Municipal Development Fund of Georgia

Initial Environmental Examination

For Procurement of Construction of Coastal Protection Facility in Anaklia,
Contract No: SUTIP-ICB-1.02

Project: **Anaklia Coastal Improvement Project (Phase II)**
FUNDED BY: ADB
Loan: 2655-GEO

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GEORGIA
August, 2013

CURRENCY EQUIVALENTS
(As of 04 April 2012)
Currency Unit – lari (GEL)
GEL1.00 = $0.6
$1.00 = GEL1.657

ADB	- Asian Development Bank
CAS	- Center of Archaeological Search of the Ministry of Cultur
MoE	- Ministry of Environmental Protection
IEE	- Initial Environmental Examination
GIS	- Geographical Information Systems
EMP	- Environmental Management Plan
MAC	- Maximum Admissible Concentrations
RAP	- Resettlement Action Plan
MoA	- Ministry of Agriculture
MLHSP	- Ministry of Labor, Health and Social Protection
GOG	- Government of Georgia
NGO	- Nongovernment Organization
MUFSRA	- Management Unit for Food Safety and Risk Analyze of the Ministry of the Agriculture
FS	-Feasibility Study
MDF	-Municipal Development Fund
EIP	-Environmental Impact Permit
MoESD	-Ministry of Economy and Sustainable Development
SPS	– Safeguard Policy Statement
MoRDI	Ministry of Regional Development and Infrastructure

CONTENTS

Table contents

Figures:

A. Executive Summary

1. Anaklia is a town and seaside resort in western Georgia. It is located in the Samegrelo-Zemo Svaneti region, at the place where the Enguri River flows into the Black Sea, near the administrative border with Abkhazia. With the elevation of 30 m from sea level Anaklia received the status of the town on August 22, 2011.

2. This project is to review of design which is for Anaklia shore line rehabilitation and further protection of the beaches against erosion by means of submerged hydrotechnical coast protecting structures. The prepared design documentation aims at Anaklia shoreline rehabilitation, restoration of the full profile of beaches to the possible limits (which is necessary for wave breaking and suppression of its power and assigns to the beach a function of bank protecting structure), by selection of the most optimum types and design of hydro-technical coast protecting structures, to take into account the requests of Georgian and ADB environmental legislation.

A.1 Policy, Legal, and Administrative Framework

3. According to the law of Georgia on Permit on Environmental Impact (2008) the project does not require preparation of EIA and obtaining of Permit on Environmental Impact

4. Following 'Environmental Considerations in ADB Operations' of September 2006, the Project can be considered to be a Category B project requiring an Initial Environmental Assessment (IEE).

ADB Environmental Guidelines

5. All projects funded by ADB must comply with ADB Safeguard Policy as set out in the Safeguard Policy Framework (2009). The purpose of the environmental safeguards to establish an environmental review process to ensure that projects undertaken as part of programs funded under ADB loans are environmentally sound, are designed to operate in compliance with applicable regulatory requirements, and are not likely to cause a significant environmental, health, or safety hazards.

6. Safeguard policies are generally understood to be operational policies that seek to avoid, minimize, or mitigate adverse environmental and social impacts, including protecting the rights of those likely to be affected or marginalized by the development process.

7. ADB's safeguard policy statement (SPS) sets out the policy objectives, scope and triggers, and principles for three key safeguard areas:

   - The Involuntary Resettlement Policy (1995);
   - The Policy on Indigenous Peoples (1998), and
   - The Environment Policy (2002).

A.2 Project Description

8. Anaklia is supposed to become a tourism centre in Georgia. Anaklia infrastructure development and rehabilitation plan was announced by the Government of Georgia. Erosion processes take place on various pleases at Georgian Black Sea coastal line and Anaklia is one of them. Today this process is seriously destroyed coastline.

9. Coastal protection structure of underwater breakwaters is totally composed with 4 units (for phase 2) with total length 1,130m. Among them, the length of one section equals 300m and length of the last one – 230m. (totally 1,130m)

10. Length of artificial nourishment is 1,400m. Amount of Sand for phase II is 97,855 m3.

11. Total Width of artificial nourishment is 60m, from beach line to land side is 40m and forward to seaside is 20m. Slope of beach line will be composed with 1:20.

A.3 Description of the Environment (Baseline Data)

Physical Resources

12. Georgia is a country in Caucasus, Eurasia, at the Black Sea coast. Georgia is situated at the crossroad of South-East Europe and West Asia and it is a transcontinental country by its location although it is part of Europe by its socio-political situation and culture. Area of the country is 69,700 km^2. Administratively there are 12 administrative units. Each administrative unit is divided into Municipalities (64 municipalities in total).

Climate

13. Average air temperature is 13.8^0C. The coldest months are January and February with the temperatures of -5.40C and -6.20C, respectively, and the absolute minimum is -190C. The hottest months are July and August with the temperatures of 220C and -230C, respectively and the absolute maximum temperature is +400C.

14. The main direction of winds during the warm season is western and it is eastern in winter, with the average speeds of 4-5 m/sec. The average thickness of the snow cover does not exceed 10 cm and is expected to lie until the middle of March.

Air Quality

15. Despite the fact that there are no monitoring stations complying with modern international requirements and corresponding database on the baseline air pollution close to the project territories, we can soundly presume that ambient air quality parameters in the areas adjacent to the project area are within appropriate standards considering that the project implementation territory is entirely within non-urban zone.

Geology

16. According to the maps of regions of Georgia the researchable territory is located at the 8 force seismic zone.

17. According to the processing difficulties the allocated soils belong to:

- I. EGE – according to processing difficulties (BR and Demands IV-5-82) the soils belong to 27^a group – the first category of elaboration by hands and the first category during elaboration by one bucket excavator.
- II. EGE – according to processing difficulties (BR and Demands IV-5-82) the soils belong to 27^b group – the second category of elaboration by hands and the first category during elaboration by one bucket excavator.

Radiation Background

18. Radiation screening has been undertaken for the assessment of radiation baseline. Measures were taken on 12.03.2011 with the use of standard certified Russian device СРП 6801. In Anaklia from the beginning of the project section till bridge crossing area the background radiation was 6-8 micro-roentgen/hour and at Ganmukhuri – 11 micro-roentgen/hour.

Noise

19. Background noise levels were identified in vil. Anaklia and vil. Ganmukhuri. Measures were taken on 12^{th} March, 2010 at 12:00-13:00 and 18:00-19:00 (Anaklia) and 15:00-16:00 (vil. Ganmukhuri) using standard certified Russian device Шум 1М30. Background noise was 38-45 Db.

Hydrology

20. R. Enguri water belongs to hydro-carbonate class and calcium groups by its chemical composition. Mineralization changes within 129.5-252.6 mg/l. The most polluted point at r. Enguri is cross-section below vil. Abastumani, the contamination of which spread on the whole downstream of the river. Disruption of oxygen pattern was observed downstream of vil. Abastumani, the water diluted oxygen composition reduced to 5.25 mg/m. The amount of organic substances did not exceed 3.20 mg/l.

21. Maximum concentrations of the contaminant substances was as follows: at vil. Abastumani point – ammonium nitrogen – 0.41 mg/l, nitrite nitrogen – 0.040 mg/l, phosphates – 0.090 mg/l; at vil. Darcheli point – ammonium nitrogen – 0.44 mg/l, nitrite nitrogen – 0.200 mg/l (10 ПДК), phosphates – 0.031 mg/l.
22. The main source of pollution is effluent waters from Enguri cellulose-paper integrated works.
23. The salt composition of the upper layer of the Black Sea water averagely is 18.2-18.5 %. Seasonal fluctuation of salt level is insignificant in this part of the sea. Along with depth, increase the salt level increases. At 100 m depth salt level is 19 %, at 150 m – averagely 20 %, at 300 m exceeds 21 %. At deeper layers the salt level increases slightly and at 2000 m can be 22 %.
24. Flora and Fauna After the completion of detailed botanical survey of the planned around the project area (see figure 23) Project identification and detail charachteristic of sensitive areas have been conducted. Thus, proceeding from the literature sources review and field sureys the following high sensitive areas have been revealed:
25. A narrow littoral zone to the north of village Anaklia is inhabited by the species that are relics of ancient Mediterranean flora. Sandy beach is only habitat for a highly decorative Sea Lily *Pancratium maritimum* that is included into the Red Data Book of Georgia and RDB of the former USSR. Of associates of Sea Lily a mention should be made of *Eryngium maritimum*, *Stachys maritima*, *Silene euxina*, etc.

Marine Bio-Diversity

26. The depth of the Black sea is 220m average. .Only top layer of 100m contains oxygen and having alive elements relatively, sub layer is almost dead layer – it is poisoned with sulphate hydrogen..
27. The east coast of the Black sea where the project territory is located is relatively poor with micro fits compared with other coastal regions due to existence of sandy material. Totally 113 kinds are known (38 % among total amount of micro fits of the black sea). Mostly we meet red and black water plants.
28. Amount of water plants reduces according to the depth of the sea. Maximum amount of water plants grow in the depth of 2-3m.
29. Project territory is also very poor in regards of fish kinds. We meet only the kinds that are typical for sandy bottom.
30. During the project implementation period, the sea plants that grow in the line of construction will die, but as we mentioned already, the amount is very slight as for kinds as for amount. Of course it will not make any destruction of water plants as the similar plants grow on several km distance in the sea.
31. During the project implementation period variety of fish living in the territory of project area will move in the vicinity and will be back after the completion of the construction.
32.

A.4 Anticipated Environmental Impacts and Mitigation Measures

Water Contamination

33. Construction of various structures in close proximity to the water sources and contamination with effluent waters could significantly impact on the quantitative and qualitative composition of fishes. Hence, measures for reduction of negative impact on fishes should be facilitated during the respective activities:
34. If harmful impact through deterioration of reproduction conditions of fishes, invertebrates as well as algae occurs during the implementation of the activity, actions should be undertaken according to the methodology of calculation of damage inflicted to the environment.

Mitigation Measures

35. The following should be considered for the minimization of negative impact on the environment through project activities:

- Strict following of the agreed traffic route;
- Implementation of fire safety measures;
- Obligatory protection of the borders of the construction areas;
- Training of the working personnel on the issues of implementation of the environmental requirements;
- Avoidance of accumulation of household and construction waste in the area and their disposal in the water;
- Control of oil and oil product spill in water and soil;
- Elaboration of the environmental monitoring and emergency response plans;
- Implementation of the activities during the periods, which do not coincide with breeding/spawning of the fishes and marine mammals.

Impact on Flora and Fauna

36. Despite the fact that the planned activities will be mainly located within the area already utilized by men and respective impact on flora and fauna will be insignificant, measures of impact avoidance are discussed below.

37. Mitigation Measures

- Areal fragmentation; Disturbance on breeding and feeding areas;
- Fragmentation of individual areas;
- Spreading of harmful substances in reservoirs;
- Dealing with live water bed during activities;
- Activities should not be undertaken and bird nests approached during bird breeding and nesting periods;
- Measures should be undertaken for reduction of dust amount during works;
- Measures should be undertaken for reduction of noise and vibration levels during works;
- During activities pits, ditches, etc. should be fenced and/or surrounded with a band of vivid color to avoid falling in of animals. Boards should be installed into the ditches to at night to aid the ingress of fallen animals;
- Prior to commencement of activities the territory should be inspected in the areas, where Cherioptera shelters could be located. If such shelters are discovered, activities within the territory should be avoided and/or artificial shelters arranged for the Cherioptera;
- If areas of otter (included in the Red List of Georgia) distribution are discovered during activities, the activities within the territory should be restricted. If this is impossible, respective offset measures should be introduced.

Hazardous Construction Wastes

38. Small quantities of hazardous wastes will be generated as a result of vehicle operations and the maintenance activities.

Mitigation Measures

39. There are no specific hazardous waste treatment facilities in Georgia, so the common construction practice accepted by the authorities is to dispose of these types of wastes at the municipal landfills. However, prior to disposal appropriate consultation and agreement of MoE is required, and controlling will be required to obtain the necessary approvals. To ensure good practice they will also be required to store, transport, and deposit all hazardous materials in secure watertight containers.

Transport related impacts

40. The construction process will produce large number of movement by heavy trucks on the roads served the site, delivery construction materials. This can cause a number of impacts.

Mitigation Measures

41. These impacts can be reduced by a variety of measures, many of which are common in most urban construction. These include:

- Require adherence to engine maintenance schedules and standards to reduce air pollution.
- Use of defined, well planned haulage routes and reductions in vehicle speed where required;
- Periodically water down temporary roads on site;
- Cover trucks carrying cement gravel or other loose materials;
- Wet or cover trucks carrying stone/ sand/ gravel;
- Haul materials to and from the site in off peak traffic hours.

A.5 Analysis of Alternatives

42. During the preparation process of the proposed project due to the simple fact that the project comprises Anaklia shore protection hydro-technical structures and inert material for the stability of the beach, the main discussed alternatives were related to the versions of shore protection structure.

43. From different alternatives – shore protection with crushed stone wave breaker, filling with inert material, protection with concrete walls and tetrapod built underwater wave breaker – the latter alternative of tetrapod built underwater wave breaker was preferred in technical-economic terms.

A.6 Information Disclosure, Consultation, and Participation

44. Most of the main stakeholders and People who live, and work near construction sites have already been identified and consulted during preparation of this IEE.

45. The borrower/client will carry out meaningful consultation with affected people and other concerned stakeholders, including civil society, and facilitate their informed participation. Meaningful consultation is a process that (i) begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle;1 (ii) provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people; (iii) is undertaken in an atmosphere free of intimidation or coercion; (iv) is gender inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups; and (v) enables the incorporation of all relevant views of affected people and other stakeholders into decision making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues.

A.7 Grievance Redress Mechanism

46. As the work is being done in inhabited areas, most of the impacts are construction related, and therefore it is anticipated that improper or inadequate implementation of EMP may lead to disturbance and inconvenience to local people during construction. In order to provide a direct channel to the affected persons for approaching project authorities and have their grievance recorded and redressed in an appropriate time frame, MDF will establish a Grievance Redress Mechanism. A Complaint Cell and a Grievance Redress Committee will be established in Anaklia municipality to function throughout the construction period.

A.8 Environmental Management Plan

47. The EMP identifies actions for environmentally sound implementation of the Project through avoidance and/or mitigation of adverse effects.

48. The EMP has the following objectives:

(I) To meet the requirements of Georgian legislation and ADB Safeguard Policies requirements for environmental restoration and mitigation of adverse effects;
(ii) To identify adverse impacts on the environment due to operation of project areas;
(iii) To give instructions concerned for environmental protection, restoration, and mitigation of negative environmental effects;
(iv) To serve a reference document for the environmentally sound implementation of the Project.

A.9 Conclusion and Recommendation

- Project implementation and bringing in the material of necessary volume will enable us to restore the inland beach and labile layer of the underwater line in the needed amount;
- Bringing of inert material is recommended in the period of the calm sea – May-October months. The bringing of the main mass of the inert material should be preceded with the construction of wave breaker;
- The preservation of the inland and underwater line of the restored beach will be achieved through periodical compensation of the annual deficit of beach forming material;
- The material washed from the artificial beach and moved along the shore, in its turn, will facilitate the stabilization of the abutting areas;
- Annual compensation filling should be undertaken in spring one-two months ahead of the start of the beach season. April-May storms will distribute the material along the shore and restore the natural profile of the beach;
- Temporary disturbance of local population is expected during the construction works, which shall be connected with the transportation of the construction material and equipment. In other cases the impact on the social environment shall be positive, because temporary employment of the local population is expected;
- During the functioning of the coastal improvement project the negative impact on physical environment and biological systems is not expected;
- Only positive impact on the social system is expected during the coastal improvement project, which shall be connected with the employment of the certain number of workers.
- Project implementation will support the stabilization of Anaklia beach, which will enable the government to further develop the tourist infrastructure of the area.

B. Policy, Legal, and Administrative Framework

B.1 Administrative Structure in Georgia

49. **Ministry of Environment Protection (MoE).** MoE has the overall responsibility for protection of environment in Georgia. The Service of Licenses and Permits of MoE is responsible for reviewing EIAs and for issuance of the Environmental Permits. The MoE Inspectorate is responsible for compliance monitoring, including monitoring of construction activities and auditing of all kind of entities. Regional services of MoE are involved during agreement on Terms of Reference on architectural design of a project and in commissioning of completed facilities. Ministry of Environmental Protection and Natural Resources of Georgia (MoE) is the main state body pursuing state policy in the sphere of environment. Their functions for regulating economic or development activities with regard to environmental protection include:

    - Issuing permits for project development (Environmental Impact Permit)
    - Setting emission limits and issuing surface water intake and discharge consents
    - Inspection of operating plants
    - Responding to incidents and complaint
    - MoE is responsible for monitoring air pollution and noise levels (especially near residential areas)

50. The Ministry defines and evaluates real and possible risk of impact on natural environment during implementation of different types of activities. Accordingly the Ministry has been assigned as responsible body for making decision on granting permission to the proponent on implementation of projects, which require Environmental Impact Assessment (EIA). Granting procedures slightly differ for different type of projects.

51. For the projects, which do not require Construction Permit, the Environmental permit is being issued by the MoE on the ground of State Ecological Examination. State Ecological Examination is carried out by MoE upon official submission of Environmental Impact Assessment (EIA) prepared by project developers.

52. For projects requiring Construction Permit, no special permit is issued by MoE (according to "One window principle", only one permit shall be issued for each activity). The Construction Permit is issued by the Ministry of Economic Development of Georgia, but the issuance of the Permit is subject to the consent of the MoE in a form of Conclusion of Ecological Expertise, as well as the Ministry of Culture (Center of Archaeological Studies, Department of Monuments protection). Consent of the MoE in such cases should be issued according to the same procedures (EIA, public consultations; SEE etc.) as for issuing Environmental Permit. The Ministry of Economic Development as an administrative body issuing a permit ensures the involvement of the MoE as a different administrative body in the administrative proceedings initiated for the purpose of permit issuance, in accordance with Georgia's Law on Licenses and Permits.

53. Project screening (definition of the project category and necessity for preparation of EIA) and scoping (definition of set of environmental issues and Terms of Reference) is carried out by the project implementing agency and its consultants (in this case Municipal Development Fund (MDF) and its consultants). Scoping and screening do not represent mandatory procedures according to Georgian legislature although review of scoping/screening outcomes and agreement of the Ministry of Environment Protection and Natural Resources is considered a desired practice.

54. As a rule, EIA permitting conditions contains requirement for informing MEPNR regarding fulfillment of the EIA permit conditions. This basically means giving information regarding implementation of Environmental Management and Monitoring Plans.

55. **The Ministry of Economic Development (MoED).** MoED is responsible for carrying out the review of technical documentation (including conclusion of an independent experts) and issuing Permits on Construction for projects classified as the projects of Special Importance, as well as for supervision over constructing activities and for arranging Acceptance Commission after completion of construction.

56. State supervision of construction and compliance monitoring is provided by the Main Architecture and Construction Inspection (MACI), which is operating under the Ministry of Economic Development of Georgia

57. **Ministry of Regional Development and Infrastructure of Georgia (MRDI).** MRDI is responsible for elaboration of policy and strategic plans related to developing infrastructure facilities, management construction, rehabilitation, reconstruction and maintenance of the infrastructure of public use of

international and national significance, utilizing funds from the state budget, lawns, grants and other financial sources.

Constructing Contractor

58. After appointment all Constructing Contractors should provide Constructing Contractor's Environmental Management Plan (EMP) developed on the basis of the EEI for the project. The necessity to develop Contractor/s management plan is normally fixed in the Construction Contract. The Constructing Contractor has the following obligations:

- To employ Environmental consultants (persons or company) responsible for developing and implementing the construction phase EMP and for provision of corresponding information to MDF;
- To develop, if required, a Spoil Disposal Plan and Construction Waste Disposal Plan agreed with the MoE and Local government;
- Constriction Schedule;
- The EMP implementation costs should be included into the construction budget.

Other Responsible Governmental Institutions:

59. The Ministry of Culture. The ministry is responsible on supervision of the construction activities in order to protect archaeological heritage. In case if construction is to be carried out in a historic sites or zones of cultural heritage, consent of the Ministry of Culture is also required for issuing construction permit (If such is necessary).

60. **Management Unit for Food Safety and Risk Analyze of the Ministry of the Agriculture (MUFSRA). MUFSRA** is responsible for implementation of complex sanitary protection measures in case of identification of burial sites during earthworks. Information about suspicious burial sites should be delivered to the "MUFSRA" of the Ministry of the Agriculture by the Constructing Contactor (field environmental officer) and RDMRDI field officer.
[Note: Governmental institutions responsible for technical supervision and compliance with the design documentation and construction standards are described in Design Documentation and are not subject for EIA or EMPs]

B.2 Legislation

B.2.1 Framework Legislation

61. The basic legal document is "The Constitution of Georgia", which was adopted in 1995. While the Constitution of Georgia does not directly address environmental matters, it does lay down the legal framework that guarantees environmental protection and public access to information with regard to environmental conditions.

62. Article 37, Part 3 states "any person has the right to live in a healthy environment, use the natural and cultural environment. Any person is obliged to take care of the natural and cultural environment." Article 37, Part 5 states that - "an individual has the right to obtain full, unbiased and timely information regarding his working and living environment."

63. Article 41, Part 1 states that "a citizen of Georgia is entitled to access information on such citizen as well as official documents available in State Institutions provided it does not contain confidential information of state, professional or commercial importance, in accordance with the applicable legal rules.

64. Legislative execution of constitutional requirements in the sphere of environmental protection is implemented through framework Georgian "Law on Environmental Protection" (1996, as amended) and the set of specific laws developed on its basis. The framework law regulates the legal relationship between the bodies of the state authority and the physical persons or legal entities (without distinction-legal form) in the scope of environmental protection and in the use of nature on all Georgia's territory including its territorial waters, airspace, continental shelf and special economic zone. The law deals with education and scientific research in the scope of environment, environmental management aspects, economic levers, licensing, standards. EIA and related issues considers different aspects: protection of ecosystems, protected areas, global and regional management, protection of ozone layer, biodiversity, protection of Black Sea and international cooperation aspects. In particular, the law addresses broad spectrum of issues, like environmental management, environmental education and awareness building, licenses and permits, fines and enforcement, environmental impact assessment, which should be further

regulated by specific laws. According to the requirements set forth in the framework law, numerous laws and normative–legal documents were adopted to regulate specific environmental issues in Georgia. Further below the environmental regulations most relevant to the project – and first of all, to the permitting process – are described.

B.2.2 Other Environmental Laws

65. **The Law on the environmental Protection Service (Agency).** In accordance with the '**Law on the environmental Protection Service** of 2008, an environmental protection control system has been established to ensure the following: (a) state control in the field of environmental protection and ecological systems safety, (2) observance of the proper laws by the subjects of regulation, (3) population's trust in the mentioned system and in state organs, generally in respect of performance of state obligations and transparency in the field of environmental protection. Under the same Law, there has been an environmental protection agency established (on the base of a former environmental protection inspection) and the functions of its employees specified. In particular, they are authorized to accomplish an environmental inspection of the objects of regulation (physical and legal entities, state authority and local self-governing bodies) and monitoring of their activities. Besides, the prerogative of the environmental protection agency is to calculate the damage to the environment to compensate it to the state, put forward the requirement to the objects of regulation to compensate the damage, and in case of non-meeting such a requirement, file a proper appeal before the court.

66. A subject of inspection and monitoring may be the process of building (legal use of resources; environmental pollution, noise and vibration, etc.) and exploitation-related activity (waste management, emissions; safety etc.).

67. Waste Management. The following acts of the Ministry of Labor, Health and Social Protection of Georgia define the waste management rules to be met during the project:

68. The act on "Approval of the rules of collection, storage and neutralization of the wastes of preventive treatment establishments" 16 August of 2001, 300 ("Georgian Legislative Messenger" N90 24/08/2001);

69. The act on "Approval of arrangement of polygon/grounds for disposal of solid household wastes and adoption of sanitary rules and norms" 24 February, #36 (Georgian Legislative Messenger #17, 07.03.03);

The "Georgian Law on Ambient Air Protection" was put into effect from 1 January 2000.

70. The scope of the "Georgian law on Ambient Air Protection" is to protect ambient air on the whole territory of Georgia from harmful human impact. This law does not govern the field of air protection in work places. Main competences of governmental authorities in the field of ambient air protection (a) Development of environmental monitoring (observation) system; (b) Development and implementation of common policies and strategies; and (c) Development of integrated ambient air pollution control.

- Types of harmful human impact include:
- introduction of pollutants into the ambient air;
- radioactive impact on ambient air;
- ambient air pollution with micro-organisms and microbial toxins;
- physical impact of noise, vibration, electromagnetic field etc on ambient air.

