

Initial Environmental Examination

July 2012

GEO: Urban Services Improvement Investment
Program - Project 1
-Improvement of Anaklia Water Supply Subproject

Prepared by the United Water Supply Company of Georgia for the Asian Development Bank.

CURRENCY EQUIVALENTS

(as of 31 July 2012)

Currency unit	–	Georgian Lari (GEL)
GEL1.00	=	\$.604
\$1.00	=	GEL1.655

ABBREVIATIONS

ADB	-	Asian Development Bank
BOD	-	Biochemical Oxygen Demand
CA	-	Cross section area
COD	-	Chemical Oxygen Demand
CWRD	-	Central and West Asia Region Department
EA	-	Executing Agency
EIA	-	Environmental Impact Assessment
EIP	-	Environmental Impact Permit
EMP	-	Environmental Management Plan
GoG	-	Government of Georgia
GRC	-	Grievance Redresses Mechanism
HDPE	-	High Density Poly Ethylene
IA	-	Implementing Agency
IEE	-	Initial Environmental Examination
IPMO	-	Investment Program Management Office
DC	-	Design Consultant
MC	-	Management Consultant
Km	-	Kilometer
LPCD	-	Liters per Capita per Day
M	-	Meter
MC	-	Management Contractor
MFF-IP	-	Multitranch Financing Facility Investment Program
mg/l	-	milligram per litre
Mm	-	Millimetre
MoEPNR	-	Ministry of Environment Protection and Natural Resources
MoRDI	-	Ministry of Regional Development & Infrastructure
OSPF	-	Office of the Special Project Facilitator
OCR	-	Office of the Compliance Review panel
PCB	-	Polychlorinated Biphenyls
RCC	-	Reinforced Cement Concrete
SF6	-	Sulfur Hexafluoride
SIEE	-	Summary Initial Environmental Examination
SOP	-	Standard Operating Procedures
UWSCG	-	United Water Supply Company of Georgia
WSS	-	Water Supply & Sanitation
WWTP	-	Waste Water treatment Plant

NOTE

In this report, "\$" refers to US dollars.

This initial environmental examination is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature. Your attention is directed to the "terms of use" section of this website.

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EXECUTIVE SUMMARY

1. It is proposed to improve the water supply system in Anaklia under the Asian Development Bank (ADB) funded Urban Services Improvement Investment Program, which is under preparation stage. This Investment Program, implemented in six towns will develop the water and sanitation services, which will improve quality of life and optimize the social and economic development. Ministry of Regional Development and Infrastructure (MoRDI) is the Executing Agency (EA) and United Water Supply Company of Georgia (UWSCG) is the Implementing Agency (IA) of this Program. This subproject will be implemented from mid-2011 and likely to be completed by the end of 2012. Since the subproject is unlikely to have significant adverse impacts, it is classified as environment Category B, and accordingly an Initial Environmental Examination has been conducted. This is a summary of the IEE Report concerning the Anaklia headworks (well fields, transmission line and location of the new reservoir).
2. Situated in the west of Georgia at the Black Sea within the Zugdidi District Anaklia is supposed to become a tourism centre in Georgia. The service level of waste water disposal is low. No waste water treatment plant has been installed. Basically domestic waste water drains untreated into the Black Sea and Enguri River at several locations. With the government initiative to develop Anaklia as a major tourist destination, the water demand is likely to grow significantly. Simultaneously the waste water production will increase. This subproject only includes the Anaklia headworks. WWTP and sewerage is included in Anaklia subproject 2.
3. Design and construction of a new water supply system will focus on the following installations: transmission lines and new reservoir to the North-East of Anaklia.
4. The project area extends from Zugdidi to Anaklia and Ganmukhuri on the Black Sea Coast. The entire area is in the Enguri River Basin; the topography varies from hilly to flat towards the coast. Owing to its varied physical and geographic conditions, the vegetation in the project area is rich, diverse and consists of foothill forests and Kolketi low lands, and, (iii) Kolkheta marshes and swamp forests. Almost all the roads in project area are lined with avenue plantation; the trees include some species listed in the Red Book as “endangered”.
5. The Enguri River drains into the Black Sea north of Anaklia. The township surrounding area is flat. The vegetation in the project area consists of Kolkheta marshes and swamp forests. Almost all the roads in project area are lined with avenue plantation; the trees include some species listed in the Red Book as “endangered”.
6. The water supply improvement subproject in Anaklia involves straightforward construction and low-maintenance operation. Although there are forests and marshy lands, none of the components will cross these areas and all the activities are planned along the roads and on vacant lands. Further, any disturbance will be limited to construction. The likely impacts are short-term, localized and can either be easily avoided or mitigated.
7. The Red Book species along pipeline alignment will be identified and marked during the alignment fine tuning. These trees will not be cut.
8. The other predicted impacts associated with the construction process, are produced because that process is invasive, involving trenching and other ground disturbance. However the routine nature of the impacts means that they can be easily mitigated. Impacts mainly arise from generation of dust from soil excavation and refilling; and from the disturbance of residents, traffic and activities by the construction work. These are common im-

pacts of construction, and there are well developed methods suggested for their mitigation. These include: (i) Utilizing surplus/waste soil for beneficial purposes; (ii) Measures to reduce/control dust generation; (iii) Providing prior public information; (iv) Planning transport routes/schedules carefully and awareness creation in drivers; (v) Following standard and safe procedures for public and worker safety, and (vi) Avoiding night time construction activities. (vii) avoiding tree cutting through location alignment changes, and (viii) to avoid safety hazards construction site will be secured at critical segments.

9. The main risk of operating an improved water supply system is that increased water abstraction will deplete the water resource and will have impacts on the downstream ecosystem. However, for this subproject, water is abstracted from a well field, and the abstraction of approximately 6100 m³/d is just a fraction of total water flow of Enguri River. It will also not affect current uses. Present water quality is suitable for drinking after treatment to reduce turbidity and remove pathogens, and the necessary facilities are included. There are no major water pollution sources in the catchment besides Zugdidi wastewater discharges.

10. There are a number of development activities (for instance, road works) currently under implementation in Anaklia. The following measures are suggested so that roads and inhabitants are not subject to repeated disturbance by work in the same area for different purposes: scheduling construction in consultation with the other implementing agencies.

11. To ensure that all the mitigation measures as suggested are implemented, a program of environmental monitoring is prepared. Department of Quality Management and Environmental Protection (DQMEP) of UWSCG will oversee and be responsible for implementation of mitigation and monitoring measures. Provided the mitigation and enhancement measures are implemented in full, there should be no significant negative environmental impacts as a result of the subproject. There should in fact be positive benefits through major improvements in quality of life and individual and public health once the scheme is in operation.

I. INTRODUCTION

A. Background

1 The proposed Urban Services Improvement Investment Program is intended to optimize social and economic development in select urban areas (provincial capitals and secondary towns) through improved urban water and sanitation (WSS) services. This ADB funded Multitranche Financing Facility Investment Program (MFF-IP) complements the government's emerging vision for the WSS sector, formulated in its sector development strategy and road map, policy framework and reform implementation plan, and a business climate that encourages increased donor investment. This support will also complement ongoing donor efforts to improve and expand Georgia's urban WSS services. ADB identifies support to developing the country's municipal infrastructure a key contributor to enhancing sustainable economic growth, with the cross cutting themes of governance, regional cooperation and environmental protection. ADB's support can contribute to: (i) sector reforms; (ii) strengthening the link between financing local infrastructure projects and decentralization reforms; (iii) stimulating local economic development; and (v) improving the quality of life of urban population.

2 *WSS Services in Georgia.* The service levels of urban water supply and sanitation systems in Georgia at present are not satisfactory. Piped water supply service is available to less than 75 percent of urban population. Most of the serviced population suffers with inefficient service levels – inadequate and intermittent supply with low terminal pressure. Due to old systems, most of the pipelines are profusely leaking, and water lost in the system is as high as 50-70 percent. Similarly, less than 50 percent of the urban population is connected with the underground sewerage system, and the rest depend on individual disposal systems like pit latrines, septic tanks etc. Sewage treatment facilities are almost non-existent and collected waste is disposed untreated into rivers/streams raising environment and public health concerns.

3 The Zugdidi Service Centre staff report that the well water in Anaklia, being located on the Black sea area, is brackish. Groundwater becomes less saline the farther one moves from the coast. The Service Centre currently does not perform water quality tests for Anaklia boreholes or private wells. Drinking water in the Anaklia area is not chlorinated. There is urgent need to improve the water supply for Anaklia.

4 This Investment Program focuses on investments to improve basic urban infrastructure (i.e. water supply and sewerage). Besides, it will also provide policy reforms to strengthen urban governance, management, and support for urban infrastructure and services. This Program will be implemented in 3 tranches over a period of 8 years beginning in 2011. The Executing Agency (EA) is the Ministry of Regional Development and Infrastructure (MoRDI), Government of Georgia; and the Implementing Agency (IA) is the United Water Supply Company of Georgia, a wholly-owned company of Government of Georgia under MoRDI. The proposed investments under Tranche-1 include improvement of water supply systems in urban areas of Marneuli, Zugdidi, Anaklia and Mestia.

5 This IEE is for the water supply components only. The Anaklia water supply improvement subproject has been classified as environmental assessment category B (some negative impacts but less significant than category A). According to ADB procedures, the impacts of the subproject were assessed by the Initial Environmental Examination, conducted according to ADB Safeguard Policy Statement (2009).

6 According to ADB procedures, the impacts of the subproject were assessed by the Initial Environmental Examination, conducted according to the ADB Safeguard Policy Statement. For the water supply components of the subproject IEE was conducted in 2010.

7 EIA for the waste water treatment plant and the main sewage collector was conducted in March 2011. According to Georgian Legislation an Environmental Impact Assessment needs to be conducted only for the following components of the Anaklia subproject:

- Installation of the main sewage collector and
- Construction of the sewage treatment plant, because it is exceeding 1000 cm³ per day.

8 In May 2012 the IEE was divided into two subproject parts 1 and 2. The IEE for the subproject 2 includes the works compromising only Anaklia headworks (well fields, transmission line and new location of the reservoir). Subproject 2 includes the Water Supply and Sanitary System with location of the WWTP.

B. Extent of the IEE Study

9 This is the Initial Environmental Examination (IEE) Report for the Subproject 1 (compromising Anaklia headworks including transmission lines and new reservoir). It discusses the environmental impacts and mitigation measures relating to the location, design, construction and operation of all physical works proposed under this subproject. The IEE was initially prepared in July – October 2010 by an International and a Domestic Environmental Specialist via inputs of 2.5 months each and then updated with the design for the individual components further developed.

10 This IEE study is conducted based on the feasibility study proposals. It is based on the Initial Environmental Examination for the water supply components of the subproject for ADB (August, November 2010) and current stage of the design documents. Certain details will change as development of the subproject progresses, particularly in the detailed design stage. This however is expected not to result in any alterations of the environmental assessment. It should also be noted that at this stage the infrastructure has been designed in outline only, to determine overall feasibility and budget costs.

11 This IEE study is conducted based on secondary information and data from various sources and field observations. Field surveys were limited to essential baseline factors such as source water and sediment quality.

12 Since there are no significant, irreversible, or complex issues involved, no specialized techniques were required to be employed. All impacts were simple, easy to identify and mitigation measures were readily available.

13 The focus of this IEE will be on following issues:

Anaklia headworks consisting of

- transmission line
- new location of reservoir

C. Report Structure

14 This IEE Report is organized into seven sections including this introductory section:

Section 2 establishes the project need, rationale and alternatives

Section 3 describes project components and construction & operation details

Section 4 discusses impacts on physical and biological environment

Section 5 discusses impacts on socio-economic environment

Section 6 provides Environmental Management Plan and Monitoring Plan, and Section 7 emphasizes on IEE recommendations and concludes the report

D. Policy, Legal, and Administrative Framework

15 This section discusses the national and local legal and institutional framework within which the environmental assessment is carried out. It also identifies project-relevant international environmental agreements to which the country is a party.

1. ADB Policy

16 Superseding the previous safeguard policies (the Involuntary Resettlement Policy, 1995, the Policy on Indigenous Peoples, 1998, and the Environment Policy 2002), ADB, has adopted a comprehensive Safeguard Policy Statement in 2009 (SPS, 2009). This Statement describes common objectives of ADB's safeguards, lays out policy principles, and outlines the delivery process for ADB's safeguard policy. It applies to all ADB-financed and administered projects, and their components including investment projects funded by a loan, grant or other means.

17 Aiming on promotion and sustainability of project outcomes by protecting the environment and people from projects' potential adverse impacts, the objectives of ADB's safeguards are to:

- (i) avoid adverse impacts of projects on the environment and affected people, where possible;
- (ii) minimize, mitigate, and/or compensate for adverse project impacts on the environment and affected people when avoidance is not possible; and
- (iii) help borrowers/clients to strengthen their safeguard systems and develop the capacity to manage environmental and social risks.

18 ADB's SPS sets out the policy objectives, scope and triggers, and principles for three key safeguard areas:

- (i) environmental safeguards,
- (ii) involuntary resettlement safeguards, and
- (iii) Indigenous Peoples safeguards.

19 Concerning the present IEE environmental safeguards are considered. The Policy Principles of environmental safeguards are as follows:

- (i) A screening process for each proposed project should be applied. The appropriate extent and type of environmental assessment should be identified so that appropriate studies are undertaken.
- (ii) An environmental assessment should be carried out for each proposed project. Data concerning physical and cultural resources of the project's area of influence should be collected and evaluated. Potential direct, indirect, cumulative, and induced impacts of the project should be identified: Risks to environmental media (physical and biological environment) should be determined. Socioeconomic impacts should be highlighted (livelihood, health and safety, vulnerable groups, and gender issues), The potential of transboundary and global impacts, including climate change has to be assessed as well. A strategic environmental assessment should be applied where appropriate.

(iii) Discuss alternatives to the project's location, design, technology, and components and their potential environmental and social impacts. Propose the rationale for selecting the particular alternative. Consider the no project alternative.

(iv) Avoid, and minimize, mitigate, or offset adverse impacts and describe positive impacts by environmental planning and management. An environmental management plan (EMP) must be prepared. The EMP includes the proposed mitigation measures, environmental monitoring and reporting requirements. Related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators have to be added to the EMP.

(v) Carry out public consultation with affected people. Ensure women's participation in consultation. Involve stakeholders, including affected people and concerned nongovernment organizations. Continue consultations with stakeholders throughout project implementation as necessary to address issues related to environmental assessment. Establish a grievance redress mechanism to receive and facilitate resolution of the affected people's concerns and grievances regarding the project's environmental performance.

(vi) Disclose a draft environmental assessment (including the EMP) in a timely manner, before project appraisal to affected people and other stakeholders.

(vii) Do not implement project activities in areas of critical habitats, unless (i) there are no measurable adverse impacts on the critical habitat that could impair its ability to function, (ii) there is no reduction in the population of any recognized endangered or critically endangered species, and (iii) any lesser impacts are mitigated.

(ix) Apply pollution prevention and control technologies and practices consistent with international good practices as reflected in internationally recognized standards such as the World Bank Group's Environmental, Health and Safety Guidelines. Avoid the use of hazardous materials subject to international bans.

(x). Work has to be carried out under safe and healthy conditions. Prevent accidents, injuries, and diseases.

(xi). Conserve physical cultural resources and avoid destroying or damaging. Chance findings have to be taken into account. A pre-approved management and conservation approach for materials has to be provided.

20 The objective of environmental safeguards is to ensure the environmental soundness and sustainability of projects and to support the integration of environmental considerations into the project decision-making process. All ADB funded projects are screened at initial stages of preparation and categorized according to significance of the project's potential environmental impacts and the most sensitive feature. Projects are assigned to one of the following three categories:

Category A - Projects likely to have significant adverse environmental impacts, which are irreversible, diverse or unprecedented and may affect an area larger than the location subject to physical works. An Environmental Impact Assessment is required.

Category B –. Projects with adverse environmental impacts that are less significant than those of Category A projects, are site-specific, generally not irreversible, and in

most cases can be mitigated more readily than for Category A projects. An Initial Environmental Examination (IEE) is required.

