Initial Environmental Examination

August 2014

GEO: Urban Services Improvement Investment Program – Tranche 4
(Improvement of Poti Wastewater System Sub-project)

Prepared by United Water Supply Company of Georgia LLC of the Ministry of Regional Development and Infrastructure for the Asian Development Bank

ABBREVIATIONS

ADB	-	Asian Development Bank
BOD	-	Biochemical Oxygen Demand
CA	-	Cross section area
CC	-	Civil Contractor
COD	-	Chemical Oxygen Demand
DC	-	Design Consultant
EA	-	Executing Agency
EIA	-	Environmental Impact Assessment
EIP	-	Environmental Impact Permit
EMP	-	Environmental Management Plan
GoG	-	Government of Georgia
GRC	-	Grievance Redress Mechanism
IA	-	Implementing Agency
IEE	-	Initial Environmental Examination
IP	-	Investment Program
IPMO	-	Investment Program Management Office
kg	-	Kilogram
km	-	Kilometre
lpcd	-	Litres per Capita per Day
M	-	Metre
MFF-IP	-	Multitranche Financing Facility Investment Program
mg/l	-	milligram per litre
mm	-	Millimetre
MoRDI	-	Ministry of Regional Development & Infrastructure
MoE	-	Ministry of Environment and Nature Resources Protection of Georgia
MPD	-	Maximum Permissible Discharge
PS	-	Pumping Station
SC	-	Supervision Consultant
UWSCG	-	United Water Supply Company of Georgia
WS		Water Supply
WWTP	-	Waste Water treatment Plant

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EXECUTIVE SUMMARY

1. It is proposed to improve the wastewater system in Poti under the Asian Development Bank (ADB) funded Urban Services Improvement Investment Program, which is under preparation stage. This Investment Program, implemented in seven 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 2014 to 2017. The majority of the works will be within the existing boundaries of facilities; however there will be a number of new pipelines lay. All environmental impacts associated with the works are minor and can be managed through effective implementation of an environmental management plan. 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.

2. The Investment Program will improve water supply and sanitation (WSS) services in 7 secondary towns of Georgia. The Investment Program includes (i) infrastructure improvement to rehabilitate, improve, and expand WSS services; (ii) institutional effectiveness to improve the service utility's technical and management capabilities of the key WSS service provider, United Water Supply Company of Georgia LLC (UWSCG) to provide efficient WSS services, and develop the capacity of sector regulators to regulate tariffs, services standards, environmental protection, and drinking water quality in the long-term; and (iii) Investment Program implementation support.

3. This sub-project is located in Poti. The City of Poti is the most developed part of the Samegrelo - Zemo Svaneti region of Georgia. It is located on the Black Sea and lies some 360 km to the west from the capital City of Tbilisi. To the west it borders the Black Sea; to the north the right tributary of the rivers Rioni and Khobi and to the southeast the river Kapartchina and Paliastomi Lake. Regional location of Poti is shown in below.

4. The project measures for the sewer network comprise the laying of 150 km new gravity pipes (DN 100 to DN 1200) and 25 km new pressure pipes (OD 110 to OD 630). The sewer network is divided into two zones. Poti South and Poti North. The southern part will serve an existing wastewater treatment plant in the South of Poti, the northern part - about 85% of the total network - will serve the new wastewater treatment plant to be constructed under the present project.

5. As the terrain is flat a number of pumping stations of different size will be constructed. All existing pumping stations will be replaced.

6. The WWTP will be constructed within the property of the existing WWTP on the right hand side of Rioni River, comprising approximately an area of 7 ha. The treated sewage will be discharged into Rioni River. The WWTP is designed to cover a population of 98,000 by the year 2040.

7. Project will be implemented as according to the national as well as ADB’s environmental legislative framework (SPS 2009) requirements.

8. However, due to the specifics of the project as at the construction also at operational phase, it is necessary to develop a number of mitigation measures to avoid possible negative impact on the environment.

9. The main problems arise from the construction phase of the rehabilitation of the existing sewer pipes and in the process of pipe installation. The construction activities will be carried out in the town itself and will cause disturbance of the population due to noise and dust. Also, the usage of heavy construction equipment required for project implementation will cause significant restriction of movement for population, especially in the narrow streets of the town.

10. In the process of construction there is a high risk of groundwater contamination. Geological studies conducted on the territory of the town showed that ground water level varies from 20 cm to 2 m. In the process of excavation of trenches necessary for the installation of sewer pipes there is a high probability of crossing the upper level of groundwater and the last will cause their contamination.

11. During the phase of implementation and operation of planned activities, possible indirect impacts in the protected areas (KNP, Ramsar sites) would not be significant because the project is in a significant distance away from the nearest wetland. There may be only those types of impacts, which have the potential for spreading on long distance, including ambient air pollution and noise in the mentioned area. According to the results of the modeling developed during the project preparation (construction phase), deterioration caused by exposure to noise is not expected. The project does not envisage large scale air pollution, a major source of pollution is only construction equipment. There is a theoretical risk of negative impacts on birds inhabiting in protected area. Given that the project is located in populated areas, such a risk is also minimal.

12. In present document has been developed a number of mitigation measures to eliminate above mentioned problems, relevantly their proper and timely implementation will significantly reduce the potential negative impact.

13. Project implementation body is UWSCG, which in turn based on the bid hires construction and consulting companies. The team takes full responsibility for the effective implementation of the project.

14. 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. Project will stimulate economic growth. The wastewater good quality is a prerequisite for tourism development. Standard of individual and public health will improve as a result of the project. Project will generate new job opportunities.

I. 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.

A. 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:

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

18. 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. 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.

19. The WW subproject has been classified as environmental assessment category B) according to the criteria laid down in the checklist for water supply projects of the Environmental Assessment and Review Framework (up-dated in November 2013) that was especially prepared for the environmental assessment of the Georgia Urban Services Improvement Investment Program and approved by ADB.

20. *ADB Review and Approval.* For Category B projects the Draft IEE report is 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.

B. Georgian Law

1. Framework Legislation

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

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

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

24. The **Law of Georgia on Environmental Impact Permit (2007)** defines the full list of activities on the territory of Georgia subject to mandatory ecological expertise. The Law defines the legal aspects of issuing an environmental permit, undertaking the ecological expertise, informing the public and participating in the given procedures. Under the Law, the environmental permit is the authorization to realize the planned activities. Under the Law, an environmental permit is issued by the Ministry of Environmental Protection and Natural Resources of Georgia based on the review/expertise of the application of an applicant for the environmental permit. The aim of the Law is to ensure the protection of a human health, natural environment, physical assets and cultural heritage during the activity.

25. The **Law of Georgia on Environment Protection (1997)** regulates the legal relations between the state establishments and physical or legal entities in the field related to the use of territorial waters, air space, including continental shelf and special economic zones, environmental protection and natural resources on the territory of Georgia. The Law regulates the standards of the environmental protection and issues of environmental management; it describes the economic sanctions, standards and issues of environmental impact, different issues of protection of the natural eco-systems and biodiversity, and global and regional management issues. In addition to the abovementioned, the Law considers the major principles of waste management. The law defines the ecological requirements for the waste (Article 34). According to the provision of the given Article, an entrepreneur is obliged to reduce the origination of industrial, domestic and other types of waste, ensure their treatment, utilization, placement or burying by considering the environmental, sanitary-hygienic and epidemiological standards and rules. The Law defines the requirements for the placement of toxic, radioactive and other hazardous waste and prohibits their discharge in the surface water sources.

26. **The Law of Georgia on Licenses and Permits (2005)** defines the list of activities needing licenses or permits, including so called "Environmental permit". It also defines the requirements for the license or permit issue. The Law, together with the normative by-laws, regulates such organized activity or action, which relates to an indefinite circle of entities, is characterized by increased hazard to the human life or health, affects particularly important state or public interests or is related to the use of a state resource. The given Law regulates the field regulated by a license or permit; it gives a

thorough list of licenses and permits, and establishes the rules to issue the licenses and permits, makes amendments to them or abolishes them. Under the Law, a state regulation of the activity or action through a license or permit is undertaken only when the given activity or action is directly associated with the increased hazard to the human life or health or fields of state or public interests. The state regulation is undertaken only when the issuance of a license or permit is a real means to reduce the hazard in question or consider state or public interests. The aim and major principles of regulating the activity or action via licenses or permits are as follows:

- Provision and protection of human life and health;
- Safety and protection of a human's residential and cultural environment;
- Protection of state and public interests;

27. The **Law of Georgia on State Ecological Expertise (2007)**. Under the given Law, the ecological expertise is a necessary measure for making decision on the issuance of environmental and/or construction permit(s). The aim of the ecological assessment is to protect the ecological balance by considering the requirements of environmental protection, rational use of natural resources and principles of sustainable development. A positive conclusion of the ecological expertise is mandatory for obtaining an environmental and/or construction permit. In addition, the holder of environmental and/or construction permit is obliged to comply with conditions specified in the ecological expertise conclusion. The process of ecological assessment is regulated by the Ministry of Environmental Protection and Natural Resources.

28. The procedure to be observed during ecological expertise, as well as the requirements on forming the expert commission is prescribed in the Provision on the Rule for Carrying out Ecological Expertise, which is approved by the Minister of Environment and Natural Resources Protection of Georgia. The full list of the activities, subject to mandatory ecological expertise for decision making on issuance of environmental permit or building permit, is specified by the Law of Georgia on Environmental Permit.

29. The state ensures protection of the environment and, correspondingly, protection of water as its main component in **The Law of Georgia on Water (1997)**. 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 objective 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 wastewater from the sources of pollution located on the land. The use of a surface water body for discharging industrial, communal-household, drainage and other wastewater 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. Currently the new law on Water is under preparation by the MoENRP and its initial draft version has already been distributed to various stakeholders including line ministries. All received comments on draft law has been reflected in the documents and in the near future it will be submitted to the Parliament of Georgia for its adoption.

30. The **Law of Georgia on Cultural Heritage (2007)**. Article 14 of the Law specifies the requirements for 'large-scale' construction works. According to this Article, a decision on career treatment and ore extraction on the whole territory of Georgia, as well as on construction of an object of a special importance as it may be defined under the legis-

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

31. The aim of the **Law of Georgia on Public Health (2007)** is as follows: Promotion of the introduction of a good health and healthy lifestyle of the population; Creation of the environment, which is safe for a human health; Promotion of the protection of the reproductive health of a family; Prevention of infectious and non-infectious diseases. The Law defines the rights and obligations of the population and legal entities in the field of public health. Aiming at establishing the environment safe to the public health, the Ministry sets the qualitative standards for the environment safe for a human health (atmospheric air, water, soil, noise, vibration, electromagnetic radiation), including maximum permissible concentrations and rates of harmful impact. The standards are mandatory. Every person on the territory of Georgia is obliged not to carry out the activity, which causes a hazard of the infectious and non-infectious diseases to spread and helps the origination of the risks to human health; protect the sanitary and epidemiological standards; to supply the information to the public health department about all emergencies caused by the violation of the sanitary norms in the production or technological process, etc. The observance of the standards is controlled by appropriate state structures. The responsibility for the internal and external audits rests with a certified, independent laboratory.

32. Environmental Assessment and Review Framework (November 2010, updated in November 2013 due to changes in the scope of the USIIP, EARF) was established for the Asian Development Bank funded Georgia Urban Services Improvement Investment Program (or the Investment Program). This is prepared to adequately address the ADB Safeguard Policy Statement (2009) requirements and is to be endorsed by the Georgian government. Projects have to be assigned to Categories A, B, and C. General mitigation measures are listed for anticipated impacts.

2. Licenses & Approvals Required

33. Environmental assessments of various activities and development projects in Georgia is governed by the Law on Environmental Impact Permits (EIP). This Law notifies the list of the activities and projects, which are subject 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.

34. None of the components of the proposed waste water improvement subproject in Poti are notified in the Law on EIP and therefore environmental impact permit is not required.

35. The requirements related to EIA studies and the EIA report are set forth in the Order N31 of 15 May 2013 of MoENRP.

36. The Law of Georgia "On the Red List and Red Book" (2003) regulates the legal relations in the field of developing the Red List and Red Book, protecting and using the endangered species, except the legal issues of the international trade with endangered wild animals and wild plants, which within the limits of the jurisdiction of Georgia are regulated by virtue of the Convention 'On the international trade with the endangered species of wild fauna and flora' concluded on March 3 of 1973 in the city of Washington. According to Article 10 of the Law, any activity, including hunting, fishing, extraction, cutting down and hay-mowing, except particular cases envisaged by the present Law, Law of Georgia 'On animal life' and legislation of Georgia, which may result in the reduction in number of the endangered species, deterioration of the breeding area or living conditions, is prohibited. The Red List of Georgia was approved by the Presidential Decree No. 303 'On approving the Red List of Georgia' (May 2, 2006).

Table 1: Other National Environmental Legislations and Applicability

Legislation	Applicability	Remarks
Forestry Code of Georgia, 1999	Applicable to works located in forest areas	Requires permission from the Ministry of Economic and Sustainable Department (MESD). The project proponent shall submit application to the MESD, which in turn forwards it to the Forest Division of MoEPNR for its review and advise, based on which the MESD gives an approval to proceed with works in forest areas
Law on Ambient Air Protection, 2000		It stipulates Maximum Allowable Concentration (MAC) of various pollutants in Ambient Air; however the establishment of emission standards for various sources or activities is under process, therefore at present no standards are available
Law on System of Protected Areas, 1996	Applicable to works or activities in protected areas	Depending on the activity and type of protected area, permission for any work will be granted or denied
Technical Regulation of Drinking Water, 2007 (Decree N 349/N), the Ministry of Labour, Health and Social Affairs of Georgia	Applicable to water supply projects	Water supply and monitoring shall comply with the technical regulation
Rules of the Protection of the Surface Waters of Georgia from Pollution, 1996 (№130 order of the Minister of the Protection of the Environment and Natural Resources of Georgia)	Applicable to water supply projects	Source water quality shall comply with the provisions for domestic use
Technical Regulation of Environmental Protection, 2008 (Decree N745), Minister of the Protection of the Environment and Natural Resources of Georgia	Applicable to sewerage projects	Treated effluent disposal from sewage treatment plants shall comply with the specified standards
"Approval of Environmental Quality Standards" –		The Georgian standards for noise control as approved by the Decree of the Minister for Health, Labour and

Legislation	Applicability	Remarks
approved by Minister of Health, Labour and Social Affairs [Decree number - 297n of August 16, 2001])		Social Affairs (297n of August 16, 2001) upon the 'Approval of Environmental Quality Standards'; specifying the tolerable and maximum admissible levels of noise for different zones

37. Some of the **International Treaties and Conventions** Ratified or Signed by Georgia are provided in the list below.

- Short List of the Ratified or Signed Conventions:
- Ramsar Convention on Wetlands (1996);
- United Nations Framework Convention on Climate Change (UNFCC) (1994);
- Kyoto Protocol (1994);
- Kyoto Protocol (1999);
- Basel Convention on the Control of Transboundary Movement of Hazardous Waste and Their Disposal (1999);
- Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention) (1999);
- Convention on Biological Diversity (1994);
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (1996);
- Convention on Long-range Transboundary Air Pollutants (1999);
- Stockholm Convention on Persistent Organic Pollutants (2006);
- Convention on the Conservation of European Wildlife and Natural habitats (2008);
- The Vienna Convention for the Protection of the Ozone Layer (1995);
- Montreal Protocol on Substances that Deplete the Ozone Layer (1995).

3. Administrative Structure in Georgia

38. Ministry of Environment and Natural Resources Protection of Georgia (MoENRP). MoENRP has the overall responsibility for protection of environment in Georgia. The Department of Permits of MoENRP is responsible for reviewing EIAs and for issuance of the Environmental Permits. MoENRP is the main state body pursuing state policy in the sphere of environment. Their functions for regulating economic or development activities with regard to environmental protection include:

- Issuing permits for project development (Environmental Impact Permit)
- Setting emission limits and issuing surface water intake and discharge consents
- Responding to incidents and complaint

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

40. For projects requiring Construction Permit, no special permit is issued by MoENRP (according to "One window principle", only one permit shall be issued for each activity). The Construction Permit is issued by the Ministry of Economy and Sustainable Development of Georgia, but the issuance of the Permit is subject to the consent of the MoENRP in a form of Conclusion of Ecological Expertise, as well as the Ministry

of Culture (Centre of Archaeological Studies, Department of Monuments protection). Consent of the MoENRP in such cases should be issued according to the same procedures (EIA, public consultations; SEE etc.) as for issuing Environmental Permit.

41. The Ministry of Economic and Sustainable Development as an administrative body issuing a permit ensures the involvement of the MoENRP as a different administrative body in the administrative proceedings initiated for the purpose of permit issuance, in accordance with Georgia's Law on Licenses and Permits.

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

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

4. Comparison of the National Legislation and ADB Requirements

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

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

46. Considering ecological risk, cultural heritage, resettlement and other factors, the Bank classifies projects supported by them under categories A, B, C and FI. However in the Georgian legislation, EIA is carried out only if a developer seeks to implement projects listed in the Law on Environmental Impact Permit. This list is compatible with the category A projects of the Bank classification. According to the Georgian legislation EIA is not required in other instances, while Asian Development Bank guidelines requires limited EIA or IEE for the B category projects, and an environmental review of projects that are not expected to produce environmental impacts (category C).

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

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

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

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

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

Table 2: Activities and Responsibilities in EIA for National Law and ADB Policy

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

#	Action	Georgian Legislation	ADB Requirements
		content and timing	Management Plans in the EIA.
7	Review and Approval	MoE	Bank and separately - MoE (if the EIA is required by Georgian legislation).
8	Disclosure of final EIA	Not requested	Publication (mainly electronic) of the final EIA.

5. Harmonization of ADB and Georgian Legislation Requirements

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

II. DESCRIPTION OF PROJECT

A. Type of the Project

53. This is the Poti wastewater sub-project. It involves the rehabilitation and extension of the wastewater network and the construction of a wastewater treatment plant.

B. Need of the Project

54. The service level of urban water supply and wastewater treatment at present is not satisfactory in Georgia. Services are not available to entire population and the serviced areas suffer from inefficient service levels. Systems are old and inefficient. The situation is not different in the project area, comprising the City of Poti. This subproject is needed because the present wastewater infrastructure in Poti is inefficient and inadequate to the needs of the population. Untreated sewage contaminates soil and surface water. It endangers human health.

55. The existing sewer network was designed as a separate system and covers the centre of Poti. It is orientated towards the location of the existing wastewater treatment plant at the northern edge of Poti. The total length of gravity sewer is 22 km, the total length of pressure pipes is 10 km. The current condition of the sewer network is not known. The sewer system is submerged most of the time as the pumping stations run only one or two hours per day. The rest of the time the wastewater is stored in the sewer network and CCTV-inspections are not possible. The existing pressure pipes need replacement as they are either out of operation, or damaged or in a bad condition. All existing pressure pipes are in a poor condition, some of them are out of order due to pipe burst and blockages.