- Types of ambient air pollution are specified:
  emission of pollutants into the ambient air from stationary pollution source;
- emission of pollutants into the ambient air from mobile sources of pollution;
- emission of pollutants into the ambient air from non-point sources of pollution;
- emission of pollutants into the ambient air from small-scale sources of pollution.

71. According to the Article 29^{1}, the inventory on emissions of air pollutants from stationary pollution sources is obligatory for physical and legal entities. The special inventory report is to be prepared for 5 years for each source of the atmospheric air pollution and each type of a harmful substance.

72. At preparing the EIA project, a full inventory on emissions (in case of existence) is to be carried out and maximum permissible concentrations or temporarily agreed permissible concentrations of the emitted harmful substances for stationary pollution sites are to be set. Maximum permissible concentration is an amount of permitted emissions of air pollutants from stationary pollution sources. Temporarily agreed permission concentrations can be approved for five years (maximum) without prolongation. The

Maximum permissible concentration of the emitted harmful substances for stationary pollution sites is approved for 5 years for each source of the atmospheric air pollution and each type of a harmful substance.

73. Registration of emissions from stationary pollution sources comprises:

- self-monitoring of emissions;
- state emission registration system.

74. Self-monitoring of emission of pollutants from stationary pollution sources means that economical actor (operator) shall conduct adequate self-monitoring of pollutant emissions from stationary pollution sources. It includes:

- emission measurements (assessment)
- registration of emissions
- reporting of emissions

75. State emission registration system is a system of compilation, processing and analysis of emission reporting documentation. The Ministry of Environment Protection and Natural Resources of Georgia conducts state registration of emissions.

76. The Wildlife Law of 1996 mandates the MoE to regulate wildlife use and protection on the whole territory of the country. The law empowers the MoE to issue hunting permits and licenses, declare hunting areas, control poaching etc. Potential poaching by the workers should be controlled also during construction works, especially in sensitive ecological areas.

Law of Georgia 'On the system of the protected areas' (1996)

77. The Law defines the categories of 'protected areas' and specifies the frames of activities admissible in the given areas. The permitted actions are defined by considering the designation of the areas and in accordance with the management plans and provisions of the international conventions and agreements to which Georgia is a party. As a general requirement, the following activities are prohibited in the protected areas:

- Disturbance or any other changes of the natural ecosystems
- Demolition (destroy), arrest, disturbance, damage (invalidation) of any natural resource with the purpose of its exploitation or any other purpose
- Damage of the natural ecosystems or species by reason of the environmental pollution
- Bringing and breeding foreign or exotic species of living organisms
- Bringing explosives or toxic materials to the area.

78. According to the above-mentioned Management Plan, all kinds of economic and entrepreneurship activities are admissible in the support zone provided they do not hamper the functioning of the protected areas.

Law of Georgia "on the Establishment and Management of Kolkheti Protected Areas:

79. The Georgian legislation on the establishment and management of Kolkheti protected areas is based upon the Constitution of Georgia, Biodiversity Convention, RAMSAR convention and other international agreements and treaties of Georgia, laws of Georgia on "Protected Areas System", "Protection of the Environment", "Wildlife", "Environmental Permits" and "Fossils", this law and other legal and sub-legal acts of Georgia.

80. The main objectives of the law are:

a Support the protection and rehabilitation of the Kolkheti natural or modified wetlands prominent for biodiversity and with the aim to facilitate the continuous development of the natural processes;

b Provide for the protection, rehabilitation and conservation of the biodiversity of the natural ecosystems, landscapes, fauna and flora, especially – gene fund of the endangered wild animals and plants included in the Red List of Georgia within Kolkheti protected areas;

c Support the establishment of the favorable conditions and legal mechanism for the sustainable development of the recreation of the natural and historical-cultural environment, tourism and agriculture within Kolkheti protected areas;

d Provide for the maintenance, protection, rehabilitation and wise use of the land, water, animal and plant world (among them – forests) and other natural resources; protection of the 5 marine mile wide sea waters to preserve ecological balance in the adjacent coastline; establishment of the favorable conditions for education and scientific research-surveys; protection and restoration of historical-cultural landscapes and monuments; protection and monitoring of the natural bio-ecological regime of the water objects within Kolkheti protected areas.

81. The project corridor comprises the following categories of Kolkheti protected areas: a) Kolkheti National Park; b) Kolkheti Multiple Use Area. Kolkheti National Park is 45447.4 ha, of which land surface is 29704.4 ha and sea waters – 15743 ha.

82. Kolkheti National Park comprises the below territorial-functional zones: a) Zone of Strict Nature Protection; b) Zone of Managed Nature Protection; c) Rehabilitation Zone; d) Traditional Use Zone; e) Visitor Zone; f) Historical-Cultural Zone; g) Administration Zone.

Law of Georgia 'On the Red List and Red Book' (2003)

83. The Law regulates the legal relations in the field of developing the Red List and Red Book, protecting and using the endangered species, except the legal issues of the international trade with endangered wild animals and wild plants, which within the limits of the jurisdiction of Georgia are regulated by virtue of the Convention 'On the international trade with the endangered species of wild fauna and flora' concluded on March 3 of 1973 in the city of Washington.
According to Article 10 of the Law,

84. any activity, including hunting, fishing, extraction, cutting down and hay-mowing, except particular cases envisaged by the present Law, Law of Georgia 'On animal life' and legislation of Georgia, which may result in the reduction in number of the endangered species, deterioration of the breeding area or living conditions, is prohibited.

85. Possible harmful effect of anthropogenization on the endangered species should be taken into account when issuing the permit on environmental impact during the ecological expertise.

86. The Red List of Georgia was approved by the Presidential Decree No. 303 'On approving the Red List of Georgia' (May 2, 2006)

87. The Law of Georgia 'On Tourism and resort' and Law of Georgia 'On the zones of sanitary protection of resorts and resort areas' should be considered.

88. **Decree No. 538; There** is a chance that the project activity may cause harm to the environment, which will be impossible to mitigate even through planning and realizing the preventive measures. The rules to estimate and compensate for the environmental damage have been developed for such cases under the Decree No. 538 'On approving the methods to estimate the environmental damage' of the Minister of Environmental Protection and Natural Resources of Georgia adopted on July 5, 2006. Below we site the clauses, which may be useful to estimate the damage within the limits of the project.

- **Article 2.** The rule to estimate the damage caused by the harmful anthropogenic action on the atmospheric air
- **Article 3.** The rule to estimate the environmental damage caused by the soil pollution
- **Article 4.** The rule to estimate the environmental damage caused by the soil degradation
- **Article 5.** The rule to estimate the environmental damage caused by illegal action with forest resources
- **Article 6.** The rule to estimate the environmental damage caused by damaging the green plantations in the capital of Georgia, other cities and towns, regional centers and settlements
- **Article 7**. The rule to estimate the damage caused by damaging the fish reserve and other biological forms
- **Article 8.** The rule to estimate the damage caused by illegal acquisition of the animal life objects **Article 9.** The rule to estimate the environmental damage during the fossil exploitation
- **Article 10**. The rule to estimate the environmental damage caused from the pollution of water resources.

89. The 'Law of Georgia on Cultural Heritage' was approved in May of 2007. Article 14 of the Law specifies the requirements for 'large-scale' construction works. According to this Article, a decision on

career treatment and ore extraction on the whole territory of Georgia, as well as on construction of an object of a special importance as it may be defined under the legislation of Georgia, is made by a body designated by the legislation of Georgia based on the positive decision of the Ministry of Culture, Monument Protection and Sport of Georgia. The basis for the conclusion is the archeological research of the proper territory to be carried out by the entity wishing to accomplish the ground works. The entity wishing to do the ground works is obliged submit the Ministry the documentation about the archeological research of the territory in question. The preliminary research should include field-research and laboratory works. In case of identifying an archeological object on the territory to study, the conclusion of the archeological research should contain the following information: (a) a thorough field study of the archeological layers and objects identified on the study territory by using modern methodologies, (b) recommendations about the problem of conservation of the identified objects and planning of the building activity on the design territory, on the basis of the archeological research.

Georgian Law on Regulation and Engineering Protection of Coasts of Sea, Water Reservoirs and Rivers of Georgia (27.12.2006, No. 4131)

90. Article 9. Rules regulating the economic activity within the coast protection zone

- The body issuing a building permit within the zone of coast engineering protection is obliged to engage the Ministry in the permit issuing process as a concerned administrative body and send it proper documentation for the obligatory conclusion.
- The construction project of buildings and premises within the zone of coast engineering protection should envisage the compensation amounts for the expected coastal damage.
- Extraction of inert material within the zones of strict supervision of sea, water reservoir or river is prohibited, unless this is done for the purposes of coast-formation or control of streams.

B.3 International Conventions and Agreements

91. Georgia is a party to the following environmental protection conventions and agreements:

- UN Framework Convention on Climate Change;
- UN Framework Convention on Climate Change Kyoto Protocol;
- Montreal Protocol on Substances That Deplete the Ozone Layer (also London, Copenhagen and Montreal revisions);
- Vienna Convention for the Protection of the Ozone Layer;
- Geneva Convention on Long-range Trans-boundary Air Pollution;
- Ramsar Convention on Wetlands of International Importance, especially as Waterfowl Habitat;
- UN Rio de Janeiro Convention on Biological Diversity;
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES);
- Convention on Migratory Species;
- Paris Convention on the Protection of World Culture and Natural Heritage;
- European Archaeological Heritage Convention; and
- Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters.

B.4 Environmental and Social Requirements of the ADB

B.4.1 The Asian Development Bank's (ADB) Safeguard Policy

ADB Environmental Guidelines

92. All projects funded by ADB must comply with ADB Safeguard Policy Statement (2009). The purpose of the Policy is to ensure that the projects undertaken as part of programs funded under ADB loans are environmentally sound, are designed to operate in compliance with applicable regulatory requirements, and are not likely to cause significant environmental, health, or safety hazards.

93. Safeguard policies are generally understood to be operational policies that seek to avoid, minimize, or mitigate adverse environmental and social impacts, including protecting the rights of those likely to be affected or marginalized by the development process.

94. ADB's safeguard policy statement (SPS) sets out the policy objectives, scope and triggers, and principles for three key safeguard areas:

- The Involuntary Resettlement Policy (1995);
- The Policy on Indigenous Peoples (1998), and
- The Environment Policy (2002).

95. All three safeguard policies involve a structured process of impact assessment, planning, and mitigation to address adverse effects of projects throughout the project cycle. The safeguard policies require that (i) impacts are identified and assessed early in the project cycle; (ii) plans to avoid, minimize, mitigate, or compensate for the potential adverse impacts are developed and implemented; and (iii) affected people are informed and consulted during project preparation and implementation. The policies apply to all ADB-financed projects, including private sector operations, and to all project components.

96. Affected people are consulted during project preparation and implementation and information is disclosed in a form, manner, and language accessible to them. Safeguard plans are disclosed to the general public and the information is updated at various stages in the project cycle.

97. ADB is committed to the principles of host-country responsibility for measures to mitigate adverse environmental and social impacts. ADB in funded projects shall therefore comply with host-country laws, regulations and standards, as well as requirements by which the host country is bound under international agreements.

EIA and Environmental Screening under ADB Guidelines

98. ADB carries out project screening and categorization at the earliest stage of project preparation when sufficient information is available for this purpose. Screening and categorization is undertaken to (i) reflect the significance of potential resources required for the safeguard measures; and (iii) determine disclosure requirements.

99. ADB uses a classification system to reflect the significance of a project's potential environmental impacts. A project's category is determined by the category of its most environmentally sensitive component, including direct, indirect, cumulative, and induced impacts in the project's area of influence. Each proposed project is scrutinized as to its type, location, scale, and sensitivity and the magnitude of its potential environmental impacts. Projects are assigned to one of the following four categories:

(i) Category A. A proposed project is classified as category A if it is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An environmental impact assessment is required.
(ii) **Category B.** A proposed project is classified as category B if its potential adverse environmental impacts are less adverse than those of category A projects. These impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. An initial environmental examination is required.
(iii) **Category C.** A proposed project is classified as category C if it is likely to have minimal or no adverse environmental impacts. No environmental assessment is required although environmental implications need to be reviewed.
(iv) **Category FI.** A proposed project is classified as category FI if it involves investment of ADB funds to or through a FI (financial intermediary).

100. **Involuntary Resettlement.** ADB will screen all projects to determine whether or not they involve involuntary resettlement. For a project involving involuntary resettlement, a resettlement plan will be prepared that is commensurate with the extent and degree of the impacts.

101. **Indigenous Peoples.** ADB will screen all projects to determine whether or not they have potential impacts on Indigenous Peoples. For projects with impacts on Indigenous Peoples, an Indigenous Peoples plan will be prepared.

102. **Information Disclosure.** In line with ADB's Public Communications Policy, ADB is committed to working with the borrower/client to ensure that relevant information (whether positive or negative) about social and environmental safeguard issues is made available in a timely manner, in an accessible place, and in a form and language(s) understandable to affected people and to other stakeholders, including the general public, so they can provide meaningful inputs into project design and implementation. ADB will post the following safeguard documents on its website:

103. For environment category A projects, draft environmental impact assessment reports at least 120 days before Board consideration;

(ii) Draft environmental assessment and review framework, draft resettlement frameworks and/or plans, and draft Indigenous Peoples planning frameworks and/or plans before project appraisal;
(iii)Final or updated environmental impact assessments and/or initial environmental examinations, resettlement plans, and Indigenous Peoples plans upon receipt;
(iv) Environmental, involuntary resettlement, and Indigenous Peoples monitoring reports submitted by borrowers/clients during project implementation upon receipt.

Environmental Impact Assessment

104. According to the ADB policy, environmental assessment report should include:

A. Executive Summary
B. Policy, Legal, and Administrative Framework
C. Description of the Project
D. Description of the Environment (Baseline Data)
E. Anticipated Environmental Impacts and Mitigation Measures
F. Analysis of Alternatives
G. Information Disclosure, Consultation, and Participation
H. Grievance Redress Mechanism
I. Environmental Management Plan
J. Conclusion and Recommendation

Public consultation

105. In line with ADB's Public Communications Policy, ADB is committed to working with the borrower/client to ensure that relevant information (whether positive or negative) about social and environmental safeguard issues is made available in a timely manner, in an accessible place, and in a form and language(s) understandable to affected people and to other stakeholders, including the general public, so they can provide meaningful inputs into project design and implementation.

106. For policy application, meaningful consultation is a process that (i) begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle; (ii) provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people; (iii) is undertaken in an atmosphere free of intimidation or coercion; (iv) is gender inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups; and (v) enables the incorporation of all relevant views of affected people and other stakeholders into decision making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues.

107. According the ADB policy public consultation process should:

(i) Describes the process undertaken during project design and preparation for engaging stakeholders, including information disclosure and consultation with affected people and other stakeholders;
(ii) Summarizes comments and concerns received from affected people and other stakeholders and how these comments have been addressed in project design and mitigation measures, with special attention paid to the needs and concerns of vulnerable groups, including women, the poor, and Indigenous Peoples; and
(iii) Describes the planned information disclosure measures (including the type of information to be disseminated and the method of dissemination) and the process for carrying out consultation with affected people and facilitating their participation during project implementation.

B.5 Comparison of the National legislation and ADB Requirements

108. The above accounts of national environmental low and ADB policy indicate that the two systems are similar but then there are certain aspects in which ADB policy is more demanding or specified than the Georgian procedure. The main differences are as follows.

109. The Bank's guidelines provide a detailed description of procedures for screening, scoping and conducting EIA and explain a complete list of stages, which are not specified under the national legislation.

110. Considering ecological risk, cultural heritage, resettlement and other factors, the Bank classifies projects supported by them under categories A, B, C and FI. However in the Georgian legislation, EIA is carried out only if a developer seeks to implement projects listed in the Law on Environmental Impact Permit.

This list is compatible with the category A projects of the Bank classification. According to the Georgian legislation EIA is not required in other instances, while Asian Development Bank guidelines requires limited EIA or IEE for the B category projects, and an environmental review of projects that are not expected to produce environmental impacts (category C).

111. Georgian legislation does not specify the format of environmental management plans (EMPs) and the stage of their provision for projects requiring EIA and does not require EMPs for projects not requiring EIAs. The Asian Development Banks guidelines require EMPs for all categories of projects and provides detailed instructions on the content

112. According to Georgian legislation MoE is responsible for monitoring of project implementation and compliance with the standards and commitments provided in the EIA, and the role of the EMP is less clearly is defined.. The PIU or "Project Proponent" is responsible for implementing "self-monitoring" programs for projects requiring EIA. In contrast ADB guidelines stress the role of EMPs, which are important for all categories of projects, and the Project Proponent (in our case – MDF) is required to ensure inclusion of a monitoring scheme and plans into EMPs. Monitoring of performance compliance against EMPs is important element of ADB requirements.

113. The national legislation also does not take into account the issue of involuntary resettlement at any stage of environmental permit issuance. The Georgian legislation considers social factors only in regard to life and health safety (e.g. if a project contains a risk of triggering landslide, or emission/discharge of harmful substances or any other anthropogenic impact). While the Bank's document establishes the responsibility of a Borrower for conducting an environmental assessment, the national legislation provides for the responsibility of a project implementing unit to prepare EIA and ensure public consultation.

114. The role of the Ministry is restricted to participation in EIA consultation and carrying out state ecological examination required for the adoption of a decision on issuing an EIA permit as established under the legislation of Georgia. Under ADB regulations ADB carry out project screening and categorization at the earliest stage of project preparation when sufficient information is available for this purpose, also according ADB's Public Communications Policy, ADB is committed to working with the borrower/client to ensure that relevant information (whether positive or negative) about social and environmental safeguard issues is made available in a timely manner.

115. In regard with consultation: The Bank provides for consultations for A and B Category projects (at least two consultations for Category A projects) and requires a timetable of consultations from the Borrower. The national legislation until recently contained only a brief reference to this issue without providing real tools of its fulfillment. The amendments to the Governmental Decree On the Procedure and Conditions of Environmental Impact Assessment established the requirement of public consultation of the EIA, which obligates a developer (i) to ensure public consultation of EIA, (ii) publication of information, (iii) receive comments within 45 days, (iv) arrange consultation not later than 60 days from the date of publication, invite stakeholders and determine the place of consultation.

#	Action	Georgian Legislation	ADB Requirements
1	Screening	Project Proponent in consultation with MoE	Bank and Consultant hired by Project Proponent
2	Scoping	Not required. Could be conducted voluntarily by Project Proponent.	Obligatory. Bank and Consultant hired by Project Proponent
3	Draft EIA	To be prepared by Environmental Consultant.	To be prepared by Environmental Consultant.
4	Public Consultations	The EIA should be available for public review during 45 days. Publication of information in central and regional mass-media. Arrange consultation not later than 60 days from the date of publication.	At least two consultations for Category A projects – one at the scoping stage and one for the draft EIA.
5	Final EIA	Consider all comments received during public consultations, incorporate accepted remarks and explain rational when the comments are disregarded.	Consider all comments from Bank and public. Agree with the Bank on each raised point. Incorporate accepted public comments and explain rational when the comments are disregarded.
6	Management Plans	No clear guidelines on format, content and timing	Incorporate Monitoring and Management Plans in the EIA.
7	Review and Approval	MoE	Bank and separately - MoE (if the EIA

			is required by Georgian legislation)
8	Disclosure of final EIA	Not requested	Publication (mainly electronic) of the final EIA.

<table 1> Table of Activities and responsibilities in EIA for national law and ADB policy

B.6 Harmonization of the ADB and Georgian Legislation Requirements

116. In order to comply with the both regulations – the ADB and Georgian legislation – the content of the EIA should comprise issues required in both regulations, thus complementing each other. The EMPs should therefore be elaborated in details as required by the ADB regulations. The assessment of the stationary sources of emission (e.g. diesel generators) should be executed according to Georgian regulations: "Inventory of the Stationary Sources of Emission" and "Approval of the Emission Limits". For the category a projects the first public consultation (requested by ADB guidelines but not by Georgian regulations) will be held at the Scoping stage. The second one will be executed according to Georgian requirements. Disclosure will be conducted as required by ADB.

C. Description of the Project

C.1 Category of the Project

117. According to the law of Georgia on Permit on Environmental Impact (2008) the project does not require EIA and obtaining of Permit on Environmental Impact.

118. Following 'Environmental Considerations in ADB Operations' of September 2009, the Project can be considered to be a Category B project requiring an Initial Environmental Assessment (IEE). The Project will not require an acquisition of land and resettlement activities will not become necessary at all. There is no protected area located closely and ecologically sensitive habitats will not be affected.

C.2 Need for Project

119. Anaklia is supposed to become a tourism centre in Georgia. Anaklia infrastructure developments and rehabilitation plan was announced by Government of Georgia.

120. Construction of Anaklia - the main pearl of the Black Sea region has started. The government offers following unprecedented terms for the construction of hotels along the seaside:

- Land, hotel projects and communications with investors will be provided by the government as a present;
- Tax exemption for 15 years,
- New road from Poti (Port on the Black sea) to Anaklia along the seaside.
- The government will lay mineral water to the new resort for free;
- Investors who will construct hotels with more than 100 rooms will receive casino licenses for free;
- Foreign investors will also be offered Georgian citizenship;
- A new airport in Anaklia-Zugdidi Free Touristic Zone will be constructed;

121. Currently Anaklia coastal area built three hotels and Foot Bridge over the river Enguri. Construction of four extra hotels and casino are under operation passé (figure 1).

<Figure 1> Existing and under construction tourist infrastructure near the project area

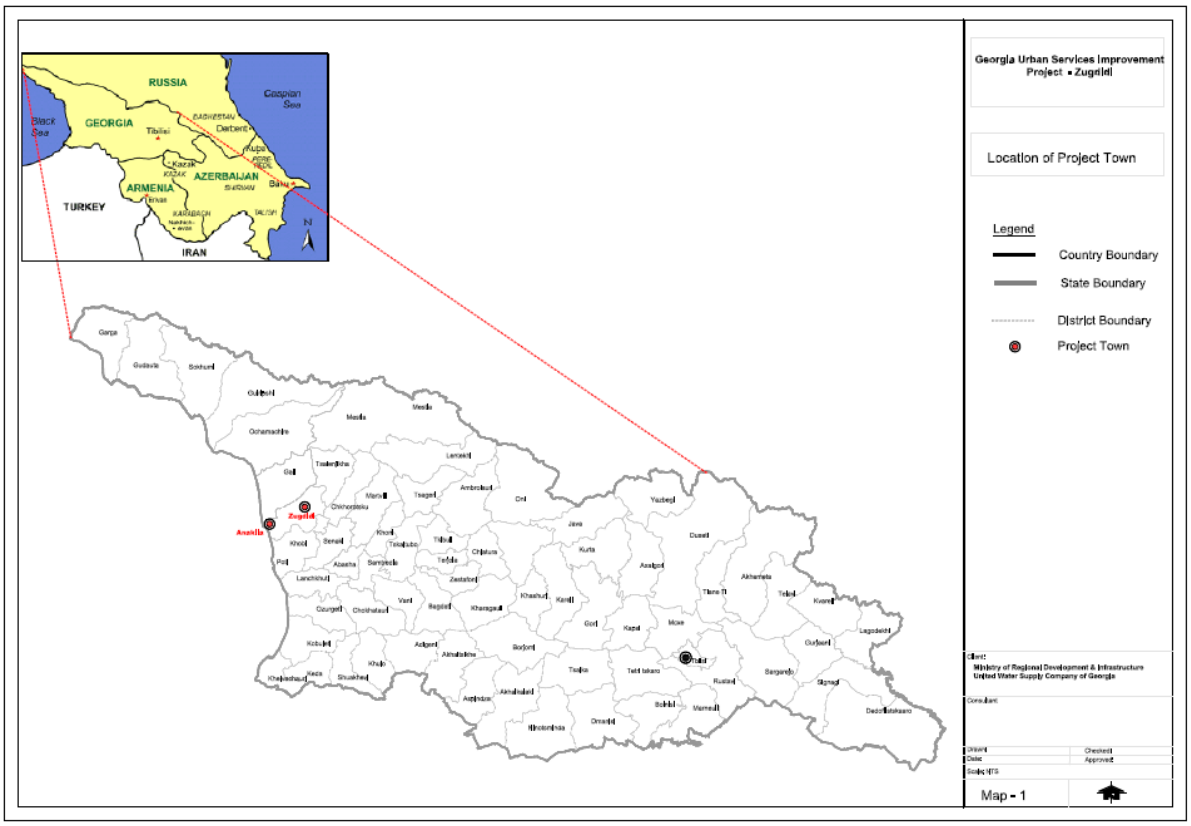
122. Washing out processes take place on various pleases at Georgian Black Sea coastal line and Anaklia is one of them. The catastrophic degradation speed of the coastal line was detained a little by applying of the artificial beach-forming method of increasing of solid sedimentation process. In 1982-1990, the washed out coastal line was shortened. Since 1992 the 'artificial feeding' of the coastal line has been ceased and consequently the washing out processes were renewed at the temporarily stabilized areas. Today this process is seriously destroyed landslides (Figure 2 and 3).