Category C - likely to have minimal or no adverse environmental impacts; EIA is not required.

21 The Anaklia WSS subproject has been classified as environmental assessment category B (some negative impacts but less significant than category A) according to the criteria laid down in the checklists for sewerage projects and the checklist for water supply projects of the ADB's Environmental Assessment and Review Framework (November 2010) that was especially prepared for the environmental assessment of the Georgia Urban Services Improvement Investment Program.

2. Georgian Law

22 The **Law of Georgia on Environmental Permit** (2008) establishes legal bases for participation of the public. The purpose of the Law is to protect persons' health, natural surroundings, material assets and cultural heritage in the course of the activity. The installation of a WWTP and main sewage collector requires an Environmental Permit including Environmental Impact Assessment. Discharge of WWTP must follow limiting values.

23 The **Law of Georgia on Environmental Protection** regulates the legal relationship between the bodies of the state authority and the persons or legal entities (without distinction-legal form) in the scope of environmental protection and in the use of nature. Rights and obligations of citizens in the scope of environmental protection are described. Citizens may take part in the decision-making process in the scope of environmental protection. Basically the use of water is subject to licensing. Endangered wild animals and plants are listed in "The Red Book" and in "The Red List" of Georgia. Any activity relating to the endangered species of wild animals and plants, as well as to deterioration of their habitats are prohibited.

24 The state ensures protection of the environment and, correspondingly, protection of water as its main component in The **Water Act of Georgia** (16 October 1996). All residents of Georgia are liable to ensure the rational and sustainable use and protection of water. They have to prevent its contamination, pollution and depletion. The dumping of industrial, household and other garbage and wastes in water bodies is prohibited according to this act. The disposal of industrial, household and other effluents into water bodies is permitted on the basis of a license by the Ministry. With the object of protecting the Black Sea and preserving its ecological system, all natural and legal persons (including foreigners) are obliged to take measures for preventing pollution of the sea with waste water from the sources of pollution located on the land. The use of a surface water body for discharging industrial, communal-household, drainage and other waste waters is allowed only under a water use license issued on the basis of the Ministry-approved multipurpose water utilization plans and water management balance-sheet.

II. PROJECT RATIONALE AND NEED

A. Type of the Project

25 This is an urban water supply subproject. It involves development of infrastructure facilities for water abstraction from suggested well field, treatment, transmission and storage facilities. The subproject is urgently needed because the existing situation is inefficient and inadequate to the needs of the growing population and tourists.

B. Need of the Project

26 With the government initiative to develop Anaklia as an all weather tourist destination, the water demand is likely to grow significantly as will grow the waste water production. The government estimates, 21,000 tourists expected to visit daily by 2040. Therefore the subproject is urgently needed.

27 As discussed earlier, the service level of urban water supply in Georgia at present is not satisfactory. Services are not available to entire population and the serviced areas suffer with inefficient service levels. Systems are old and inefficient. The situation is at it's worst in Anaklia. UWSCG's Zugdidi Service Centre operates the water supply system in Zugdidi City and a number of outlying small towns and villages in Zugdidi and Tsalenjika District Areas. UWSCG supplies water to Anaklia, the coastal village where tourism development works are underway, from a separate groundwater source.

28 The present sub-project is therefore designed for a complete revival of the water supply system to meet the present and future demands. The subproject will improve the service standards – a daily supply of potable water in adequate quantities (203 lpcd) and at the requisite pressure.

29 With the increasing focus of the government on tourism as a major economic activity, the coastal areas of the Zugdidi District (Anaklia and Ganmukhuri) are expected to generate a significant increase in water demand in the near future.

C. Location

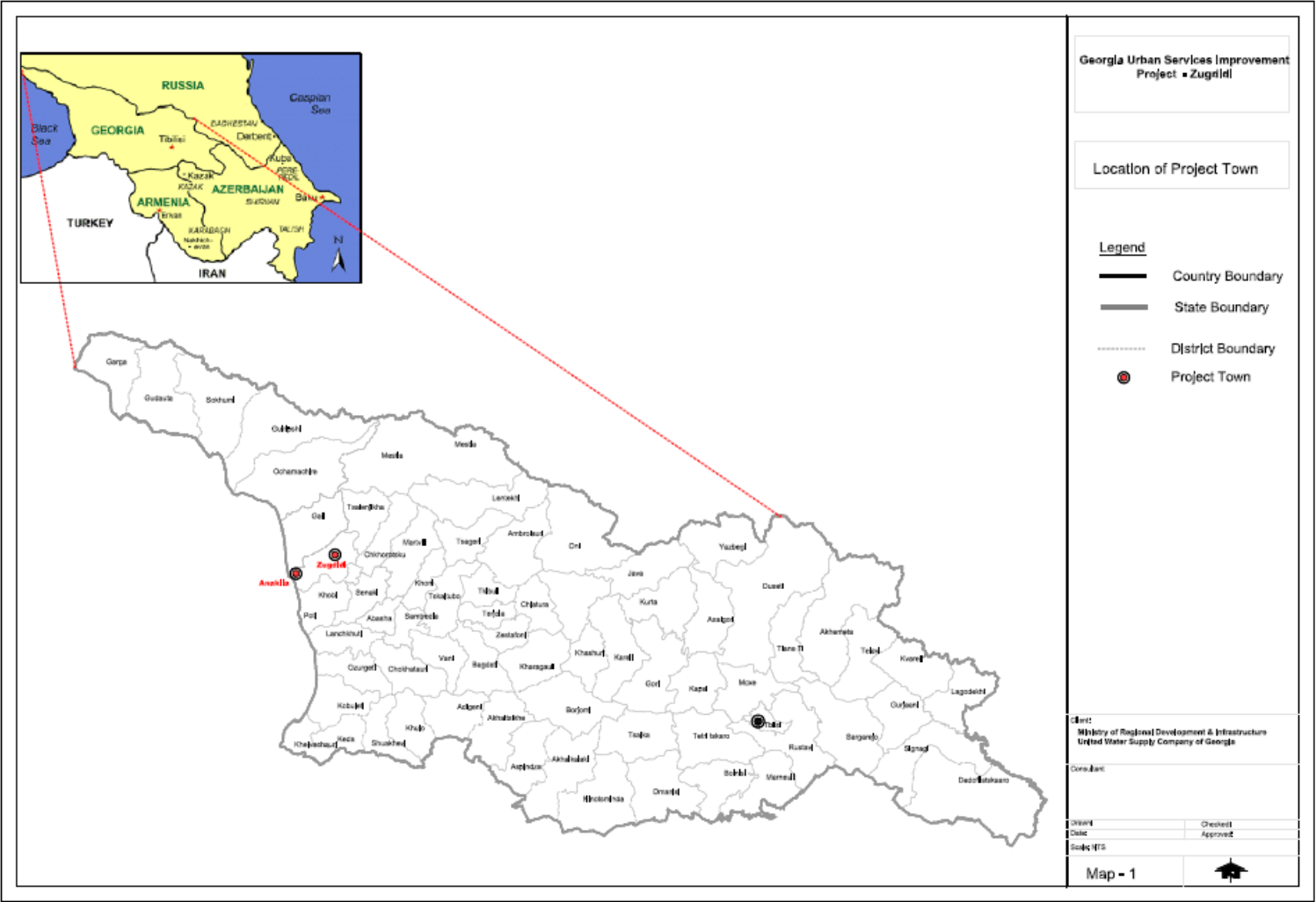
30 This subproject is located in Anaklia Town in Zugdidi District in western part of Georgia. Anaklia is situated about 30 km west of Zugdidi and about 480 km west of Tbilisi. Regional location of Anaklia is shown in **Map 1**.

31 The subproject includes the works comprising transmission lines and the construction of a new reservoir. The proposed infrastructure improvement works will be located east of Anaklia. The main component will be construction of new reservoir and laying of transmission line. Extraction from public registry for location of Anaklia reservoir is attached as Appendix 3.

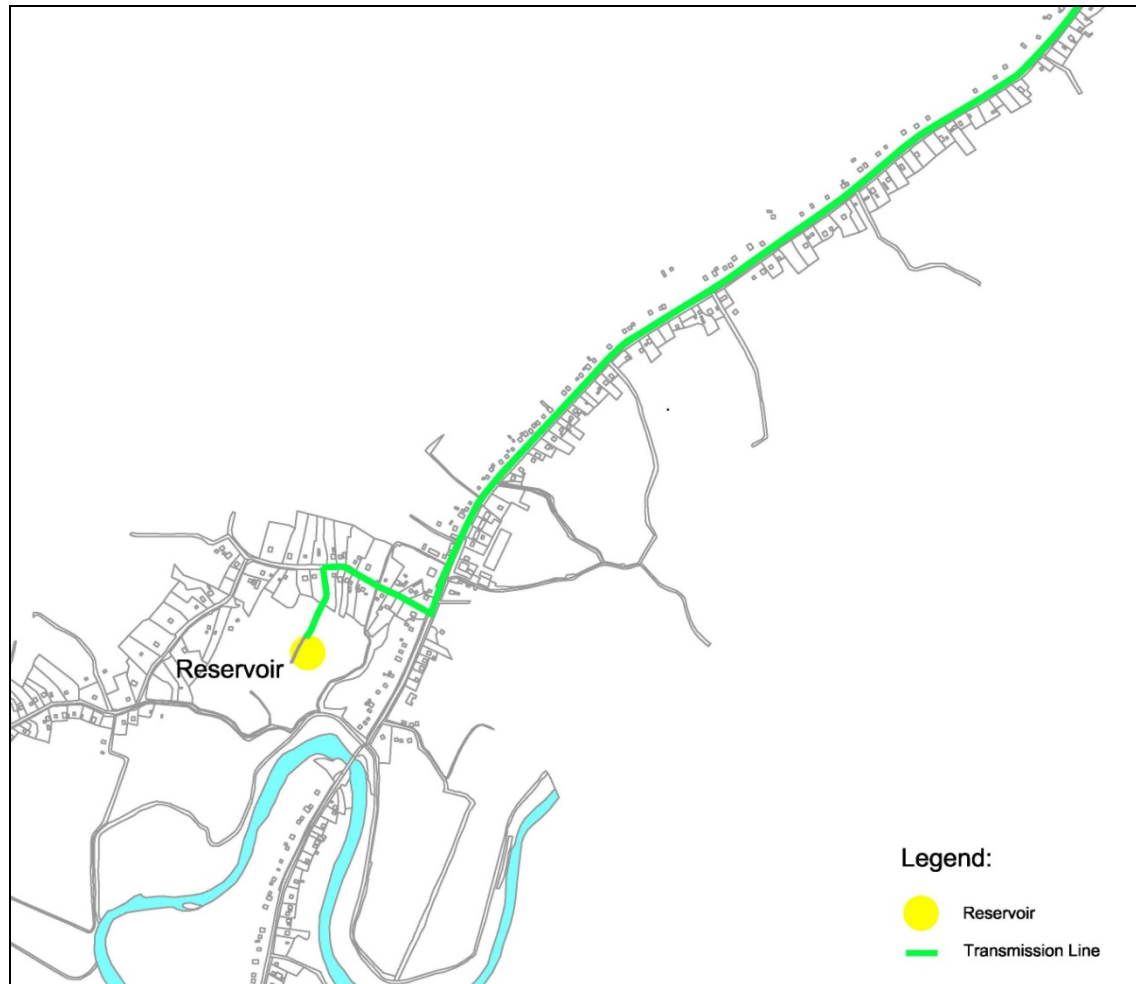
D. Implementation Schedule

32 Detailed design of the subproject will begin in 2012 and should be completed by 2014, after which construction will take about 2 years, so all work should be completed by the middle of 2014.

Map 1: Location of Project Town



Map 2 Location of new reservoir and transmission line in the North-East of Anaklia



33 Above map shows location of new reservoir in the North-East of Anaklia and transmission line running down from well fields site Inghiri (4) and site Kachati (5), both located to the West of Zugdidi.

E. Analysis of Alternatives

1. Water Supply

34 The current raw water source is brackish groundwater from wells close to the Black Sea. A new source had to be identified and two options were discussed: a) use of surface water from Enguri Dam and b) abstraction of groundwater from new well fields. Enguri Dam: The Enguri Dam is used for the production of hydropower. Water is available throughout the year and at a level that would allow a gravity flow scheme for the project area (Zugdidi, Anaklia). The abstraction of the water would require important rehabilitation works at the dam structure and the desilting of the reservoir. The water quality is not fit for consumption and would require treatment. Investment and operation costs would be significant. Groundwater abstraction: The region along Enguri River was considered to have good groundwater and geophysical investigations and test wells confirmed the assumption.

35 For its lower investment and operation costs as well as the more simple operation, the alternative groundwater abstraction was chosen. This alternative also has a lower environmental impact as the treatment of surface water would have required an important amount of chemicals and the produced sludge would have to be disposed of. The environmental impact of the groundwater abstraction will be minimized by the managed operation of the well field. Pump tests are carried out that will determine the maximum yield of each well and pump design and operation instructions will ensure that the groundwater will not be over-exploited. The Enguri river is continuously recharging the groundwater.

36 Alternatives for the construction of the transmission lines and the new reservoir were not investigated. The alignment of the transmission line is given by the location of the well fields and the location of the reservoir and follows the public roads. The reservoir site has a technically favourable location on the only plot of land that was available in the vicinity.

F. Licenses & Approvals Required

37 Environmental assessment of various activities and development projects in Georgia is governed by the Law on Environmental Impact Permits (EIP), which has entered into force in January 2008. This Law notifies the list of the activities and projects, which will be subjected to ecological expertise and require Environmental Impact Permit. The Law also makes the public participation mandatory in the process of environmental assessment, ecological expertise and decision making on issuance of an environmental impact permit. Under this Law, various projects/activities have been divided into four categories based on their size, importance and potential environmental impact, and sets out permitting process for each category.

38 None of the components of the proposed water supply improvement subproject in Anaklia are notified in the Law on EIP and therefore environmental impact permit is not required.

39 Abstraction of water from well fields requires permission of Ministry of Energy of Georgia.

40 *ADB Review and Approval*. For Category B projects the Draft IEE report are reviewed by ADB's Operational Department (in this case Central & West Asia Department)

and after addressing their comments, if any, the EA then officially submits the IEE reports to ADB. Completed reports are made available on the ADB website.

III. PROJECT DESCRIPTION

41 A feasibility study was conducted to improve the water supply system in Zugdidi and Anaklia to meet the design year demand (2040) and the project is formulated for implementation under the proposed ADB funded Investment Program. Works are proposed to be implemented through multi tranche funding. The following **Table 1** shows the subproject and components selected for implementation under tranche-1, for which, according to ADB requirement, this IEE is conducted.

A. Sub Project Components

42 This subproject focuses on creation of a new source based water supply system and source development. The descriptions shown in **Table 1** are based on the present proposals.

Table 1: Proposed Subproject & Components for Anaklia

Infrastructure	Function	Description	Location
Water supply components of the subproject			
Transmission main from well fields to new reservoir either by gravity or by pumping station	Convey water from the well fields to the new reservoir	Transmission pipes of diameter up to 400 mm	Area in between well fields and new reservoir. As pipes will be buried impact is restricted to construction stage.
Transmission main from new reservoir to Anaklia	Convey water from storage reservoir to distribution system	400 mm Diameter MS pipe over a length of approximately 21 km	Buried in a trench along the road; partly through private agricultural lands

B. Construction Activities

43 Main elements of the subproject are indicated in above **Table 1**.

44 Construction activities associated with the water supply components refer to laying of transmission mains from well fields to reservoir and from new reservoir to the Anaklia network as well as the construction of the new reservoir.

45 A new reservoir will be constructed to fit the new requirements. Water will be conveyed from the well fields to the new reservoir and from new reservoir to Anaklia by means of transmission pipes as indicated in above table. Construction activities required for trench digging and pipe laying are as described below. Pipe will be laid along existing roads as far as technically feasible. On some sections however it is necessary to traverse river floodplain, agricultural and private land.