56. There are nine existing wastewater pumping stations. Most of these pumping stations are in a very bad condition. The mechanical and electrical equipment has long passed

its design life time and also the civil works need complete replacement. The pumping stations are over-sized.

57. Besides the old age of most installations and constructions, an important deficiency in Poti is the intermittent operation of the wastewater pumping stations. As the sewer network is submerged during most of the day there is sedimentation of sludge and considerable silting. For an adequate operation of a modern sewer network, the pumping stations need to be operated 24 h/d. The pressure pipes are partly out of order because of pipe breaks and material failure. The present condition of the gravity pipes is not known. The continuous accumulation of wastewater in the sewer pipes makes their inspection impossible.

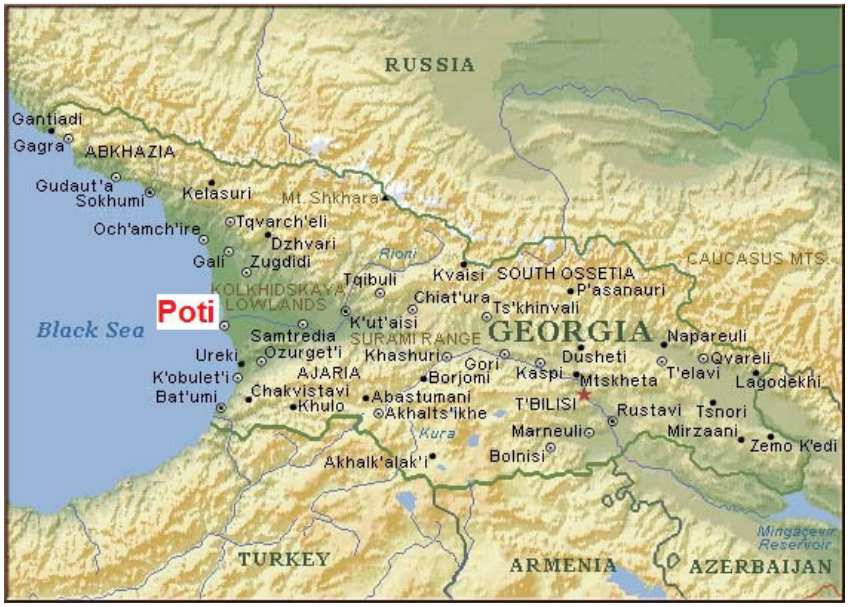
58. The present sub-project is designed to improve the service standards of the wastewater system in Poti. It is designed to collect and treat the wastewater expected in the year 2040. The development of the demand level in Poti is based on the projected number of inhabitants as indicated in the following table.

Table 3: Wastewater Flow

Description	unit	Year			
		2010	2020	2030	2040
Water supply					
inhabitants (permanent stay)	capita	47.700	91.352	96.024	98.452
Total water demand (average)	***m³/d***	***11.944***	***28.964***	***33.457***	***37.652***
Peak factor daily demand	-	1,80	1,80	1,80	1,80
Peak factor hourly demand	-	3,00	3,00	3,00	3,00
Max. daily water demand	**m³/d**	**15.884**	**37.085**	**42.498**	**47.232**
Max. hourly water demand	**m³/h**	**1.415**	**3.114**	**3.461**	**3.771**
average hourly water demand	**m³/h**	**747**	**1.810**	**2.091**	**2.353**
Waste Water (seperate sewer system)					
connection ratio		95%	95%	95%	95%
wastewater/water ratio		90%	90%	90%	90%
result wastewater flow (average)	m³/d	6.737	12.903	13.563	13.906
wastewater from industry	m³/d	1.314	8.514	12.114	15.714
peak factor	h/d	16	16	16	16
result wastewater flow (average)	***m³/d***	***8.051***	***21.417***	***25.677***	***29.620***
infiltration (0,5 m³/(d*Manhole)					
No. of Manholes appr.	No.	450	2.600	2.600	2.600
peak factor for wastewater flow	-	3,0	3,0	3,0	3,0
daily flow (average)	**m³/d**	**8.051**	**21.417**	**25.677**	**29.620**
max. daily flow (incl. peak factor for daily water demand)	**m³/d**	**15.090**	**35.231**	**40.373**	**44.870**
hourly flow (average)	**m³/h**	**335**	**892**	**1.070**	**1.234**
hourly flow (max.) dry weather	**m³/h**	**503**	**1.339**	**1.605**	**1.851**
hourly flow (max.), for hydraulic calc. only	**m³/h**	**1.016**	**2.731**	**3.264**	**3.757**
hourly flow (max.), for hydraulic calc. only	**l/s**	**282**	**759**	**907**	**1.044**

C. Location

59. This sub-project is located in Poti. The City of Poti is the most developed part of the Samegrelo - Zemo Svaneti region of Georgia. It is located on the Black Sea and lies some 360 km to the west from the capital City of Tbilisi. To the west it borders the Black Sea; to the north the right tributary of the rivers Rioni and Khobi and to the southeast the river Kapartchina and Paliastomi Lake. Regional location of Poti is shown in below**.**



Map 1: Location of Poti

60. The wastewater project measures comprise the rehabilitation and extension of the sewer network with gravity sewers and pressure lines, the construction of wastewater pumping stations as well as the construction of a new wastewater treatment plant.

61. The project measures for the sewer network comprise the laying of 150 km new gravity pipes (DN 100 to DN 1200) and 25 km new pressure pipes (OD 110 to OD 630). The sewer network is divided into two zones. Poti South and Poti North. The southern part will serve an existing wastewater treatment plant in the South of Poti, the northern part - about 85% of the total network - will serve the new wastewater treatment plant to be constructed under the present project.

62. As the terrain is flat a number of pumping stations of different size will be constructed. All existing pumping stations will be replaced. The WWTP will be constructed within the property of the existing WWTP on the right hand side of Rioni River, comprising approximately an area of 7 ha. This location is away from residential areas and is available. There are no water users downstream of the location. The treated sewage will be discharged into Rioni River. The WWTP is designed to cover a population of 98,000 by the year 2040. The location of the future WWTP is shown below.

Map 2: Aerial photograph of location of WWTP Poti

D. Implementation Schedule

63. The design of the subproject will be completed by August 2014. The construction is divided into two tranches of which the first tranche is planned to commence in the end of 2014 or the beginning of 2015. The construction period will be two years.

64. The project is formulated for implementation under the proposed ADB funded Investment Program. Table 4 shows the subproject and components selected for implementation in Poti, for which, according to ADB requirements, this IEE is conducted.

E. Sub Project Components

65. This subproject focuses on the rehabilitation and extension of the existing sewerage system and the construction of aWWTP.

Table 4: Proposed Subproject & Components Wastewater System

Infrastructure	Function	Description	Location
Sewage network	Collection and transport of sewage	Laying of gravity and pressure pipes	Poti
Pumping stations	Lifting of sewage	Construction of pumping stations (civil works, electro-mechanical installations)	Poti
Wastewater treatment plant	Treatment of sewage	Construction of plant (civil works and electro-mechanical installations)	North of Poti, at Rioni River

1. Sewage network

66. The new sewage network will comprise the following pipes.

Table 5: Pipe lengths and diameters

Pipe Diameter	Pipe Length
	m
DN 100	35,615
DN 200	53,751
DN 250	17,086
DN 300	36,961
DN 400	1,952
DN 500	636
DN 700	2,372
DN 900	708
DN 1000	22
DN 1200	231
OD 110	6,550
OD 140	2,440
OD 180	1,945
OD 225	1,830
OD 355	4,400
OD 400	700

Pipe Diameter	Pipe Length
OD 450	350
OD 500	15
OD 560	935
OD 630	5,825

67. The southern part of the network will be connected to an existing WWTP that was recently constructed under another project..

Map 3: Location of existing WWTP South

2. Wastewater Treatment Plant

68. The wastewater treatment plant (WWTP) will be designed according to Georgian and European Standards. The application of these standards will result in a very robust treatment process, so that all required effluent criteria can be met even in case of shock loads.

69. All tanks will be constructed as compact concrete structures, so the space requirements will be much reduced compared with more nature orientated technologies like

ponds or constructed wetlands. This compact design also results in a significant reduction of odour emissions.

70. Like for all wastewater treatment plants (WWTPs) in the project towns with a capacity over 30,000 PE, for Poti the activated sludge technology with a separate anaerobic sludge digestion is proposed. This process basically includes the following treatment steps:

- Screens
- Aerated grit chambers
- Pre-sedimentation tank
- Aeration tanks
- Final sedimentation tanks
- Sludge thickener
- Digestion
- Sludge dewatering
- Gas storage

71. *Sludge disposal*. After the sludge treatment, the sludge is stabilised, it is not digesting anymore and it has also been dewatered. As there is industry in Poti, heavy metals may occur in the treated sludge. The sludge quality and consistency will allow its disposal on a landfill. Sludge quantities amount to:

- 40.1 m^3/d in 2020
- 52.6 m^3/d in 2040.

72. There is a temporary sludge storage area at the WWTP that has sufficient volume to store the sludge for 30 days in 2040. From time to time the sludge shall be transported to the landfill of Poti. The landfill is regulated by the Solid Waste Management Company under the Ministry of Regional Development and Infrastructure. UWSCG will provide transportation from the WWTP to the landfill.

73. Another alternative for the disposal of the sludge could be its use as fertilizer in the agriculture. However there is industry in Poti and heavy metals will probably occur in the sludge which would exclude the use of the sludge in agriculture.

F. Construction Activities

74. There are the following main elements in the wastewater components of the subproject:

- construction of sewer network
- construction of pumping stations
- construction of wastewater treatment plant

75. Construction practices of these works are described below:

76. *Laying of Sewer Pipes*. Sewer pipes will be laid in the settled area of Poti. The pipes will have diameter between DN 100 and DN 1200. The network will be laid with a total length of 175 km. Trenches for new pipe sections will be dug using a backhoe digger, supplemented by manual digging. Excavated soil will be placed alongside, and the pipes will be placed in the trench. Pipes will be joined, after which excavated soil will then be replaced on beneath and sides. The trench will be refilled with excavated soil and sand and compacted. The depth of trench will be 1 m – 5 m. Minimum width of the trench will be 0.9 m**.**

77. *Construction of pumping stations and wastewater treatment plant*. This work will involve excavation for foundations, placing of reinforcement rods in wooden shutters and pouring of concrete in voids to form foundations, floor, walls and roof. Cement mortar plaster will be applied to walls (outside and inside), floor and roof for smooth finish. Inlet and outlet pipes and fixers/valves will be installed. Excavation for foundation will be done by backhoe digger or manually, where required. Ready-made concrete will be supplied from a concrete plant and a needle (pen) vibrator will be used for compaction of concrete around the reinforcement. The quantity waste/surplus soil generated from this activity will be insignificant and can be used within the sites to level the ground surface.

78. Earthwork for construction of WWTP will consist of site clearing, trench excavation, grading, embankment filling and backfilling of excavation trench after built in of structures. Excavated soil will be placed alongside. Surplus soil will be used for other construction activities. Base of foundation will be gravel and sand.

79. The treatment installations and equipment will be designed according to the standards of the German DWA (German Association for Water, Wastewater and Waste). All tanks will be constructed as compact concrete structures, reducing the requirements for space in comparison with more nature oriented technologies as ponds or constructed wetlands. Main construction materials used for the various components of the WWTP are concrete and steel. Area of influence during construction comprises the construction site exhibiting an area of approximately 2 ha, the borrow areas required for material extraction and the haulage routes. Impacts arising within these areas during construction activities are described in the chapter impacts and mitigation measures.

80. *Source of construction materials*. Sand and aggregates will be sourced from licensed borrow areas. There is no designated disposal site for construction waste.

81. Water needed for civil works comprises potable water and construction water. Potable water shall comply with the national quality standards and shall not compete with the needs of the local population. Construction water and water to be used for dust suppression measures may be taken from the Enguri River or from ground water. Quantity of these resources is not a critical issue.

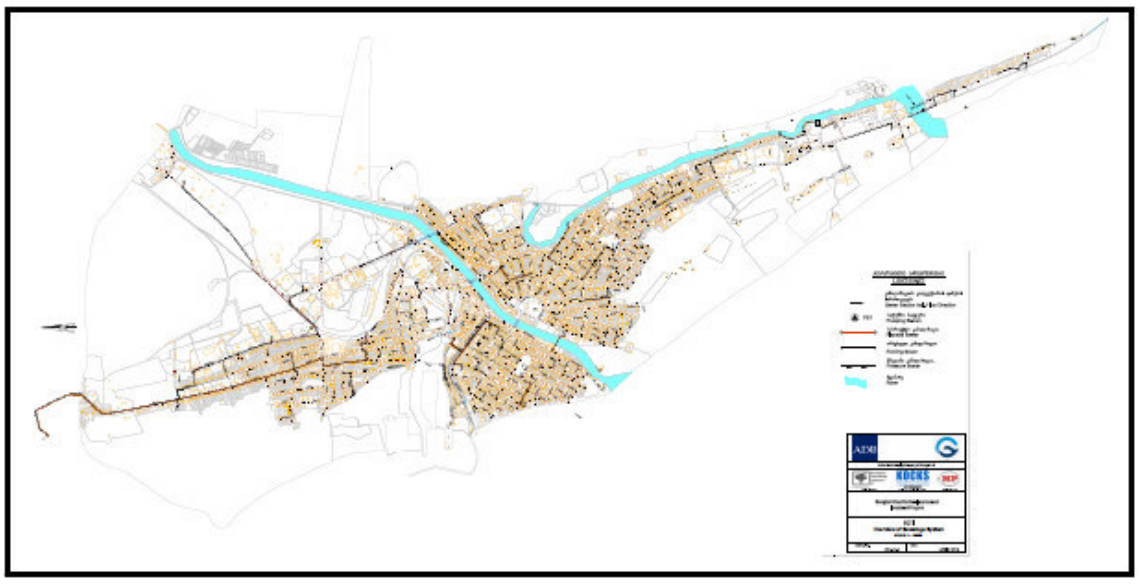


Fig. 1 Sewage network, pumping stations and WWTP in Poti (large map in Annex 3)

82. *Transportation routes*. The sewage network, the pumping stations and the wastewater treatment plant are located outside settled areas and are accessible via the highway and dirt roads. For mitigation measures please refer to subsequent chapters.

G. Operation of Improved Wastewater System

83. The wastewater system will require repair and maintenance activities like cleaning inspection. Repair work will be conducted in the same way the pipe was laid.

84. The WWTP will require inspection and maintenance activities like physical and chemical analyses and disposal of stabilized sludge and compacted waste on a waste disposal site.

III. DESCRIPTION OF THE ENVIRONMENT (BASELINE DATA)

A. Physical Resources

1. Atmosphere

85. City of Poti is located at the south-east coast of the Black Sea, in the subtropical zone. The local climate is mainly formed under the influence of the Black Sea and Caucasus mountains located north-east. The latter protect the city from encroaching of the cold air masses, resulting in mild and warm winter.

2. Air and Soil Temperature Patterns

86. Average monthly ambient temperatures in Poti vary from 6°C to 23°C, the average temperatures in February and August are 5.8°C and 22.6°C respectively, with annual average temperature as high as 14.3°C. The lowest recorded temperature is -11°C, and the highest one is +41°C. The coldest month during year is February, and the warmest is July. Tables 6 and 7 show the annual hair and soil temperature patterns according to the multi-year observation results.

Tempe-rature / Month	January	February	March	April	May	July	July	August	September	October	November	December
Average	5.7	6.4	8.8.	11.9	16.4	20.3	23.3	23.5	20.5	16.5	11.9	7.9
Average minimum	2.9	3.3	5.4	8.5	12.9	16.8	19.9	20.0	16.6	12.7	8.5	5.0
Absolute minimum	-11	-11	-9	-2	3	9	13	12	6	3	-3	-10
Average maximum	9.4	10.3	13.3	165	20.6	24.0	26.2	26.9	24.5	21.2	16.3	11.8
Absolute maximum	20	24	33	35	36	39	41	40	36	33	29	22

Table 6: Ambient air temperature pattern, °C

Tempe-rature / Month	January	February	March	April	May	July	July	August	September	October	November	December
Average monthly	4	5	10	15	22	27	29	28	22	17	11	6
Average minimum	0	0	4	7	12	16	19	19	15	10	6	1
Absolute minimum	-20	-23	-9	-5	0	7	10	11	11	-1	-8	-12
Average maximum	11	15	22	32	42	46	47	46	38	30	20	14
Absolute maximum	4	5	10	15	22	27	29	28	22	17	11	6

Table 7: Soil temperature pattern, °C

3. Precipitation and Humidity

87. The study area is humid due to the air condensation processes supported by vicinity of the Caucasus Range. The region is characterized by high precipitation rates with average annual rainfall as high as 1,810 mm. The peak rainfall rates are recorded during July-October period. According to data of Poti weather station, the maximum recorded daily precipitation amounts to 268 mm. The average number of days with precipitation is 175. The precipitation pattern is seasonal, i.e., as a rule, summer and autumn are more humid compared to winter and spring. Precipitation and humidity data are given in Table 8.

Month	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Monthly average	138	119	116	75	56	176	193	216	181	193	180	166
Absolute minimum	10	22	13	7	4	8	9	7	7	4	3	21
Absolute maximum	227	347	220	178	123	553	516	488	527	412	456	340
Number of days with precipitation	16,8	16.3	17.8	10.8	14.5	11.8	15.5	14.0	14.7	13.9	12.2	15.5

Table 8: Precipitation, mm

4. Sunshine Data

88. Total annual sunshine is in the range of 2,000-2,100 hours. The total annual solar radiation amounts to 150 kCal/cm². Annual sunshine distribution is shown on the following figure.

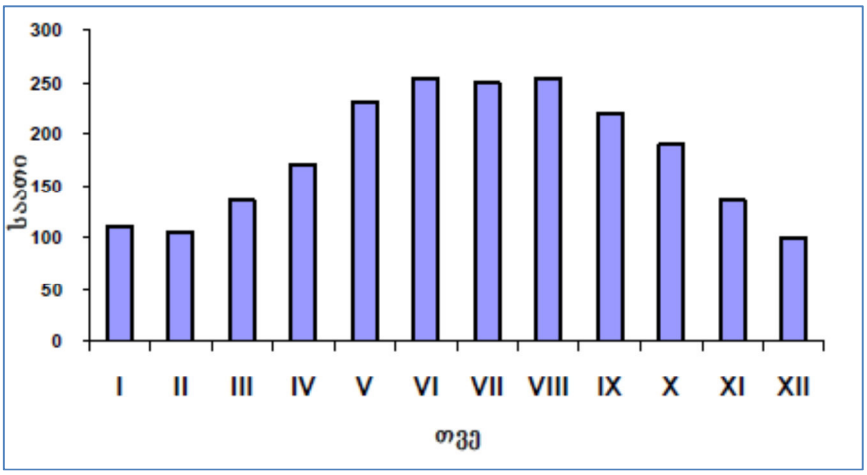


Fig. 2 Annual sunshine distribution

5. Wind Pattern

89. The monsoon wind pattern is clearly evidenced in Poti area. Mainly the east winds encroached from the Caucasus Range predominate, however the west and south-west winds are also quite common. The average annual wind velocity is 4.3 m/s, while the maximum wind velocity expectable during an year is as high as 26 m/s. With respect to direction, the prevailing winds show the seasonal distribution pattern that may be explained by influence of Smaller Caucasus and Likhi Ranges over the air circulation regime. The following charts illustrate directions and seasonal distribution of the prevailing winds.

