

In the Georgian EIA law, the public had right to be informed about the proposed project and EIA procedure - and also had right to express its concerns at various intervals during the EIA process in a public hearing. If you are concerned about the impacts of a certain project, watch the newspapers at both local and national levels for announcements regarding information sessions and/or public meetings. Opinions about a given project may also be requested in writing by the officials overseeing the EIA process in your area. However these rights have been downsized to twenty days and public can express its rights within limited number of days.

What steps should be undertaken in the EIA process for waste disposal facility

The following approach should be taken before embarking on the EIA process:

- setting **clear targets** for the EIA report;
- setting up an **interdisciplinary team** with the necessary expertise to undertake the given project;
- ensuring that good **collaboration** exists between the involved authorities;
- enabling effective **feedback** to be made by setting up appropriate forums for this purpose;
- providing sufficient **time and resources** to carry out public participation, and
- ensuring that the results of the evaluation are taken into consideration in the **final decision**.

The members of an EIA team to conduct an EIA for a given hazardous waste landfill project should include at least the following general expertise:

- General EA experience;
- Environmental experience;

As well as the following more specific expertise:

- Solid and hazardous waste management specialists;
- landfill leachate and groundwater pollution control and management;
- land-use planners with experience in facility siting;
- biologists/ecologists with environmental assessment experience in facility siting;
- toxicologists and risk assessment specialists;
- air pollution control specialists;
- water quality analysis specialists;
- transportation planning/traffic control specialists;
- hydrologists/hydro geologists;
- noise specialists, and
- socio-economists, social assessment and public participation specialists.

Scoping and Screening

It should be noted that little may be said about screening in the case of waste disposal facility. Screening process will not be a main focus of this document it will be done in accordance of the pending new legislation of Georgia.

The new legislation has to be a reference for any scoping that is undertaken for the given hazardous waste disposal project. However, the scoping and final format for the associated EIA report must particularly take into account.

2. IMPACTS

Environmental damage from solid and hazardous waste disposal typically can include contamination of soil, groundwater, surface water and air quality with various chemical compounds. Adverse impacts result from improper siting, inadequate design and/or poor operation. For example, leaking from solid waste contains fine particulates and micro-organisms which can be filtered by soil matrices. Leaking also contains dissolved solids which can be attenuated by soil through precipitation, adsorption or ion exchange mechanisms. Under favorable hydrologic conditions, contaminated seepage (also called leachate) from solid waste can pass through the unsaturated soil beneath the solid waste deposit and enter groundwater. Hazardous substances may be released to soil, water or air – perhaps undergoing

chemical hange along the way – and by entering the food chain or via the air expose various organisms including humans to the deleterious effects of these substances or chemical compounds resulting from environmental interactions. Various hazardous substances, such as certain heavy metals, are capable of biomagnifying in the environment, which may also lead to higher levels of exposure through various pathways – most commonly through food. It should be noted that public health risks and risks to waste handling workers are also present in terms of impacts, as further discussed below.

Surface water can be contaminated as polluted groundwater is discharged into it, or by surface runoff directly from the solid waste deposit. Sources of air quality degradation include smoke from open burning; dust from inadequate containment, collection, and open dumping; and gases generated by decomposition of wastes within an open dump or sanitary landfill.

Public Nuisance Impacts

Uncollected solid waste is a public nuisance. It clogs sewers and open drains, encroaches on roadways, diminishes landscape aesthetics, and causes unpleasant odours and irritating dusts. Generally, a solid waste project would include improving waste collection and would thus lessen the quantity of uncollected waste. However, if a project is not appropriately designed to fit in with the needs and behavioural patterns of local residents, it could result in increasing impacts related to uncollected waste. In the case of hazardous waste, which is usually disposed of in smaller amounts, especially as regards medical or clinical waste, public nuisance is less problematic than potential risks to public health.

Public Health Impacts

Public health can be affected when solid and hazardous waste is not adequately contained at and collected from living and working environments. Furthermore, direct contact occurs when there is inadequate protection of collection and disposal workers (e.g., gloves, boots, uniforms and changing/washing facilities). As a result, the design of a solid or hazardous waste project needs to consider the economic costs of waste containment and worker protection relative to potential public health impacts in order to derive an appropriate level of design. Especially in the case of hazardous waste projects, the following information must be obtained:

- definition of all potential hazards (along with national exposure guidelines for each substance; if these do not exist, WHO or other internationally-accepted guideline should be used)
- health and safety implications of each hazard
- description of routine health and safety management techniques to be used on-site
- description of basis for development of emergency response procedures.

In an open dump, there is ready access to the waste by domestic animals and, subsequently, potential spread of disease and chemical contaminants through the food chain. From an open dump, windblown dusts may carry pathogens and hazardous materials. Gases generated during biodegradation within an open dump (and to a lesser extent, a sanitary landfill) may include toxic and potentially carcinogenic volatile organics (e.g., benzene and vinyl chloride), as well as typical biodegradation by-products (e.g., methane, hydrogen sulfide, and carbon dioxide). Smoke generated from burning wastes at open dumps is a significant respiratory irritant and can cause affected populations to have a much-increased susceptibility to respiratory illness.

Direct Impacts

Environmental damage from solid waste disposal typically can include contamination of soil, groundwater, surface water and air quality. Adverse impacts result from improper siting, inadequate design and/or poor operation. For example, leak from solid waste contains fine particulates and micro-organisms which can be filtered by soil matrices. Seepage also contains dissolved solids which can be attenuated by soil through precipitation, adsorption or ion exchange mechanisms. Under favourable hydrologic conditions, contaminated seepage (also called leachate) from solid waste can pass through the unsaturated soil beneath the solid waste deposit and enter groundwater.

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3. .NATURAL RESOURCE ISSUES

Land Issues

The most obvious contamination of land is caused by windblown litter and clandestine dumping in open areas and along roadways. This contamination causes an aesthetic impact, which can result in diminished civic pride and loss of property value.

Soil underlying solid and hazardous waste deposited within an open dump or sanitary landfill is typically contaminated by pathogenic micro-organisms, heavy metals, salts and chlorinated hydrocarbons contained in seepage from the waste. The extent to which the soil attenuates such contaminants will depend on its porosity, ion exchange capacity, and ability to adsorb and precipitate dissolved solids. Furthermore, not all contaminants can be attenuated by soil. For example, anions, such as chloride and nitrate, pass readily through most soils without attenuation. Soils consisting of clay and organic matter are more likely to attenuate contaminants than soils consisting of sand, silt and gravel. If seepage continues after underlying soils have reached their full capacity to attenuate contaminants, contaminants may be released to groundwater.

When solid waste is processed by composting, the resulting compost product may be applied to agricultural land, wooded areas, and/or home gardens. Depending on the concentration of potentially hazardous chemicals within the compost and the land application rate used, soil can be contaminated and plants can subsequently uptake toxic chemicals. Some chemicals stay within the soil matrix and build up to phytotoxic levels after repeated applications of composting.

Water Issues

Through biodegradation and chemical oxidation/reduction mechanisms on deposited solid wastes, dissolved by-products of decomposition are added to the interstitial waters within the solid waste mass. Over time, the solid waste decomposes into smaller particles and the waste consolidates under its own weight, releasing the polluted interstitial waters.

Both the initial interstitial waters and any infiltration waters contaminated by decomposition by-products can seep into groundwater under certain hydrologic conditions (i.e., saturation of the waste to the point of field capacity and permeable conditions in soils underlying the wastes, as well as other hydrologic connections such as fractures in rock and inadequate casing and seals on wells).

Surface water can be polluted when it receives groundwater or surface runoff which has been contaminated with leachate from landfill areas. In the event that solid waste is placed in a sanitary landfill designed to enable leachate collection and leachate treatment, there may be a water quality impact attributable to the discharge of treated leachate into receiving surface waters.

Air Issues

The most obvious air quality problems associated with solid and hazardous waste collection and disposal are dust, odors and smoke. Less obvious air quality problems may arise when the biodegradation of hazardous materials in the solid waste leads to release of potentially toxic volatile organics. For the most part, following good design and operating practices can minimize these impacts.

The air quality problem most associated with solid waste collection is dust created during loading operations. The level of dust created depends largely on the method of collection selected. Dust is primarily a nuisance and an eye irritant; however, it may also carry pathogenic micro-organisms which could be inhaled when airborne.

There is typically a putrid smell from hydrogen sulfide gas and other gases created by anaerobic biodegradation of wastes within an open dump or sanitary landfill. By contrast, at a compost facility where biodegradation is designed to occur by aerobic mechanisms, the odor is typically an inoffensive earthy smell. If the compost facility is not properly operated and anaerobic conditions develop, however, a foul odor could result.

At a disposal site may occur underground and on the surface. Once an open dump begins to burn underground, it can last for decades, or until sanitary landfill methods (including gas collection and venting) are implemented.

In the case of facilities that are not properly controlled, explosions and fires associated with hazardous waste disposal may release toxic fumes into the atmosphere and cause air pollution, again risking public health.

4. SOCIAL AND CULTURAL ISSUES

Public Cooperation

In designing a solid waste collection system, social and cultural issues should be considered in order to maximize public cooperation and thus minimize costs.

For example, curb-side collection can be used only in neighborhoods where residents can afford appropriate containers to be left along the curb (e.g., plastic bags or metal dustbins). When communal containers are used for collection, the distance and direction in which residents may have to walk to discharge their solid waste into a communal container should be designed to fit in with their normal routine. Collection for certain types of hazardous waste may be set up by implementing special containers around the neighborhood to collect batteries, solvents and other chemical wastes, for example.

Littering and Clandestine Dumping

Most solid waste service organizations place a high priority on providing collection service. On the other hand, they place a low priority on education and enforcement of public behaviors regarding environmental regulations. The result is that the service organization unnecessarily wastes time and money trying to compensate for the uncooperative behavior of some residents by providing extra service.

It clearly takes more time and money (three to ten times more, is a common estimate) to pick up wastes which have been illegally discharged by littering along roadways or clandestine dumping on vacant lands. Furthermore, when the illegally discharged wastes are potentially hazardous materials (e.g., pumped sewage or industrial processing wastes), environmental impacts could be significant. Therefore, increased budgetary allocation to education, vigilance and enforcement is money well spent.

Marginal Zones

In the marginal zones of cities, where rural immigration and illegal settlement onto open land has occurred, providing refuse collection service is difficult. Road access for refuse collection vehicles is poor and residents may not know how to cooperate with a refuse collection system. Furthermore, where residents are settled illegally and not paying property taxes, there may be less political commitment to providing refuse collection service.

Based on these conditions common to marginal zones, it is typical to see clandestine dumping of wastes around the periphery of these zones, as well as on open lands between homes. As the piles of refuse accumulate, residents are likely to set fire to them at night. An understanding of the community's current practices should be sought, and grass roots efforts made to educate residents in the need for adequate refuse disposal and, to the extent possible, to help them set up relatively self-reliant refuse management systems.

Siting Facilities

In designing a solid waste disposal system, social and cultural issues arise during the siting of facilities especially. Facility siting needs to conform to land-use plans. Siting should provide for enough land area for a buffer zone to minimize aesthetic impacts. Consideration should be given to proximity to residential developments (because of noise and truck traffic impacts, as well as gas migration), prevailing wind direction (because of dust, odour, and smoke), and groundwater flow (because of water supply wells and receiving surface waters). This topic is taken up further in section 3.1.5.

5. OTHER SPECIAL ISSUES

Landfill Gas Migration

Landfill gas develops from anaerobic decomposition of wastes within a land disposal site. Unless there are competent gas control systems installed and operating at the disposal site, landfill gas can migrate underground along the paths of least resistance in the unsaturated zone (in either up-gradient or down-gradient directions).

Landfill gas can accumulate in basements of buildings along its migration pathway. Because landfill gas contains high concentrations of methane, it is potentially explosive. Landfill gas can also contain potentially toxic organic gases. Risks in terms of fires and explosions – including release of toxic materials into the atmosphere – are also present.