46 *Laying of pipes.* All pipes will be buried along existing roads. Trenches will be dug using a backhoe digger, supplemented by manual digging where necessary. Excavated soil will be placed alongside, and the pipes will be placed in the trench manually or using a crane. Pipes will be joined, after which excavated soil will then be replaced on beneath and sides. A sand layer of 5 cm thick will be laid on top of the pipes, after which the trench will be

refilled with excavated material and compacted manually. The size of trench will be 1.4 - 1.7 m deep and 0.5 - 1.0 m wide. Surplus soil will be used for other construction activities.

47 *Laying of water supply system.* All pipes will be buried along existing roads. Trenches will be dug using a backhoe digger, supplemented by manual digging where necessary. Excavated soil will be placed alongside, and the pipes will be placed in the trench manually or using a crane. Pipes will be joined, after which excavated soil will then be replaced on beneath and sides. A sand layer of 5 cm thick will be laid on top of the pipes, after which the trench will be refilled with excavated material and compacted manually. The size of trench will be 1.4 - 1.7 m deep and 0.5 - 1.0 m wide. Surplus soil will be used for other construction activities.

- **Asbestos:** If any old pipes that require replacement are Asbestos they will be left in-situ and new pipes will be laid above them. If any asbestos pieces are broken or accidentally excavated these will be disposed off as explained in the **Table 6** EMP matrix.

48 Source of construction materials. In Anaklia, sand and aggregate is sourced from licensed mines along River Enguri. There is no designated disposal site for construction waste. It shall be disposed according to Georgian legal requirements!.

C. Operation of Improved Water Supply System

49 Utilizing the wells at Enguri, water pumping has been designed. This system involves – abstraction of water from wells, from where the water is conveyed to storage reservoirs. From reservoirs, water will be supplied into distribution system. This system will supply a maximum of 6.956 m3 of water per day.

50 The main operation requirement of the proposed system is treatment of water by chlorination.

IV. IMPACTS ON THE PHYSICAL & BIOLOGICAL ENVIRONMENT

A. Introduction

51 The following sections evaluate the impacts on physical and biological environment due to the proposed subproject. Each subsection first describes the baseline profile followed by impact identification and assessment during construction and operation. Mitigation measures are also discussed in conjunction with the impacts.

B. Topography, Geology & Soils

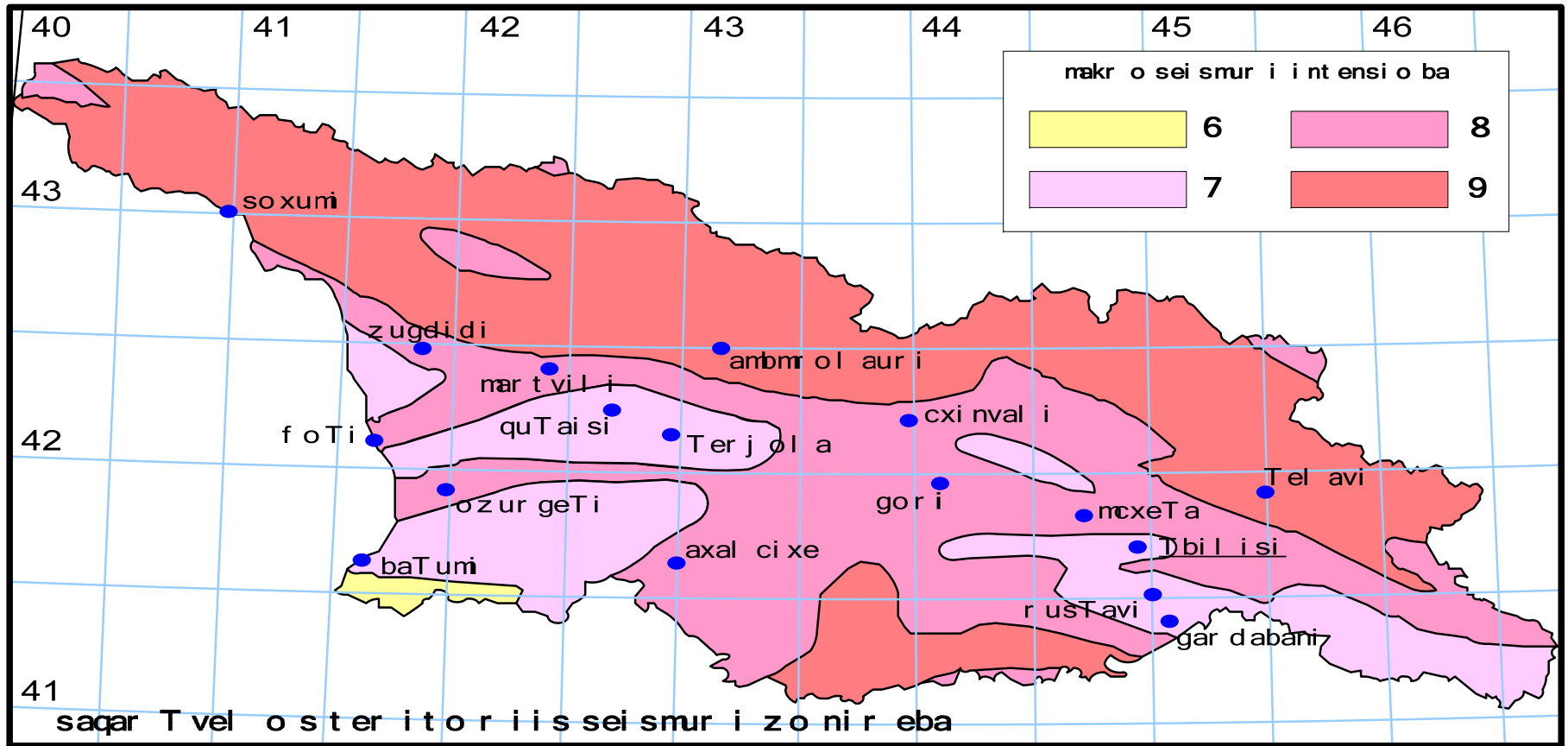
1. Baseline Conditions

52 *Topography.* Despite its small area, Georgia presents one of the most varied topographies within its geographical boundaries. Georgia lies mostly in the Caucasus Mountains, and its northern boundary is partly defined by the Greater Caucasus range. The Lesser Caucasus range runs parallel to the Turkish and Armenian borders and the Surami and Imereti ranges connect the Greater Caucasus and the Lesser Caucasus, and create natural barriers in the region. The project area is characterized by both hills and plains. Anaklia and Ganmukhuri are located in the Coast, with almost flat landscape. Elevation ranges from 1-500 m above MSL, over a length of 80 km.

53 *Geology.* The project area is situated in the Central Caucasus and in Kolkheti depression. In terms of tectonic development, the major part belongs to Kolkheti tectonic depression, which is bordered with the Black Sea basin to the west and Fanavi and Samagrela (Egrisi) ridges to the north. Poti-Askhi and Kurzu-Khikhadziri deep faults are located within this area. Erosive forms of mezo and micro relief riverine accumulative terraces are widely spread. According to seismic zoning map, Georgia is classified into Zone 6 to Zone 9 (in increasing order of seismic intensity, **Map 3**) and Zugdidi falls under Zone 8 (high seismic intensity zone). There has been no history of major earthquakes in Zugdidi.

54 *Soil.* The Samagrela region is characterized by various types of soil due to diverse climate-relief conditions. Soils in the areas near the coast are part of the lowland marshy and podzol soil zone of the Western Georgian lowland. Peat soils are predominant along the coastal strip of 2-8 km wide. Marshy silt soils are represented along riverbanks. Towards the Enguri Dam, variety of alluvial soils can be found in the altitude between 100-200 m; riverine clays, loams and silt sands are dominant. These soils are poor in humus, and are less fertile. Yellow soils of clayey and thick strata and red soils are found in the foothill zone. The upper part of 200-500 m above MSL, are mostly characterized by Humus rich carbonate soils and forest Chernozem soils. Depth of soil in the project area ranges from 3-5 m.

Map 3: Seismic Zone Map of Georgia



2. Impacts and Mitigation during Construction

55 During the construction, impacts on topography and geology are mainly due to invasive nature of excavation activities. No impact for the water and sewage network is expected since earth work will be carried out along existing roads. The initial situation will be rehabilitated after construction.

56 The excavation work will also tend to loosen the top soil, which may lead to soil erosion during winds and rains. Therefore the contractor should:

- Ensure proper compaction of refilled soil and there shall not be any loose soil particles on the top; the material shall be refilled in layers and compacted properly layer by layer

57 During the construction, impacts on topography, geology and soils are mainly due to earthworks and implementation of contractor's yard.

58 Excavation for transmission line comprises material excavation, pipe laying and backfill of material including compaction. Material will be stored temporary alongside the trench and build in again after pipe laying. Therefore impacts associated with earthworks for trench laying are of temporary nature. Excavated soil will be placed alongside the trench, and the pipes will be placed in the trench manually. Pipes will be joined, after which excavated soil will then be replaced on beneath and sides. A sand layer of 30 cm thickness will be laid on top of the pipe, after which the trench will be refilled with excavated material and compacted manually. The size of trench will be 2.2 m deep and 1.15 m wide. The excavation is expected to generate approximately 2,400 m³ material (2.2 m x 1.15 m x 930 m = 2,352.9 m³). After construction, part of trench will be occupied by pipe and sand layer and trench is refilled with the excavated material. Considering a trench width of 2.2 m and a depth of the sand layer of 0.3 m above pipe (DN 400, 1.15 m x 0.75 m x 930 m) approximately 800 m³ of the excavated material needs to be substituted by sand. Surplus material will be used as embankment fill as far as possible.

59 The excavation and refilling works will disturb the soil characters at the sites. The excavation will lead to disturbance and loss of fertile top soil. Therefore the Contractor should implement the following measures:

- Top soil of about 1 ft depth (0.3 m) shall be removed and stored separately during excavation work, and after main collector construction the same soil shall be replaced on the top.

60 Depth for foundations for new reservoir will be determined in design stage.

61 Since the project is located in very high seismic intensity zone, appropriate precautions have to be included in the structural design of facilities:

- Apply design and construction norms of Zone-7 (MSK-64 scale) according to Government of Georgia "Construction in Seismological Regions"
- Select appropriate pipe material and design for main collector and WWTP according to seismic intensity of project area

62 *Source of construction materials.* Due to Initial Environmental Examination conducted for the water supply components of the subproject in Anaklia sand and aggregate is sourced from licensed mines along Enguri River.

63 *Contractors yard:* The establishment of contractor's work camp may cause adverse impacts if various aspects such as liquid and solid waste management, equipment maintenance, materials' storage, and provision of safe drinking water are not addressed properly. The site for the work yard will be selected by the contractor.

64 To ensure that potentially resulting impacts are kept at a minimum the contractor will be required to prepare the following plans or method statements:

- Layout plan of the work camp including a description of all precautionary measures proposed to avoid potential adverse impacts on the receiving environment (surface and ground water, soils, ambient air, human settlement);
- Sewage management plan for provision of sanitary latrines and proper sewage collection and disposal system to prevent pollution of watercourses or groundwater;
- Waste management plan covering the provision of garbage bins, regular collection and disposal in a hygienic manner, as well as proposed disposal sites for various types of wastes (e.g., domestic waste, used tires, etc.) consistent with applicable national regulations; and
- Description and layout of equipment maintenance areas and lubricant and fuel storage facilities including distance from the beach and from Enguri River. Storage facilities for fuels and chemicals will be located at a distance to the shore and to the river-side. Such facilities will be bounded and provided with impermeable lining to contain spillage and prevent soil and water contamination.
- These plans will be approved by the Engineer prior to beginning of construction activities.

65 Prior to establishment of the work camp(s) the contractor shall conduct consultations with local authorities to identify sources of potable water for the workforce that will not compete with the needs of the local population. Potable water for the workforce shall comply with the national quality standards. Construction water may be taken from Enguri River.

3. Impacts during Operation

66 Regular operation of water supply system will be within the constructed facilities and therefore no impacts envisaged.

67 The main requirement for maintenance of the water supply infrastructure will be detection and repair of leaks. Repairs will be conducted in essentially the same way the pipes were laid. Trenches will be dug to reveal the leaking area and the faulty connection will be re-fitted, or the pipe will be removed and replaced if necessary. This activity is not expected to generate any waste soil nor will have any impacts.

C. Surface Water and Groundwater

1. Baseline Conditions

68 *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 lower reaches of the Enguri River Basin.

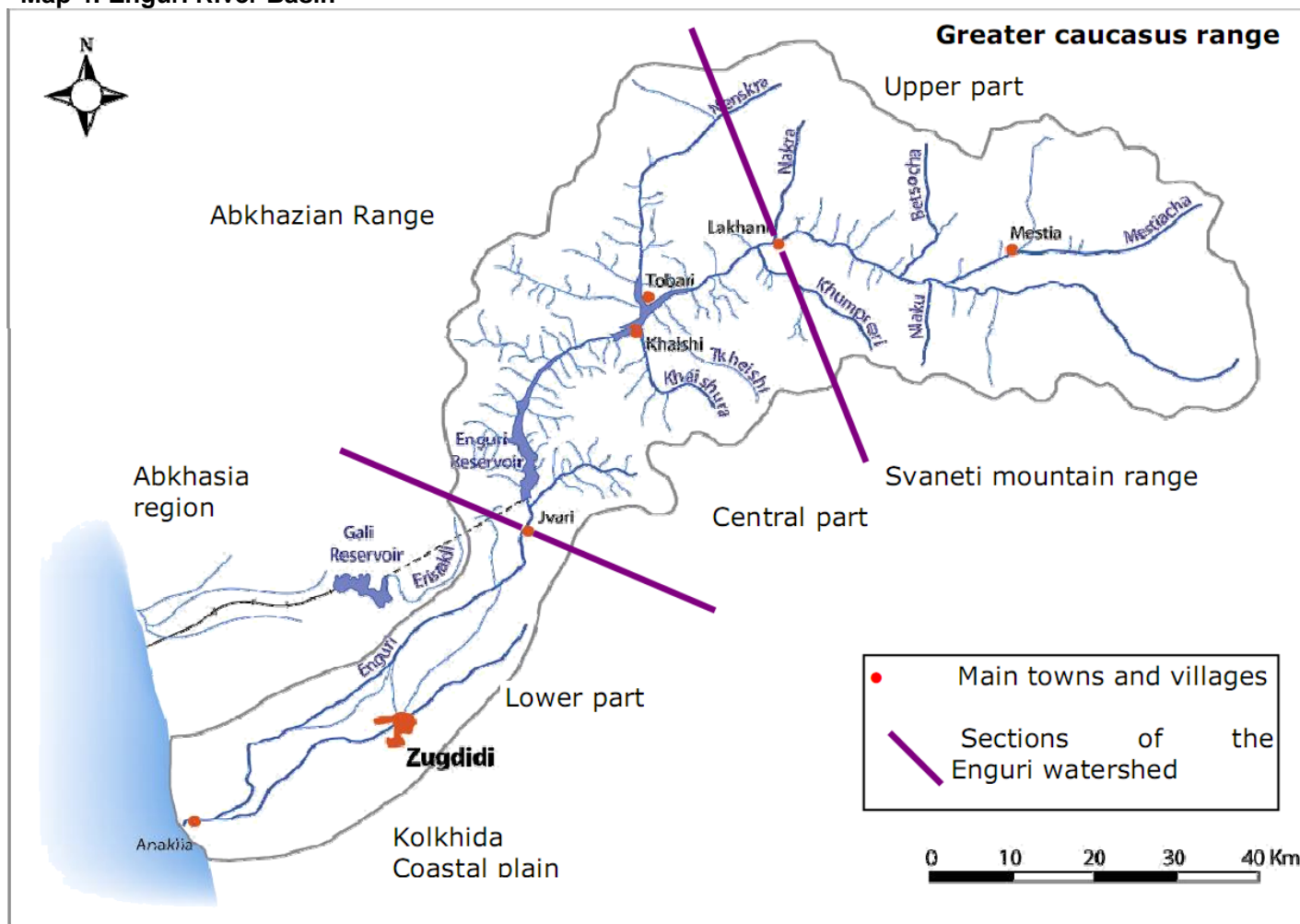
69 Originating from Namkvani Glacier in Greater Caucasus Range and flowing into Black Sea in the west, the Enguri is one of the biggest rivers in Georgia. It traverses a distance of 213 km, during which it is joined by a number of small and large streams/rivers. River flows through hilly region in the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

70 Enguri hydropower dam is located north of Zugdidi. It is the world's highest concrete arch dam. The construction of dam was started in 1961, but became fully operational only in 1987. Enguri Hydroelectric power station generates over 40% of the total electricity supply of Georgia. the dam is exclusively used for power generation; water is released to power station located in Abkhazia via a diversion channel. Dam has seven bottom gates through which surplus water is released. Water is also released downstream regularly to maintain minimum environmental flow however there is record of water releases from the dam either for power plant or downstream discharges.