<Figure 2> Erosion of shore at Anaklia beach

123. The prepared design documentation aims at Anaklia shoreline rehabilitation, restoration of the full profile of beaches to the possible limits (which is necessary for wave breaking and suppression of its power and assigns to the beach a function of bank protecting structure), selection of the most optimum types and design of hydro-technical coast protecting structures.

C.3 Project Location

124. **Georgia** is a sovereign state in the Caucasus region of Eurasia Located at crossroads of the Western Asia and Eastern Europe. It is bounded to the west by the Black sea, to the north by Russia, to the south by Turkey and Armenia, and to the southeast by Azerbaijan. The capital of Georgia is Tbilisi. Georgia covers a territory of 69,700 km² and its population is almost 4.7 million.



Map 1: Location of Project

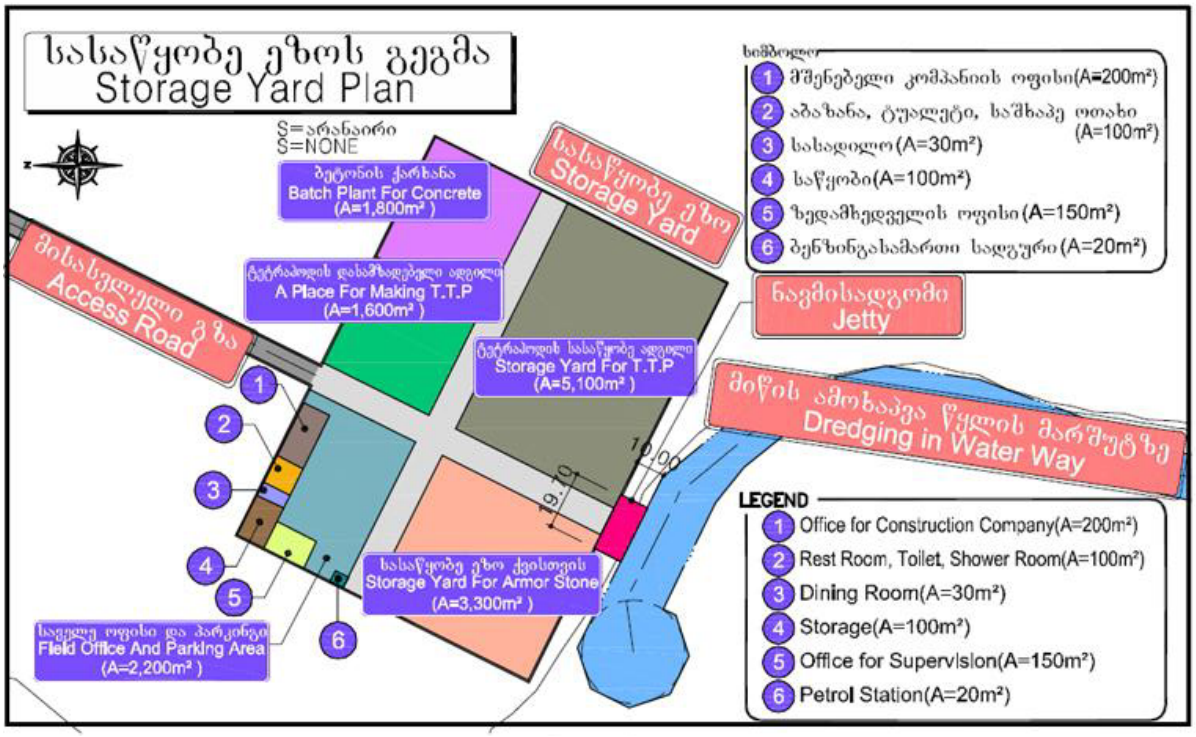
125. Anaklia is a town and seaside resort in western Georgia. It is located in the Samegrelo-ZemoSvaneti region, at the place where the Enguri River flows into the Black Sea, near the administrative border with Abkhazia. With the elevation of 30 m from Sea level Anaklia received the status of the town on August 22, 2011 (See map 1).

126. Project includes constriction of 4 unit of underwater breakwater and Artificial Sand Nourishment of the beach.

127. Underwater Breakwater – consists of 4Units with total length 1,130m. Among them, the length of one section equals 300m and length of the last one – 230m. (Totally 1,130m)

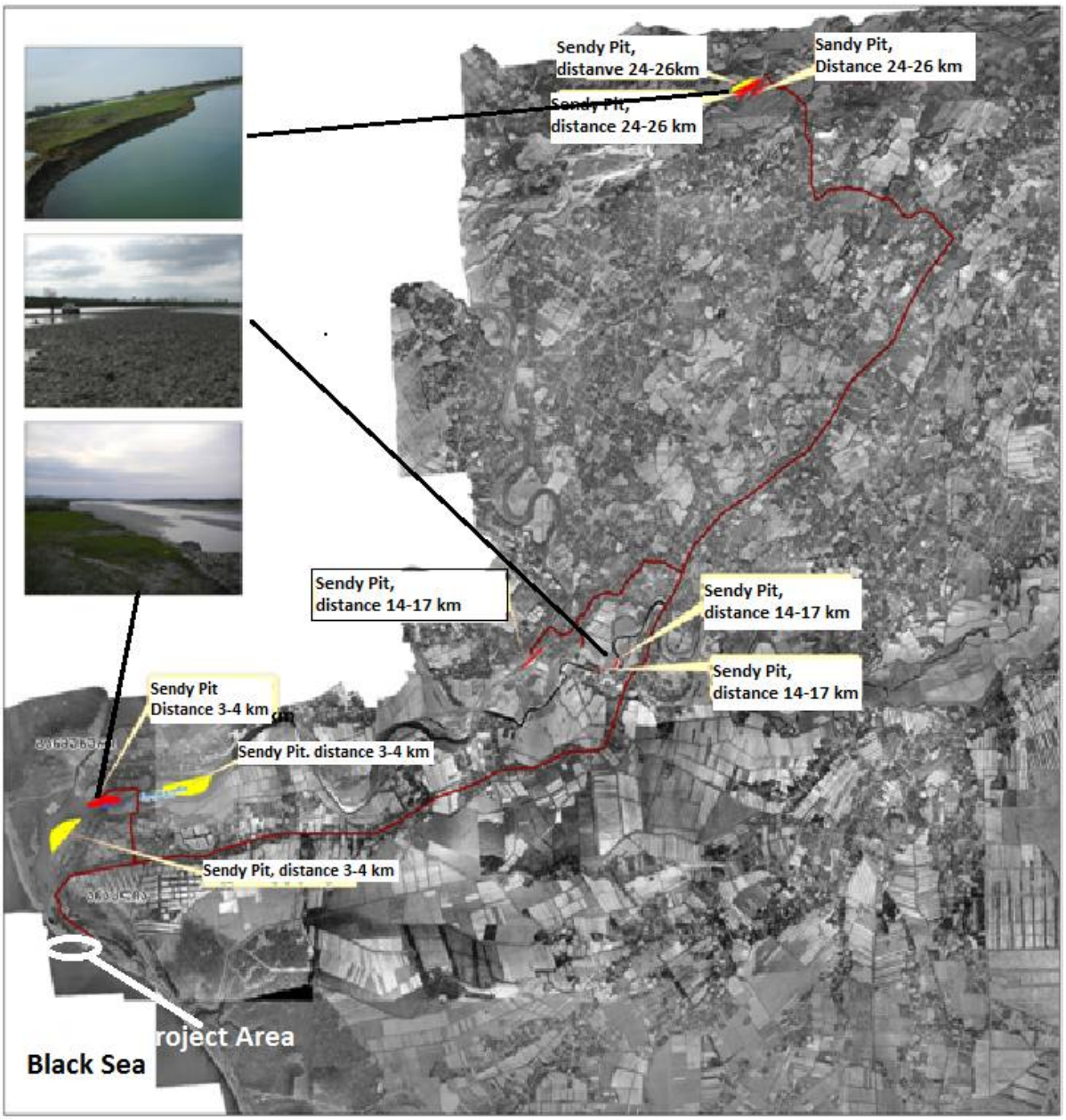
128. Artificial Sand Nourishment of the beach: Length of the beach = 1,430m, Amount of Sand = 97,855 m^3. Total Width of artificial nourishment is designed to be 60m, from beach line to land side - 40m and 20m towards the seaside.

129. Working and storage area had been selected together with head of Zugdidi Municipality, Mr. Alexandre Kobalia and Anaklia Municipality, Mr. Davit Tskhakaia. Taking in consideration many issues (construction process during the touristic season, the close distance to the touristic zone, availability of construction of access roads), it was decided to have mentioned area 900m far from Enguri river.



<Figure 3> Storage year plan

130. Project realization needs to transport large amount of sand materials during construction and operation stages. On the figure 5 designed the licensed sandy pits near project area and excess road for them.



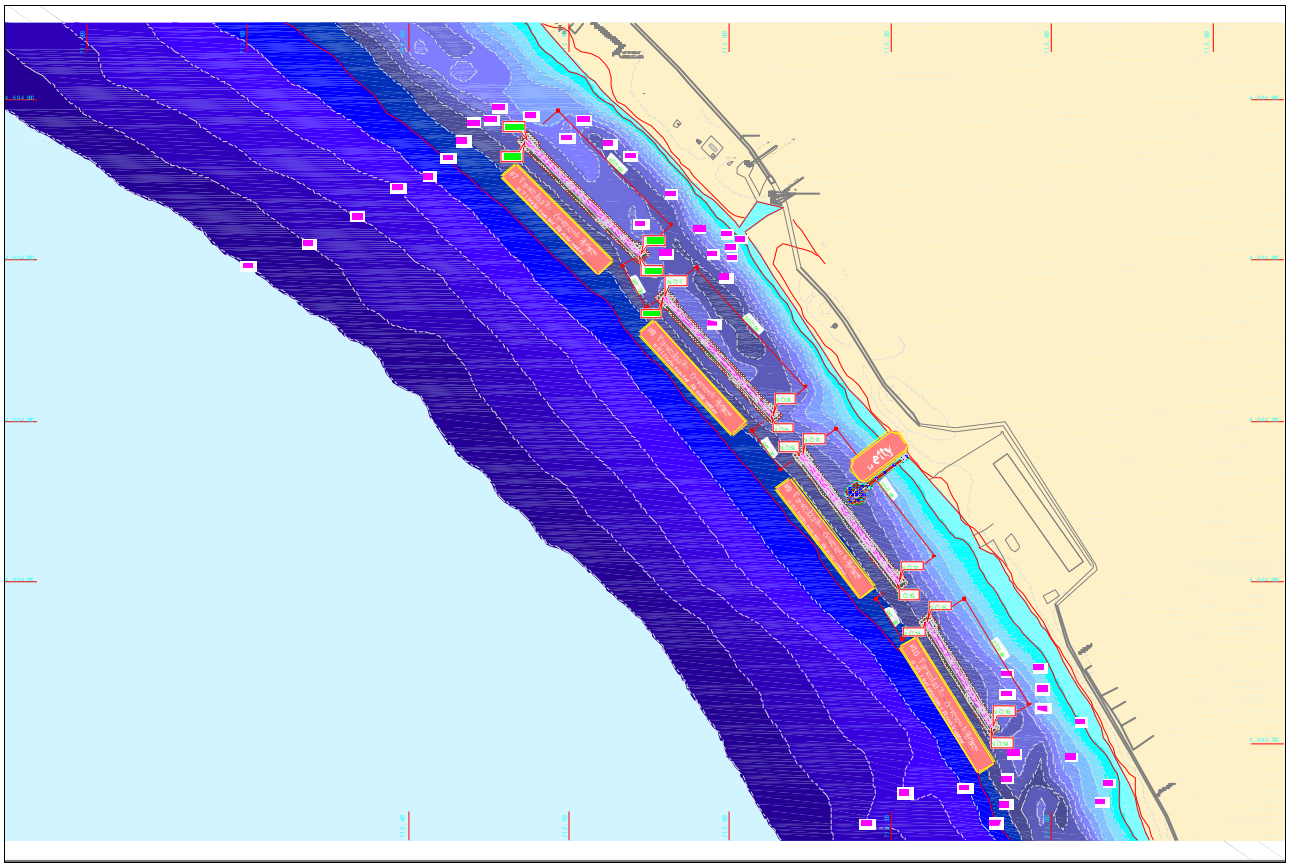
<Figure 4> Location of the sandy pits near the project area

C.4 Project Description

131. The project of coastal protective structure in Anaklia is prepared by South Korean company "Dohwa" and association "Hydrosphere" on the basis of the request of the municipal development fund of Georgia in 01.02.10. Project is financed by Asian Development Bank.

132. Discontinuous underwater breakwater has been selected according to the test of topography Fluctuation. And it is not only effective to circulate water but also can reduce the cost.

133. Plan of layout for the project is shown below.



<Figure 5> Plan of layout of structure

C.4.1 Coast Protecting Hydro technical Structure

134. The beach line point where we start the nourishment works, locates in front of the river Ticori mouth.

135. Our design protective structure for the second stage of the project consists of 4 units. The distance between them is 90m. The length of from first section of underwater breakwaters to third onis 300m and anotheris 230m each. Therefore, total length of underwater breakwater is 1,130m

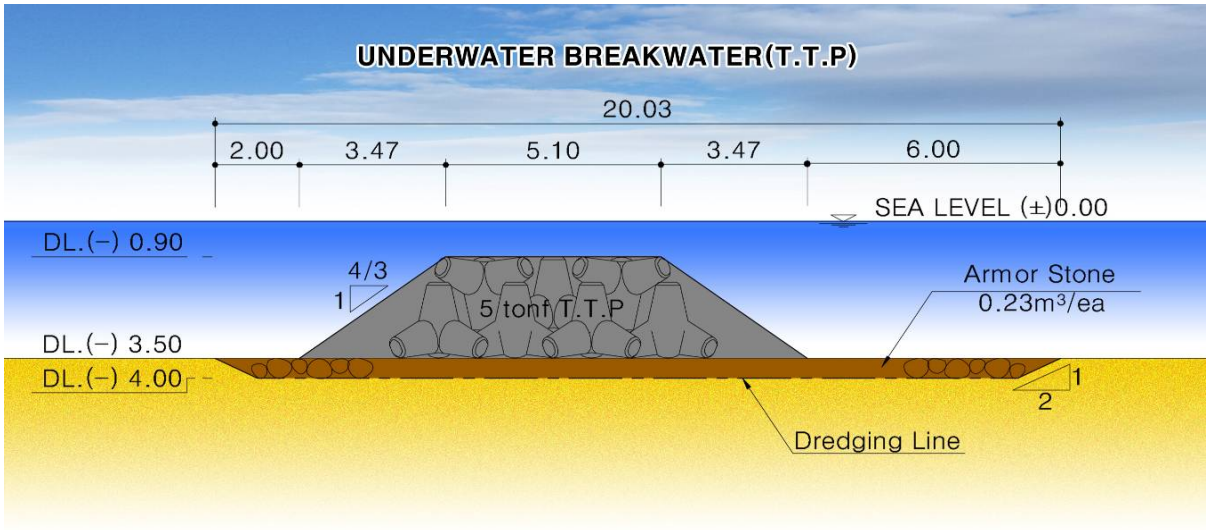
136. All underwater breakwaters are designed to be built with Tetrapod having weigh of 5 t (totally 6,368units).

137. Length of the beach section where it is designed to perform artificial nourishment is 1,420m. Amount of Sand for phase1 is 97,855m^3.

C.4.2 Underwater Breakwater

138. The depth of water for installation of underwater breakwater is DL (-) 3.5m like it was suggested during Preliminary design. Width of underwater breakwater is decided to be 5m according to test of transmitted wave (transmitted wave is 0.55 when upper side of T.T.P is 5m).

Types of Cross-sections (Underwater Breakwater No.7 ~ No.10)



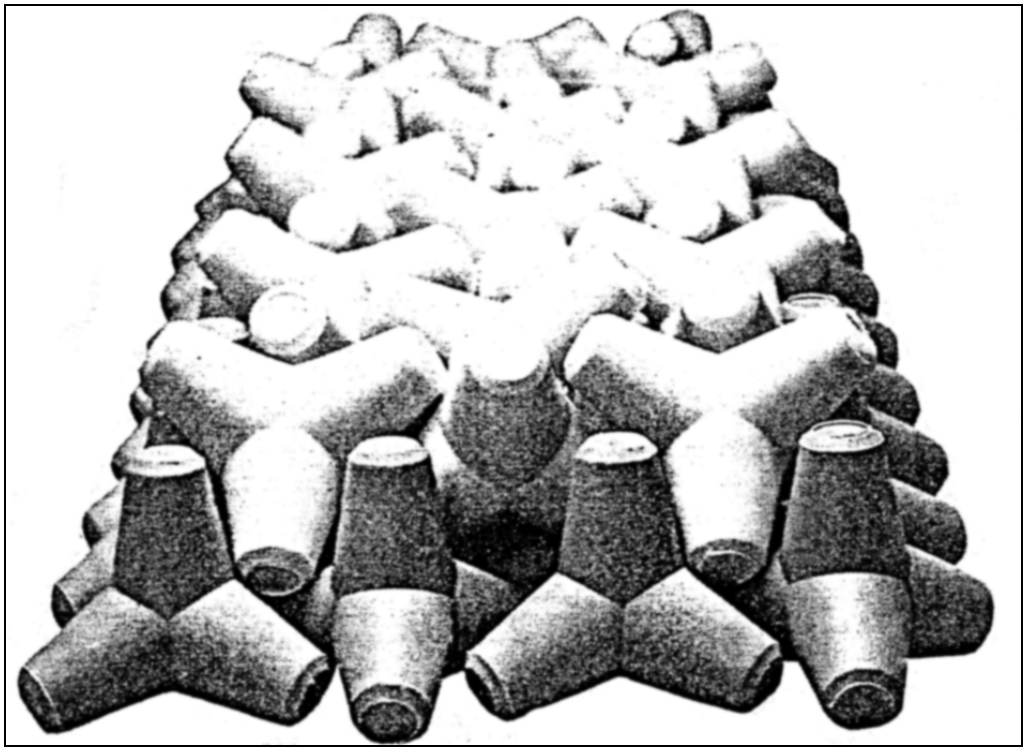
<Figure 6> Types of Cross-sections (Underwater Breakwater No.7, 8, 9,10)

Method of construction of underwater breakwater has to be as followed

Excavation(DL(-)4.0m)→ Placing armor stone (0.23㎥) for scouring, width of scouring work is 6.0m from end of Tetrapod to seaside and 2m to landside..

Crest level of underwater breakwater is planned to DL.(-) 0.90

Shape of Tetrapod is shown in the picture below.



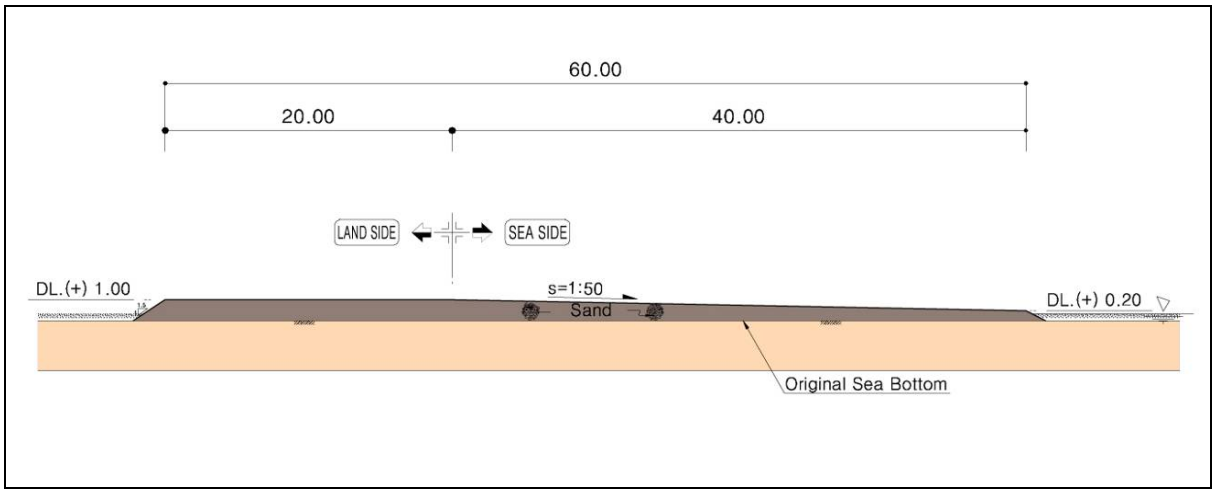
<Figure 7> Formal Type of Tetrapod Placing

C.4.3 Artificial Nourishment of the Beach with Sand

139. Total Width of artificial nourishment is designed to be 60m, from beach line to land side - 40m and 20m towards the seaside.

140. Slope of beach line will be composed with 1:20 when wave comes to the beach, which is filled, into sand which size is more than 0.3mm.

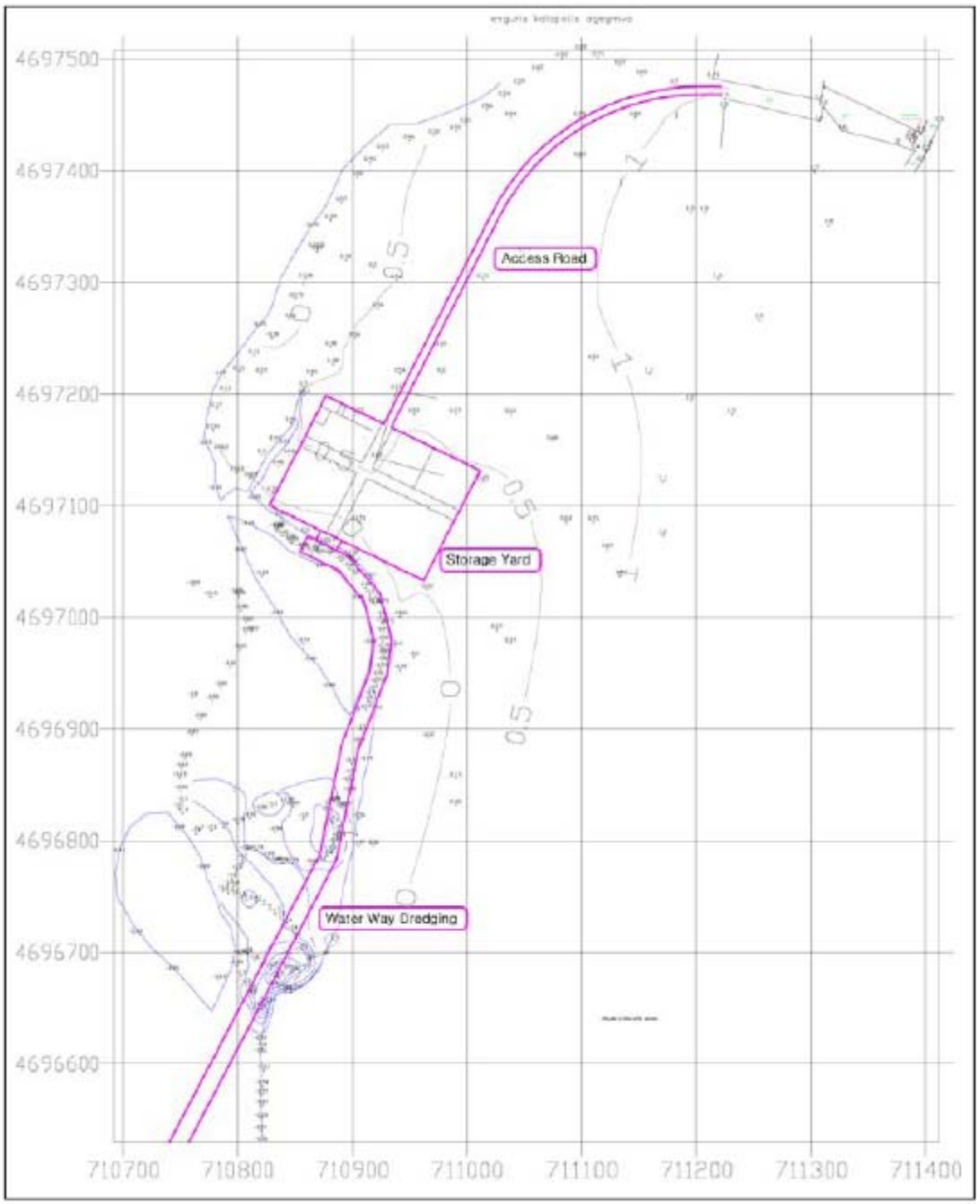
141. Sand recommended to be brought from the sand borrow pit locating in the Enguri river bed (distance is 10km from the working place) by dumper trucks and nourishment works will be performed by bulldozers.