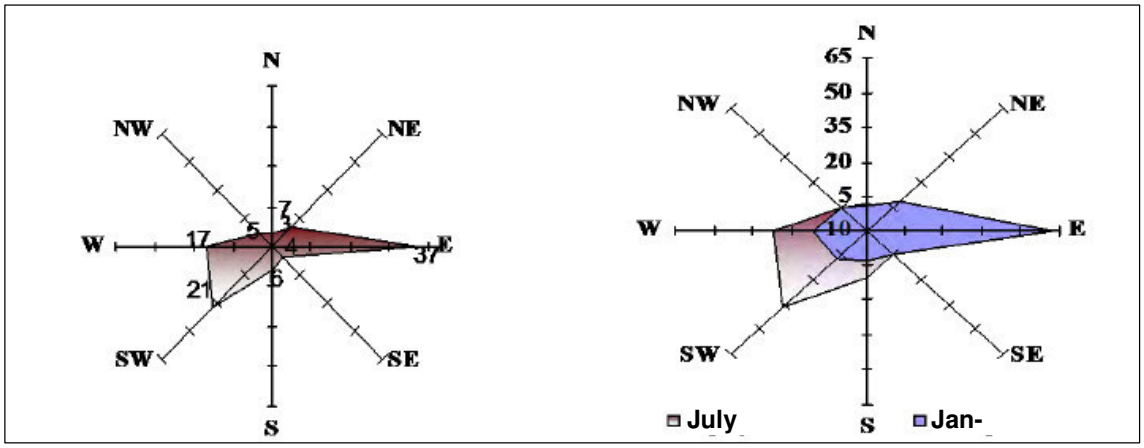


Fig. 3 Annual monthly (January and July) recurrence frequencies of wind direction (%)

6. Ambient Air Quality

90. According to the visual audit results, no stationary sources contributing to ambient air contamination are located within the study area. The quality of the ambient air in the study area may be affected by exhaust gases produced by machinery and transportation means operating in the sites of the nearby container terminals and production facilities, as well as by the vehicles moving along the city bypass road. It is obvious that no air quality gauging stations exist in Poti for years, and therefore practically no air quality data are available for the project impacted area. Due to such situation, it was found reasonable to apply the methodology approved by the Ministry of Environment and Natural Resources of Georgia (P 52.04,186-89). This methodology recommends application of the population-based approach for evaluating the baseline ambient air condition for the areas lacking any observation data (Table 7).

Population ('000)	Baseline pollution level, mg/m³			
	NO_2	SO_2	CO	Dust
250-125	0 .03	0 .05	1 .5	0 .2
125-50	0 .015	0 .05	0 .8	0 .15
50-10	0 .008	0 .02	0 .4	0 .1
<10	0	0	0	0

Table 9: Recommended baseline pollution levels by population quantities

91. The baseline pollution data required for estimating the ambient air impact were determined based on the above methodology with consideration of Poti's population (>10,000), specifically:

- Nitrogen dioxide: 0.015 mg/m³;
- Sulphur dioxide: 0 .05 mg/m³;
- Carbon oxide: 0 .8 mg/m³;
- Dust 0.15 mg/m³.

7. Noise and Vibration

92. As determined in result of the audit, no fixed noise and vibration sources exist within the study area. The noise propagated over the area is mainly generated by the moving vehicles and the special machinery operated at the container terminal sites. For evaluating the background noise levels in the study area, instrumental measurements were carried out using noise and vibration measurement device Digital MultiMeter (this device has passed the metrological certification testing). The measurements were conducted during daylight hours (from 11:00 to 18:00), three measurements per day, and the average value was recorded as the background level. The results of noise level study are given in Table 6.

Measurement point number	Measurement point description	Sound levels / Equivalent sound levels, dBA
1	Project area	44,2
2	Nearest residential zone	41,6

Table 10: Results of noise level study

93. According the measurement results, the noise propagation levels within the study area do not exceed the statutory limits.

8. Natural Background Radiation

94. In Georgia, the radiation safety issues are regulated by the Laws of Georgia on Health Care, and on Nuclear and Radiation Safety, and the secondary legislation including Radiation Safety Limits (RUN-2000), and Principal Hygienic Standards Applicable to Handling Radioactive Substances and Other Ionizing Radiation Sources. In May, 2014, monitoring of the background radiation was carried out in the study area aiming exploration of the background gamma radiation and identification of the possible non-controlled radioactive sources.

95. It should be stated that the natural radiation background in Poti surrounds varies in the range of 8-15 □R/h, and remains stable during the last years. The radiation monitoring was conducted using the dosimeter RADEX intended for determining the background gamma radiation for the area.

96. The open parts of the project area were checked in detail during radiation monitoring process. The measured background gamma radiation rates for the study area varied from 7 □R/h to 15 □R/h that is within characteristic interval for Poti surrounds. Neither uncontrolled radiation sources nor any radioactive contamination was revealed.

9. Geology, Geomorphology and Seismicity

Geological and Geomorphological Conditions

97. The study area is located within the boundaries of Kolcheti accumulated lowland. This area represents the geotectonic depression with a bulk quantities of accumulated terrigenous materials. The geological structure of the lowland is composed of 10 km thick Mesozoic and Quaternary sedimentary rocks. These deposits are covered by relatively recent terrigenous materials of Pliocene Era, with thicknesses of up to 1,0 km. Down warping of the Kolcheti Lowland has still been continuing during the mod-

ern geological epoch, and therefore, generation of the sandy-clayey deposits is continuing as well, although here prevail the lacustrine and boggy sediments with thicknesses at some locations reaching 35-40 m.

98. The following terrain types are identified in the Kolcheti Lowland:

- The modern dune strip of the Black Sea shore, which follows the sea cost and consists of 1-3 m high and 30-100 m wide sand dunes;
- Alluvial lowland of Rioni River, with flat, slightly westwards descended (0.0003-0.0005) terrain and absolute altitudes of 0-18 m;
- Alluvial and alluvial-marine lowland with almost flat surface dissected by old beds and inter-river depressions, slightly outlined riverbeds and drainage (reclamation) canals;

99. The lowland is slightly descended towards the sea with average gradient of 0.0005. Its western part is composed of wetland. The absolute altitudes vary in the range from 10-18 m to 0-3 m from the east to the west. Within the zone of boggy deposits, the terrain is composed of the peat domes elevated 3.04 m higher above the wetland surface. In the geomorphologic point of view, the proposed terminal construction site belongs to the Kolkheti Lowland. The terrain is straight. Geotectonically, the area belongs to the Kolkheti sub-district of the western depression zone of the Georgian Block. The geological structure of the district is composed of quaternary deposits genetically belonged to alluvial soils with thicknesses exceeding several tens of meters.

100. Construction sites selected for sewerage routes of Poti entirely cover Poti territory and suburbs, streets, residential blocks, harbour and agricultural and industrial buildings of various destinations. The complete project area is located in the lowland. There is no risk of land slides.

101. Internal network is studied on base of lithological section analyses of twenty three 5m deep boreholes. According to its geological structure, geomorphological and hydrogeological conditions the investigation territory represents one whole area. The beginning of the site is at North of Poti, in “Nabada” settlement. Then it covers central part of the city, peripheries and ends at Maltakva.

102. South part of Poti. The territory surface is straight, bending a little to the seaside, covered with residential houses, land sections, asphalted streets and infrastructures characterizing for other city. Almost homogeneous soils lithologically represented by recent and old Quaternary marine, various grained sands take part in geological structure of the territory. Building soils of the section (especially within the city boundaries) are covered with 0.15- 1.3m thick technigenic soils (tQIV) – GE 1 (cobbles, gravel, sand, construction residuals and others – observed in 12 boreholes).

103. In upper part of lithological section firm clays are rarely observed – GE 5. Their thickness changes within 0.6-2.5m areas. Clays are characterized by local distribution.

104. Besides the soils mentioned above four types of sand of various density and grains are observed in the section. Loose, silty, fine and medium grained brown sands – GE 2 are observed most often (18 boreholes). Their minimal thickness is 0.6m, but maximal thickness exceeds 5.0m surveyed depth at some places.

105. Among 23 drilled boreholes brown saturated medium and fine grained sands – GE 3, are observed in 14 boreholes. Their minimal thickness is 1.5m, but maximal thickness exceeds 5.0m surveyed depth at some places. Sand, brown, fine grained, saturated,

medium dense, with shell inclusions to 20% - GE-4. Among 23 drilled boreholes GE 4 is observed in 8 boreholes, from 2.0-3.6m depth to 5.0m surveyed depth.

106. Sand, grey-bluish, fine grained, medium dense, gleizated – GE 6, is observed only in four Boreholes. Layer thickness is 2.4-3.0m, but it is more than 3.0m at some places.

107. At the studied territory modern dangerous geological processes do not take place. Groundwater outlets are observed in all boreholes to 0.2-2.0m depth.

Seismicity

108. Poti area is located in the active seismic zone. Due to this, the terminal shall be designed and constructed in compliance with the requirements stipulated in the applicable Georgian construction standard Seismic Resistant Construction (PN 01.01-09). According to Annex No.1 of this document, the area selected for construction of the project facility is located in the seismic intensity zone 8 (MSK 64 scale), which dimensionless seismic coefficient 'A' equals to 0.15.

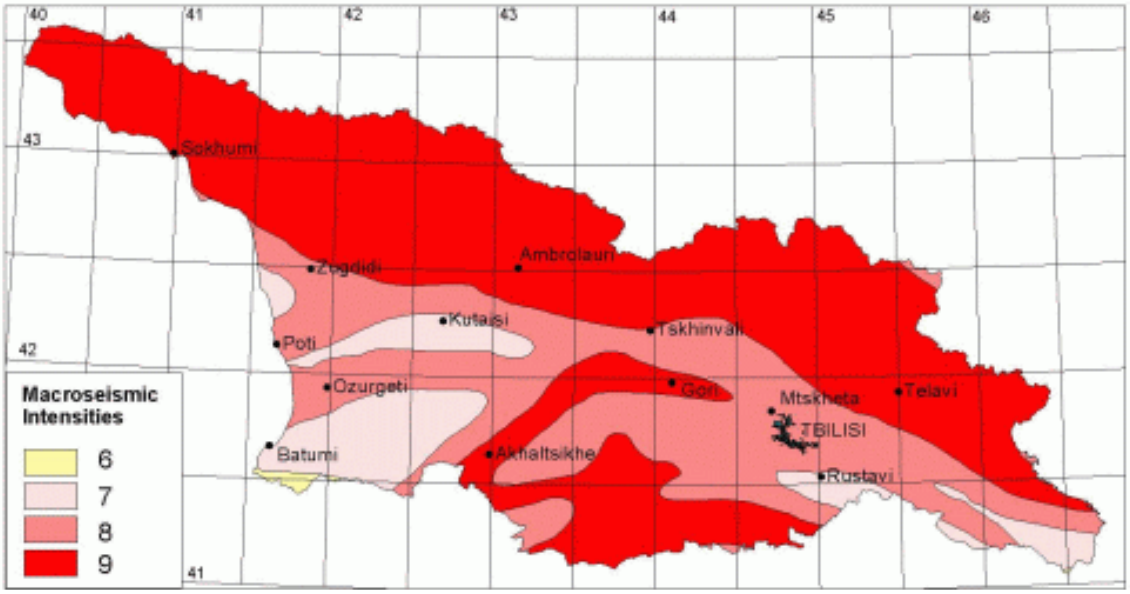


Fig. 4 Seismic zones of Georgia

Soils

109. Around city of Poti there are distributed wet meadow, slimy wetland, wetland sod and alluvial wetland soils.

110. **Wet meadow soils** are characterized by uneven mechanical compositions. Within the boundaries of Rioni River lowland, such soils are sandy, and at their early generation stages were developed with immediate participation of the forest cover.

111. **Slimy wetland soils** are mainly developed in the area between Rioni and Khobistskali Rivers. These soils are clayey, and by mechanical structure belong to dusty light loams.

112. **Alluvial wetland soils** are distributed around depressions of the inter-river lowland, where during floods, the disperse particles of the suspended sediments are periodically settled in a form of very thin layers. Therefore, such soils are also of clayey composition. In addition, these soils lack any established structure and have only carbonate content.

113. **Wetland sod (turf) soils** mainly occur in the west part of the area. Such soils originated in result of decaying of the vegetation cover developed over the old inundated areas, while deterioration of the aeration regimes facilitated accumulation of the dead vegetation layer. These processes worsen the surface runoff dynamics and support to intensification of the swamping.

Hydrogeology and Hydrology

114. The study area is located within the Black Sea coastal accumulated lowland largely formed under the influence of Rioni River.

115. The hydrological conditions of the study area are mainly explained by impacts of the listed water bodies. Below is given the brief hydrogeological description of the area.

10. Hydrogeological Conditions and Water Quality

116. **Rioni River** is the biggest river of the West Georgia. It originates from the glaciers located on the southern flanks of the major Caucasus watershed range, at 2620 m above sea level. In the upper reaches, the river flows along the narrow deep gorge, then runs through the large valley located between Lechkhumi and Racha Ranges, and then again enters the narrow valley. Downstream of city of Kutaisi, the river approaches Kolkheti Lowland, where it diverges into two branches. The bed of Rioni River is slightly elevated above adjacent lowland and meanders. Prior to mouthing into Black Sea, the river forms the delta. The total length of Rioni River is 327 km, the catchment basin area is 13,400 km², and the average flow at the mouth is 405 m³/s. The average flow depth (stage) is 635 cm, while the maximum depth is 745 cm (Saqochakodze Gauging Station, 1956). The maximum flow recorded in the north branch amounts to 1,400 m³/s. Rioni River feeding regime is mixed: the main water sources are precipitation and, in the upper reaches, the glaciers. The river is navigable along its 95 km long section upstream of the mouth. River runoff is characterized by high sediment content – its total average annual solid sediment load is 5 million m³, from which 10% is composed of bottom sediments. The volume of beach-forming bottom sediments with grain sizes of up to 0.1 mm amounts to 1.2-1.4 million m³. The current shape of the coastal zone of central Kolkheti has been mainly formed by sediment carried by Rioni River flow that deposition of the sediments along the riverbanks. The right branch of the river has not been gauged during the last years. According to the data of the National Environmental Monitoring Centre of the Ministry of Environment Protection and Natural Resources, the average annual flow in the right branch of Rioni delta is 305 m³/s, exhibiting clearly identifiable high water levels during spring floods, and flash floods occurred in autumn (Table 11).

Average monthly flows in the right branch of Rioni River (1971-1997)													
Month	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Average
m³/s	257	261	346	467	421	403	300	245	185	220	292	270	305
%	7.0	7.2	9.5	12.5	11.5	11.0	8.3	6.4	5.0	6.0	7.6	7.4	100
Monthly average water levels in the right branch of Rioni River (1971-1997) ('0'-5.0 m interval on the chart)													

Month	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Average
H, cm	495	497	509	529	529	523	508	494	482	485	494	499	504

Table 11: Average monthly flow in the right branch of Rioni River (1971-1997)

117. In the frame of project on 04.06.2014 has been done a chemical analysis of water of riv. Rioni as baseline an analysis that is given in table 13 below. Rioni water sample was taken at the location of the old WWTP.

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CHEMICAL ANALYSIS OF WATER # 4228LabN& w

Customer: Gamma Consaltingi

			mg/l	mg-Eq
Kind of Water	Surface	Hardness		2.623
Water ID	Rioni	Fr.Alkalinity		N.D.
Waterpoint	Vicinity of Nabada bridge	Diss O_2	-	
Region		Free CO_2	-	
Debit(m^3/day)	-	C.O.D (mg/l O)	<15	
Pasport		B.O.D (mg/l O)	7	
Colour	-	Total N	14.5	
Odour		Total P	1.7	
Suspend solid (mg/l)	376.5	General N	-	
Turbidity (FTU)	>10000	Organic C	-	
pH	7.75	Summary SiO_2	-	
Temperature °C	-	H_3PO_4	-	
Dry Resid. (mg/l)	153.491	H_3BO_3	-	
Conductiv.(S/m)	0.02042	H_2S	-	
		TPH	<0.04	

Cations				Anions			
Ion	mg/l	mg-Eq	mg-Eq%	Ion	mg/l	mg-Eq	mg-Eq%
NH_4	N.D.	N.D.	N.D.	Cl	6.381	0.1800	6.29
*Ca	36.000	1.8000	63.24	*HCO_3	122.000	2.0000	69.85
*Mg	10.000	0.8230	28.92	CO_3	N.D.	N.D.	N.D.
Na	4.400	0.1921	6.75	*SO_4	30.400	0.6333	22.12
K	1.210	0.0310	1.09	NO_2	N.D.	N.D.	N.D.
				NO_3	3.100	0.0500	1.75
Sum	51.610	2.8462	100%	Sum	161.881	2.8633	100%

Microbiological analysis	Lactose-positive colon baccilus	CFU	250 000

<*> - above 20%; <N.D.> - not detected; <-> - not measured, < - Background level

mineralization (mg/l): 213.491

The Work Leader V.Gvakharia

04.06.2014

Table 12: Chemical analyses of water in Rioni River

118. Additional sample of grease was taken at the location of Rioni River water (Poti, near Nabadi Bridge) on 19 September 2014 by Ltd. “Gamma Consulting”. The value for oil and grease is < 5,0 mg/l.

Gamma
SCIENTIFIC RESEARCH FIRM
samecniero-kvleviTi firma “gama”

Client	Ltd. “Gamma Consulting”
Numebr of Samples	1
Type of Samples	Rioni River water (Poti, near Nabadi Bridge)
Date of receipt of a sample	19.09.2014
Laboratory Registration №	№ 1219-W

Results of the Analysis

№	Defined component	Obtained result, mg/l
1	Oil and Grease	<5.0

Head of Laboratory T. Adamia

26.09.2014

Table 13: Chemical analyses of water in Rioni River

119. Also in the frame of project on 27.05.2014 has been done chemical analysis for existing sewage water, sewage water that is discharging into the river without cleaning. Sewage water sample was taken sewage pumping station n° 10.