71 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. 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 the dam holds good volume of water throughout the year.

72 The river is divided into three parts as shown in **Map 4**. 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.

Map 4: Enguri River Basin



73 **Table 2** shows the Enguri Dam water quality in comparison with the national surface water norms¹ and drinking water norms² set by the GoG. Two water samples were collected for analysis: one, from the top of the dam, and two, from the outflow of discharge sluice, where the water supply line is likely to be connected. All the quality parameters confirm to the use of water body for domestic and fishing purposes. In comparison with the drinking water norms, the sample collected from bottom sluice discharge, shows higher turbidity. Both samples show the presence of coli form which are above levels required for drinking water, however all the other parameters analyzed were well within the limits.

Table 2: Water Quality of Enguri Dam

S. No	Parameters	Unit	Enguri Dam Storage	Enguri Dam sluice	Surface water – domestic use	Surface water –fishing purpose	Drinking Water Norms
1	Color	-	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 coli form	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

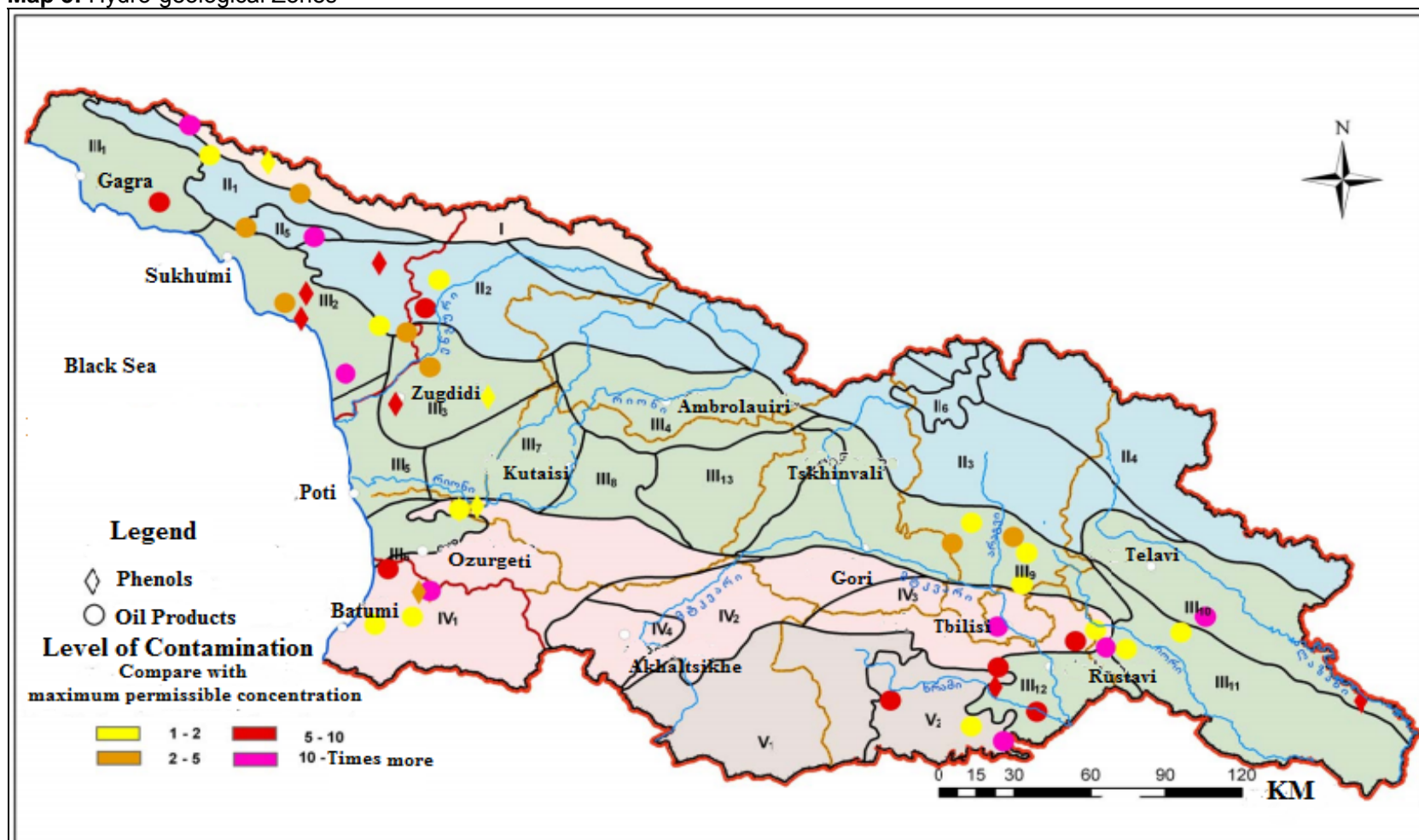
¹ Rules of Protection of the Surface Waters from Pollution, 2001 (Decree №297/N), Ministry of Labor, Health and Social Welfare (Attached at **Appendix 4**)

² Technical Regulation on Drinking Water, 2007, (Decree №349/N), Ministry of Labour, Health and Social Welfare (Attached at **Appendix 5**)

Source: Sampling Survey, September 2010

74 *Groundwater.* 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- III₃ (Fractured and fractured / karstic artesian basin of Samegrelo) (**Map 5**). 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 leachate from poor sanitation systems.

Map 5: Hydro-geological Zones



2. Impacts and Mitigation Measures during Construction

75 The project area experiences rainfall throughout the year. Surface runoff can collect in the trenches dug for pipeline. The silt-laden run-off from the construction sites may pollute the surface water by increasing the turbidity. Therefore the Contractor should:

- Protect open trenches from entry of rain water by raising earthen bunds with excavated soil,
- Confine construction area including the material storage (sand and aggregate) so that runoff from upland areas will not enter the site
- Ensure that drains are not blocked with excavated soil/material

76 Potential impact also arises from implementation and maintenance of contractors' yard, transport, maintenance of vehicles and handling and storage of lubricants and fuel. The required provisions for contractor's yard are described in the chapter on impacts and mitigation measures concerning topography, geology and soils.

77 If not properly compacted the backfilled trench may affect the surface water drainage during rains. To avoid this qualified site supervision is needed.

3. Impacts and Mitigation Measures during Operation

78 During the operation stage no effects on groundwater is envisaged. However as this is a ground water based water supply system, the effects due to water abstraction from the source and source water contamination risk needs to be assessed.

79 Generally the main risk to the physical environment of operating a new/improved water supply system is that of increased abstraction, which may deplete the water resource. Unsustainable reduction may affect downstream uses and may have ecological impacts (such as on flora, fauna and inadequate groundwater recharge). On the other hand, unsustainable source may also lead to closure of the system and wastage of investment.

80 Water is taken from 5 well fields along the Enguri River (site Zeda Lia, site Lia, site Rukhi, site Inghiri and site Kachati) as indicated in map 3 "location of proposed well fields" and conveyed via a transmission pipe to the new reservoir North-East of Anaklia. No relevant environmental impacts are to be expected due to operation of this system.

81 An important aspect of increased water supply is that of increased sewage generation, which needs to be treated and disposed properly without causing any impacts. In case of inadequate facilities, disposal of untreated sewage into rivers/streams is common and therefore it offers a potential impact to surface and groundwater.

82 With the increase in water supply, the total sewage generation from the project area will be 39,800 m³ per day, with most of it generating from Zugdidi City and Anaklia – from both resident and tourism areas. Without any proper sewage collection and treatment system, the disposal of the large quantities of sewage will have negative impacts on receiving environment, particularly on Enguri River and coastal waters. It is therefore necessary that:

- Sewerage system with adequate treatment facilities, which can treat the sewage to Georgian standards and dispose safely, shall be provided; the urban and tourism areas (Zugdidi City and Anaklia) shall be provided with sewerage system on priority

- The above measures shall be implemented along with the water supply system improvement

D. Climate & Air Quality

1. Baseline Profile

83 *Air Quality.* Ambient air quality monitoring is conducted at only seven locations in Georgia. None of these are located in Anaklia, as there are no major air polluting sources 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.

84 *Climate.* Anaklia climate is humid sub-tropical with warm winters and hot summers. The annual average temperature is 13.8 °C, average winter temperature (January) is 4.9 °C, while the average summer (August) temperature is 22.7 °C. Annual average precipitation is 1,616 mm almost equally spread across the months, although comparatively higher during the rainy season. Winds are influenced by the Black Sea in the west and mountains in the northeast. Throughout the day winds are from the lowland to the mountains and in the night, from the mountains to lowlands. Wind velocity ranges from 0.1 m/sec to 1.8 m/sec.

Fig. 1 Monthly Average Temperature

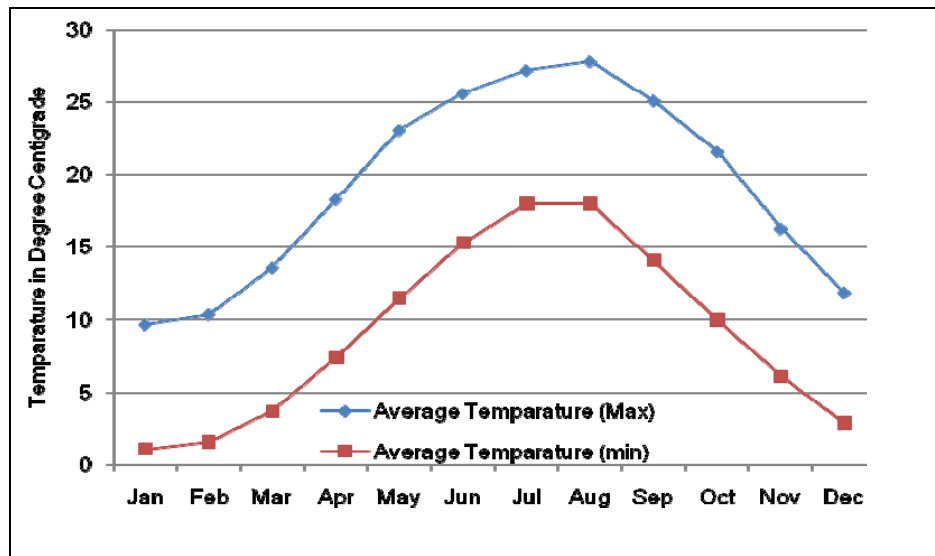
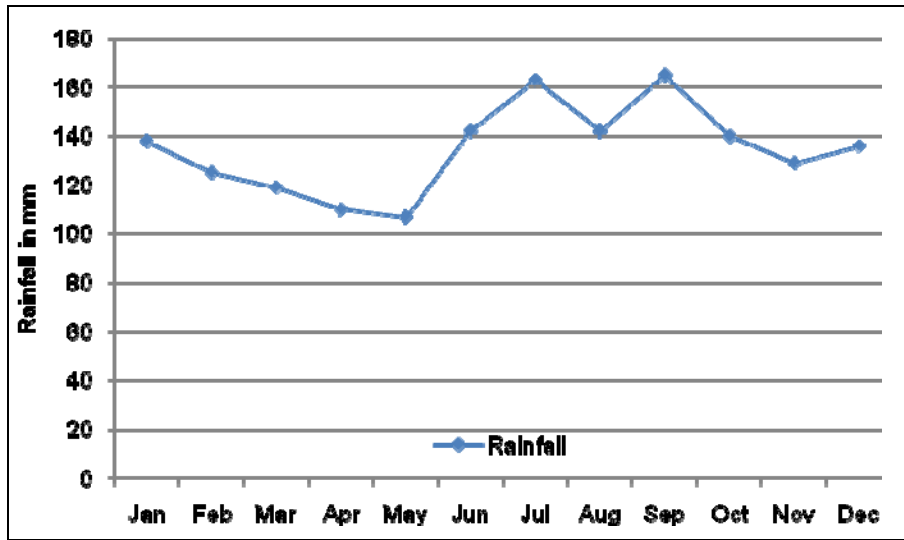


Fig. 2 Monthly Average Precipitation



2. Impacts and Mitigation Measures during Construction

85 The activities that could cause impact on ambient air quality are (i) dust generation from construction activity, and (ii) air emissions including dust from operation of construction equipment (like excavators, cranes) and material and waste transport vehicles.

86 The construction work has a lot of potential for the creation of dust, from the excavation of dry soil and its storage, and levelling on the ground. Some sections are located in the urban areas where the impacts of dust generation will comparatively be higher. Action will therefore be needed to reduce the impacts on air quality at both the construction and disposal sites, by controlling dust. The Contractor should therefore be required to:

- Cover or damp down by water spray on the excavated mounds of soil to control dust generation;
- Apply water prior to levelling or any other earth moving activity to keep the soil moist throughout the process;
- Bring the material (aggregate and sand) as and when required;
- Ensure speedy completion of work and proper site clearance after completion
- Damp down unsurfaced/bad condition roads to avoid dust generation while using for transport of waste/material
- Use tarpaulins to cover loose material that is transported to and from the site by truck
- Control dust generation while unloading the loose material (particularly aggregate and sand) at the site by sprinkling water/unloading inside a barricaded area
- Clean wheels and undercarriage of haul trucks prior to leaving construction site
- Restrict access to the work area except for workers to limit soil disturbance.

87 Various types of equipment and vehicles would be required for the construction activity. The exhaust emissions from these may degrade the ambient air quality. Considering the scale of work and use of equipment, impact will be insignificant, and will be beyond the scope of this project. However, to enhance the subproject benefits, the Contractor should consider the following:

- Ensure that all equipment and vehicles used for construction activity are in good condition and are well maintained
- Ensure that all equipment and vehicles confirms to emission and noise norms

1. Impacts and Mitigation Measures during Operation

88 No impacts on air quality are envisaged when operating the water supply system.

E. Biological Environment

1. Baseline Profile

89 About 40 percent of total geographical area of the country accounts for forests. 97 percent of forests situated on mountain, the rest 3% are low-lying and flood plain forests in Kolhida Region and in the Western Georgia.