<Figure 8> Types of Cross-section Artificial Nourishment

C.5 Working and Storage Area

142. While visiting Zugdidi and Anaklia for site trips, it was decided by our Project Team to select the Working Yard (for producing T.T.P and for Site offices purposes) and Storage Area and to get an Approval from local Authorities.



<Figure 9> Result of topographic and bathymetric surveys in area for producing of T.T.P and storage of material/equipment

C.6 Proposed Schedule for Project Implementation

143. The official date for completion of detailed design of Stage II can be indicated June, 2012. Bidding documents are already prepared. As soon as the Design will be approved, the bidding will be officially announced by the client (MDF), hopefully, in June 2012. The tendering phase is estimated to consume - 45 days for bidders to submit their proposals, 2 weeks for evaluation of bids, 1 week for non-objection for selected bidder from ADB, 2 weeks for contract negotiations and maximum 28 days for contractor's mobilization on site.

144. The total period of construction of 4 underwater breakwaters (this work considered to include preparation of forms and shaping of concrete tetrapods, transportation and placing them in the sea bottom), beach nourishment with sand is considered to last 6 months. The works will be done at the same time in parallel regime.

Among abovementioned:

- Construction of the seventh section of underwater breakwaters will take 1.5 months;
- Construction of the eighth section – 1.5 months;
- Construction of the ninth section – 1.5 months;
- Construction of the tenth section – 1.5 months;
- Total work for the beach nourishment with sand – 4.0 months

D. Description of the Environment

D.1 Physical Resources

145. Georgia – a country in Caucasus, Eurasia, at the Black Sea coast. Russia borders Georgia from the North, Turkey and Armenia from the South and Azerbaijan from the South-East. Georgia is situated at the crossroad of South-East Europe and West Asia and it is a transcontinental country by its location although it is part of Europe by its socio-political situation and culture (Figure 9).

<Figure 10> Location of Georgia on the crossroad of South-East Europe and West Asia

Territory – total area of the country is 69,700 km^2, total length of its borders is 1,771 km including 1,461 km land border (164 km with Armenia, 322 km with Azerbaijan, 723 km with Russia and 252 km with Turkey) and 310 km coastal border (Black Sea);

- **Religious structure (according to the 2002 census)**: Orthodox Christian 84.0%, Muslim 9.9%, Armenian-Gregorian 3.9%, Catholic 0.8%, Jesuits 0.4%, Judaists 0.1% and etc.

146. Administratively there are 12 administrative units (Figure 10). Each administrative unit is divided into Municipalities (64 municipalities in total). According to the constitution territorial arrangement of the country should be defined after restoration of central authority on whole territory of Georgia.

147. Each municipality represents self-governing unit with homogenous physical-geographic conditions and defined natural boundaries as well as ethnic-cultural characteristics of population and historically established territorial-administrative function.

<Figure 11> Administrative Units of Georgia

148. The project area is located on the territory of Zugdidi Municipality in Samegrelo-Zemo Svaneti administrative region.

D.1.1 Atmosphere

149. According to the climatic zoning of Georgia, the study area belongs to the climatic zone of West Georgia, with subtropical wet climate. The climate is subtropical and is characterized by abundant atmospheric precipitations. Average annual precipitations amount to 1620-1650 mm.

Weather station	abs. height, m	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
Anaklia	3	124	112	108	99	96	128	147	128	149	127	117	123	1458

<table 2> Atmospheric Precipitations, mm

150. Average air temperature is 13.8^{0}C. The coldest months are January and February with the temperatures of -5.4^{0}C and -6.2^{0}C, respectively, and the absolute minimum is -19^{0}C. The hottest months are July and August with the temperatures of 22^{0}C and -23^{0}C, respectively and the absolute maximum temperature is +40^{0}C.

#	Weather station	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual	abs. min.	Abs. max.
1	Anaklia	5,4	6,2	8,6	11.8	16,4	20,2	22,8	22,9	19,6	15,4	11,4	7,2	14,0	-17	39

<table 3> Temperature, ^{O}C

151. The abundant precipitations characteristic to the given region is the result of frequent cyclones. This zone is protected against the penetration of north and north-west cold air masses by the Caucasioni, and the cold air masses penetrating from the north-west get significantly warm when crossing the sea basin and therefore, no sharp variations of temperatures, which are characteristic to other zones of the Black Sea, are observed in this given zone. The following monthly temperatures of air and water and their difference in different months, characteristic to the area under consideration (according to the data of the weather station of the city of Poti) are given in Table 5.

Months	1	2	3	4	5	6	7	8	9	10	11	12
Air t^0	5,2	5,8	8,7	12,0	16,6	20,3	22,9	23,2	19,8	15,9	11,8	7,1
Water t^0	9,8	8,6	8,6	11,0	16,0	20,0	23,7	25,3	22,8	19,1	16,1	12,7
Difference, t^0	4,6	2,8	- 0,1	- 1,0	- 0,6	- 0,3	0,8	2,1	3,0	3,2	4,3	5,6

<table 4> Monthly Temperatures of Air and Water and their Difference

152. We must note that the weather in winter, which is characterized by abundant precipitations and storms, start at the end of November in this region. The periods of penetration of cold air masses in winter are characterized by bulk clouds, thunder, downpours and continuous rains. At the end of winter (at the beginning of March) the cyclone activity decreases and the weather becomes relatively stable and smooth. In summer and in the first half of autumn in the area cold air masses penetrating from north-west and tropical air masses penetrating at high speeds meet.

153. Besides, in the zones where thunder is formed, in the back of cyclones, around the cold fronts, whirlwinds are formed. We should mention that the average number of days with thunder reaches 40 a year.

154. The main direction of winds during the warm season is western and it is eastern in winter, with the average speeds of 4-5 m/sec.

155. The average thickness of the snow cover does not exceed 10 cm and is expected to lie until the middle of March.

156. According to the many-year data, almost no soil freezing is observed in the area under consideration.

157. Air Quality. Ambient air quality monitoring is conducted at only seven locations in Georgia. None of these are located in Zugdidi. There is no air polluting source like industries. Most of the roads in project area are in good condition with considerable tree cover in and around, and therefore dust pollution due to traffic is also very limited.

D.1.2 Radiation Background

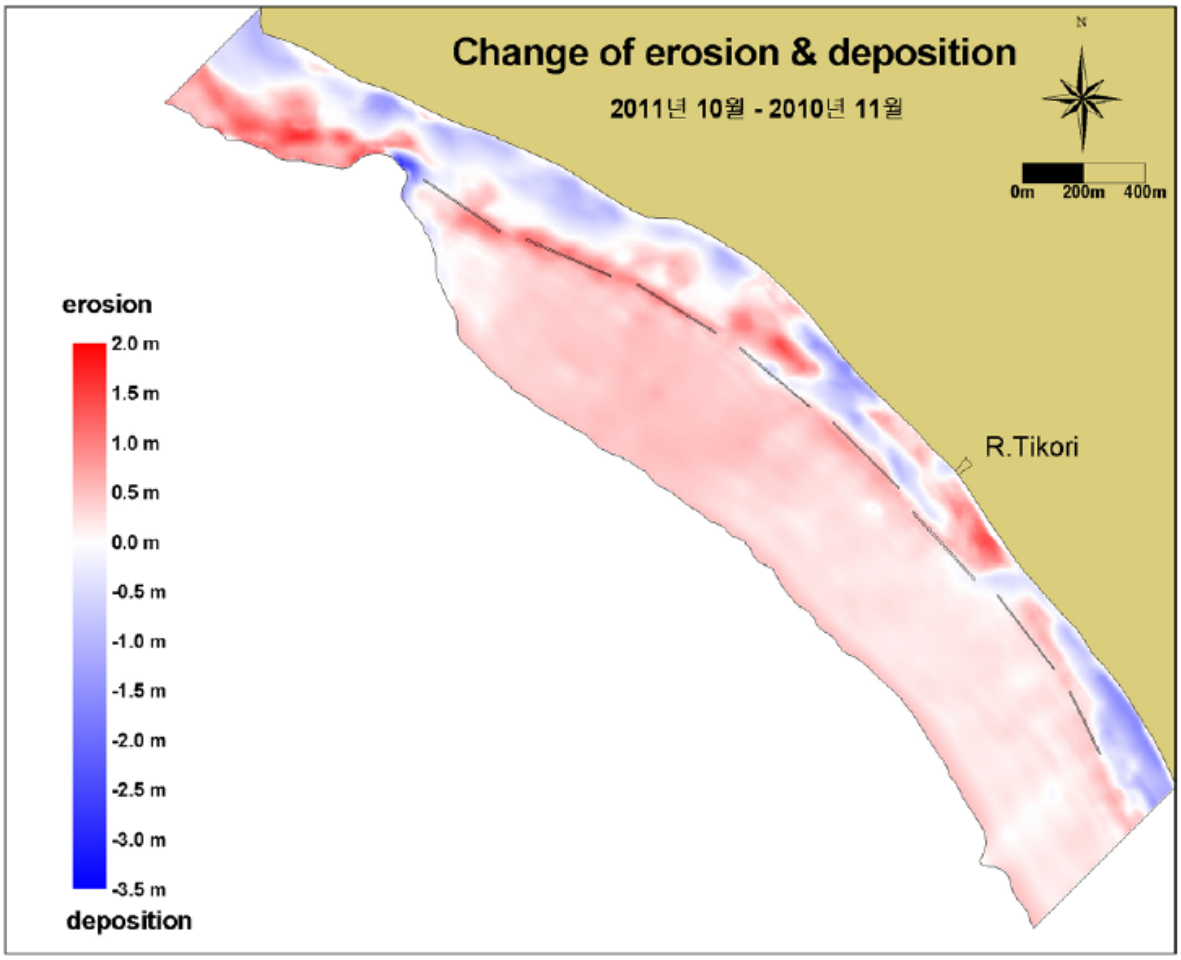
158. Radiation screening has been undertaken for the assessment of radiation baseline. Measures were taken on 03.12.2011 with the use of standard certified Russian device СРП 6801. In Anaklia from the beginning of the project section till bridge crossing area the background radiation was 6-8 micro-roentgen/hour and at Ganmukhuri – 11 micro-roentgen/hour.

D.1.3 Noise Background

159. Background noise levels were identified in vil. Anaklia and vil. Ganmukhuri. Measures were taken on 12th March, 2010 at 12:00-13:00 and 18:00-19:00 (Anaklia) and 15:00-16:00 (vil. Ganmukhuri) using standard certified Russian device ШУм 1М30. Background noise was 38-45 Db.

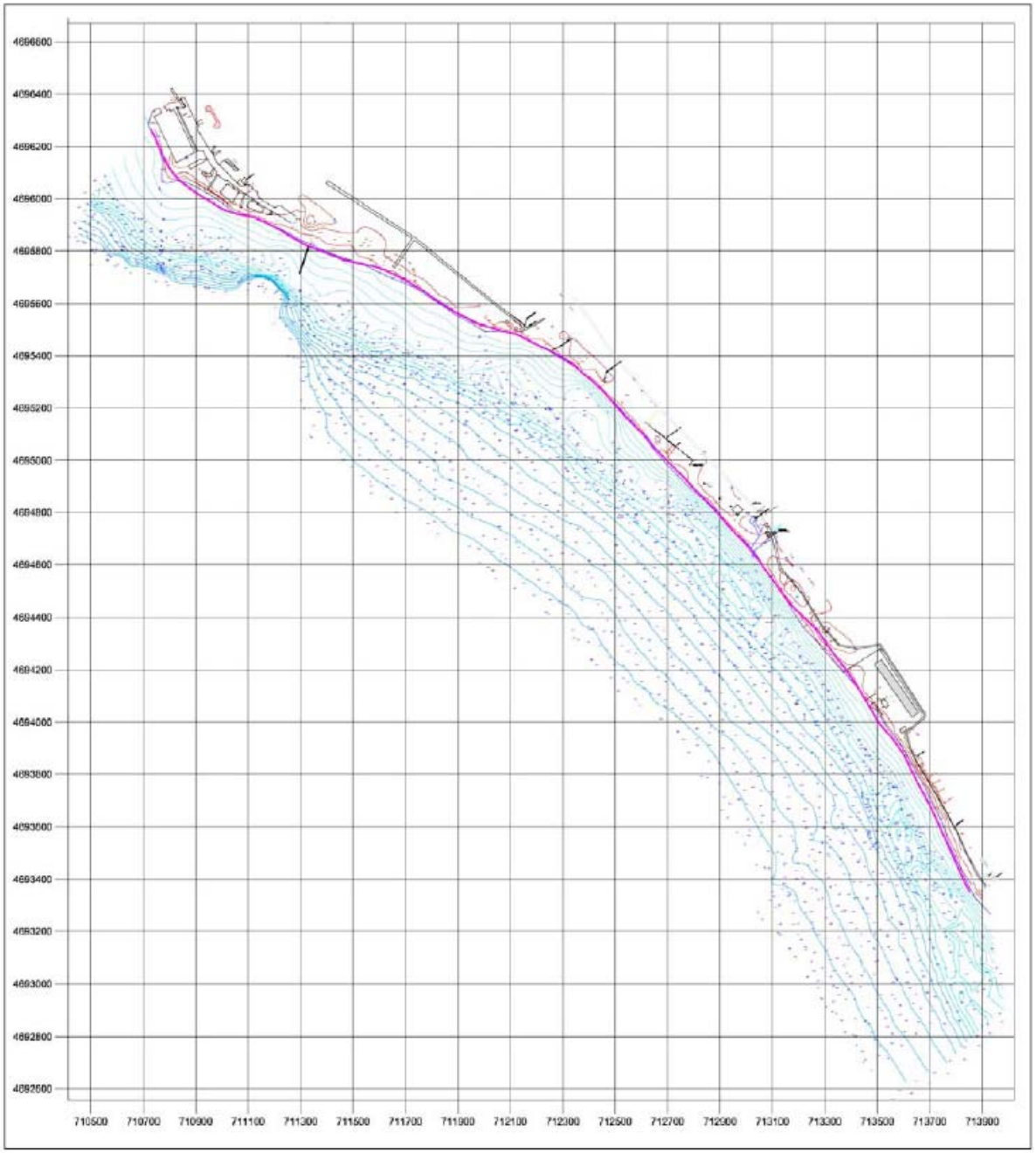
D.1.4 Topographic and Bathymetric Survey

160. Before starting the detailed design In November, 2011, it was decided to carry out complete topographic survey for installation of underwater breakwater and implementing artificial nourishment in our project area. Our project team also did the bathymetric survey till maximum 7m of water depth. Received data are shown in the Fugure 10.



<Figure 12> Comparison of Bathymetric Surveys (2011.11 - 2010.10)

161. According to the data we can figure out that water depth 3.5m which was initially expected to be enough to install underwater breakwater has moved to landside compared when it was investigated in 2010. It also shows that erosion has been increased during last one year. We can mention that erosion process is still progressing if compare bathymetric survey data between 2010 and the present days. Fugure 11 below expresses the mentioned situation.



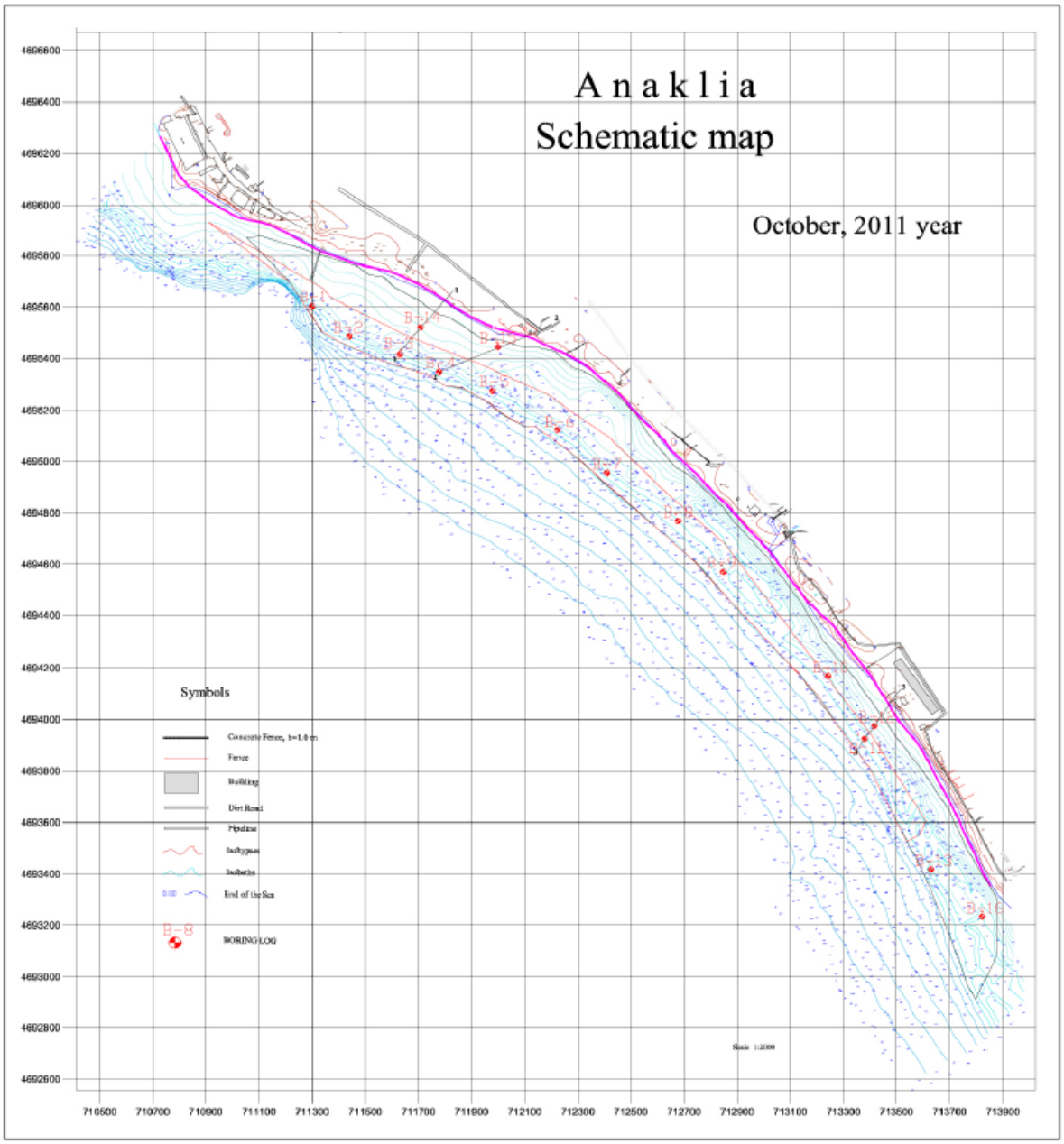
<Figure 13> Result of Topography and Bathymetric study

D.1.5 Geology/Seismology

Geomorphological conditions

162. According to the geomorphological zoning of Georgia (Maruashvili L, 1971), the study territory is located in the extreme western part and northern-western part of Kolkheti Lowland, and according to morphological-genetic factors, there is one principal type identified – the tectonic-accumulative relief of Kolkheti plain lowland, which was formed by filling the eastern bay of the Black Sea with solid alluvium drifted from the zones of Great Caucasioni and piedmonts by the rivers. In the Upper Quaternary and Holocene periods, the alteration of the Continental and marine phases occurred what is evidenced by the layers of the relevant deposits.

163. Project Team carried out geological survey in the area where underwater breakwater and artificial nourishment on the beach are planned to be constructed. Number of geological bore holes BH-8~BH-13, BH-16 are for phase 2



<Figure 14> Result of Topography and Bathymetric study Results of Geological Survey

164. Results of geological survey show that Silt Sand is distributed in the soil from 0.4~0.8m, and layer of boulders is appeared beneath that silt sand in areas where underwater breakwater is going to be installed.

D.2 Ecological Resources

D.2.1 Flora and Vegetation

165. Flora and Fauna of the coastal line Sandy beaches, hot sun, salty water and wind is difficult environment for living of creatures. Waves are permanently washing the sandy beach, because of that reason amount of alive creatures are very fey. We meet sea birds, crabs, and short plants very seldom.

166. Project area is urban area already since many years. Because of human's activities, environments is changed a lot. In addition, during the summer season a lot of tourists come to Anaklia that changes environment.

167. Permanent scoring of the coast is destroying flora and fauna. Anaklia coastal improvement projects aims to protect the beach from the waves. The coefficient of keeping flora and fauna is higher in case of project implementation rather than not to make any construction there.

168. The flora and fauna described beloy located in vicinity of the project area and the project activities vill not have inpact on them.

169. A narrow littoral zone to the north of village (1-1.5 km Distance from the project area) Anaklia is inhabited by the species that are relics of ancient Mediterranean flora. Vegetation of littoral zones is almost extinct on the territory of Georgia due to heavy human impact. Sandy beach is only habitat for a highly decorative Sea Lily Pancratium maritimum that is included into the Red Data Book of Georgia and RDB of the former USSR. Of associates of Sea Lily a mention should be made of Eryngium maritimum, Stachys maritima, Silene euxina, etc.

170. A narrow littoral zone to the north of the Project impact zone is inhabited by the species that are relics of ancient Mediterranean flora. Vegetation of littoral zones is almost extinct on the territory of Georgia due to heavy human impact. Sandy beach is only habitat for a highly decorative Sea Lily Pancratium maritimum that is included into the Red Data Book of Georgia. Of associates of Sea Lily a mention should be made of Eryngium maritimum, Stachys maritima, Silene euxina, etc. The distribution of above taxa within the Kolkheti Protected Areas is restricted to the littoral zone and reduced because of the anthropogenic pressure.

171. During the sand transportation from carriers to project area together with endangered species and sensitive habitats (sites) having different conservation value special attention is given to forested areas and the urgent necessity to mitigate the residual impact on forest ecosystems is emphasized. In case where a residual impact is identified in these areas, the eco-compensation measures should be undertaken which imply the rehabilitation/restoration of the equivalent forest habitats. In case of residual impact on wetland habitats as it is promoting extension of the surface water area and such areas become forever lost for the useful land fund. Although wetland vegetation on the surface water ecotypes is re-developed and peat accumulation takes place, it takes thousands of years to fill up these voids with organic mass.

<Figure 15> Sensitive zones around the project area

D.2.2 Seabed System

172. The depth of the Black sea is 220m average. .Only top layer of 100m contains oxygen and having alive elements relatively, sub layer is almost dead layer – it is poisoned with sulphate hydrogen..

173. The east coast of the Black sea where the project territory is located is relatively poor with micro fits compared with other coastal regions due to existence of sandy material. Totally 113 kinds are known (38 % among total amount of micro fits of the black sea). Mostly we meet red and black water plants.

174. Amount of water plants reduces according to the depth of the sea. Maximum amount of water plants grow in the depth of 2-3m.

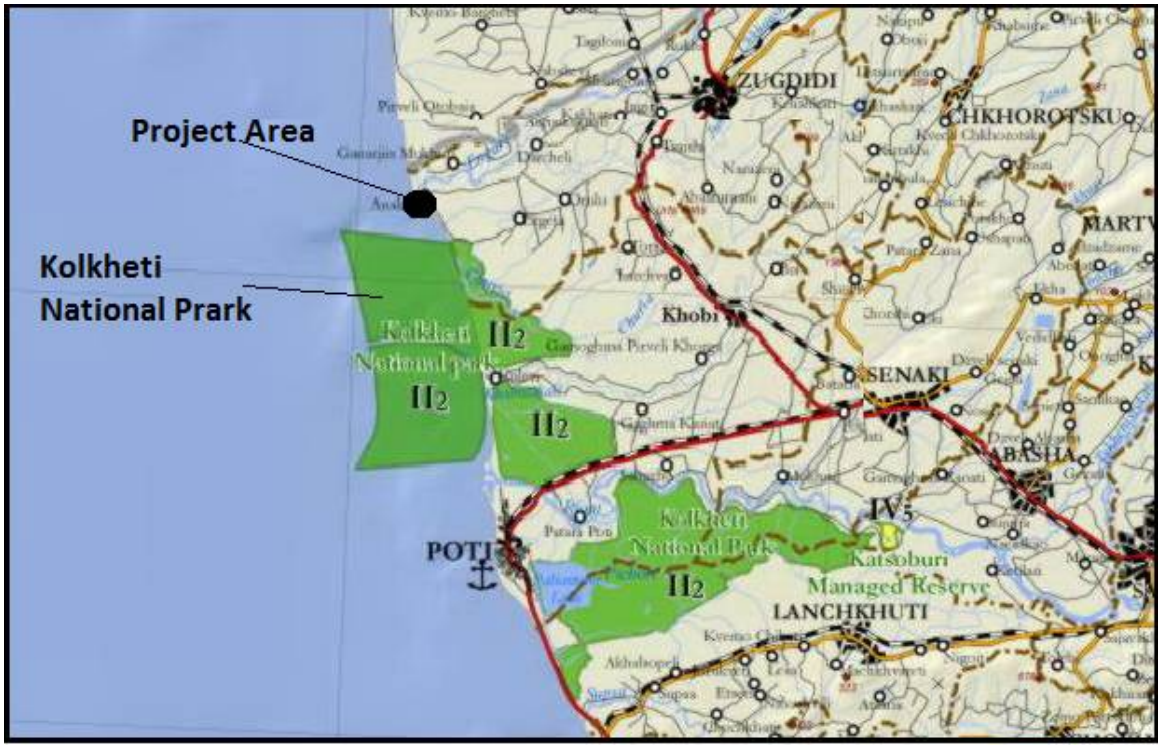
175. Project territory is also very poor in regards of fish kinds. We meet only the kinds that are typical for sandy bottom.

176. During the project implementation period, the sea plants that grow in the line of construction will die, but as we mentioned already, the amount is very slight as for kinds as for amount. Of course it will not make any destruction of water plants as the similar plants grow on several km distance in the sea.

177. During the project implementation period variety of fish living in the territory of project area will move in the vicinity and will be back after the completion of the construction.

D.2.3 Protected Areas

178. Historically protected territories in Georgia were established in woodlands, because of it peculiarities and sensitiveness for human impact. The strict natural reserves became key-point in nature conservation in Georgia. Existed system mainly demanded on strict protection of areas and their isolation from local population. Except nature keeping works in the existing reserves are permitted scientific researches.



<Figure 16> Location of Kolkheti national Park

179. Georgia acceded to the Convention on Wetlands (Ramsar Convention) on 7 February 1997 and two sites, known as N°893 "Wetlands of Central Kolkheti" and N°894 "Ispani II Marshes", were included in the Ramsar List of Wetlands of International Importance.

180. Site N°893 "Wetlands of Central Kolkheti" covers a total of 33,710 ha (55,500 ha including the marine part). This site consist of three distinct peat bogs: Churia, Nabada and Pichora-Paliastomi with Paliastomi and Imnati lakes, rivers, swamped forests and coastal Black Sea areas as well as the mouths and lowermost parts of Khobi (or Khobistskali) and Rioni rivers. The site located in the central part of the Black Sea coastal plain, within the administrative regions of Khobi and Lachkhuti and the territory of the city of Poti. Local population is high depended of resources of the area. Human activities include agriculture, timber cutting for fuel, fishing, hunting, tourism, and peat extraction (in past).

181. The site is rich in relict and endemic flora and fauna species. The mires vegetation consists of typical bog and peatland species, what is not typical for subtropical climate areas. The freshwater marshes are supporting reedbeds and brackish areas supporting halophytic plants. Waterbirds species in plenty are using the site for wintering and as a stop over site during passage. A few nesting species are occurring here in internationally important numbers, including the raptor - white-tailed sea-eagle.
The distance from the project area to north border of Kolkheti national Park is 6-7 km forever the project activities will have no impact on the national park's biodiversity.

D.2.4 Surface Water and Groundwater

Baseline Conditions

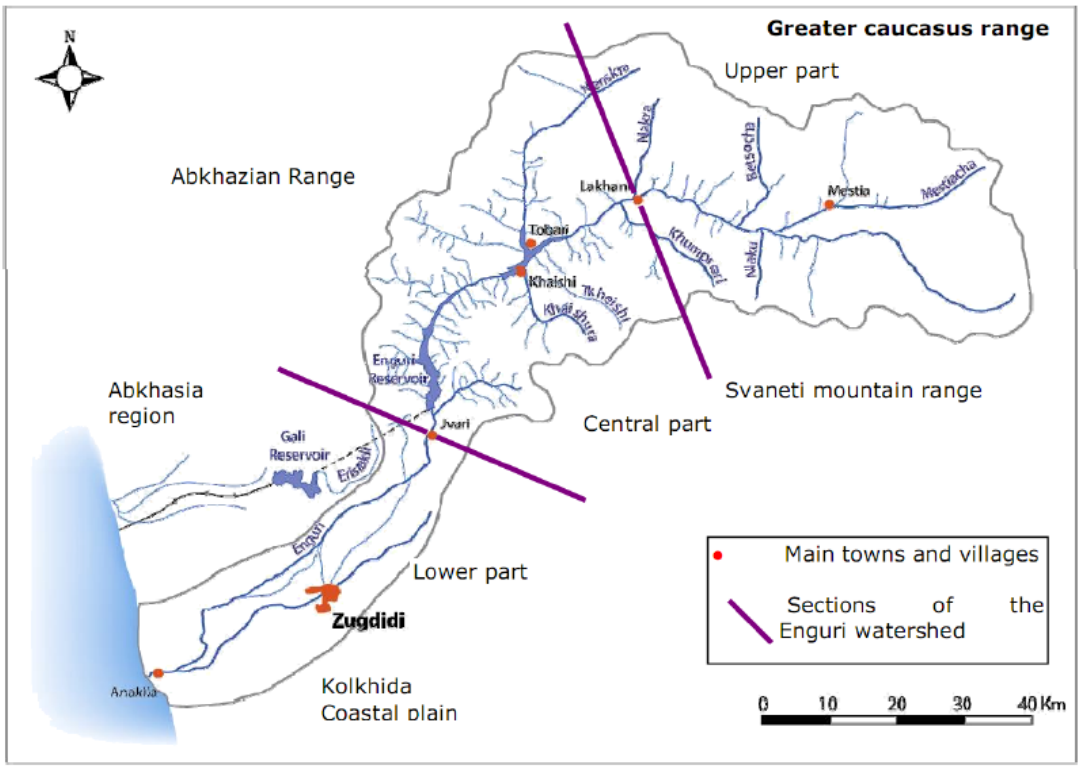
182. Surface Water. Georgia is rich in water resources; there are in all 26,060 rivers with a total length of ~ 59,000 km. Besides, there are many thermal and mineral water springs, lakes and man-made water reservoirs. These however are distributed unequally, with major concentration in the western part of the country. Nearly all rivers of East Georgia flow into the Caspian Sea while and the rivers in the west join the Black Sea. The project area is located in 1400 m from mouthe of the river Enguri.

183. Originating from Namkvani Glacier in Greater Caucuses Range and flowing into Black Sea in the west, the Enguri is one of the biggest rivers in Georgia. It traverses a distance of 213 km, during which it is joined by a number of small and large streams/rivers. River flows through hilly region in the upper parts, before the Enguri Dam at foot hills.

184. Uppstream of the river there is Enguri Dam, on River Enguri, just upstream of Dzvari Town. This is a hydropower dam, and is the world's highest concrete arch dam.

185. The river is fed by glaciers, snow and rainfall, and experiences floods during the warm seasons and lower flow in colder periods. In July-September flow is very high, caused both by snow melting and the rainfall. As show in Figure 1, generally water level in Dam is high in July-August (summer) and minimum in March-April (winter). In the last 10 years, water level in the Dam has always been above the requirement for power plant diversion channel, except in April-May 2006, which recorded a lower level of 389.86 m. It shows that he dam holds good volume of water throughout the year.

186. The river is divided into three parts as shown in Map below. Due to steep slopes in the upper portion, the river is deep; flow is turbulent and carries heavy loads of silt, which accumulates in Enguri Dam on the foothills near Dzvari Town. The river is wide and shallow in the lower reaches.



<Figure 17> Enguri River Basin

187. *Aquatic Life in River Enguri*. A total of 35 fish species were recorded in the Enguri River System and are divided into four groups according to their eco-biology and distribution along the Enguri River System.

(i)Amphibiotic migratory species: The species of sturgeon (*Acipencer sturio, A. stellatus, A. gueldenstaedti colchicus and Huso Huso*) are anadromous species with a life cycle between the Black Sea and the lower Enguri River. The Enguri Dam is a barrier for migration.

(ii) Euryhaline species: They are found in the lower part of the Enguri River, up to the mouth and comprises of Mullets (*Mugil cephalus*, and *M. auratus*), Pipefish (*Syngnatus nigrolineatus*); Round Gobbies (*Neogobius cephalarges* and *Neogobius melanostomus*) and Three-spined Stickleback (*Gasterosteus aculeatus*). These species are specific to the estuary and the lower reaches of the river.

(iii) Lower river freshwater fishes: these species form the community of the lower part of rivers with large bed and low current. Some of them are present in the Enguri Reservoir too. These include: Carp Bream, White Bream and Russian Bream (*Abramis brama, Blicca bjoerkna* and *Vimba vimba*), Common Carp (*Cyprinus carpio*), Rudd (*Scardinius eurythrphtalmus*) and Chub (*Leucosiscus. boristhenicus*), Common Bleak and Danube bleak (*Alburnus alburnus* and *Chalcalburnus chalcoides*), Bitterling (*Rhodeus sericeus amarus*) and Asp (*Aspius aspius*).

(iv) Upper river fishes: These species are living in mountainous river courses with high currents, gravels and oligotrophic conditions. The common species are truite, Salmo trutta with a form living in reservoirs (*Samo trutta morpho labrax*). Among them are cyprinids including the Crimea Barbel (*Barbus tauricus escherichi*), Colchic nase (*Chondrostoma colchicum*, endemic to colchic rivers), Chub (*Leuciscus cephalus*), Minow (*Phoxinus phoxinus colchicus*) and Gudgeon (*Gobio gobi*).

188. There is no commercial fishing activity, even at a small scale, in the Enguri Reservoir or in the river. The fish and biomass in the reservoir is said to be very poor, and the attempts to restock with commercial fish species failed in the past. Only species like trout are found.

The river Tikori

189. The beach line point where will be started the nourishment works, locates in front of the river Ticori mouth.

190. The river Tikori heads 2 km east of village Anaklia, in the marshes in the ash forest with the same name, at about 2,5 m altitude and flows into the Black Sea 2,7 km south of the Engurimouth. The length of the river is 3,4 km, it total fall is 2,5 m, and its mean slope is 0,74 43 ‰. The area of the river catch basin is 11,7km2. The main tributaries of the river are the Didi- Gala and PataraTikori. It is a water intake of the drainage networks over the areas of the villages Anaklia, Didi-Nedzi, Orulu and Ergeta.

191. The river bed under natural conditions is of ground. Its width does not exceed 30-35 m at the mouth and its depth is 1-1,3 m. The current speed is very little because of flooding by the Sea. It should be noted that it is planned to construct the sea port in the present natural bed of the river Tikori and adjacent territory with the length of 3,2 km and width of 0,7 km according to the

192. preliminary design.

193. It should be considered that the mouths of the above-described small rivers during the rough sea are often sealed with the solid matter drifted by the sea waves. This causes flooding of the rivers and rise of water level in river beds. In such a case, a river tries to find a weak spot over the Sea dune to open a new mouth and flows into the Sea. The distance between the existing and spot of an expected mouth after the rought Sea may vary from several meters to several hundreds of meters.

Maximum Levels of the Black Sea

194. In order to fix the present water levels of the Black Sea, many researchers have developed the hydrological balances and the data of multi-year observations of the sea hydrological posts of Batumi and Poti have been used. The accomplished studies demonstrate that the incoming portion of the Black Sea hydrological balance exceed es the discharge portionby 2-3 km3-causing the rise of the Sea levelby 4,7-5,0 mm annually. At thesame time, the Sea levelrises in parallel to the rise of the world ocean level. This process is intensified by the heat and dense omento of anupper 120-140-m-thick biologically active layer of the Black Sea withits role in increasing the Sea wáter level constituting 70%. The set of the above-listed events has causedtherise of the Sea level at thevelocity of 1 cm per annum in recent 20-25 years. The same studies provethat the mean level of the Black Sea at presents lightly exceedes the 0,00 m leve linstead of -0,40 m fixed on top ographic maps.

195. The peak discharge values of differ entprovisions of the Black Sea are taken from the reference book "Extreme values of thewaterlevels at the sea coasts and rivermouths of theUSSR" giving the maximum levels of the Black Sea omen to the data of observation of Poti post from Green Cape to the mouth of tehriver Kodori.

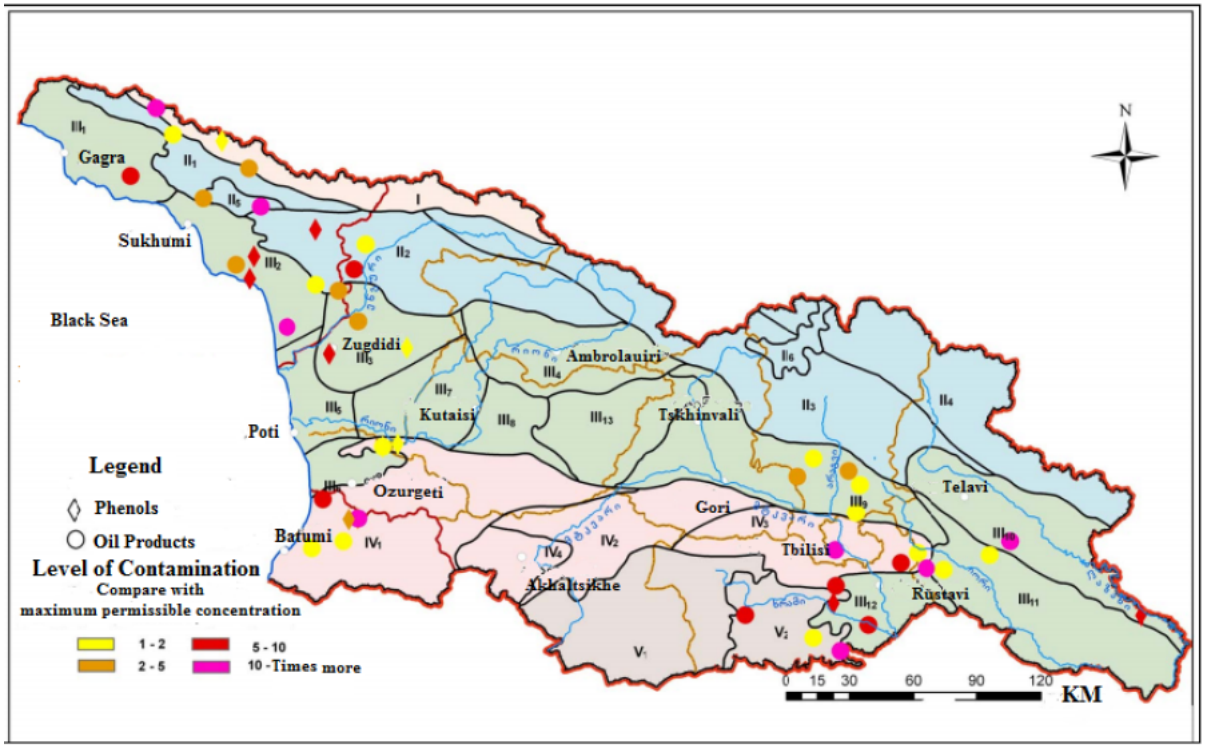
196. Its hould be noted that by the omen to of calculation of the Sea peak discharges given in there ference book, the average level of the Black Sea was fixed at -0,40 m. As the level of the Black Sea increases, the levels fixed in this reference book are attached to the present average level of the Sea, which is fixed at 0,00 m.

197. It should also be noted that the absolute máximum level of the Black Sea in February of 1998 wasfixed at 1,29 m abs. Fixed by Poti post.

198. Unfortunately, there is no information about the levels of the marsh waters.

D.2.5 Groundwater

199. Based on the groundwater characteristics, Georgia is divided into five hydro-geological zones, which are further defined into sub-zones/districts. Project area, Zugdidi is in Zone – III (Artezian basin zone of Georgian belt) and in hydro-geological district- III_3 (Fractured and fractured/karstic artesian basin of Samegrelo) (Fugue 21). The water in this artesian zone is abundant, and towards the coast the utilizable groundwater is limited. The depth of groundwater is about 5 m and towards the coast it is between 1-2 m. Groundwater in the densely populated areas shows the presence of Nitrogen compounds - nitrates, nitrites, and ammonia, mainly due to leachates from poor sanitation systems.



Map 26 Hydro-geological Zones

D.3 Economic Development

D.3.1 Industries

D.3.1.1 The sector structure of the municipality economics is represented as follows: agriculture, industry, construction, transport, trade, hotel and restaurants, other sectors. The largest share in the sector structure of the municipality belonged to construction – 25 % in 2009. It was followed by agriculture – 23 %. It is noteworthy that 7 % of the sector economics belongs to hotels and restaurants.

200. Main profile product types are as follows: hazel nut, wheat flour, inert material, tea, bread and bakery. Goss municipal product per capita is 1845 GEL. There are 17 working small enterprises in Zugdidi municipality. A bit more than 527 people are employed in these enterprises. According to 2009 situation, the total cost of the produce of the mentioned enterprises was 26.6 million GEL. Some of the enterprises are temporarily stopped or work seasonally. The main problem is outdated equipment and lack of investment.

D.3.2 Infrastructure Facilities

D.3.2.1 Sewerage System

201. The total length of sewerage system of Zugdidi is 65 km. 3000 thousand m^3 of waste water flows into the sewerage annually. Sewerage does not provide for the full servicing of the town (42 % of the population not connected to the sewerage). The modernization and extension of the system is necessary. The system does not have treatment building.

Water Supply System of Zugdidi Municipality

202. Water supply is facilitated through three systems within Zugdidi municipality:

- 1. Boreholes;
- 2. Individual wells;
- 3. Village water pipes outside the system.

203. It should be noted that the length of the internal water supply system of the town is 120 km, which have not functioned since 1993. 60 % of the population are connected to the water supply system and the source of their water supply is 4015 functioning artesian wells.

D.3.2.2 Cleaning and Landfill

204. Zugdidi municipality has a working landfill within vil. Tchitatskharo. Its area is 6 ha. It is located in 10 km from the town center and in 2 km from the nearest settlement. Up to 40-45 thousand cubic meter of solid household and construction waste is disposed at the landfill annually.

205. At present the functioning landfill polygon is almost overfilled. As ground waters are present and proceeding from the specific nature of the soil disposed waste cannot be composted-buried, ecological situation in the landfill is unsatisfactory. Proceeding from the above the functioning landfill does not comply with modern requirements.

206. New landfill complex is being built on the area of former landfill of vil. Tsatskhvi. The area of the landfill is determined up to 10 ha. Processing and recycling objects are planned to be allocated in the area. Appropriate equipment for transportation of increased volume of household waste and treatment on place will be purchased.

D.3.2.3 Transportation

207. Central railroad of Georgia passes the municipality. Railway stations within the municipality are: Khamiskuri, Tsaishi, Ingiri, Zugdidi. Highway towards Abkhazia also traverses Zugdidi municipality (Tbilisi-Sokhumi highway).

208. According to the recent situation, 31 internal city and 56 suburban regular passenger routes function within Zugdidi municipality. 59 buses service internal city routes daily. 13 of these buses are medium and

46 small capacity. “Municipal Transport” LLC has been established, which facilitates passenger servicing with Bogdan brand comfortable autobuses and cheaper fares for internal town and suburban routes.

209. 4 bus terminals and 3 bus cash-desks function in the city. Route buses are connected with the above proceeding from the direction of the route. Passengers are transported to all large cities of Georgia outside the municipality. It is noteworthy that the number of passengers transported by auto vehicles have decreased recently, which is mainly caused by increase in cost of travel to Tbilisi and population prefers to travel by train.

D.3.2.4 Roads

210. Total of 591 km of roads are registered within Zugdidi municipality. 351 km is black (asphalt) covered roads and 240 km – gravel roads.

211. As we can see, major part of the roads (40.6 %) is graveled and requires asphalting. It is noteworthy that the conditions of the internal roads have significantly improved. With central and local budget funds the internal village roads have been repaired, the fund of municipal development financed asphalting of Ingiri-October-Kakhati and Kakhati-Koki-Orsantia roads as well as asphalting of the town streets. The process is being undertaken now.

212. The length of road by categories is as follows:

- 1. roads of international importance – 25 km, of which 25 km is covered with asphalt-concrete;
- 2. roads of internal state importance – 120 km, of which 120 km is covered with asphalt-concrete;
- 3. roads of local importance (except for roads in the town) – 276 km, of which 115 km is asphalted and 161 km – graveled.

213. As regards the condition of the internal town roads, the total length of internal roads and streets of Zugdidi is 170 km, of which 91 km is asphalted, 79 km graveled. Up to 80 pedestrian and automobile bridges re located within the municipality. Their total length is 1600 m.

214. Four main construction organizations build roads and bridges of municipal importance within Zugdidi municipality.

D.3.3 Agricultural Development, Mineral Development, and Tourism Facilities

D.3.3.1 Agricultural

215. Agro-climate conditions are fairly favorable for multi-sector and highly profitable agricultural production, especially – for the development of such fields as hazel nut growing, maize growing, tea growing, sub-tropical crop production (citruses, laurel, feijoa, etc.), fruit growing, annual grain and vegetable crop production.

216. The total agricultural land within Zugdidi municipality is 36316 ha, of which:

- Arable – 13110 ha;
- Perennial crops – 7419 ha;
- Pastures – 6271 ha.

217. According to 2009 data, 1.2 t mandarin, 25 t orange, 50 t lemon, 9400 t hazel nut, 625 t laurel, 250 t kiwi, 30 000 t maize, 300 t tea were produced in Zugdidi municipality. The main agricultural export products are hazel nut, citruses and kiwi. Hazel nut production has significantly increased. The export demand for this product grows annually.

218. Several hazel nut plants function in Zugdidi municipality. They export their produce. Tea processing plants are not fully loaded. It is noteworthy that Georgian tea “Gurieli” (vil. Rukhi) is manufactured in Zugdidi. This product is exported as well.

219. Unfortunately, tin and juice plants do not function. They used to process local raw material. Consequently, the number of employees was comprehensive. Proceeding from the fact that there are no large agro-plants within the municipality, dependent farmer households are mainly individual and small scale.

D.3.3.2 Mineral Resources

220. Thermal water sources are located within Zugdidi municipality. The strongest thermal water sources, which has been explored in detail and prepared for use, is Zugdidi-Tsaishi source. At present the exploitation supply of the source is estimated as 14300 m^3 daily and the temperature is 800-100° C.

- Brick clay – it is extracted within vil. Odishi. It can be used for ceramic brick and block (various sizes) production;
- Turf – it is extracted in vil. Anaklia and Tchuria. It can be used in agriculture and chemical production in addition to thermal energetics;
- Inert material – sand and gravel, which is used in different construction works;
- Limestone deposit and barite deposit – the deposits occur within the municipality.

221. The above mineral deposits are present, although their supply has not been estimated yet. In addition to the above mentioned, ground fresh potable water, medicinal waters and medicinal mineral supply are observed in the region.

D.3.3.3 Tourism

222. Zugdidi municipality is significant for tourists due to its historical past and great many monuments. Archeological material and monuments of material culture discovered in Zugdidi confirm that human has populated the area since the Stone Age. The name of t. Zugdidi was established in Late Feudal Age, when Anaklia and Zugdidi became prominent among other settlements of Samegrelo and formed into “small towns”. First were a port and the second – residence of the rulers of Samegro and trade point. Significant development of Zugdidi started in the 50s of XIX c. during the last ruler of Samegrelo Davit Dadiani.

223. First class resorts of Zugdidi municipality are Anaklia and Ganmukhuri shore line and vil. Tsaishi balneological bath. It is noteworthy that the development of Anaklia and Ganmukhuri shore line is one of the priorities of the central authorities. A development plan has been elaborated and investments are being attracted, hotel construction has commenced. Up to 30 significant historical and cultural objects are located within Zugdidi municipality, which is the important source of interest for tourists. Zufdidi Municipality’s area is 682 km² and abovementioned historical and cultural monuments are not in the vicinity of the project area.

D.4 Social and Cultural Resources

D.4.1 Population and Communities

224. The population of Zugdidi municipality was 165 674 by 1st January, 2010, of which 68 894 live in towns (41.6 % of the entire population) and 96 780 – in villages (i.e. 68.4 %).

225. It is noteworthy that Zugdidi municipality is the largest center (after Tbilisi) of compact resettlement of the refugees. The number of refugees within the municipality reaches 43 453. Zugdidi municipality is prominent for population density – the highest in Samegrelo (1/01 –according to 2010 data – 239 men per 1 sq. m.). According to national population census conducted in 2002 98.2 % of the population are Georgian, 0.9 % - Russian, 0.1 % - Abkhazians, 0.1 % - Ukrainians and the remaining 0.1 % - other ethnical population. Municipality population is distributed in 31 territorial bodies, according to which 2010 majoritarian elections were organized. 58 villages are united within the mentioned territorial bodies.