Client: "Gamma Consulting" Ltd.
Sample title: Poti sewage water
Date of sample obtainment: 27.05.2014
Lab. Number: 750'w

Results of Chemical Analysis of Poti Sewage Water

#	Defined parameter, unit	Received value
1	Ammonium ion, mg/l	850
2	Nitrite ion, mg/l	38.0
3.	Nitrate ion, mg/l	120.0
4.	Total nitrogen, mg/l	699.7
5.	Total phosphorus, mg/l	45.6
6	Suspended particles, mg/l	550
7	C.O.D mg/l O_2	>700
8	B.O.D. mg/l O_2	580
9	Bacteria of lactose-positive group, CFU	$>11\,10^9$

Head of laboratory service: T. Adamia

05.06.2014

Table 14: Results of chemical analyses of Poti Sewage Water

11. Flora and Fauna

Flora

120. Above mentioned project area is located on the territory of the town and was under significant anthropogenic impact. Considering of specification of company activities green surface practically doesn't exist, except typical herbal species of similar areas.

121. In general in the suburbs of the city remained floristic composition with various, relic and endemic species - in the face of wetlands, Colchis forests and sandy dune plants along the coast.

122. The local forest plants are adapted to excess moisture, warm climate, flooding. In wetland conditions onthe peat-swampy and sandy swampy soils are developed forests, where human access is often impossible. In the forests dominate peculiar Alder and along wetland plain-valleys are plant communities in the face of swamp, water, forest and secondary meadow. Typical representative of Alder is fern (Matteucia struthiopteris) the height of which sometimes reaches 180 cm. We can meet Fern Chaduna (Dryopteris filix mas); to the perimeter of the lake is distributed dense massif of Eceri Fern (Pteridium tauricum). There are well-preserved wetland ecosystems. This massif is presented by rush-sandy, grassy-mossy, reed mace-reed and partly bushes - herbaceous. Reed mace and rush plants are fragmentary repeated on swampy ecotopes and alder wetlands. Swampy plants are much more diverse than aquatic ones. Swampy plants species composition is as follows: rush (Juncus effuses), water chestnut (Scirpus lakustrum), endronika (Galium palustre), horse-toothed (Leucojium aestvum), tsalika (Polygunium hidropiper), water iris (Iris pseudocorus). In the lake

Nabada grows Colchis Hemp (Cannabis colchicum). In Nabada wetland areas we register such rare plant as Kotkhoji (Acorus calamus).

123. Some representatives of the mentioned flora found on the adjacent territory to existing WWTP-A (Figure 5).

Fig. 5 Adjacent territory to existing WWTP

124. From aquatic plants swamps and reservoirs are covered with a thin, water-floating or dipped plants, such as water nut (Trapa colchida), Water Perry (Lemna minor), water strawberry grass (Comarum palustre), water star (Callitriche cophocarpa), yellow (Nufar luteum) and Colchis white lily (Nymphaea Alba)

Flora

125. Colchis plain, with flowing rivers and lakes on its surface (lake Paliastomi, Anaklia, Churia, Nabada swamps) is a reliable shelter for rare and endangered aquatic-earthy and aquatic animals, as well as for a number of invertebrate animal groups. In addition, these swamps has great significance for local and migratory birds.

126. Between inhabitants of Kolkheti National Park birds are very easily visible. Everyone can see them at every turn, because Eurasia of migratory birds – here passes Africa's migration route, so it's not just a nesting territory, but you can meet enormous flocks of birds started off distant journey in the spring and autumn. Seasonally is observed multiplicity of birds characteristic for Polar-North. In winter from North are flying ducks, skein and swan flights. From big mammals jackals are most well adapt to swampy groves and forests and is distinguished by its multiplicity. At the surrounding areas of Poti are rarely, but even possible to meet fox and reed cat. In the lkes and surrounding swamps it is possible to see otter and nutria.

127. From Kolkheti inhabitant amphibians there are: tree frog, pond frogs, toads, small Asian newt. The area is not rich with diversity of reptiles due to the excess humidity.

Thus it is mostly found species associated with water (marsh turtle, the ordinary and aquatic snake).

128. From identified 53 species of reptiles in Georgia, 9 species are found here. The surrounding reservoirs of Poti are characterized by diversity of ichthyofauna. Here are distributed characteristic species as for freshwater also for salty-water: (skelshubla, carp, grey mukket, bitterling, catfish, herring Caucasus, Colchis Toby, etc.). in these ecosystems and biotopes are widely represented invertebrate animals following groups: nematodes, leeches, mollusks, crustaceans, spidery (mites, scorpions, spiders) and insects.

129. From leg joint type endemic forms should be mentioned Megruli Scorpio (Euscorpius migrelikus), as well as scorpions migrant form - Italian Scorpio (Euscorpius italikus), which is common only in a narrow coastal strip of the Black Sea.

130. Kolkhetis relic forests together with its peat swamps is well preserved by flora and fauna and represents the object of special care. As noted above, the project area is located in the industrial zone and during audit only synanthropic animal species have been fixed.

Preserved Territories

131. The KNP is located in the study area of the region, which partially covers the Ramsar № 893 district. As Colchis Park, as well as Ramsar site is represented by two territories – one of them is located at north from Poti, and another one adjoin city from - south - east.

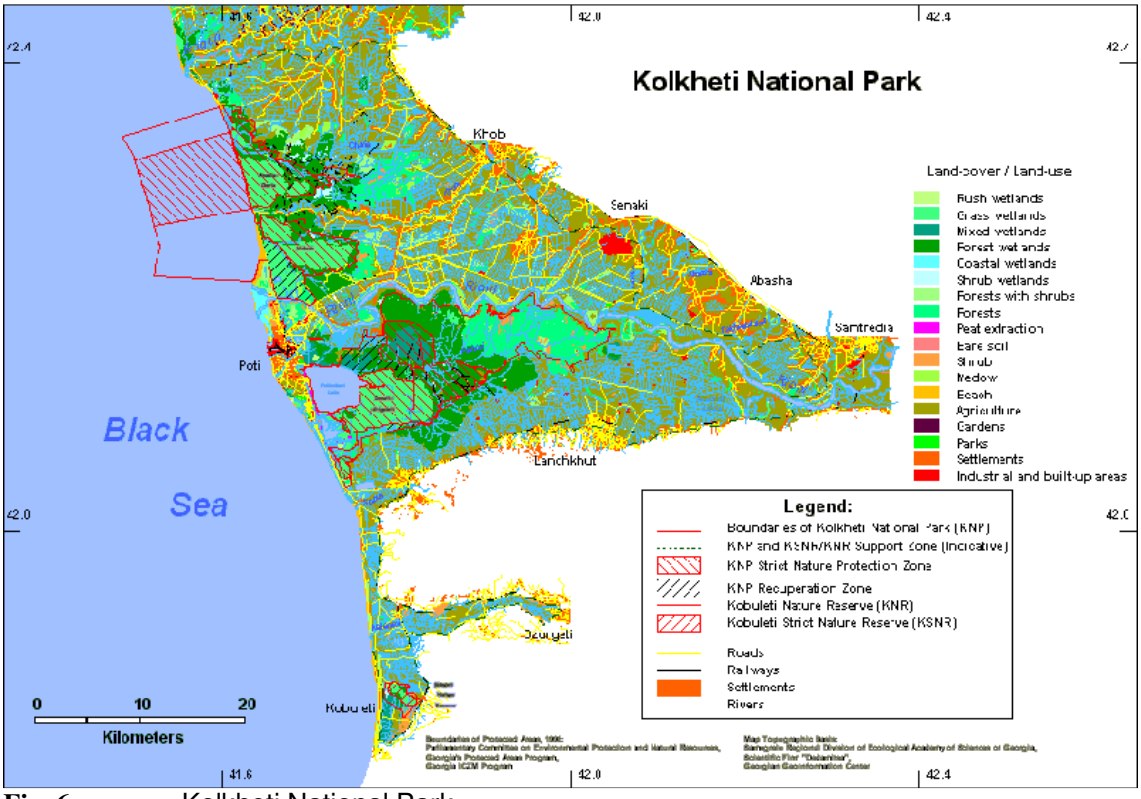


Fig. 6 Kolkheti National Park

132. The KNP, Kolkhetis State Reserve and Ramsar Site № 8935 KNP is located from south of the Caucasus range, at the Colchis lowlands. It includes the eastern Black Sea coast line and Paliastomi lake basin. The park is located at five administrative districts' territories - Zugdidi Khobi, Senaki, Abasha and Lanchkuti. Its total area is 45 447.4 ha, from which 29 704,4 ha of is located at earth, and the remaining 15 743 ha - Sea waters. Kolkheti Park has been founded in 1999 for protection and surviving of having international importance wetland ecosystems. It has been established in the frame of "The Integrated Coastal Management - Project, World Bank (WB) and the Global Environment Facility (GEF) funding. Colchis National Park was included also Colchis State Reserve (500 ha), which was founded in 1947 and covers the surrounding wetlands and Lake Paliastomi. The park is divided into area - Churia (between river Churia and Khobistskali ravines coastal sections), Nabada (between rivers Khobistskali and Rioni ravines west sections) and Imnati (between rivers Rioni and Supsa ravines west sections) natural geographical regions. In addition, sea water area located between river Rioni and Churia mouth is included in the national park. Anaklia-Churia site area is 13 713 ha, Nabada site area is 10 697 ha - and Imnati site area - 19 903 ha.

133. KNP covers significant part of № 893 Ramsar sites –namely part of the complex of Anaklia- Churia, Nabada and Pichora, Paliastomi peat swamp, Paliastomi lake, adjacent wetland forests, Black Sea coastline, as well as the rivers Khobistskali and Rioni mouth and downstream. The total area of Ramsar sites is 33.710 ha (including 55,500 ha of sea water area) and belongs to Lanchkuti and Khobi regions, as well as Poti area.

134. Colchis swamps are important with its relic origin. The remains of the tropical and subtropical lowland landscapes, which about 10 million years ago, during the Cenozoic era was stretched across the Eurasian continent; Today ,existing local relic plants are characterized only for the far north of the taiga and tundra ecosystems typical swamps. This species is by fragments of sphagnum mosses (Spagnum imbricatum, Sp. Palustre, Sp. Acutiflium), round leaf Drozera (Drosera rotundiflora), Northern Sedge (Carex lasiocarpa), etc,. At the territory of park still remain quite diverse floristic composition of relict and endemic species-rich phytocoenoses complexes - swamps, wetland forests and different plant communities of the sandy dunes along the sea coast.

135. Along the lakes and swamp rivers in mighty dump locations are distributed such plants as: Colchis lily (Nymphaea colchica), yellow water lily (Nuphar lutea), water lily (Nymphaea alba), water nut (Trapa colchica), water Vine (Potamogton crispus, P . natans), water plan tain(Alisma plantago-aquatica), lemna (Lemna minor), and in peat swamps together with like tundra boreal species are found (see above) royal fern (Osmunda regalis) and Imeretian sedge (Molionia litoralis). Actic plant complexes belongs to the ancient relic vegetation landscape types, which are represented by such species as sea lily (Pancratium maritimum) (included in the Red Book), yellow poppy (Glaucium flavum) (included in the Red Book), thrush (Euphorbia paralias), coastal thistle (Eryngium maritimum), sea motherbee (Stachys palustris). In sandy dunes is growing up buckthorn (Hippophae rhamnoides), thorn (Paliurus spina-christ) Hawthorn (Crataegus) and others.

136. Along peat bog in the peripheral zone and along the wetland forests grow Colchis - Hircan alder (Alnus barbata), Caucasian wingnut (Pterocaya pterocarpa), Imeretian oak (Quercus imeretina), beech (Fagus orientalis), ash (Fraxinus excelsior), hornbeam (Carpinus caucasica), Georgian oak (Quercus iberica), alder (Alnus barbata). In the forests still exist box-tree (Buxus colchica), azalea (Rhododendron luteum),

rhododendron (Rhododendron ponticum), Cashmere (Ruscus ponticus), Page (Ilex colchica) and others.

137. As a rare and endangered species, some of them are included on the Red List; These are: Colchis oak (Quercus hartwissiana), Caucasian wingnut (Pterocarya pterocarpa), Buxus (Buxus colchica), Colchis ivy (Hedera colchica) and others. In humid forests, swamps and rivers are nesting and wintering 194 species of birds, among them 76 species are flying away and home, and 62 are habitant and wintering are 56 species. Park along the coastal zone of Lake Paliastomi, Africa-Eurasian water is one of the important migration zone for marsh birds. From wintering species should be mentioned mekalote goose (Anser fabialis), white forehead goose (Anser albifrons), wild duck (Anas plathyrynhos), spotted Swan (Aythya fuligula), curly Pelicans (Pelecanus crispus), black stork (Ciconia nigra), little egret (Egretta garzeta), white-tailed eagle (Haliaetus albicilla). Some species, including storks (Ciconia Nigra), gray crane (Grus grus), a crowing eagle (Egretta alba), great egret (Cosmerodius albus), red-throat murtala (Podiceps auritus) can be found here, and the white-tailed (Haliaeetus albicilla) and on the brink of extinction and are included in the Georgian Red List. Park and other areas in the Colchis Lowland is Colchis endangered pheasant (Phasianus colchicus colchicus) living place. Here exist black-eyed (Falco vespertinus), which is included in the regional Red List categories - vulnerable; Swallow Valley (Glareola nordmanni), which is included in the regional Red List category - endangered (Birds in Europe, BirdLife International, 2004).

138. At Kolkhetis swampy groves, forests from Terrestrial mammals are distributed: jackal (Canis aureus), wild boar (Sus scrofa), roe deer (Capreolus capreolus), otter (Lutra lutra), Caucasian mole (Talpa caucasia). It should be noted that there are 6 species of endangered animal species distributed.

139. Marine mammals are represented in the face of 3 species of dolphins: apalinati (Tursiops truncatus), white-sided dolphins (Delphinus delphis and Lagenorhynchus acutus) and the pig (Phocoena phocoena). All three species included in the Red Data Book of IUCN-they are endowed by their status-Insufficient ll (small). The park reptiles inhabitants are: the smooth newt (Triturus vulgaris), Newt (Triturus. vittatus), a water snake (Natrix tesselata), Aesculapian snake (Elaphe longissima) and marsh turtle (Emys orbicularis).

140. Ichthyofauna of aquatic ecosystems in the National Park is represented by 88 species, among them 23 species are going out fish, 21 species of fresh water fish and 44 species of fish of the Black Sea. 6 species are in the Red List, They are: hops (Huso huso), poreji (Acipenser sturio), Atlantic sturgeon (Acipenser stelatus), Black Sea salmon (Salmo fario (truta) morpha), goby - mekvi times (Gobius (Neogobius) fluvatilis), stirring roach (Rutilus frisii). In addition, in the sea water and the lake was found targhana (Asipenser stellatus pallas), Colchis sturgeon (Asipenser persicus colchicus V. Marti), herring (Alosa caspia paleostomi), Severity (Migil cephalus), charghala (Asipenser nudiventrislovetzki), zander (Stizostedion lucioperca) , kepali (Mugil auratus) and others.

B. Socio-Cultural Resources

1. Location and Population

141. The city and port are located on the Kolkheti Lowland, at the Black Sea mouth of Rioni River, and administratively belong to Samegrelo-Zemo Svaneti Region. The area of the city is 69 km², and the population is 47,149.

	2004	2005	2006	2007	2009	2010	2011	2012	2013	2014
Samegrelo-Zemo Svaneti Region	459.5	460.4	471.0	469.8	467.7	468.0	474.1	477.1	479.5	476.9
Poti	46.5	46.7	47.3	47.3	47.4	47.5	47.7	47.8	47.9	47.7

Table 15: Population

2. Employment and Economy

142. Poti area is among essential regions of the Georgian economy. Poti Sea Port is one of the biggest within the Black Sea basin. It is located on the TRASECA corridor and serves as the largest hub of the Caucasian transit network. Poti gained important role in Europe-Asia corridor. On April 15, 2008 the presentation of Free Industrial Zone was held in Poti that is a novelty for Georgian economy and a new wave in national economical development. The railway ferry terminal is of a high importance that connects Poti with Ukrainian, Bulgarian, Turkish, Romanian and Russian ports. It should be noted that Poti port is the largest employer in the region providing jobs for 1309 persons, i.e. 3.1% of total employed people. The number of indirect jobs available in the port-related services, including external container terminals and onshore shipping companies is unknown. Formally, 114 such companies have been registered. Therefore, it may be stated that relatively high employment rate in the region is result of the port's and its related activities.

143. As noted above, the absolute majority of Poti's working-age population has been employed in the sea port and related infrastructural and service facilities. Other businesses important regarding employment include trade, service and transport infrastructure facilities, and Black Sea Terminal Ltd. (in village Kulevi). From 1309 persons working in the port, 1135 are residents of Poti, including 386 persons resided in Nabada settlement. During 2006-2010, the port had 28.7-40 per cent share in regional transport and communication sector, and provided 4.5-6% of total added value in the region. In 2009, the taxes paid to the State Budget by Poti Sea Port totalled to GEL 4,564,047. Such data obviously evidence importance of the port for economical development of city of Poti and entire region.

3. Healthcare

144. There are 89 health care facilities operating in Samegrelo-Zemo Svaneti Region, including hospitals, polyclinics and feldsher stations, which employ 260 ambulance crews. From this, 7 facilities are located in high-mountain areas. The number of doctors per 10,000 people is 25.7.

145. There are 10 medical facilities operating in Poti comprising hospitals (inc. 1 nursery), polyclinics, laboratories and ambulance stations. By the end of 2009, number of hospital beds was 107, and number of doctors 160, i.e. 33.7 doctors per 10,000 people that is the highest rate around the Region.