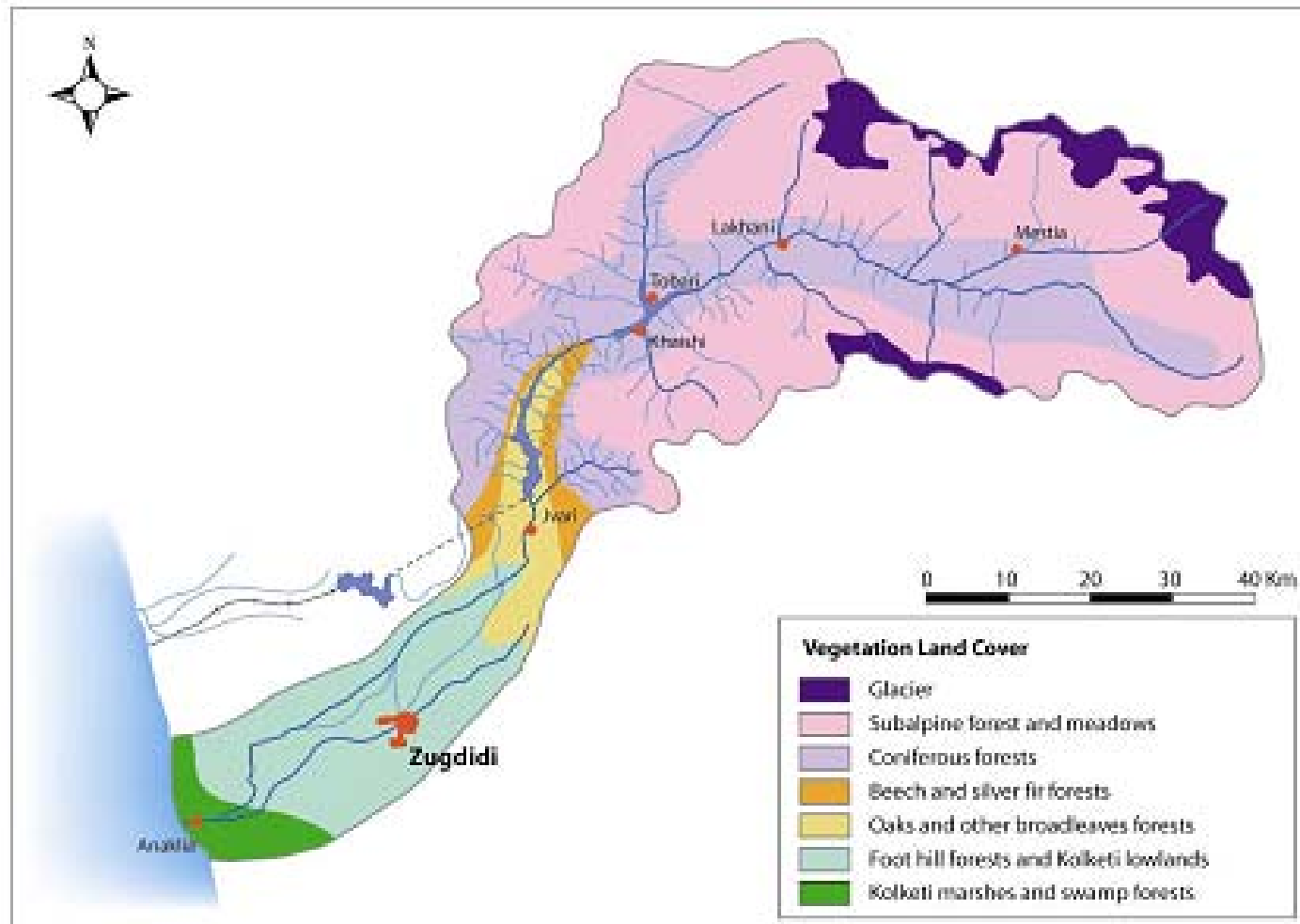
90 *Flora.* Owing to its varied physical and geographic conditions, the vegetation in the project area is rich and diverse. Flora consists of about 1,200 higher plant species, of which 175 are endemics. In floristic terms peat bogs are unique along with Colchic forests with evergreen undergrowth, oak forests, beech and coniferous forests, sub-alpine crook stem forests, sub-alpine and alpine high grass and alpine meadows. All the project components are located along the roads and in government lands. A pipeline for about 200 m passes through agricultural lands. As shown in the following

Map 6, Project area consists of three types vegetation: (i) Oaks and broad leaved forest near the Dam, (ii) Foothill forests and kolketi low lands for most of the area, and (iii) Kolkheti marshes and swamp forest. Following species are found in areas around Enguri Dam: oak (*Quercus iberica*), hornbeam (*Carpinus caucasicus*), oriental hornbeam (*Carpinus orientalis*), chestnut (*Castanea sativa*), beech (*Fagus orientalis*), and hazel tree (*Coryllus avellana*). Moist areas are dominated by beech forests (*Fagus orientalis*), chestnut (*Castanea sativa*), box tree (*Boxus colchicus*) and undergrowth is dominated by rhododendron (*Rhododendron ponticum*, *R. caucasicum*), and bilberry (*Vaccinum myrtillus*, *V. arctostaphylos*).

91 Almost all the roads in project area including the highways are lined with avenue plantation. Species include: silver fir, spruce, palm tree, Georgian maple, chestnut, eucalyptus, cedar, bay leaf, cypress, hazel nut, floodplain oak, Megrelian birch, Colchic Holly, Rhododendron, Ash, Alder and Great Sycamore. The following species are listed as endangered in the IUCN Red Book:

- Georgian maple (*Acer ibericum*)
- Chestnut (*Castanea sativa*)
- Floodplain oak (*Quercus pedunculiflora*)
- Megrelian Birch (*Betula megrelica*)

Map 6: Vegetation Cover in Enguri Catchment



92 *Fauna.* Samagrela fauna comprises distinct species. Wolf, jackal, fox are present in the region. Roe deer are found in forest flood plains. Many nesting and migratory species occur in Kolkheti reserve, which is the migration route for the species from the Europe and Russia. Notable avifauna in the area include: white wagtail, blackbird, tit, starling, raven, hooded crow, swallow, etc. Kolkheti lowland is the place of origin of the pheasant (*Phasianus colchicus*). Raptors are also abundant: black kite, falcon, marsh harrier, and imperial eagle are common. Otters can be found on the banks of Paliastomi lake, Tskhenistskhali and Enguri. The area is not rich in reptiles.

93 *Protected Areas.* There are 14 Strict Nature Reserves, 8 National Parks, 12 Managed Nature Reserves, 14 Natural Monuments and 2 Protected Landscapes in Georgia. These protected areas cover about 7 % of the country's territory. About 75 % of Protected Areas are covered by forests. Primary function of the Protected Areas is protection of natural heritage of the country. Kolkheti National Park (KNP) is the nearest protected area, boundary of which is located at about 10 km from the project area. KNP was established in 1998 with the purpose to protect wetland ecosystems. The total area of the Park is 28,571 ha including 15,742 ha of water area, classified into three zones: The Paliastomi Lake in the Park is the ideal environment for many species of fish and invertebrates. Kolkheti wetlands are important for their floristic diversity.

94 *Aquatic Biota 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 (*Acipenser 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 Mulletts (*Mugil cephalus*, and *M. auratus*), Pipefish (*Syngnatus nigrolineatus*); Round Gobies (*Neogobius cephalargus* 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 eurythralmus*) and Chub (*Leuciscus 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 morpha labrax*). Among them are cyprinids including the Crimea Barbel (*Barbus tauricus escherichi*), Colchic nase (*Chondrostoma colchicum*, endemic to colchic rivers), Chub (*Leuciscus cephalus*), Minnow (*Phoxinus phoxinus colchicus*) and Gudgeon (*Gobio gobi*).

95 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.

2. Impacts and Mitigation Measures during Construction

96 During the construction, impacts on flora and fauna are due to site clearance activities and implementation of contractors' yard and the well fields.

97 Following measures need to be implemented to avoid any impacts on flora and fauna:

- Avoid tree cutting by local and small change of layout plan/alignment
- In unavoidable cases, plant four trees of same species for each tree that is cut for construction
- Bushes and grasses shall be cleared only in actual construction area; all other preparatory works (material storage) shall be conducted on barren lands where there is no vegetation.
- Use excavated soil for refilling the pipeline trench; avoid sand layer on the top of the pipe in inaccessible areas to avoid importing material and related disturbances
- Trench construction shall be taken up in small segments, so that work (excavation, pipe laying and refilling) in each segment is completed in a day. No trenches shall be kept open in the night/after work hours. This will avoid any safety risk to wild animals.

3. Impacts and Mitigation Measures during Operation

98 The operation and maintenance activities would be conducted within the facilities, and therefore no impacts envisaged on biological environment.

V. IMPACTS ON THE SOCIOECONOMIC ENVIRONMENT

A. Economic Resources

1. Baseline Profile

99 *Agriculture.* Agriculture is the main economical activity of the region. Region was once famous for tea plantations. Owing to various reasons, however at present, there are practically no tea plantations. This has given way to commercial crops like Hazelnut, which is presently a major product which is exported from the region. In addition, new fruit species like kiwi and feijoa have been introduced; currently the production satisfies the entire country's demand. Besides, cereal production and live stock breeding for milk and meat is predominant in the region. In some areas grape cultivation is also practiced. The low land areas towards coast are less fertile compared to the agricultural lands in the mid-reaches of Enguri River, between the dam and Zugdidi City.

100 *Industry.* There are no major industries in the project area; there are small scale agro-based units like timber processing, fruit and hazel nut processing units in the region.

101 *Mining.* Major peat deposits are found in Anaklia. At present mining for lime, peat and building materials like brick earth, gravel and building stone is conducted to meet the domestic demand. The region also has mineral resources like: gold, lead, zinc, copper, cobalt and silver, most of which are still unexploited.

102 *Roads & transport.* Anaklia is connected to the rest of the country via Zugdidi. Zugdidi is an important and strategic city in Georgia and is well connected with the rest of the

country with roads and a railway. The Tbilisi-Samtredia-Sochi highway and Tbilisi-Batumi railroad pass through the city. The nearest port is at Poti (60 km), and the nearest airport is at Senaki (40 km). Internal roads in the city are very well developed and are in good condition. Public transport facilities are available and connect to all areas.

103 *Urban Services.* UWSCG provides water supply and sewerage services in the project area. At present, due to lack of source, the water supply system is almost non-functional. With supply from local bore wells, about 7% population is covered, and the remaining depend on own bore wells. In Anaklia, water supply is provided from bore wells and serves only a part of the area.

104 *Power Supply.* After the independence, Government of Georgia has made efforts to improve the power supply through new generating sources. Hydropower is the predominant source (88%), while the rest is from gas based thermal power stations. Zugdidi gets power supply from Enguri Hydropower Station. Uninterrupted and good quality power supply is available in Zugdidi.

2. Impacts and Mitigation Measures during Construction

105 The water supply improvement works will all be conducted on existing roads.

106 In Anaklia, pipeline will be laid along the main roads, most of which are busy with commercial and business activities. Although work will not require land acquisition it could still have economic impacts, if the presence of trenches, excavated material and workers discourage customers from visiting shops and other businesses, which lose income as a result. These losses however will be short in duration. Implementation of the following best construction measures will reduce the inconvenience and disturbance:

- Informing all residents and businesses about the nature and duration of work well in advance so that they can make necessary preparations
- Providing wooden walkways/planks across trenches for pedestrians and metal sheets where vehicle access is required
- Increasing workforce and using appropriate equipments to complete the work in minimum time in these stretches

107 The another aspect of the work that has economic implications is the transportation of material to the site and waste from the site to locations where it can be put to beneficial use as recommended. Dust generated during the transport may also impede the commercial and trade activities. The transportation of material and waste shall be implemented by the Construction Contractor in liaison with the city authorities, and the following additional precautions should be adopted:

- Plan transportation routes in consultation with the Anaklia Municipality and Police
- Schedule transportation activities by avoiding peak traffic periods
- Use tarpaulins to cover loose material that is transported to and from the site by truck
- Control dust generation while unloading the loose material (particularly aggregate and sand) at the site by sprinkling water/unloading inside a barricaded area
- Clean wheels and undercarriage of haul trucks prior to leaving construction site
- Inform all residents and businesses about the nature and duration of any work well in advance so that they can make necessary preparations if necessary;
- Provide wooden walkways/planks across trenches for pedestrians and metal sheets where vehicle access is required

- Increase workforce to complete the work in minimum time in these stretches

108 The work of laying pipelines along the roads may disrupt/damage the existing infrastructure like storm water drains, water and sewer lines and power supply lines. Storm water drains along the roads are likely to be disturbed. It is therefore required to implement following measures to avoid or minimize the impact during construction:

- Design alignment with minimum disturbance to the existing infrastructure
- Identify the services to be affected and notify the respective service agencies about the construction work and if there is any need for shifting
- Coordinate with respective agencies and provide prior information to public about the disruption in services during construction
- In case of damage to storm water drains, temporary arrangements shall be made to let-off the runoff downstream to avoid flooding; rehabilitate the drains as early as possible to original position immediately after the pipeline work

3. Impacts during Operation

109 As the operation and maintenance activities would be conducted within the existing facilities, no impacts are envisaged on economic resources. Repairs and leaks of the transmission main pipeline will be minor and localized. In fact, the improvement water supply system will bring various benefits. Availability of good infrastructure facilities will add to the quality of life, and there will be more people interested to live and work, which will bring new investments and boost economic development.

B. Socio-Cultural Resources

1. Baseline Profile

110 *Demography.* The present population of Anaklia is 2,855, and floating population (tourists) is about 3,500. Contrary to overall growth rate of Georgia, which had declined during the last two decades, population of Anaklia has increased though marginally. This is mainly attributed to decline in out-migration due to revival of tourism related economy. With the government focusing on development of Anaklia as a all-weather tourist destination with tourism related facilities and infrastructure, the tourist population is likely to increase to 20,000 by 2040 (*Source: Government Estimates*).

111 *Population Composition.* Almost entire population in Zugdidi / Anaklia region is ethnic Georgians. Georgian is the main language, while most can speak Russian few can also speak English. There is no population which can be categorized as indigenous in the project area. About 98% of Zugdidi / Anaklia population is literate.

Table 3: Population of Zugdidi / Anaklia Region

Year	Population			CAGR
	Urban	Rural	Total	
2010	69,750	56,320	126,070	-
2015	87,206	56,170	143,376	2.61%
2020	94,670	57,110	151,780	1.15%
2025	101,160	58,070	159,230	0.96%
2030	107,190	59,070	166,260	0.87%
2035	113,760	60,090	173,850	0.90%
2040	119,880	61,140	181,020	0.81%

112 *Education & health facilities.* There are schools (primary and secondary) and kindergartens in Anaklia. For higher education, people mainly depend larger urban centres of Kutaisi and Tbilisi.

2. Impacts during Construction

113 The construction impact will include noise and dust, and interrupted access due to movement of heavy vehicles transporting material and waste. Mitigation will therefore be needed to protect socio-cultural resources and to enable usage by local people and visitors to continue throughout the construction work. This will be achieved through several of the measures recommended above (under the impacts on air quality), including:

- Limiting dust by removing waste soil quickly; by covering and watering stockpiles, and covering soil with tarpaulins when carried on trucks
- Providing wooden walkways planks across trenches for pedestrians and metal sheets where vehicle access is required
- Increasing the workforce in to complete the work quickly
- Dust suppression by spraying water

114 There is invariably a safety risk when substantial construction such as this is conducted in an urban area, and precautions will thus be needed to ensure the safety of both workers and citizens. The Contractor will be required to formulate and implement health and safety measures at construction sites, which should include such measures as:

- Following standard and safe procedures for all activities – such as provision of shoring in deeper trenches (> 2 m)
- Excluding public from the site – enclosing the construction area and provide warning and sign boards, and security personnel
- Providing adequate lighting to avoid accidents
- Ensuring that all workers are provided with and use appropriate Personal Protective Equipment - helmets, hand gloves, boots, masks, safety belts (while working at heights etc)
- Maintaining accidents records and report regularly
- Traffic control: Irregular control of trucks by local police (radar control, safety control)
- Speed limits to be introduced within construction areas and on access roads
- Yellow / orange warning tape to protect workers and pedestrians from falling into building pits, to prevent pedestrians from entering the construction site
- Warning signs to prevent accidents within the construction site and on access roads

115 *Economic Benefits.* There could be some short-term socio-economic benefits from the construction work if local people gain employment in the workforce. To ensure that these benefits are directed to local people, the Contractor should be required to employ as much of his labour force as possible from the local communities in the vicinity of construction sites. Drawing of majority of workforce from local communities will avoid problems that can occur if workers are imported, including social conflicts and issues of health and sanitation due to labour camps. If temporary labour camps are to be provided, Contractor should ensure that they are maintained well with proper water supply and sanitation facilities.

- To the extent possible labour force must be drawn from the local community

- In unavoidable case of sourcing labour from other areas, provide adequate housing facilities so that there are no impacts and conflict with the local people. Following measures shall be followed:
 - Establish the temporary labour camps in consultation with the local authority
 - Shall be located away from water bodies
 - No clearance of trees vegetation shall be allowed for establishment of camp
 - Provide all basic amenities (water supply and sanitation, waste collection & disposal, first aid facilities, etc)
 - Contractor shall provide fire wood and no worker shall be allowed to cut any tree
 - Ensure regular and clean maintenance of the camp

116 *Archaeological heritage.* Since prehistoric times, Georgia, as a part of the Caucasian geopolitical region, has been an area of interest for such great states and empires as Achaemenids and later Iran, classical Greece and Rome Byzantium, Arab caliphates, Tatar Mongolian hordes, and the Ottoman Empire. Due to this, local Georgian and other peoples' material and spiritual culture have left significant archaeological traces.