Leachate Control

Ideally, a solid waste landfill is located in an area where the permeability of underlying soils is very low, the nature of the soils is attenuate of dissolved chemical constituents, and uses of the receiving ground or surface waters would not be significantly affected by contamination. When less than ideal siting conditions prevail, design could include placement and compaction of a layer of relatively impermeable clay soils between the base of the landfill and the first layer of solid waste.

When either the nature of the waste or the site necessitates leachate collection, the issue of treatment and control must be considered. If possible, the collected leachate should be discharged to the nearest sewer to be handled as part of the area's wastewater treatment system. If no sewers are located in proximity to the landfill, on-site treatment by biological and sedimentation mechanisms should be undertaken. Recycling of the treated leachate back into the landfill system should be considered.

Medical and Toxic Wastes

Medical wastes are often discharged with other wastes at municipal disposal sites with no special means of protecting disposal site workers or pickers. Furthermore, at disposal sites where domestic animals are allowed to graze, there is the risk of reintroducing pathogenic micro-organisms into the food chain.

To a limited extent, toxic wastes are similarly collected inadvertently as refuse collection workers service their normal routes. More commonly, however, toxic wastes are brought to municipal disposal sites by industries in their own trucks. Most disposal sites in developing countries do not have restricted access, nor do the disposal site supervisors keep any record of the nature and volume of wastes received. The wastes are dumped in the same work place as incoming refuse. Because there is no supervision of dumping, disposal workers or pickers have no forewarning of potential hazards to enable them to protect themselves. Also, there are no special safeguards at the disposal site to control the hazards that toxic wastes pose to the natural environment.

6. MANAGEMENT AND TRAINING

Solid waste management consumes a significant portion of municipal revenues. To have efficient and effective collection and disposal service, the system needs to be continuously monitored and adjusted where necessary. The managing institution, therefore, needs the appropriate authority and competence to meet these responsibilities. For example, the managing institution should be at the department level in a municipality or be set up as a public enterprise so that it could be staffed with the appropriate grade level of professional engineers and planners. To the extent possible, the institution also needs to be empowered to generate revenues adequate to cover costs. As part of its mandate, the institution needs to be authorized to provide public education, perform inspections on public cleanliness, and enforce solid waste regulations.

Program support from the central government is necessary to allow local authorities to function properly, i.e., laws, regulations and policies at the central level are needed to support local ordinances, enforcement, operations and plans. Technical support from the central level may be necessary as well. Development of the country-specific state of knowledge on waste management and guidance on appropriate technology requires expertise and finance; not only are the necessary resources usually unavailable at the local level, but to develop them at other than the central level would lead to duplication of effort. For example, it is preferable for waste quantity and composition data, operational norms, service costs, available technologies, and environmental impact issues to be comparatively analyzed at the central government level, with assistance from local officials.

Waste management skills are not taught in a single curriculum in universities and adequate training seminars are often not available. Waste managers benefit greatly by attending conferences which enable them to compare experiences and would further benefit from training packages which specifically address the following: selection of appropriate collection equipment; development of collection equipment specifications; planning efficient route designs; special handling of medical wastes; design and operation of sanitary landfill, optimization of workshop maintenance and repair operations, and use of management information systems to facilitate accountability and performance monitoring.

Workers in solid and hazardous waste systems also need training. In particular, drivers need training on the operation of the specific equipment to which they are assigned. Refuse collection workers, inspectors

and supervisors need training on the public health aspects of solid and hazardous waste management and on how to relate courteously and effectively with the people served. Workshop personnel need training in the repair and maintenance of each type of equipment serviced. When resource recovery systems are part of the solid waste management system specialized training for the operations and maintenance staff is needed. Everyone in the system needs training in occupational health and safety.

Occupational health and safety training is essential to ensure that personnel adhere to appropriate operating practices which minimize adverse health and safety impacts. The following areas of knowledge and experience are considered essential:

(a) Appreciation of the properties (e.g., flammability, corrosiveness, toxicity, reactivity) of hazardous substances, as well as the levels at which they pose a significant danger requiring protective measures.
(b) Awareness of early-warning indicators of hazard/risk identification, and ability to recognize potentially hazardous situations.
(c) Familiarity with engineering controls to avoid occurrence of hazardous situations.
(d) Familiarity with capabilities and limitations of the facility to response to hazardous emergencies: ventilation systems, plumbing systems, shut-off systems, containment devices, and emergency response procedures as outlined in the appropriate health and safety plans.
(e) Knowledge of the use and maintenance of emergency response equipment, as well as routine equipment for health and safety monitoring and protection.
(f) Knowledge of methods and procedures for decontaminating personnel, equipment, and facility, following potential chemical contamination.
(g) Refresher training and regular drills simulating emergencies and appropriate emergency response procedures.
(h) Familiarity with and acceptance of the need for continuous reliance on the "Buddy" system. In the Buddy system, work groups are organized so that each employee exposed to hazard is designated for observation by at least one other employee who would be ready and able to provide immediate emergency assistance as needed.
(i) Empowerment to act decisively in accordance with health and safety plans during potentially hazardous situations or actual emergencies, especially in situations where supervisors are unavailable or have become victims of the emergency.

7. MONITORING

In solid waste systems, monitoring of collection and disposal operations should be developed to:

- measure quantities of wastes collected under the auspices of the public cleansing institution;
- measure quantities of wastes brought to official disposal sites by others;
- supervise efforts of refuse collection workers and disposal site attendants;
- provide inspection regarding overall public cleanliness and adequacy/effectiveness of cleansing service delivery;
- provide inspection regarding violations of littering and clandestine dumping regulations;
- assess cost-effectiveness of collection systems;
- evaluate efficiency of collection route designs;
- maintain appropriate stock of spare parts and consumable supplies;
- monitor quality and migration of landfill gas;
- monitor quality and movement of leachate and leachate contaminated groundwater;
- monitor quality of receiving waters or land application site;
- ensure that sanitary landfill operating procedures are being followed.

8. ALTERNATIVE DEVELOPMENT AND MITIGATION MEASURES

Alternative Technologies and Operating Methods

For various aspects of a solid waste management project, there are appropriate alternative technologies or operating methods, as listed below.

Collection Systems:

- source reduction of wastes,
- self-reliant systems of on-site waste management, equipment includes: pushcart, animal cart, tractor, and truck
- communal stationary container systems
- communal portable container systems
- curb-side collection systems from liftable containers
- block collection systems with resident cooperation
- separate collection for potentially hazardous materials

Disposal Systems:

- source reduction of wastes
- sanitary landfill (i.e., designed refuse cell construction)
- sanitary landfill with gas and leachate control
- landfill gas recovery and use
- incineration with air pollution control
- mass burn with energy recovery and air pollution control
- refuse-derived fuel production
- composting
- separate disposal zone in sanitary landfill or separate disposal site for construction/demolition debris, bulky wastes and tires
- separate disposal for potentially hazardous materials
- hold and bleed pumped sewage into wastewater treatment facilities, where available, or provide separate disposal
- separate incineration for medical wastes

Recycling Systems:

- increase product durability
- source segregation of recyclables
- manual or mechanized sorting of recyclables at transfer stations and disposal facilities
- financial incentives to private sector recycling initiatives
- refurbishing and remanufacturing of durable products
- modify procurement specifications to increase opportunities for products made from recycled materials

The main aspects of alternative development and mitigation regarding hazardous waste facilities are as follows:

Siting

Facilities with risk of structural collapse, rupture, fire, or explosion will need to be located in geotechnical stable locations (e.g., minimal risk of seismic activity or subsidence). Siting is taken up in following sections.

Buffer Zones

Based on the nature of the potential hazard (e.g. fireball, toxic gas release, spill), facilities will need to have an appropriately sized buffer zone.

Layout Design

Within an installation with industrial hazards, unit operations will need to be laid out so that incompatible substances are not located within proximity of each other (e.g. substances which would react upon mixing to generate heat, fire, gas, explosion, or violent polymerization). Also, incompatible operations are not to be located within proximity of each other (e.g. welding operations are not to be located near storage of ignitable materials).

Box 1 Reduction in hazardous materials use in products and processes

It is also possible to reduce the use of hazardous materials in products and processes before disposal becomes an issue. Here are some methods for consideration in this respect.

Resource Substitution

Within processing or other operations, substitute a hazardous material with a non-hazardous material. Change the form of the material (e.g., to a gas or a liquid) if the resulting form would be less hazardous (e.g., store toxic gases in a suitable solvent form).

Resource Minimization

Minimize the quantities of hazardous materials used by recovering and recycling them within the process operation. Reduce the inventory of hazardous materials in storage. Use more efficient processing techniques.

Process or Storage Modifications

Store hazardous gas as a refrigerated liquid rather than under pressure. Reduce process temperatures and pressures. Change process methods (e.g., change from spray painting to dip or brush painting)

Dust Control

Dust control measures include spraying water (or water with a wetting agent) at the source of dust dispersion, to minimize the generation of dust. Ventilation, collection and filtration are also effective for dust control. Dusty operations should be isolated and/or contained to the extent possible, especially when the dusts could lead to lung diseases such as silicosis, one the most common occupational diseases in the world and most prevalent at mines, brickyards, glassmaking plants, and sand blasting operations. Occupational asthma is caused by a broad array of chemicals and natural substances, including isocyanides, acid anhydrides, grain dust, cotton dust and wood dust.

Fire Control

In order to reduce fire risk, proper landfill gas collection facilities must be put into place. As well, safety measures such as the presence of water sources and hoses, as well as foams, should be available on-site.

Access Control

Limitation of personnel to those specifically trained in the work conditions present within a potentially hazardous area, including use of personnel identification, double locks, security services, barriers.

Secondary Containment

Provide, as appropriate, systems to contain releases, such as: water curtains to restrict gas release, dikes and portable booms to contain spills, emergency response equipment to collect spilled material, bunkers or blast walls to confine explosions, fire-proofing to limit the spread of fire, absorbents to absorb or adsorb hazardous substance, and buffer zones.

Administrative controls are used when it is not possible to reduce exposure to acceptable levels through engineering controls. Administrative controls may include rearranging work schedules to minimize the duration of exposure to hazards and transfer or rotation of personnel who have reached a maximum allowable exposure limit over time.

9. SITING

One of the most important aspects of alternative development regarding hazardous waste management is siting. Facility siting is one of the areas in which EA can be most effective, but only if the assessment process begins before siting options are foreclosed. Complex industrial development projects and similar facilities with the potential for significant environmental impact cannot be handled with the simple application of siting criteria. Such projects need a full EA. The EA should be initiated well before the siting decision has been made, so that real alternatives can be considered. Identifying the potential impacts associated with each site and comparing sites on that basis causes environmental issues to come to light early and permits project planners and designers to take maximum advantage of all possible ways to avoid impacts. For those impacts that cannot be avoided and are accepted as part of the costs of the development, the opportunity to select an alternative site may lead to a project in which the efficiency of measures to mitigate impacts is higher and the costs of the measures are lower than would otherwise be the case. A timely EA also prevents the disruption, delay, and extra expense involved when a site must be changed because of environmental or public acceptance issues that come to light during final design.

Sites for hazardous waste disposal in general are selected on the basis of economic and technical factors, including favourable terrain, energy sources, transportation and labor, location and size of service areas, taxes and duties, and availability of utilities and other support services essential for successful plant operation. More recently, the siting of industry has evolved to include considerations of the natural and socio-cultural environment and of acceptance by the communities that could be affected, either positively or negatively.

Increased public health effects and experience with the degradation of air, water, and land that can occur in the absence of sound planning in industrial areas, and community unwillingness to tolerate disturbance in forms such as noise, traffic, odours and physical presence of large facilities has increased in recent years.

Although there are different methodologies employed for comparative siting, seven basic elements are common to all of them:

- A short list of potential sites (may include both preferred and alternative sites).
- Description of each site in terms of ecological and socio-cultural sensitivities.
- Analysis of capacity to assimilate impacts at each site in terms of a common set of criteria for prevention of natural and socio-cultural resource degradation.
- Elimination of sites with serious environmental limitations.
- For remaining sites, description of measures to avoid or mitigate impacts and comply with environmental standards, including consideration of technical and institutional feasibility, reliability and life-cycle cost.
- Consultation with affected communities.
- Ranking of alternatives and selection of proposed site. Depending on the regulations of the country and the nature of the industry, the site selection process may be carried out in the context of an EA or as a more specific analysis under a licensing or permit application procedure.

Sites may be "pre-selected" as well, either as part of a planning and zoning process which narrows the range of alternatives to areas designated for industry, or under development policies which seek to localize industrial development in industrial estates. If planning and zoning and industrial estate siting are based on environmental criteria, there may be no need for additional siting analysis, or the studies required may be limited to particular issues, such as the need to pre-treat a proposed plant's

wastewater. However, it is often true that only economic and engineering feasibility criteria are used as the basis for identifying areas for industrial development. There is then no guarantee that environmental objectives will be met. An environmental analysis of possible sites should be conducted.

In the case of a proposed expansion of production facilities at their present site, it is important to evaluate the site on the basis of the combined effects of the existing and new operations. Some unique feature of the new process may make the site undesirable, or the measures needed to manage the overall impact may be so costly that a new site is preferable. The same concept applies to location of a new plant in an already industrialized area. The incremental increase in cumulative air emissions, for example, may make the site unacceptable for the proposed facility.

Sites should be compared and selected on the basis of a comprehensive set of siting criteria. Sometimes industrial siting criteria may already exist in the form of government regulation or guidelines. Where they do not exist in this form, they can be derived for the project from various sources. Siting criteria may be implicit in planning and zoning, as the basis for determining suitability for industrial land uses. Laws or regulations for protection of certain sensitive areas or resources act as restrictions on and should be incorporated in the criteria used in site selection. There are criteria considered to represent good practices for particular industries. Finally, there are the general principles of environmentally sensitive land-use planning that should be considered.

Siting Criteria

Georgia should develop its own recommended guidelines (sensitivity) addressing areas to be avoided and environmental requirements for industrial sites. For example:

- An industrial site shall be at least the following distances from the features listed:
  - 25 km from ecologically or otherwise sensitive areas (examples include religious and historic places and archaeological monuments, scenic areas, beach resorts, coastal areas and estuaries which are important breeding grounds, national parks and sanctuaries, natural lakes and swamps, and tribal settlements)
  - 0.5 km from high tide line in coastal areas
  - 0.5 km from natural or modified flood plain boundary
  - 25 km from projected growth boundary of major settlements (population of 3 million or larger).
- The following are examples of environmental requirements associated with industrial use of particular sites:
  - no conversion of forest land to non-forest activity to sustain the industry
  - no conversion of prime agricultural land to industrial use
  - sufficient space on-site to provide for storage of solid waste and appropriate treatment and reuse of wastewater
  - provision for a 0.5-km wide "greenbelt" around the site perimeter
  - adaptability of the proposed facilities to the landscape, so that scenic features are not altered by the development.

Examples of other factors that might be placed in a list of characteristics precluding selection of a particular site for use by industry with high potential for pollution include (depending on the nature of the industry):

- Recharge area for aquifer of present or possible water supply use, or catchment area of public water supply reservoir.
- Receiving waters unable to assimilate wastewater without water quality degradation despite appropriate treatment.
- Air shed prone to episodes of poor air quality.
- Habitat of endangered species.
- Proximity of site (or access roads) to incompatible land uses -e.g., health care institutions, schools, residential areas.

- No local or regional capability for disposal of hazardous waste (if industry produces any).

There are other factors which ordinarily do not exclude a site from consideration, but which are potential areas of impact and should be taken into account in ranking alternative sites:

- number of residents that would be displaced;
- number of properties that would be affected or expropriated;
- distance to nearest non-industrial land use;
- compatibility of wastewater with local collection and treatment system, if any.

10. SPECIAL CONSIDERATIONS IN WASTE FACILITY SITING

Assimilative Capacity of the Environment

In the case of hazardous waste disposal facilities, an example of a site where the assimilative capacity of the surrounding environment is one where the underlying soil's attenuate capacity is insufficient for what is disposed of in that location. The environment should also be able to assimilate the results of non-routine operations, such as process upsets, failure of pollution control systems, and accidental releases. Proximity to sensitive natural areas or human settlements may necessitate extraordinary measures to prevent or respond to such events.

Area of Influence

Depending on the type of facility and the medium being considered (air, water, plant, animal or human communities), the area that might be influenced by a project can extend well beyond the site and its immediate environs. The characteristics of the natural resources and land uses in the air shed for long distances downwind are relevant and so are environmental impacts along transportation corridors. If the project would result in ancillary developments that would differ depending on site selection (e.g., asphalt plants at quarry sites, new rail or roadways, new port facilities or pipelines, workers dwellings, resettlement sites), their water catchments and air sheds should be considered in the siting decision.

Capacity for Emergency Response

It is irresponsible to locate a hazardous waste facility which poses a significant risk to neighbouring communities or sensitive natural systems in surroundings where an emergency cannot be managed in such a way that damage or disaster can be averted. If it is not possible to develop a response plan which can reasonably be expected to be effective (including provisions for emergency evacuation, if warranted by the type of installation), another site should be selected. The absence of institutions for communication and accident response makes hazard management impossible. Unsafe roads or railways and unsafe trucks or trains lead to unacceptable risk, if they are used to transport hazardous substances through residential areas. Lack of a buffer zone between hazardous material storage or processing facilities and communities or sensitive natural systems (fish breeding areas, for example) create a situation in which neither warning nor containment can be timely enough to prevent injury.

Some of these limitations can be overcome by adding hazard management components to a project. Local government's response capacity can be strengthened by providing equipment and training. Transportation facilities can be improved, or alternate routes to the site can be developed. However, some dimensions of the emergency response problem can only be resolved through sound site selection.

Induced Development

Employment opportunities are magnets to immigration of workers and thus to the growth of local communities. Especially where industrial development is newly occurring, the community may experience induced land development and may be ill-prepared to manage its impacts. They range from overloading of municipal infrastructure and services to cultural conflicts between long-time residents and immigrant workers. Particular care is needed to prevent unplanned settlements just outside the factory gates. Institutional strengthening of local government and involvement of local communities in project preparation can be effective ways of minimizing these adverse impacts.

Community Involvement in Industrial Plant Siting

Community participation in siting decisions is of great importance. Businesses that have involved local residents early in decisions that may affect them, even on controversial projects, have more often than not found the experience to be worthwhile. Conducted well, community involvement leads to better mutual understanding and can be the basis of productive community relations instead of protest. This topic is revisited in more detail in Chapter 5.

11. WRITING THE REPORT

What follows is a suggested format, or Terms of Reference, for the EIA report for a project addressing construction of a hazardous waste disposal facility (compiled from World Bank, 1999).

Introduction

This section should state the purpose of the terms of reference, identify the hazardous waste project to be assessed, and explain the executing arrangements for the environmental assessment.

Background Information

Pertinent background for potential parties who may conduct the environmental assessment, whether they are consultants or government agencies, would include a brief description of the major components of the proposed project, a statement of the need for it and the objectives it is intended to meet, the implementing agency, a brief history of the project, (including alternatives considered), its current status and timetable, and the identities of any associated projects. If there are other projects in progress or planned within the region that may compete for the same resources, they should also be identified here.

Major components of an industrial project to be described herein include, as appropriate: local and foreign raw material sources include transport systems (e.g., roads, rail); pollution control systems (e.g., source reduction and recycling to minimize wastes, stack gas emission control, non-point source emission control, wastewater treatment and discharge, solid waste disposal, spill prevention); supplies (e.g. location of stocks of parts and chemicals, transport routes); staffing (e.g. numbers of workers, skill requirements); services (e.g. fire protection, security, transportation, medical); and community involvement (e.g. worker housing during construction).

Objectives

This section should summarise the general scope of the environmental assessment and discuss its timing in relation to the processes of project preparation, design, and execution. This section should also identify constraints, if any, regarding the adequacy of existing environmental assessment baseline data and needs to phase additional data collection (e.g., over several seasons) and assessment efforts so as not to hinder the rest of the project development schedule.

Environmental Assessment Requirements

This paragraph should identify any regulations and guidelines which will govern the conduct of the assessment or specify the content of its report. They may include national laws and/or regulations on environmental reviews and impact assessments; regional, regional or communal environmental assessment regulations; environmental assessment regulations of any other financing organizations involved in the project. This section should identify design or operating standards which project components must address to be environmentally acceptable including air emission standards, receiving water quality standards, and occupational health and safety requirements.

Study Area

This section will specify the boundaries of the study area for the assessment. (e.g., water catchments, air shed). Where appropriate, specify the right-of-way (ROW) width and alignment for transportation corridors for raw material and product shipments. If there are adjacent or remote areas which should be considered with respect to impacts of particular aspects of the project, identify them. For example, where intermediate supplies for a processing operation will be generated at remote facilities, identify the remote facilities (e.g., identify the sources of intermediate chemical supplies to be used at a pharmaceutical plant), because an added demand for supplies from this remote facility may cause an environmental impact to the remote area.

Scope of Work

In some cases, the tasks to be carried out by a consultant will be known with sufficient certainty to be specified completely in the terms of reference. In other cases, information deficiencies need to be alleviated or specialized field studies or modeling activities performed to assess impacts, and the consultant will be asked to define particular tasks in more detail for contracting agency review and approval.

Description of the Proposed Project

(a) For project improvements to solid or hazardous waste collection, include: physical layout of the neighborhoods to receive improved collection; social, cultural and economic conditions of the neighborhoods to receive improved collection; and description of the project elements, including method of collection proposed, pilot tests to confirm the proposed collection method as appropriate, pre-implementation activities of public education and involvement, cost recovery systems, equipment specifications and procurement plans, implementation plans, operation and maintenance procedures, responsible parties for each aspect of the system.

(b) For project improvements to solid waste transfer and disposal, include: location of all project-related development sites and ROW's; general layout of facilities at project-related development sites; physical layout of the overall urban area to be served by transfer and/or disposal facilities, including mapping of all major roads; strategic siting of the facilities, including economic justification for the overall strategic plan of collection service areas, direct haul routes, transfer stations, transfer routes and disposal

locations; physical, ecological and demographic setting of facilities, including surrounding land use characteristics, proximity to residential neighborhoods, location of public water supply sources and private wells, direction of ground water flow, uses of surface waters, prevailing wind direction; and description of the project elements, including layout of proposed facilities (e.g., fencing, buildings, weighbridges, roads, ramps, drainage, gas and leachate control systems, monitoring wells); construction schedule, operating plans, closure plans, long-term monitoring plans, and responsible parties. Provide flow diagrams of facilities/operations; design basis, size, capacity, flow-through of unit operations; pre-construction activities; construction activities, schedule, staffing and support, facilities and services; operation and maintenance activities, staffing and support, facilities and services; reclamation activities, such as in mining projects; required off-site investments; life expectancy for major components.

Provide maps at appropriate scales to illustrate the general setting of project-related development sites and ROW's, as well as surrounding areas likely to be environmentally affected. These maps shall include topographic contours, as available, as well as locations of major surface waters, roads, railways, town centers, parks and preserves, and political boundaries. Also provide, as available, maps to illustrate existing land uses.

Description of the Environment

(a) For project improvements to collection systems:

Physical environment: neighborhood layout, showing locations for communal containers, stops for truck during block collection, or streets served by curb-side collection; conditions of road or walkway access for collection equipment; and climate and meteorology, as it affects refuse containment and frequency of collection.

Socio-cultural environment**:** population density and demographic level by neighborhood; community structure of local leaders and traditional public involvement process; employment and other activities indicating patterns of movement to and from neighborhood; education level with regard to sanitation and public health; and customs and attitudes relative to cooperation with collection system.

(**b) For project improvements to transfer and disposal facilities:**

Physical environment**: location** of proposed facilities with regard to nature of surrounding land uses and proximity to homes and other establishments; existing road and traffic conditions in the area of proposed facilities, versus proposed road and traffic conditions; existing topography and proposed changes, including area which will be affected by any visible aesthetic impacts; soils and geology; surface and ground water hydrology, and hydraulic connections between the proposed sites and receiving waters down-gradient of the sites; existing and proposed uses of receiving waters, including location of private and public water supply wells and intakes; climate and meteorology, including prevailing wind direction.

Biological environment**:** flora and fauna; sensitive habitats (e.g., wetlands delineation); and rare, endangered, or commercially important species.

Socio-cultural environment**:** past uses of sites and consideration of any historic significance; land use and demographic character of surrounding neighbourhoods; planned development activities; education, awareness, and sensitivity of public to proposed siting of facilities; and public concerns over traffic, insects, noise, dust, odour, smoke, or aesthetic issues.

c) For waste facilities:

***Physical environment*:** geology (e.g. stratigraphy and structure of well fields, seismic history of storage tank areas, integrity of geological layers protecting potable groundwater supplies); topography (e.g. drainage patterns around construction areas, view-sheds around facilities); soils (e.g. agricultural value, potential use for lining or soil cover in residue disposal); climate and meteorology (e.g. prevailing wind patterns around stacks, precipitation patterns at residue disposal sites); ambient air quality (e.g. ability to assimilate emissions and maintain air quality standards); (note input from other major pollutant generators in the area, if any); surface water hydrology (e.g. downstream water resources from reservoirs, soil erosion and sedimentation potential, flood hazard potential); water resources (e.g. adequacy of water supplies); coastal and oceanic parameters (e.g. currents in docking areas, dispersion potential at effluent discharge locations); receiving water quality (e.g. ability to assimilate effluent discharges and maintain water quality standards for desired uses); (note input from major pollutant generators in the area, if any); significant pollutant sources in the area and prospect for their mitigation.

Biological environment: flora and fauna; rare or endangered species within or in areas adjacent to project-related development sites or ROW's; sensitive habitats, including wetlands, parks or preserves, significant wildlands within or in areas downstream/down-gradient of project-related development areas or ROW's; species of commercial importance in areas affected by the project, including coastal areas at docking facilities.

Socio-cultural environment (include both present and projected where appropriate): population (i.e., full time and seasonal); land use (i.e., year-round and seasonal); planned development activities; community structure; employment and labor market; distribution of income, goods and services; recreation; public health; education; cultural properties (e.g., archaeological and historically significant sites); indigenous peoples and traditional tribal lands; customs, aspirations and attitudes.

Legislative and Regulatory Considerations:

Describe national laws and local ordinances which delineate the solid waste management responsibility and authority delegated to local government. Describe national laws and guidelines which define the design and operating standards which local governments are to meet in the conduct of their responsibilities. Include description of any environmental standards which are to be met, including any requirements for submission of environmental monitoring data or environmental impact assessment statements by local governments to the national government. Describe local ordinances which govern citizen responsibility to participate in and cooperate with the solid waste system. Discuss the extent to which the local government uses education, inspection and enforcement to assure compliance with the available regulations. Describe the technical assistance, environmental monitoring, and regulatory enforcement activities provided by national and provisional government as a support to local government operations and actions.

Describe the pertinent regulations and standards governing environmental quality, health and safety, protection of sensitive areas, protection of endangered species, siting, land use control, etc., at international, national, regional and local levels. (The TOR should specify those that are known and require the consultant to investigate for others.)

Determination of the Potential Impacts of the Proposed Project

For solid waste projects, there are numerous potential impacts to be reviewed as a part of design. For the most part, well-conceived designs will minimize adverse impacts. Also, many potential impacts can be minimized by altering operating practices. There are some potential impact issues whose consequences would be environmentally significant over the long term. With regard to these impact

issues, special studies conducted as a part of environmental impact assessment are recommended. Specifically, prior to design of a land disposal site, borings need to be drilled both on-site and off-site to assess the character of soils and geology and confirm the flow of ground water. Data from these borings coupled with information on rainfall and infiltration should be used to make a simple determination of the quantity of leachate which could be generated and released from the land disposal site and its potential effect on the nearest receiving water.

For hazardous waste projects, all significant changes which the project would incur should be identified. These would include, but not be limited to, changes in the following: employment opportunities, wastewater effluents, air emissions, solid wastes, land use, infrastructure, exposure to disease, risk of industrial hazard, noise, traffic, socio-cultural behavior. The impacts from changes brought about by the project on baseline environmental conditions as described above should be evaluated. In this analysis, distinguish between significant positive and negative impacts, direct and indirect impacts, and immediate and long-term impacts. Identify impacts which are unavoidable or irreversible. Wherever possible, describe impacts quantitatively, in terms of environmental costs and benefits. Assign economic values when feasible. Impact analysis for industrial projects should be divided between construction impacts and operation impacts (e.g. stack emissions, effluent discharges, noises, industrial hazards). Assess the risk of occurrence of potential industrial hazards (e.g. accidental spills, fires, explosions, impoundment structural failure, gaseous releases). Consider the ability of the community to provide emergency response services for potential industrial hazards. Consider the ability of the community to provide medical services to respond to emergencies. Based on the above, assess the potential impacts. Characterize the extent and quality of available data, explaining significant information deficiencies and any uncertainties associated with predictions of impact. If possible, give the TOR for studies to obtain the missing information. For information which could not be obtained until after project execution commences, provide TOR for studies to monitor operations over a given time period and to modify designs and/or operational parameters based upon updated impact analysis.

Analysis of Alternatives to the Proposed Project

Describe alternatives that were examined in the course of developing the proposed project and identify other alternatives which would achieve the same objectives. The concept of alternatives extends to siting, design, technology selection, construction techniques and phasing, and operating and maintenance procedures. Compare alternatives in terms of potential environmental impacts; capital and operating costs; suitability under local conditions; and institutional, training, and monitoring requirements. When describing the impacts, indicate which are irreversible or unavoidable and which can be mitigated.

The analysis may lead to designs that are more sound from an environmental, socio-cultural or economic point of view than the original project proposal. The concept of alternatives extends to siting, design, fuels, raw materials and technology selection, construction techniques and phasing, and operating and maintenance procedures. Include the "no action" alternative -not constructing the project -in order to demonstrate environmental conditions without it. Alternatives should include the following: the "no action" alternative (as discussed above); alternative means of meeting industrial product requirements; the alternative of upgrading existing facilities; alternative routes and sites; alternative design; and alternative methods of construction, including costs and reliability. Describe how the alternatives compare in terms of potential environmental impacts; capital and operating costs; suitability under local conditions (e.g., skill requirements, political acceptability, public cooperation, availability of parts, level of technology); and institutional, training, and monitoring requirements. To the extent possible, quantify the costs and benefits of each alternative, incorporating the estimated costs of any associated mitigating measures. Describe the reasons for selecting the proposed project over the other alternatives.

Development of Management Plan to Mitigate Negative Impacts

For the proposed project, recommend feasible and cost-effective measures to prevent or reduce significant negative impacts to acceptable levels. Estimate the impacts and costs of those measures, and of the institutional and training requirements to implement them. Consider compensation to affected parties for impacts which cannot be mitigated. Include measures for emergency response to accidental events (e.g., ruptures, leaks, tanker truck accidents, fires, explosions), as appropriate. Estimate the impacts and costs of those measures, and of the institutional and training requirements to implement them. Consider compensation to affected parties for impacts which cannot be mitigated. Prepare a management plan including proposed work programs, budget estimates, schedules, staffing and training requirements, and other necessary support services to implement the mitigating measures.

Identification of Institutional Needs to Implement Environmental Assessment Recommendations

Review the authority and capability of institutions at local, regional/regional, and national levels and recommend steps to strengthen or expand them so that the management and monitoring plans in the environmental assessment can be implemented. The recommendations may extend to new laws and regulations, new agencies or agency functions, inter-sectoral arrangements, management procedures and training, staffing, operation and maintenance training, budgeting, and financial support.

Development of a Monitoring Plan

Monitoring of the environment in the immediate vicinity of potential hazards, as well as at the fence-line of the installation, provides an early warning of a hazard occurring. For example, air quality monitoring for volatile organics, oxygen levels, combustible gas levels, and/or specific air constituents could be conducted on a regular basis using portable equipment or a continuous basis with stationary equipment. Smoke detectors, heat monitors, radiation detectors, as appropriate to the type of installation, are used to signal a hazard occurring.

For solid waste projects which include a land disposal facility, environmental monitoring should include gas and ground water monitoring wells and a regular schedule of monitoring for key indicators of contamination. If the land disposal site has a gas collection and ventilation system, periodic monitoring of the composition of gas being discharged from the vents is recommended. Also recommended is periodic monitoring, on-site and off-site with a portable meter, of the ambient air's oxygen and combustible gas levels. Similarly, for projects which include an incinerator or resource recovery plan, environmental monitoring should include air quality monitoring of stack gases.

In the case of hazardous waste facilities, based on knowledge of site conditions relative to topography, wind direction etc., a site control plan should be developed, which determines the corresponding levels of required personnel protection in various areas around the site. If the hazardous conditions could potentially exist beyond the actual project site, for example to residential or farm properties, the plan should also address emergency notification and evacuation procedures. Community coordinators

should be assigned who are responsible for lead any emergency response activities. The given community should always be made fully aware of any potential emergency that may occur in the area.

It should also be noted that medical monitoring is necessary for all workers who may be exposed to hazardous materials. Before the worker begins activities on-site, a baseline examination including blood sampling of the specific chemicals involved should be undertaken for comparison purposes. A questionnaire should be given inquiring about the worker's medical history. The worker should then undergo (at least) annual examinations to determine whether negative health symptoms are being caused by exposure to hazardous substances on-site.

When the nature of the hazard is known and routine, the precise type and level of protective gear can be defined and routinely used (e.g., hard hats, chemical-resistant gloves, air-purifying respirators, safety shoes, ear protection, safety glasses). On the other hand, when the nature of the hazard is unknown (e.g., when several hazardous materials accidentally are combined, or when a toxic waste dump is unexpectedly discovered), it may be necessary to use the most conservative type of protective gear (e.g., chemically resistant and gas impermeable suits, self-contained breathing apparatus), downgrading only after the hazard is identified as requiring a lower level of protective gear.

Personnel protection involves more than special clothing, glasses, hard hats, earplugs, etc., to protect the body from harm. The following items are also part of personnel protection, as appropriate to the situation: knife (for emergency exit of a protective suit), portable light, personal monitor (e.g., dosimeter for radiation, personal thermometer for heat/cold stress), harness and lifeline, safety belt, two-way radio, locator beacon (e.g., for locating a victim of hazard).

Health and safety planning involves a complete assessment of an installation with all potential hazards identified. The plan provides the following information: (a) Definition of all potential hazards. (b) Health and safety implications of each hazard. (c) Description of routine health and safety management techniques (e.g., health and safety inspections, maintenance /repair follow-up on inspection citations, record-keeping, personnel protective gear, and medical monitoring). (d) Outline of emergency response procedures following occurrence of a major hazard (e.g., organization structure of key trained personnel to act as emergency responders, action steps for entering and working within zone of hazard, evacuation procedures, protective gear requirements, decontamination procedures, lines of communication, emergency telephone numbers, map of route to nearest emergency medical care). (e) Follow-up procedures after the emergency is over.

Use of personnel protection equipment is appropriate for work with in the vicinity of potential hazards. Personnel protection choices are based on the nature of the hazard, the level and/or concentration of the hazard, the duration of exposure, and the person-specific susceptibility to being adversely affected.

Assist in Inter-Agency Coordination and Public/NGO Participation

Assist in coordinating the environmental assessment with other government agencies, in obtaining the views of local NGO's and affected groups, and in keeping records of meetings and other activities, communications, and comments and their disposition. The Terms of Reference (TOR) should specify the types of activities; e.g., interagency scoping session environmental briefings for project staff and interagency committees, support to environmental advisory panels, public forum.

Report

The environmental assessment report should be concise and limited to significant environmental issues. The main text should focus on findings, conclusions and recommended actions, supported by summaries of the data collected and citations for any references used in interpreting those data. Detailed or uninterrupted data are not appropriate in the main text and should be presented in appendices or a separate volume. Unpublished documents used in the assessment may not be readily

available and should also be assembled in an appendix. Organize the environmental assessment report according to the outline below.

- Executive Summary.
- Policy, Legal and Administrative Framework.
- Description of the Proposed Project.
- Baseline Data.
- Significant Environmental Impacts.
- Analysis of Alternatives.
- Mitigation Management Plan.
- Environmental Management and Training.
- Environmental Monitoring Plan.
- Appendices:
- List of Environmental Assessment Preparers References Record of Interagency/ Forum/ Consultation Meetings

Schedule

Specify dates for progress reviews, interim and final reports, and other significant events.

Other Information

Include here lists of data sources, project background reports and studies, relevant publications, and other items to which the consultant's attention should be directed.

Reviewing

The user of this guideline is referred to the translated EU document entitled “Guidance on EIA: Reviewing” (June 2001) as an excellent reference for any reviewing that is undertaken for the given hazardous waste project. Essentially, however, a review must ensure that all relevant topics discussed in Chapter 3 regarding specific issues associated with hazardous waste disposal facilities are covered properly in the EIA report.

12. PUBLIC CONSULTATIONS

Public consultation is considered to be the cornerstone of the EIA process. Please refer to Chapter 5 for a fuller discussion.

What is required by law?

At present, Georgian legislation has been changed and the new law for Licenses and Permits has been adopted. The law mandated issuance of the permit and licenses within 20 days and reduced public hearing procedures down twenty days. Hence at this stage it is very unclear MoE attitude towards conducting of the public hearings.

Who must be present (or invited to be present) at a public consultation on hazardous waste facility project proposals?

There are a few individuals and organizations that *must* be present at a public consultation for any kind of EIA public consultation. These are as follow:

- representatives of the MoE;
- the developer and its consultant, and
- representatives of the associated regions.

Members of the public are also necessarily invited to any public consultation through the announcement of the public consultation through at least one local and one national newspaper.

However, specific to projects dealing with hazardous waste facilities, it is also desirable to invite NGOs concerned with this topic, related business NGOs and environmental NGOs, individuals or organizations involved in the waste cycle (especially collectors and disposers), and other groups that may be deemed appropriate given the particular circumstances.

13. MANAGING THE EIA PROCESS FOR WASTES

Proper management of the EIA process is very important because of the complex nature of the various involved parties and because of the multi-disciplinary nature of the environmental information involved. To be specific, proper management must take into account the following:

- the multitude of involved actors. These should include:

    1 the initiator of the plan (the waste authority);
    2 the environmental authority;
    3 other departments having an interest in waste disposal (e.g. housing, public health, safety);
    4 the decision-maker who has the competence to approve the final waste management design or plan (e.g. Parliament);
    5 non-governmental organizations (NGOs) and the general public;

- the complex nature of the alternatives and issues considered;
- linkage to planning and other assessments,
- the need for co-ordination and feed-back to avoid unnecessary delays.

It is, in fact, the overall planning and assessment process which has to be managed. Done well, considerable time and quality gains are possible (based on DG Transport, 1999).

Division into clear-cut scheduling, roles and responsibilities

Each of the steps of the EIA process (e.g. scoping, impact assessment and review) should be divided into phases with clear tasks, roles and responsibilities. At the end of each phase, intermediate decisions should be made to accept or reject the outcome and to determine the work that still has to be done. Georgian law prescribes a specific EIA procedure. This should involve formal and informal co-operation between all involved authorities.

Phasing and structuring the process over time

Each of the steps of the EIA process (e.g. scoping, impact assessment and review) should be divided into phases with clear tasks, roles and responsibilities. At the end of each phase, intermediate decisions should be made to accept or reject the outcome and to determine the work that still has to be done. EIA legislation exists in Georgia and the law does prescribe an EIA procedure. Transparency is greatly enhanced by agreeing a clear procedure at the start of the EIA process. This procedure may specify (i) the initial project description, (ii) the objectives of the EIA process, (iii) the sequential steps of the procedure (i.e. documents and decision points), (iv) the time frame, (v) provisions for consultation and participation, (vi) the actors and their roles. The size of these documents depends on the complexity of the decision-making problem (i.e. the number of environmentally relevant issues) and the degree of openness and transparency. The most complex step is the assessment itself.

Flexibility - ensuring that the EIA process is not too rigidly defined

The EIA process should respond appropriately to the various inputs from consultation and participation. The EIA procedure should therefore be flexible with respect to its phasing and organization. Flexibility can be enhanced in a number of ways:

- anticipating possible outcomes from consultation and public participation;
- communicating frequently, and at an early stage, with interested agencies and groups; listening to signals and clearly explaining the EIA process;
- making short-term or framework contracts with consultants to respond to uncertain outcomes.

Applying management tools - other tools for EIA process management

The initiator may appoint an EIA process manager, who is in charge during the whole EIA process. The following management tools are particularly helpful in the assessment step:

- setting **clear targets** for the EIA report and its intermediate drafts;
- setting up an **inter-disciplinary team** of experts (e.g. ecologists, waste management experts, geo-hydrologists, socio-economic experts, landscape planners, etc.);
- ensuring good **collaboration** exists between the planning and environmental authorities;
- enabling effective **feedback** to be made between assessment results and the planning process, for example by:
    1. drawing up organization charts;
    2. preparing internal draft plans and assessments which are circulated among those taking part in the planning and assessment work;
    3. stationing planners and environmental experts in the same location;
    4. applying team-building techniques;
- providing sufficient **time and resources** to open up the assessment and planning phase by encouraging external parties and the public to comment on the drafts;
- ensuring that the results of the evaluation are taken into consideration in the **final decision.**

There are many advantages in setting up informal collaborations between departments in carrying out an EIA (*Ibid*).

14. ROLES AND RESPONSIBILITIES

Planning

The Ministry of Environment (MoE) is responsible for implementation of the EIA process cycle, from scoping to final evaluation and approval.

The MoE is responsible for giving orders for different kinds of studies as required by the screening process. In the first stages, the MoE must decide whether the project purpose and description as submitted in the general format are adequate. If not adequate, it makes the request for any editing required. If it is complete, the MoE calls for state ecological expertise representatives of related institutions and organizations, Ministry officials.

The MoE checks the EIA report submitted by the developer and determines whether it is in accordance with the format that was assigned to the developer, and has a XXXX business day period to do so. It may then assign a period of up to six months to make changes or corrections as required. If the EIA report is in compliance with the format, it is copied for each member of the commission, and mailed with an invitation to the next meeting for the examination of the EIA report by the MoE. The Ministry and Regional Directorate in question must then notify the public through an appropriate medium (internet) that the EIA report appraisal is occurring, and that the report is available for public viewing. The MoE must then make the report available for viewing.

The Ministry then takes into account all the studies brought forth by the project and the history of the meetings of the past months, and issues an EIA Positive or an EIA Negative order with XXXX working days. It notifies the developer, the concerned Regional Directorate and other parties, and the Regional Governorate announces the decision through appropriate media to the concerned public.

For projects that receive either an “EIA Not Required” or an “EIA Positive” order, the Ministry monitors the events that occur during the implementation of the project and ensures that they adhere to what has been agreed upon on in the EIA report; the Ministry may also consult various experts and related institutions as necessary in the matter. The developer in either of these situations is responsible for providing reports on their activities in the construction, operation and post-operation phases, as well as copies of their various permits, to the Ministry. The Ministry forwards these items to the regional governorates so that they can inform the public.

If it is found that the construction has begun on a project without the complete execution of an EIA and without an “EIA Not Required” or an “EIA Positive” order, the works are suspended until one of these two orders comes through. If various conditions were set out in the EIA report or preliminary EIA report that are not met during the execution of the project, a non-extendable period of 60 business days may be granted by the MoE in order to fulfil the requirements. If after this period is complete the requirements have not been met, the project is suspended by the MoE until the requirements are finally met.

A number of other items are generally the responsibility of the MoE:

- Extra time can be appended to any of the periods mentioned with good reason and with Ministry permission.
- Changes in project ownership require the new owner to take over all responsibilities from the previous owner in terms of the EIA.
- In case of disputes, the Ministry always has the final word.
- The Ministry is permitted to carry out many kinds of educational and public-awareness activities in the field of EIA in cooperation with other organizations, at local, national or international levels.
- Regarding military projects, EIAs are carried out in cooperation with the organization in question along with the Ministry.

- For applications involving several projects, the Ministry may decide that a single EIA report or EIA preliminary report is required as opposed to multiple reports.
- The Ministry may issue communiqués regarding the EIA regulation when necessary.
- Items submitted before the enforcement date of the new regulation abide by the rules set out in the old legislation.

The Proponent

The project developer or proponent is responsible for preparing whatever kind of EIA study is ordered by the Ministry. It may hire a consultant in order to achieve this purpose.

Initially it is responsible for filing an application to execute the project in the general format specified in Annex III. If the MoE requests changes or editing the developer must finish this, and, when the MoE deems the application appropriate for further development, the developer must provide sufficient copies of the application to MoE.

The location of the public participation meetings must be convenient for interested parties' purposes and is assigned by the developer and the regional governor's office working together. Any costs associated with any such meetings are the responsibility of the developer. The developer is responsible for advertising the location, date, time and subject of public participation meetings at least five days in advance in a medium that is determined by the MoE.

During the scoping meeting, the most important environmental impacts to address are identified and the specific contents to be included in the format are determined. The commission also decides which professional branches will also take part in the preparation of the EIA report. It is the responsibility of the proponent to take all the advice of the Commission and the MoE into account in its EIA study.

The EIA format is valid for one year's time, and it is the responsibility of the proponent to complete the report within this period. During the review phase, the commission may ask the developer for detailed information on what measurements and analyses were performed, and in doubt the site may be visited, samples re-taken, or other expert advice sought. Expenses are the responsibility of the developer.

On completion of the review phase, and receipt of the report from the Commission on the EIA report, the developer has a 30-day period to correct the EIA report to reflect the judgments of the review meeting and re-submit it. As well, the developer must submit a signed document stating that the project and the final EIA report and annexes are his/her responsibility.

The Consultant

The responsibility of any consultant hired by the proponent is to undertake the tasks described above in a competent and objective manner.

The Public

At three points in the EIA process (two if no pre-EIA is involved), the public has the chance to participate in the process and thus aid in decision-making. It is the responsibility of the public to know its rights in this respect and add its voice to the process. The specific points that the public could participate in the gathering of environmental and social information in this process, in the absence of a pre-EIA, are 1) with the initial announcement of the intention to undertake an EIA for the given project in a public forum, and 2) with the completion of the EIA report and its available viewing at the MoE or at the regional directorate. At the end of the process, the EIA Positive or Negative Order shall be announced by the governorship to the public.

GOVERNMENT OF GEORGIA

MINISTRY OF ENVIRONMENT PROTECTION AND NATURAL RESOURCES OF GEORGIA

EIA GUIDELINES FOR HARBORS AND PIERCES

1 INTRODUCTION

Why this Guideline?

The Ministry of Environment (from now on the "Ministry") has expressed its wish to develop sectoral guidelines for the purpose of clarifying procedures for certain types of EIAs. This Guideline provides details on an appropriate approach to the **execution of a proper EIA for construction of harbors, piers**. It is hoped that the Guideline will aid in ensuring that EIA reports for these kinds of projects are complete, well-written and useful to decision-makers, and that the process is efficient and sound.

What are the target groups for this Guideline?

The Guideline is aimed specifically at consultants carrying out EIAs, but also for Ministry experts and the public.

The Georgian legislation for EIA and how it applies to harbours and piers

The Georgian approach to EIA – as detailed in the EIA Manual and outlined in Chapter 3 – requires that a full EIA be performed for the construction of harbors, piers and quays allowing docking for marine vessels of at least 1350 DWT. This type of activity is listed in Annex I of the Georgian EIA legislation of 6 June 2002.

Why is EIA important in the decision-making process for harbours, piers ?

Waterborne transport and port structures play strong roles in the transport chain and are necessary to proper functioning of movement of goods and bulk materials, as well as the transfer of passengers (International Navigation Association, 1999). The level of environmental concern increases with the size of the facility and the number of services it provides (cargo handling, passenger services, fishing, and leisure or recreational activities). Ideally, building and managing harbors, piers would be done by preserving and enhancing their environmental values without compromising quality of the actual facilities and services on offer.

International Conventions in the Field of Harbours, and Piers

Generally the international shipping community recognizes the Biodiversity Convention, developed in 1992 at the Earth Summit in Rio de Janeiro, and its role in eventually achieving sustainable development.

In Georgia, the following international conventions may apply to the development of a project involving harbors, piers:

- Areas that are under protection in accordance with the 'Convention on Wetlands of International Importance Especially as Waterfowl Habitat' (RAMSAR Convention), enforced upon its publication in the Official Gazette dated 17 May 1994 no. 21937;
- International Maritime Dangerous Goods Code (IMDG), 1990, involving safe transport of dangerous goods and related activities

- London Convention on the Prevention of Marine Pollution by Dumping of Waste and Other Matters (London Convention), 1972
- Basel Convention on Transboundary Movement of Hazardous Wastes and Their Disposal, 1989;
- International Convention for the Prevention of Pollution from Ships (MARPOL) (1973-78); and
- United Nations Convention on the Law of the Sea (UNCLOS) (1982).

Note to the Concerned Individual in the Public: what are my rights?

In the Georgian EIA law, the public has the right to be informed about the proposed project and EIA procedure - and also has the right to express its concerns at various intervals during the EIA process in a public forum. If you are concerned about the impacts of a certain project, watch the newspapers at both local and national levels for announcements regarding information sessions and/or public meetings. Opinions about a given project may also be requested in writing by the officials overseeing the EIA process in your area.

2 IMPORTANT STEPS

The Approach and the EIA Team

The general approach that should be taken before embarking on the EIA process is as follows:

- setting clear targets for the EIA report;
- setting up an interdisciplinary team with the necessary expertise to undertake the given project;
- ensuring that good collaboration exists between the involved authorities;
- enabling effective feedback to be made by setting up appropriate forums for this purpose;
- providing sufficient time and resources to carry out public participation, and
- ensuring that the results of the evaluation are taken into consideration in the final decision.
-
- The consultant team for preparation of an EIA for inland navigation projects should include members from the following professional disciplines:
- environmental impact specialist, team leader;
- civil/environmental/port engineer(s) with experience in dredging projects, port and harbor development, and water-based transport;
- aquatic or marine biologist, or other specialty depending on the dredging site and natural resources which could be impacted;
- surface water hydrologist;
- coastal resource management specialist;
- land-use planner, and
- socio-economist.

Screening

In terms of screening for the need for an EIA for harbors, piers. It is necessary in cases where it is not clear whether a full EIA is required to examine the planned location(s) and find out whether they are classified as “sensitive areas”.

However, for the purposes of this document, facilities that require full EIAs are addressed. As a result, the screening process will not be a main focus of this document..

Scoping

Scoping and final format for the associated EIA report must particularly take into account the issues discussed in the above sections.

Impacts

The success of maritime commerce, fishing industries, and naval defense are dependent on harbor, pier and quay development; therefore, proper design, construction, and maintenance of these coastal and marine resources are of importance. Maritime development usually generates local environmental problems; however, development associated with sensitive estuaries or inland on freshwater rivers may yield regional-scale problems. The impacts of maritime development will differ by location because of variations in features such as geography, hydrology, geology, ecology, industrialization, urbanization and type of shipping.

The alteration of natural waters and the construction of man-made structures can lead to direct impacts on the water body being developed, as well as direct and indirect impacts on related ecosystems and communities in the project surroundings.

Dredging operations, materials disposal, shore zone development, increased maritime traffic and vehicle traffic in the port can result in the release of natural and anthropogenic contaminants to the environment. Since numerous dredging, materials disposal, and construction methods exist for developing port and harbor facilities, the combinations of physical, chemical, and biological effects on the medium of interest will vary. Potential aquatic impacts include oil spills and discharges; contaminant release from sediment resuspension, surface runoff, and point source discharges; habitat destruction; changes in water chemistry and circulation; occupational and public health concerns; and transportation safety. Terrestrial impacts may include contamination due to dredged materials disposal; erosion and sedimentation due to hydrologic changes caused by channel deepening and widening and shore zone development (construction of breakwaters, etc.); loss of sensitive habitat (e.g. wetlands) due to shoreline and port-related development; and loss of existing and future land use. Air impacts can include degradation of air quality due to emissions from industrial stacks and vehicular traffic, and the generation of fugitive dusts (The World Bank, 1999; International Navigation Association, 1999).

3 NATURAL RESOURCE ISSUES

Water

Dredging and dredge spoil disposal activities for port development and maintenance can induce short- and long-term impacts on aquatic systems, such as:

- degradation of marine resources such as beaches, estuaries, coral reefs, and fisheries;
- re-suspension and settlement of sediments; partitioning of toxic contaminants and reintroduction to the water column;
- contaminant uptake by and accumulation in fish and shellfish;
- increased turbidity causing decrease in light penetration and associated photosynthetic activity;
- short-term depletions of dissolved oxygen levels;
- modified bathymetry causing changes in circulation;

- possible saltwater intrusion to groundwater and inland surface water;
- altered species diversity and structure of benthic communities, and fluctuations in water chemistry;
- changes in shoreline structure; and loss of habitat and fisheries resources (*Ibid*).

Similar impacts can also result from increased maritime traffic and facility development along the shore zone.

Improved navigability and development of port facilities will increase maritime traffic and with it, the risk of spills and the discharge of oily bilge, ballast, anti-fouling materials and sewage. The increase in shore zone development will also put stress on the receiving aquatic system through point discharges of sewage, process and cooling waters, and accidental releases.

Land

The waterfront region in the port and harbor area will be altered to suit new industry. These new industries can lead to relocation of villages, increased vehicular traffic, dust and airborne emissions from traffic and raw materials stockpiles, and contamination of surface runoff. Numerous port and harbor facilities are proximal to sensitive saltwater marshes, mangroves, and estuaries which can act as sinks for the collection of contaminated storm water and sediment from the waterfront area.

Land disposal of dredge materials in confined and unconfined systems can also affect underlying groundwater, contaminate surface runoff, and alter future land-use options.

4 SOCIAL AND CULTURAL ISSUES

Generally, new or expanded port and harbor facilities are welcomed since these projects provide new jobs and bring an influx of commerce to the region. However, improvements, expansion, and industrialization may upset the local cultural, ethnic, historical and religious traditions. In some cases, project acceptance and success may be hampered by local concern for the potential destruction of historical places, parks, reserves and valuable coastal zone recreational and fisheries resources. Community involvement in project planning is essential.

During the planning and implementation phases, projections should be made of the possible impacts of increased demands on the local technical and labor resources to prevent excess pressure on limited resources. Care must be taken to limit and/or prevent impacts on scarce local commodities. For example, the destruction of a valuable local fishery or recreational beach for the development of port and harbor facilities could result in undesirable economic and cultural impacts.

5 SPECIAL ISSUES

Hazardous Materials/Cargoes

The shipping and handling of hazardous materials such as pesticides, explosives or pressurized gases at port facilities could pose an unacceptable risk to human health and the environment. To protect workers and the surrounding communities, authorities should ensure that effective measures are enforced for monitoring the transport and handling of hazardous materials at the port.

Maintenance Dredging

Maintenance dredging is performed in approach channels and harbor basins to maintain depth and width and ensure safe access for large vessels. The dredged materials from maintenance dredging typically present a greater disposal problem than deeper sediments removed during construction dredging, since surface sediments are composed of recently deposited materials that are usually contaminated. These younger sediments usually contain natural and anthropogenic contaminants and can arrive from atmospheric fallout, erosion of local land surface and channel banks, fallout from biological activity in the water column, sediment transport from inland waters, point source dischargers, and surface runoff from the surrounding area. To mitigate potential contaminant release from the port area, the following should be addressed:

- proper design of storm water handling and treatment facilities;
- sewage and wastewater outfalls; local land use (e.g., proximity of agricultural fields or mining operations);
- procedures for handling hazardous materials; and
- types of industries permitted to operate in the port area.

Environmental Law

Internationally, greater attention is being given to the importance of maintaining and protecting the structural and functional integrity of marine and coastal zone resources; therefore, any port and harbor development which may affect these resources must comply with local and/or regional restrictions.

Open-ocean disposal of wastes, including contaminated dredge materials, has received considerable scrutiny in recent years. Applicable local and international regulations should be followed. The International Maritime Organization (IMO) is responsible for establishing guidelines for ports to prevent and control releases and discharges from ships.

Dredged Material Disposal

The initial screening for evaluating disposal options is a physical and chemical analysis for geotechnical character and the presence of contaminants in the sediments. Depending on the physical and chemical character of the dredged material, disposal may be confined, unconfined, or treated prior to release in open water, along the shoreline, or on land. Disposal must be in accordance with applicable regulations. Long-term monitoring of the dredging process and disposal may be required.

Dredging Process

The primary categories of dredges include mechanical, hydraulic and innovative technologies. When selecting the appropriate dredging technology or combination of technologies, the project engineer should consider the following site-specific factors:

- environmental constraints associated with the physical and chemical character of the sediments;
- cost and availability of equipment; disposal site location and limitations;
- proximity of sensitive systems such as estuaries, regional groundwater and freshwater bodies;
- physical conditions affecting the dredge, transit and disposal locations; and
- interference with other users at the dredge, transit and disposal locations.

Alternative Development and Mitigation Measures

Siting

Of special concern when developing alternatives for coastal structure projects is siting. Many countries are characterized by dense human populations, inadequate potable water and sanitary waste disposal systems, intensive land use, and increasing levels of environmental degradation. Developing a port and harbor for increasing maritime commerce and port-related industry in an area currently experiencing environmental stress may be ill-advised, unless adequate mitigation measures are planned to ensure the proper handling of wastes from development-related activities. The decision to improve or develop harbor facilities is usually based on economic, geographic and political parameters rather than on those of an ecological nature. In choosing location, the assimilative capacity of the prevailing natural systems should be considered along with accessibility, employment needs and local commerce. Often several project planning, design and implementation alternatives exist for development of a harbor facility.

Selection of a site for the development of new port or harbor facilities depends on many physical characteristics of the local surroundings as well as on socioeconomic concerns. Good locations typically satisfy the following criteria:

- Physical characteristics including wind, tides, currents and weather do not require excessive maintenance or preclude maritime traffic.
- Alterations in circulation do not position the port where maximum sedimentation will occur, leading to increased frequency of maintenance dredging.
- Shore zone land area is adequate for the processing and waste management needs of any new waterfront industries.
- Scheduling considerations such as the spawning and migration periods for indigenous biota are not violated.
- Need for resettlement is minimal.
- Project does not compete with or displace other highly valued land uses such as fishing beaches, agricultural fields or villages.
- Project activities do not adversely affect the value of an existing marine or coastal resource, such as dunes or a shellfishery.
- Construction materials, skilled labor, support industries, energy and freshwater supply, waste disposal facilities and transportation are accessible.
- Construction, operation and maintenance of the port or harbor do not damage sensitive habitats (e.g., estuaries, mangroves) or rare, threatened or endangered species.
- Port access by road/rail can be established easily without excessive disturbance to communities.

Other important issues that should be addressed when developing alternatives for coastal structures projects include their design and technology selection, construction techniques and phasing, and operating and maintenance procedures. These should be chosen in accordance with the site(s) in question. Timing in construction may be of special importance, as at certain times of the year fish spawning and bird nesting occur in coastal areas, for example.

6 WRITING THE REPORT

What follows is a suggested format, or Terms of Reference, for the EIA report for a project addressing construction of a harbor, pier or quay.

Introduction

This section should state the purpose of the terms of reference, identify the development project to be assessed, and explain the executing arrangements for the environmental assessment.

Background Information

Pertinent background for potential parties who may conduct the environmental assessment, whether they are consultants or government agencies, would include a brief description of the major components of the proposed project, a statement of the need for it and the objectives it is intended to meet, the implementing agency, a brief history of the project, (including alternatives considered), its current status and timetable, and the identities of any associated projects. If there are other projects in progress or planned within the region that may compete for the same resources, they should also be identified here.

Objectives

This section will summarise the general scope of the environmental assessment and discuss its timing in relation to the processes of project preparation, design, and execution.

Environmental Assessment Requirements

This paragraph should identify any regulations and guidelines that will govern the conduct of the assessment or specify the content of its report. They may include any or all of the following: national laws and/or regulations on environmental reviews and impact assessments; regional, provincial or communal environmental assessment regulations; environmental assessment regulations of any other financing organizations involved in the project.

Study Area

Specify the boundaries of the study area for the assessment (e.g., water catchments, air shed). If there are any adjacent or remote areas which should be considered with respect to impacts of particular.

Scope of Work

In some cases, the tasks to be carried out by a consultant will be known with sufficient certainty to be specified completely in the terms of reference. In other cases, information deficiencies need to be alleviated or specialized field studies or modeling activities performed to assess impacts, and the consultant will be asked to define particular tasks in more detail for contracting agency review and approval.

Description of the Proposed Project

Project-specific descriptions of the following. Disposal options for dredged materials should be specified as open-water, shoreline or upland, and whether treatment or containment will be necessary, especially if the materials are contaminated. Dredging equipment requirements based on physical and chemical character of dredge material, disposal site, and physical conditions at the dredge site. Transportation requirements such as terminal facilities and berths, barges and vessels, pipelines, roads, and disruption of transit for commercial and recreational users. Energy-producing operations, including solid wastes, emissions, and discharges and their quantities, and transport and handling procedures for fuels and other hazardous materials. Port-related industries which may be developed and serviced by the facilities including hazardous materials, handling, storage, processes, and disposal, special energy needs, and waste disposal requirements.

Description of the Environment

Assemble, evaluate and present baseline data on the relevant environmental characteristics of the study area. Include information on any changes anticipated before the project commences. Annotate or modify the lists below to show the critical information for this project category, or that which is irrelevant to it; particularly avoid the collection of irrelevant data.

Physical environment: geology; topography; soils; climate and meteorology; ambient air quality; surface and ground- water hydrology; coastal and oceanic parameters; existing sources of air emissions; existing water pollution discharges; and receiving water quality.

Biological environment: flora; fauna; rare or endangered species; sensitive habitats, including parks or preserves, significant natural sites, etc.; species of commercial importance; and species with potential to become nuisances, vectors or dangerous.

Socio-cultural environment (include both present and projected where appropriate): population; land use; planned development activities; community structure; employment; distribution of income, goods and services; recreation; public health; cultural properties; any affected tribal peoples and their customs, aspirations and attitudes.

Legislative and Regulatory Considerations

If open-water disposal in international waters is being considered then the requirements of the applicable international conventions should be evaluated. In addition, the International Maritime Organization (IMO) should be consulted for guidelines pertaining to releases and discharges from ships.

Determination of the Potential Impacts of the Proposed Project

Dredge Material Characterization Studies. Studies of the physical and chemical character of the dredge materials is necessary to select appropriate dredging equipment and disposal options, estimate quantities of different materials, and design monitoring programs and mitigate measures. All sampling results should be statistically representative of the project area (i.e., vertical and horizontal extent) to ensure proper environmental planning and reduce the likelihood of encountering contaminated "hot spots".

Screening for Sensitive Environments. Field evaluations of the ecosystems and communities in the project area surroundings provide information concerning direct and indirect impacts on pervasive, sensitive, and/or threatened and endangered components of potentially affected systems. For example, alteration of flow within an aquatic system could yield adverse impacts on a downstream mangrove.

Effluent Characterization Studies. These may be necessary to design appropriate water pollution control options for the port facilities and industries. Ideally, one should identify sanitary wastewater streams, cooling water streams, and process water streams.

"Null Zone" Identification. The existing location and potential relocation of development activities should be determined to mitigate the rate of sedimentation and saltwater intrusion as well as to reduce the frequency of maintenance dredging activity.

Analysis of Alternatives to the Proposed Project

Describe alternatives that were examined in the course of developing the proposed project and identify other alternatives that would achieve the same objectives. The concept of alternatives extends to siting, design, technology selection, construction techniques and phasing, and operating and maintenance procedures. Compare alternatives in terms of potential environmental impacts; capital and operating costs; suitability under local conditions; and institutional, training, and monitoring requirements. When describing the impacts, indicate which are irreversible or unavoidable and which can be mitigated. To the extent possible, quantify the costs and benefits of each alternative,

incorporating the estimated costs of any associated mitigating measures. Include the alternative of not constructing the project, in order to demonstrate environmental conditions without it.

Development of Management Plan to Mitigate Negative Impacts

Recommend feasible and cost-effective measures to prevent or reduce significant negative impacts to acceptable levels. Estimate the impacts and costs of those measures, and of the institutional and training requirements to implement them. Consider compensation to affected parties for impacts which cannot be mitigated. Prepare a management plan including proposed work programs, budget estimates, schedules, staffing and training requirements, and other necessary support services to implement the mitigating measures.

Identification of Institutional Needs to Implement Environmental Assessment Recommendations

Review the authority and capability of institutions at local, provincial/regional, and national levels and recommend steps to strengthen or expand them so that the management and monitoring plans in the environmental assessment can be implemented. The recommendations may extend to new laws and regulations, new agencies or agency functions, intersectoral arrangements, management procedures and training, staffing, operation and maintenance training, budgeting, and financial support.

Development of a Monitoring Plan

Prepare a detailed plan to monitor the implementation of mitigating measures and the impacts of the project during construction and operation. Include in the plan an estimate of capital and operating costs and a description of other inputs (such as training and institutional strengthening) needed to carry it out.

Assist in Inter-Agency Coordination and Public/NGO Participation

Assist in coordinating the environmental assessment with other government agencies, in obtaining the views of local NGOs and affected groups, and in keeping records of meetings and other activities, communications, and comments and their disposition. The Terms of Reference should specify the types of activities; e.g. interagency scoping session environmental briefings for project staff and interagency committees, support to environmental advisory panels, public forum.

Report

The environmental assessment report should be concise and limited to significant environmental issues. The main text should focus on findings, conclusions and recommended actions, supported by summaries of the data collected and citations for any references used in interpreting those data. Detailed or un-interpreted data are not appropriate in the main text and should be presented in appendices or a separate volume. Unpublished documents used in the assessment may not be readily available and should also be assembled in an appendix. Organize the environmental assessment report according to the outline below:

- Executive Summary
- Policy, Legal and Administrative Framework
- Description of the Proposed Project. Baseline Data
- Significant Environmental Impacts. Analysis of Alternatives
- Mitigation Management Plan

- Environmental Management and Training
- Environmental Monitoring Plan
- Appendices: List of Environmental Assessment Preparers References Record of Interagency/Forum/Consultation Meetings

7 MANAGEMENT AND TRAINING

A comprehensive dredging and dredged-materials management plan should be considered for the port and harbor facilities to ensure that maintenance projects can be carried out on schedule with minimum environmental effects. Port authorities and engineers should develop a plan using data from a characterization of the materials to be dredged; a vertical and horizontal profile of contaminant distribution in the channel sediments -to define homogeneity and locate prominent "hot spots"; an evaluation of sediment behavior using different dredging equipment and disposal options; and an analysis of potential long-term effects of maintenance on human and environmental health.

Support for efficient pollution control and waste reduction strategies may be important for dredging and construction activities, equipment operation, materials disposal and waterfront industries. Port and industrial engineers should be familiar with state-of-the-art equipment and a disposal technology to ensure environmentally sound waste and spoils management.

All project staff and laborers should receive training under "standards of practice" for occupational health and safety and emergency response. The training should include procedures to be followed in the event of accidents, spills, explosions or fires.

Training for government officials charged with supervision of an environmental management and monitoring plan may be required. To assess training needs, the capacity of local institutions to assume responsibility for environmental review should be evaluated, as well as the record of legal and regulatory agencies to monitor and enforce standards.

8 MONITORING

A site-specific environmental monitoring plan that enables government officials to manage a project and ensure compliance with environmental standards should be prepared for each individual project. Generic parameters that may require monitoring during project planning, start-up and operation are as follows: geotechnical and chemical characterization of sediments; water quality of project area and proposed disposal area; long-term chemical/physical testing of project area; disposal location sediments and water quality; long-term monitoring of biota for the possible accumulation of contaminants; long-term monitoring of sediment transport, accretion (shoaling), erosion, and the impacts and effectiveness of any manmade structures (e.g. groins, jetties); maintenance programs to keep a high level of employee environmental awareness; and monitoring of effects of project on populations and systems in the environs of the port and harbor facilities.

Reviewing

The user of this guideline is referred to the translated EU document entitled “Guidance on EIA: Reviewing” (June 2001) as an excellent reference for any reviewing that is undertaken for the given harbor, pier or quay project. It is of importance that the reviewers ensure that the necessary points discussed above are included in the EIA process and corresponding report.

9 MANAGING THE EIA PROCESS FOR HARBORS, PIERS THAT WILL ALLOW DOCKING OF MARINE VESSELS

Proper management of the EIA process is very important because of the complex nature of the various involved parties and because of the multi-disciplinary nature of the environmental information involved. To be specific, proper management must take into account the following:

- the multitude of involved actors. These should include:
- the initiator of the plan (the port authority);
- the environmental authority;
- other departments having an interest in port infrastructure (e.g. public health, safety);
- the decision-maker who has the competence to approve the final port infrastructure plan (e.g. Parliament);
- non-governmental organizations (NGOs) and the general public;
- the complex nature of the alternatives and issues considered;
- linkage to planning and other assessments, and
- the need for co-ordination and feed-back to avoid unnecessary delays.

It is, in fact, the overall planning and assessment process which has to be managed. Done well, considerable time and quality gains are possible.

Division into clear-cut scheduling, roles and responsibilities

Each of the steps of the EIA process (e.g. scoping, impact assessment and review) should be divided into phases with clear tasks, roles and responsibilities. At the end of each phase, intermediate decisions should be made to accept or reject the outcome and to determine the work that still has to be done. Georgian law prescribes a specific EIA procedure. This should involve formal and informal co-operation between all involved authorities.

Phasing and structuring the process over time

Each of the steps of the EIA process (e.g. scoping, impact assessment and review) should be divided into phases with clear tasks, roles and responsibilities. At the end of each phase, intermediate decisions should be made to accept or reject the outcome and to determine the work that still has to be done. EIA legislation exists in Georgia and the law does prescribe an EIA procedure. Transparency is greatly enhanced by agreeing a clear procedure at the start of the EIA process. This procedure may specify (i) the initial project description, (ii) the objectives of the EIA process, (iii) the sequential steps of the procedure (i.e. documents and decision points), (iv) the time frame, (v) provisions for consultation and participation, (vi) the actors and their roles. The size of these documents depends on the complexity of the decision-making problem (i.e. the number of environmentally relevant issues) and the degree of openness and transparency. The most complex step is the assessment itself.

Flexibility - ensuring that the EIA process is not too rigidly defined

The EIA process should respond appropriately to the various inputs from consultation and participation. The EIA procedure should therefore be flexible with respect to its phasing and organization. Flexibility can be enhanced in a number of ways:

- anticipating possible outcomes from consultation and public participation;
- communicating frequently, and at an early stage, with interested agencies and groups; listening to signals and clearly explaining the EIA process;
- making short-term or framework contracts with consultants to respond to uncertain outcomes.

10 APPLYING MANAGEMENT TOOLS - OTHER TOOLS FOR EIA PROCESS MANAGEMENT

The initiator may appoint an EIA process manager, who is in charge during the whole EIA process. The following management tools are particularly helpful in the assessment step:

- setting **clear targets** for the EIA report and its intermediate drafts;
- Setting up an **inter-disciplinary team** of experts (e.g. ecologists), traffic modelers, experts, landscape planners, etc.);
- ensuring good collaboration exists between the planning and environmental authorities;
- enabling effective feedback to be made between assessment results and the planning process, for example by:
- drawing up organization charts;
- preparing internal draft plans and assessments which are circulated among those taking part in the planning and assessment work;
- stationing planners and environmental experts in the same location;
- applying team-building techniques;
- providing sufficient time and resources to open up the assessment and planning phase by encouraging external parties and the public to comment on the drafts;
- ensuring that the results of the evaluation are taken into consideration in the **final decision.**

There are many advantages in setting up informal collaborations between departments in carrying out an EIA. This is particularly true in countries where environment ministries are influential.

11 ROLES AND RESPONSIBILITIES

EIA Planning

The Ministry of Environment (MoE) is responsible for implementation of the EIA process cycle, from scoping to final evaluation and approval.

The MoE is responsible for giving orders for different kinds of studies as required by the screening process. In the first stages, the MoE must decide whether the project purpose and description as submitted in the general format are adequate. If not adequate, it makes the request for any editing required. If it is complete, the MoE calls for state ecological expertise representatives of related institutions and organizations, Ministry officials.

The MoE checks the EIA report submitted by the developer and determines whether it is in accordance with the format that was assigned to the developer, and has a XXXX business day period to do so. It may then assign a period of up to six months to make changes or corrections as required. If the EIA report is in compliance with the format, it is copied for each member of the commission, and mailed with an invitation to the next meeting for the examination of the EIA report by the MoE. The Ministry and Regional Directorate in question must then notify the public through an appropriate medium (internet) that the EIA report appraisal is occurring, and that the report is available for public viewing. The MoE must then make the report available for viewing.

The Ministry then takes into account all the studies brought forth by the project and the history of the meetings of the past months, and issues an EIA Positive or an EIA Negative order with 14 working days. It notifies the developer, the concerned Regional Directorate and other parties, and the Regional Governorate announces the decision through appropriate media to the concerned public.

For projects that receive either an “EIA Not Required” or an “EIA Positive” order, the Ministry monitors the events that occur during the implementation of the project and ensures that they adhere to what has been agreed upon on in the EIA report; the Ministry may also consult various experts and related institutions as necessary in the matter. The developer in either of these situations is responsible for providing reports on their activities in the construction, operation and post-operation phases, as well as copies of their various permits, to the Ministry. The Ministry forwards these items to the regional governorates so that they can inform the public.

If it is found that the construction has begun on a project without the complete execution of an EIA and without an “EIA Not Required” or an “EIA Positive” order, the works are suspended until one of these two orders comes through. If various conditions were set out in the EIA report or preliminary EIA report that are not met during the execution of the project, a non-extendable period of 60 business days may be granted by the MoE in order to fulfill the requirements. If after this period is complete the requirements have not been met, the project is suspended by the MoE until the requirements are finally met.

A number of other items are generally the responsibility of the MoE:

- Extra time can be appended to any of the periods mentioned with good reason and with Ministry permission.
- Changes in project ownership require the new owner to take over all responsibilities from the previous owner in terms of the EIA.
- In case of disputes, the Ministry always has the final word.
- The Ministry is permitted to carry out many kinds of educational and public-awareness activities in the field of EIA in cooperation with other organizations, at local, national or international levels.
- Regarding military projects, EIAs are carried out in cooperation with the organization in question along with the Ministry.
- For applications involving several projects, the Ministry may decide that a single EIA report or EIA preliminary report is required as opposed to multiple reports.
- The Ministry may issue communiqués regarding the EIA regulation when necessary.
- Items submitted before the enforcement date of the new regulation abide by the rules set out in the old legislation.

The Proponent

The project developer or proponent is responsible for preparing whatever kind of EIA study is ordered by the Ministry. It may hire a consultant in order to achieve this purpose.

Initially it is responsible for filing an application to execute the project in the general format specified in Annex III. If the MoE requests changes or editing the developer must finish this, and, when the MoE deems the application appropriate for further development, the developer must provide sufficient copies of the application to MoE.

The location of the public participation meetings must be convenient for interested parties’ purposes and is assigned by the developer and the regional governor’s office working together. Any costs associated with any such meetings are the responsibility of the developer. The developer is responsible for advertising the location, date, time and subject of public participation meetings at least five days in advance in a medium that is determined by the MoE.

During the scoping meeting, the most important environmental impacts to address are identified and the specific contents to be included in the format are determined. The commission also decides which professional branches will also take part in the preparation of the EIA report. It is the responsibility of the proponent to take all the advice of the Commission and the MoE into account in its EIA study.

The EIA format is valid for one year's time, and it is the responsibility of the proponent to complete the report within this period. During the review phase, the commission may ask the developer for detailed information on what measurements and analyses were performed, and in doubt the site may be visited, samples re-taken, or other expert advice sought. Expenses are the responsibility of the developer.

On completion of the review phase, and receipt of the report from the Commission on the EIA report, the developer has a 30-day period to correct the EIA report to reflect the judgments of the review meeting and re-submit it. As well, the developer must submit a signed document stating that the project and the final EIA report and annexes are his/her responsibility.

The Consultant

The responsibility of any consultant hired by the proponent is to undertake the tasks described above in a competent and objective manner.

The Public

At three points in the EIA process (two if no pre-EIA is involved), the public has the chance to participate in the process and thus aid in decision-making. It is the responsibility of the public to know its rights in this respect and add its voice to the process. The specific points that the public could participate in the gathering of environmental and social information in this process, in the absence of a pre-EIA, are 1) with the initial announcement of the intention to undertake an EIA for the given project in a public forum, and 2) with the completion of the EIA report and its available viewing at the MoE or at the regional directorate. At the end of the process, the EIA Positive or Negative Order shall be announced by the governorship to the public.

12 PUBLIC CONSULTATIONS

What is a public consultation?

Public consultations are considered to be the cornerstone of the EIA process. The public participation meeting is held to obtain the views of interested parties regarding the project. The concerned public is invited, through the medium of an announcement in a medium – usually one local and one national newspaper – that is determined by the MoE and that is specific to each particular project.

What is required by law?

At present, Georgian legislation has been changed and the new law for Licenses and Permits has been adopted. The law mandated issuance of the permit and licenses within 20 days and reduced public hearing procedures down twenty days. Hence at this stage it is very unclear MoE attitude towards conducting of the public hearings.

Who must be present (or invited to be present) at a public consultation?

There are a few individuals and organizations that *must* be present at a public consultation for any kind of EIA public consultation. These are as follow:

- representatives of the MoE;
- the developer and its consultant, and
- representatives of the associated regions.

Members of the public are also necessarily invited to any public consultation through the announcement of the public consultation through at least one local and one national newspaper.

However, specific to projects dealing with harbor, piers, it is also desirable to invite NGOs concerned with this topic, related business NGOs and environmental NGOs, individuals or organizations involved.

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MINISTER OF ENVIRONMENT PROTECTION AND NATURAL RESOURCES OF GEORGIA

„27" „04" 2006წ.
№ 01/1261

Subject: **Request for consideration of the Project Proposal for the Development of a Multi-Criteria Tool for Integrated Decision-Making / Geo-Spatial Information System for Georgia**

To Whom It May Concern

April 27, 2006

LETTER OF SUPPORT

The course of development taken by the Government of Georgia is quite fast and requires prompt and effective decision making in different fields. Currently, the Ministry of Environmental Protection and Nature Resources (MoEPNR) implements reform to introduce mechanisms for effective decision-making and optimize efforts and activities for better environmental governance.

The Ministry of Environmental Protection and Nature Resources together with the Caucasus Environmental NGO Network (CENN) prepared a Project Proposal on **Development of Multi-Criteria Tool for Integrated Decision-Making / Geo-Spatial Information System for Georgia** aiming at:

- Development of a Geo-Spatial Information System for integrated decision making;
- Improvement of effectiveness of environmental decision making towards the following aspects:
  - Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) decision-making;
  - Identification of hot spots for investment needs;
  - Effective disaster and risk management - emergency preparedness and response planning.
- Development of structure and mechanisms of intersectoral State cooperation as well as training of GIS team at the Ministry of Environmental Protection and Nature Resources to use and maintain the Geo-Spatial Information System.

The Geo-Spatial Information System (GSIS) for Georgia will be characterized by the integration of multiple databases into one comprehensive and holistic information system. It will be built by superimposing sensitivity maps, which measure the environmental, cultural, and socioeconomic assets of a specific region. These assets (as calculated by separate sensitivity maps) will include: Relief (Demo Elevation Model), Geology and Mineral Resources, Water Resources, Land Cover, Soil, Forestry, Protected Areas, Agroclimatic Resources, Agriculture, Energy, Demography / Settlements, Transport infrastructure, Government of Georgia and international donor development projects, etc. An area's total sensitivity will be then calculated by combining the values of all assets into one score.

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This Project is indeed actual and the need of such tool is emphasized by emerging problems and obstacles related to the time that is currently required to access existing data and the accessibility of various data sources, lack of awareness of the existence of some data sources, the number and fragmentation of data sources, the lack of data in a useable formats, and the cost of retrieving existing information. Having the Geo-Spatial Information System with credible and updated information will be an important tool for the specialists of the Ministry in decision making and licensing processes.

The national geo-spatial infrastructure will allow the Ministry to have instant access to a wide range of information. From this one informational system, State institutions will be able to retrieve data that relates to their specific needs and interests. Furthermore, besides having access to data, the Geo-Spatial Information System will allow the specialists of the different Departments of the Ministry to make technically well supported analyses and prognosis.

By having a holistic system that provides comprehensive and detailed information on environmental, social, and economic issues, policy makers' and government officials' decisions will become more focused and beneficial for all those affected.

A national geo-spatial infrastructure is vital for informed decision making, economic efficiency, and survival in a global and knowledge-based world. An integrated informational system will reduce the country's expenses by decreasing the duplication of informational systems created by individual groups; save the efforts, time, and money necessary in collecting necessary data. A geo-spatial informational system should stimulate investments in the country as this tool will make it easy to obtain preliminary information on where to locate business, where to focus marketing, and even on the most cost efficient transportation routes. This is very important for Georgia since the country is involved in a dynamic process of privatization.

The Spatial Information Center and the Department of Cartography and Geodesy of the MoEPNR will be actively involved in the implementation of the Project. The Project will implement the following activities:

- Topographical map with vector data of the whole territory of Georgia will be consolidated at a scale of 1:200,000. The map will include information on the following: Relief (Demo Elevation Model), Geology and Mineral Resources, Water Resources, Land Cover, Soil, Forestry, Protected Areas, Agroclimatic Resources, Agriculture, Energy, Demography / Settlements, Transport infrastructure, GoG and international donor development projects, etc.;
- Sensitivity mapping / analyses - development of the layers with legal environmental requirements and restrictions for different sectors and activities;
- GIS team of the Ministry of Environmental Protection and Nature Resources will be established and trained;
- User-friendly NT software will be developed that will be used by the different Departments of MoEPNR to access the GSIS;
- Internet site of Geo-Spatial Information System of Georgia will be created for the Ministry of Environmental Protection and Nature Resources.

The Geo-Spatial Information System of Georgia will be managed by the Spatial Information Center that is a newly established agency of the MoEPNR. The Spatial Information Center has developed plan for commercialization of the information system to reach a financial sustainability.

The Ministry is confident that the Geo-Spatial Information System will contribute to the effective environment management, the improvement of the quality of decision-making process in the field of environment and result in both time and cost savings.

Georgia can derive many benefits from a geospatial infrastructure that can foster a competitive knowledge-based economy and informed decision making. The MoEPNR with the support of CENN is best equipped to undertake this project. The MoEPNR already possesses local and national environmental data, which constitutes the first (and most costly) step in building a Geo-Spatial Information System. The Ministry, however, lacks the necessary tools to organize, process, and integrate this data thus rendering it inaccessible and impractical. On the other hand, CENN has the technological tools that can make this project possible: the Geographic Information System (GIS). CENN uses GIS extensively in its work for environmental assessments and analyses. Therefore, this

environmental approach and the partnership between the State and NGO allow the possibility to construct a holistic geospatial database for Georgia.

With this letter we would like to request to consider the project proposal for development of the Geo-Spatial Information System for financial support.

We hope that your institution will consider the funding of the project with due attention allowing launching this initiative that will benefit the environmental, socioeconomic, and political future of Georgia.

Should you have any question, please feel free to contact us.

Sincerely,

George Papuashvili
Minister