4. Vulnerable Population

146. The following vulnerable population has been identified in Poti:

- Retired persons – 8,822;
- Veterans of the Second World War and recent military conflicts occurred in Georgia – 148 (disabled persons, whose incomes are below the minimum subsidence level);
- Poor households – 266 families (families, whose per capita incomes are below the minimum subsidence level);
- internally displaced persons – more than 6000

5. Education and Culture

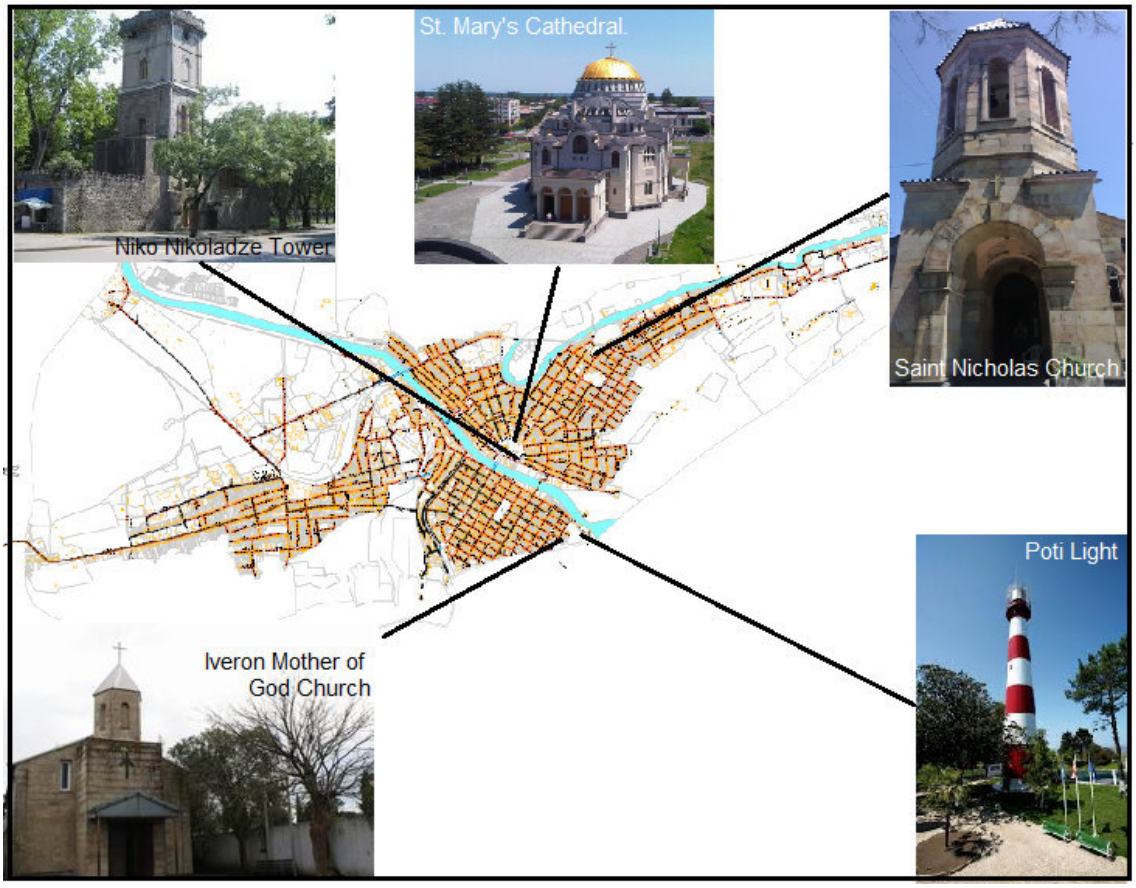
147. There are 11 public schools (689 teachers and 6,867 pupils), 5 art education facilities, 17 kindergartens, one higher education institute, network of libraries, and art exhibition hall. Also, one theatre, and up to 15 sport facilities are operating in the city. According to the information provided by the city education service-centre, no illiterate persons are registered in the municipality.

6. Cultural Heritage

148. Several buildings in Poti may be attained to the cultural heritage, including:

- Cathedral Church of the Nativity of the Blessed Virgin Mary built in the downtown in 1906-1907. The cathedral is an imitation of Hagia Sophia located in Istanbul;
- Saint Nicholas Church located in the area of the old cemetery. This church was constructed in 1892 as a wooden structure replaced by brick structure in 1904. Further, in 1990, it was reconstructed;
- Niko Nikoladze Tower – five-storey structure located at the Central City Park and Cathedral. The tower was rebuild several times during 16th-18th centuries, and further was subjected to several reconstructions;
- Poti Light House located at the south branch mouth of River Rioni, south of the port. This building was constructed in 1864.

Fig. 7 Poti - Historical Monuments layout



149. Besides above, several buildings are of architectural value for the city, including Iveron Mother of God Church. Please see Annex 4 for more detailed location maps.

7. Public Services

150. The cleaning and waste management responsibilities for the Poti area are assigned to the municipal entity, which under contractual arrangement caries out cleaning of the city streets and parks, as well as removes and disposes the waste. This entity has sufficient garbage trucks and other required equipment. The special waste collections containers are made available around the city area.

151. It should be noted that the segregated waste collection practices are not employed. The waste is removed to the municipal landfill, which is the balance sheet asset of the municipal entity. The landfill is located north-east of Nabada Settlement, at the south bank of Rioni River, 600-650 m apart from the closest residential building. As identified during audit, the technical condition of the landfill is unsatisfactory, and the rules applicable to waste placement and disposal are not respected. The landfill is not fenced, and the wastes are not covered with soil that leads to high environmental contamination risks. According to the information provided by City Hall, reconstruction of the landfill and bringing it to compliance with environmental standards was planned in 2011. Within the Poti region, only privately-owned Ureki Landfill operates under the valid Environmental Impact Permit. The City Hall has allocated the special disposal sites for the construction (aggregate material) wastes. No hazardous waste disposal

sites exist in Georgia. The Ministry of Environment Protection and Natural Resources of Georgia has issued Environmental Impact Permits with respect to the management of some hazardous wastes (e.g. expired and failed batteries, luminescence lamps, mercury-containing substances, hydrocarbon-contaminated waste, etc). The industries operating in the city area (including Poti Sea Port Corporation) have executed contracts with the waste management companies, which undertake management of the hazardous waste. All other hazardous waste generated in the city is removed to the existing landfill together with domestic one.

8. Water Supply and Sewerage

152. City of Poti is supplied with water for drinking and domestic use by central urban water supply system fed from the ground waters. The headworks of the water supply system are located in Senaki and Martvili Municipalities. Currently, supplied water is sufficient for the city (400 l/d per capita), however due to poor technical condition of the distribution system, part of the city population are provided with water under schedule. The rehabilitation works of the distribution network is near end, and after completed, the population will have 24-hour water supply.

153. Drainage and treatment of the sewage water generated in the city is still a problem. The sewer mains and pumping stations are obsolete and damaged, while the waste water treatment facilities do not function during years and are out of order. The sewerage system will be further challenged after reconstruction of the water supply system is completed, because improved water supply will lead to increased waste water flow, although the sewer mains are not designed for such loads and, therefore, their frequent damages shall be expected.

9. Transport Infrastructure

154. Poti transport infrastructure includes airport (local), sea port, railway station and motor roads. The railway track to Tbilisi makes this port more suitable comparing to Batumi's one. The city has 35 public transport routes served by 25 busses and up to 70 minibuses. The total length of the municipal road network is 167 km, including 43 km long secondary road, and 124 km long local roads. It should be noted that construction of the Poti International Airport has been planned. Poti is provided with electric power from several alternative sources that ensures uninterrupted supply. In 2010, new transmission line and substation were constructed for power supply of the terminal, which may be used as additional power supply source for local residents. Number of infrastructure development projects are planned that should be financed as from the local budget, so from the other sources.

IV. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Summary of Activities and Anticipated Impacts

155. Proposed wastewater treatment plant project will certainly produce some environmental impacts in project area. Activities to be performed within the scope of the Project were examined in 2 phases:

A) Construction Phase

- Pre-construction activities such as contractor office set ups and necessary equipment stacks;
- Construction of the Treatment Plant per tender drawings

156. Environmental effects likely to occur during the construction of the Project are noise, dust, solid and liquid wastes. Effects likely to occur during the construction phase are short term effects and they cannot deteriorate the existing conditions,

A) Operational Phase

- Commissioning and Operation of the Wastewater Treatment Plant;
- Use of treated effluent for irrigation or/and dispose of on the landfill

157. Possible environmental effects during operational phase arise from effluent discharge, solid and hazardous wastes, sludge disposal and odour and do not include any adverse environmental effects as long as monitoring and mitigation measures, if needed, are executed.

158. This paragraph provides a brief description of anticipated site-specific impacts related to the construction phase of the sub-project "Improvement of Poti Waste Water system".

#	**Construction Phase. Potential Impacts During Construction Works**	**Risk**	**Sites**
1	Dust, noise, vibration	High Risk	During excavation of pipe trenches within the areas of town of Poti.
2	Pollution of surface water during construction and rehabilitation works	Moderate Risk	Existing sewage network that should be rehabilitated in some places crosses water flows.
3	Contamination of underground water	High Risk	Based on conducted survey in the territory of city (drilled 25 wells) groundwater level was fixed as 0.2 - 2.0 m height, relevantly sewage pipes.
4	Impacts on Archaeological Sites	Low Risk	No damage to any archaeological site shall be expected. The pipe laying sites in Poti is located in the areas of extensive on-going human impact.
5	Impacts on traffic	High Risk	According to the project Poti existing sewage system will be almost entirely replaced. For its implementation is required excavation of trenches in the streets of the city that will cause breaking of the movement both - transport means and passengers, especially in the narrow streets of the city.
6	Landslides, slumps, slips and other mass movements.	Moderate Risk	No large scale earthworks are planned under the Project. Despite this, the landslide processes may be triggered during construction of the pumping stations.
7	Impacts on flora and fauna	Low Risk	Territory of city is located along Kolkheti National Park (KNP) and during construction works are expected indirect impact on flora and fauna.
8	Pollution risk for air quality	Moderate Risk	Air pollution may occur in the inhib-

#	Construction Phase. Potential Impacts During Construction Works	Risk	Sites
			ited areas, including town of Poti.
9	Poaching by construction workers	Low Risk	Rioni river
110	Hazardous Construction Wastes	Low Risk	Small quantities of hazardous wastes will be generated as a result of vehicle operations and the maintenance activities.
111	Impact on existing infrastructure	Low Risk	Electric power transmission systems, existing water supply and drainage channel systems and channels
112	Poor sanitation and solid waste disposal in construction camps and work sites (sewerage, sanitation, waste management)	Low Risk	Camp will not be used as living facilities because it is expected that majority of the employees would be local persons. The construction camp would be equipped with a bio toilet and other necessary infrastructure.
113	Construction Related Impacts at the Quarrying Sites	Low Risk	The exploration of the borrow pits should be conducted by the licensed companies or the Contractor has to obtain its own license. However, potential impact of the increased quarrying activities on river bed and floodplain landscape, ichthyofauna and groundwater should be considered.

B. Air Quality

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

Construction Phase

159. Noise and emissions of harmful substances are typical impacts of construction. Air quality will be affected during construction by emissions from vessels, equipment, and land vehicles in work activities at work locations. During the pipe replacement stage the rehabilitation works are to be carried out in Poti streets. The noise and dust generated in course of excavating the trenches will cause nuisance of the local residents that will further increase during summer season assuming growth of the local population on the account of holiday makers.

160. Modeling and assessment of the noise, caused by construction activities is based on existing information about operation of various equipments at various stage of construction. For example, noise level in 15 m as it is considered by the Federal Highway Administration of the ministry of transport of the USA (FHWA), California Department of transportation (CADOT) and SBAG is as follows:

Table 16: Noise levels

Noise source	Equivalent noise level dBA
Excavator	84 - 85
Bulldozer	84 - 85
Grader	91 - 92
Compressor	80 - 88

Noise source	Equivalent noise level dBA
Pneumatic drilling hummers	85 - 98
Pile boring equipments	96 - 107

Table 17: Noise levels

Noise source	Equivalent noise level dBA
Excavator	72 - 92
Bulldozer	83 - 93
Grader	80 - 95
Compressor	75 - 88
Pneumatic drilling hummers	82 - 98
Pile boring equipments	72 - 82

161. As a rule, noise caused by moving equipments is reduced at some distance. Such reduction has logarithmic properties. In case of noise caused by construction activities, noise spread pattern from the noise point is used, that can be determined as: Noise level 1 - Noise level 2 = 20 log r2/r1, meaning that by doubling of distance noise is reduced by 6dBA.

Table 18: Noise levels

Distance from noise source, m	Calculation level of the noise Average value - dBa	Calculation level of the noise Maximum value - dBa
10	80	90
20	74	84
40	68	78
80	62	72
160	56	66
320	50	60

162. The existing and forecasted noise level at a distance of 80 meters from the point of use of construction equipments is not significant. In fact, after 120-130 m from the noise source, the noise level is acceptable without implementation of mitigation measures. It can be assumed according to rough calculations, that noise impact will not exceed 150 m and increase of noise level within 150 m is assessed as acceptable impact. There are a houses within 150 m radius from the new pumping stations, therefore, the contractor should implement all mitigation measures mentioned in the document.

Mitigation Measures

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

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

- No truck movements in inhabited areas between 22:00 and 6:00.
- Public awareness about feasible construction works.

Operation Phase

164. No permanent dust emission sources will exist during operation phase. It is expected that in small quantities dust will be generated only during maintenance works.

165. In the phase of operation sewage sludge wrong placement at Poti landfill might be one of the sources of air pollution.

Mitigation Measures

166. The standard approaches shall be employed to reduce the dust and noise pollutions during maintenance works as follows:

- Periodically water down temporary roads on site;
- Immediately replacing defective equipment and removing it from the work site
- No truck movements in inhabited areas between 22:00 and 6:00.

C. Water Quality

1. Contamination of Surface Water

Construction Phase

167. During implementation of the Project the risk of surface water contamination is of medium level. The surface water may be contaminated due to improper placement of the excavated soil, poor management of construction camps, and improper storage of construction materials and leakage of fuel and lubricates from construction machinery.

168. Contamination of river Rioni is also expected during replacement of existing sewage pipes at river crossing points.

169. New customers of the northern part of the wastewater network will not be connected connected before the wastewater treatment plant is in operation.

170. Existing customers will remain connected as they do not have an alternative solution for their wastewater disposal. The pollution load of the currently connected population amounts to about 1,800 kg/d BOD_5, 2,161 kg TKN and 354 kg/d P. This load will remain until the completion of the WWTP.

171. Both Works contracts (for network and for WWTP) will run in parallel and the construction schedule will be coordinated so that the final connection of the new users to the sewer network will not take place before the WWTP has been commissioned. The pollution load of the new users amounts to about 5,200 kg/d BOD_5, 1,600 kg/d TKN and 270 kg/d P. The southern part of the network can be commissioned as soon as it is completed as it will be connected to an existing wastewater treatment plant. There will be no temporary discharge of collected wastewater into the Rioni River before the completion of the WWTP.

Mitigation Measures

172. The following mitigation measures shall be implemented:

- Where works are in progress, erosion control and sedimentation facilities including sediment traps and straw bale barriers or combinations thereof will remain in place;
- Lubricants, fuels and other hydrocarbons will be stored at least 100m away from water bodies.
- Topsoil stripped material shall not be stored where natural drainage will be disrupted.
- Solid wastes will be disposed of properly (not dumped in streams).
- Guidelines will be established to minimize the wastage of water during construction operations and at campsites.
- During construction, machinery and transport will be used by the contractor, both have potential of causing contamination to under ground and above ground water assets. There is need to compile temporary drainage management plan before commencement of works.
- Proper installation of temporary drainage and erosion control before works within 50m of water bodies should be done

Operations phase

173. The operation of the wastewater treatment plant involves various processes:

- Screening
- Sedimentation
- Aeration
- Final sedimentation
- Sludge thickening
- Sludge dewatering

174. The wastewater treatment will generate waste, which will comprise of the following:

- Screenings from coarse and fine screen
- Grit from aeration
- Sludge from biological treatment

175. The operation of the wastewater treatment plant will generate treated wastewater. The treated wastewater will be discharged into Rioni River near the location where at present the untreated wastewater is discharged. The quality of the surface water will significantly improve. The quality of the effluent is according to European and Georgian regulations and can be discharged into the surface water without harm. Georgian legislation requires the preparation of a Report on the Maximum Allowable Discharge into Sepa River that was prepared by Gamma Scientific Laboratory, Tbilisi. The permissible concentrations were determined as shown in the table below. They are based on calculations of the concentration of effluent in the receiving water body. The calculations take into account the background concentration existing in the water object for each indicator, the category of the water object, the maximum permissible concentrations of substances in the water and their assimilation capability.The report confirms the applicability of the norms for Rioni River. The design of the wastewater treatment plant is in line with these effluent quality parameters.

N°	Ingredients	Permissible concen-tration, Mg/l
1.	Suspended solids	30
2.	BOD_5	25
3.	COD	125
4.	Total Nitrogen	15
5.	Total Phosphorus	2

Table 19: Maximum Permissible Discharge

176. The table below presents the decisive parameters for untreated wastewater (inflow WWTP), treated wastewater (outflow WWTP), Rioni river, and the dilution of effluent and river water in comparison to the Georgian environmental standards. The loads were calculated for 2020 and 2040 and with an average discharge of 305 m^3/s of Rioni river. The environmental standars are adhered to with the exception of suspendid solids, that are very high in the baseline quality already.

Pollution load	BOD5 mg/l	COD mg/l	Suspended Solids mg/l	Total N mg/l	Total P mg/l
Inflow WWTP, 2020	400	800	467	73	12
Inflow WWTP, 2040	355	709	414	65	11
Outflow WWTP	25	125	30	15	2
Rioni river baseline	7	15	376,5	14,5	1,7
Operational case: Dilution of effluent and river water in 2020	7,01	15	376,34	14,50	1,70
Operational case: Dilution of effluent and river water in 2040	7,03	15	375,92	14,50	1,70
Environmental Standards	**6**	**30**	**< 0.75 +**	**15**	**2**
Failure of operation in 2020: Dilution of untreated wastewater and river water	7,18	15,36	376,54	14,53	1,70
Failure of operation in 2040: Dilution of untreated wastewater and river water	7,62	16,35	375,98	14,59	1,72

Table 20: Dilution of effluent

177. In case of failure of the WWTP the pollution load into Rioni river would amount to 10,504 kg/d BOD_5, 1,926 kg/d total TKN, 315 kg/d total P in 2040, when the system is running at full capacity.

178. There is a risk of accidental release of untreated wastewater at the WWTP, due to a possible malfunctioning of the electric, mechanical or control system, or the failure of the treatment process as a result of shock loads or chronic system overload.

179. There is low risk of additional environmental pollution from the north side of the city when house connections are made before the WWTP has been commissioned. In the current situation the wastewater is collected and disposed of untreated already. As for the southern part of the city network will be connected to the existing south Waste Water Treatment Plant.

Mitigation measures

180. The wastewater treatment plant will be designed and constructed in several lines so that even if one line fails, for a short time the other line(s) will remain in operation.

181. Improper disposal of the waste will pollute receiving water bodies. Following measures shall be incorporated into the design:

- Provide a container solution for collection of screenings and grit.
- Provide a proper sludge collection and treatment for achieving stabilised and dewatered sludge.
- Dispose the dried sludge in a landfill

182. Regular monitoring will be conducted at WWTP to ensure that the treated water meets standards. There is occupational health and safety risk involved while working in WWTP, however all the necessary precautionary measures are included. Adequate manpower, operation and maintenance equipment will be provided. Necessary training will also be provided to the personnel. No impacts due to disposal of sludge are envisaged as the sludge will be dried before its disposal. The treatment and drying processes kill enteric bacteria and pathogens.