117 However in the case of the proposed Project no archaeological monuments are expected to be touched during construction phase since pipes will run along and inside existing roads as far as technically feasible. There is no evidence for chance finds of archaeological objects. This also can be concluded due to the conduct of the three public meetings. One meeting was conducted in Zugdidi in November 2010 and two meetings were conducted in Anaklia, on 12th of April 2011 and on 11th of May 2012. Attendances to the meetings (NGO's, stakeholders, governmental regulatory institutions) were given the opportunity to raise concerns and to comment on the Project. No concerns with regard to any archaeological issue were raised.

118 In the unlikely event of an archaeological chance find the mitigation measure stipulated in "Table 6 Environmental Impacts and Mitigation Measures" of the Chapter "Environmental Management Plan" will have to be carried out. Furthermore **Appendix 4** provides a Chance Find Checklist to be followed.

3. Impacts during Operation

126. As the operation and maintenance activities would be conducted within the facilities, therefore no major impacts on socio-cultural resources envisaged.

119 The improved and expanded water supply system would require additional workforce – both skilled and unskilled, for operation and maintenance, and therefore creates new employment opportunities for local people.

C. Noise & Vibration

1. Baseline Profile

120 Ambient noise is not subject to monitoring in Georgia, so there is no data on ambient noise/vibration available. Main noise generating sources in the project area are transport vehicles. Following table shows the subproject sites and their background noise levels (based on the site observations) and sensitive receptors, if any.

Table 4: Ambient Noise & Vibration and Sensitive Receptors at Project Sites

Subproject Sites	Background Noise/Vibration	Sensitive Receptors
Pipeline Alignment of water supply in Anaklia	Pipeline runs along the main roads, carrying considerable traffic. Linear sparse development can be observed along the roads. The main noise source is traffic.	residential areas

2. Impacts during Construction

121 Construction activities are likely to generate noise and vibration. In the present project, haulage of construction materials, and operation of equipment like backhoe loader (80 dB), handheld pneumatic drill (85 dB), concrete mixers (80 dB) and concrete vibrators (76 dB) are the primary noise generating activities. This project does not involve high noise/vibration generating activities like pile-driving or rock cutting.

122 Assuming the worst case conditions and simultaneous working of two pieces of equipment (backhoe and pneumatic drill) the following table shows the noise levels in comparison with the Georgian noise standards. Since the construction noise is intermittent and short-term, the maximum admissible noise levels as per the Georgian standards (figures in bracket) are considered for comparison. The predicted day-time noise levels exceed the standard only within a distance of 50 m (single equipment use) and 100 m (combined use of two equipments). There are no sensitive receptors within this distance of work sites, therefore no impacts envisaged. There may be sensitive receptors within 50 m of pipeline works in residential/urban areas. The noise from pipeline works will be temporary (on an average a 50 m length of trench will be excavated in 4 hours), no special precautions will be required. Sensitivity to noise increases during the night hours. Appropriate safety measures shall be put in place for workers, who will be continuously in the noisy work environment. Following measures therefore shall be implemented:

- no construction activities shall be conducted in the night
- Provide personal protection equipment like ear plugs to the workers at the noisy working site
- Sound barriers should be erected at schools and hospitals if the distance to the construction site is 50m or less than 50m

Table 5: Noise Levels at Various Distances from the Site

Distance for equipment	Backhoe	Hand-held pneumatic drill	Mixer	Vibrator	Combined ³	Noise Standard ⁴ Leq dB(A)	
<i>M</i>	<i>Leq dB(A)</i>					<i>Day</i>	<i>Night</i>
15	80	85	80	76	86	55	45
50	70	75	70	66	76	(70)	(60)
100	64	69	64	60	70		
200	58	63	58	54	64		
500	50	55	50	46	56		
1,000	44	49	44	40	50		

³ Combined noise of two noise generating equipment (backhoe and pneumatic drill) likely to be used

⁴ Tolerable and maximum admissible levels of noise for residential zone as per Decree on Environmental Quality Standards notified in 2001 by the Ministry of Labour, Health and Social Welfare, Government of Georgia; figure shown in bracket are maximum admissible levels.

2,000	38	43	38	34	44		
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123 Another important activity is haulage of construction materials and waste to and from the sites. Following measures shall be included to avoid nuisance due to haulage of material and waste.

- Schedule material and waste haulage activities in consultation with local authorities
- No nighttime haulage activity; limit to day time off peak hours
- Educate drivers: limit speed and avoid use of horns
- Earmark parking place for construction equipment and vehicles when idling; no parking shall be allowed on the roads that may disturb the traffic movement

124 None of the activities in the subproject has potential to generate observable vibration, and therefore no impacts are envisaged.

3. Impacts and Mitigation Measures during Operation

125 There are no sources of noise/vibration from the operation of the water supply system.

D. Cumulative Impacts

126 The project is designed to improve environmental quality and living conditions in Anaklia through the improved water supply system. The potential negative impacts identified on various environmental parameters, during both construction and operation, in the previous sections of this report, are localized and temporary.

127 By nature, impacts such as on air quality and on people (due to disturbance, nuisance, safety risk of construction activity) can have cumulative impacts, as all the construction activities are conducted simultaneously. However, as the construction sites are spread over a large area, cumulative impacts are unlikely. Further, these are common impacts associated with any construction activity, and as discussed in the earlier sections, there exists proven and easy-to-implement measures to mitigate these impacts.

128 No cumulative impacts are envisaged either during the operation stage.

E. Public Consultation

1. Water Supply System and Waste Water System (IEE)

129 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 Zugdidi and Anaklia
- UWSCG as implementing agency
- Other government regulatory institutions
- NGOs and CBOs working in the affected communities;
- Other community representatives (prominent citizens, religious leaders, elders, women's groups);
- The beneficiary community in Zugdidi and Anaklia in general; and

- The ADB, as funding agency

130 Two forms of public consultation have been used during preparation of the IEE, to discuss the project and involve the community in planning the mitigation measures and develop the Environmental Monitoring Plan. These are:

A public meeting was held in Zugdidi City in November 2010, to which stakeholders were invited.

- Participants of the meeting in Zugdidi city in November 2010 were informed about the aim of the subprojects and the benefits together with their likely impacts and the ways in which they would be mitigated. Participants were invited to discuss their views and concerns, which were then incorporated into the IEE.
- Ad hoc discussions were also held on site with people and communities who could be affected by the subprojects, so that views could be expressed in a less formal setting. These were also considered in preparing the IEE.

The meeting at Zugdidi did however not extend to Anaklia residents. An additional public meeting in Anaklia was held therefore on 12.04.11 as described in Appendix 1. In Appendix 1 the following issues are provided:

- List of participants
- Key concerns
- Date (12.4.2011)

131 The meeting itself was held at the public school.

132 This IEE Report in Georgian language will be distributed to the interested public. Report will be available for review in Tbilisi (at the UWSCG Head Office), and Zugdidi (at the UWSCG Service Centre, the Town Hall and the Public Library). It will also be disclosed to public by making it available on websites of UWSCG, MRDI and ADB, together with the IEEs prepared for the other subprojects.

133 The following changes in design were implemented:

- New well fields to develop at Enguri River to abstract water
- Transmission line from well field to new reservoir
- Water reservoir with pumping station to the North-East of Anaklia

134 An additional public consultation as required according to ADB regulations due to changes in the design was held in Anaklia on 12th of April 2011. The appendix contains a summary of the meeting. It was confirmed that the whole drinking water and waste water network for Anaklia will be installed to connect each house hold. The duration of construction activities could not be fixed. The old drinking water wells will be taken out of operation.

135 Due to changes in site location for headworks an additional Public Hearing was held in Anaklia on 11th of May 2012. The employer of the Anaklia Headworks project was presented as the United Water Supply Company of Georgia. The objective of the IEE was explained.

Map : Anaklia Public School were the public consultation took place on 12.04.2012



Anaklia Public School



VI. ENVIRONMENTAL MANAGEMENT PLAN

A. Institutional Arrangements

136 Following agencies will be involved in implementing the Investment Program:

- (i) Ministry of Regional Development and Infrastructure (MoRDI) is the Executing Agency (EA) responsible for management, coordination and execution of all activities funded under the loan. MoRDI will have overall responsibility for compliance with loan covenants.
- (ii) United Water Supply Company of Georgia (UWSCG) is the implementing agency (IA), which will be responsible for administration, implementation (design, construction and operation) and all day-to-day activities under the loan. An Investment Program Management Office (IPMO) will be established within the UWSCG for all Investment Program related functions. The IPMO will coordinate construction of sub-projects across all towns, and ensure consistency of approach and performance.
- (iii) The IPMO will be assisted by (a) Management Contractor (MC) who will provide Investment Program management support, assure the technical quality of design and construction, and provide advice on policy reforms, and (b) Detailed Engineering Design Consultants (DC), who will design the infrastructure and manage tendering process. Civil works contractors build the infrastructure.
- (iv) ADB is the donor financing the Investment Program.

137 UWSCG, specifically its Department of Quality Management and Environment Protection (DQMEP), will bear the responsibility of implementing the subproject in compliance with the Georgian Law and ADB Policy throughout design and implementation phase. Specific tasks would include:

- Updating this IEE to reflect any changes in final project design,
- Submission of revised IEE to ADB, for review and approval; incorporating ADB comments, if any
- Obtaining the approval from the Ministry of Energy of Georgia for water abstraction from the Enguri Dam, and
- Implementation of the EMP including grievance redress

138 Currently DQMEP is staffed with an Ecologist/Environmental Specialist, who also heads the Department. The incumbent Ecologist/Environmental Specialist, with a master's degree in ecology and 7 years of professional experience (including 5 years in Licenses and Permits Department of the MoEPNR), is well versed with the Georgian environmental law, EIA and EIP processes, and other government regulations. With the existing staff, the DQMEP can update the IEE internally and can also coordinate with government agencies for necessary approvals. The DQMEP, however, requires support for implementation of EMP.

139 Implementation of EMP of this subproject requires an experienced Environmental Management Specialist (EMS) to spend a total of around 16 months over the average 6 month design and 15 month construction period, conducting routine observations and surveys, and preparing monitoring reports. The EMS should be on site one month before construction and 15 months during construction activities. The EMS will also be responsible for: incorporation of mitigation measures in design and construction; and, baseline and construction-stage environmental quality monitoring. Support of an additional EMS is also required to oversee the EMP implementation, and collating and submitting bi-annual Environmental Monitoring Reports (EMR) to ADB. Since the specialist support is not required continuously,

it will be feasible and convenient to engage consultants to implement these tasks, which can be part of MC and DC.

140 DC will be responsible for: incorporation of mitigation measures in design and construction; and, baseline and construction-stage environmental quality monitoring. The MC will review and approve IEE and/or EIA reports and oversee implementation of EMP. The civil works Civil Contractor will implement mitigation measures during construction. Implementation of mitigation and monitoring measures during operation will be the responsibility of DQMEP. Government regulatory agencies such as MoEPNR will also monitor the environmental performance. The Contractor should employ an environmental specialist who will ensure that the site specific EMP (SSEMP) is prepared and implemented. The EMS at the IA will review and approve the SSEMP.

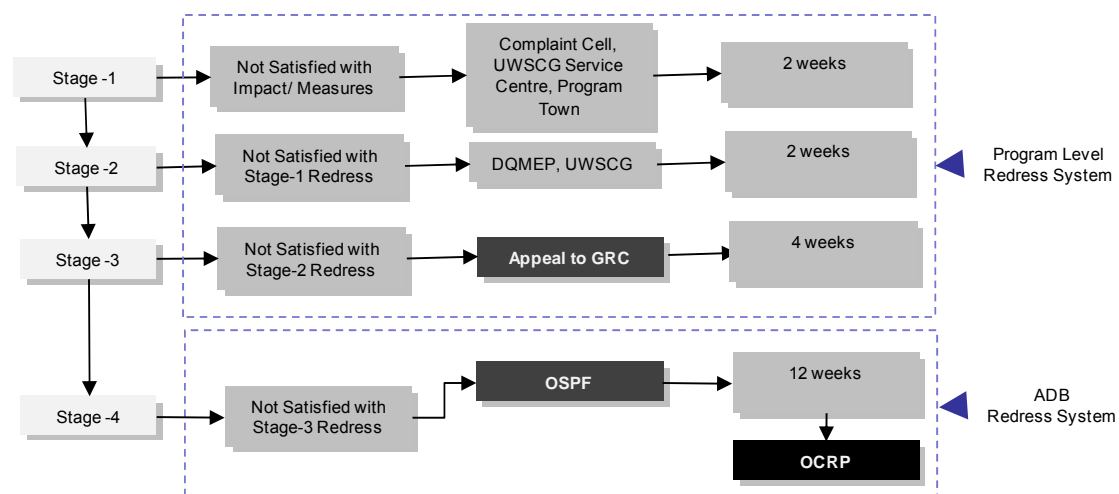
B. Grievance Redress Mechanism

141 The affected population and stakeholders may send their grievances, related to the project induced environmental impacts and nuisance to UWSCG or directly to the administrative bodies responsible for the environmental protection. The MoEPNR and concerned municipalities are obliged to respond on the grievances, which have been received from population or other interested parties in accordance with the Administrative Code of Georgia.

142 UWSCG on its part, in order to provide a direct channel to the affected and concerned citizens for approaching project authorities and have their grievance recorded and redressed in an appropriate time frame, will establish a Grievance Redress Mechanism. A Complaint Cell and a Grievance Redress Committee will be established for each Investment Program town at the UWSCG service centre, which will function throughout the construction period. The procedures adopted and the responsibilities of various project agencies in grievance redress are discussed in the following paragraph.

143 The Complaint Cell at the UWSCG Service Centre in the Investment Program town will accept complaints regarding the environment safeguard issues in implementation of subprojects under the respective town. A four stage grievance redress mechanism is indicated in **Figure 1** below. The grievances received and actions taken will be included into the environmental monitoring reports submitted to ADB.

Figure 1: Grievance Redress Mechanism



- (i) Complaints received (written or oral communication) by the Complaint Cell will be registered in database system, assigning complaint number with date of receipt; informs the complainant the time frame in which the corrective action will be undertaken.
- (ii) The Complaint Cell and UWSCG 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 intimates 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 subproject whether this issue was identified and mitigation was suggested; if yes, the Complaint Cell and UWSCG IPMO will direct the civil works Contractor to take immediate actions as per the EMP.
- (iv) If this is an unanticipated issue, the UWSCG IPMO will identify mitigation measures and advise 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.
- (vi) If the complainant is not satisfied with the action taken by the Contractor within two weeks from the start of corrective action as directed the Complaint Cell, the grievance will be directed to the Department of Quality Management and Environmental Protection (DQMEP) of the UWSCG.
- (vii) The DQMEP will review the issue with the IPMO and relevant Service Centre and may ask for additional information or conduct site visit, and will advise the IPMO and relevant Service Centre on actions to resolve the issue.
- (viii) The Service Centre will submit the interim report in a week to DQMEP on the status of the complaint investigation and follow-up actions, and final action taken report within two weeks of completing the action. The DQMEP will intimate the complainant of the same.
- (ix) If the complainant is still dissatisfied with the action taken or decision, he/she may approach the Grievance Redress Committee (GRC, see below) established in the town.

144 **Grievance Redress Committee (GRC).** A GRC will be established to resolve the unresolved issues at Stage 2 and this will function throughout the construction period, and will have hearings on need-basis. GRC will have following members:

- Chairman, respective municipality or an elected member nominated by the Chairman
- UWSCG Service Centre Head
- Member of IPMO

145 Considering the anticipated impacts, it is not expected that there is any likely issue which will remain unresolved in the Stage 3 of the process. In the unlikely event of dissatisfaction after Stage 3, 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 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

146 In the event of unsatisfactory redress from OSPF, the complainant can further approach Office of the Compliance Review Panel (OCRP) at ADB headquarters.

C. Environmental Impacts & Mitigation Measures

147 The Following **Table 6** summarizes the environmental impacts and suggested mitigation measures as discussed in previous sections. It also delegates the responsibility of mitigation measures implementation to various project agencies.