D.4.2 Health Facilities

226. According to 2010 situation, 21 medical-ambulatory institutions function within the municipality. St. Lucas Zugdidi Medical Center formed on the basis of medicinal complex of the republic in Zugdidi is noteworthy. It fully complies with modern Euro standards. Blood transfusion center functions on the basis of the same complex. Working medical-ambulatory institutions are:

- JSC St. Lucas Medical Center – 206 Gamsakhurdiastr.
- JSC Central Hospital – 30 Kostavastr.
- JSC Medical Complex Enguri – 3 Khelaiastr.
- Zugdidi Regional TB Hospital LLC – 12 Paris Commune str.
- Zugdidi Infectious Hospital LLC – vil. Onaria
- Darcheli Zonal Hospital LLC
- Ambulatory/Polyclinic Association LLC – 28 Kostavastr.
- Adult Polyclinic LLC – 1 Kostavastr.
- Psycho-Neurological Dispensary LLC – 5 Stalin str.
- Zugdidi Children Polyclinic LLC – 5 Kostavastr.
- Dental Polyclinic LLC – 24 D. Aghmashenebelistr.
- Women Consultation LLC
- Skin and Venereal Disease Dispensary LLC – 208 Gamsakhurdiastr.
- Emergency Station LLC – 03 – 206 Gamsakhurdiastr.
- Sports Medicine and Rehabilitation Center LLC – 15 Kediastr.
- Non-commercial legal entity Public Health Center – 206 Gamsakhurdiastr.
- "Curatio – Z" LLC – 39 Z. Gamsakhurdiastr.
- Medical-Diagnostic Center LLC – 5 E. Janashiastr.
- Cardiologic Clinic "Guli" (Heart) – Zugdidi LLC – Gamsakhurdiastr.
- JSC Samegrelo-Zemo (Upper) Svaneti Regional Branch of Ghvamichava Georgian National Oncological Center – 206 Gamsakhurdiastr.
- Terminal LLC – Ambulatory "Sanus" – 1 Ts. Dadianistr.
- Non-commercial legal entity LuaraGergaia Ambulatory/Polyclinic Center "Pediatrician" – 36 Z. Gamsakhurdiastr.

D.4.3 Education Facilities

227. Reorganization of Zugdidi educational division – the territorial body of the ministry of education and science of Georgia was accomplished on the basis of the resolution of the government of Georgia in 2006. The incumbency of the division is educational resource center of Zugdidi.

228. According to 2010 situation, 59 schools function within the municipality, of which 50 are public, 1 elementary and 8 private. One public school is located in Anaklia. It hosts 281 pupils. There are 37 teachers in the school (picture 20). One public school is located in Ganmukhuri too. There are 229[2] pupil and 26 teachers in the school (Figure 26).

[2] **Source: Center of Development of Educational and Scientific Capacities**

<Figure 18> locations of School and kindergarten

229. 2 higher educational institutions are located in Zugdidi as well (Independent University of Zugdidi and ShotaMeskhiZugdidi State Institute). Boarding school of parent-less and disabled children (vil. Akhali (New) Abastumani) and school-boarding school for homeless children (t. Zugdidi) also function within the municipality.

230. The number of pre-school institutions (kindergartens) is 56, of which 9 are private. One kindergarten is located in Anaklia and Ganmukhuri respectively.

D.4.4 Physical and Cultural Heritage

Brief Review of Colchic Culture

231. According the Letter # 06/08-92 at 06.01.2012 provided by Georgian national Museum vicinity at the project area there are no cultural heritage monuments (Annex 1).

232. Generally Kolketi, as historical-geographical province, in broad terms comprises entire Western Trans-Caucasus.

233. Archeological monuments of various types and periods have been discovered in Kolkheti. As a result of the survey the presence of man proved to date back to the Stone Age, many cave dwellings containing strong cultural layers of the period have been found. Remnants of settlements and mounds of IV-III millennia B.C. and Late Bronze Age-Early Iron Age (XIV-VIII c.c.), developed centers of bronze and metallurgic production in broad terms of the word – ore extraction, smelting, creation of metal items, etc have been studied in Kolkheti, mainly – within the marine coastline. The remnants of iron and bronze production, great many ingots and slag occur throughout the coastline, foothills or highland.

234. The archeological culture of the Late Bronze Age-Early Iron Age (XIV-VIII c.c.) is known in the scientific sources as well developed Colchic bronze culture. Diverse economic and war tools, unique ceramics, log-type (Jargvali) wood architecture form this culture.

235. Bronze and iron production makes the Colchic culture more prominent: diverse battle axes, daggers, arrow and spear heads, shields, swords, parts of horse equipment, etc. as well as economic tools: hoes, hatchets, ploughs, sickles, knifes, segment-like tools, crockery, etc. and jewelry: clasps, buckles, pins, bracelets, belts, necklaces, beads made from different material. The artifacts are often decorated with engraved animals (dog, deer, horse, snake, fox, etc.) and astral-symbolic signs (star, the moon, the sun). The major part of the metal artifacts has been discovered as treasures throughout entire Kolkheti.

236. The lengthy and complex process of the socio-economic development of Kolkheti population had accomplished in VI c. B.C. with the establishment of a strong state unit – Kolkheti kingdom. Greek historian of V c. B.C. – Herodotus names it beside large monarchies of the east – Midia and Achaemenid Iran.

237. As a result of the development of the craftsmanship and trade-economic relationships with the other parts of the world, the scientists think, large town type centers were created presumably from VI c. B.C.: Kutaisi, Phasis, Dioskuria, Vani, Gienos (Ochamchire), Eshera, Sairkhe, etc.

238. The presence of a strong state and class society is proved by palaces, monastery complexes, fortification and civil buildings and mounds excavated in the towns of that period.

239. Along with the common mounds aristocrats' sepulchers have been discovered with vast riches: exquisite gold and silver jewelry, crockery, weapons, power insignias, coins, etc. The existence of state is undoubted due to the presence of local coins – Colchic Tetri. The geography of their discovery entirely coincides with the regions of the modern Western Georgia.

240. Based upon the recent archeological research, the scientists claim that strong jewelers' and crafters' school existed in some of the Colchic town centers in VI-II c.c. B.C. The brilliant works of jewelry had been created using the most complex technical methods (forging, brazing, granulation, carving, etc.), i.e.: earrings, buckles, diadems, temple jewelry, necklaces, rings, beads, etc.

241. It is well known that Greek and Roman writers tell the stories of the gold extraction and treatment in Kolkheti. They name the country as "golden". The oldest and most popular myth on Argonauts and their journey for the Golden Fleece is connected with Kolkheti. One of the most prominent geographer and historian of the old world – Strabo (I c. B.C.-I c. A.D.) says that the country, where the Greek heroes travelled, was called Kolkheti. The same source describes the ancient gold extraction process in Kolkheti.

Archeological Monument in the Vicinity of the Project

242. Dozens of archeological monuments dating back to III-I c.c. B.C. (mounds, remnants of dwelling on hills or "Dikhagudzubs", remnants of settlement on lowland – among them dune and under-peat remnants of settlements and individual artifacts) have been discovered by archeological excavations, small reconnaissance trenches and surface reconnaissance in Central Kolkheti Lowland.

243. Archeological monuments and cultural layers of the Bronze Age and Antiquity have been mainly discovered in the boggy area near the sea as well as marine and riverine terraces.

244. The geo-climate conditions of Kolkheti Lowland resulted in the presence of remnants of settlements of original type. Due to high humidity and marshes the residential and other buildings were built on areas ricked and rammed in advance in III-I millennia B.C. The wooden residential building types and construction equipment have been discovered as a result of excavations (Anaklia, Kulevi). These are wicker-log bound buildings, peasant house type with woven frame and stake-picket foundation, which were plastered with clay and peasant house like structures on piles. The detailed description of the Colchic house could be found in the works of a Roman architect – Vitruvius. Such remnants as a rule are located along large or small rivers or in their proximity. They could be easily seen and distinguished from the surroundings. These hills of remnants are sometimes located in groups – several elevated squares around the higher hill, each of which is surrounded with channels. All of these channels are joined with the rivers. Local population names these hills differently in different parts of the region – in Samegrelo they are called Dikhaguzuba, Dikhazuga, Naokhvamu, Naokhoru, Nazonare, etc. Various stages of the living and activities of the society are reflected on these hills.

245. As regards the lowland remnants of settlements, specialists refer with the term to archeological monuments which have been discovered on plains and are conspicuous from the surrounding due to their slight elevation in comparison with the environs. Layers of burnt plaster and pieces of clay crockery have been found in their sections. The majority of such remnants have been observed in the proximity of the settlement hills – Dikhaguzubs, namely, in 100-500 m radius. It should be mentioned that none of such monument have been studied archeologically so far. According to the artifacts collected from the surface they date back to the middle of I millennium B.C. (preliminary estimates).

246. Unfortunately, the literature sources do not refer to the exact coordinates of these monuments during their listing and description.

247. Anaklia section – Dikhaguzuba I is located to the south-west of the village on Tikori side in 1 km from the sea. The hill is 5 m high, diameter – 70-80 m. The large part of the monument was excavated in the 30s of the past c. Log building and respective Colchic ceramics of III-II millennia B.C. have been observed.

248. Dikhaguzuba II is located at the edge of the village in district Tchitatskhari – on the left side of Zugdidi-Anaklia automobile road in 2 km from the sea. The hill is 5 m high, diameter – 40-50 m. The main part of the hill was excavated in 1971-1978. The remnants of log buildings and Colchic ceramics have been discovered in the layers of III-II millennia B.C. as well.

249. According to the scientific sources the provided information proves the prominence of the Kolkheti lowland coastline and river banks in archeological terms. The abundance of the monuments shows that r. Enguri lower reaches were densely populated in III-I millennia B.C. Only 10 % of the archeological objects have been scientifically studied in Kolkheti. The researchers assume that unstudied monuments shall contribute information not only to Georgian history and culture, but the resolution of key issues of Caucasian archeology.

Transportation of contraction material and sand

For using the transportation of construction material and sand for beach nourishment, existed road will be used. Project does not include to construct new or temporary roads.

On the other hand, it has to be admitted that during the sand transportation the traffic of Anaklia will increase. The transportation route goes in the center of Anaklia, close to school, kindergarten and medical center. Also the route will go close to few settlements. There are no cultural properties along the road.

E. Anticipated Environmental Impacts and Mitigation Measures

Summary of Activities and Anticipated Impacts

250. This paragraph provides a brief description of anticipated site-specific impacts related to the construction phase of the project "Anaklia Coastal Improvement Project"

#	**Construction Phase. Potential Impacts During Construction Works**	**Yes/No Severity**	**Sites**
1	Loss of aquatic benthic biota	Yes significant	During excavation and placing armor stone on the bottom of the sea will result in the short term irreversible loss of the existing benthic biota (sea grass) on the affected area.
2	Contemination of the water during the construction activities	Yes significant	Construction of various structures in close proximity to the water sources and contamination with effluent waters could significantly impact on the quantitative and qualitative composition of fishes. Hence, measures for reduction of negative impact on fishes should be facilitated during the respective activities
2	Impacts on Archaeological Sites	No	According the information provided by Georgian national Museum at the project area there are no cultural heritage monuments. During construction activities special care should be taken not only at the construction sites, but also at construction camps and storage areas.
3	Impact on terrestrial ecology	Yes Minor	Despite the fact that the planned activities will be mainly located within the area already utilized by men and respective impact on flora and fauna will be insignificant
4	Landslides, slumps, slips and other mass movements.	No or minor	Geologically the research Does not contain geo-hazards, although there is a possibility of provocation of geo-hazardous processes during construction due to using improper design of cuts.
5	Noise and Dust Caused by Construction Activities and Emissions of Harmful Substances into the Atmosphere Air	Yes Minor	Noise and emissions of harmful substances are typical impacts of construction. However, in the case of this project, it is clear that there will not be any significant impact on the environment due to noise or air emissions
6	Transport related Impact	Yes. Medium	The construction process will produce large number of movement by heavy trucks on the roads served the site, delivery construction materials. This can cause a number of impacts.
7	Noise pollution from vehicle operation during construction in populated areas. Traversed by the highway, notably metropolitan areas or densely settled rural areas. Local noise.	Yes. Medium	As above mentioned Intensive operations of heavy trucks are required to deliver required amount of inert materials amount of materials to the needed sites. The construction sites impose certain safety risks for the population and, therefore, compliance with safety rules is important.
8	Poaching by construction workers	Very low probability	The river Enguri Black Sea.
9	Hazardous Construction Wastes	Yes Minor	Small quantities of hazardous wastes will be generated as a result of vehicle operations and the maintenance activities.

10	Declined water quality and increased pollution and sedimentation. Increased suspended sediment in stream affected by construction activities	Yes	Excavation and construction of wordbreak structures in the water sources and construction of various structures in close proximity to the water sources which may cause suspending sediments in streams.
11	Declined water quality and increased pollution through concrete emergency discharge incidents	Yes Minor	During project activities by construction contractor will be used large quantity of concrete materials which may cause suspending sediments in streams.
12	Contamination of resort area during beach nourishment	Yes Minor	sand from carriers to be placed along the proposed beach nourishment areas must incorporate a sampling and analysis program to identify the concentrations of potential contaminants
13	Impact on existing infrastructure	No or minor	Electric power transmission systems, water supply and drainage channel systems and channels
14	Poor sanitation and solid waste disposal in construction camps and work sites (sewerage, sanitation, waste management)	Yes Minor	Camp will not be used as living facilities because it is expected that majority of the employees would be local persons. The construction camp would be equipped with a biotoilet and other necessary infrastructure.
15	Construction Related Impacts at the Quarrying Sites	yes	The exploration of the borrow pits should be conducted by the licensed companies or the Constructing Contractor has to obtain its own license. However, potential impact of the increased quarrying activities on river bed and floodplain landscape, ichthyofauna and groundwater should be considered.

E.1 Air Quality

E.1.1 Noise and Dust Caused by Construction Activities and Emissions of Harmful Substances into the Atmosphere Air

251. Noise and emissions of harmful substances are typical impacts of construction. Air quality will be affected during construction by emissions from vessels, equipment, and land vehicles in work activities at work locations. However, in the case of this project, it is clear that there will not be any significant impact on the environment due to noise or air emissions. Therefore, no special measures are necessary to mitigate any impacts. Rather, the rules required by the building practice and norms should be sufficient to observe and carry out monitoring.

252. The construction process will produce large number of movement by heavy trucks on the roads served the site, delivery construction materials and sand. This can cause a number of impacts for local population.

253. Number of impacts will cause by Beach Artificial Nourishment process.

254. Effects on air quality are expected during the post-construction period. Pre-construction process will be produced large number of movement by heavy trucks on the roads served the site delivery sand for Artificial Nourishment of the Beach. Non significant impacts on air quality during the post-construction period are expected also during repair of any damage.

Mitigation Measures

255. These impacts can be reduced by a variety of measures, many of which are common in most urban construction. These include:

- Require adherence to engine maintenance schedules and standards to reduce air pollution.
- Use of defined, well planned haulage routes and reductions in vehicle speed where required;
- Periodically water down temporary roads on site;
- Cover trucks carrying cement, gravel, sand or other loose materials;
- Wet or cover trucks carrying stone/ sand/ gravel;
- Haul materials to and from the site in off peak traffic hours;
- Halting work during excessive onshore winds.
- Immediately replacing defective equipment and removing it from the work site
- No truck movements in inhabited areas between 22:00 and 6:00.

E.2 Water Quality

E.2.1 Sediment Dispersal and Water Turbidity

256. Excavation and construction of wordbreak structures in the water sources will disturb the substrate and place sediments into suspension. Those suspended sediments may than smother nearby bottom leaving flora and fauna as and when they settle. The affect will be greatest in those areas with fine sediments, which are more easily placed into suspension. The suspension of sediments will be minimized to the extent that the powerful section pumps on the dredgers are able to suck up those materials out of the water column.

257. If harmful impact through deterioration of reproduction conditions of fishes, invertebrates as well as algae occurs during the implementation of the activity, actions should be undertaken according to the methodology of calculation of damage inflicted to the environment.

Mitigation Measures

258. The following should be considered for the minimization of negative impact on the environment through project activities:

259. **Water Turbidity.** It is essential that the turbidity be kept to a minimum during dredging in order not to affect aquatic life and fresh water intakes for domestic and agricultural purposes in the waterways. The Contractor should take suitable measures to limit the amount of turbidity and hence the amount of suspended sediments in the water column to a minimum.

260. If the turbidity measured during dredging operations at a distance of 250 meters from the point of dredging exceeds the background turbidity by more than 250mg/l the Contractor will be instructed to take suitable measures to reduce the turbidity. As dredging will continue through different seasons the background turbidity measurements will be continually taken and used to account for any seasonal variations in turbidity.

261. The discharge of dredge run-off water from the spoil relocation areas will also be monitored on a regular basis to ensure that the suspended sediment concentration meets specified requirements. Water being discharged back to the waterways from the spoil relocation areas shall have a minimum sediment concentration of 10mg/l. If the specified limit is exceeded the Contractor will be instructed to change operations in such a way as to meet the specified limit.

262. Should the contractor subsequently fail to meet any water turbidity requirements within twenty four (24) hours of being instructed to do so, the Engineer's Representative may instruct the Contractor to cease dredging operations at that location until the Contractor can meet the water turbidity requirements. All such associated delay and cost shall be to the Contractor's account.

E.2.2 Leaks or Spills of Operational Material

263. During construction, water quality near work areas could be affected by leaks or spills of operational material such as fuels, oils, or hydraulic fluids.

264. The methods of transportation and placement of tetrapods shall be proposed by the Contractor for the approval of the Engineer. They shall not interfere with transportation work of any other construction materials from either land or offshore. During preparation of the method in should be taken in consideration: construction process during the touristic season, the close distance to the touristic zone, availability of construction of access roads The Contractor shall obtain the prior approval of the Engineer on his methods.

265. The Contractor shall contain in his methodology for prevention of future settlement of rubble mound by either placing of wave dissipating concrete blocks or the natural wave action.

Mitigation measures

266. Leaks and discharges of oil based products into the waterways from dredging and spoil relocation activities shall not be permitted.

267. The Contractor shall have and maintain at each work location oil containment booms and absorptive materials and persons trained in their use to clean up any spills of oil based products. No chemicals will be used to clean up or disperse any oil based products.

268. Should the Contractor fail to clean up any oil based products in or near the waterways the Engineer's Representative may order third parties to do so and all costs associated with the same will be deducted from other monies due to the Contractor.

269. During underwater breakwater work it is encouraged to make use of materials available in the local for the construction. Imported materials must have sufficient import procedures and certificate of quality issued by the manufacturer.

270. Concrete surface, forms and reinforcement steel shall be prepared properly before mixing. Dropping concrete of mortar must be cleaned.

271. Concrete should not be poured without the agreement by the Client and Engineer's Representative. Within 24 hours after the Client and Engineer's Representative's approval, if the concrete has not been poured then the Contractor must get the approval once again.

E.3 Impact on Flora and Fauna

E.3.1 Aquatic Biota

272. Excavation and construction of wordbreak structures in the water sources could significantly impact on the quantitative and qualitative composition of aquatic biota.

273. Dredging of the areas for placing the armor stone will result of the short term irreversible loss of the existing sea grass and temporary movement of the fishes. The potentially negative impact on the associated fish species are thought to be less severing given that there are adequate ecosystems along the several km radius to which they may retreat. Also over time during operation stage at the project area the similar ecological system would become establish.

274. Non significant impacts on aquatic biota during the post-construction period are expected during repair of any damage.

E.3.2 Terrestrial Biota

275. Despite the fact that the planned activities will be mainly located within the area already utilized by men and respective impact on flora and fauna will be insignificant.

276. In stand of there are no sensitive zones in the project area the most important direct factor connected with the coastal improvement project is the possible disruption of migratory bird species during autumn migration and wintering.

Measures of impact avoidance are discussed below

Mitigation measures

277. On this stage of work it is possible to offer only general recommendations. It is necessary to carry out the detailed pre-construction survey in the field along chosen route from the sandy carriers to project araea.

278. Generally one can propose following:

- The sensitive sites, containing the specific faunistic complexes and Red Data List species, should be included in the constructor contract.
- Neither of breeding (nesting) area on beforehand definite distance should not be damaged or disturb without survey by experts and allowances of MOEPNR. In order to mark on the country all locations of breeding areas and nesting areas of the threatened species it is in need to carry out the detailed account before they will be disturbed or destroyed. That should be included into detailed program of the construction
- Construction contractor should mark all sites, mentioned in construction program, directly before beginning of work.
- Neither home range in construction area and axcess road corridor should not be damaged or disturb without survey and allowances of experts. It had to carry out the field research to locate of borders of individual sites (home range) of animals for specifying ranges of these species and of sensitive communities (vertebrates and invertebrates). The field research should be carried out after the construction arae will be marked, but before of any preparation of area to work (clearing and etc). The requirements should be included in detailed construction program.
- Areal fragmentation; Disturbance on breeding and feeding areas;
- Fragmentation of individual areas;
- Spreading of harmful substances in reservoirs;
- Dealing with live water bed during activities;
- Measures should be undertaken for reduction of dust amount during works;
- Measures should be undertaken for reduction of noise and vibration levels during works;
- During activities pits, ditches, etc. should be fenced and/or surrounded with a band of vivid color to avoid falling in of animals. Boards should be installed into the ditches to at night to aid the ingress of fallen animals;
- Prior to commencement of activities the territory should be inspected in the areas, where Chiropteran shelters could be located. If such shelters are discovered, activities within the territory should be avoided and/or artificial shelters arranged for the Chiropteran;

- If areas of otter (included in the Red List of Georgia) distribution are discovered during activities, the activities within the territory should be restricted. If this is impossible, respective offset measures should be introduced.

E.4 Hazardous Construction Wastes

279. Small quantities of hazardous wastes will be generated as a result of vehicle operations and the maintenance activities.

Mitigation Measures

280. There are no specific hazardous waste treatment facilities in Georgia, so the common construction practice accepted by the authorities is to dispose of these types of wastes at the municipal landfills. However, prior to disposal appropriate consultation and agreement of MoE is required, and controlling will be required to obtain the necessary approvals. To ensure good practice they will also be required to store, transport and deposit all hazardous materials in secure watertight containers.

E.5 Other Wastes from Construction Activities

E.5.1 Municipal Waste

281. Municipal waste may be generated on the Storage area. Mainly this is rubbish, plastic or glass bottles, glasses, waste food, etc. and a stationary waste. Waste should be collected both by the specially assigned personnel and the workshop workers on the area. The waste is placed into 0.24m3 plastic containers and further a local Sanitary Service takes it to landfils.

The following should be taken into account:

- Generation of dust should be avoided;
- Plastic containers should be closed to prevent spread of the smell and also to avoid contact of rodents and insects with the waste.

282. The personnel involved in the handling of hazardous and non-hazardous waste will undergo specific training in:

- Waste handling
- Waste treatment; and
- Waste storage.

283. Burning of waste on any construction site is forbidden with the exception of stub and small branches from felled trees and bushes, which is better to be burned in order to avoid pest dissemination.

E.5.2 Medical waste

284. Medical waste is generated in the Medical Care and Control Point and belongs to hazardous waste category. This waste is collected in special plastic boxes and is transferred to a contractor for farther incineration. It is recommended that the medical waste is directly transferred to a contractor from the place of its consolidation.

While disposal of the medical waste the following requirements are to meet:

- Medical waste must be disposed in special plastic boxes, which can be hermetically closed.
- Medical waste for farther incineration should be transferred to a certified contractor (Batumi municipal waste operator).

E.5.3 Non hazardous construction waste

285. Non hazardous construction waste may be generated on the Storage and construction area and will be collected by contractors workers. Waste disposed first on the sites of origin, and then moved to construction waste temporary storage facility before transferred to a contractor.

286. While disposal construction wastes both on the sites and at the temporary storage facilities the following requirements are to meet:

- Place of disposal of the waste concerned must be enclosed.
- The waste must not have access to drainage water.
- Waste must be immediately removed from the working sites.
- Waste must be placed in secondary protective basins.
- This waste can be transferred only to a certified contractor.

E.6 Sand Quality

287. Project design indicates the use of sand from carriers near the project area for beach nourishment. The exact locations of sand will be determined on the basis of samples to be collected from the carriers, and analyzed to identify the locations where the particle size and quality are appropriate.

288. The types of possible contaminants and the spatial variability of contaminants in sand within the proposed carriers are not yet known. Accordingly, the effect of such contaminants on beach and water quality, ecological conditions, and human health are uncertain.

Mitigation measures

289. Sourcing plans for the acquisition of sand from carriers to be placed along the proposed beach nourishment areas must incorporate a sampling and analysis program to identify the concentrations of potential contaminants. The sampling program and choice of compounds to be analyzed must be based on a review and synthesis of historical data, and potential sources and types of potential contaminants. Compounds such as oil and grease, additional metals, and pesticides may be included together with additional parameters to support the interpretation of laboratory results for selected contaminants of concern. The program must identify acceptable thresholds based on international standards for each potential contaminant of concern.

E.7 Construction Related Impacts at the Quarrying Sites

290. The quarries and borrow pits will be finally selected by the construction contractor. The exploration of the borrow pits should be conducted by the licensed companies or the Constructing Contractor has to obtain its own license. However, potential impact of the increased quarrying activities on river bed and floodplain landscape, ichthyofauna and groundwater should be considered.

Mitigation Measures

291. The exploration of the borrow pits should be conducted by the licensed companies. In case if the constructing company intend to perform quarrying activities, the company has to obtain related license. Potential impact of the increased quarrying activities on ichthyofauna, groundwater and landscape should be considered anyway. Validity of licenses for the abovementioned companies is a main mechanism to guarantee that most of impacts related to quarrying will be mitigated. License is provided by the MoE only on a basis of preliminary assessment (including limits and conditions for reinstatement). The Regional Services of the MoE and Environmental Inspectorate are in charge to control compliance of the quarrying company's performance. The role of the MDF within this plan should be to ensure timely and permanent involvement of the MoE in construction supervision.

292. The measures aimed on mitigation of the dust and emission impacts, as well as potential river contamination due to improper fueling and vehicle operation should be the same as above described pollution prevention measures, but control on this sensitive site should be stricter. MDF and Constructing Contractor's environmental personnel should pay more attention to this site during monitoring.

E.8 Worker Camps

293. The potential impacts related to the construction and operation of the camp could be summarized as follows:

- Potential damage of topsoil
- Contamination related to fuel storage and fuelling operations
- Waste management
- Wastewater and sanitation

Mitigation Measures

294. The construction camp shall be equipped with a biotoilet and other necessary infrastructure.

295. The potential impacts related to the construction and operation of the camp could be summarized as follows:

- Potential damage of topsoil
- Contamination related to fuel storage and fuelling operations
- Sewerage related contamination
- Waste management

E.9 Impacts on Archaeological Sites

296. Land clearance works, grading and excavations are associated with the risks of damaging underground archaeological remnants. However, not listed sites could be as sensitive as already known archaeological sites. The known sites have been identified just during major construction works, particularly during construction of the existing project. The other sites have not been studied systematically. Therefore, special care should be taken not only at the new construction sites, but also at construction camps and storage areas.

Mitigation Measures

297. Monuments or areas of an archeological interest, destruction of archeological layers during the construction process is possible. To avoid this risk, preliminary preventive studies and archeological supervision during the earth-works is necessary. Supervisory procedures and all other necessary measures should be agreed with the Ministry of Culture when obtaining the construction permit, in accordance with the rules of the permit issuance. According to the article 14 of the Law on Cultural Heritage, Permit on conducting quarrying activities in Georgia, as well as construction of an object of a special importance as it may be defined under the legislation of Georgia, is issued by a competent authority based on the positive decision of the Ministry of Culture, Monument Protection and Sport of Georgia. The basis for the conclusion is the archeological research of the proper territory to be carried out by the entity wishing to accomplish the ground works. The entity wishing to do the earth-works is obliged to submit the Ministry the documentation about the archeological research of the territory in question. The preliminary research should include field-research and laboratory works

298. At the construction stage archaeological monitoring should be ensured by the constructing contractor under the supervision of the Ministry of Culture, Monument Protection of Georgia. The budget necessary for the archeological supervision and other agreed works should be fixed under the construction works appraisal.

E.10 Residential houses close to Project Area

299. Our specialist together with Head of Anaklia, Mr. Gela Lemonjava, visited Anaklia to describe the modest settlement of small wooden houses along the Anaklia beach. The distance between the houses and sea is 40-50m. As it was determined, this place has been settled since 90s, by the refugees from Gali region, Abkhazia. Before that these houses served as holiday cottages for the factory workers during Soviet Union Times.

300. The settlement itself is not big, composing by 13 houses. Total number of residents is 40. Among them, 10 children, live there. One of the buildings is abandoned. It was used for military purposes. People living here used to live in extremely poor conditions. They do not have gas or internet supply. Anaklia municipality provided water supply just few years ago. Residents do not have any income rather than the Government monthly aid that equals 28 Gel per person. They do not use the sea for fishing. They hope that during the Construction of Anaklia Coastal Protection Facilities they will be employed somehow.

<Figure 19> Refugees's residential houses close to the Project Area

301. The main negative impact that can be occurred during the project implementation period due to the contruction vehicles traffic is:

302. Bothering the residents because of noise, dust and emission;

303. Vibration may damage the houses that even now are not in perfect conditions;

304. During the contruction vehicels traffic population may have the safety problems, especially children.

305. But on the other hand, Project will have positive impact on residents – they might be employed temporary.

306. Also, project implementation will improve their living conditions:

307. As we mentioned, sea water washes the beach line constantly. If project is not implemented, after several years these houses could be surounded by the sea water.

308. During the storms, the acces road to the wooden houses is covered by water and as the residents mentioned, they move around only by boats.

Mitigation Measures

309. These impacts can be reduced by a variety of measures, These include:

- Require adherence to engine maintenance schedules and standards to reduce air pollution.
- Use of defined, well planned haulage routes and reductions in vehicle speed where required;
- Periodically water down temporary roads on site;
- Cover trucks carrying cement, gravel, sand or other loose materials;

- Wet or cover trucks carrying stone/ sand/ gravel;
- Haul materials to and from the site in off peak traffic hours;
- Halting work during excessive onshore winds.
- Immediately replacing defective equipment and removing it from the work site
- No truck movements in inhabited areas between 22:00 and 8:00.

F. Alternatives

310. During the preparation process of the proposed project due to the simple fact that the project comprises Anaklia shore protection hydro-technical structures and inert material for the stability of the beach the main discussed alternatives were related to the versions of shore protection structure.

311. From different alternatives – shore protection with crushed stone wave breaker, filling with inert material, protection with concrete walls and tetrapod built underwater wave breaker – the latter alternative of tetrapod built underwater wave breaker was preferred in technical-economic terms.

G. Information Disclosure, Consultation, and Participation

312. In order to comply with the Georgian legislation and the ADB requirements and to ensure meaningful consultations, the following actions were done. Most of the main stakeholders have already been identified and consulted during preparation of this IEE, and any others that are identified during project implementation will be brought into the process in the future. Stakeholders of this project include:

- People who live, and work near construction sites of facilities in Anaklia;
- MDF as implementing agency;
- Other government regulatory institutions
- NGOs working in the affected communities;
- Owners and managers of the hotels;
- Other community representatives;
- The beneficiary community in Anakli in general.

313. The borrower/client will carry out meaningful consultation with affected people and other concerned stakeholders, including civil society, and facilitate their informed participation. Meaningful consultation is a process that (i) begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle;1 (ii) provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people; (iii) is undertaken in an atmosphere free of intimidation or coercion; (iv) is gender inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups; and (v) enables the incorporation of all relevant views of affected people and other stakeholders into decision making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues.

Disclosure of documents

314. The electronic versions of the draft EIA was placed on the Zugdidi Municipality web-site.

315. Hard copies of Project environmental documentation (draft IEE and Executive Summary) was placed in:

- the Zugdidi Municipality and Anaklia Municipality office;
- MoE Department of Licenses and Permits

Public consultation meetings

316. Public consultation meeting was conducted in the Hotel "Anaklia"

Minutes of Meeting

Of

Public Consultations for discussion the Report of Environmental Impact Assessment Prepared for the Project for Construction of Coastal Protection Facility in Anaklia (Phase II)

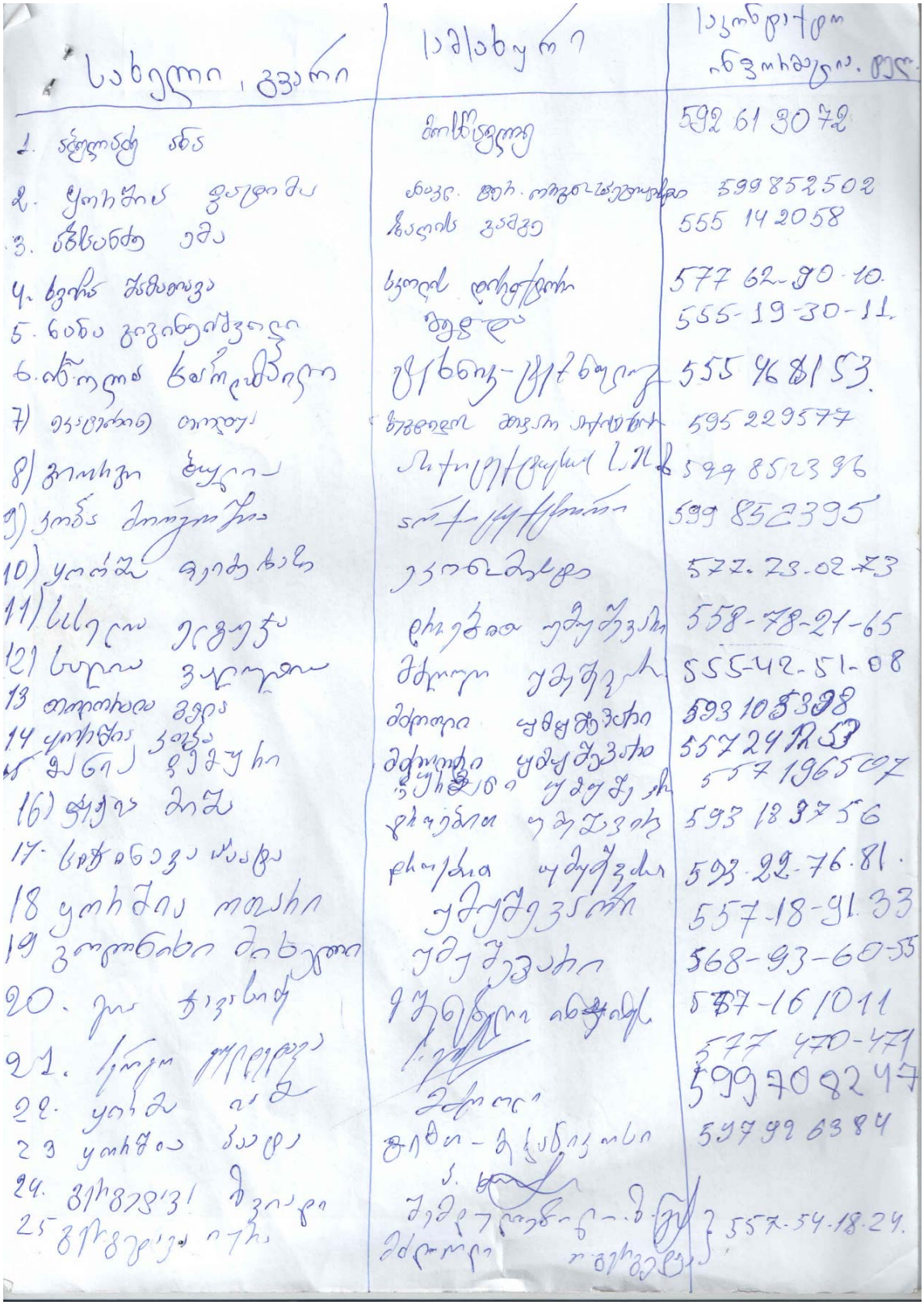
Anakli
June 7 2013

Public Consultations for the Report of Environmental Impact Assessment Prepared for the Project for Construction of Coastal Protection Facility in Anaklia took place on June 7, 2013 in hotel "Anaklia" in Anaklia city.

The meeting was attended by:

Representative of Municipal Development Fund of Georgia (MDF):

- Mrs. Aleksandre Dumbadze – Head of Environmental Protection Analyze Department of MDF;
- Environmental Protection consultant:
- Mr. Irakli Kaviladze
- Representatives of Consulting Company DOHWA Engineering Co. Ltd:
- Mr. Yong Jun Choi;
- Ms. Maya Mamajanashvili.



317. DOHWA Engineering Co. Ltd, Mr. Yong Jun Choi, opened the meeting. He introduced everyone the aim of the meeting, informed about the Project and briefly explain about the Project itself.

318. Mr. Choi discussed the main issues of design, its alternatives, importance and expected consequences. He mentioned that the Project consists of two stages – Phase I and Phase II. At first, it is planned to implement the works of *Phase I* that considers the works of construction of coastal protection facilities

from Enguri river mouth to Tikori river mouth. It is considered to construct 6 underwater breakwaters with the total length of 1700m. The structures will be contracted with the 5 and 10 tones tetrapods. Besides that, it is planned to perform the artificial nourishment of the send on the beach with total length of 2300m and width – 60m.

319. It is planned to construct the coastal protection facility from Tikori river mouth to Churia river mouth during the Phase II. It is approximately going to be constructed 4 underwater breakwaters with tetrapods with the total length of 1200m. In addition, it is foreseen the artificial nourishment of sand on the beach with the total length of 1400m and width – 60m.

320. Mr. Irakli Kaviladze environmental consultant presented the information regarding the Environmental impact assessment within the project scope and relative report. He admitted that during the process of preparation of environmental impact assessment they researched and studied the background of the physical and social conditions of Anaklia and its vicinity.

321. In consideration of the works to be performed in the scope of project, on the base of EIA results, it is determined the possible affect, impact quality and mitigation measures. It has been prepared the environmental management and monitoring plans of planned works as well.

322. Taking into consideration all the above-mentioned details, the design of construction of coastal protection facility in Anaklia is ecologically acceptable and its implementation will not create any danger to the environment and local population after performing the mitigation measures described in EIA report and on the base of environmental management plan terms.

323. After the presentation of Environmental Impact Assessment report, the attended members of the public consultations meeting were allowed to tell their opinions and express some comments and suggestions. The members of the local government and non-governmental persons were involved in the discussions. All the members admitted that the project implementation is very important for developing, protecting and maintenance of Anaklia beach line.

Records of Meetings

Job No.		Ref No.	MM	Prepared By	Maya M.
Job Title	Detailed Design and Construction Supervision of Anaklia Coastal Protection Facilities (Phase II)				
Meeting Title	Public Consultations				
Date / Time	07.06.2013				
Venue	Anaklia Hotel Conference Hall				
Attendance	MDF: Mr. Sandro Dumbadze DOHWA: Mr. Choi Yong Jun, Ms. Maya Mamajanashvili Hydrosphere: Mr. Irakli Kaviladze Anaklia city residents (Please see attachment – List of Participants)				

Contents of the Meeting

- What is the material that is designed to be used during the construction and from where it has to be transported?

The following materials will be used for construction purposes: Concrete, Stone, sand. During the detailed design stage we surveyed several quarries for getting the material that where in the vicinity of project area. Construction company will select which of them to use.

- During Soviet Union period, mostly it was used the vertical barriers to protect the beach. this time you designed horizontal barriers, will it be effective?

Vertical barriers are used in the places where the beach is not considered for touristic purposes. Horizontal barriers designed by our company will be effective to reduce the wave strength and also visually it will not be seen from the coast.

- Poti and Kulevi ports are often being cleaned and dredged from extra material. For artificial nourishment purposes, instead procurement of material from sand quarries, why didn't you design placing material on the beach that could be taken from there?

The material that has to be placed on the beach of Anaklia has to conform special requirements considering the grain size and quality. We already surveyed the material in Kulevi and Poti ports as we had the same consideration about using dredged material from there but the quality is not suitable.

- After you place the sand on the beach, what is the period to re-fill the material?

It has to be re-filled with sand according to the result of monitoring

- After you take material from Enguri riverbed, will it cause some problems to the environment?

The material will not be taken from the river bed. It will be taken from the riverside from selected quarry. It will not cause any damage to the environment.

- Is it possible and if so, how many local persons will be employed during the construction period?

It depends on construction company. We think that for simple works, such as earth works, company can employ local residents.

- Why you designed underwater breakwaters instead of breakwaters? If the structure is under the water can it stop the wave?

Underwater breakwaters cannot stop the wave, they will reduce the strength of the wave approaching the coast.

- What is the distance between the protective structures and the coast?

The distance is different in different places. Average distance is 200-250m.

- If the person is swimming in the water, can he mention the protective structures?

Underwater breakwaters will be equipped with warning signals and everyone can mention their location under the water.

- What is the spacing between the crest of the structure and water surface?

0.9m.

- Who is responsible for safety of Anaklia residents? Drivers of the trucks transporting the construction material are generally driving fast that cause accidents in the streets.

Construction company will be strictly warned to keep safety measures. Supervision will control their manner of driving.

- When the construction of Phase I will be started and what is the period?

We hope within June, the period according to the design in 9 months.

- Touristic season is starting soon. Will construction process disturb the tourist?

We considered this matter and construction will be started from Tikori river mouth to Enguri river mouth direction.

NAME,SURNAME	OCCUPATION	CONTACT NUMBER
Mr. Gela Lemonjava	Anaklia City hall. Deputy director	599 85 24 32
Ms.Anna Abuladze	Pupil	592 61 30 72
Ms.Patima Korshia	Anaklia City hall. Specialist	599 85 25 02
Ms. Emma Absandze	Anaklia Kindergarten. Director	555 14 20 58
Mr. Khvicha Shamatava	Anaklia School. Director	577 62 90 10
Ms. Nana Gigineishvili	Doctor	555 19 30 11
Inola Kharlampili	Technician	555 96 81 53
Ms. Ekaterine Todua	Zugdidi city hall. Chief Architect.	595 22 95 77
Mr. Giorgi Bulia	Zugdidi city hall. Architect service	599 85 23 96
Mr. Koba Morgoshia	Architect	599 85 23 95
Mr.Teimuraz Korshia	Economist	577 73 02 73
Mr. Elguja Soselia	Unemployed	558 78 21 65
Mr. Salia Valodia	Driver	555 42 51 08
Mr. Gela Toloraia	Driver	593 10 53 98
Mr. Koka Korshia	Driver	557 24 12 53
Mr.Demur Mania	Driver	
Mr. Misha Chejia	Unemployed	593 18 37 56
Mr. Paata Sichinava	Unemployed	593 22 76 81
Mr. Otar Korshia	Unemployed	557 18 91 33
Mr. Micheil Golnikhi	Unemployed	568 93 60 55
Mr. Gia Javakhidze	Constructor engineer	577 16 10 11
Mr.Sergo Guldedava		577 470 471
Mr. Iasha Korga	Driver	599 70 82 47
Mr. Paata Korshia	Mechanic	597 92 63 84
Mr. Zviad Gergedava	Welder	557 54 18 24
Mr. Iura Gergedava	Driver	
Mr. Alexandre Dumbadze	Head of Environmental Department (MDF)	599 32 74 36

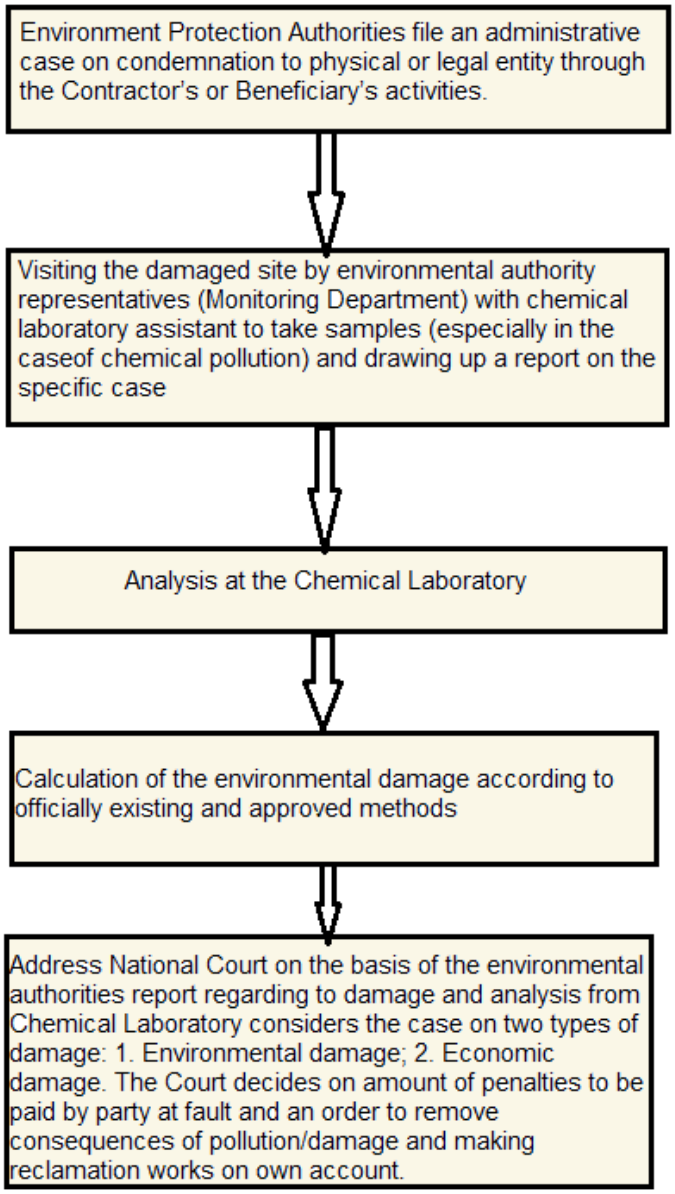
H. Grievance Redress Mechanism

324. As the work is being done in inhabited areas, most of the impacts are construction related, and therefore it is anticipated that improper or inadequate implementation of EMP may lead to disturbance and inconvenience to local people during construction. In order to provide a direct channel to the affected persons for approaching project authorities and have their grievance recorded and redressed in an appropriate time frame, MDF will establish a Grievance Redress Mechanism. A Complaint Cell and a Grievance Redress Committee will be established in Anaklia municipality to function throughout the construction period.

325. Two scenarios can be distinguished:

a) Accidental environmental pollution,
b) Individual grievances related to damage of health, property or other complaints

a) in cases of accidental environmental pollution the local/national environmental authority (State Inspectorate for Environmental and Technical Safety), will have to be directly informed and legal procedures started.



b) The Complaint Cell (CC) at the Municipality of Anaklia will accept complaints regarding the environment safeguard issues in implementation of the project. A three stage grievance redress mechanism is indicated in Figure below. The grievances received and actions taken will be included into the environmental monitoring reports submitted to ADB.

(i) Complaints received (written or oral communication) by the Complaint Cell (CC) will be registered in database system, assigning complaint number with date of receipt; Complaint Cell will inform the complainant the time frame in which the corrective action will be undertaken.

(ii) The Complaint Cell and Investment Program Management Office (IPMO) will investigate the complaint to determine its validity, and assess whether the source of the problem is indeed subproject activities; if invalid, the Complaint Cell will intimate the complainant and may also provide advice on the appropriate agency to be approached.

(iii) If the complaint is valid, the Complaint Cell will check the environmental management plan (EMP) of the project whether this issue was identified and mitigation was suggested; if yes, the Complaint Cell and IPMO will direct the civil works Contractor to take immediate actions as per the EMP.

(iv) If this is an unanticipated issue, the IPMO will to identify mitigation measures and advice the civil works Contractor accordingly and a corrective action should be taken and a Corrective Action Plan (CAP) prepared.

(v) The Complaint Cell will review the civil works Contractor's response on corrective action and update the complainant within two weeks.

(ix) If the complainant is dissatisfied with the action taken or decision, he/she may approach the Grievance Redress Committee (GRC, see below) established in the town

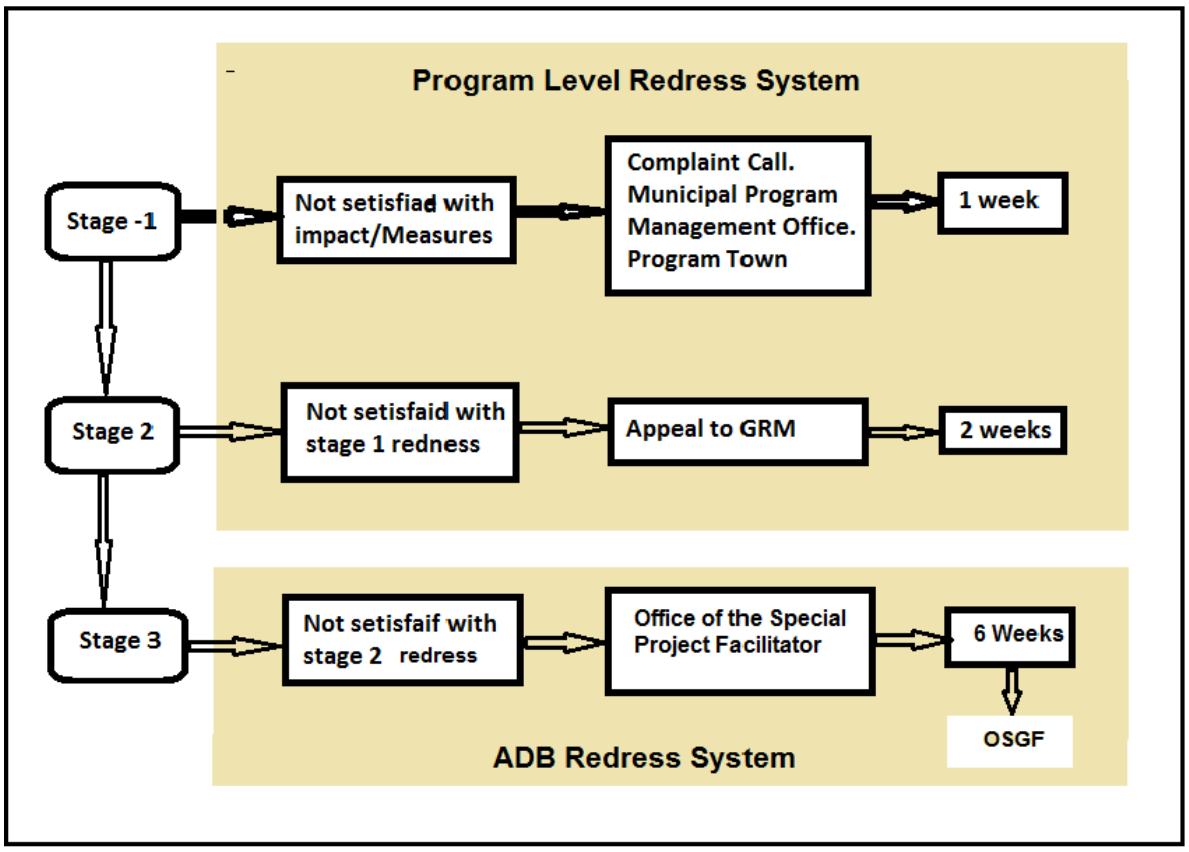
359. Grievance Redress Committee (GRC). A GRC will be established to resolve the unresolved issues at Stage 1 and this will function throughout the construction period, and will have hearings on need-basis. GRC will have following members:

- Chairman, Anakli Municipality or an elected member nominated by the Chairman
- MDF Representative
- Member of IPMO

326. Considering the anticipated impacts, it is not expected that there is any likely issue which will remain unresolved in the Stage 2 of the process. In the unlikely event of dissatisfaction after Stage 2, the complainant can approach ADB with the complaint. ADB has in place a system under the ADB Accountability Mechanism, where people adversely affected by ADB-assisted projects can voice and find satisfactory solutions to their problems. An affected person can file a complaint (mail, facsimile, electronic mail, or by hand delivery) with:

327. The Office of the Special Project Facilitator (OSPF), ADB, 6 ADB Avenue

Mandaluyong City, 0401 Metro Manila, Philippines
Tel: (63-2) 632-4825; Fax: (63-2) 636-2490; Email: spf@adb.org
Or
Georgia Resident Mission, which will forward it to OSPF



328. Community leaders will act as informal mediators in case of complaints. However APs have the option to choose a different representative or directly liaison with the Grievance Redress Committee (GRC) staff, designated for grievance redress. All grievances and their resolution process shall be documented.

329. NGOs will monitor grievance redress negotiations, assist with grievance arbitration, raise public awareness. APs need to be informed that in case of problems with the local administration they can address NGO staff or the construction supervision consultant to follow up their complaint.

330. The grievance mechanism is designed to avoid lengthy court procedures, but does not limit the citizen's right to submit the case straight to the court of law just in the first stage of grievance process.

331. ADB is not directly a part of the Grievance procedure but shall receive reports, which complaints were received and how they have been followed up / mitigated.

"Aps can have access to ADB accountability mechanism at any stage".[3]

332. The constructor shall include the provisions for the grievance mechanism in his budget.

[3] http://www.adb.org/documents/accountability-mechanism-policy-2012

I. Environmental Management Plan

333. A detailed site specific EMP shall be prepared by contractors and submitted to the Engineer for approval.

334. Prior to the start of the works, the Contractor shall consult with the local authorities that nuisance (noise, dust distribution, illumination etc.) as a result of his working method will not be in conflict with local law and regulations. The Contractor shall apply for all necessary permits in order to execute the works according to his proposed working method or modify his working method in accordance with permit conditions.

335.

I.1 Institutional Arrangements

336. Following agencies will be involved in implementing the Investment Program:

(i) Municipal development Fund (MDF)) is the Executing Agency (EA) responsible for management, coordination and execution of all activities funded under the loan. MDF will have overall responsibility for compliance with loan covenants.

(ii) MDF as responsible PIU for the project will recruit a construction supervision consultant (CSC). The national and international team of consultants will assist MDF as project supervision for the construction of Anaklia coastal improvement project. The Consultant will also provide capacity building training to construction contractor staff for management and operation and maintenance for the Project. The Consultant will assist MDF in assuring that the project is implemented according to the specified standards.

This Consultant assignment will include the update of the environmental management and monitoring plan (EMP) detailing environmental mitigation measures, to address each identified impact and recommend appropriate environmental mitigation measures. CSC will assess the cost, responsibilities schedule, location and monitoring framework associated with the implementation of the mitigation measures and the EMP and he will assist MDF in monitoring the implementation of the EMP.

(iv) All mitigation measures during construction have to be implemented by the construction contractor what will be monitored by the construction supervision consultant (CSC). Implementation of EMP of this project require an experienced Environmental Management Specialist (EMS) to spend a total of around 6 month for project construction period, conducting routine observations and surveys, and preparing quarterly reports. The EMS will also be responsible for: incorporation of mitigation measures in construction; and, construction-stage environmental quality monitoring. Support of an additional EMS is also required to oversee the EMP implementation, and collating and submitting quarterly Environmental Monitoring Reports

337. The Constructing Contractor has the following obligations:

- to employ Environmental consultant responsible for developing and implementing the construction phase EMP and for provision of corresponding information to MDF;
- to develop, if required, a Spoil Disposal Plan and Construction Waste Disposal Plan agreed with the MoE and Local government;
- Constriction Schedule;
- The EMP implementation costs should be included into the construction budget.

(V) ADB is the donor financing the Investment Program.

338. Reporting on EMP Implementation
The construction contractor will be required by the construction supervision consultant to prepare monthly progress reports on the EMP implementation. Such reports shall be prepared by the Contractors environmental specialist and will contain information on the main types of activities carried out during the reporting period, status of any clearances/permits/licenses which are required for carrying out such activities, mitigation measures applied, and any environmental issues that have emerged in relations with suppliers, local authorities, affected communities, etc. Contractor's monthly progress reports shall be submitted to the technical supervisor and MDF.

339. The construction supervision consultant being also responsible for supervision of all environmental issues shall prepare monthly reports including the progress of the implementation of the EMP. These reports shall be submitted to MDF and distributed to all involved departments; the report shall contain all discrepancies from the EMP and list all HSE relevant incidents and accidents that occur during the implementation of the refurbishment measures. Based on these reports and on own regular construction site audits the Consultant together with MDF/CSC will prepare semi-annual performance and monitoring reports and submit them to ADB.

I.2 Costs of Environmental Management Plan

340. The monitoring plan for the project is summarized in table 12 Monitoring measures include construction site supervision, verification of permits, monitoring of compliance of the contractor performance and specific monitoring of environmental impacts like: noise, dust, soil and water pollution and air emissions etc.

341. Most of the mitigation measures require the contractors to adopt good site practice, which should be part of their normal construction contract, so there are no additional costs to be included in the EMP. Extra costs with respect to environmental mitigation are related to additional measures determined by Project Implementation Consultant All mitigation measures given above are included in the regular construction costs.

342. The construction supervision consultant is also responsible for permanently supervision of all environmental issues. Costs for consultant environmental monitoring will be included in the consulting services costs of the project.

343. In order to supervise appropriate implementation of the EMP an estimate of monitoring cost of 45,400.00 USD will be necessary. However the CSC will be requested to provide detailed budget for environmental monitoring

<table 5> Costs of Environmental Management Plan

Environmental Management Costs	Item	Quantity Unit Cost (USD)	Total Cost (USD)
Environmental Management Specialist (local)	6 month	2 500.00	15,000.00
Water samples analysis during construction	12 sample	700.00	8 400.00
Sand samples analysis during construction	12 sample	400.00	4 800.00
Air samples analysis during construction (Dust, Noise)	12 sample	100.00	1.200.00
Biological resources	8 sample(2tiimes during construction, 6times during operate)	2,000	16,000
		Total:	**45,400.00 USD**

<table 6> Mitigation Measures to be Implemented During the Construction Phase

Project Stage	Project Activity	Potential Environmental Impact	Proposed Mitigation Measure	Responsibility for Implementation	Responsibility for Monitoring	Cost Estimates
Pre-Construction	Site preparation: material and equipment staging areas and beach access locations	Possible removal of terrestrial habitat	Sites rehabilitated before contractor leaves site upon completion of construction activities. Planting and stabilization of site, including replacement of any native plant species	Contractor	MDF CSC	Included in construction contract
Construction	Excavation and placing Tetrapods	Water turbidity	Protocols for routine equipment inspection repair, maintenance, and fueling will be required before the start of work, and practices during work must be documented. Contingency plans to be used in the event of spills will also be required beforehand, and spill containment and clean-up equipment must be present during all fueling and fluid replacement or top-up activities. Vessels and equipment should be fueled at shore mooring locations where spill containment equipment is present before the start of fueling	Contractor	MDF CSC	Included in construction contract
		Sediment dispersal	The suspension of sediments will be minimized to the extent that the powerful section pumps on the dredgers are able to suck up those materials out of the water column.	Contractor	MDF CSC	Included in construction contract
		Water Contamination	Contractor should fail to clean up any oil based products in or near the waterways the Engineer's Representative may order third parties to do so and all costs associated with the same will be deducted from other monies due to the Contractor. During underwater breakwater work it is encouraged to make use of materials available in the local for the construction. Imported materials must have sufficient import procedures and certificate of quality issued by the manufacturer.	Contractor	MDF CSC	Included in construction contract

Construction	beach artificial nourishment	Dust into the Atmosphere	Periodically water down excess roads on site; Cover trucks carrying sand; Wet or cover trucks carrying sand; Halting work during excessive onshore winds; Immediately replacing defective equipment and removing it from the work site.	Contractor	MDF CSC	Included in construction contract
		Contamination of resort area	sand from carriers to be placed along the proposed beach nourishment areas must incorporate a sampling and analysis program to identify the concentrations of potential contaminants	Contractor	MDF CSC	Included in construction contract
Construction	General construction activities	Workers health and safety	The construction contractor shall develop an HS Management Plan and install an HS Management System for the construction phase Including training of workers.	Contractor	MDF CSC	Included in construction contract
		Producing of waste	While disposal wastes both on the sites and at the temporary storage facilities the following requirements are to meet: 1. Place of disposal of the waste concerned must be enclosed. 2. The waste must not have access to drainage water. 3. Waste must be immediately removed from the working sites. 4. Waste must be placed in secondary protective basins. This waste can be transferred only to a certified contractor.	Contractor	MDF CSC	Included in construction contract
Construction	General construction activities	Disruption of migratory bird species during autumn migration and wintering.	Neither of breeding (nesting) area on beforehand definite distance should not be damaged or disturb without survey by experts and allowances of MOEPNR	Contractor	MDF CSC	Included in construction contract

Construction	delivery construction materials and sand	Noise and Dust and Emissions of Harmful Substances into the Atmosphere Air	Require adherence to engine maintenance schedules and standards to reduce air pollution; Use of defined, well planned haulage routes and reductions in vehicle speed where required; Periodically water down excess roads on site; Cover trucks carrying cement, gravel, sand or other loose materials; Wet or cover trucks carrying stone/ sand/ gravel; Haul materials to and from the site in off peak traffic hours; Halting work during excessive onshore winds; Immediately replacing defective equipment and removing it from the work site; No truck movements in inhabited areas between 22:00 and 6:00.	Contractor	MDF CSC	Included in construction contract

<table 7> Environmental Monitoring Plan (Matrix)

Construction Phase

Phase	**What?** (parameter is to be monitored)	**Where?** (is the parameter to be monitored)	**How?** (is the parameter to be monitored /type of monitoring equipment/?)	**When?** (is the parameter to be monitored – frequency of measurement or continuously)	**Why?** (is the parameter to be monitored (reply is not obligatory))	**Cost**	**Responsible Institution**
Construction period.	Quality of Air	Construction site; Access roads; Cut asphalt and rocks crushing area.	Site investigation and Chemical analysis	Once per three month	Confirm for the pollution caused by construction	In the range of 50-100 USD for one analysis (Reflect the quote price of the local firm)	CSC MDF
Construction period.	Vibration and Noise	Construction site; Access roads Cut asphalt and rocks crushing area.	Site investigation and analysis	Once per three month	Confirm for effect of flora and fauna around the site	In the range of 50-100 USD for one analysis (Reflect the quote price of the local firm)	CSC MDF
Construction period.	Quality of Water	Water of the around construction site	Site investigation and Chemical analysis	Once per three month	Confirm for the pollution caused by construction	In the range of 50-100 USD for one analysis (Reflect the quote price of the local firm)	CSC MDF
Construction period.	Topsoil and subsoil management	Construction camp, Storage area,	Site investigation and Chemical analysis	Once per three month	Assure compliance	Minimal Included in supervision contracts	CSC MDF
Construction period.	Quality of sand for nourishment	Beach of project area and carriers	Site investigation and Chemical analysis in a certified	Once before beach nourishment	Confirm for effect of flora and fauna around the site	Reflect the quote price of the local firm	CSC MDF

			laboratory				
Construction period.	Proper handling and storage of the waste	Construction site; Material and waste storage sites;	Site investigation	During material delivery and periodically during construction (average 1/week), especially during precipitation (rain/ snow/ etc).	Assure pollution abatement; Assure compliance with, construction standards, environmental norms and EMP provisions;	Minimal Included in supervision contracts	CSC MDF
Construction period.	Biological Diversity (flora and fauna on the see and land)	Water of the around construction site and near the area	Site investigation (Species and populations of the flora and fauna)	Once per three month,	Confirm for effect of flora and fauna around the site	Reflect the quote price of the local firm	CSC MDF
Operation period. (During 3 years after construction)	Biological Diversity (flora and fauna on the see and land)	Water of the around construction site and near the area	Site investigation (Species and populations of the flora and fauna)	Once per six month	Confirm for the pollution caused by operation	Includes in operation costs	The local government or MDF

J. Conclusion and Recommendation

- Project implementation and bringing in the material of necessary volume will enable us to restore the inland beach and labile layer of the underwater line in the needed amount;
- Bringing of inert material is recommended in the period of the calm sea – May-October months. The bringing of the main mass of the inert material should be preceded with the construction of wave breaker;
- The preservation of the inland and underwater line of the restored beach will be achieved through periodical compensation of the annual deficit of beach forming material;
- The material washed from the artificial beach and moved along the shore, in its turn, will facilitate the stabilization of the abutting areas;
- Annual compensation filling should be undertaken in spring one-two months ahead of the start of the beach season. April-May storms will distribute the material along the shore and restore the natural profile of the beach;
- Temporary disturbance of local population is expected during the construction works, which shall be connected with the transportation of the construction material and equipment. In other cases the impact on the social environment shall be positive, because temporary employment of the local population is expected;
- During the functioning of the coastal improvement project the negative impact on physical environment and biological systems is not expected;
- Only positive impact on the social system is expected during the coastal improvement project, which shall be connected with the employment of the certain number of workers.
- Project implementation will support the stabilization of Anaklia beach, which will enable the government to further develop the tourist infrastructure of the area.

Annex 1 Record of Meetings				
Data	Agency/ Institution	Place	Name of Person consulted Position	Reason for Visit
02.02.2012	Municipality of Zugdidi	Zugdidi	Aleksand Qobabalia – head Of Municipality	Consultation. Select the Working Yard and Storage Area and to get an Approval from local Authorities.
02.02.2012	Municipality of Anaklia	Anaklia	David Tskhakaia head Of Municipality	Consultation. Select the Working Yard and Storage Area and to get an Approval from local Authorities.
06.02.2012	National Agency of Cultural Heritage	Tbilisi	Nokoloz Vachishvili – head of national agency of Cultural Heritage.	Consultation.
10.02.2012	Anaklia Public school	Anaklia	Anaklia school teachers: Soso Sartania, Zurab Sordia, Pridon Mosia, Gela Lemonjava, Zurab Kvaraia	General overview Consultation of representatives of the region
07.02.2012	Legal person	Tbilisi	Irakli Kvaratskhelia. Owner of the 1 hectare land near the project area	General overview Consultation with biasness representatives
11.02.2012	Representatives' of the region	Anaklia	Klimenti Parulava, Vakhtang Kvaratckhelia, Ramaz Oksusogli, Otar Korshia	General overview Consultation of representatives of the region
06.02.2012	Ministry of Regional Development and Infrastructure	Tbilisi	Deputy Lasha Mgeladze	Consultation.
10.02.2012	Hotel "Anaklia"	Anaklia	Ekaterine Merabishvili	General overview cconsultations with Hotel "Anaklia" management team Representative
06.02.2012	Municipal Development Fund	Tbilisi	Head of MDF Levan Chichinadze	Consultation.
10.02.2012	Anaklia Dispensary	Anaklia	Marina Sordia, Liana Tabidze. Mamuka Gabelia	Consultation
07.02.2012	Georgian National Museum	Tbilisi	Head of archeological centre Zurab Maxaradze	Consultation
10.02.2012	Hotel "Golden Fleece"	Anaklia	Manager – Merab Turmanidze	Consultation
11.02.2012	Representatives' of the region	Anaklia	Guram Sartania, Mamoka Gulua, Anzor Kvaraczelia, Zaur Mamforia. Elena Odisharia	Consultation

Annex 2 Results of analyzes of water quality in the river Enguri

S. No	Parameters	Unit	Enguri River (upper part)	Enguri River (Down Part)	Surface water – domestic use Georgian stan	Surface water – fishing purpose	Drinking Water Norms
1	Colour	-	5	15	-	-	15
2	Odor	-	0	1/2	-	-	2
3	Turbidity	NTU	10	40	-	-	3.5
4	Sulphate	mg/l	38.3	42.8	500	100.0	250
5	Chlorides	mg/l	35	30	350	300	250
6	Oil Products	mg/l			0.3	0.05	
7	Calcium	mg/l	18.03	20.04	-	-	140
8	Magnesium	mg/l	26.97	7.8	-	-	85
9	Sodium	mg/l	8.1	8.3	-	-	200
10	Zinc	mg/l	0.0311	0.0386	1.0	0.01	3.0
11	Iron, total	mg/l	0.08	0.1102	0.3	0.005	0.3
12	Total coliform	MPN	110	160	-	-	Nil
13	E-coli	MPN	50	80	-	-	Nil
14	pH		7.8	8.3	-	-	6-9
15	Total mineralization	mg/l	206.6	322.4	-	-	1000
16	Barium	mg/l	0.0025	0.0030	0.1	2.0	0.7
17	Boron	mg/l	0.0136	0.0151	0.5	10.0	0.5
18	Arsenic	mg/l	0.0041	0.0046	0.05	0.05	0.01
19	Mercury	mg/l	0.0003	0.0003	0.0005	0.00001	0.006
20	Cadmium	mg/l	0.0006	0.0009	0.001	0.005	0.003
21	Manganese	mg/l	0.0025	0.0072	0.1	0.01	0.4
22	Nickel	mg/l	0.0034	0.0037	0.1	0.0001	0.07
23	Nitrate	mg/l	10	20	45.0	40.0	50
24	Nitrite	mg/l	-	-	3.3	0.08	0.2
25	Copper	mg/l	0.0058	0.0120	1.0	0.001	2.0
26	Aluminum	mg/l	0.0062	0.0095	0.5	0.5	0.1
27	Lead	mg/l	0.0073	0.0086	0.03	0.1	0.01
28	Fluoride	mg/l	0.0065	0.0088	0.05	0.05	0.7
29	Chromium	mg/l	0.0051	0.0073	0.1	0.001	0.05
30	Antimony	mg/l	-	0.0003	-	-	
31	Cyanide	mg/l	-	-	0.1	0.05	0.07
32	Pesticides	mg/l	-	-	-	-	0.05
33	Alkalinity	mg/l	0.92	1.25			-
34	DO	mg/l	7.27	6.55			-
35	BOD	mg/l	3.63	0.19	3	15	-
36	COD	mg/l	3.2	3.2	6	15	-

BOD – Biochemical Oxygen Demand; Chemical Oxygen Demand, and DO – Dissolved Oxygen
Source: Sampling Survey, September 2010

Annex 3 Information provided by Georgian National Museum according the project area

№ 06/08-92
„31“ 01 2012

საქართველოს მუნიციპალური განვითარების ფონდის
აღმასრულებელი დირექტორის პირველ მოადგილეს
ბ-ნ დ. სირაძეს

ბატონო დავით,

თქვენი 30.01.2012 წლის № 222-გ წერილის პასუხად გაცნობებთ, რომ ტერიტორია, რომელზეც იგეგმება ანაკლიის სანაპირო ზოლის რეაბილიტაცია პლაჟის პროფილის აღდგენის მიზნით წარმოადგენს ზღვისგან მიტაცებულ ტერიტორიას (200-250 მ). აქედან გამომდინარე, თუ აღნიშნულ ტერიტორიაზე არსებობდა არქეოლოგიური ობიექტები, ჩავარაუდოდ, ისინი უკვე განადგურებულია და რაიმე სახის წინასწარული არქეოლოგიური სამუშაოების ჩატარებას არ საჭიროებს.

მიუხედავად ზემოაღნიშნულისა სამუშაოების დროს, თუ ადგილი ექნება საავარაუდო არქეოლოგიური ობიექტების შემთხვევით აღმოჩენას კერამიკის ნატეხების ან სხვა არტეფაქტების სახით, საქართველოს კანონის კულტურული მემკვიდრეობის შესახებ მიხედვით, მშენებელი ორგანიზაცია ვალდებულია შეატყობინოს შესაბამის სამსახურს.

პატივისცემით,

არქეოლოგიის ცენტრის უფროსი
ზურაბ მახარაძე

საქართველოს ეროვნული მუზეუმი
რუსთაველის გამზირი 3
თბილისი 0105
ტელეფონი 99 80 22
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Translation of above letter (not official)

Georgian National Museum

N06/08-92
31.01.2012

To Mr. David Siradze,
First Deputy Chief,
Municipal Development Fund of Georgia

Mr. David, according to your letter N222-g, dated on 30.01.2012, we want to answer that the area of territory that is planned to be placed sand material for further improvement of beach profile, is the area that is taken from the sea, (200-250m). Thus if there is any archeological segment, it might be already destroyed and we do not have to make any kind of preliminary archeological surveys there.

Besides abovementioned, if during the construction stage any of archeological item such as ceramic remaining or other, is found, , Construction Company is obliged to inform about it related organizations according to Georgian Law regarding the cultural properties.

With respect,

Mr. Zurab Makharadze

Head of archeological centre. /signed/ /sealed/

Georgian National Museum

Annex 4 Letter from Zugdidi municipality related with Public Consultation

საქართველო
ზუგდიდის მუნიციპალიტეტის გამგეობა

2100 ზუგდიდი. რუსთაველის ქ. 90, ტელ: (8215) 5-01-23, ფაქსი: (8215) 5-01-11, E-mail: zugdidi.gamgeoba@gmail.com

№10-1/282 "23" 02 2012წ

საქართველოს მუნიციპალური განვითარების ფონდის
აღმასრულებელი დირექტორის პირველ მოადგილეს
ბატონ დავით სირაძეს

თქვენს 22.02.2012 წლის №404-ვ-ზე

ბატონო დავით

მიმდინარე წლის 23 იანვარს საქართველოს მუნიციპალური განვითარების ფონდიდან შემოვიდა №178-ვ წერილი, სადაც გვეცნობა, რომ 29 თებერვალს 15.00 საათზე საჯაროდ განიხილება ,,ანაკლიის ნაპირდამცავი ნაგებობის \ მშენებლობის პროექტი''-ს გარემოზე ზემოქმედების შეფასების საკითხი.

აღნიშნული ცნობილია საზოგადოების ფართო მასებისათვის, წინასწარ გავეცანით რა პროექტს, ზუგდიდის მუნიციპალიტეტის გამგეობა თანახმაა ანაკლიაში წარმოებულ იქნეს ნაპირდამცავი ნაგებობების მშენებლობა.

პატივისცემით,

ზუგდიდის მუნიციპალიტეტის გამგებელი ალექსანდრე ქობალია

Translation of Above letter (not official)

Zugdidi Municipality Government

N10-1/282
Date: 23.02.2012

To Mr. David Siradze,
First Deputy of Chief,
Municipal Development Fund of Georgia

Answer to your letter N404-g, dated on 22.02.2012.

Mr. David,

On January 23, 2012 we received a letter from Municipal Development Fund of Georgia where it was stated that it is planned to hold the Meeting for Public Consultations at 15:00, on February 29 in Zugdidi, where it will be discussed Environmental Impact Assessment for Anaklia Coastal Improvement Project.

This fact is already known for public, we studied the project in advance and we want to confirm that Zugdidi Municipality is agree with the Project Implementation.

With Respect,
Mr. Alexandre Kobalia
Head of Zugdidi Municipality /signed/

Annex 5 Construction Schedule