183. In case all lines of the wastewater treatment plan fail, the following mitigation measures shall be implemented:

- Reduction of sewage pumping and using the network as temporary storage volume
- Notification of government agencies, including local government, regional offices of the Ministry of Environment and Natural Resources ;
- Notification of population;
- Notification of services at adjacent facilities;
- Accelerated repair;
- Keeping spare parts in stock at the service centre.
- Temporarily prohibition of swimming in River and close beach areas;
- Measurement of oxygen level in the river

184. Other mitigation measures include:

- provision of dual power supply
- spare parts for key components
- regular inspection and proper maintenance of the WWTP
- automated on-line, real-time monitoring of influent and effluent quality
- an in-house analytical lab will be established prior to operation of the WWTP. The major analytical equipment will include the following: wastewater sampler, pH meter, flow meter, conductivity meter, DO meter, COD speedy tester, thermostat incubator, electric balance, and centrifuge

185. It is necessary that staff is trained adequately before taking over the WWTP from design-build contractor, and it should also be provided with necessary technical manuals in Georgian language.

186. Emergency Response Plan. An emergency preparedness and response plan will be formulated and put in place before the WWTP becomes operational. The emergency preparedness and response plan will address, among other things, training, resources, responsibilities, communication, procedures, and other aspects required to respond effectively to emergencies associated with the risk of accidental discharges. Appropriate information about emergency preparedness and response activities, resources, and responsibilities will be disclosed to affected communities.

2. Ground Water

Construction Phase

187. During the project, there is a very high risk of groundwater contamination. Geological studies conducted in the city shows that groundwater height varies from 20 cm up to 2 meters range. Accordingly, at any place of the city during the trench excavation is possible groundwater level crossing, which will cause water contamination

Mitigation Measures

188. In order to minimize the risk of contamination of the water environment, the contractor must ensure the development of following measures:

- automated on-line, real-time monitoring of influent and effluent quality
- Construction of drain pipes at perimeter of construction site;
- Construction materials (cement, paints, etc.) should be stored in a specially designed storage premises for this purpose;
- To arrange area with gravel for replacement of construction equipment and transport means, with separated place for maintenance and fuel debugging.
- To be arranged sedimentation reservoirs for purification of contaminated water with suspended particles pumped from trenches during the process of excavation works
- To collect faecal sealed wastewater, it should be excavated pits from where it must be taken out by "Poti water service" cesspool emptier and be discharged into the sewage collector;
- In case of risk of construction machinery oil leakage, the equipment to be equipped with special droppers.
- Adequately licensed disposal contractor should be responsible for collection of segregated construction and household waste, for hazardous waste temporary replacement acceptable from environmental point of view and waste disposal

D. Soils Quality and Topsoil Management

Construction Phase

189. During the construction, impacts soils are mainly due to earthworks and the operation of the contractor's yard.

190. The works for the transmission mains comprise material excavation, pipe laying and backfill of material including compaction. Material will be stored temporary alongside the trench and refilled after pipe lying. Therefore impacts associated with earthworks for trench laying are of temporary nature. The pipes will be placed in the trench manually. 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 excavation is expected to generate surplus material. Surplus material will be used as embankment fill as far as possible.

191. Construction of the pumping station and WWTP, as well as performance of trenching works for installation of waste water main may lead to disturbance or loss of topsoil. Therefore the Contractor shall implement the following measures:

- The top soil of about 1 ft depth (0.3 m) shall be removed and stored separately during excavation work, and after the construction of the main trunk the same soil shall be replaced on the top, in unpaved areas;
- Subject to advance consent of the local self-governance authorities, the excess topsoil remained after construction of the new pumping station, reservoir and WWTP will be used at other Project sites or handed over to the appropriate authorities.

Mitigation Measures

192. The following practices will be adopted to minimize the risk of soil contamination and topsoil loss:

- The contractors will be required to instruct and train their workforce in the storage and handling of materials and chemicals that can potentially cause soil contamination.
- Solid waste generated during construction and at campsites will be properly treated and safely disposed of only in demarcated waste disposal sites.
- Construction chemicals will be managed properly
- Clearly labelling all dangerous products,
- Fuel tanks (diesel or oil) should be placed in a concrete pool which its perimeter walls will be at least 1.0 m high with the concrete or plastered masonry wall,
- A proper floor drain should be installed on the slab of the concrete pool for safely discharging the leakages.

Operation Phase

193. During operation phase, the soil may be contaminated due to water leakage from the damage pipe. In case such damage is not detected in a due time, the area may be "bogged". Soil contamination may also occur during performance of the planned or emergency repair works.

194. Operation of the WWTP will generate sludge from the treatment processes. The sludge has to be removed regularly to maintain good operational performance. The cannot simply be disposed without proper treatment since it may cause land pollution.

Mitigation Measures

195. Water pressure in the pipelines must be continuously monitored during entire operation phase. In addition, the relevant mitigation measures shall be implemented during maintenance works.

196. Considering WWTP class it is necessary to develop plan for sewage sludge landfill. The plan must be implemented in agreement with the Ministry of Environment and Natural Resources, as well as the waste management company.

E. Biological Environment

1. Impacts during Construction

197. As noted above the project area is poor in terms of vegetation. The tree plants are not met practically. Here is presented units of invaluable plants and various types of weeds. The important thing is that protected plant species were not recorded at this

area. Taking this into account during the construction works significant negative impact on vegetation is not expected.

198. According to the results of the audit the wild fauna species have not been identified in the project area, it was observed only a few bird synothropic species and characteristic for populated places rodents, reptiles and amphibians existence.

199. During construction works negative impacts can be expected on the wildlife inhabitants in the following fields:

- Increased traffic, movement of people, noise and due to changesof illumination background will cause disturbance factor for animals living near the construction site
- Pollution of environment will result existence of direct and indirect risk of impact on animal habitats

Mitigation Measures

200. At construction stage the mitigation measures are the following:

- Strict adherence of the boundaries of construction sites;
- To reduce the usage of spread light up to minimum;
- The work, which causes overly disturbance of the animals can be implemented in a short timeframe
- proper waste management
- Water, soil and air pollution, noise and etc, mitigation measures effective implementation;
- recultivation sites after the completion of construction works

201. In considering of above mentioned, during construction works significant impacts on wildlife is not expected.

2. Impacts during Operation

202. Operation of the wastewater supply components of the subproject will not have any significant negative impact on the biological environment.

F. Traffic

1. Impacts during Construction

203. The rehabilitation of the waste water network will be mainly conducted along roads existing in the town. 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. A time limit for completing working sections of pipelines and quantitative assessment of noise at Bashi reservoir shall be part of the site-specific SEMP.Implementation of the following best construction measures will reduce the inconvenience and disturbance.

- **Traffic management**. A traffic control and operation plan will be prepared together with the local traffic management authority prior to any construction. The plan shall include provisions for diverting or scheduling construction traffic to avoid morning and afternoon peak traffic hours, regulating traffic at road

crossings with an emphasis on ensuring public safety through clear signs, controls and planning in advance;

- **Information disclosure**. Residents and businesses will be informed in advance through media of the road improvement activities, given the dates and duration of expected disruption
- **Construction sites**. Clear signs will be placed at construction sites in view of the public, warning people of potential dangers such as moving vehicles, hazardous materials, excavations etc and raising awareness on safety issues. Heavy machinery will not be used after day light and all such equipment will be returned to its overnight storage area/position before night. All sites will be made secure, discouraging access by members of the public through appropriate fencing whenever appropriate

204. Another aspect of the work that has economic implications is the transportation of material to the site and surplus soil from the site to locations where it can be put to beneficial use as recommended. There will be truck movements carrying material. Although this is not significant, considering the narrow roads, it could disrupt traffic in the Town. Dust generated during the transport may also impede the commercial and trade activities, which are predominantly located along the main roads. The transportation of material/waste shall be implemented by the Civil Contractor in liaison with the town authorities, and the following additional precautions should be adopted to avoid effects on traffic:

- Plan transportation routes in consultation with 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

2. Impacts during Operation

205. As the operation and maintenance activities would be conducted within the existing facilities no impact is envisaged on economic resources. Repairs and leaks of the wastewater pipes will be minor and localized. In fact, the improvements to the wastewater 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 visit, which will bring new investments and boost economic development.

G. Hazardous Construction Wastes

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

Mitigation Measures

207. There are no specific hazardous waste treatment facilities in Georgia, so the common construction practice accepted by the authorities is to dispose of these types of wastes at the municipal landfills. However, prior to disposal appropriate consultation and agreement of MoENRP is required, and controlling will be required to obtain the

necessary approvals. To ensure good practice they will also be required to store, transport and deposit all hazardous materials in secure watertight containers.

H. Other Wastes from Construction Activities

1. Municipal Waste

208. Municipal waste may be generated on the Storage area. Mainly this is rubbish, plastic or glass bottles, glasses, waste food, etc. and a stationary waste. Waste should be collected both by the specially assigned personnel and the workshop workers on the area. The waste is placed into 0.24 m^3 plastic containers and further a local Sanitary Service takes it to landfills. The following should be taken into account:

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

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

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

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

2. Medical waste

211. Medical waste is generated in the Medical Care and Control Point and belongs to hazardous waste category. This waste is collected in special plastic boxes and is transferred to a contractor for farther incineration. It is recommended that the medical waste is directly transferred to a contractor from the place of its consolidation. While disposal of the medical waste the following requirements are to be met:

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

3. Non hazardous construction waste

212. Non hazardous construction waste may be generated on the Storage and construction area and will be collected by contractors workers. Waste disposed first on the sites of origin, and then moved to construction waste temporary storage facility before transferred to a contractor. While disposal construction wastes both on the sites and at the temporary storage facilities the following requirements are to meet:

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

I. Impacts on Archaeological Sites

213. Land clearance works, grading and excavations are associated with the risks of damaging underground archaeological remnants. 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 a low probability for chance finds of archaeological objects. However, during construction, possibility of appearance of new archaeological findings still should be expected, therefore, therefore, special care should be taken not only at the new construction sites, but also at construction camps and storage areas.

Mitigation Measures

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

215. Therefore steps should be taken minimize the risk. This should involve:

- During rehabilitation works (excavation of trenches, soil disposal) not to be happened blocking up of access roads to cultural monuments;
- Constructor must take into account religious holidays and at the adjacent territories of the Virgin Mary's and St. Nickolas Cathedral in these mentioned days all kind of works should be stopped;
- Limit the speed of all construction equipment while moving at the adjacent territories of historical and cultural monuments;
- during rehabilitation works to prohibit the movement of heavy equipment at the adjacent territories of historical monuments;
- Monitoring of vibration has to be developed permanently at the adjacent territories of historical monuments
- In case of existing cracks (if they exist) special deformation fixing devices (Strain gauges) should be installed.
- Contractor should put in place a protocol for conducting any excavation work, to ensure that any chance finds are recognized and measures are taken to ensure they are protected and conserved.
- To comply with the previous condition, having excavation observed by a person with archaeological field training. Supervisory procedures and any other necessary measures shall be agreed with the Ministry of Culture;
- Stopping work immediately to allow further investigation if any finds are suspected;
- Calling in the state archaeological authority if a find is suspected, and taking any action they require ensuring its removal or protection in situ

216. At the construction stage archaeological monitoring should be ensured by the contractor under the supervision of the Ministry of Culture, Monument Protection of Georgia.

The budget necessary for the archaeological supervision and other agreed works should be fixed under the construction works appraisal.

J. Socio-Cultural Resources

1. Impacts during Construction

217. There are various social-cultural resources (such as schools, churches, recreation and entertainment centres etc.) in the town. 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

218. There is invariably of safety risks 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.

219. *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. In unavoidable case of sourcing labour from other are-

as, provide adequate housing facilities so that there are no impacts and conflict with the local people. Following measures shall be followed:

- Establish 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 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

K. Construction Camps

220. 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 in agreement with the Municipality, UWSCG and the supervisor.

221. 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 Rioni River. Storage facilities for fuels and chemicals will be located at a save distance to the river. 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.

222. 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 should be sourced from the local water supply.

L. Construction Related Impacts at the Quarrying Sites

223. The quarries and borrow pits will be finally selected by the contractor. The exploration of the borrow pits should be conducted by the licensed companies or the Contractor

has to obtain its own license. However, potential impact of the increased quarrying activities on river bed and floodplain landscape, ichthyofauna and groundwater should be considered.

Mitigation Measures

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

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

M. Existing Asbestos Pips

226. At construction stage, according to the contract is considered the installation of new pipes in the whole area of the city. During excavation works of trenches it is possible to damage as existing sewer pipe network, also other legally or illegally water supply pipes. A large part of the existing pipes contains asbestos and asbestos dust in case of damage may occur, and which is very dangerous for health.

Mitigation Measures

227. It is necessary to implement whole set of mitigation measures:

- Construction company staff should be trained properly;
- The company environmental specialist has to work out special procedure and later it should be provided to Water Company and it will be implemented during excavation works of trenches - in case of existence of asbestos pipes.
- trench excavation works should be supervised construction company's environmental specialist;
- In case of asbestos pipes excavator should stop works and excavation should be continued by the oar manually.
- In case of damage of asbestos pipes construction works should be stopped. Environmental specialist should fix the fact and should make official record on it.
- Only after issuance of special permit construction works can be continued.

N. Cumulative Impacts

228. This subchapter provides a discussion of the potential cumulative and growth-inducing impacts associated with the proposed project. Cumulative impacts are defined as two or more individual effects which, when considered together, are considerable or which compound or increase other environmental effects.

229. The water component of the project in Poti will have been completed at the time the works for the sewer compoment will start so there will be no cumulative impact of these two sub-projects. The works at the sewer network at the works at the WWTP are at different locations (the network is south of Rioni River and the WWTP is north of the Rioni River) and the works will not have a cumulative impact. No other large projects in Poti are expected during the implementation of the sub-project.

230. With the construction of the new WWTP discussed within this report, no projects have occurred recently or are anticipated to occur in the near future within the project study area. While there are environmental impacts of construction and operation of the WWTP, as discussed in Chapter IV of this report and summarized in Table 14, it is not anticipated that the impacts will accumulate over time with impacts from other projects if proper mitigation techniques are utilized.

231. Positive Impacts:

- In general, operation of the WWTP will have large positive impact on the quality of the groundwater, the bottom sediment and the most of all on the water quality of the River Rioni;
- The operation of the WWTP will have positive impact on the restoration and maintaining of the aquatic fauna in the River Rioni;

232. Cumulative impact during operation: No cumulative New customers of the northern part of the wastewater net-work will not be connected before the wastewater treatment plant is in operation.

233. The pollution load of the currently connected population amounts to about 1,800 kg/d BOD5, 2,161 kg TKN and 354 kg/d P. will remain the same until the completion of the WWTP.

234. Project is designed to improve environmental quality and living conditions in Poti through the improvement of the wastewater 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.

235. By nature, impacts such as on air quality and on people (due to disturbance, nuisance and safety risk of construction activity) can have cumulative impacts, as all the construction activities are conducted simultaneously. 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.

V. ANALYSIS OF ALTERNATIVES

A. Layout of sewer network

236. Two options were considered for the general layout of the system. The first option is the extension of the existing system with the same principle: with sub networks that are connected directly to a pumping station. The other option is to design a network with integrated pumping stations. These pumping stations, which are in the alignment of the sewer network, lift up the wastewater, when the incoming sewers have a depth of more than 3 to 4.50 meters. For the second option, the realignment of existing sewers is necessary.

237. The length of the sewer network is similar in both options; the difference is between the lengths and diameters of the pressure pipes and the power requirements of the pumping stations. The current condition of the existing sewers is not known. It is not possible to estimate the required total length for the replacement of existing sewers. It is assumed that 10 % of the existing sewers of each diameter must be replaced. This assumption is valid for both options.

238. Option 1 is the continuation of the existing system. Therefore, all new sewers are orientated to the new or replaced old pumping stations. Every pumping station has an associated sewer network. The associated sewer network for each pumping station has an average length (arithmetic mean) of 4.5 km. In some cases, the diameter for the sewer pipes are increased to avoid depths of over 4.50 meter. All existing pumping stations will be replaced at the same location. For option 1, the pressure pipes of each pumping station discharges into a manhole of the next sewer sub-network.

239. Option 2 includes a system, where the pumping stations are not connected as in Option 1, where we have several pressure pipes that run in parallel. The pumping stations are not isolated applications, they are rather integrated in the alignment of the sewer network. Due to the fact that the terrain is very flat, with an average slope of 0.35 % for sewers, after a distance of appr. 714 m (with an initial depth of 1.50 m), a depth of 4.0 m is achieved. At this depth, a pumping station is required. The number of pumping stations is higher than in Option 1. In Option 2, the existing system of the main trunks, which will be used also in future, must be relocated. In Option 2, the locations of the pumping stations would be different and consequently the alignment of the main trunks would need to change. Higher costs for the replacement of main trunks would occur. For a redundant system of pressure pipes it is necessary to lay several pressure pipes in parallel in one alignment to the sewage treatment plant. The power requirements for the pumping stations may be less than in Option 1, but the friction losses are higher. The disadvantages of Option 2 are higher than its advantages and Option 1 was chosen for the design of the system.

B. Treatment Alternatives

240. Different treatment processes were compared in the feasibility study. All treatment options have the same effllluent quality. While the construction of the new WWTP will be tendered as design-build contract and the contractor will be responsible for the detailed design of the plant, in the following, different technical options for the treatment process were compared and a rough preliminary design waspresented. The new WWTP will remove the carbon compounds and also nutrients and phosphorus contained in the wastewater to the greatest possible extent. For this purpose, a number of different wastewater treatment processes applied in various WWTPs across the globe, adapted to the particular conditions of each site and wastewater quality are known. Examples are the activated sludge and biofilm process or the membrane technology.

241. The membrane technology, the biofiltration and the anaerobic process are sophisticated wastewater treatment processes that require much experience in the design and in the construction of the plants. Particularly the operation of such systems demands a highly qualified and experienced work force in order to ensure the proper treatment of the wastewater.

242. Other treatment alternatives are the activated sludge (aeration) and the biofilm process (trickling filter). These treatment methods have been successfully applied for many decades and in many countries of the world. These two processes have a good treatment performance and a high buffer capacity with regard to the wastewater quality as well as the wastewater inflow quantities. Furthermore, the treatment process is easy to operate and monitor. Most maintenance works can be carried out by the staff of the wastewater treatment plant.

243. For these reasons, the aeration and biofilm processes were chosen for a more detailed comparison of technical options. In order to determine the most feasible option for the WWTP the following three alternatives of the aeration and biofilm process were investigated and compared in technical and financial terms:

- Aeration tank with secondary sedimentation
- Sequencing-Batch-Reactor(SBR) process
- Trickling filter (biofilm process)

244. The dimension of each alternative was based on the design criteria and the allowable effluent quality. A net present value calculation of the three alternatives was carried out. As a result, the aeration system with the secondary sedimentation the most economical solution for the WWTP Poti.

VI. INFORMATION DISCLOSURE, CONSULTATION, AND PARTICIPATION

245. 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 Poti
- UWSCG as implementing agency
- Other government regulatory institutions
- Municipality of Poti
- NGOs and CBOs working in the affected communities;
- Other community representatives (prominent citizens, religious leaders, elders, women's groups);
- The beneficiary community in Poti in general; and
- The ADB, as funding agency

246. The public meeting with population, non-governmental organizations, business representatives and local government officials and industry specialists took place at several stages of the preparation of the IEE.

247. Public Opinion. Consultation with affected population was undertaken.

- to ensure their informed participation in the design, implementation and monitoring of the project measures and their impacts on the environment, as well as the efforts to minimize and the mitigate impact when avoidance is not possible;
- to introduce the project benefits to the local population that accrue to them as a result of project implementation;
- to incorporate all relevant views of affected people and other stakeholders into decision making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues.;

248. The following topics were discussed during the meeting.

- project context and rationale
- expected start and end of the project
- benefits of the project to local population and to the country as a whole
- the environmental issues and mitigated measures related to the project

249. The public consultation showed a support for the Poti subproject by the local population. During public consultation importance of a good cooperation between the local population, the contractor and UWSCG has been discussed. Local population were aware of the need to improve the water and sanitation system services. Residents also were of the view that the proposed project will improve the public health, the environment, and the socio-economic development of Poti.

250. The residents were mainly interested in the start and the duration of the project, the impacts and benefits of the sub-project as well as in the planned social safeguard measures. UWSCG explained the schedule of works and underlined that impacts are mainly limited to construction works and temporary. The Contractor will have to follow an Environmental Management Plan to minimize impacts and carry out mitigation measures. The principal benefit will be the 24 h supply with drinking water after completion of the project.

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

252. On July 3, 2014 Public meeting has been held in Poti. In attachment # 1 is given protocol of the public meeting and relevant photo material.

VII. GRIEVANCE REDRESS MECHANISM

253. The contractor is obliged to implement the environmental management plan during the whole construction period and the supervising consultant will monitor these activities. The consultant will point out any deviations from the EMP and make sure that the contractor addresses all issues of the EMP in a timely and professional manner.

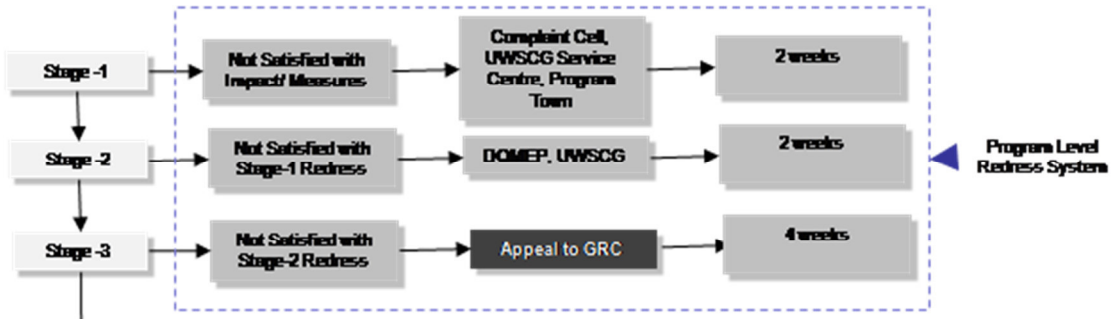
254. A grievance resolution mechanism will be set up to allow an AP appealing any disagreeable decision, practice or activity arising from project implementation. APs will be fully informed of their rights and of the procedures for addressing complaints whether verbally or in writing during planning and implementation of the project. Care will al-

ways be taken to prevent grievances rather than going through a redress process. This is achieved by ensuring full AP participation and consultation, and by establishing extensive communication and coordination between AP, UWSCG, and the local government. 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 MoENRP 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.

255. 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 local 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. During the public consultation process, UWSCG (the IA) will inform the stakeholders about the Grievance Redress Mechanism and provide contact details of persons responsible for grievance collection and response. These details will also be made available on UWSCG website. The DREP at the head office of UWSCG will be available for the local complaint cells for establishing direct links to relevant environmental authorities.

256. 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 three stage grievance redress mechanism is indicated in Fig. 5 below. The grievances received and actions taken will be included into the environmental monitoring reports submitted to ADB.

Fig. 8 Grievance Redress Mechanism



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

(ii) Complaint resolution will be attempted at Poti level with the involvement of Community leaders and informal mediators.

(iii) The Complaint Cell and the Investment Program Management Office (IPMO), which is the Project Investment Projects Management Department at UWSCG,will investigate the complaint to determine its validity, and assess whether the source of the problem is indeed due to subproject activities; if inva-

lid, the Complaint Cell will intimate the complainant and may also provide advice on the appropriate agency to be approached.

(iv) 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.

(v) If this is an unanticipated issue, the UWSCG IPMO and DREMP 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.

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

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

257. **Grievance Redress Committee (GRC)**. 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 of the GRC – Head of Department of Social issues at Poti Municipality
- UWSCG Service Centre Head
- Designated informal leader of sub-project affected community
- Female AP
- Local NGO representative

258. 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 a 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:

Complaints Receiving Officer, Accountability Mechanism
Asian Development Bank Headquarters
6 ADB Avenue, Mandaluyong City 1550, Philippines
Email: amcro@adb.org, Fax +63-2-636-2086

259. Complaints will also be accepted by any ADB office such as a resident mission, regional office or representative office, which will forward them unopened to the CRO.

VIII. ENVIRONMENTAL MANAGEMENT PLAN

260. EMP is addressed as a condition of the contract.

A. Institutional Arrangements

261. Following agencies will be involved in the Investment Program:

262. Ministry of Regional Development and Infrastructure (MoRDI) is the Executing Agency (EA) responsible for

- oversee progress and provide guidance on the Investment Program implementation
- meet regularly until Investment Program completion
- responsible for Investment Program oversight and administration
- hold monthly meetings with UWSCG to review progress
- submit progress reports to the SC for decision making
- ensure compliance with Investment Program covenants
- submit Investment Program documents, including audit reports, to ADB on time
- convene regular meetings in consultation with the SC Chairperson and UWSCG

263. United Water Supply Company of Georgia (UWSCG) is the project Implementing agency (IA), which will be responsible for

- prepare the periodic financing request oversee Investment Program implementation and management
- oversee Investment Program accounting and auditing
- manage all consultants
- coordinate with all line ministries to ensure smooth and efficient implementation
- secure technical and environmental approvals for all civil works prior to bidding
- implement the environmental management plan for each subproject
- ensure compliance with Investment Program covenants
- comply with social safeguards requirement detailed in the PAM
- invite bids, evaluate and prepare bid evaluation reports for ADB's approval
- award contracts prepare quarterly progress reports

264. UWSCG as responsible IA for the project recruited a Supervision Consultant (SC). The national and international team of consultants will assist UWSCG as project supervisor for the construction of Poti WW project. The SC will also provide capacity building training to contractor staff for management and operation and maintenance for the Project. The SC will assist UWSCG in assuring that the project is implemented according to the specified standards. This SC assignment will include the supervising of the implementation of the environmental management plan. All mitigation measures during construction have to be implemented by the contractor that will be monitored by the supervision consultant (SC). Implementation of EMP of this project require an experienced Environmental Management Specialist (EMS), employed by the SC, to spend a total of around 36 months for project construction period, conducting routine observations and surveys, and preparing quarterly reports.

The Contractor has the following obligations:

- to employ environmental consultant responsible for developing and implementing the construction phase EMP and for provision of corresponding information to UWSCG and SC;
- to prepare SSEMP;
- to develop, if required, a Spoil Disposal Plan and Construction Waste Disposal Plan agreed with the MoENRP and Local Government;
- to prepare and update Construction Schedule;
- The SSEMP implementation costs should be included into the construction budget

265. Local Service Centre of UWSCG in Poti will coordinate all line agencies at the local level including Municipality of Poti and existing Non-governmental organizations to ensure smooth and effective implementation of sub-project.

266. The environmental specialist (ES) is hired by UWSCG under the Urban Services Improvement Investment Program (USIIP) to assist and advise the Division of Resettlement and Environmental Protection (DREP) of UWSCG in USIIP program implementation in compliance with the, ADB Safeguard Policy Statement, 2009 and National Legislation, and oversee the work of DCs and SCs in safeguard compliance. ES supports DREP in EARF implementation, in particular, reviewing IEE/EIA Reports and overseeing implementation of EMP/SEMPs and in training and capacity building activities.

B. Reporting

267. The **Contractor** is responsible for preparation of weekly environmental monitoring reports that shall be sent to SC.

268. The **Supervision Consultant** is responsible for preparation of quarterly environmental monitoring reports that shall be sent to UWSCG.

269. The **Environmental Specialist** is responsible for preparation of bi-annual and annual Environmental Monitoring Reports (based on contractor's and supervisor's and own audit reports) and will provide to ADB.

C. Inspection

270. The Employer will regularly inspect works undertaken by the contractor to check on the implementation of environmental management and monitoring requirements. A non-compliance notice will be issued to the contractor if the employer requires action to be taken. The contractor is required to prepare a corrective action plan which is to be implemented by a date agreed with the employer. The non-compliances will be ranked according to the following criteria:

271. **Non-compliance Level I**: A noncompliance situation not consistent with the requirements of the concession agreement, but not believed to represent an immediate or severe social or environmental risk. Repeated Level I concerns may become level II concerns if left unattended.

272. **Non-compliance Level II**: A noncompliance situation that has not yet resulted in clearly identified damage or irreversible impact, but which potential significance requires expeditious corrective action and site specific attention to prevent severe effects.

273. **Non-compliance Level III**: A critical situation, typically including observed significant social or environmental damage or a reasonable expectation of very severe impending damage, intentional disregard of specific prohibitions is also classified as a level III concern. The failure to prepare a corrective action plan or to implement it within the required time frame will result in the owner undertaking the works and the cost, and 20% will be recovered from the final payment to the Contractor.

274. The contractor will have a system for recording and communicating any complaints received by any person employed by or contracted to the Contractor. All complaints

will be communicated in writing to the Employer within one working day of their receipt.

D. Implementation Costs

275. The Costs for Environmental Management of the project shall mainly consist of the (i) monitoring of works by the EMS who will be employed by the SC; (ii) baseline and regular parametric measurements of noise, dust and emission. All of the implementation of mitigation measures shall be part of the contractual works and obligation of the Contractor.

276. The cost for the environmental management for construction period is tentatively estimated.

Table 21: Environmental management cost table

Item	Quantity[1]	Unit Cost*	Total Cost	Remarks
Baseline Parametric Measurements	6	200 USD	1,200	To be conducted by the Contractor for noise, air emissions, dust (and water, if necessary) measurements
Monthly Parametric Measurements (at least 2sites)[2]	72	200 USD	14,400	Tests to be conducted by the Contractor at 2 sites x 36 months monthly monitoring
Environmental Management Specialist (SC)	36 months	2,500 USD	90,000	The costs are included in the contract signed between UWSCG and SC and no additional costs will occur.
Environmental Consultant				Contractor to be hired EC on the full time bases
Miscellaneous			10,560	10% for above Items
Subtotal			116,160	Total for above
Contingency			13,939	12% of Subtotal
GRAND TOTAL			130,099	For the entire construction period of 36 Months

[1]To be established by CS Consultant and Environmental Specialist.
[2]These may be moving sites, based on the construction intensity (network, pumping stations) and will be determined by SC and Environmental Specialist.

Table 22: Environmental Impacts and Mitigation Measures

Potential Negative Impacts	Mitigation measures	Responsibility	Location	Cost
Pre-Construction				
Possible removal of terrestrial habitat. Loss of the top soil	Sites rehabilitated before contractor leaves site upon completion of construction activities. Planting and stabilization of site, including replacement of any native plant species	Construction Contractor	Construction and labour camp, storage area. WW Pipe construction	Part of construction cost
Construction				
Ambient Air and Local Dust[3]	• 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 unsatisfied /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 Don't allow access in the work area except workers to limit soil disturbance and prevent access by fencing	Construction Company	Excavation areas for trenches at Poti town and WWTP construction area	Part of construction cost

[3]Environmental Quality Norms approved by the Order #297N (16.08.2001) of the Ministry of Labour, Health and Social Protection (as amended by the Order No 38/n of the same Ministry of 24.02.2003). The quality of atmospheric air (pollution with hazardous matter) is also defined by the order of the Minister of Environment Protection and Natural Resources (#89, 23 October 2001) on approval of the rule for calculation of index of pollution of atmospheric air with hazardous pollution

Potential Negative Impacts	Mitigation measures	Responsibility	Location	Cost
	The Contractor shall coordinate with local Traffic Management Department to minimize construction traffic impact in the following topics: • Temporary parking restrictions, • Pedestrian and cyclist diversion routes where construction prevents access, • Temporary traffic signals, • One way scheme, • Maintaining local residential access at all times, • General traffic diversion routes where roads are closed. • Sound barriers should be erected at schools and hospitals if the distance to the construction site is less than 50 m	Contractor	Transportation routes of construction materials	Part of construction cost
Noise Pollution[4]	• Maintain machinery and vehicle silencer units to minimize noise • Keeps noise generating activities associated with construction activities to a minimum and within working hours. • Notify the residents of Poti town close to the Project area prior to commencement of the construction phase. • Vehicles and machinery that are used intermittently should not be left idling condition for long period of time. • Equipment used on site will be quietest reasonably available. • Haul routes for construction traffic entering and leaving the site will be selected to ensure noise levels at noise sensitive receptors are kept at a minimum.	Construction Contractor	Excavation areas for trenches at Poti town and WWTP construction area	Part of construction cost
Impact on surface water bodies due to construction[5]	• In case of heavy rain, 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	Construction Contractor	Project area	Part of construction cost

[4]The Georgian standards for noise control as approved by the Decree of the Minister for Health, Labour and Social Affairs (297n of August 16, 2001) upon the 'Approval of Environmental Quality Standards', which specify the tolerable and maximum admissible levels of noise for different zones

[5]Rules of the Protection of the Surface Waters of Georgia from Pollution

Potential Negative Impacts	Mitigation measures	Responsibility	Location	Cost
Impact on underground water	• Construction materials (cement, paints, etc.) should be placed in a specially designed storage premises for this purpose • To arrange area with gravel for replacement of construction equipment and transport means, with separated place for maintenance and fuel debugging • To be arranged sedimentation reservoirs for purification of contaminated water with suspended particles pumped from trenches during the process of excavation works • To collect fecal sealed wastewater it should be excavated pits from where it must be taken out by "Poti water service" cesspool emptier and be discharged into the sewage collector; • In case of risk of construction machinery oil leakage, the equipment to be equipped with special droppers. • Adequately licensed disposal contractor should be responsible for collection of segregated construction and household waste, for hazardous waste temporary replacement acceptable from environmental point of view and waste disposal.	Civi contractor	Project area	Part of construction cost
Soil Contamination	• The contractors will be required to instruct and train their workforce in the storage and handling of materials and chemicals that can potentially cause soil contamination. • Solid waste generated during construction and at campsites will be properly treated and safely disposed of only in demarcated waste disposal sites. • Construction chemicals will be managed property • Clearly labelling all dangerous products, • Fuel tanks (diesel or oil) should be placed in a concrete pool which its perimeter walls will be at least 1.0 m high with the concrete or plastered masonry wall, • A proper floor drain should be installed on the slab of the concrete pool for safely discharging the leakages.	Construction Contractor	Construction site Camp	Part of construction cost
Impact on Flora and Fauna	• Avoid tree cutting • In unavoidable cases, plant four trees of same species for each tree that is cut for construction	Construction Contractor	Construction sate Camp	Part of construction cost

Potential Negative Impacts	Mitigation measures	Responsibility	Location	Cost
	• The trench shall not be kept open in the night/after working hours. This will avoid any safety risk to people, domesticated, stray or wild animals. • The Contractor shall ensure that the work site be kept clean, tidy and free of rubbish that would attract animals. • Strict adherence of the boundaries of construction sites; • To reduce the usage of spread light up to minimum; • The work, which causes overly disturbance of the animals can be implemented in a short timeframe • proper waste management • Water, soil and air pollution, noise and etc, mitigation measures effective implementation; • recultivation sites after the completion of construction works			
Impact on Traffic	• Informing all residents and businesses about the nature and duration of any work well in advance so that they can make necessary preparations if necessary; • Providing wooden walkways/planks across trenches for pedestrians and metal sheets where vehicle access is required • Increasing workforce to complete the work in minimum time in these stretches • Initial situation of private properties has to be re-established after construction	Construction Contractor	Construction site Access Road	Part of construction cost
Hazardous Materials	• Comply with all national, regional and local legislation with regard to the storage, transport, use and disposal of petroleum, chemical, harmful and hazardous substances and materials. • Establish an emergency procedure for dealing with spills or releases of petroleum. • Storage of all hazardous material to be safe, tamper proof and under strict control. • Petroleum, chemical, harmful and hazardous waste throughout the site must be stored in appropriate, well maintained containers. • Any accidental chemical / fuel spills to be corrected immediately.	Construction Contractor	Construction site Storage Area	Part of construction cost

Potential Negative Impacts	Mitigation measures	Responsibility	Location	Cost
Solid Waste	• Place of disposal of the waste concerned must be enclosed. • The waste must not have access to drainage water. • Waste must be immediately removed from the working sites. • Waste must be placed in secondary protective basins. • This waste can be transferred only to a certified contractor. The personnel involved in the handling of hazardous and non-hazardous waste will undergo specific training in: • Waste handling • Waste treatment; and • Waste storage.	Construction Contractor	Construction site Storage Area Camp	Part of construction cost
Loss of top soil	• 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.	Construction Contractor	Pipeline work in pasture lands, agricultural land	Part of construction cost
Erosion due to excavation/refilling	• 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.	Construction Contractor	All construction sites	Part of construction cost
Impact on air quality due to emissions from construction equipment/vehicles	• 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	Construction Contractor	Poti town, WWTP construction area	Part of construction cost

Potential Negative Impacts	Mitigation measures	Responsibility	Location	Cost
Socio-economic benefits from employing local people in construction work	• To the extent possible labour force should be drawn from the local community	Construction Contractor	All construction sites	Part of construction cost
Impacts due to import of labour and establishment of temporary labour camps	• 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: o Establish temporary labour camps in consultation with the local authority o Shall be located away from water bodies o No clearance of trees vegetation shall be allowed for establishment of camp o Provide all basic amenities (water supply and sanitation, waste collection & disposal, first aid facilities, etc.) o Contractor shall provide fire wood and no worker shall be allowed to cut any tree o Ensure regular and clean maintenance of the camp	Construction Contractor	Temporary labour camps	Part of construction cost
Safety risk – public and worker	• Follow standard and safe procedures for all activities – such as provision of shoring in deep trenches (>2 m) • Exclude public from the site – enclose construction area, provide warning and sign boards, 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 • 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.	Construction Contractor	All construction sites	Part of construction cost
Historical, archaeological chance finds during excavation	• During rehabilitation works (excavation of trenches, soil disposal) not to be happened blocking up of access roads to cultural monuments; • Constructor must take into account religious holidays and at the adjacent territories of the Virgin Mary's and St.	Construction Contractor	All construction sites	Part of construction cost

Potential Negative Impacts	Mitigation measures	Responsibility	Location	Cost
	Nickolas Cathedral in these mentioned days all kind of works should be stopped; • Limit the speed of all construction equipment while moving at the adjacent territories of historical and cultural monuments; • during rehabilitation works to prohibit the movement of heavy equipment at the adjacent territories of historical monuments; • Monitoring of vibration has to be developed permanently at the adjacent territories of historical monuments • In case of existing cracks (if they exist) special deformation fixing devices (Strain gauges) should be installed; • Contractor should put in place a protocol for conducting any excavation work, to ensure that any chance finds are recognized and measures are taken to ensure they are protected and conserved. • To comply with the previous condition, having excavation observed by a person with archaeological field training. Supervisory procedures and any other necessary measures shall be agreed with the Ministry of Culture; • Stopping work immediately to allow further investigation if any finds are suspected; • Calling in the state archaeological authority if a find is suspected, and taking any action they require ensuring its removal or protection in situ.			
Cumulative impacts – repeated disturbance to roads and people	• Schedule the construction activities in harmony with the other ongoing works • Schedule works before road work	Civil Contractor, SC	Project area	Part of construction cost
Operation Phase				
risk of accidental release of untreated wastewater at the WWTP	• provision of dual power supply; • spare parts for key components; • regular inspection and proper maintenance of the WWTP; • automated on-line, real-time monitoring of influent and effluent quality;	UWSCG	Well fields, water network	Part of operating costs

Potential Negative Impacts	Mitigation measures	Responsibility	Location	Cost
Foul Odour Off-site Migration from WWTP	• anaerobic pond shall be covered with a polymer (such as "Hypalon") to capture odour and biogas for flaring (to minimize the escape of methane gas), • close monitoring of the aerobic units to ensure the conditions are not anaerobic (without enough oxygen), • landscaping with trees and shrubs around the facility shall be done to position them as wind breaks, and • conduct of WWTPs annual odour audit to identify operational measures that can prevent odour problems			
land pollution cause from sludge dispose	prior to the operation should be prepared the plan of replacement of sewage silt on the landfill in agreement with Ministry of Environment and Natural Resources and Waste management company.	UWSCG	Poti Municipal Landfill	Part of operation costs

E. Monitoring

277. Monitoring describes (a) monitoring measures with technical details, including parameters to be measured, methods to be used, sampling locations that will signal the need for corrective actions; and (b) monitoring and reporting procedures to ensure early detection of conditions that necessitate particular mitigation measures and document the progress and results of mitigation.

278. 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. Regular monitoring of implementation measures by Civil Contractors will be conducted by the SC, on behalf of Implementing Agency. Monitoring during operation stage will be conducted by the UWSCG.

279. 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. The regular control and inspection during general construction activities in is needed.

Table 23: Environmental Monitoring Plan for general construction activities in Poti

Item	Parameter	Frequency	Action Level	Response When Action Level Exceeded	Responsibility
Pre construction					
Tender documentation	Environmental Issues	Once before bid announcement	Environmental audit of bidding documents to ensure relevant sections of the EMP have been included	The bidding document shall reflect all environmental mitigation measurements	SC
Contract documentation with constriction contractor	Environmental Issues	Once before contract signature	Environmental audit of contract documents to ensure relevant sections of the EMP have been included	The contract document shall reflect all environmental mitigation measurements	SC
Construction					
Ambient Air	Dust	Continual	Visual assessment during the Works Impact Monitoring Compliance Monitoring	If dust levels are above acceptable visual levels, implement dust suppressiontechniques (wetting down area) and/or assess weatherconditions and maybe temporarily cease works untilconditions ease	SC will monitor based on measurements executed by the Contractor.
Noise	(15 minute) Noise Levels	Only as required: Periodic attended Monitoring at hourly intervals at nearest potentially sensitive	+20 dBA for short term (1 month)	If noise action level is exceeded then review work practices and noise control procedures,	SC will monitor based on measurements executed by the Contractor.

Item	Parameter	Frequency	Action Level	Response When Action Level Exceeded	Responsibility
		receivers.		including maintenance of equipment, installation of silencers, provision of noise barriers and modification of work hours.	
Water Quality	Quality/ Contaminant concentrates	Continual In rain weather	guideline / licence requirements (whichever is Applicable) Impact Monitoring Compliance Monitoring	If contaminant concentrations/licence conditions are exceeded, review disposal options and decide on most applicable. Report any accidences of licence (of applicable) to issuing authority.	SC will monitor based on meas-urements executed by the Contractor.
Waste Management Implications	Segregation, Storage and transport of wastes	Monthly inspection	- visual assessment during the Works; - Field inspection, - Report of waste volumes generated Report and record all leakages and spills Impact Moni-toring Compliance Monitoring	Solid waste cycled as 0 % of movement of solids or liquid waste through the soil, rocks, water, atmosphere.	SC
Ground	Soil	Continual	Assess adequacy	If controls have	SC

Item	Parameter	Frequency	Action Level	Response When Action Level Exceeded	Responsibility
	Monitoring and Erosion Control		of sedimentation/ environmental controls on-site Impact Monitoring	failed or are found inadequate, cease works immediately and repair to an acceptable standard	
Ecological Resources	Fauna and Flora	Continual	Minimal ecological impacts Impact Monitoring	Required to ensure the recommended mitigation measures are properly implemented.	SC
Landscape and Visual	Surface treatment of temporary structures	Once at the Completion of work	Minimum disturbance of the original landscape Impact Monitoring	Required to ensure the recommended mitigation measures are properly implemented	SC
Operation					
WWTP quality monitoring, inflow	BOD5, COD, Nitrogen, Phosphorus	weekly	Compare with design parameters		UWSCG
WWTP quality monitoring, aeration tank	Oxygen	daily	Compare with design parameters	Adjust treatment process	UWSCG
WWTP quality monitoring, aeration tank	Sludge volume	daily	Compare with design parameters	Adjust treatment process	UWSCG
WWTP quality monitoring, aeration tank	Dry matter contents	Thrice per week	Compare with design parameters	Adjust treatment process	UWSCG
WWTP quality monitoring, aeration tank	Dry matter contents of return sludge	Weekly	Compare with design parameters	Adjust treatment process	UWSCG
WWTP quality monitoring, aeration tank	Microscopical analysis	Twice per week	Compare with design parameters	Adjust treatment process	UWSCG
WWTP quality monitoring, outflow	Temperature, pH, suspended solids	daily	compare with permission	Adjust treatment process	UWSCG
WWTP quality monitoring, outflow	BOD5, COD, NH4-N, NO3-N, Pgesamt	weekly	compare with permission	Adjust treatment process	UWSCG

Item	Parameter	Frequency	Action Level	Response When Action Level Exceeded	Responsibility
WWTP quality monitoring, outflow	NO2-N	monthly	Compare with design parameters	Adjust treatment process	UWSCG
WWTP quality monitoring, outflow	Coliforms	monthly	Monitor development		UWSCG
WWTP quality monitoring, sludge treatment	temperature, pH	daily	Compare with design parameters	Adjust treatment process	UWSCG
WWTP quality monitoring, sludge treatment	dry matter contents	monthly	Compare with design parameters	Adjust treatment process	UWSCG
WWTP quality monitoring, sludge treatment	loss on ignition	monthly	Compare with design parameters	Adjust treatment process	UWSCG
WWTP quality monitoring, sludge treatment	sludge gas	daily	Compare with design parameters	Adjust treatment process	UWSCG
WWTP quality monitoring, sludge treatment	sludge production (watered, de-watered)	as required	Compare with design parameters	Adjust treatment process	UWSCG
WWTP quality monitoring	energy consumption	daily	Compare with design parameters	Adjust treatment process	UWSCG
WWTP quality monitoring	Methane	monthly	Check occurrence	Check sludge treatment installations	UWSCG
River Rioni water quality monitoring	Suspended particles, BODoverall, COD, Total Nitrogen, Total Phosphorus	weekly	Sample taking, water analysis, compare with baseline data	Compare with effluent quality, adjust treatment process	UWSCG
WWTP operation	Noise	monthly	Compare with Georgian standards for noise control	Inspect installations	UWSCG
WWTP operation	Odor	monthly	Compare with normal odor levels	Inspect installations	UWSCG
Infrastructure	Breaks / Deteriorations/ Leakage	Monthly inspection	Visual Assessment Public Complaints Compliance Monitoring	If breaks/ failures occur, close isolation valves (or plug manholes)immediately and repair / replace to an acceptable standard.	Operational Unit
Rioni River during failure of WWTP	O_2	Twice per day			Operational Unit

IX. CONCLUSION AND RECOMMENDATION

A. Recommendation

280. The environmental impacts of infrastructure elements proposed in the waste water system improvement subproject in Poti have 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 sub project components. Mitigation measures have been developed to reduce all negative impacts to acceptable levels.

281. Mitigation measures were discussed with engineering specialists, and some measures have already been included in the designs.

282. 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 monitoring measures to guarantee the long term and sustainable operation of the waste water system are presented in a monitoring plan.

283. When operating, waste water components will have overall beneficial impacts to human health and the environment as it will provide the inhabitants of Poti with a new waste water system.

284. The main beneficiaries of the improved system will be the citizens of Poti, who will be provided with a new waste water system. This will improve the quality of life of people as well as raising the standards of both individual and public health as the improvements in hygiene should reduce the incidence of disease. 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.

285. 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.

286. The recommendation of this Environmental Assessment process is that all mitigation, enhancement and monitoring activities proposed here 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

287. The environmental impacts of the proposed waste water components have been assessed by the Initial Environmental Examination reported in this document.

288. An Environmental Management Plan (EMP) has been prepared and will be implemented during the project implementation. The EMP identifies the potential environmental impacts arising from the project along with a set of the mitigation measures to reduce the impacts to acceptable levels. It also includes the institutional arrangements for implementing the EMP to ensure its effectiveness.

289. 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 subpro-

ject. 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.. Project will stimulate economic growth. The. Waste water good quality is a prerequisite for tourism development. Standard of individual and public health will improve as a result of the project. Project will generate new job opportunities.

Appendices

Appendix 1

Minutes of Meeting of Public Hearing on 3rd of July 2014

LCC "United Water Supply Company of Georgia"

Public Hearing Meeting
Improving the Water Supply and Sanitation System in Poti

Initial Environmental Examination Report

Minutes

Poti 04.07.2014

The following persons attended the meeting:

1. Ketevan Chomakhidze – "United Water Supply Company of Georgia", LLC (UWSCG), USIIP, Environmental Monitoring Specialist;
2. Nino Abuladze - UWSCG, Investment Project Manager
3. Beka Giorgadze – UWSCG, Investment Project Manager
4. Alexander Mikashvili – Representative of the Kocks Georgia
5. Nugzar Patsatsia - UWSCG, Head of the Local service center;

From the Poti Local Population the meeting has been attended:

1. Lasha Kupreishvili – Representative of the Poti City Hall
2. Zrab Jamburia – Representative of the Poti City Hall
3. Sulkhan Tolordava – Representative of the Poti City Hall
4. David Babilia – Head of the City Governer
5. Gocha Dolbaia – Deputy head of City Governer
6. Tamar Janashia – Local resident
7. Natia Vadakaria – Local resident
8. Mikheil Marshanishvili – Local resident
9. Gela Bakhbava – Local resident
10. Violeta Kutsia – local resident
11. Inga Gvasalia - local resident
12. Nana Vekua - local resident
13. Ilarion melkadze – Local resident
14. Ela Shonia – Local resident
15. Otar Guraspashvili – Local resident

Meeting Agenda

The public hearing was held on July 3, 2014 in Poti City Hall and commenced at 11:00 a.m. The consultative meeting was organized with representatives from the local population of Poti. The meeting covered the sanitation system to be rehabilitated and extended in Poti.

By giving advertisements in advance, attendance of a wide range of related people to the meetings was encouraged. During the public hearing, citizens were informed about the activities to be carried out within the scope of the project, environmental effects of the project and measures to be taken against these effects. Opinions, ideas and suggestions of the local residents and related people were received during the meeting.

Public Opinion

Consultation with affected population was undertaken

- to ensure their informed participation in the design, implementation and monitoring of the project measures and their impacts on the environment, as well as the efforts to minimize and the mitigate impact when avoidance is not possible;
- to introduce the project benefits to the local population that accrue to them as a result of project implementation;
- to incorporate all relevant views of affected people and other stakeholders into decision making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues.

The following topics were discussed during the meeting:

- project context and rationale
- expected start and end of the project
- benefits of the project to local population and to the country as a whole
- the environmental issues and mitigated measures related to the project

The power point presentations were held by Alexander Mikiashvili and Ketevan Chomakhidze. UWSCG and the Consultant gave full information for local residents and attendees about the projected activities and described the project nature and estimated impacts as a result of this project implementation.

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	What is duration, date of start and completion of the construction of the project?	Project will start in 2015 and end in 2018.
2	Who will supervise and monitor construction and operation of the project?	Project implementation will be monitored by the UWSCG and supervised by the Supervision Consultant - Eptisa
3	Will local people employed in the construction?	Yes, contractor will be encouraged to employee unskilled labour from the local population during the construction.
4	How far will be brought network and who provides yards sewer system?	The sewerage network will be brought to the yards, and system into the yard will be brought by local population.
5	What type of impact on	There are other impacts associated with the

#	Questions from local residents	Answers from the United Water Supply Company of Georgia
	environment is associated with the project? And what mitigation measures will be taken?	construction process 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 methods suggested for their mitigation. These include: (i) utilizing surplus/waste soil for beneficial purposes; (ii) using 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; (vi) avoiding night-time construction activities; (vii) avoiding tree cutting through location alignment changes; and (viii) avoiding hazards during construction by securing the site at critical segments.
6	Who is responsible for repair and maintenance of pipes in case of damage?	United Water Supply Company of Georgia
7	What is the standard of sewer pipes?	The standard sewerage pipes are HDPE (High Density Polyethylene) corrugated pipes according to technical specification. 200 mm up to 1200 mm diameter.
8	What type of impact on environment is associated with the project?	Environmental impacts that are associated with the project are only site specific. Impacts are mostly confined to the construction stage of the project and are therefore temporary. For permanent environmental impacts during operation stage, suitable mitigation measures will be implemented
9	Who is sponsoring the Project?	Project is co-financed by the Asian Development Bank (ADB) and the Government of Georgia.
10	Will the house connections have a manholes near the fences to connect to it easy.	Yes, they will have connection manholes.
11	What is the depth of the pipes?	1.5 to 4-5 m
12	What kind of sewerage treatment plant will be built?	The treatment plant will have all standard stages. Started with mechanical treatment to biological treatments and sedimentation tanks.
13	What is the cost of building of Poti sewerage system	This question could not be answered and was noted for the next meeting.

Local population noted the importance of the rehabilitation of the sewer system in Poti, however, expressed concern that it would be better that the project is carried out in conjunction with the rehabilitation of the water supply system in Poti, because in this case people are less likely to be disturbed.

Photos of the public consultation:

Appendix 2

Chance Finds Report Form

Please contact: _____
To discuss find, on: _____

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: _____ m^2
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):

WWTP South (existing)

WWTP North (project measure)

pirobiTi aRniSvnebi
LEGEND

kanalizaciis koleqtoris dinebis mimarTuleba
Sewer Section incl, Flow Direction

PS1 **satumbo sadguri**
Pumping Station

saproeqto kanalizacia
Planned Sewer

arsebuli kanalizacia
Existing Sewer

wneviani kanalizacia,
Pressure Sewer

mdinare
River

ADB

United Water Supply Company of Georgia LLC

Consulting Consulting Contractor LLC — Tbilisi, Georgia

KOCKS INGENIEURE Land Management — Koblenz, GER - Tbilisi GEO

MP — Tbilisi, Georgia

Georgian Urban Services Improvement Investment Program

POTI

Overview of Sewerage System

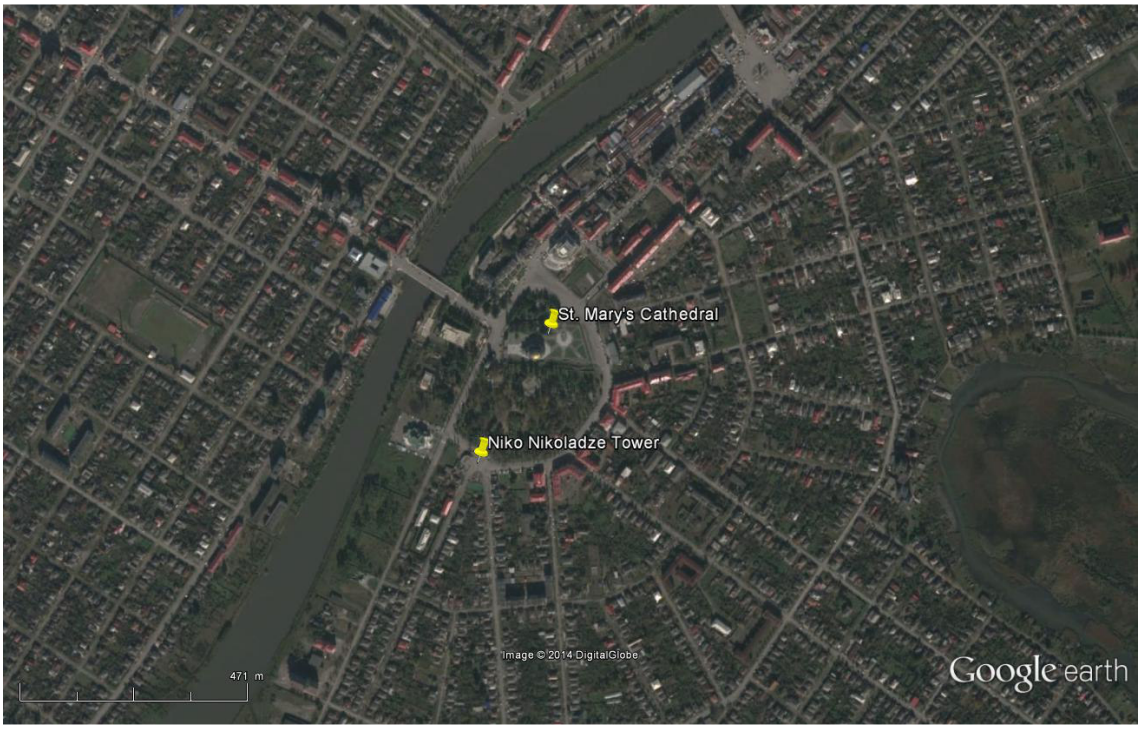
SCALE 1 : 10000

Drawing No. : POT-01-1

Date : APRIL 2013

Appendix 4


Iveron Mother of God Church
Lighthouse
Image © 2014 DigitalGlobe
180 m
Google earth


St. Mary's Cathedral
Niko Nikoladze Tower
Image © 2014 DigitalGlobe
471 m
Google earth


Temple of St. Nickolaus
Image © 2014 DigitalGlobe
138 m
Google earth