Table 6: Environmental Impacts and Mitigation Measures

Potential Negative Impacts	Mitigation measures	Responsibility	Location	Cost
Construction				
Risk due to high risk seismic intensity zone	<ul style="list-style-type: none"> • Apply design and construction norms of Zone-7 (MSK-64 scale) according to Government of Georgia "Construction in Seismological Regions" • Select appropriate pipe material and design for transmission lines according to seismic intensity of project area 	UWSCG	-	Design Cost
Impacts due to excavation and generation of waste soil	<ul style="list-style-type: none"> • Use the surplus soil where possible in construction projects, to raise the level of land prior to construction of roads or buildings, or to fill previously excavated areas 	Contractor	All construction sites	Part of construction cost
Loss of top soil	<ul style="list-style-type: none"> • Top soil of about 1 ft depth (0.3 m) shall be removed and stored separately during excavation work, and after pipeline construction the same soil shall be replaced on the top. 	Civil Contractor	Pipeline work in pasture lands	Part of construction cost
Erosion due to excavation/refilling	<ul style="list-style-type: none"> • No trees shall be removed on the slopes; clearing of shrub, bushes and grass shall be limited to actual construction area only; no clearance is allowed for activities such as material/waste storage, concrete mixing, etc. • Ensure proper compaction of refilled soil and there shall not be any loose soil particles on the top; the material shall be refilled in layers and compacted properly layer by layer • In the steep slopes, local grass species shall be planted on the refilled trenches 	Civil Contractor	All construction sites	Part of construction cost
Impact on surface water bodies due to construction during rains	<ul style="list-style-type: none"> • Avoid scheduling of excavation work during heavy rain • Confine construction area including the material storage (sand and aggregate) so that runoff from upland areas will not enter the site • Ensure that drains are not blocked with excavated soil 	Civil Contractor	All construction sites	Part of construction cost
Impacts due collecting rain water in excavated trenches	<ul style="list-style-type: none"> • Protect open trenches from entry of rain water by raising earthen bunds with excavated soil, • Confine construction area including the material storage (sand and aggregate) so that runoff from upland areas will not enter the site • Ensure that drains are not blocked with excavated soil 	Contractor	All construction sites	Part of construction cost

Potential Negative Impacts	Mitigation measures	Responsibility	Location	Cost
Impact on ambient air quality due to dust generation	<ul style="list-style-type: none"> • Cover or damp down by water spray on the excavated mounds of soil to control dust generation; • Apply water prior to levelling or any other earth moving activity to keep the soil moist throughout the process; • Bring the material (aggregate and sand) as and when required; • Ensure speedy completion of work and proper site clearance after completion–; • Damp down unsurfaced/bad condition roads to avoid dust generation while using for transport of waste/material • Use tarpaulins to cover loose material that is transported to and from the site by truck • Control dust generation while unloading the loose material (particularly aggregate and sand) at the site by sprinkling water/unloading inside barricaded area • Clean wheels and undercarriage of haul trucks prior to leaving construction site • Restrict access to the work area except for workers to limit soil disturbance • Don't allow access in the work area except workers to limit soil disturbance and prevent access by fencing 	Contractor	All construction sites	Part of construction cost
Impact on air quality due to emissions from construction equipment/ vehicles	<ul style="list-style-type: none"> • Ensure that all equipment & vehicles used for construction activity are in good condition and are well maintained • Ensure that all equipment & vehicles confirms to emission and noise norms 	Contractor	-	Part of construction cost
Removal of vegetation/trees for construction	<ul style="list-style-type: none"> • Avoid tree cutting by local and small change of alignment • Avoid tree cutting by locating the pipeline below the drain or into the road tarmac as far as possible • Avoid cutting of matured trees • In unavoidable cases, plant four trees of same specie for each tree that is removed • Do not cut tree species listed in the Red Book (Georgian maple, Chestnut, Floodplain oak and Megrelian) • Identify and mark all the Red Book species in the immediate vicinity of 	DSC / EA	All construction sites	Part of construction cost

Potential Negative Impacts	Mitigation measures	Responsibility	Location	Cost
	<p>the alignment during the design,</p> <ul style="list-style-type: none"> • Sensitize the civil contractor and supervising staff before the start of construction • Trees, bushes and shrubs shall be removed only in actual construction area, all other preparatory works (material storage) shall be conducted on barren lands where there is no vegetation. 			
Disturbance to business, people, activities and socio-cultural resources due to construction work	<ul style="list-style-type: none"> • Inform all residents and businesses about the nature and duration of work well in advance so that they can make necessary preparations • Limit dust by removing waste soil quickly; by covering and watering stockpiles, and covering soil with tarpaulins when carried on trucks • Provide wooden walkways/planks across trenches for pedestrians and metal sheets where vehicle access is required • Increasing workforce and use appropriate equipments to complete the work in minimum time in the important areas • Avoid construction work in sensitive times like festivals near religious places 	Contractor	Pipeline works	Part of construction cost
Disturbance/nuisance/noise due to construction activity including haulage of material/waste	<ul style="list-style-type: none"> • Plan transportation routes in consultation with the Anaklia Municipality and Police • Schedule transportation activities by avoiding peak traffic periods • Use tarpaulins to cover loose material that is transported to and from the site by truck • Control dust generation while unloading the loose material (particularly aggregate and sand) at the site by sprinkling water/unloading inside a barricaded area • Clean wheels and undercarriage of haul trucks prior to leaving construction site • Educate drivers: limit speed between 20-25 kmph and avoid use of horn in the town • Earmark parking place for construction equipment and vehicles when idling; no parking shall be allowed on the roads, that may disturb the traffic movement • Provide prior information to local people about work; • No night time construction activities including material/waste haulage, construction activities are not allowed between 7 pm and 7 am 	Contractor	All construction sites	Part of construction cost

Potential Negative Impacts	Mitigation measures	Responsibility	Location	Cost
	<ul style="list-style-type: none"> Educate drivers: limit speed between 20-25 kmph and avoid use of horn in the town Earmark parking place for construction equipment and vehicles when idling; no parking shall be allowed on the roads, that may disturb the traffic movement 			
Disturbance/damage to other infrastructure	<ul style="list-style-type: none"> Design alignment with minimum disturbance to the existing infrastructure Identify the services likely to be affected and notify the respective service agencies about the construction work and if there is any need for shifting Coordinate with respective agencies and provide prior information to public about the disruption in services during construction In case of damage to storm water drains, temporary arrangements shall be made to let-off the runoff downstream to avoid flooding; rehabilitate the drains as early as possible to original position immediately after the pipeline work 	Contractor	Pipeline Sites	Part of construction cost
Safety risk – public and worker	<ul style="list-style-type: none"> Follow standard and safe procedures for all activities – such as <ul style="list-style-type: none"> provision of shoring in deep trenches (>2 m) When working on height - testing structures for integrity prior to undertaking work and using appropriate safety belts Restrict entry into the construction area, provide warning and sign boards and security personnel Provide adequate lighting to avoid accidents Ensure that all workers are provided with and use appropriate Personal Protective Equipment - helmets, hand gloves, boots, masks, safety belts (while working at heights etc); Maintain accidents records and report regularly 	Contractor	All construction sites	Part of construction cost
Safety risk – public and worker - asbestos	<ul style="list-style-type: none"> Follow standard and safe procedures for all activities – such as <ul style="list-style-type: none"> Asbestos pipes if broken during removal should be dismantled by hand and disposed Detachable fasteners must be removed in such a way that the asbestos cement products are not broken Avoid disruption of asbestos cement. If the old pipes require replacement they are not to be removed. Leave all asbestos pipes 	Contractor	All construction sites	130\$ per sample Costs for disposal of asbestos cement depends on local conditions Part of construction

Potential Negative Impacts	Mitigation measures	Responsibility	Location	Cost
	<p>in-situ and lay new pipes over them.</p> <ul style="list-style-type: none"> Asbestos pipes must be kept wet when eroded Asbestos pipes must be sprayed prior to abrasion or dismantling with dust-binding agents The asbestos retrieved or accidentally excavated should be bagged in a double coating of HDPE liner and sealed using duct tape. The bagged asbestos should be buried at the location The site where the bagged recovered Asbestos material is buried should be marked with yellow tape as warning for future excavations. 			<p>cost</p> <p>300\$/m removal asbestos pipe</p> <p>Disposal 350\$/t</p>
Socio-economic benefits from employing local people in construction work	<ul style="list-style-type: none"> To the extent possible labour force must be drawn from the local community Contractor should at least source 50% of unskilled labour force from local communities 	Contractor	All construction sites	Part of construction cost
Impacts due to import of labour and establishment of temporary labour camps	<ul style="list-style-type: none"> In unavoidable case of sourcing labour from other areas, provide adequate housing facilities so that there are no impacts and conflict with the local people: <ul style="list-style-type: none"> Establish the temporary labour camps in consultation with the local authority Shall be located away from water bodies No clearance of trees vegetation shall be allowed for establishment of camp Provide all basic amenities (water supply and sanitation, waste collection & disposal, first aid facilities, etc) Contractor shall provide fire wood and no worker shall be allowed to cut any tree Ensure regular and clean maintenance of the camp 	Contractor	Temporary labour camps	Part of construction cost
Disturbance due to construction noise	<ul style="list-style-type: none"> No construction of activities in the night Sound barriers should be erected at schools and hospitals if the distance to the construction site is less than 50 m Provide personal protection equipment like ear plugs to the workers at the noisy working site Schedule material and waste haulage activities in consultation with 	Contractor	All construction sites	Part of construction cost

Potential Negative Impacts	Mitigation measures	Responsibility	Location	Cost
	local authorities <ul style="list-style-type: none"> No nighttime haulage activity; limit to day time off peak hours Educate drivers: limit speed and avoid use of horns Earmark parking place for construction equipment and vehicles when idling; no parking shall be allowed on the roads, that may disturb the traffic movement 			
soil contamination due to leakages with mineral oil	<ul style="list-style-type: none"> Provide double walled fuel tanks or store single walled fuel tanks in collecting basin for refuelling construction engines Provide modern non-leaking equipment 	Civil Contractor	WWTP and main collector	---
contamination of surface water	<ul style="list-style-type: none"> Store fuel tanks away from surface water on a safe location minimum 50 m distance to surface water Provide modern non-leaking equipment 	Civil Contractor	WWTP and main collector	---
Archaeological chance finds	<ul style="list-style-type: none"> In the event of the unexpected discovery of archaeological objects during construction activities the contractor shall immediately inform UWSCG who will notify the Ministry of Culture and obtain further instructions. In this case construction works would be stopped until the Ministry has given clearance for the continuation of operations. Appendix 4 presents a Chance Find Checklist that the contractor and the EA's Environment Specialist will follow once the find has been made. Works will resume only after appropriate measures have been taken as requested by the Ministry of Culture and confirmation has been received that works may continue. 	Civil Contractor	Construction Site	To be determined in case of the unlikely event of a chance find
Operation				
Impact on surface and groundwater due to disposal of increased volumes of sewage resulting from water supply augmentation	<ul style="list-style-type: none"> Provide sewerage system with adequate treatment facilities, which can treat the sewage to Georgian standards and dispose safely; The urban and tourism areas (Zugdidi City and Anaklia) shall be provided with sewerage system on priority 	UWSCG	-	US\$ 35.3 million as per FS Report
Air quality impacts due to spill/leak of hazardous oils and gases (like PCBs and	<ul style="list-style-type: none"> Avoid use of transformers and other electrical equipment containing PCB through alternative models (green models) Minimize use of SF6 through appropriate selection of equipment 	UWSCG	-	As part of equipment costs

Potential Negative Impacts	Mitigation measures	Responsibility	Location	Cost
SF6) used in electrical/ laboratory equipment during repairs	<ul style="list-style-type: none"> In unavoidable cases due to non-availability of appropriate equipment the following measures shall be put in place: <ul style="list-style-type: none"> Supplier shall conduct awareness programs to workers/lab operators to know about the equipment containing hazardous material The repair and maintenance of such equipment shall be conducted only by trained persons and in appropriate facilities; more appropriately the contract for procurement with supplier/ manufacturer shall include taking back the equipment after the useful life 			
Influx of insects, rodents	<ul style="list-style-type: none"> Regular waste and sludge disposal, regular cleaning of the facility 	UWSCG	WWTP	Part of operation costs

\$ refer to US Dollar

D. Environmental Monitoring Plan

148 A program of monitoring will be required to ensure that all concerned agencies take the specified action to provide the required mitigation, to assess whether the action has adequately protected the environment, and to determine whether any additional measures may be necessary. The DC will conduct the sampling and analysis of water quality and sediment quality as part of the detailed design and construction supervision. Regular monitoring of implementation measures by civil works contractor will also be conducted by the DC, and overseen by the MC. Monitoring during operation stage will be conducted by the UWSCG.

149 Most of the mitigation measures are fairly standard methods of minimizing disturbance from building in urban areas (maintaining access, planning work to minimize public inconvenience and traffic disruptions, finding uses for waste material, etc). Monitoring of such measures normally involves making observations in the course of site visits, although some require more formal checking of records and other aspects.

150 The following **Table 7** shows the proposed Environmental Monitoring Plan (EMP) for this subproject, which specifies various monitoring activities to be conducted. It describes: (i) mitigation measures, (ii) location, (iii) measurement method, (iv) frequency of monitoring and (v) responsibility (for both mitigation and monitoring).

151 A modern laboratory including trained personnel is required to implement physio-chemical analyses and sampling.

Table 7: Environmental Monitoring Plan

Mitigation Measures/ Monitoring Activities	Parameters to be Monitored	Location	Measurements	Frequency	Responsibility
Construction Phase					
• All construction re- lated mitigation measures	Implementation on site	All construction sites	Observations on/off site; CC records; interviews with people and workers	Weekly	DC
• All design related mitigation measures	Inclusion in the project design	-	Design review	As needed	MC
• Raw water quality investigation	pH, Turbidity, conductivity, tem- perature, sulphate, Chlorides, Calcium, Nitrate, Nitrite, Fluo- ride, Magnesium, Sodium, Zinc, Total coli form, E- coli, BOD	test wells	measurements on site and in laboratory	once	DC
Operation					
Long Term Surveys					
• Raw water quality monitoring	pH, Turbidity, Sulphate, Chlorides, Calcium, Nitrate, Nitrite, Fluo- ride, Magnesium, Sodium, Zinc, Total coli form, E- coli, BOD	Raw water quality near inlet of WTP	Comparison with the base val- ues of design period monitoring	Once before start of con- struction then quarterly during construction	UWSCG (independ- ent laboratory)
	pH, suspended solids, turbidity, DO	Raw water quality near inlet of WTP	Comparison with the base val- ues of design period monitoring	Daily	UWSCG (WTP labo- ratory)
• Treated water quality	pH, Turbidity, Sulphate, Chlorides, Calcium, Nitrate, Nitrite, Fluo- ride, Magnesium, Sodium, Zinc, Total coli form, E- coli, BOD	1 sample after treatment	Comparison with GoG drinking water standards ⁵	Once before start of con- struction then quarterly during construction	UWSCG (independ- ent laboratory)

5

5) Technical Regulation on Drinking Water, 2007, (Decree №349/N), Ministry of Labor, Health and Social Welfare (Attached at **Appendix**)

E. Costing & Budget

152 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. Costs of design-related mitigation measures are included in the budgets for the civil works. Detailed surveys and investigations to be conducted by the DC are part of the design costs.

153 Monitoring of implementation of mitigation measures by contractor during construction will be conducted by the Environmental Management Specialist (EMS) of the DC. The review of design and contract to check the inclusion of all design-related mitigation measures will be conducted by the EMS of the MC. The inputs costs of these experts are included in the EMP.

VII. RECOMMENDATIONS & CONCLUSION

A. Recommendation

154 The environmental impacts of infrastructure elements proposed in the water supply and waste water system improvement subproject in Anaklia has been assessed and described in the previous sections of this document. Potential negative impacts were identified in relation to design, location, construction and operation of the improved infrastructure. Mitigation measures have been developed to reduce all negative impacts to acceptable levels.

155 Mitigation measures were discussed with engineering specialists, and some measures have already been included in the designs. This means that the number of impacts and their significance has already been reduced by amending the design. These include:

- Locating the water supply and waste water network within ROW of existing roads to minimize the need to acquire private land and related resettlement issues

156 Regardless of these and various other actions taken during the IEE process and in developing the project, there will still be impacts on the environment when the infrastructure is built and when it is operating. Appropriate avoidances/mitigation/enhancement measures have been suggested for the likely impacts that are identified.

157 Impacts include generation of dust from soil excavation and refilling; the disturbance of residents and traffic by the construction work, collection of water in trenches, etc. These are common impacts of construction and there are well developed methods for mitigation. Some of these are listed below:

- Utilizing surplus/waste soil for beneficial purposes
- Measures to reduce/control dust generation (cover/damp down by water spray; consolidation of top soil, cover during transport etc)
- Providing prior public information and work planning in consultation
- Planning transport routes/schedule carefully; awareness creation in drivers
- Following standard and safe procedures for public and worker safety
- Avoiding nighttime construction activities

158 Although limited, this environmental assessment process also identified opportunities for environmental enhancement. Certain measures suggested in this regard include:

- Employing the local people in construction work as much as possible to provide them with a short-term economic gain
- Employing local people in operation and maintenance of the improved system
- Avoiding the use of electrical equipment with PCBs and SF6

159 The main beneficiaries of the improved system will be the citizens of Anaklia, who will be provided with a constant supply of better quality water, which serves a greater proportion of the population, including urban poor (and tourists as well). This will improve the quality of life of people as well as raising standards of both individual and public health as the improvements in hygiene should reduce the incidence of disease associated with poor sanitation. This should lead to economic gains as people will be away from work less and will spend less on healthcare, so their incomes should increase.

160 Mitigation will be assured by a program of environmental monitoring conducted during both construction and operation to ensure that all measures are provided as intended, and to determine whether the environment is protected as envisaged.

161 The recommendation of this IEE process is that all mitigation, enhancement and monitoring activities proposed here and through the parallel process of Resettlement Planning shall be implemented in full. This is essential to ensure that the environmental impacts are successfully mitigated; this is the responsibility of UWSCG.

B. Conclusion

162 The environmental impacts of the proposed water supply subproject in Anaklia have been assessed by the Initial Environmental Examination reported in this document. The impacts are found to be limited to the construction phase.

163 The overall conclusion of the IEE is that provided the mitigation and enhancement measures are implemented in full, there should be no significant negative environmental impacts as a result of location, design, construction or operation of the subproject. There should in fact be positive benefits through major improvements in quality of life and individual and public health once the scheme is in operation.

164 There are no uncertainties in the analysis; thus there is no need for further study such as EIA.

Appendices

LTD “United Water Supply Company of Georgia”

**Public Hearing for the Anaklia Subproject of the Georgia Urban Services Improvement Investment Program
Environmental and Social Assessment for Improvement and New Construction of Water Supply and Sanitation Facilities in Anaklia**

**Protocol
Anaklia 12.04.11**

Public Hearing Participants:

1. Tinatin Zhizhiashvili - Head of Environmental Protection and Quality Control Department “UWSCG” LTD
2. Jürgen Meyer – Environmental Expert “ KOCKS GMBH Consulting Engineers”
3. Nugzar Ardazishvili - Director "Municipal Project" LTD
4. Alexander Mikiashvili – Engineer “Municipal Project” LTD
5. Levan Zarandia – Project Manager “UWSCG ” LTD
6. David Potckhveria – Zugdidi Service Centre Manager “UWSCG ” LTD

Public Hearing Attendees from Anaklia local population:

1. David Tckhadaia – Anaklia Territorial Organ Specialist
2. Zurab Sordia – Anaklia Public School Teacher
3. Gela Lemonjava - Anaklia Public School Teacher; Local Council Member
4. Svetlana Daraselia - Anaklia Public School Teacher
5. Marina Sordia – Anaklia Dispensary; Family doctor
6. Liana Tabidze - Anaklia Dispensary; Family doctor
7. Elguja Esartia - Anaklia Dispensary; Family doctor
8. Klimenti Parulava – Pensioner
9. Soso Sartania – Teacher
10. Vakhtang Kvaratkhelia – Driver
11. Pridon Mosia – Choreographer, teacher;

12. Elguja Sordia – Lawyer
13. Gvanji Sartania –Unemployed
14. Ramaz Oksusogli - Unemployed
15. Otar Korshia - Unemployed
16. Lulia Shamugua - Anaklia Public School Teacher
17. Zurab Kvaraia - Anaklia Public School Teacher
18. Lela suleimanashvili - Anaklia Public School Teacher

Issues

Environmental and Social Assessment for Improvement and New construction of water Supply and Sanitation Facilities in Anaklia has been presented by means of a Power Point presentation by the Head of UWSCG Environmental Protection and Quality Control Department Tinatin Zhizhiashvili

After the presentation attendees had the opportunity to ask questions.

Following questions were asked:

Nr.	Questions	Answers
1	Will drinking water and waste water network be installed for the whole of Anaklia?	Yes, drinking water as well as waste water will be installed for every house for the whole of Anaklia.
2	How long will construction works persist?	Cannot be answered exactly at the moment. Depends on capacity on construction companies, whether conditions etc.
3	How will it be ensured that top soil protection as it was described in the presentation is actually conducted?	Top soil protection will be an item in the tender documents. To ensure that it will be actually implemented during construction there will be construction site supervision.
4	There are already existing wells. Are these wells part of the project?	No, for the project new wells will be installed.
5	From a former project there are still open trenches. These trenches are a safety hazard.	The open trenches are not within our responsibility. We can only learn from this. As part of the Environmental Management Plan trenches will be excavated and refilled in segments to mitigate safety hazards from open trenches.
6	Will the water from the wells be filtered?	At the moment investigations are conducted concerning the wells at Enguri river near Zugdidi. Results will be compiled in a study. Study will show to what extent additional treatment is necessary.
7	Which water will be fed into the net?	Water from the wells will be fed into the net.

No special comments or proposals, related to Environmental Aspects had been emerged from attendant population.

Summary of Consultation Meeting on 11th of May 2012

LCC “United Water Supply Company of Georgia”

MEETING MINUTES

Anaklia Headworks Subproject
Initial Environmental Examination Report

Anaklia

11.05.2012

Attendees Present:

1. Tinatin Zhizhiashvili – “United Water Supply Company of Georgia, LLC” (UWSCG), Head of Quality Management, Resettlement and Environmental Protection Division
2. Ketevan Chomakhodze - “United Water Supply Company of Georgia, LLC”, Environment Specialist

Attendees Present from the local residents of Anaklia:

1. Lali Nachkebia – local resident;
2. Manana Kvaratskhelia – local resident;
3. Nato Korshia - local resident;
4. Lamzira Abkhazava – local resident;
5. Lela Suleimanishvili - local resident;
6. Sophio Shonia– local resident;
7. Manana Gvinepadze – local resident;
8. Marina Razmadze – local resident.

AGENDA:

Meeting was called for public hearings of Initial Environmental Examination of the Construction of Anaklia Headworks Subproject.

Tinatin Zhizhiashvili made the opening of meeting informing the participants with the aim of public hearings.

The PowerPoint presentation was submitted by Ketevan Chomakhidze. She presented full information for local residents and attendees present about projected activities and described the project nature and estimated impacts as a result of this project implementation.

Tinatin Zhizhiashvili explained the participants the meaning of environmental management plan and projected mitigation measures.

Local residents and the representatives of UWSCG held discussions about particular issues during the meeting.

The Following questions have been asked from the local population:

#	Questions from local residents	Answers from the United Water Supply Company of Georgia
1	Name of the employer of a Anaklia Headworks project	LCC "United Water Supply Company of Georgia"
2	What is duration of construction and date of completion of the project?	Duration of the project: is 36 months
3	What are the objectives of the initial environmental examination?	To examine the project's potential negative and positive environmental impacts and to recommend any measures needed to prevent, minimize, mitigate or compensate for adverse impacts and improve environmental performance
4	Who will supervise and monitor construction and operation of the project?	LCC "United Water Supply Company of Georgia"/ Supervision Consultant
5	Is the water metering considered at this stage of the project implementation?	There is no water metering considered at this stage of the project implementation

There were no other comments or/and opinions from local population.

Extract from Public Registry for New Reservoir

Land (real estate) cadastral #code 43.25.41.060

Extract from Public Registry

Application registration

Date of preparation

882012197736 - 08/05/2012 13:47:34

08/05/2012 15:07:49

		Property section		
Zone	Sector	Block	Land plot	
Zugdidi	Darcheli			
43	25	41	060	

Address: Zugdidi region, village Darcheli

Land plot ownership type: Property /ownership
 Land plot function: agricultural land (arable land)
 Affirmed area/territory: 13109.00 sq.m
 Land plot previous number:

Owner's section

Application registration: number # 882012197736 , date 08/05/2012 13:47:34
 Registration of ownership: date 08/05/2012

Confirming document of ownership:

- Reference # 35/o, confirmation date: 05/05/2012 Ministry of Regional Development and Infrastructure of Georgia.

Owners:

LLC 'United Water Supply Company of Georgia' ID number: 412670097

Owner:

LLC 'United Water Supply Company of Georgia'

Description:

Real Estate Mortgage

loan on mortgage:
Not registered

obligation

Sequestration/arrest of property:

Not registered

Registry of debtors:

Not registered

National Agency of Public registry. <http://public.reestri.gov.ge>

Income tax is paid till 1st of April of the next year of the accounting year in case of realization of material assets owned by private person with the time period up to 2 years, or in case when property with value of GEL 1000 or more is granted as a gift during the tax year. The physical person submits declaration to the tax authority in the same period of time. Non-fulfilment of abovementioned obligation is considered as the law violation, which results in responsibility according to the chapter # XVIII of the Tax Code of Georgia.

In case of detection of technical defects in the extract from public registry, it is possible to submit application without visiting the registration office on the following web-page: <http://public.reestri.gov.ge>; or/and through following phone numbers: 2 405 405; 595 33 71 81. You can receive the amended extract on the web-page in electronic version, or at the registration office or at any affiliate of the "Liberty Bank".

Ministry of Justice of Georgia
National Agency of Public registry
Cadastral Plan

Land plot cadastral code: 43 25 41 060

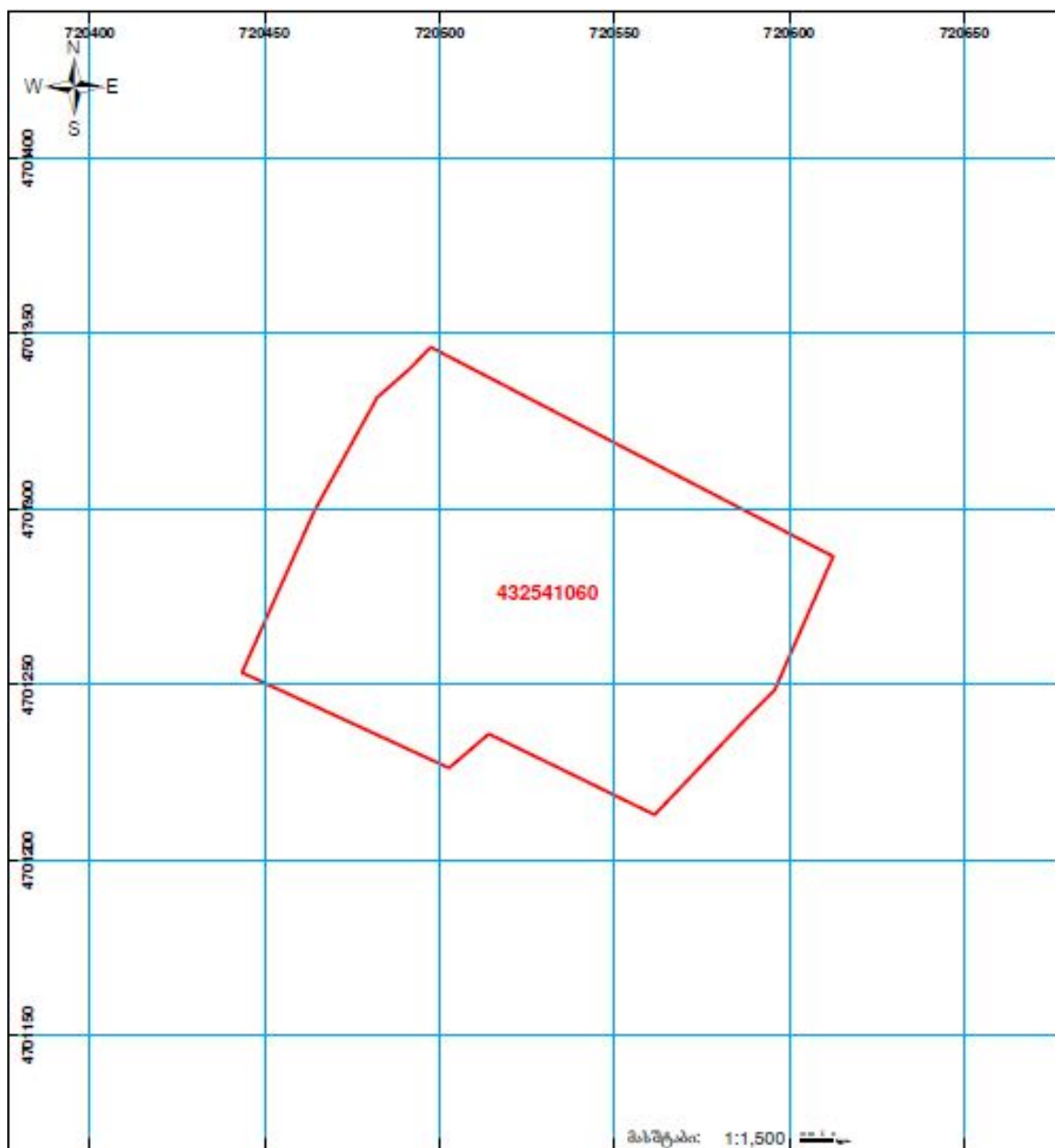
Application registration number: 882012197736

Land plot area/territory: 13109 m²

Function: Non-agricultural

Category:

Date of preparation: 06.06.11



CHANCE FINDS REPORT FORM

Chance Finds Report Form

Please contact: _____
To discuss find, on: _____

Location of Find: _____ Date of Find: _____ Person who identified find: _____

Description of Initial Find:

Was work stopped in the immediate vicinity of the find?

☐ Yes ☐ No

Was an archaeologist contacted?

☐ Yes ☐ No

Archaeological Detail:

Date of inspection: _____

Reporting Archaeologist: _____

GPS coordinates:

Photo Record:

Zone: _____ N: _____ E: _____

☐ Yes ☐ No

Does Chance Find Correspond to a known PNG National Museum site? ☐ Yes ☐ No

If Yes, which site code: _____

If No, temporary site code is: _____

If No, new Museum site code is: _____

Description of Find (fill in applicable information) (use additional pages if required):

Artefact type: _____

Max artefact length (in mm): _____

Max artefact width (in mm): _____

Max artefact thickness (in mm): _____

Max artefact platform width (in mm): _____

Approximate number of artefacts at site:

☐ 1

☐ 2 to 10

☐ > 10

☐ > 50

Other: _____

Approximate size of site:

Site area: _____ m²

Site length: _____ m

Site height (max) (for rockshelters/caves): _____ m

Brief description of site and vegetation (e.g., surface sediment type, ground surface visibility, distance to nearest freshwater source, attach site sketch if necessary):

Brief description of find(s):

Statement of Significance (scientific, spiritual, historic, aesthetic and emotive and any evidence of stratification):

Level of Significance as per the PNG LNG Chance Finds Protocol Flowchart
Low ☐ Medium ☐ High ☐ Skeletal ☐

Impact Assessment

Is site destroyed?

☐ Yes

☐ No

Can further impacts to the chance find be avoided?

☐ Yes

☐ No

Avoidance and mitigation measures discussed:

Impact to Find

Avoidance and mitigation outcome:

Date completed form lodged:

Person who lodged form:

Signature:
