

FRAMEWORK FINANCING AGREEMENT
(GEO: Urban Services Improvement Investment Program ("Investment Program"))

Parties	This Framework Financing Agreement ("FFA") dated <u>1 March, 2011</u> is between Georgia and Asian Development Bank ("ADB").
Investment Program	<p>Georgia is committed to and will implement its Urban Water Supply and Sanitation Sector Development Plan ("Sector Development Plan"). The Investment Program is an integral part of the Sector Development Plan.</p> <p>The Investment Program comprises:</p> <p>(a) an Infrastructure Improvement Component to rehabilitate, improve and expand water supply and sanitation ("WSS") facilities in 6 secondary towns, and provision of vehicles and equipment for operation and maintenance for these towns;</p> <p>(b) an Institutional Effectiveness Component for capacity development for the Ministry of Regional Development and Infrastructure ("MRDI"), the Ministry of Environmental Protection and Natural Resources ("MEPNR"), the Ministry of Agriculture ("MA"), the Georgia National Energy and Water Supply Regulatory Commission ("GNEWSRC") and the United Water Supply Company of Georgia Limited Liability Company ("UWSCG"). This includes providing management contractor support to improve management and technical capabilities of UWSCG; and</p> <p>(c) a Project Implementation Support Component for detailed engineering, construction supervision, safeguard compliance, preparing subsequent projects of the Investment Program and a public awareness program on health, hygiene, sanitation and water conservation.</p> <p>Both the Sector Development Plan and the Investment Program are described in Schedule 1 hereto.</p> <p>The total cost of the Sector Development Plan over the period 2011 to 2020 is estimated at \$1,645 million equivalent. The total cost of the Investment Program, over the period 2011 to 2019 is expected to be \$625 million equivalent.</p>
Multitranche Financing Facility	<p>The Multitranche Financing Facility ("Facility") is intended to finance projects under the Investment Program, provided that the projects comply with the criteria set out in Schedule 4 hereto and that understandings set out in this FFA are complied with.</p> <p>The projects intended to be financed include: (a) rehabilitation, improvement and expansion of water intake facilities, water treatment facilities, water transmission systems, water storage and distribution systems, sewerage systems and sewerage treatment plants; (b) capacity development for MRDI, MEPNR, MA, GNEWSRC and UWSCG and management contractor support for UWSCG; and (c) project implementation support for detailed engineering, construction</p>

supervision, safeguard compliance, preparing subsequent projects of the Investment Program and a public awareness program.

This FFA does not constitute a legal obligation on the part of ADB to commit any financing. At its sole discretion, exercised reasonably, ADB has the right to deny any financing request made by Georgia, cancel the uncommitted portion of the Facility, and withdraw Georgia's right to request any financing tranche under the Facility. Financing tranches may be made available by ADB provided matters continue to be in accordance with the general understandings and expectations on which the Facility is based and which are laid out in this FFA.

This FFA does not constitute a legal obligation on the part of Georgia to request any financing. Georgia has the right not to request any financing under the Facility. Georgia also has the right at any time to cancel any uncommitted portion of the Facility.

Georgia and ADB may exercise their respective rights to cancel the Facility or any uncommitted portion thereof, and ADB may exercise its right to refuse a financing request, by giving written notice to such effect to the other parties. The written notice will provide an explanation for the cancellation or refusal and, in the case of a cancellation, specify the date on which the cancellation takes effect.

Financing Plan

The financing plan for the Investment Program is summarized below.

Financing Source	Total (\$million)	Share (%) of Total
Government	125	20%
Asian Development Bank	500	80%
Total	625	100%

Financing Terms

ADB will provide loans to finance projects under the Investment Program, as and when they are ready for financing, provided Georgia is in compliance with the understandings hereunder, and the projects are in line with those same understandings. Each loan will constitute a tranche.

Each tranche may be financed under terms different from the financing terms of previous or subsequent tranches. The choice of financing terms will depend on the project, capital market conditions, and ADB's financing policies, all prevailing on the date of signing the legal agreement for such tranche. Tranches may be provided in sequence or simultaneously, and some may overlap in time with each other.

There is no maximum or minimum size for a tranche.

Commitment charges or guarantee fees are not payable on the Facility.

They are payable only on financing actually committed by ADB as a loan or guarantee. ADB rules on commitment charges and guarantee fees, which are in effect when the legal agreements are signed for a tranche, will apply with respect to such tranche.

Amount

The maximum financing amount available under the Facility is \$500 million. It will be provided in individual tranches ADB's ordinary capital resources¹ and ADB's Special Funds resources (i.e. Asian Development Fund ("ADF"))², subject to the latter availability and allocation under ADB's applicable policies and procedures, from time to time.

In the event that ADF financing increases, any additional ADF financing will be accompanied by a corresponding reduction in the OCR financing, such that the total available amount under the Facility will not exceed \$500 million.

Availability Period

The last date on which any disbursement under any tranche may be made will be 30 September 2019. The last financing tranche is expected to be executed no later than 31 March 2014.

Terms and Conditions

Georgia will cause the proceeds of each tranche to be applied to the financing of expenditures of the Investment Program, in accordance with conditions set forth in this FFA and the legal agreements for each tranche.

Execution

The Executing Agency will be the MRDI. The Executing Agency will implement the Investment Program in accordance with the principles set forth in Schedule 1 to this Agreement, and as supplemented in the legal agreements for each tranche.

Periodic Financing Requests

Georgia may request, and ADB may agree, to provide loans under the Facility to finance the Investment Program upon the submission of a Periodic Financing Request ("PFR"). Each PFR should be prepared by MRDI and submitted by the Ministry of Finance. Georgia will make available to MRDI and UWSCG the proceeds of the loan in accordance with the related PFR and the legal agreements for the tranche. ADB will review the PFR and, if found satisfactory, prepare the

¹ Provisions of the Ordinary Operations Loan Regulations applicable to LIBOR-Based Loans Made from ADB's Ordinary Capital Resources, dated 1 July 2001, would apply to each such Loan, subject, to modifications, if any, that may be included under any Loan Agreement (said Ordinary Operations Loan Regulations, as so modified, being hereinafter called the OCR Loan Regulations).

² Provisions of the Special Operations Loan Regulations applicable to Loans Made by ADB from its Special Funds Resources, dated 1 January 2006, would apply to each such Loan, subject, to modifications, if any, that may be included under any Loan Agreement (said Special Funds Loan Regulations, as so modified, being hereinafter called the SF Loan Regulations and, collectively with the OCR Loan Regulations, the Loan Regulations).

related legal agreements.

The projects for which financing is requested under the PFR will be subject to the selection criteria set out in Schedule 4 hereto, satisfactory due diligence, and preparation of relevant safeguard and fiduciary requirements and other documents. The Facility will be implemented in accordance with the general framework set out in Schedule 3 to this FFA, and the Facility Administration Manual agreed between Georgia and ADB.

Until notice is otherwise given by Georgia, the Ministry of Finance will be Georgia's authorized representative for purposes of executing and submitting PFRs:

**General
Implementation
Framework
Procedures**

The Facility will be implemented in accordance with the general framework set out in Schedule 3 hereto.

Tranches to be provided under the Facility will be subject to following procedures and undertakings:

- (a) Georgia will have notified ADB of a forthcoming PFR in advance of the submission of the PFR;
- (b) Georgia will have submitted a PFR in the format agreed with ADB;
- (c) ADB may, in its sole discretion, decline to authorize the negotiation and execution of any legal agreement for a tranche; and
- (d) Once ADB confirms acceptance of the PFR, the legal agreements will be negotiated and executed by the parties.

PFR information

The PFR will substantially be in the form attached hereto, and will contain the following details:

- (a) Loan amount;
- (b) Description of projects to be financed;
- (c) Cost estimates and financing plan;
- (d) Implementation arrangements specific to the projects;
- (e) Confirmation of the continuing validity of and adherence to the provisions of this FFA;
- (f) Confirmation of compliance with the provisions under previous legal agreements, as appropriate; and
- (g) Other information as may be required under the Facility Administration Manual or reasonably requested by ADB.

Safeguards

Attached as Schedule 5 are references to the environmental and social safeguard frameworks that will be complied with during the implementation of the Investment Program.

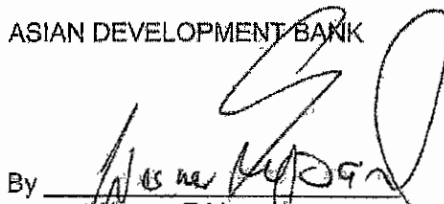
ADB safeguard policies in effect as of the date of signing of the legal agreements for a tranche will be applied with respect to the projects financed under such tranche.

Procurement	All goods and services to be financed under the Facility will be procured in accordance with ADB's <i>Procurement Guidelines</i> (2010, as amended from time to time).
Consulting Services	All consulting services to be financed under the Facility will be procured in accordance with ADB's <i>Guidelines on the Use of Consultants</i> (2010, as amended from time to time).
Advance Contracting and Retroactive Financing	Under each tranche, ADB may, subject to its policies and procedures, allow on request (a) advance contracting; and (b) retroactive financing of eligible expenditures for up to 20% of the proposed individual loan, incurred prior to loan effectiveness but not earlier than 12 months before the date of signing of the related legal agreement. Georgia acknowledges that any approval of advance contracting and/or retroactive financing will not constitute a commitment by ADB to finance the related project.
Disbursements	Disbursements will be made in accordance with ADB's <i>Loan Disbursement Handbook</i> (2007, as amended from time to time).
Monitoring, Evaluation, and Reporting Arrangements	Within 6 months of the effectiveness date of the loan agreement for each tranche of the Facility, MRDI will establish a project performance monitoring system ("PPMS") in form and substance acceptable to ADB. The PPMS will be based on the performance indicators described in the Design and Monitoring Framework ("DMF") for the tranche, as set forth in the PFR for that tranche. The DMF for the Investment Program is attached in Schedule 2 hereto. Details on the review of the Investment Program are described in Schedule 3 attached hereto.
Undertakings	Schedule 6 hereto sets out the undertakings provided by Georgia in relation to the Facility.

GEORGIA

By 
 Kakha Baidurashvili
 Minister of Finance

ASIAN DEVELOPMENT BANK

By 
 Werner E. Liepach
 Deputy Director General
 Central and West Regional Department

- Schedule 1: Facility Constituents
- Schedule 2: Design and Monitoring Framework for the Facility
- Schedule 3: Implementation Framework
- Schedule 4: Selection Criteria and Approval Procedure
- Schedule 5: Safeguard Requirements and Social Development Policies
- Schedule 6: Undertakings

SCHEDULE 1

FACILITY CONSTITUENTS

A. Background

1. Foreign Direct Investment ("FDI") in Georgia has been one of the principal drivers of economic growth over the last five years and is a major balancing factor for the trade deficit. The service sector accounted consistently for a predominant share of total FDI (averaging at nearly 60%) and continues to create employment opportunities in urban centers.

2. As FDI finds its way to cities and large urban centers it creates new employment opportunities that condition further rural-to-urban migration, which weighs down on city/secondary town infrastructure and urban service provision, such as water supply and sanitation with growing impacts on the habitats and concomitant public health implications. This underscores the importance of urban infrastructure projects and associated institutional accountability and responsibility for municipal service delivery.

3. Improved municipal services, and specifically WSS, is therefore a key government priority, which is highlighted in the context of major urban centers, such as Tbilisi, Rustavi, Kutaisi, Poti and Zugdidi where larger populations are associated with increased demand for municipal services and greater pressures on service delivery. Urban centers in traditional tourist destinations such as Kobuleti, Batumi and most recently Mestia serve as important magnets for tourist attraction and are expected to witness similar pressures on municipal service delivery in the medium term.

4. Urban WSS services in Georgia are provided by three service utilities:

- (i) Georgia Water and Power Company ("GWPC"), which serves Tbilisi and the peri-urban area, covers 31.8% of the total population. Being a privatized company, its business plans including service standards and revenue recovery mechanisms are regulated by the GNEWSRC.
- (ii) Batumi Water Company, Kobuleti Water Company, and Adjara local self governments, which serve the Adjara Autonomous Republic, cover 8.6% of the total population. The development plans for the water companies and local self governments are governed by the development vision of the autonomous region. Further, investments in the region have already been identified and financing tied up through KfW.
- (iii) UWSCG serves the rest of the country, which amounts to 58.5% of the total population). UWSCG comprises a Central Office, six regional branches and 56 service centers covering 54 cities and towns.

B. Road Map

1. Vision and Objectives

5. To address the problems and constraints prevalent in the urban WSS sector – associated with technical sustainability and environmental protection, institutional and financial

sustainability, and enabling legal and regulatory framework – Government of Georgia adopted an urban WSS Sector Development Plan (SDP) on 31 January 2011. The overall aim of the SDP is to ensure that continuous and reliable water supply, and safe sanitation services, are provided to all of Georgia's urban population by 2020.

6. The SDP's policy and development objectives include:

(i) Technical Sustainability and Environmental Protection

- a. Providing WSS infrastructure to progressively achieve full water supply and sanitation service coverage of all urban households;
- b. Ensuring implementation of asset management and strengthening programs for better operation and maintenance of WSS infrastructure leading to efficient service delivery; and
- c. Introducing appropriate mechanisms for environmental protection by maintaining drinking water quality standards, promoting treatment and discharge of domestic and industrial effluents, and ensuring water resource protection from abstraction and pollution.

(ii) Institutional and Financial Sustainability

- a. Improving the institutional effectiveness of service utilities by implementing an enterprise resource management plan, encouraging public-private partnerships, and undertaking a customer outreach program leading to a healthy fiscal status of the service utilities and improved hygiene and sanitation condition of urban households; and
- b. Improving sector governance through efficient financial management; operational and commercial efficiency of service utilities.

(iii) Enabling Legislative and Regulatory Framework

- a. Providing an enabling legal and regulatory (economic, quality of service, environmental and health) framework for WSS services, and strengthening the capacity of GNEWSRC to effectively monitor and enforce quality of service and approve tariffs, MEPNR for environmental monitoring, and MA for drinking water quality monitoring.

2. Strategic Directions

7. The SDP comprises an Investment Plan for physical and non-physical investments, and a policy and institutional reform framework to ensure sustainability of investments. Physical investments will address the technical sustainability and environmental protection objectives, while non-physical investments will address the institutional and financial sustainability, and enabling legislative and regulatory framework objectives. By prioritizing public expenditures for these investments, the Government will ensure that WSS services are improved and there is adequate regulation of these services to ensure delivery standards are met. These investments address medium-term (2011-15) and long-term (2016-20) needs.

a. Physical Investments

8. Physical investments will help address the shortfall in infrastructure financing for the sector and ensure long-term system operations and maintenance and will include (i) water supply intake, pumping, treatment, transmission, storage and distribution systems; (ii) sewerage network, pumping and treatment plants, and septic tanks for low-density areas; and (iii) WSS system maintenance equipment and machinery.

9. In this context, the Investment Plan under the SDP identifies physical investments in towns and cities served by UWSCG as (i) UWSCG covers 90% of the country's geographical area and approximately 60% of the population including economically strategic urban centers proposed for development by the Government; and (ii) physical investments for GWPC and BWC have already been defined based on their current organizational structures – GWPC being privatized and BWC working under the plans of the autonomous region.

b. Non-physical Investments

10. Non-physical investments will include (i) capacity development and institutional support to the UWSCG to help it improve WSS service delivery through a business planning framework (asset management plan, operational plan, commercial plan, and financing plan), and improved operation and maintenance, accounting, financial reporting, procurement, communications, and detailed engineering and construction supervision support;¹ and (ii) capacity development of regulatory bodies to oversee service provision by service utilities in the WSS sector – GNEWSRC (the regulatory body for the WSS sector), the MEPNR to ensure environmental protection of natural resources, and the MA to ensure adequate monitoring of drinking water quality.

3. Investment Plan

11. The Investment Plan is estimated at \$1.645 billion (Table 1):

- (i) Physical investments are estimated to cost \$1.57 billion and comprise \$819 million (approximately 52%) for water supply, \$728 million (46.5%) for sanitation, and \$23 million (1.5%) for maintenance vehicles and equipment.
- (ii) Non-physical investments are estimated to cost \$75 million and will include (a) capacity building and public relations improvement for the UWSCG, and capacity building of regulatory bodies (1.2%), and (b) project management support in terms of infrastructure design engineering and construction supervision (3.3%).

12. Institutional support and effective financial management will ensure that funds are available for system operation and maintenance. In the medium-term, the Government will provide for viability gap funding and ensure steady stream of cash flows to the UWSCG so that system maintenance is not compromised.

¹ The focus is on the institutional development of UWSCG as GWPC and Adjara water companies and local self governments have their independent and autonomous operating structures.

Table 1: Urban WSS Investment Plan Estimates
(\$ million)

Item	2011-15	2016-20	Amount	Share (%)
I. Physical Investments				
Water Supply				
Augmentation and Treatment	68.50	14.50	83.00	5.04
Pumping	5.00	1.00	6.00	0.36
Storage	9.00	2.00	11.00	0.67
Transmission	236.50	53.50	290.00	17.63
Distribution	311.00	75.00	386.00	23.47
Meters	35.00	8.00	43.00	2.61
Total - Water Supply	665.00	154.00	819.00	49.79
Sanitation				
Sewage Treatment	135.00	39.00	174.00	10.58
Sewers	414.50	69.50	484.00	29.42
Septic Tanks	56.50	13.50	70.00	4.26
Total - Sanitation	606.00	122.00	728.00	44.26
Vehicles and Equipment	14.00	9.00	23.00	1.40
Total - Physical	1,285.00	285.00	1,570.00	95.44
II. Non-physical Investments				
Institutional Effectiveness	15.00	5.00	20.00	1.22
Project Management	45.00	10.00	55.00	3.34
Total - Non-physical	60.00	15.00	75.00	4.56
Total	1,345.00	300.00	1,645.00	100.00

Source: UWSCG estimates.

4. Policy and Institutional Reform Framework

13. To achieve the SDP objectives and implement the Investment Plan, the Government has adopted a policy and institutional reform framework that clearly defines the actions to meet SDP objectives, the institutions responsible, and the targets or indicators that will help the Government measure its performance. A defined time frame or milestone will help the Government program and plan its actions efficiently (Table 2).

Table 2: Policy and Institutional Reform Framework

Sector Policy and Development Objectives	Actions and Description	Institutional Responsibility	Target / Indicator and Timeframe
A. Technical Sustainability and Environmental Protection			
1. Asset Creation. Provide WSS infrastructure to progressively achieve full service coverage with a continuous and reliable water supply and safe sanitation services	<p>a. Classify towns based on current levels of service and identify comprehensive infrastructure improvement requirement to address longterm, city development before expanding services across all 56 towns and cities</p> <p>b. Prepare a capital investment plan for short (2013), medium (2017) and long-term (2020) for urban WSS sector that will address current back-log and future demand</p>	MRDI and UWSCG	<ul style="list-style-type: none"> - Preliminary Investment Plan based on normative standards developed by Jun 2011 - Final Investment Plan based on detailed engineering designs progressively completed between 2011 and by 2017
2. Asset Management. Ensure better operation and maintenance of WSS infrastructure to provide efficient services	<p>a. Create a geospatial WSS utility management system that will capture WSS asset information and condition in all towns</p> <p>b. Ensure asset management and strengthening to (i) provide water supply of suitable quality, frequency, and pressure; and (ii) provide adequate sanitation service coverage, and safe treatment and disposal of domestic sewage and industrial effluent</p> <p>c. Introduce public-private partnerships in system operation and maintenance (e.g., commence with high-skilled requirement like sewage treatment plants)</p>	UWSCG	<ul style="list-style-type: none"> - Geospatial WSS utility management system completed for Kutaisi, Poti, Marneuli, Mestia, Zugdidi and Anaklia by Jun 2011 - Geospatial WSS utility management system for remaining 50 centers completed by 2016 - PPP intervention with UWSCG concluded by the end of 2013
3. Environmental Protection. Maintain drinking water quality standards, and ensure water resource protection from abstraction and pollution	<p>a. Program adequate investments in water treatment and water quality testing equipment and laboratories, and amend national legislations to provide the MEPNR adequate policing and enforcement powers as appropriate</p> <p>b. Ensure enforcement of existing regulatory system</p>	MRDI, UWSCG, MEPNR, and MA	<ul style="list-style-type: none"> - Relevant national legislations and Water Law amended by the end of 2013

Sector Policy and Development Objectives	Actions and Description	Institutional Responsibility	Target / Indicator and Timeframe
	<p>for water abstraction</p> <p>c. Incorporate adequate investments in wastewater treatment to ensure that treated effluent quality meets national standards and that water resources are protected from pollution threats</p>		
B. Institutional and Financial Sustainability			
<p>1. Institutional Effectiveness. Implement an enterprise resource management plan in utilities and customer outreach program to improve institutional effectiveness of utilities</p>	<p>a. Design and establish improved organizational structures and practices, including delegation of responsibilities (and budgets) to regional offices</p> <p>b. Enhance utility staff capacity at the managerial-level through public-private partnerships and twinning programs with service utilities outside Georgia, and enhance technical staff capacity through a WSS Management Program in collaboration with educational institutions in Georgia</p> <p>c. Conduct consumer outreach programs on water, hygiene and sanitation practices, tariff payments, and infrastructure improvement plans through customer care units at UWSCG service centers</p> <p>d. Institute a grievance redress mechanism to address technical and (environmental and social) safeguard issues associated with UWSCG operations</p> <p>d. Ensure capacity building of GNEWSRC to effectively review business plans, tariff proposals, monitor UWSCG operations and performance with regards quality of service, and use of regulatory tools</p>	MRDI and UWSCG	<ul style="list-style-type: none"> - UWSCG Business Plan for 2013 to include human resource management plan - First WSS Management Program commenced in 2012 - GNEWSRC staff trained in using tools and systems by 2013 - Consumer outreach program commenced in 2011
<p>2. Improved Governance. Ensure improved financial management, operational and commercial efficiency of utilities</p>	<p>a. Prepare a 3-year Business Plan with annual operations plan focusing on measures to reduce non-revenue water, optimize energy usage, improve human resource management, and enhance</p>	MRDI, UWSCG, and GNEWSRC (as relevant)	<ul style="list-style-type: none"> - UWSCG's first 3-year Business Plan developed by 2013 - Improved accounting,

Sector Policy and Development Objectives	Actions and Description	Institutional Responsibility	Target / Indicator and Timeframe
	<p>revenues through improved billing and collection</p> <p>b. Establish an improved financial accounting and reporting system, internal audit and controls systems, and procurement and inventory management system</p> <p>c. Plan full metering of domestic and non-domestic consumers by 2020 on a progressive basis by addressing non-domestic and houses with gardens, and areas receiving 24-hour service first, and expanding further based on the financial viability established by the GNEWSRC and UWSCG</p> <p>d. Review potentials of setting WSS tariffs to meet revenue requirements in the medium-term (till 2017) and in the long-term based on long-run cost analysis to include revenue to recover operation and maintenance, taxes, depreciation of assets and return on capital based on socially equitable principles</p> <p>e. Review the practicality and sustainability of continuing subsidies to the UWSCG to maintain current levels of service and subject to improved financial performance of the UWSCG</p>		<p>auditing, and procurement systems established by 2013</p> <ul style="list-style-type: none"> - Full metering in all 56 service centers by 2020 - Short-term tariffs established in 2010, medium-term tariff planned for setting in 2013, and long-term tariffs planned for setting by 2020
C. Enabling Legal and Regulatory Framework 1. Oversight of economic and service standard regulation and UWSCG operations	<p>a. Conduct a multi-year regulation (3-year cycles) with the first regulatory cycle to commence in 2014, and develop regulatory functions, reporting and monitoring tools</p> <p>b. Develop improved regulatory tools and systems that include a business planning framework (asset management, operational, commercial and financing plan), regulatory accounting guidelines, tariff design and modeling, performance monitoring</p>	<p>GNEWSRC in coordination with MRDI, MEPNR and MA</p>	<ul style="list-style-type: none"> - Multi-year regulatory functions, accounting guidelines, reporting tools and control systems established by the end of 2013 (technical assistance financed using donor funds)

Sector Policy and Development Objectives	Actions and Description	Institutional Responsibility	Target / Indicator and Timeframe
2. Environmental and Health Regulation	<p>and control, legal procedures, etc.</p> <p>a. Develop for MEPNR improved environmental regulatory requirements including, water resources abstraction regulatory framework, effective water resources abstraction reporting and monitoring system, and effective wastewater discharge quality and sludge disposal monitoring system</p> <p>b. Based on World Health Organization standards for drinking water, develop for NSFSPVP within MA a water quality regulatory framework founded on the concepts of risk based audits, establish an effective audit mechanism, develop reporting systems and necessary enforcement measures as appropriate</p>	MEPNR and MA	<p>– Environmental regulatory framework, reporting and monitoring systems developed for MEPNR by 2013</p> <p>– Water quality regulatory framework, reporting and monitoring systems developed for MA by 2013</p>
3. Legislative Framework	<p>a. Amendments to relevant legislations to (i) adopt a multi-year regulatory cycle; and (ii) redefine return on assets to return on capital invested</p> <p>b. Facilitate GNEWSRC to establish a multi-year price setting methodology</p> <p>c. Amendments to the Law on Public Health to grant powers to NSFSPVP with respect to water quality regulation</p>	UWSCG, GNEWSRC, MEPNR and MA	<p>– Law 816 on Electrical Energy and Gas and other relevant legislations amended by 2013</p> <p>– Law on Public Health amended by 2013</p> <p>– Water Law amended by 2013</p>

GNEWSRC = Georgia National Energy and Water Supply Regulatory Commission, MRDI = Ministry of Regional Development and Infrastructure, MESD = Ministry of Economic and Sustainable Development, UWSCG = United Water Supply Company of Georgia LLC, MA = Ministry of Agriculture, NSFSPVP = National Service of Food Safety, Veterinary and Plant Protection, SCWSE = State Commission on Water Supply and Energy

C. Strategic Context

14. The strategic context for the Facility is the need to finance improvements to WSS services in Georgia's secondary towns that will catalyze economic growth in the country through development of the service sector. With increasing FDI in secondary towns the Government anticipates (i) increased rural-urban migration; and (ii) increased tourist inflow in regions with tourism potentials thereby increasing the demand for efficient, continuous and reliable WSS services.

15. The Government's SDP objectives are fully consistent with the strategy agreed between Georgia and ADB for the purposes of the ADB assistance program in the country¹ and in line with principal elements of ADB's water policy:² national focus on water sector reform, improving and expanding the delivery of water services (focusing on water supply and sanitation and encouraging public-private partnerships), and improving sector governance. The existence of a policy framework, strategy and roadmap also happens to be preconditions for the use by ADB of the multitranche financing facility as a funding modality.

16. For long, physical investments in the sector have been spread thin across Georgia's cities and towns due to the demand based on decades of neglect. Additionally, sector development has also suffered with negligible focus on institutional development of service utilities and commensurate development of staff technical capacities. The SDP is premised on the need to improve the quality of WSS infrastructure and associated service delivery functions.

17. The Facility will finance physical investments in 6 secondary towns identified for economic development by the Government in line with its economic growth strategy – the secondary towns include Kutaisi and Poti, which are being developed as free industrial zones; Marneuli and Zugdidi, which have agro-processing industries and potentials for developing agriculture produce markets; and Mestia and Anaklia, which are being developed as tourist centers. Non-physical investments financed by the Facility will help develop the service utility's (UWSCG's) capacity for service provision, and develop regulatory bodies' (GNEWSRC, MEPNR and MA) capacities in service regulation to ensure that investments are sustainable in the long-term.

D. Investment Program

18. The Investment Program will support the implementation of the SDP to improve the health of residents in the secondary towns of Marneuli, Kutaisi, Poti, Zugdidi, Anaklia and Mestia, and improve the institutional effectiveness of organizations delivering services and regulating service delivery. The outcome of the Investment Program is improved WSS services in these secondary towns. It will support physical and non-physical interventions through the following components:

- (i) Component 1: Infrastructure Improvement (Physical)
- (ii) Component 2: Institutional Effectiveness (Non-physical)
- (iii) Component 3: Project Implementation Support (Non-physical)

¹ ADB. 2007. *Interim Operational Strategy 2008–2009*. Manila. Country Partnership Strategy is under preparation.

² ADB. 2005. *Water for All: The Water Policy of the Asian Development Bank*. Manila.

19. The Investment Program is estimated at \$625 million and will finance a slice of the Government's Investment Plan. The Investment Program will be implemented from 2011 through 2019 over eight years. **Table 3** provides the Investment Program estimates.

Table 3: Investment Program Estimates
(\$ million)

Item	Amount
A. Base Cost	
1. Component 1: Infrastructure Improvement	463.83
2. Component 2: Institutional Effectiveness	13.50
3. Component 3: Project Implementation Support	13.77
Subtotal (A)	491.10
B. Contingencies	117.95
C. Financing Charges During Implementation	15.95
Total (A+B+C)	625.00

Source: Asian Development Bank estimates.

E. Financing Plan

20. ADB's Facility will finance the Investment Program and will account for 30.4% of the Government's SDP. Cofinancing under the SDP is expected from other donors and few funds have already been tied up. **Table 4** provides a breakdown of the SDP and Investment Program financing plan.

Table 4: SDP and Investment Program Financing Plan

Source	Investment Plan (\$ million)	Share of Total (%)	Facility (\$ million)	Share of Total (%)
ADB	500.00	30.40	500.00	80.00
Cofinanciers ^a	300.00	18.24	-	-
Government ^a	845.00	51.36	125.00	20.00
Total	1,645.00	100.00	625.00	100.00

^a Under discussion.

Source: UWSCG and MRDI estimates.

SCHEDULE 2
DESIGN AND MONITORING FRAMEWORK – MFF

Design Summary	Performance Targets and/or Indicators	Data Sources and/or Reporting Mechanisms	Assumptions and Risks
Impact Improved health of residents in the urban centers of Marneuli, Kutaisi, Poti, Zugdidi, Anakila and Mestia	By the end of Investment Program plus three years (2022): ¹ <ul style="list-style-type: none"> (i) Prevalence of waterborne illness in households reduced by at least 75% from current levels of incidence in 4% households/annum² (ii) Productive days lost due to waterborne illness is reduced by at least 75% from current levels of 8 days/person/annum (iii) Average annual household expenditure on treating waterborne illnesses reduced by at least 75% from current levels of \$74 per household/annum 	Sex-disaggregated baseline survey conducted at Investment Program inception (2011), completion (2019), and in 2022. Surveys conducted as a part of PPMS and by the UWSCG	Assumptions The Government continues to provide support for an enabling investment climate.
Outcome Improved water supply and sanitation services in the urban centers of Marneuli, Kutaisi, Poti, Zugdidi, Anakila and Mestia	By end of Investment Program (2019): <ul style="list-style-type: none"> (i) Population access to safe sanitation³ increased from 25% in 2011 to 88% by 2019 (ii) Population access to 24-hr potable water supply increased from 74% in 2011 to 95% by 2019 (100% female headed households in the region will be covered)	Annual sex-disaggregated socioeconomic surveys undertaken as part of PPMS to determine public satisfaction with the quality of water supply and sanitation National statistics for water supply quality and effluent discharge by MEPNR, MA, and UWSCG	Assumptions Government ensures water company staff and Management Contractor provides efficient service delivery. Risks Political systems interfere with enforcement of legislative and regulatory control.
Outputs Component 1: Infrastructure Improvement Water supply system efficiency improved through rehabilitation and replacement, and coverage increased through expansion	<ul style="list-style-type: none"> (i) 60,000 cum reservoirs, 110 km of water transmission mains, and 350 km distribution networks are rehabilitated, reconstructed or newly constructed (ii) 36 MLD capacity water treatment plants constructed (iii) Nonrevenue water progressively reduced from 60% to 30% 	Semiannual progress reports prepared by the UWSCG Disbursement and reimbursement records maintained by UWSCG PPMS reports prepared	Assumptions Ongoing donor financed projects are efficiently implemented. Risks Sudden increase in cost of construction

¹ Baseline will be re-established during socioeconomic surveys conducted as a part of the project performance management system (and will include knowledge, attitude, and practice surveys).

² Water borne diseases focus on diarrhea and will be confirmed during baseline surveys.

³ Includes pour-flush latrines with reticulated sewerage network.

Design Summary	Performance Targets and/or Indicators	Data Sources and/or Reporting Mechanisms	Assumptions and Risks
	<p>(baseline and target to be established at Investment Program tranche Inception)</p> <p>(iv) Energy savings achieved through efficient pumping systems (baseline and target to be established at Investment Program tranche 1 Inception)</p> <p>(v) Residual chlorine at tail ends of water supply system maintained between 0.2 and 0.4 parts per million</p>	<p>by UWSCG</p> <p>UWSCG annual work plans</p> <p>As-built drawings developed by contractors</p> <p>Project component completion and commissioning certificates provided by Investment Program Construction Supervision Consultant</p>	Items.
Sewerage and sanitation system efficiency improved through rehabilitation and reconstruction, and coverage increased through expansion	<p>(i) Access to sewerage network increased from 83,000 persons in 2011 to 305,000 persons in 2019</p> <p>(ii) Sewer cleaning vehicles procured and made operational by 2011 for sewer maintenance</p> <p>(iii) Sewage pumps operating on a daily basis and discharging sewage to treatment plants</p> <p>(iv) Sewage treatment plants rehabilitated or constructed to treat and safely discharge sewage</p>		
Component 2: Institutional Effectiveness			Risks
Business Plans developed and Implemented	(i) UWSCG develops long-term capital improvement plans, asset strengthening plans, resource mobilization and expenditure management plans	Semiannual progress reports prepared by UWSCG	Poor enrollment in the WSS management program
Financial management improved, MIS and Accounting systems developed	<p>(i) UWSCG operating ratio improved from 1.8 in 2010 to 1 by 2019, indicating improved financial management</p> <p>(ii) UWSCG revenue collection efficiency improved from 49% in 2010 to 95% by 2019</p> <p>(iii) Sex-disaggregated consumer database created for UWSCG to develop targeted marketing campaigns for female household heads</p>	UWSCG annual work plans	
Geospatial WSS utility management systems operationalized	(i) Calibrated network models developed for water and sewerage networks based on GIS maps		
Management capacity of UWSCG enhanced	(i) WSS management program with Georgian universities operationalized		

Design Summary	Performance Targets and/or Indicators	Data Sources and/or Reporting Mechanisms	Assumptions and Risks
Sector regulatory capacity of GNEWSRC, MEPNR, and MA developed	(ii) 30% of key management staff in UWSCG comprised of women (iii) UWSCG staff trained on financial management and accounting (30% number of women) (iv) Sex-disaggregated data base for human resource management in place (v) MEPNR confirms treated sewage meets discharge standards (i) GNEWSRC staff approve tariff and monitor WSS service delivery (ii) MEPNR staff monitor treatment facility performance and effluent discharge standards (iii) MA staff monitor drinking water quality standards		
Component 3: Project Implementation Support Public awareness program effectively implemented, materials on hygiene and sanitation disseminated, and women developed as hygiene and sanitation advocates	(i) Each investment Program service center has a customer care unit staffed by women (at least 30%), which disseminates IEC on water, hygiene and sanitation practices (ii) Public awareness program (targeting women as household managers) rolled out in all Investment Program towns	Semiannual progress reports prepared by UWSCG PPMS reports prepared by UWSCG UWSCG annual work plans	Assumption Nongovernment organizations actively involved in educating beneficiaries on project benefits

Activities and Milestones:	Inputs
Component 1: Infrastructure Improvement – Water intake, treatment and transmission mains constructed (January 2014) – Equipment for system performance monitoring and improvement procured (July 2011) – Water supply, sewerage network, sanitation systems, and sewage treatment plants constructed or rehabilitated (January 2019) Component 2: Institutional Effectiveness – Management Contractor appointed (2012) – Sex-disaggregated consumer database created (January 2012) – MIS and revenue enhancement plans rolled out (January 2013) Component 3: Investment Project Implementation – Sex-disaggregated baseline surveys conducted (October 2011) – Design Engineers appointed (October 2010) – Supervision Engineers appointed (July 2011) – GAP targets confirmed (December 2013)	ADB: \$500 million with ADF and OCR Government: \$125 million Total: \$625 million

cum = cubic meter, IEC = information, education and communication, GAP = gender action plan, GNEWSRC = Georgia National Energy and Water Supply Regulatory Commission, km = kilometer, MLD = million liters per day, MA = Ministry of Agriculture, MEPNR = Ministry of Environmental Protection and Natural Resources, PPMS = project performance management system, UWSCG = United Water Supply Company of Georgia LLC, WSS = water supply and sanitation

Source: Asian Development Bank estimates.

SCHEDULE 3

IMPLEMENTATION FRAMEWORK

Executing and Implementing Agencies

1. The Executing Agency for the Investment Program will be the MRDI. UWSCG will be the Implementing Agency for the Infrastructure Improvement Component and the Project Implementation Support Component. MRDI will be the Implementing Agency for the Institutional Effectiveness Component. The State Commission on Water Supply and Energy ("SCWSE") will provide overall guidance and review progress of the Investment Program.

2. MRDI will be responsible for the overall implementation of the SDP and the Investment Program. It will hold regular meetings with UWSCG to review progress and submit semiannual progress reports to the SCWSE. It will also coordinate with the Ministry of Finance, the MEPNR, the MA and the GNEWSRC.

Investment Program Review

3. ADB will field review missions periodically to review the progress of the Investment Program. It will discuss the progress under each tranche of the Facility, any changes in implementation arrangements, or remedial measures that are required to achieve the overall objectives of specific projects and the overall Investment Program.

4. ADB will conduct a midterm review of each tranche of the Facility and conduct a detailed review of the Investment Program after three years from the effective date of the first tranche. The midterm review will evaluate in detail project activities and issues related to implementation arrangements, environmental and social safeguards requirements, achievement of construction milestones, quality assurance (including compliance with this FFA and loan covenants set forth in the applicable loan agreements) and other relevant issues. The review will confirm any changes required to be made to achieve the investment Program objectives.

SCHEDULE 4

SELECTION CRITERIA AND APPROVAL PROCESS FOR PROJECTS

Selection Criteria

1. The following are the requirements for project selection under the Investment Program:
 - (i) the projects will be technically viable and based on "least life-cycle cost" option. A feasibility study with preliminary design, infrastructure coverage and implementation plan will be used to confirm the technical viability of these projects;
 - (ii) the projects will be economically viable and financially sustainable, and their economic internal rate of return is equal to or higher than 12%. The economic analysis should be conducted in accordance with ADB's Guidelines for the Economic Analysis of Projects (1997); and
 - (iii) the projects will comply with laws and regulations in Georgia for environmental and social safeguards and ADB safeguard policies.
2. To facilitate project selection, UWSCG will submit for ADB's review (i) the feasibility report and preliminary engineering design report for the proposed projects; and (ii) the environmental and involuntary resettlement screening report.

Approval Process

3. Each periodic financing request will be prepared and processed in accordance with the following procedures:
 - (i) for each project, UWSCG will submit for ADB's review, a detailed engineering design report for the project (including cost estimates and bills of quantities), the Initial Environmental Examinations or Environmental Impact Assessments and Resettlement Plans (RPs) (if any);
 - (ii) UWSCG will submit to ADB the procurement plan for the project and confirm that all necessary government approvals (save for those described under subparagraph (iii) below) have been secured; and
 - (iii) On ADB's approval of the procurement plan, UWSCG will prepare a PFR for the MRDI's approval. The Ministry of Finance will sign and submit the PFR with accompanying technical, procurement and safeguard documents for ADB's approval.

SCHEDULE 5

ENVIRONMENTAL AND SOCIAL SAFEGUARDS

1. Georgia will ensure that all the requirements prescribed in this Schedule, and the following safeguard frameworks and plans that have been prepared with respect to the Facility and the first tranche and of which ADB has been provided full copies, and which are deemed incorporated herein by reference, are complied with during the processing and implementation of the projects financed under the Facility:

- (i) environmental assessment and review framework ("EARF");
- (ii) resettlement framework ("RF"); and
- (iii) environmental management plans ("EMPs") and resettlement plan ("RP") for the first tranche,

2. The safeguard frameworks cover the Facility-specific information and requirements in accordance with ADB's safeguard policies: (i) the general anticipated impacts of components or projects likely to be financed under the Facility on the environment and involuntary resettlement; (ii) the safeguard criteria that are to be used in selecting components or projects; (iii) the requirements and procedure that will be followed for screening and categorization, impact assessments, development of management plans, public consultation and information disclosure (including the 120-day disclosure rule, if required), and monitoring and reporting; and (iv) the institutional arrangements (including budget and capacity requirements) and the Georgia's and ADB's responsibilities and authorities for the preparation, review and clearance of safeguard documents.

3. Prior to the preparation of each PFR, the applicability and relevance of each safeguard framework will be reviewed and updated to ensure relevance and consistency with applicable laws and regulations in Georgia and ADB's safeguard policies, as amended from time to time.

4. In all cases, for each new PFR preparation, Georgia through MRDI will review ongoing projects to check on the status of compliance with the safeguards plans and frameworks, and submit the review reports to ADB, together with other required safeguard documents relevant to the project included in the tranche being processed. In any case if major noncompliance is discovered in the course of the review of ongoing projects, a corrective action plan will be prepared and submitted to ADB.

Environment

5. Georgia will ensure that each project financed under the Facility are developed, implemented and maintained in accordance with all applicable laws and regulations of Georgia, ADB's Safeguard Policy Statement (2009) and the EARF.

6. Georgia will cause UWSCG to ensure that:

(i) an environmental impact assessment ("EIA") or initial environmental examination ("IEE") is prepared for each project in accordance with all applicable laws and regulations of Georgia, ADB's Safeguard Policy Statement (2009) and the EARF, and that all EIA/IEEs are approved by ADB and adhered to during design, construction and operation phases of such project;

(ii) the environmental management plans ("EMPs") are implemented by the contractors, all recommendations of the EMPs are incorporated in the bidding documents and civil works contracts to ensure compliance, and adequate budgetary allocation is made by the contractors for implementation of the EMPs. Prior to commencement of civil works, UWSCG will update the EMPs in consultation with the construction supervision consultant and the contractors;

(iii) no civil works contract will be awarded until the corresponding EIA/IEE has been approved by ADB; and

(iv) semiannual monitoring reports on EMPs implementation are submitted to ADB in a timely manner.

7. Georgia will ensure that the Facility will not be used to finance any activity included in the list of prohibited investment activities provided in Appendix 5 of ADB's Safeguard Policy Statement (2009).

Involuntary Resettlement

8. Georgia will ensure that each project financed under the Facility are developed, implemented and maintained in accordance with all applicable laws and regulations of Georgia, ADB's Safeguard Policy Statement (2009) and the RF.

9. Georgia will cause UWSCG to ensure that:

(i) for projects with involuntary resettlement, a RP acceptable to ADB is prepared for each project in accordance with all applicable laws and regulations of Georgia, ADB's Safeguard Policy Statement (2009) and the RF, as a submission with the PFR;

(ii) all land and rights-of-way required by the projects are made available free and clear from any and all rights and claims of third parties and any other encumbrances in a timely manner, subject to compliance with all applicable laws and regulations of Georgia, ADB's Safeguard Policy Statement (2009), the RF and the RPs; and

(iii) no civil works contract for projects involving involuntary resettlement will be awarded until the relevant RP has been approved by ADB. Contractors will only commence civil works after the RP has been implemented in accordance with its terms, as verified by an independent body or person.

Labor Standards, Health and Gender and Development

10. Georgia will cause UWSCG to ensure monitoring of the social impacts throughout the implementation of all projects financed by the Facility, in consultation with local governments, local communities and nongovernment organizations. In this respect, UWSCG will ensure that all civil works contractors: (i) comply with all applicable labor laws of Georgia; (ii) use their best efforts to employ women and local people, including disadvantaged people, living in the vicinity of the projects financed under the Facility; (iii) disseminate information at worksites on health safety (including HIV prevention programs) for those employed during construction; (iv) maintain equal pay to men and women for work of equal type; (v) provide safe working conditions and appropriate facilities for male and female workers; and (vi) abstain from child labor.

11. Georgia will cause UWSCG to ensure that the gender action plan prepared for the Investment Program is implemented in a timely manner over the Investment Program period. MRDI will cause UWSCG to monitor implementation of the gender action plan and submit semiannual reports to ADB.

SCHEDULE 6

UNDERTAKINGS

1. Georgia will: (i) ensure timely implementation of the Investment Program, including executing the implementation arrangements set out in Schedule 3 to this FFA and monitoring and evaluating implementation based on the Design and Monitoring Framework set out in Schedule 2 to this FFA; (ii) ensure that all projects financed under the Facility are selected and approved in accordance with the criteria and procedure set out in Schedule 4 to this FFA; (iii) ensure that all projects financed under the Facility are developed, implemented and maintained in accordance with the safeguard requirements set out in Schedule 5 to this FFA;

Counterpart Funding and Resources

2. Georgia will ensure that: (i) financial, technical and human resources necessary for implementation of the Investment Program are provided on a timely basis throughout the implementation period; and (ii) adequate funds are allocated for the maintenance of the infrastructure built and items procured under the Investment Program.

Construction Quality

3. Georgia will ensure that the Investment Program is carried out in accordance with applicable standards and international best practice for design, technical specifications, construction supervision, quality control and project management.

Sector Development

4. Georgia will ensure that: (i) ADB is kept informed of Georgia's policies and programs for the WSS sector that will materially affect the economic viability of each project and subproject financed under the Facility; and (ii) best efforts are used to sustain and strengthen the WSS sector.

5. Georgia will cause GNEWSRC to strengthen its regulatory function, including tariff setting, and monitoring and enforcing quality of service delivered by service providers.

6. Georgia will cause UWSCG to strengthen its financial management through: (i) adoption of a 3-year business plan by the end of 2013 to improve services, enhance revenue and reduce system loss; and (ii) achieve financial sustainability through attainment of an operating ratio (i.e. the ratio of expenditure over revenue) of 1 by the end of 2019.

7. Georgia will cause UWSCG to improve its service delivery and revenue collection through attainment of an aggregate 90% revenue collection rate per annum from all domestic consumers and non-domestic consumers by the end of 2019.

8. Georgia will cause UWSCG to improve its management of WSS assets through the establishment and implementation of the geospatial WSS management system by the end of 2013.

9. Georgia will ensure that ADB's consent is obtained at least 3 months prior to the implementation of any of the following: (i) any change in the ownership or control of UWSCG or any asset, facility or structure rehabilitated, procured or constructed under the Investment Program; or (ii) any revision of the UWSCG charter, or any change to UWSCG's authority or functions, that may affect implementation of the Investment Program. Georgia will ensure that any such change is carried out in accordance with all applicable laws and regulations of Georgia..

Environmental Protection

10. Georgia will ensure that UWSCG is issued licenses or permits for water abstraction activities by the end of 2011. Georgia will cause UWSCG to ensure that water intake facilities under the Investment Program shall not be commissioned and made operational until it has been issued licenses or permits for water abstraction activities for these facilities.

11. Georgia will cause UWSCG to make best efforts to meet the legal requirements for domestic effluent discharge, bearing in mind the affordability constraints. This includes compliance of UWSCG with the legal requirements for domestic effluent discharge in relation to sewage treatment facilities financed under the Investment Program by the end of 2019.

Good Governance and Anticorruption

12. Georgia will follow ADB's Anticorruption Policy (1998, as amended to date) and acknowledge that ADB, consistent with its commitment to good governance, accountability and transparency, reserves the right to undertake directly, or through its agents, investigation of any alleged corrupt, fraudulent, collusive or coercive practices related to the Investment Program and cooperate with such investigation and extend all necessary assistance, including access to all Investment Program-relevant books and records, and engaging independent experts who may be needed for satisfactory completion of such investigations. All contracts financed by ADB under the Investment Program will include provisions specifying the right of ADB to audit and examine the Investment Program-related records and accounts of the MRDI and UWSCG and all contractors, suppliers, consultants, and other service providers as they relate to the Investment Program.

საქართველოს შინაგნობის
მინისტრი



MINISTER OF FINANCE
OF GEORGIA

№ 07-02/3213

02 03 2011

Asian Development Bank
6 ADB Avenue
Mandaluyong City, Metro Manila

ATTENTION: Mr. Juan Miranda
Director General
Central and West Asia Department

**Subject: Urban Services Investment Improvement Program - Periodic
Financing Request 1**

Dear Mr. Miranda,

Please refer to the Framework Financing Agreement for Urban Services Investment Improvement Program dated 1 March 2011 between Asian Development Bank (ADB) and Georgia. Expressions defined in the FFA shall have the same meanings herein.

Pursuant to the provisions of the FFA, we request ADB to process this Periodic Financing Request (PFR) for a tranche, in the form of a loan from its Special Funds resources. The proposed financing amounts, terms, conditions and financing plan are specified in Attachment A hereto. Descriptions of the components for which financing is hereby requested are also set out in Attachment A hereto.

Sincerely,

Kakha Baindurashvili

Attachment A

Project Description The Project proposed for financing under this PFR comprises:

- (a) Infrastructure Improvement Component
 - Construction of water supply facilities, water treatment facilities and water transmission systems in Anaklia, Marneuli, Mestia and Zugdidi
 - Procurement of vehicles and equipment for water supply and sewerage (WSS) operation and maintenance in Anaklia, Kutaisi, Marneuli, Mestia, Poti and Zugdidi
- (b) Institutional Effectiveness Component
 - Provision of management contractor support to the United Water Supply Company of Georgia Limited Liability Company (UWSCG)
 - Provision of capacity development for the Ministry of Regional Development and Infrastructure (MRDI), Ministry of Environmental Protection and Natural Resources (MEPNR), Ministry of Agriculture (MA), and the Georgia National Energy and Water Supply Regulatory Commission (GNEWSRC) and on regulatory functions
- (c) Project Implementation Support Component
 - Provision of support to UWSCG for detailed engineering, construction supervision, safeguards compliance, preparing subsequent projects of the Investment Program and a public awareness program on health, hygiene, sanitation and water conservation

[The Design and Monitoring Framework for this tranche is in **Annex 1**]

Cost Estimates and Financing Plan The total cost of the projects is estimated at \$105 million [inclusive of taxes, duties, and interest and other charges on the loan during construction]. The detailed cost estimates and financing plan are in **Annex 2**.

(\$ million)				
Project	ADB	Georgia	Total	
Component 1: Infrastructure Improvement	52.97	9.53	62.50	
Component 2: Institutional Effectiveness	11.44	2.06	13.50	
Component 3: Project Implementation Support	10.42	1.88	12.30	
Base Cost	74.83	13.47	88.30	
Contingencies	3.01	11.53	14.54	
Financing Charges	2.17	-	2.17	
Total	80.00	25.00	105.00	

Loan Amount and Terms	The request is for a loan of \$80 million from the Special Funds resources Asian Development Fund (ADF) of the Asian Development Bank (ADB) with a 32-year term, including a grace period of 8 years, an annual interest rate of 1.0% per annum during the grace period and 1.5% per annum thereafter, and such other terms and conditions as agreed in the FFA, and further supplemented under the Loan and Project Agreements.
Period of Loan/Guarantee Utilization	The project is expected to be completed by 31 March 2016. No disbursements from the loan account will be requested or made later than 30 September 2016.
Advance Contracting	Advance contracting is requested for procurement of civil works and goods, and recruitment of consulting services.
Retroactive Financing	Retroactive financing is requested for civil works, goods, and consulting services, not exceeding the amount of \$16 million, incurred before loan effectiveness, but not earlier than 12 months before the signing of the legal agreement.
Implementation Arrangements	The Executing Agency will be the MRDI. The Implementing Agency will be the UWSCG. Implementation arrangements are detailed in the Facility Administration Manual.
Procurement and Consulting Services	The procurement plan is attached as Annex 3 .
Readiness of the Project for Implementation	The following actions have been taken/completed: Component 1: Infrastructure Improvement – Summary of feasibility study for infrastructure components in Marneuli, Zugdidi, Anaklia and Mestia (Annex 4)
Safeguards	Summary Initial Environmental Examinations for the three subprojects is in Annex 5 and the Resettlement Plan for Mestia subproject is in Annex 6 .
Gender and Social Dimensions	The Gender Action Plan is in Annex 7 .

ANNEX 1

DESIGN AND MONITORING FRAMEWORK – Tranche 1

Design Summary	Performance Targets and/or Indicators	Data Sources and/or Reporting Mechanisms	Assumptions and Risks
Impact Improved water supply in Marneuli, Mestia, Zugdidi and Anaklia	By the end of Tranche 1 plus three years (2019): ¹ (i) Population access to 24-hr potable water supply increased from 31% in 2011 to 95% by 2016 (100% female headed households in the region will be covered)	Sex-disaggregated baseline survey conducted at Investment Program inception (2011), completion (2019) and in 2022. Surveys conducted as a part of PPMS and by the UWSCG	Assumptions The Government continues to provide support for an enabling investment climate.
Outcome Improved operations of the UWSCG	By end of Tranche 1 (2016): (i) UWSCG operating ratio improved from 1.8 in 2010 to 1.4 by 2015, indicating improved financial management (ii) UWSCG revenue collection efficiency improved from 49% in 2010 to at least 75% in 2015	UWSCG Annual Reports and audited statements	Assumptions Government ensures water company staff and Management Contractor provides efficient service delivery. Risks Political systems interfere with enforcement of legislative and regulatory control.
Outputs Component 1: Infrastructure Improvement Water intake, treatment and transmission pipeline constructed	 (i) 22,000 cum reservoirs and 8 km of transmission mains are rehabilitated and/or reconstructed (ii) 97 km of transmission mains are newly constructed (iii) 36_MLD capacity water treatment plants constructed (iv) Energy savings achieved through efficient pumping systems (v) Residual chlorine at tail ends of water supply system maintained between 0.2 and 0.4 parts per million	Semiannual progress reports prepared by the UWSCG Disbursement and reimbursement records maintained by UWSCG PPMS reports prepared by UWSCG UWSCG annual work plans As-built drawings developed by contractors	Assumptions Ongoing donor financed projects are efficiently implemented. Risks Sudden increase in cost of construction items.

¹ Baseline will be re-established during socioeconomic surveys conducted as a part of the project performance management system (and will include knowledge, attitude, and practice surveys).

Design Summary	Performance Targets and/or Indicators	Data Sources and/or Reporting Mechanisms	Assumptions and Risks
		Project component completion and commissioning certificates provided by Investment Program Construction Supervision Consultant	
Component 2: Institutional Effectiveness			
Business Plans developed and implemented	(i) UWSCG develops long-term capital improvement plans, asset strengthening plans, resource mobilization and expenditure management plans	Semiannual progress reports prepared by UWSCG UWSCG annual work plans	Risks Poor enrollment in the WSS management program
Financial management improved, MIS and Accounting systems developed	(i) UWSCG operating ratio improved from 1.8 in 2010 to 1.4 by 2015, indicating improved financial management (ii) UWSCG revenue collection efficiency improved from 49% in 2010 to at least 75% in 2015 (iii) Sex-disaggregated consumer database created for UWSCG to develop targeted marketing campaigns for female household heads		
Geospatial WSS utility management systems operationalized	(i) Calibrated network models developed for water and sewerage networks based on GIS maps		
Management capacity of UWSCG enhanced	(i) WSS management program with Georgian universities operationalized (ii) UWSCG staff trained on financial management and accounting (30% number of women) (iii) Sex-disaggregated data base for human resource management in place		
Sector regulatory capacity of GNEWSRC, MEPNR, and MA	(i) GNEWSRC staff approve tariff and monitor WSS service delivery (ii) MEPNR staff monitor		

Design Summary	Performance Targets and/or Indicators	Data Sources and/or Reporting Mechanisms	Assumptions and Risks
developed	treatment facility performance and effluent discharge standards (iii) MA staff monitor drinking water quality standards		
Component 3: Project Implementation Support Public awareness program effectively implemented, materials on hygiene and sanitation disseminated, and women developed as hygiene and sanitation advocates	(i) UWSCG service center in Marneuli, Mestia, Zugdidi, and Anaklia has a customer care unit staffed by women (at least 30%), which disseminates IEC on water, hygiene and sanitation practices (ii) Public awareness program (targeting women as household managers) rolled out in all investment Program towns	Semiannual progress reports prepared by UWSCG PPMS reports prepared by UWSCG UWSCG annual work plans	Assumption Nongovernment organizations actively involved in educating beneficiaries on project benefits

Activities and Milestones:	Inputs
Component 1: Infrastructure Improvement <ul style="list-style-type: none"> Water intake, treatment and transmission main constructed (January 2014) Equipment for system performance monitoring and improvement procured (July 2011) Component 2: Institutional Effectiveness <ul style="list-style-type: none"> Management Contractor appointed (January 2012) Sex-disaggregated consumer database created (January 2012) MIS and revenue enhancement plans rolled out (January 2013) Component 3: Investment Project Implementation <ul style="list-style-type: none"> Sex-disaggregated baseline surveys conducted (October 2011) Detailed Engineering Design consultants appointed (October 2010) Supervision Engineers appointed (July 2011) GAP targets confirmed (December 2013) 	ADB ADF loan: \$80 million Government: \$25 million Total: \$105 million

cum = cubic meter, IEC = information, education and communication, GAP = gender action plan, GNEWSRC = Georgia National Energy and Water Supply Regulatory Commission, km = kilometer, MLD = million liters per day, MA = Ministry of Agriculture, MEPNR = Ministry of Environmental Protection and Natural Resources, PPMS = project performance management system, UWSCG = United Water Supply Company of Georgia LLC, WSS = water supply and sanitation

Source: Asian Development Bank estimates.

ANNEX 2

COST ESTIMATES – TRANCHE 1

A. Detailed Cost Estimates by Expenditure Category

Items	Total Cost	% of Total Base Cost
A. Investment Costs		
1 Civil Works	57.50	65.10
2 Equipment and Machinery	5.00	5.70
3 Environment and Social Mitigation	0.50	0.60
4 Consultants	24.50	27.70
Subtotal (A)	87.50	99.10
B. Recurrent Costs		
1 IPMO Consultants	0.80	0.90
2 System Operation and Maintenance	-	-
Subtotal (B)	0.80	0.90
Total Base Cost	88.30	100.00
C. Contingencies		
1 Physical	9.28	-
2 Price	5.26	-
Subtotal (C)	14.54	-
D. Financing Charges During Implementation		
1 Interest During Construction	2.17	-
2 Commitment Charges	-	-
Subtotal (D)	2.17	-
Total Project Cost (A+B+C+D)	105.00	-

Source: United Water Supply Company of Georgia and Asian Development Bank estimates.

B. Allocation and Withdrawal of Tranche 1 Loan Proceeds

Number	Category	Total Amount Allocated for ADB Financing (SDR)	ADB Financing Percentage and Basis for Withdrawal from the Loan Account
1	Works	31,274,000	84.75%
2	Goods	2,719,000	84.75%
3	Consulting Services	14,030,000	84.75%
4	Interest	1,393,000	100.00%
5	Unallocated	1,927,000	
	Total	51,343,000	

Source: United Water Supply Company of Georgia and Asian Development Bank estimates.

C. Detailed Cost Estimates by Financier

		\$ million				
	Item	Total Cost	ADB		Government	
			Amount	% of Cost Category	Amount	% of Cost Category
A.	Investment Costs					
1	Civil Works	57.50	48.73	84.75	8.77	15.25
2	Equipment and Machinery	5.00	4.24	84.75	0.76	15.25
3	Environment and Social Mitigation	0.50	0.42	84.75	0.08	15.25
4	Consultants	24.50	20.76	84.75	3.74	15.25
	Subtotal (A)	87.50	74.15	84.75	13.35	15.25
B.	Recurrent Costs					
1	IPMO Consultants	0.80	0.67	84.75	0.12	15.25
2	System Operation and Maintenance	-	-	-	-	-
	Subtotal (B)	0.80	0.67	84.75	0.12	15.25
	Total Base Cost	88.30	74.83	84.75	13.47	15.25
C.	Contingencies					
1	Physical	9.28	-	-	9.28	100.00
2	Price	5.26	3.01	57.20	2.25	42.80
	Subtotal (C)	14.54	3.01	20.70	11.53	79.30
D.	Financing Charges During Implementation					
1	Interest During Implementation	2.17	2.17	100.00	-	-
2	Commitment Charges	-	-	-	-	-
	Subtotal (D)	2.17	2.17	100.00	-	-
Total Project Cost (A+B+C+D)		105.00	80.00	76.20	25.00	23.80

Source: United Water Supply Company of Georgia and Asian Development Bank estimates.

D. Detailed Cost Estimates by Outputs/Components

Item	Total Cost	Water		Sanitation	
		Amount	% of Cost Category	Amount	% of Cost Category
A. Investment Costs					
1 Civil Works	57.50	57.50	65.88	-	-
2 Equipment and Machinery	5.00	3.00	3.40	2.00	11.29
3 Environment and Social Mitigation	0.50	0.25	0.20	0.25	1.41
4 Consultants	24.50	12.25	14.03	12.25	69.13
Subtotal (A)	87.50	73.00	83.64	14.50	81.83
B. Recurrent Costs					
1 IPMO Consultants	0.80	0.40	0.45	0.40	2.26
2 System Operation and Maintenance	-	-	-	-	-
Subtotal (B)	0.80	0.40	0.45	0.40	2.26
Total Base Cost	88.30	73.40	84.10	14.90	84.10
C. Contingencies					
1 Physical	9.28	7.71	8.83	1.57	8.90
2 Price	5.26	4.37	5.00	0.89	5.02
Subtotal (C)	14.54	12.08	13.84	2.46	13.89
D. Financing Charges During Implementation					
1 Interest During Implementation	2.17	1.80	2.01	0.37	2.10
2 Commitment Charges	-	-	-	-	-
Subtotal (D)	2.17	1.80	2.01	0.37	2.10
Total Project Cost (A+B+C+D)	105.00	87.28	100.00	17.72	100.00

Source: United Water Supply Company of Georgia and Asian Development Bank estimates.

ANNEX 3

PROCUREMENT PLAN

Basic Data

Project Name: Urban Services Improvement Investment Program	
Country: Georgia	Executing Agency: Ministry of Regional Development and Infrastructure
Loan Amount: \$80 million	Loan Number: TBC
Date of First Procurement Plan: loan approval date	Date of this Procurement Plan: 24 February 2011

1. Process Thresholds, Review and 18-Month Procurement Plan

a. Project Procurement Thresholds

1. Except as the Asian Development Bank (ADB) may otherwise agree, the following process thresholds shall apply to procurement of goods and works.

Procurement of Goods and Works

Method	Threshold
International Competitive Bidding (ICB) for Works	Above \$1,000,000
International Competitive Bidding for Goods	Above \$500,000
National Competitive Bidding (NCB) for Works	Beneath that stated for ICB, Works
National Competitive Bidding for Goods	Beneath that stated for ICB, Goods
Shopping for Works	Below \$100,000
Shopping for Goods	Below \$100,000

b. ADB Prior or Post Review

2. Except as ADB may otherwise agree, the following prior or post review requirements apply to the various procurement and consultant recruitment methods used for the project.

Procurement Method	Prior or Post	Comments
Procurement of Goods and Works		
ICB Works	Prior	ADB SBD
ICB Goods	Prior	ADB SBD
NCB Works	Prior and Post	ADB SBD (prior followed by post)
NCB Goods	Prior and Post	ADB SBD (prior followed by post)
Shopping for Works	Post	ADB SBD
Shopping for Goods	Post	ADB SBD
Recruitment of Consulting Firms		
Quality- and Cost-Based Selection (QCBS)	Prior	RFP
Quality-Based Selection (QBS)	Prior	RFP
Other selection methods: CQS, LCS, FBS and SSS	Prior	RFP
Recruitment of Individual Consultants		
Individual Consultants	Prior	ToR

ADB = Asian Development Bank, Consultants Qualifications = CQS, Fixed Budget = FBS, Least-Cost Selection = LCS, RFP = Request for Proposal, SBD = Standard Bidding Document, Single Source Selection = SSS, ToR = Terms of Reference.

c. Goods and Works Contracts Estimated to Cost More Than \$1 Million

3. The following table lists goods and works contracts for which procurement activity is either ongoing or expected to commence within the next 18 months.

General Description	Contract Value	Procurement Method	Prequalification of Bidders (y/n)	Advertisement Date (quarter/year)	Comments
Procurement of vehicles and equipment for system maintenance	[This information was deemed confidential according to exception # 10 of paragraph 126 of ADB's Public Communications Policy (2005)]	ICB - Goods	N	Q3/2010	Advance actions and retroactive financing. 4 packages
Procurement of water laboratory equipment		ICB - Goods	N	Q1/2011	1 package
Procurement of civil works for surface water intake, transmission and treatment		ICB - Works	N	Q3/2011	1 package in Marneuli and 1 package in Mestia
Procurement of civil works for surface water intake, transmission and treatment		ICB - Works	Y	Q3/2011	1 package for Zugdidi

d. Consulting Services Contracts Estimated to Cost More Than \$100,000

4. The following table lists consulting services contracts for which procurement activity is either ongoing or expected to commence within the next 18 months.

General Description	Contract Value	Recruitment Method	Advertisement Date (quarter/year)	International or National Assignment	Comments
Design Engineering Consultant	[This information was deemed confidential according to exception # 10 of paragraph 126 of ADB's Public Communication s Policy (2005)]	QCBS (80:20)	Q2/2010	International	Advance actions and retroactive financing.
Construction Supervision Consultant		QCBS (80:20)	Q2/2011	International	-
Management Contractor		QCBS (80:20)	Q1/2011	International	ADB staff / staff consultant will be an observer in the CSC
Consultants for the public awareness program		QCBS (80:20)	Q2/2011	National	-
Consultants for the baseline surveys		QCBS (80:20)	Q2/2011	National	-
Consultants for auditing		QCBS (80:20)	Annually	National	To conduct UWSCG and Project Accounts auditing

QCBS = Quality and Cost Based Selection.

e. **Goods and Works Contracts Estimated to Cost Less than \$1 Million and Consulting Services Contracts Less than \$100,000**

5. The following table groups smaller-value goods, works and consulting services contracts for which procurement activity is either ongoing or expected to commence within the next 18 months.

General Description	Value of Contracts (cumulative)	Number of Contracts	Procurement / Recruitment Method	Comments
Consultants to support the IPMO	[This information was deemed confidential according to exception # 10 of paragraph 126 of ADB's Public Communications Policy (2005)]	Minimum 4	-	Individual consultants
Consultants to support on capacity building and PPP transaction advisory		Minimum 6	-	Individual consultants
Consultants for conducting the WSS Management Program		Minimum 3	-	Individual consultants

IPMO = Investment Program Management Office.

2. **Indicative List of Packages Required Under the Project**

6. The following table provides an indicative list of all procurement (goods, works and consulting services) over the life of the project. Contracts financed by the Borrower and others should also be indicated, with an appropriate notation in the comments section.

General Description	Estimated Value (cumulative)	Estimated Number of Contracts	Procurement Method	Domestic Preference Applicable	Comments
Goods					
Procurement of vehicles and equipment for system maintenance	[This information was deemed confidential according to exception # 10 of paragraph 126 of ADB's Public Communications Policy (2005)]	4	ICB	N	-
Procurement of water laboratory equipment		1	ICB	N	-
Works					
Procurement of civil works for surface water intake, transmission and treatment	[This information was deemed confidential according to exception # 10 of paragraph 126 of ADB's Public Communications Policy (2005)]	2	ICB	N	1 package for Marneuli and 1 package for Mestia.
Procurement of civil works for surface water intake, transmission and treatment		1	ICB	N	1 package for Zugdidi.

General Description	Estimated Value (cumulative)	Estimated Number of Contracts	Recruitment Method	Type of Proposal	Comments
Design Engineering Consultant	[This information was deemed confidential according to exception # 10 of paragraph 126 of ADB's Public Communications Policy (2005)]	1	QCBS (80:20)	FTP	International = 36 pm and National = 113 pm
Construction Supervision Consultant		1	QCBS (80:20)	FTP	International = 60 pm and National = 720 pm
Management Contractor		1	QCBS (80:20)	FTP	International = 1,404 pm
Consultants for the public awareness program		1	QCBS (80:20)	STP	National = 200 pm
Consultants to support the IPMO		Minimum 4	-	-	-
Consultants to support on capacity building and PPP transaction advisory		Minimum 6	-	-	-
Consultants for conducting the WSS Management Program		Minimum 3	-	-	-
Consultants for the baseline survey		1	QCBS (80:20)	National	-

3. National Competitive Bidding

a. General

7. The procedures to be followed for national competitive bidding shall be those set forth in the Law of Georgia on State Procurement January 1, 2006 with the clarifications and modifications described in the following paragraphs required for compliance with the provisions of the ADB's *Procurement Guidelines* (April 2010, as amended from time to time).

b. Eligibility

8. The eligibility of bidders shall be as defined under section I of ADB's *Procurement Guidelines*, published by ADB (April 2010, as amended from time to time); accordingly, no bidder or potential bidder should be declared ineligible to ADB-financed contracts for other reasons than the ones provided by section I of ADB's *Procurement Guidelines*. Bidders must be nationals of member countries of ADB, and offered goods and services must be produced in and supplied from member countries of ADB. For loan from Special Funds resources, refer to eligibility defined in clauses 1.2 (a) and 2.11 (a) of ADB's *Procurement Guidelines*.

c. Prequalification

9. Normally, post-qualification shall be used unless explicitly provided for in the loan agreement/procurement plan. Irrespective of whether post qualification or prequalification is used, eligible bidders (both national and foreign) shall be allowed to participate.

d. Registration and Licensing

- (i) Bidding shall not be restricted to pre-registered/licensed firms.
- (ii) Where registration or licensing is required, bidders (i) shall be allowed a reasonable time to complete the registration or licensing process; and (ii) shall not be denied registration/licensing for reasons unrelated to their capability and resources to successfully perform the contract, which shall be verified through post-qualification.
- (iii) Foreign bidders shall not be precluded from bidding. If a registration or licensing process is required, a foreign bidder declared the lowest evaluated bidder shall be given a reasonable opportunity to register or to obtain a license without unreasonable cost and additional requirements.

e. Bidding Period

10. The minimum bidding period is twenty-eight (28) days prior to the deadline for the submission of bids.

f. Bidding Documents

11. Procuring entities should use standard bidding documents for the procurement of goods, works and services acceptable to ADB.

12. The term "services" above are applicable to the following: (a) related services (for supply of goods and works) such as transportation, insurance, installation, commissioning, training and initial maintenance, and (b) other services such as drilling, mapping, and similar operations.

g. Preferences

13. No domestic preference shall be given for domestic bidders and for domestically manufactured goods.

h. Advertising

14. Invitations to bid shall be advertised in at least one widely circulated national daily newspaper or freely accessible, nationally-known website allowing a minimum of twenty-eight (28) days for the preparation and submission of bids.

15. Bidding of NCB contracts estimated at US\$500,000 equivalent or more for goods and related services or US\$1,000,000 equivalent or more for civil works shall be advertised on ADB's website via the posting of the Procurement Plan.

i. Bid Security

16. Where required, bid security shall be in the form of a bank guarantee from a reputable bank.

j. Bid Opening and Bid Evaluation

- (i) Bids shall be opened in public.
- (ii) Evaluation of bids shall be made in strict adherence to the criteria declared in the bidding documents and contracts shall be awarded to the lowest evaluated bidder who meets the qualifying criteria stated in the bid documents.
- (iii) Bidders shall not be eliminated from detailed evaluation on the basis of minor, non-substantial deviations.
- (iv) No bidder shall be rejected on the basis of a comparison with the employer's estimate and budget ceiling without ADB's prior concurrence.
- (v) A contract shall be awarded to the technically responsive bid that offers the lowest evaluated price and no negotiations shall be permitted.
- (vi) Price verification shall not be applied.

k. Rejection of All Bids and Rebidding

17. Bids shall not be rejected and new bids solicited without ADB's prior concurrence.

l. Participation by Government-owned enterprises

18. Government-owned enterprises in Georgia shall be eligible to participate as bidders only if they can establish that they are legally and financially autonomous, operate under commercial law and are not a dependent agency of the contracting authority. Furthermore, they will be subject to the same bid and performance security requirements as other bidders.

m. Right to Inspect/Audit

19. A provision shall be included in all NCB works and goods contracts financed by ADB requiring suppliers and contractors to permit ADB to inspect their accounts and records and other documents relating to the bid submission and the performance of the contract, and to have them audited by auditors appointed by ADB.

n. Fraud and corruption

- (i) The Borrower shall reject a proposal for award if it determines that the bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the contract in question.
- (ii) ADB will declare a firm or individual ineligible, either indefinitely or for a stated period, to be awarded a contract financed by ADB, if it at any time determines

that the firm or individual has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive or obstructive practices in competing for, or in executing, an ADB-financed contract.

20. For purposes of the provisions in (a) and (b) above, the definitions of the terms "fraudulent practice", "corrupt practice", "collusive practice", and "coercive practice" are the definitions given in ADB's Procurement Guidelines.

o. Conflict of Interest

21. ADB's rule in respect of "Conflict of Interest" as stipulated in ADB's Standard Bidding Documents for Procurement of Goods, Civil Works, and Plant-Design, Supply and Install shall be applicable.

p. Disclosure of Decision on Contract Awards

22. At the same time that notification on award of contract is given to the successful bidder, the results of bid evaluation shall be published in a local newspaper, or a well-known freely accessible website identifying the bid and lot numbers and providing information on (i) name of each Bidder who submitted a Bid, (ii) bid prices as read out at bid opening; (iii) name of bidders whose bids were rejected and the reasons for their rejection, and (iv) name of the winning Bidder, and the price it offered, as well as duration and summary scope of the contract awarded. The executing agency/implementing agency/contracting authority shall respond in writing to unsuccessful bidders who seek explanations on the grounds on which their bids are not selected.

4. Review of Contract Modifications

1. ADB will review contract modifications in accordance with the procedures set forth in the loan agreement between the Borrower and ADB.

ANNEX 4

SUMMARY OF FEASIBILITY STUDIES

I. MARNEULI

A. Overview

1. Marneuli is a city in the Kvemo Kartli region of southern Georgia and is the administrative center of Marneuli District, bordering neighboring Azerbaijan and Armenia. The United Water Supply Company of Georgia (UWSCG), Marneuli office services the city (21,300 persons) and 14 villages in the vicinity (27,670 persons). Marneuli and adjacent villages were once home to a variety of Soviet-era industries. Most of these industries have now closed. However, there is a plan to revive agro-based industries in the region given its unique economy.

B. Socioeconomic Profile

1. Household Characteristics

2. The majority of the population is ethnic Azeri and the primary form of employment is small-scale agriculture. The number of urban households, based on the 2002 national census data, is 6 031. According to the PATA survey, the household size was 4.2 in Marneuli which is above the average of 3.5.

2. Access to Water and Sanitation Services

3. The majority (89.4%) of households were supplied with tap water from the UWSCG of which only 17.2% were satisfied with the current water supply. The pipes are very old and damaged which result in leakage and muddy water. In contrast, a significantly lower percentage (17.6%) had access to inside sanitation facilities.

4. The water supply is scheduled and limited to 3-4 days a week for a few hours. The average water consumption rate per household was 544 litres a day in summer and 297 litres a day in winter. The difference is attributed to the fact that more water is usually consumed during the summer period when it is warmer and some may use the water for their gardens which they cultivate.

3. Health and Hygiene

5. Among the towns selected for the socioeconomic survey,¹ the highest incidents of sickness due to poor water and sanitation were reported in Marneuli. 8.8% of the surveyed adults and 10.3% of the children had fallen ill due to waterborne diseases over the last year, which in turn led to lost working days or school days.

4. Education and Employment

6. The education level is somewhat lower in Marneuli, especially among females – 14.2% had non-complete secondary education. Furthermore, 20.1% of men and 9.4% of women had achieved high education. This is partly explained by the early marriage age. Despite the recent

¹ ADB. 2010. *PATA for Developing an Urban Water Supply and Sanitation Sector Strategy and Regulatory Framework for Georgia*. Manila.

change in trend, many Azeri women often get married before leaving school and forgo the opportunity of further education.

7. According to the socioeconomic survey, 20.0% of households have no household member employed whereas 80.0% have at least one member of household who works. 1.8% had at least one household member who had an additional occupation. The majority of the population is employed in trade, followed by health care and processing industry.

C. Water Supply

1. Service Delivery

8. **Water Production.** UWSCG provides ground water based supply to Marneuli city's residential population and the 14 villages, adjoining the city. UWSCG provides 14,650 cum/day water from three sources: (i) Kolagiri; (ii) Orjonikidze; and (iii) a private supply.

9. **Water distribution.** The Marneuli service area is divided into 3 water supply zones. The approximate length of the existing water supply distribution network is 180 km including localized distribution networks for the city and 14 villages. The existing water storage capacity is 3,960 cum. Most zones receive 4-5 hours of water supply two to three times a week.

10. **Connections.** Water is supplied through 6,200 water connections comprising domestic (~99 percent), and industrial (~1 percent). There are no residential meters, but of the registered industrial customers, just over 50 percent are metered. Based on household figures for 2002 (10,310), water connection coverage is estimated to be 65 percent.

11. Following are recently completed, ongoing or proposed projects by various organizations.

- (i) **Municipal Development Fund.** With financing from World Bank and ADB, 12 km of the city's internal distribution network was replaced in 2007-2009.
- (ii) **European Investment Bank.** The works proposed for Marneuli city improvement include rehabilitation of the Kolagiri headworks and replacement of the 8.5km transmission main from Kolagiri to the two city reservoirs and 3km of the main water supply line on Rustaveli Street.
- (iii) **Local government funds** have been used to replace small sections of pipelines in several of the southern villages (~15 km of pipelines). Shulaveri village was recently allocated municipal funds to rehabilitate their water distribution network but have yet to develop a design.

2. Service Adequacy

12. The entire water supply system is pressurized and the estimated gross water supply through the piped system is currently estimated at 280 liters per capita per day (lpcd). In the absence of flow measurements, the systems reporting frequent leaks and breakdowns, it is estimated that the Non-Revenue Water (NRW) to be over 60%.

13. In Marneuli city, about 50% of the residential population receives water thrice a week for 4-5 hours; the remaining 50% population receives water twice a week for 4-5 hours.

14. In the villages, the water distribution varies significantly based on neighborhood locations. A few villages receive water for 10-12 hours/day while certain others receive water 2-3 days a week and the duration ranging from 4-10 hours/day.

15. **Reduced water abstraction.** Over the last few years, the abstraction of water has reduced considerably due to lack of regular maintenance. All boreholes in Orjonikidze and a few boreholes in Kolagiri water works are non-functional.

16. **Water quality.** Prior to 2007, the UWSCG used to collect water samples on a weekly basis and perform analyses at the Marneuli water company laboratory. Due to a paucity of funds, the laboratory was disbanded. Today ~3-4 samples are processed monthly. At the Kolagiri headworks, the automated chlorine dosage of water functioned from 1988-1998. Currently the UWSCG staff use pressurized 100 liter tanks of chlorine, whenever possible.

17. The following system inefficiencies exist in Marneuli:

- (i) Shortage of water production because the infiltration slots of all Kolagiri boreholes are clogged resulting in lower yield than the design capacity.
- (ii) Due to the aging of pipes, the bursting of pipes is frequently reported, resulting in significant loss of water in transmission. Uncontrolled tapping of water along the transmission main exists.
- (iii) The existing storage facility is insufficient. The city also requires additional storage facilities of 5300 cum.
- (iv) About 90% of the Marneuli city is covered by the water distribution network but the pipes are old and require rehabilitation or replacement.
- (v) There is complete lack of flow measurement, which negatively impacts the UWSCG's ability to detect leaks.
- (vi) Inefficient and old pumping machineries result in high operating costs.
- (vii) Currently, the water is treated by a crude method. There is a need to have adequate treatment facilities.
- (viii) Laboratories with adequately trained staff are to be provided at Kolagiri and Orjonikidze headworks.

3. Subcomponent Rationale and Design Criteria

18. The following sub-project rationale and design criteria were adopted for the water supply system:

- (i) To meet the demand for water, the proposed supply at consumer end to be designed at 200 lpcd.
- (ii) Increase in abstraction of water from the existing sources to meet water demand.
- (iii) Progressive reduction in NRW from the current estimated 60% to 30%. The reduction is proposed by (a) district/ bulk metering; (b) hydraulic zoning; (c) leak detection and rectification; and (d) consumer metering.
- (iv) Based on the availability of additional water saved through NRW, the expansion of water supply network to uncovered areas and to the poor people is to be proposed.

D. Sewerage and Sanitation

1. Service Delivery

19. **Sewerage System.** The sewerage system in Marneuli city was developed in 1986. The system covers only 3.5 sq. km area and caters to 20% of the city population. The sewerage system covers a length of 24 km and the sewerage outfall discharge untreated sewage into the Algeti river. The existing trunk sewer runs 10km from north to south east of Marneuli. The pipe diameter of the trunk sewer ranges from 200mm - 800mm. There is no sewage treatment facility.

20. **Sanitation.** It is estimated that approximately 3,600 households in Marneuli city (80%) have access to individual sanitation facilities, or pit latrines, within their premises. In the absence of any information on ground water quality and health data for the region, it is difficult to measure any pollution of ground water or occurrence of health impacts.

2. Service Adequacy

21. The existing sewerage system covers only 20% of the population and generates about 4,380 m³/day sewage. Of this, only 415 m³/day sewage is conveyed through the system. The existing trunk sewer can take additional sewage load of 15,000 m³/day.

3. Subproject Rationale and Design Criteria

22. The overall development concept of Marneuli sewerage system premises on safe and scientific collection, treatment and disposal of sewage generated in the Marneuli urban area. Key principles include:

- (i) Design of sewerage system utilizing the existing sewerage infrastructure to a maximum extent.
- (ii) Bringing maximum population under coverage through better zoning and design.
- (iii) Providing on-site/individual disposal facilities in areas with low population density that can not technically be provided with a sewer network due to inadequate flow.
- (iv) Optimizing the entire system through life-cycle cost analysis.
- (vi) Design of sewage treatment facility that suits local conditions (climate).
- (vii) Not permitting industrial process discharges into the sewerage system.

E. WSS Infrastructure Improvement

1. Overall Requirement

23. The landed cost for WSS infrastructure improvement in Marneuli (excluding consulting and management cost) is estimated as \$95.832 million. Capital cost comprises: (i) physical infrastructure, consisting of civil works, materials and equipment; (ii) physical and price contingencies; (iii) financing charges; and (iv) taxes and duties. The subproject capital cost is summarized in Table 1.

Table 1: Subproject Capital Cost
\$ million

Particulars	Cost	% Total
Civil Works and Equipment		
Water Supply System		
Water intake facilities	1.151	1.20
Water transmission system	3.680	3.84
Water distribution network	23.642	24.67
Sewerage and Sanitation		
Sewer network	20.295	21.18
Sewage treatment plant	18.949	17.69
WSS Vehicles and Equipment	0.779	0.81
Total Base Cost	66.496	68.39
Contingencies		
Physical Contingency	6.572	6.86
Price Contingency	6.027	6.29
Financing Charges	2.501	2.61
Taxes and Duties	14.237	14.86
Total Landed Cost	95.832	100.00

Source: PPTA estimates.

2. Project 1 Design

24. The subproject for Marneuli to be financed by the first tranche will benefit Marneuli Town and villages in the urban periphery. It is estimated to cost \$11.745 million (Table 2). This subproject will improve the service standards with a daily supply of potable water in adequate quantity (200 lpcd) at requisite pressure. The subproject is designed to meet the projected demand of 2040. This will be achieved by:

- (i) rehabilitating existing bore holes, reservoirs and pumping stations;
- (ii) constructing new reservoirs and pumping stations,
- (iii) laying of a new transmission from Orjonikizde headworks to Narimanov Pumping Station, and
- (iv) constructing disinfection and laboratory facilities.

Table 2: Tranche 1 Subproject Capital Cost
(\$ million)

Particulars	Amount	% Total
Civil Works and Equipment		
Water Supply System	6.000	51.09
WSS Vehicles and Equipment	0.911	7.76
Consulting and Management costs	2.418	20.59
Total Base Cost	8.274	70.45
Physical Contingency	0.750	6.39
Price Contingency	0.709	6.04
Total Contingencies	1.459	12.42
Interest During Construction	0.260	2.21
Taxes and Duties	1.752	14.92
Total Cost	11.745	100.00

WSS = water supply and sanitation.

Source: PPTA estimates.

25. **Financing plan.** The investment will be financed by an ADF loan and a government contribution. **Table 3** provides details of the financing plan for the subproject financed by tranche 1 loan.

Table 3: Subproject Financing Plan
(\$ million)

Particulars	Amount	% Total
Amount to be financed:		
Investment In Project	11.485	97.8%
IDC	0.260	2.2%
Balancing Amount		
Total Capital Investment	11.745	100.0%
Financed by:		
ADB	9.046	77.0%
Disbursement	8.786	74.8%
IDC	0.260	2.2%
Government	2.699	23.0%
Total Financed	11.745	100.0%

ADB = Asian Development Bank, IDC = interest during construction

Source: PPTA estimates.

F. Financial Analysis for Project 1

26. The analysis was conducted on a without-project and with-project basis by estimating incremental costs and revenues over 25 years. The main financial viability parameters analyzed were (i) the financial internal rate of return (FIRR), which should be greater than the weighted average cost of capital (WACC) with the financial net present value as proxy; (ii) operating ratio, which should be less than or equal to one when the Investment Program becomes fully operational; and (iii) tariff affordability, normally considered affordable if the resulting monthly charge is 5% or less than the average monthly household income. The analysis looked closely at the operating ratio as a main indicator of sustainability.

27. Revenues were based on domestic and non-domestic demand for water and sewerage services. Tariffs are programmed to increase every 2 years to cover (i) operation and maintenance costs; (ii) operation and maintenance costs plus depreciation; and (iii) operation and maintenance costs plus total debt service. Tariff increments are benchmarked on domestic customers' affordability and targeted cost recovery level. The demand forecast assumes that all water from existing alternative sources will be replaced with subproject water supply.

28. **Weighted average cost of capital.** The WACC was calculated in real terms and was used as the hurdle rate for the FIRR to measure subproject viability. Funding sources are the ADF loan and government contribution. Average inflation is estimated at 1.0% for foreign cost and at 5.0% for local costs. The rates are computed on after-tax basis, resulting in the WACC in real terms estimated at 2.30% for tranche 1 loan and presented in **Table 4**.

Table 4: Weighted Average Cost of Capital

Particulars	Capital	% Total	Nominal Rate	Tax Rate	After Tax	Inflation rate	Real Rate	WACC Real
ADB	80.00	76%	1.30%	20%	1.04%	1.0%	0.0%	0.03%
Government	25.00	24%	15.00%	0%	15.00%	5.0%	9.5%	2.27%
Total	105.00							2.30%

WACC = weighted average cost of capital. Estimated for tranche 1 loan.

Source: PPTA estimates.

29. **Operation and maintenance costs.** Subproject operation and maintenance costs include service center staff salaries, power and energy, chemical treatment, maintenance, and miscellaneous expenses.

30. **Current tariffs.** Current water tariffs in the subprojects, effective September 2010, are differentiated between domestic (metered and unmetered) and nondomestic (metered) use. Domestic customers are not yet metered while nondomestic customers are all metered as of September 2010. For domestic customers, UWSCG has set the per cubic meter tariff for water supply and sanitation (WSS) at \$0.15 /m3 (\$0.11 /m3 for water and \$0.04/m3 for sanitation) while un-metered domestic customer is charged \$1.01 /person/month for water supply and \$0.13 to \$0.36 /person/month for sanitation. Nondomestic customers are charge the maximum rate of \$1.94 /m3 for water and \$0.51 /m3 for sanitation or a total of \$2.45 /m3.

31. **Proposed tariff rate increases.** In the financial projections, where revenues and costs are given in nominal terms, the tariffs are projected to increase biennially to cover O&M cost and total debt service.

32. **Affordability analysis.** An affordability analysis was undertaken to compare the level of household water expenditure with the average household income. **Table 5** presents the affordability levels in each subproject for years 2014, 2020, and 2025.

Table 5: Tariff Affordability

Particulars	2014	2020	2025
Persons per household	4.2	4.2	4.2
Consumption, lpcd	100.0	100.0	100.0
Tariff rate \$/m3 (metered)	0.2	0.4	0.6
Tariff rate \$/person/month (unmetered)	1.19	2.23	3.53
Ave. consumption/month-m3	12.6	12.6	12.6
Ave. HH income/month-\$	316.3	335.8	352.9
Coping Strategy-\$/m3 ^a	5.7	-	-
Willingness to pay-\$/month/HH ^a	2.9	-	-
Ave. HH water bill/month-metered-\$	2.6	4.9	7.8
Ave. HH water bill/month-unmetered-\$	5.0	9.4	14.8
% of income spent for WS metered	0.8%	1.5%	2.2%
% of income spent for WS unmetered	1.6%	2.8%	4.2%

Ave. = average, HH = household, lpcd = liters per capita per day, m³ = cubic meter, WS = water supply.

^a based on focus group discussions; lpcd=liters per capita per day; HH=household; WS=water supply; m3=cubic meter.

Source: PPTA estimates.

33. From the analysis, tariff increases required for the subproject is within consumer affordability but will not generate enough revenues to cover O&M cost and total debt service. A viability gap funding was therefore considered during and after the project implementation to cover O&M cost and total debt service. Politically, exponential increases are unacceptable, and it is proposed that viability gap funding will provide the buffer to meet required operating ratios before financial reforms and progressive tariff increases reduce dependence on subsidies.

34. The period of analysis to determine the VGF is from 2011 to 2017 and from 2018 to 2025. Table 6 shows that for Marneuli subproject, for example, the average annual revenue from 2011 to 2017 is about \$ 0.996 million, O&M is about \$ 0.934 million, and O&M plus total debt service payment is about \$ 0.973 million for the same period. However, Marneuli subproject needs a VGF of \$ 2 million per year from 2011 to 2013 to attain a financial internal rate of return (FIRR) greater than WACC.

Table 6: Cost Recovery Tariffs and Required Annual Viability Gap Fund

Subproject	Period (Year)	Average Annual Revenue	Average Annual O&M	Average Annual O&M + TDS	FIRR 2011-2035	VGF (FIRR>WACC)	
						Average Annual VGF 2011 to 2013	FIRR 2011-2035
		\$ million	\$ million	\$ million	%	\$ million	%
Marneuli	2011 to 2017	0.996	0.934	0.973	(-)	2.000	5.12%
	2018 to 2025	2.064	1.289	1.636			

O&M=operation and maintenance; TDS=total debt service; VGF=viability gap fund.

Source: PPTA estimates.

35. **Sensitivity Analysis.** Table 7 provides the results of sensitivity tests and indicates that subprojects are highly sensitive to adverse economic conditions as shown below. The sensitivity analysis assumes that the VGF will be provided by the government.

Table 7: Subproject Financial Internal Rate of Return

Particulars	FIRR	FNPV (\$ million)
Base case	5.1%	1.88
Capital cost plus 20%	2.2%	0.01
O&M cost plus 10%	3.5%	0.79
Revenue less 10%	2.5%	0.19
1-Year delay in benefit	3.5%	0.91
Switching value-Capital cost	20.1%	
Switching value-Revenue	-11.1%	
WACC	2.2%	

FIRR=financial internal rate of return; FNPV=financial net present value; Switching value=change in parameter that will make the FIRR equal to the WACC.

36. **Conclusion.** The subproject is financially viable when (i) tariff increases are implemented every 2 years starting in 2013 until 2025 and should be affordable to domestic consumers; and (ii) the Government should make available VGF which include counterpart funds, subventions for O&M and total debt service to ensure service sustainability. The reform plans and related issues have been discussed and agreed with the Executing Agency with the

aim of achieving financial sustainability of the overall investment. Income affordability is a major factor in rationalizing tariffs, thus the monthly household income needs to be reviewed periodically. The sensitivity analysis indicates that the subproject FIRR is above the WACC even under adverse economic conditions.

G. Economic Analysis for Project 1

37. The analysis describes the economic rationale and undertakes a viability analysis of the subproject. A sensitivity analysis was conducted to determine the effects of several adverse economic conditions on the overall subproject viability.

38. **Economic rationale.** The Investment Program economic rationale was based on: fostering economic growth, supporting tourism development, improving urban water supply and sanitation (WSS) services, and improving institutional effectiveness.

39. **Project alternatives.** The Investment Program will (i) improve urban water supply and sanitation infrastructure; and (ii) improve service delivery through better resource management. For the Marneuli subproject 1, the component choice was based on the following decisions: replacing transmission mains and pumps, rehabilitating boreholes and reservoirs, and constructing treatment facilities, providing vehicles, tools, and equipment, and capacity development.

40. **Economic Benefits.** Economic benefits of the subprojects include water sales revenue and consumer surplus, savings on time spent for water collection, savings on wells/boreholes, pump and water storage tank investment, and operations and maintenance (O&M) costs, and health benefits.

Table 8: Economic Data
(in \$)

Item	Value
Household Monthly Income (2010)	267
Coping strategy	
Well/Borehole	610
Water Pump	142
Water Storage Tank	95
Annual Medical Cost	
Amount	94
% of HH Income	2.9%

Source: PPTA estimates.

41. **Economic Costs.** The economic capital investment and annual operation and maintenance costs were derived from the financial cost estimates using the following methodology: taxes and duties are excluded from the financial as well as price inflation, the subproject capital and operation and maintenance costs are distributed into traded and nontraded components and labor, unskilled labor is available in urban centers, which means the opportunity cost is lower than the wage rate, and the economic costs are given in real terms and phased over the project life of 25 years.

42. **Benefit-cost assessment.** The economic benefit-cost ratio was used in the analysis to assess whether project benefits outweigh costs. The benefit-cost ratio for the Marneuli subproject 1 is 2.21, thus making the subproject economically viable.

Table 9: Benefit-Cost Analysis
(\$ million)

Particulars	Value
Present value of benefits	
Non-incremental	19.296
Incremental	6.986
Health	0.086
Avoided time lost due to illness	0.043
Avoided cost for medical treatment	0.043
Total benefits	26.368
Present value of costs	
Capital investment and replacement	7.303
O&M costs	4.631
Total costs	11.934
Benefit-cost ratio	2.21

Source: PPTA estimates.

43. **EIRR and sensitivity analysis.** The economic internal rate of return (EIRR) and discounted net cash flows were determined by comparing benefit streams with cost streams.

Table 10: Economic Analysis – Summary Results
(\$ million)

Particulars	EIRR	ENPV
Base case	34.1%	14.43
Capital cost plus 20%	29.2%	12.97
O&M cost plus 10%	33.5%	13.97
Revenue less 10%	30.5%	11.80
1-Year delay in benefit	26.5%	11.36
Switching value-Capital cost	197.6%	
Switching value-Revenue	-54.7%	

EIRR=economic internal rate of return, ENPV=economic net present value.

Source: PPTA estimates.

44. **Conclusion.** The subproject is economically viable with EIRR values exceeding the EOCC (12%) for the base case scenario. The sensitivity analysis demonstrates that the Marneuli subproject is viable even when tested under adverse economic conditions

H. Safeguards Compliance

1. Environmental Safeguards Compliance

45. There are no sensitive environmental resources in the project area in general and near the subproject sites in particular. Most of the proposed infrastructure works will be located within the existing facilities of UWSCG, some of which are located within the town and some outside. Narimanov (reservoirs and pumping improvement works), Jhandari (reservoirs and pumping improvement works) and Garadakh (reservoir works) are located in the town, while Orjonikidze head works (bore well, reservoir and pumping improvement works) is located outside. Since the existing pumping main from Orjonikidze headworks to Narimanov runs through private agricultural lands, a new alignment alongside the field roads has been identified, to avoid the private land acquisition. There are no sensitive environmental features in the alignment.

46. The Marneuli water supply improvement subproject is relatively small in scale and involves straightforward construction and low-maintenance operation, in an environment that is not especially sensitive, so it is identified that there will be no major adverse impacts. The likely impacts are mostly short-term, localized and can either be easily avoided or mitigated.

47. Most of the predicted impacts are associated with the construction process, and are produced because that process is invasive, involving trenching and other ground disturbance. However the routine nature of the impacts means that most can be easily mitigated. Impacts mainly arise from generation of dust from soil excavation and refilling; and from the disturbance of residents, traffic and activities by the construction work. These are common impacts of construction in urban areas, and there are well developed methods suggested for their mitigation. These include: (i) utilizing surplus/waste soil for beneficial purposes; (ii) easures to reduce/control dust generation (cover/damp down by water spray; consolidation of top soil, cover during transport etc); (iii) providing prior public information and work planning in consultation; (iv) planning transport routes/schedules carefully and awareness creation in drivers; (v) following standard and safe procedures for public and worker safety, and (vi) avoiding nighttime construction activities and enclosing the construction area at Garadakh, which is located within a residential neighborhood.

48. The improvement works will also involve replacement of old transformers, which are likely to contain PCBs. Therefore appropriate measures in terms of testing and disposal of PCB containing oil to authorized facilities has been suggested.

49. During operation of any activity, the impacts mainly arise from resource utilization and waste generation. The main risk of operating an improved water supply system is that increased abstraction of groundwater will deplete the water resource. Unsustainable extraction of groundwater may lead to degradation of groundwater quality, impacts on local vegetation, land subsidence and reduction in water holding, etc. Depletion of water resource will also lead to closure of the system and wastage of investment. There are no waste streams anticipated from this water supply system.

50. Situated on the banks of the Khrami River, Orjonikidze headworks is in the main aquatic horizon composed of "alluvial sediments closest to river bottom and floodplain", which is a very good groundwater source. However no further data on resource status, yield, draw-down, etc are available as groundwater is not subjected to monitoring, a main reason for which could be that the groundwater is fairly abundant, usage is limited, and there are no known events of groundwater degradation or land subsidence.

51. In the absence of recorded data, the following critical information collated from the local farmers and UWSCG staff, has been used to establish the source sustainability: (i) no decline in the water table since last 50 years, and (ii) Orjonikidze headworks is in operation since 1956, and in 1980s it supplied 24,000 m³ per day of water safely. The designed extraction of 10,800 m³ per day for subproject is just 45% of this safe yield. Regardless of this, certain safeguard measures are suggested to further ensure the sustainability: conducting aquifer pumping tests during design stage; selecting boreholes for rehabilitation based on drawdown curves; and controlling groundwater extractions in the vicinity through government licensing system.

52. Degradation of source water quality is identified as another risk that may have impacts on public health. The present groundwater quality is good. Since the site is located on the banks of Khrami, the degradation of river quality could affect the groundwater, and therefore certain

long-term sustainability measures are included: liaison with MoEPNR to establish a monitoring station on Khrami River at the headworks and regular monitoring of groundwater quality.

53. There is also an identified safety and health risk in operating chlorinators, and necessary measures are already included in the subproject. Few measures are suggested to enhance the subproject benefits through avoiding transformers and electric equipment containing harmful substances, and employing local people in construction work. The subproject is likely to have several positive benefits. The citizens will be provided with a constant supply of better quality water, which will improve the quality of life.

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

2. Social Safeguards Compliance

55. The subproject does not entail any involuntary resettlement. Consequently, no resettlement plan was prepared.

II. ZUGDIDI

A. Overview

56. Zugdidi City is the geographic and administrative center of Zugdidi District and the administrative center of the Samegrelo-Zeda Svaneti Region. The District is comprised of 57 villages, with a total population of 166,400. Zugdidi city has 69,744 residents. The United Water Service Company of Georgia (UWSCG), Zugdidi Service Center is responsible for providing water supply to all people in Zugdidi City and Anaklia.

57. Zugdidi City and the future resort of Anaklia are high water investment priorities for UWSCG and the Georgian Government. Zugdidi is the second-largest city in UWSCG's portfolio, but the company has effectively no central water supply source. Overall the country's population growth rate has fallen during the last decade, but in this District it has grown because of the large influx of IDPs.

B. Socioeconomic Profile

1. Household Characteristics

58. There are 17,097 urban households in Zugdidi. The average household size based on the PATA survey was 3.5 which equals the country average. It should be noted that a high proportion of IDPs live in Zugdidi, a few in houses and others in compact settlements in non-residential accommodations.

2. Access to Water and Sanitation Services

59. A total of 84.1% said they were not supplied with tap water from the United Water Company. A further 12.7% said they had no water tap inside the house. The population mainly uses individual wells and multi-storied houses are supplied from the boreholes. Thus, the majority of respondents have no direct payments for drinking water supply. Almost 70% are satisfied with the water source they mostly use.

60. Zugdidi had the highest water consumption rate among the PATA survey towns. 563 liters of water was consumed per household a day in the summer which is almost 100 liters above the average.

61. As for sanitation, 46.6% use a dry pit latrine and 42.9% have a flush toilet inside the house. Less than half said that they had a central sewerage system connection with pipes working properly. The sanitation condition is very difficult, especially in IDP settlements where several families share one common toilet in the corridor and the water supply is not enough to keep sanitation norms.

62. The willingness to pay for an improved water and sanitation system was high; especially after households realized how much was spent on coping mechanisms.

3. Health and Hygiene

63. Despite the scarcity of data available on water-borne diseases, the National Center for Disease Control and Public Health (NCDC) attempt to collect some data and as a result of their epidemiological research, the estimated transmission factor of the infections is regarded as

drinking water. According to the results, in 2008, 43 cases of diarrhea were reported in Zugdidi out of which 20 cases were among children under 14 years.

4. Education and Employment

64. Out of the surveyed population, there were none who hadn't achieved at least secondary education. Many also had high education, both for the head of households (32.5%) and their spouses (32.2%).

65. In Georgia, overall, it is difficult to find employment. Based on the PATA survey, in Zugdidi 50.7% of households have no household member employed. Only 1% had at least one household member with additional occupation. Significantly higher percentage of IDPs have households with nobody employed. For the local population this figure was 41.7% whereas for IDPs a total of 66.2% have no household member working.

C. Water Supply

1. Service Delivery

66. **Water production.** As mentioned earlier, the 1992-1993 Abkhazia war led to the loss of operations at Reckho headwork's. Hence, these are no longer accessible to service the greater Zugdidi area, including Zugdidi city. Today UWSCG, Zugdidi Service Center provides potable water to 7% of its former customer service base. The Service Center provides water primarily to IDP settlements. There are two boreholes located at the villages of Ingiri, and Zeda Etseri, as well as one borehole at the former Zugdidi City milk factory that now houses IDPs. About 2,200 m³/day of water are abstracted from the three boreholes.

67. UWSCG, Zugdidi Service Centre also provides ground water based supply to Anaklia town's residential population. UWSCG provides water from one headwork's site developed in 1969 and is located 2 km inland from the coast in. There are no measurements of production but a new pump was installed in 2010 with a capacity of 60 m³/hour. Water is abstracted from the two boreholes, 200 m and 100 m deep and then pumped to the overhead tank(250 m³) located within the same premises. To facilitate accelerated tourism-development, in June 2010 the government increased production at the Anaklia boreholes from 2 hours to 5 hours a day and will ramp up production as more tourism projects come online. Water will be supplied to hotels and restaurants fast-tracked for opening in August 2010 along the Anaklia and Ganmukhuri coastlines.

68. **Water distribution.** Zugdidi City has an extensive water distribution network, but is not in use for the last two decades. There is no information on their current conditions, although the UWSCG Chief Technician reports that all pipes are steel. Presently, most residents rely on private wells or neighbors' private wells. In Anaklia, the approximate length of the water supply distribution network that will be in place by August 2010 is 1.8 km.

2. Service Adequacy

69. The pump house in Reckho and Rukhi stopped functioning from 1992 onwards. As a result, all other water supply infrastructure in Zugdidi stopped functioning. Only seven percent of the UWSCG Zugdidi service area receives centrally supplied water from the company.

70. The boreholes in Anaklia temporarily stopped functioning on an alternate basis in July 2010 in order to drill deeper boreholes. This is to lay a pipeline to Anaklia and Ganmukhuri, where new tourist facilities are under construction. When the tourist facilities are inaugurated in August 2010, the plan is to supply 24 hours water supply. The water company is unsure of demand and production schedules as both are expected to expand by over 500 percent in a short period of time. In Anaklia all homes either have a household well or share a well with other people. Households do not chlorinate nor filter their water, though some people boil their drinking water.

71. **Water quality.** The Zugdidi Service Center staff report that the well water in the Anaklia, being located on the Black sea area, is brackish. Groundwater becomes less saline the farther one moves from the coast. The Service Center currently does not perform water quality tests for Anaklia boreholes or private wells. Drinking water in the Anaklia area is not chlorinated.

72. **Commercial use.** There are about 150 registered commercial and industrial users in Zugdidi, although none are operational. All factories in the city no longer operate due to the collapse of the Georgian economy in the 1990s.

73. **Reservoirs.** There are four reservoirs that once serviced in the city. two in Zugdidi City on Tsereteli Street, two km northwest of the city center, and two in the village Bashi, six km northwest of the center. These are currently not functional. The Tsereteli Street reservoirs are located at an elevation of 130 meters above sea level, with two cylindrical RC reservoirs, each with a capacity of about 2,000 m³. At Bashi village, there are two 10,000 m³ rectangular RC reservoirs. The reservoirs need to be inspected for leaks and structural soundness before deciding whether to repair or replace them.

74. The following system inefficiencies exist in Zugdidi and Anaklia.

- (i) **Distribution system and coverage.** In Anaklia, only 125 households (Total 600 households) are covered by the existing system. While in Zugdidi city, except for the IDPs served by the boreholes, the rest of the city does not have any water supply.
- (ii) **Lack of treatment facility.** In Anaklia, untreated water is supplied to the residences. There is a need to provide treated water

3. Subcomponent Rationale and Design Criteria

75. The following sub-project rationale and design criteria are adopted for the water supply system. The beneficiary population for this subproject is 137,200 inhabitants from Zugdidi, Anaklia and rural areas.

- (i) In the absence of water supply in Zugdidi, it is proposed to develop a new source to meet the future demand for water. The proposed supply at the consumer end is to be designed at 200 lpcd.
- (ii) For the last two decades the existing system is not in use. There is a need to check the quality of the system and also expand the system to the newly developed and uncovered areas.

76. In the absence of any existing water supply source, the only alternative is to tap water from Enguri dam, located 50 km northwest of Zugdidi. This Dam is primarily developed for Hydel

power generation. Due to non-availability of any sustainable source, the Water Company has proposed to source water from the dam, which holds large quantity of water throughout the year. Quality of water is reportedly good, except turbidity and bacteriological pollution. A water treatment plant is proposed near Bashi village. The treated water can be delivered to the enroute villages before reaching Zugdidi and in villages between Zugdidi and Anaklia located on the south. The treated water can be conveyed through gravity, and the existing storage facility at Bashi can be used to store water for Zugdidi. The water from Bashi reservoir can supply to Zugdidi city.

77. The demand for the water supply requirement for 2040 is based on the population for Zugdidi and Anaklia and the enroute villages. The estimated demand for water is 43,445 m³/day at net 200 lpcd. The length of the transmission main from the dam to Anaklia will be about 79.5 km. This pipeline will also serve water 15 villages, Zugdidi city, and Anaklia.

4. Subcomponent Identification and Costing

78. The sub-project identified under the Investment Program will comprise the following:

- (i) **Source Development:** Enguri HESS is willing to supply water for the proposed project, however indicated that certain rehabilitation and desilting measures are necessary for supply. Dam is said to be silted up heavily, interrupting flow through outflow sluices of the dam, which allow release of sanitary flow downstream. The outlet for water supply to Zugdidi will also be given from one of the sluices, and therefore desilting the dam - at least to a level it allows free flow of water into sluices, is required for supply of water.
- (ii) **Transmission Network:** The transmission network for a length of 79.5 km from the dam to Anaklia is proposed under Tranche-1.
 - Stretch 1: Dam - Jvari - WTP Site - Bashi Reservoir (29 km)
 - Stretch 2: Bashi Reservoir - Zugdidi City (6.7 km)
 - Stretch 3: Main Branch Zugdidi City
 - Stretch 4: Rukhi - Akhal Abastumani Side route (9.4 km)
 - Stretch 5: Ingiri - Anaklia Reservoir (24.3 km)
 - Stretch 6: Ganmukhuri Side Route from Darcheli (10.1 km)
- (iii) **Storage Reservoir:** The existing storage reservoirs at Bashi are proposed for rehabilitation.
- (iv) **Operation and Maintenance:** With the expansion of the water supply system, UWSCG will require additional workforce to maintain and operate the headworks.

D. Sewerage and Sanitation

1. Service Delivery

79. **Sewerage system.** The sewerage system in Zugdidi city covers about 10 sq. km area and caters to 70 percent of the city population. The current sewer system is based on gravity flow. The sewerage system consists of 45 km sewer network and 40 km of collector sewer. There are two STPs but both are not functional.

80. **Sanitation:** A predominant proportion of city households depend on individual sanitation facilities. It is estimated that approximately 9,971 households have access to sewerage collection facilities. The rest of the population relies up on pit latrines.

2. Service Adequacy

81. The existing sewerage system covers 70 percent of the population. About 11,855 m³/day sewage is generated in Zugdidi and of this, 8475 m³/day sewage is conveyed through the system.

3. Sub-project Rationale and Design Criteria

82. Zugdidi sewerage will be designed as a separate system for municipal wastewater (excluding industrial discharges), which will not cater for storm water. Beneficiary population would be 70450 inhabitants.

- (i) Design of sewerage system utilizing the existing sewerage infrastructure to a maximum extent.
- (ii) Bringing maximum population under coverage through better zoning and design with a per capita sewage generation of 160 LPCD.
- (iii) Providing on-site/individual disposal facilities in areas with low population density that can not technically be provided with a sewer network due to inadequate flow.
- (iv) Optimizing the entire system through life-cycle cost analysis.
- (v) Design of sewage treatment facility that suits local conditions, without complex elements and that can be operated and maintained with the local expertise.

E. WSS Infrastructure Improvement.

1. Overall Requirement

83. The landed cost for WSS infrastructure improvement in Zugdidi (excluding consulting and management cost) is estimated as \$167.241 million. Capital cost comprises: (i) physical infrastructure, consisting of civil works, materials and equipment; (ii) physical and price contingencies; (iii) financing charges; and (iv) taxes and duties. The subproject capital cost is summarized in Table 11.

Table 11: Subproject Capital Cost
\$ million

Particulars	Cost	% Total
Civil Works and Equipment		
Water Supply System		
Water intake facilities	4.237	2.53%
Water transmission system	27.036	16.17%
Water distribution network	28.323	16.94%
Sewerage and Sanitation		
Sewer network	29.928	17.90%
Sewage treatment plant	25.424	15.20%
WSS Vehicles and Equipment	1.164	0.70%
Total Base Cost		
Physical Contingency	11.495	6.87%
Price Contingency	10.527	6.29%
Financing Charges	4.244	2.54%
Taxes and Duties	24.864	14.87%
Total Landed Cost	167.241	100.00%

Source: PPTA estimates.

2. Project 1 Design

84. The subproject for Zugdidi to be financed by the first tranche will benefit Zugdidi Town, Anaklia and villages in the urban periphery. It is estimated to cost \$11.745 million (**Table 12**). This subproject will improve the service standards with a daily supply of potable water in adequate quantity (200 lpcd) at requisite pressure. The subproject is designed to meet the projected demand of 2040. This will be achieved by:

- (i) Rehabilitating existing bore holes, reservoirs and pumping stations;
- (ii) Constructing new reservoirs and pumping stations,
- (iii) Laying of a new transmission from the Dam to Anaklia, and
- (iv) Constructing disinfection and laboratory facilities.

Table 12: Tranche 1 Subproject Capital Cost
(\$ million)

Particulars	Amount	% Total
Civil Works and Equipment	43.073	47.83
Water Supply System-ADB	41.695	45.44
WSS Vehicles and Equipment	1.378	2.40
Consulting and Management costs	16.800	18.95
Total Base Cost	59.873	66.78
Physical Contingency	5.849	6.44
Price Contingency	5.215	5.80
Total Contingencies	11.065	12.24
Interest During Construction	1.893	2.10
Taxes and Duties	12.769	14.22
Total Cost	85.599	100.00

WSS = water supply and sanitation.

Source: PPTA estimates.

85. **Financing plan.** The investment will be financed by an ADF loan and a government contribution. **Table 13** provides details of the financing plan for the subproject financed by Tranche 1 loan.

Table 13: Subproject Financing Plan
(\$ million)

Particulars	Amount	% Total
Amount to be financed:		
Investment In Project	83.707	97.79%
IDC	1.893	2.21%
Total Capital Investment	85.599	100%
		0
Financed by:		0
ADB	65.928	77.02%
Disbursement	64.036	74.81%
IDC	1.893	2.21%
Government	19.671	22.98%
Total Financed	85.599	100%

ADB = Asian Development Bank, IDC = interest during construction

Source: RPTA estimates.

F. Financial Analysis for Project 1

86. The analysis was conducted on a without-project and with-project basis by estimating incremental costs and revenues over 25 years. The main financial viability parameters analyzed were (i) the financial internal rate of return (FIRR), which should be greater than the weighted average cost of capital (WACC) with the financial net present value as proxy; (ii) operating ratio, which should be less than or equal to one when the Investment Program becomes fully operational; and (iii) tariff affordability, normally considered affordable if the resulting monthly charge is 5% or less than the average monthly household income. The analysis looked closely at the operating ratio as a main indicator of sustainability.

87. Revenues were based on domestic and non-domestic demand for water and sewerage services. Tariffs are programmed to increase every 2 years to cover (i) operation and maintenance costs; (ii) operation and maintenance costs plus depreciation; and (iii) operation and maintenance costs plus total debt service. Tariff increments are benchmarked on domestic customers' affordability and targeted cost recovery level.

88. The demand forecast assumes that all water from existing alternative sources will be replaced with subproject water supply.

89. **Financing plan.** The investment will be financed by an ADF loan, and a government contribution.

90. **Weighted average cost of capital.** The WACC was calculated in real terms and was used as the hurdle rate for the FIRR to measure subproject viability. Funding sources are the ADF loan and government contribution. Average inflation is estimated at 1.0% for foreign cost and at 5.0% for local costs. The rates are computed on after-tax basis, resulting in the WACC in real terms estimated at 2.30% for Tranche 1 loan and presented in **Table 14**.

Table 14: Weighted Average Cost of Capital

Particulars	Capital	% Total	Nominal Rate	Tax Rate	After Tax	Inflation rate	Real Rate	WACC Real
ADB	80.00	76%	1.30%	20%	1.04%	1.0%	0.0%	0.03%
Government	25.00	24%	15.00%	0%	15.00%	5.0%	9.5%	2.27%
Total	105.00							2.30%

WACC = weighted average cost of capital.

Source: PPTA estimates.

91. **Operation and maintenance costs.** Subproject operation and maintenance costs include service center staff salaries, power and energy, chemical treatment, maintenance, and miscellaneous expenses.

92. **Current tariffs.** Current water tariffs in the subprojects, effective September 2010, are differentiated between domestic (metered and unmetered) and nondomestic (metered) use. Domestic customers are not yet metered while nondomestic customers are all metered as of September 2010. For domestic customers, UWSCG has set the per cubic meter tariff for water supply and sanitation (WSS) at \$0.15 /m³ (\$0.11 /m³ for water and \$0.04/m³ for sanitation) while un-metered domestic customer is charged \$1.01 /person/month for water supply and

\$0.13 to \$0.36 /person/month for sanitation. Nondomestic customers are charge the maximum rate of \$1.94 /m3 for water and \$0.51 /m3 for sanitation or a total of \$2.45 /m3.

93. **Proposed tariff rate increases.** In the financial projections, where revenues and costs are given in nominal terms, the tariffs are projected to increase biennially to cover O&M cost and total debt service.

94. **Affordability analysis.** An affordability analysis was undertaken to compare the level of household water expenditure with the average household income. **Table 15** presents the affordability levels in each subproject for years 2014, 2020, and 2025.

Table 15: Tariff Affordability

Particulars	Zugdidi		
	2014	2020	2025
Persons per household	3.5	3.5	3.5
Consumption, lpcd	100.0	100.0	100.0
Tariff rate \$/m3 (metered)	0.1	0.3	0.5
Tariff rate \$/person/month (unmetered)	1.21	2.10	3.32
Ave. consumption/month-m3	10.5	10.5	10.5
Ave. HH income/month-\$	208.4	221.2	232.5
Coping Strategy-\$/m3 ^a	1.1	-	-
Willingness to pay-\$/month/HH ^a	2.3	-	-
Ave. HH water bill/month-metered-\$	1.4	2.8	4.9
Ave. HH water bill/month-unmetered-\$	4.2	7.3	11.6
% of income spent for WS metered	0.7%	1.3%	2.1%
% of income spent for WS unmetered	2.0%	3.3%	5.0%

Ave. = average, HH = household, lpcd = liters per capita per day, m³ = cubic meter, WS = water supply.

^a based on focus group discussions; lpcd=liters per capita per day; HH=household; WS=water supply; m3=cubic meter.

Source: PPTA estimates.

95. From the analysis, tariff increases required for the subproject is within consumer affordability but will not generate enough revenues to cover O&M cost and total debt service. A viability gap funding was therefore considered during and after the project implementation to cover O&M cost and total debt service. Politically, exponential increases are unacceptable, and it is proposed that viability gap funding will provide the buffer to meet required operating ratios before financial reforms and progressive tariff increases reduce dependence on subsidies.

96. The period of analysis to determine the VGF is from 2011 to 2017 and from 2018 to 2025. **Table 16** shows that for Zugdidi subproject, for example, the average annual revenue from 2011 to 2017 is about \$ 1.282 million, O&M is about \$ 0.712 million, and O&M plus total debt service payment is about \$ 0.994 million for the same period. However, Zugdidi subproject needs a VGF of \$ 24.033 million per year from 2011 to 2013 to attain a financial internal rate of return (FIRR).

Table 16: Cost Recovery Tariffs and Required Annual Viability Gap Fund

Subproject	Period (Year)	Average Annual Revenue	Average Annual O&M	Average Annual O&M + TDS	FIRR 2011- 2035	VGF (FIRR>WACC)	
						Average Annual VGF	FIRR
						2011 to 2013	2011- 2035
		\$ million	\$ million	\$ million	%	\$ million	%
Zugdidi	2011 to 2017	1,282	0,712	0,994	(-)	24,033	6.33%
	2018 to 2025	4,375	1,820	4,351			

O&M=operation and maintenance; TDS=total debt service; VGF=viability gap fund.
Source: PPTA estimates.

97. **Sensitivity analysis.** Table 17 provides the results of sensitivity tests and indicates that subprojects are highly sensitive to adverse economic conditions as shown below. The sensitivity analysis assumes that the VGF will be provided by the government.

Table 17: Subproject Financial Internal Rate of Return

Particulars	FIRR	FNPV (\$ million)
Base case	6.3%	10.24
Capital cost plus 20%	1.3%	(3.26)
O&M cost plus 10%	5.9%	8.78
Revenue less 10%	5.1%	6.66
1-Year delay in benefit	5.4%	8.02
Switching value-Capital cost	15.2%	
Switching value-Revenue	-28.6%	
WACC	2.2%	

FIRR=financial internal rate of return; FNPV=financial net present value; Switching value=change in parameter that will make the FIRR equal to the WACC.

98. **Conclusion.** The subproject is financially viable when (i) tariff increases are implemented every 2 years starting in 2013 until 2025 and should be affordable to domestic consumers; and (ii) the Government should make available VGF which include counterpart funds, subventions for O&M and total debt service to ensure service sustainability. The reform plans and related issues have been discussed and agreed with the Executing Agency with the aim of achieving financial sustainability of the overall investment. Income affordability is a major factor in rationalizing tariffs, thus the monthly household income needs to be reviewed periodically. The sensitivity analysis indicates that the subproject FIRRs are above the WACC even under adverse economic conditions.

G. Economic Analysis

99. **Methodology.** The analysis describes the economic rationale and undertakes a viability analysis of the subproject. A sensitivity analysis was conducted to determine the effects of several adverse economic conditions on the overall subproject viability.

100. **Economic rationale.** The Investment Program economic rationale was based on: Fostering economic growth. Supporting tourism development. Improving urban water supply and sanitation (WSS) services. Improving institutional effectiveness.

101. **Project alternatives.** The Investment Program will (i) improve urban water supply and sanitation infrastructure; and (ii) improve service delivery through better resource management. For tranche 1 project, the component choice was based on the following decisions:

102. **Socioeconomic analysis.** Existing water systems in Zugdidi has undergone improvement due to recent investments to increase service coverage of the population. However, intermittent water supply and low-quality of water still impact served and unserved populations.

103. **Economic benefits.** Economic benefits of the subprojects include water sales revenue and consumer surplus, savings on time spent for water collection, savings on wells/boreholes, pump and water storage tank investment, and operations and maintenance (O&M) costs.

Table 18: Economic Data

Item	Value (\$)
Household Monthly Income (2010)	199
Coping Strategy	
Well/Borehole	437
Water Pump	60
Water Storage Tank	212
Annual Medical Cost	
Amount	17
% of HH Income	0.70%

Source: PPTA estimates.

104. **Economic Costs.** The economic capital investment and annual operation and maintenance costs were derived from the financial cost estimates using the following methodology. Taxes and duties are excluded from the financial as well as price inflation. The subproject capital and operation and maintenance costs are distributed into traded and nontraded components and labor. Unskilled labor is available in urban centers, which means the opportunity cost is lower than the wage rate. The economic costs are given in real terms and phased over the project life of 25 years.

105. **Benefit-cost assessment.** The economic benefit-cost ratio was used in the analysis to assess whether project benefits outweigh costs, thus making the subproject economically viable.

Table 19: Benefit-Cost Analysis
(\$ million)

Particulars	Value
Present value of benefits	
Non-Incremental	36.991
Incremental	20.305
Health	0.008
Avoided time lost due to illness	0.005
Avoided cost for medical treatment	0.003
Total benefits	57.304
Present value of costs	
Capital investment and replacement	52.745
O&M costs	4.083
Total costs	56.829
Benefit-cost ratio	1.01

106. **EIRR and sensitivity analysis.** The economic internal rate of return (EIRR) and discounted net cash flows were determined by comparing benefit streams with cost streams.

Table 20: Economic Analysis – Summary Results

Particulars	EIRR
Base case	12.1%
Capital cost plus 20%	10.0%
O&M cost plus 10%	12.0%
Revenue less 10%	10.8%
1-Year delay in benefit	10.6%
Switching value-Capital cost	0.8%
Switching value-Revenue	-0.7%

EIRR=economic internal rate of return, ENPV=economic net present value.
Source: PPTA estimates.

107. **Conclusion.** The subproject is economically viable with EIRR values exceeding the EOCC for the base case scenario. The sensitivity analysis for the subproject demonstrates that the EIRR is below the EOCC under certain adverse economic conditions. However, if the economic benefits that are difficult to quantify are included, EIRR will be higher and may approach the value of the EOCC.

H. Safeguards Compliance

1. Environmental Safeguards Compliance

108. With the government's focus on the coastal tourism, the coastal areas of the Zugdidi District are expected to generate a huge water demand. Taking the advantage of the dam source, besides Zugdidi, subproject will also cover Anaklia, Ganmukhuri and other en-route villages. The subproject will meet the demand of 2040. This will be achieved by: (i) desilting and providing an outlet to tap water from the Enguri Dam, (ii) construction of a Water Treatment Plant near Bashi, (iii) rehabilitating the existing storage reservoirs at Bashi, and (iv) laying of raw water and clear water transmission mains.

109. The project area extends over a length of 80 km from the Enguri Dam in the foothills of Central Caucasus to Anaklia and Ganmukhuri in the Black Sea Coast. The entire area is in the Enguri River Basin; the topography varies from hilly to flat towards the coast. Owing to its varied physical and geographic conditions, the vegetation in the project area is rich, diverse and consists of three types: (i) Oaks and broad leaved forest near the Dam, (ii) Foothill forests and Kolkheti low lands, and, (iii) Kolkheti marshes and swamp forests. Almost all the roads in project area are lined with avenue plantation; the trees include some species listed in the Red Book as "endangered".

110. The subproject activities will be located along the roads and vacant land parcels. The Enguri Dam is connected by Zugdidi-Dzvari-Mestia-Lasdili Road, along which the transmission line from the Dam to the WTP will be laid. Near the dam, the pipeline runs along the river bank. The WTP will be developed on a government-owned site near the Bashi Village. The transmission line from WTP to the Bashi Reservoir will be laid along an un-surfaced road. The transmission line from the Bashi Reservoir to Zugdidi will be laid along narrow roads through sparsely developed areas. This line crosses into private fields for about 200 m. The Zugdidi – Anaklia, Ganmukhuri, Rukhi and Akhal Abastumani pipelines will be laid along the main roads.

111. The Zugdidi water supply improvement subproject involves straightforward construction and low-maintenance operation. Although there are forests and marshy lands, none of the components will cross these areas and all the activities are planned along the roads and on vacant lands. Further, any disturbance will be limited to construction. The likely impacts are short-term, localized and can either be easily avoided or mitigated.

112. The dam desilting work is also not likely to have adverse impacts, because: the volume of material produced by the desilting is likely to be small as the main purpose is to allow free flow from the bottom sluices; silt contains no hazardous substances; it is unlikely to disrupt the water supply to power plant; and, the aquatic life in the reservoirs is very limited due to poor biomass content and there is no fishing activity. However considering the lack of specific information on volumes of material, its properties and dredging method, various measures are suggested including: conducting detailed investigations during the design for sediment bathymetry and volumes, and preparing a Silt Management Plan (with appropriate sediment collection and dewatering methods, dredged material management strategy including its beneficial utilization). Tree cutting along the pipeline alignment will be avoided. The Red Book species will be identified and marked during the alignment fine tuning. These trees will not be cut.

113. The other predicted impacts associated with the construction process, are produced because that process is invasive, involving trenching and other ground disturbance. However the routine nature of the impacts means that they can be easily mitigated. Impacts mainly arise from generation of dust from soil excavation and refilling; and from the disturbance of residents, traffic and activities by the construction work. These are common impacts of construction, and there are well developed methods suggested for their mitigation. These include: (i) Utilizing surplus/waste soil for beneficial purposes; (ii) Measures to reduce/control dust generation; (iii) Providing prior public information; (iv) Planning transport routes/schedules carefully and awareness creation in drivers; (v) Following standard and safe procedures for public and worker safety, and (vi) Avoiding nighttime construction activities.

114. The main risk of operating an improved water supply system is that increased water abstraction will deplete the water resource and will have impacts on the downstream

ecosystem. However, for this subproject, water is abstracted from the Enguri dam, and the abstraction is just a fraction of total water storage. It will also not affect current uses (i.e. power generation). Present water quality is suitable for drinking after treatment to reduce turbidity and remove pathogens, and the necessary facilities are included. There are no major water pollution sources in the catchment.

115. The water treatment process will generate waste, such as sludge from sedimentation, chemical coagulation, etc, and from back washing of the filter media. Well developed methods such as the following are suggested for mitigation: providing arrangements for re-circulation of wash water; providing sludge collection, drying system and beneficial use of dried sludge. There is also an identified safety and health risk in operating chlorinators, and necessary measures are developed. Few measures are suggested to enhance the subproject benefits through avoiding transformers and electric equipment containing harmful substances, and employing local people in the construction work. The subproject is likely to have several positive benefits. The citizens will be provided with a constant supply of better quality water, which will improve the quality of life and will also support the tourism development.

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

2. Social Safeguards Compliance

117. The subproject does not entail any involuntary resettlement. Consequently, no resettlement plan was prepared.

III. MESTIA

A. Overview

118. Mestia is a city in Northwest Georgia and is administrative center of Svaneti Region, bordering Russia. The city is located about 430 km from Tbilisi, Georgia's capital, with the city center 1450 m above sea level. The average yearly rainfall is approximately 1000 mm. Mean monthly temperatures range from -4° C to -14° C in January to 12° C to 18° C in July. The municipality assumed responsibility for water supply delivery to 80 % of the town's populated areas, approximately 2,350 people, until January 2010. Later the responsibility was handed over the UWSCG. Tourism is expected to play a major role, as noted in recent interviews with municipal officials as well as in household surveys. The Georgian government is undertaking major works to facilitate tourism development in Mestia. They are laying concrete roads to connect the city and the Svaneti region to Georgia's East-West highway, and is also providing initial financial support for ski slope development. Today, Mestia's water supply system is unable to meet the existing needs of the pre-tourism boom population and thus urgently seeks to rehabilitate the system and expand supply and delivery to new areas, thereby enabling conditions for tourism and resort development. For the tourism population, the report has used government targets of 20,000 tourists to Mestia.

1. Household Characteristics

119. Based on the 2002 national census there are 680 urban households in Mestia. According to the PATA Survey, the average household size was 3.3 which is slightly lower than the country average of 3.5.

2. Access to Water and Sanitation Services

120. A predominant proportion of city households (88.6%) have no tap water provided by the water company (and 94.3% have taps from another old soviet source). However, pipe repairs and improvements have been initiated. Currently, water and electricity are provided free in Mestia, only a small %age said they pay a minimal fee. Overall, most households are satisfied with the water supply from their mostly used source. The population experience no water supply shortage as Mestia has many natural springs. Taps are left running throughout the winter to prevent it from freezing. This poses a problem for metering and economizing water use.

121. Most households depend on individual sanitation facilities. 31.4% of households use pit latrines. The rest of the population is dependent on public conveniences.

122. The priority for the population is the implementation of a sewage and sanitation system.

3. Health and Hygiene

123. In general, incidence of water and sanitation related disease is under-reported in Georgia due to low affordability and testing. Based on the survey data, there were no cases of sickness related to poor water and sanitation. The women's focus group discussion however raised issues about poor sanitation and the quality of water.

4. Education and Employment

124. Out of the surveyed population, there were none who hadn't achieved at least secondary education. A proportion had reached high education, both for the head of households (40.0%) and their spouses (55.6%).

125. Based on the survey, 37.1% of households have no household member employed whereas 62.9% have at least one member of household who works. The majority work in state enterprise/organizations. Many are also occupied in small-scale tourism

B. Water Supply

1. Service Delivery

126. **Water production.** UWSCG provides surface and ground water based supply to Mestia city's residential population, it also provides 2,600 m³/day water from two sources: (i) Skhedi; and (ii) Tsnriashi. The Skhedi headworks is the water supply system located 0.8 km south of Mestia center and was first developed in 1956. Currently about 1,100 m³/day is supplied through this system. The Tsnriashi is the water supply system located 7 km north of Mestia was first developed in 1978. The system is estimated to produce a minimum of 1500 m³/day during the low season.

127. **Water distribution.** The Mestia service area is divided into two water supply areas based on the two sources of Tsnriashi and Skhedi. The approximate length of the existing water supply distribution network is 23 km.

128. **Connections.** Water is supplied through 550 domestic water connections. There are no industrial connections. There are no residential meters. Based on household figures for 2010 (731), water connection coverage is estimated to be 70 %.

129. **Sustainable financing.** In Mestia city, water is not charged. Prior to 2010, the municipality use to collect GEL 0.30/ person/ registered to the household. There were 2200 people registered in the system.

130. Following are recently completed, ongoing or proposed projects by various organizations.

- (i) **Municipal Development Fund.** Implemented a World Bank financed project through the Bank's program RMIDP-W2. The need for this project was partially driven by the concrete road works underway in west and central Mestia that would cover the Skhedi service area.
- (ii) **Local Government.** In 2010, the local government hired the Georgian company SKMP to produce a sewerage system plan that would cover areas in the central and northeastern part of the city that are not connected to the existing sewerage system. However, the local government ran out of funds and has asked ADB to expeditiously facilitate the development sewerage system.

2. Service Adequacy

131. The entire water supply system is based on gravity flow. The gross water supply through the piped system is estimated at 1000 lpcd and the net supply to households is 207 lpcd accounting for over 80 % of Non-Revenue Water. At present, the water supply distribution system covers about 80 % of the population. For the Tsrniashi system, glacial melt water was to be collected at the spring box and stored at the Lanchvali Reservoirs located 1 km above the city center.

132. Water is supplied for 24 hours. However, certain areas like Laghami, Lekthagi, Zargashi (population ~ 300 nos) are not covered with water supply system.

133. **Water quality.** The water company only has water quality testing results for Tsrniashi headworks taken in June 2010. The pH was 8.3, total hardness 3.3 for mgeq/l. No bacteria testing were performed. For observational and chemical analysis, the headworks water had negligible levels of nutrients, chloride, iron, and sulphate. Water quality from the Tsrniashi spring is reportedly of high quality and residents prefer the glacial snowmelt supply to the sometimes turbid water supply from the Skhedi system.

134. The following system inefficiencies exist in Mestia:

- (i) **Water production.** If reducing distribution losses, the existing system can supply Mestia's 2010 water demand needs. However, by rapidly transforming Mestia to a 20,000 peak tourist destination, additional supplies are required.
- (ii) **High system losses.** Due to the aging of pipes, the bursting of pipes is frequently reported, resulting in significant loss of water in transmission.
- (iii) **Coverage.** About 80 % of Mestia's population is connected to the distribution network.
- (iv) **Flow Measurements.** There is complete lack of flow measurement at all ends.
- (v) **Water Treatment Facility.** Currently there are no treatment facilities. The MDF project was to provide UV or chlorination systems at Skhedi and Tsrniashi reservoirs in 2010; however, this is not yet developed.
- (vi) **Laboratory.** There are no laboratory facilities.
- (vii) **Staffing.** There are only 5 staff for the entire water supply and sewerage system.

3. Subcomponent Rationale and Design Criteria

135. The following sub-project rationale and design criteria are adopted for the water supply system, in the future, around 22000 people between local inhabitants and tourists, will benefit from this infrastructure.

- (i) To meet the demand for water, the proposed supply at consumer end to be designed at 200 lpcd.
- (ii) New source need to be identified to meet the future demand.
- (iii) Progressive reduction in NRW from the current estimated 80 % to 20 %. The reduction is proposed by (a) district/ bulk metering; (b) leak detection and rectification; and (c) consumer metering.

136. The gross demand for water requirement in the year 2040 is about 6,072 m³/ day. Currently 2,600 m³/ day water is abstracted from two sources.

137. The additional demand for water can be met by developing new source. The new source will be sufficient to meet the demand for the entire town for the year 2040. The service center staff has identified a new source at Gvaldiri. The source will supply the city and the proposed tourist development center.

4. Subcomponent Identification and Costing

138. The sub-project identified under the Investment Program will comprise the following:

- (i) **Source Development.** A new source is required.
- (ii) **Transmission Main.** The transmission main from the new source to the reservoir is approximately 2800m and the pipe material will be HDPE pipe.
 - Stretch 1: Headworks to New Reservoir (2.8 km).
 - Stretch 2: New Reservoir to the existing reservoirs (3.5km).
- (iii) **Storage Reservoir and WTP.** A new storage reservoir (155m³) and WTP have been proposed.
- (iv) **Distribution network.** In Mestia, the rehabilitation of existing distribution network (5.92 km) and additional 13.61 km of supply lines are required to cover the entire city.
- (v) **Vehicles and Equipments.** For the regular and efficient maintenance of the system sufficient number of vehicles and equipments are required.
- (vi) **Operation and Maintenance.** Currently, Mestia service centre has only 5 staff. With the expansion of the water supply system, UWSCG will require additional workforce to maintain and operate the headworks, treatment plant, reservoirs, and distribution network.

C. Sewerage and Sanitation

1. Service Delivery

139. **Sewerage System.** The sewerage system in Mestia city covers 1.0km² area and caters to 25 % of the city population. The system was commissioned in 1986. About 10 % of households have installed direct disposal pipelines to the nearby water bodies. The district of Ligabi and 30 % of households in the neighboring district of Lalidi have septic systems. Around 30 % of the households have pit toilets.

140. **Sanitation.** A predominant proportion of city households depend on individual sanitation facilities. It is estimated that approximately 391 households (~32 % of the assessed properties in the city) have access to individual sanitation facilities, either septic tanks or pit latrines, within their premises. The rest of the population is dependent on public conveniences.

141. **Sewage Discharge and Treatment.** The current sewer system is based on gravity flow. The sewerage system consists of 5 km sewer network. At present there is no STP, the raw sewage is disposed directly in Mestiachal River at multiple outfall.

2. Service Adequacy

142. The existing sewerage system covers 25 % of the population. About 600 m³/day sewage is generated in Mestia and of this, 160 m³/day sewage is conveyed through the system. The

absence of the sewerage facilities to the rest of population may lead to contamination of ground- and surface water and may lead to water borne diseases.

143. The existing sewerage system is functioning satisfactorily and the remaining uncovered areas can be connected to the system. In the absence of treatment facility, the raw sewage collected through the system is discharged directly in to natural courses leading to the pollution of Mestia Chala River.

3. Sub-project Rationale and Design Criteria

144. The overall development concept of Mestia sewerage system premises on safe and scientific collection, treatment and disposal of sewage generated in the urban area, meeting the Georgian wastewater disposal standards. This will be designed as a separate system for municipal wastewater (excluding industrial discharges), which will not cater for storm water.

- (i) Design of sewerage system utilizing the existing sewerage infrastructure to a maximum extent.
- (ii) Bringing maximum population under coverage through better zoning and design with a per capita sewage generation of 160 lpcd.
- (iii) Providing on-site/individual disposal facilities in areas with low population density that can not technically be provided with a sewer network due to inadequate flow.
- (iv) Optimizing the entire system through life-cycle cost analysis: for instance minimizing the pumping requirement; providing the decentralized or on-site individual facilities in low-lying areas which require huge pumping to connect to main system.
- (v) Design of sewage treatment facility that suits local conditions (climate), without complex elements and that can be operated and maintained with the local expertise.

4. Sub-project Identification and Costs

145. The Sub-project identified under the Investment Program will consist of the following:

- (i) **Sewer Network.** The existing the sewerage network can be extended to the unserved areas, the approximate total length will be 17.2 km and will cover about 5,300 ultimate local population and 25,000 tourist population in the year 2040.
- (ii) **Sewage Treatment Plant.** A sewage treatment plant with 4000 m³ is proposed to be constructed in the southeast of the city.
- (iii) **Low Cost Sanitation.** Low cost sanitation facilities will be provided to households (50 nos) that cannot covered under the sewerage system
- (iv) **Operation and Maintenance.** About 4 staff is required to maintain the sewerage network, pumping station and the STP.
- (v) **Vehicles and Equipments.** Necessary equipments for cleaning of the system and clearing the blockages are needed. As the sewerage system will be extended to other areas, more cleaning equipments will be required. The major equipments needed include vehicles, and sewage pumps.

D. WSS Infrastructure Improvement

1. Overall Requirement

146. The landed cost for WSS infrastructure improvement in Mestia (excluding consulting and management cost) is estimated as \$21.476 million. Capital cost comprises: (i) physical infrastructure, consisting of civil works, materials and equipment; (ii) physical and price contingencies; (iii) financing charges; and (iv) taxes and duties. The subproject capital cost is summarized in **Table 21**.

Table 21: Subproject Capital Cost
\$ million

Particulars	Cost	% Total
Civil Works and Equipment		
Water Supply System		
Water intake facilities	0.04	0.17%
Water transmission system	0.89	4.16%
Water distribution network	4.40	20.47%
Sewerage and Sanitation		0.00%
Sewer network	2.26	10.53%
Sewage treatment plant	6.78	31.57%
WSS Vehicles and Equipment	0.54	2.50%
Total Base Cost		0.00%
Contingencies		0.00%
Physical Contingency	1.45	6.73%
Price Contingency	1.36	6.32%
Financing Charges	0.389	1.81%
Taxes and Duties	3.217	14.98%
Total Landed Cost	21.476	100.00%

Source: PPTA estimates.

2. Project 1 Design

147. The subproject for Mestia to be financed by the first tranche will benefit Mestia Town. It is estimated to cost \$11.745 million (**Table 22**). This subproject will improve the service standards with a daily supply of potable water in adequate quantity (200 lpcd) at requisite pressure. The subproject is designed to meet the projected demand of 2040. This will be achieved by:

- (i) Rehabilitating existing bore holes, reservoirs.
- (ii) Constructing new reservoirs and STP.
- (iii) Constructing disinfection and laboratory facilities.

Table 22: Tranche 1 Subproject Capital Cost
(\$ million)

Particulars	Amount	% Total
Civil Works and Equipment	1.297	47.0%
Water Supply System-ADB	0.932	33.7%
WSS Vehicles and Equipment	0.365	13.2%
Consulting and Management costs	0.675	24.4%
Total Base Cost	1.973	71.4%
Physical Contingency	0.161	5.8%
Price Contingency	0.164	5.9%
Total Contingencies	0.325	11.8%
Interest During Construction	0.050	1.8%
Taxes and Duties	0.414	15.0%
Total Cost	2.762	100.0%

WSS = water supply and sanitation.

Source: PPTA estimates.

148. **Financing plan.** The investment will be financed by an ADF loan and a government contribution. **Table 23** provides details of the financing plan for the subproject financed by Tranche 1 loan.

Table 23: Subproject Financing Plan
(\$ million)

Particulars	Amount	% Total
Amount to be financed:		
Investment In Project	98.19%	2.712
IDC	1.81%	0.05
Total Capital Investment	100.00%	2.762
Financed by:		
ADB	76.94%	2.125
Disbursement	75.09%	2.074
IDC	1.81%	0.05
Government	23.06%	0.637
Total Financed	100.00%	2.762

ADB = Asian Development Bank, IDC = interest during construction

Source: PPTA estimates.

E. Financial Analysis for Project 1

149. The analysis was conducted on a without-project and with-project basis by estimating incremental costs and revenues over 25 years. The main financial viability parameters analyzed were (i) the financial internal rate of return (FIRR), which should be greater than the weighted average cost of capital (WACC) with the financial net present value as proxy; (ii) operating ratio, which should be less than or equal to one when the Investment Program becomes fully operational; and (iii) tariff affordability, normally considered affordable if the resulting monthly charge is 5% or less than the average monthly household income. The analysis looked closely at the operating ratio as a main indicator of sustainability.

150. Revenues were based on domestic and non-domestic demand for water and sewerage services. Tariffs are programmed to increase every 2 years to cover (i) operation and maintenance costs; (ii) operation and maintenance costs plus depreciation; and (iii) operation and maintenance costs plus total debt service. Tariff increments are benchmarked on domestic customers' affordability and targeted cost recovery level.

151. The demand forecast assumes that all water from existing alternative sources will be replaced with subproject water supply.

152. Weighted average cost of capital. The WACC was calculated in real terms and was used as the hurdle rate for the FIRR to measure subproject viability. Funding sources are the ADF loan and government contribution. Average inflation is estimated at 1.0% for foreign cost and at 5.0% for local costs. The rates are computed on after-tax basis, resulting in the WACC in real terms estimated at 2.30% for tranche 1 loan and presented in **Table 24**.

Table 24: Weighted Average Cost of Capital

Particulars	Capital	% Total	Nominal Rate	Tax Rate	After Tax	Inflation rate	Real Rate	WACC Real
ADB	80.00	76%	1.30%	20%	1.04%	1.0%	0.0%	0.03%
Government	25.00	24%	15.00%	0%	15.00%	5.0%	9.5%	2.27%
Total	105.00							2.30%

WACC = weighted average cost of capital.

Source: PPTA estimates.

153. **Operation and maintenance costs.** Subproject operation and maintenance costs include service center staff salaries, power and energy, chemical treatment, maintenance, and miscellaneous expenses.

154. **Current tariffs.** Current water tariffs in the subprojects, effective September 2010, are differentiated between domestic (metered and unmetered) and nondomestic (metered) use. Domestic customers are not yet metered while nondomestic customers are all metered as of September 2010. For domestic customers, UWSCG has set the per cubic meter tariff for water supply and sanitation (WSS) at \$0.15 /m³ (\$0.11 /m³ for water and \$0.04/m³ for sanitation) while un-metered domestic customer is charged \$1.01 /person/month for water supply and \$0.13 to \$0.36 /person/month for sanitation. Nondomestic customers are charge the maximum rate of \$1.94 /m³ for water and \$0.51 /m³ for sanitation or a total of \$2.45 /m³.

155. **Proposed tariff rate increases.** In the financial projections, where revenues and costs are given in nominal terms, the tariffs are projected to increase biennially to cover O&M cost and total debt service.

156. **Affordability analysis.** An affordability analysis was undertaken to compare the level of household water expenditure with the average household income. **Table 25** presents the affordability levels in each subproject for years 2014, 2020, and 2025.

Table 25: Tariff Affordability

Particulars	2014	2020	2025
Persons per household	3.3	3.3	3.3
Consumption, lpcd	100.0	100.0	100.0
Tariff rate \$/m ³ (metered)	0.1	0.2	0.3
Tariff rate \$/person/month (unmetered)	1.21	2.10	2.89
Ave. consumption/month-m ³	9.9	9.9	9.9
Ave. HH income/month-\$	169.7	180.1	189.3
Coping Strategy-\$/m ³ ^a	0.0	-	-
Willingness to pay-\$/month/HH ^a	1.9	-	-
Ave. HH water bill/month-metered-\$	1.4	2.3	3.2
Ave. HH water bill/month-unmetered-\$	4.0	6.9	9.6
% of income spent for WS metered	0.8%	1.3%	1.7%
% of income spent for WS unmetered	2.4%	3.8%	5.0%

Ave. = average, HH = household, lpcd = liters per capita per day, m³ = cubic meter, WS = water supply.

^a based on focus group discussions; lpcd=liters per capita per day; HH=household; WS=water supply; m³=cubic meter.

Source: PPTA estimates.

157. From the analysis, tariff increases required for the subproject is within consumer affordability but will not generate enough revenues to cover O&M cost and total debt service. A viability gap funding was therefore considered during and after the project implementation to cover O&M cost and total debt service. Politically, exponential increases are unacceptable, and it is proposed that viability gap funding will provide the buffer to meet required operating ratios before financial reforms and progressive tariff increases reduce dependence on subsidies.

158. The period of analysis to determine the VGF is from 2011 to 2017 and from 2018 to 2025. **Table 26** shows that for Mestia, the subproject is projected to generate an FIRR greater than the WACC even without the VGF

Table 26: Cost Recovery Tariffs and Required Annual Viability Gap Fund

Subproject	Period (Year)	Average Annual Revenue	Average Annual O&M	Average Annual O&M + TDS	FIRR 2011-2035	VGF (FIRR>WACC)	
						Average Annual VGF 2011 to 2013	FIRR 2011-2035
		\$ million	\$ million	\$ million	%	\$ million	%
Mestia	2011 to 2017	0.227	0.015	0.027	11.3%	0.000	11.33%
	2018 to 2025	0.829	0.024	0.106			

O&M=operation and maintenance; TDS=total debt service; VGF=viability gap fund.

Source: PPTA estimates.

159. **Sensitivity Analysis.** **Table 27** provides the results of sensitivity tests and indicates that subprojects are highly sensitive to adverse economic conditions as shown below. The sensitivity analysis assumes that the VGF will be provided by the government.

Table 27: Subproject Financial Internal Rate of Return

Particulars	FIRR	FNPV (\$ million)
Base case		
Capital cost plus 20%	11.3%	3.84
O&M cost plus 10%	9.4%	3.39
Revenue less 10%	11.3%	3.82
1-Year delay in benefit	10.2%	3.21
Switching value-Capital cost	10.1%	3.45
Switching value-Revenue	170.8%	
WACC	-61.4%	

FIRR=financial internal rate of return; FNPV=financial net present value; Switching value=change in parameter that will make the FIRR equal to the WACC.

160. **Conclusion.** The subproject is financially viable when (i) tariff increases are implemented every 2 years starting in 2013 until 2025 and should be affordable to domestic consumers; and (ii) the Government should make available VGF which include counterpart funds, subventions for O&M and total debt service to ensure service sustainability. The reform plans and related issues have been discussed and agreed with the Executing Agency with the aim of achieving financial sustainability of the overall investment. Income affordability is a major factor in rationalizing tariffs, thus the monthly household income needs to be reviewed periodically. The sensitivity analysis indicates that the subproject FIRRs are above the WACC even under adverse economic conditions.

F. Economic Analysis

161. **Methodology.** The analysis describes the economic rationale and undertakes a viability analysis of the subproject. A sensitivity analysis was conducted to determine the effects of several adverse economic conditions on the overall subproject viability.

162. **Economic rationale.** The Investment Program economic rationale was based on: Fostering economic growth, Supporting tourism development, Improving urban water supply and sanitation (WSS) services. And Improving institutional effectiveness.

163. **Project alternatives.** The Investment Program will (i) improve urban water supply and sanitation infrastructure; and (ii) improve service delivery through better resource management. For tranche 1 project, the component choice was based on the following decisions: Replacing transmission mains and pumps, Rehabilitating boreholes and reservoirs, and constructing treatment facilities, Providing vehicles, tools, and equipment and Capacity development.

164. **Socioeconomic analysis.** Existing water systems in Mestia has undergone improvement due to recent investments to increase service coverage of the population. However, intermittent water supply and low-quality of water still impact served and unserved populations.

165. **Economic benefits.** Economic benefits of the subprojects include water sales revenue and consumer surplus, savings on time spent for water collection, savings on wells/boreholes, pump and water storage tank investment, operations and maintenance (O&M) costs, and health benefits.

Table 28: Economic Data

Subproject	Household Monthly Income (2010)	Coping Strategy			Annual Medical Cost	
		Well/Borehole	Water Pump	Water Storage Tank	Amount	% of HH Income
Mestia	143	0	0	0	0	0.0%

Source: PPTA estimates.

166. **Economic Costs.** The economic capital investment and annual operation and maintenance costs were derived from the financial cost estimates using the following methodology.

- (i) Taxes and duties are excluded from the financial as well as price inflation.
- (ii) The subproject capital and operation and maintenance costs are distributed into traded and nontraded components and labor.
- (iii) Unskilled labor is available in urban centers, which means the opportunity cost is lower than the wage rate.
- (iv) The economic costs are given in real terms and phased over the project life of 25 years.

167. **Benefit-cost assessment.** The economic benefit-cost ratio was used in the analysis to assess whether project benefits outweigh costs, thus making the subproject economically viable.

Table 29: Benefit-Cost Analysis

Particulars	(\$ million)	
	Average	Mestia
Present value of benefits		
Non-incremental	18.790	0.083
Incremental	9.718	1.863
Health	0.031	0.000
Avoided time lost due to illness	0.016	0.000
Avoided cost for medical treatment	0.015	0.000
Total benefits	28.539	1.947
Present value of costs		
Capital investment and replacement	20.587	1.714
O&M costs	2.926	0.063
Total costs	23.513	1.777
Benefit-cost ratio	1.21	1.10

168. **EIRR and sensitivity analysis.** The economic Internal rate of return (EIRR) and discounted net cash flows were determined by comparing benefit streams with cost streams.

Table 30: Economic Analysis – Summary Results

Particulars	EIRR
Base case	12.4%
Capital cost plus 20%	10.4%
O&M cost plus 10%	12.3%
Revenue less 10%	11.2%
1-Year delay in benefit	11.0%
Switching value-Capital cost	3.2%
Switching value-Revenue	-3.0%

EIRR=economic internal rate of return, ENPV=economic net present value.

Source: PPTA estimates.

169. **Conclusion.** The subproject is economically viable with EIRR values exceeding the EOCC for the base case scenario. The sensitivity analysis for the subproject demonstrates that the EIRR is below the EOCC under certain adverse economic conditions. However, if the economic benefits that are difficult to quantify are included, EIRR will be higher and may approach the value of the EOCC.

G. Safeguards Compliance

1. Environmental safeguards Compliance

170. Situated in the Caucasus, Mestia is surrounded by Greater Caucasus and Svaneti-Abkhazia Ranges. The elevation of the subproject area ranges between 1,400-3,600 m above the mean sea level, and forms upper part of the Enguri River Basin. The town is developed near the confluence of the Mukhura and Mestiachala rivers, tributaries of the Enguri. There are farmhouses and fields around the foothills and in the bottom of the valleys but the majority of the district is covered with forests. The region which lies below 1,800 m MSL is covered by mixed and coniferous forests; and from 1,800 meters to about 3,000 m consists of alpine meadows and grasslands, above which lie the zone of snows and glaciers.

171. The subproject activities are partly located in the town and partly in the surrounding hills. The Gvaldi River, the new water supply source, is a tributary of Mestiachala and joins just upstream of Mestia. It is proposed to tap water from the hilly upper reaches. An intake structure, consisting of an underground gallery, will be constructed in the river bed. A transmission pipeline from the intake to Water Treatment Plant site (which is located in lower hills outside the town) will be laid along existing tracks, surrounded by pasture and partly by forests. The pipeline in this section will be laid either above or underground as the topography permits. The pipeline from WTP to existing reservoirs will be buried along a road through the town.

172. The Mestia water supply improvement subproject is relatively small in scale and involves straightforward construction and low-maintenance operation. Although there are forest areas, none of the components will encroach into these areas and all the activities are planned along the existing access roads. Further any disturbance will be limited to construction period. Construction work in river bed is also not likely to have adverse impacts as there are no dependent population and limited aquatic value. The identified impacts are mostly short-term, localized and can either be easily avoided or mitigated.

173. Most of the predicted impacts are associated with the construction process. Impacts mainly arise from the: generation of dust from soil excavation and refilling; disturbance of residents, traffic and activities in the town; increase of silt load in the river; loss of top soil in pasture lands, removal of trees, and from the disturbance to wildlife due to trenches. These are common impacts of construction, and following methods are suggested for their mitigation: (i) Utilizing surplus/waste soil for beneficial purposes; (ii) Measures to reduce/control dust generation (cover/damp down by water spray; consolidation of top soil, cover during transport etc); (iii) Providing prior public information; (iv) conducting no construction in the river bed in fish breeding season and with minimum interference with the water quality; (v) restoring the top soil after construction, (vi) avoiding tree cutting through location alignment changes, and (vii) undertaking pipe laying work in segments so that work in each segment is completed in a day.

174. There are a number of development activities (for instance, road works) currently under implementation in Mestia. The following measures are suggested so that roads and inhabitants are not subject to repeated disturbance by work in the same area for different purposes: (i) scheduling construction in consultation with the other implementing agencies, and (ii) conducting the road work, where the transmission line is proposed, after the pipeline work.

175. During the operation, the main risk is that the water abstraction will deplete the water resource. Unsustainable reduction may affect downstream uses and may have ecological impacts. On the other hand, unsustainable source may also lead to closure of the system. Originating from a glacier and supplemented by rain and snow, the Gvaldi is a perennial but small river. With the total abstraction 0.073 m³/sec, which is 15% of measured flow (0.5 m³/sec, September), and with no downstream water uses and limited aquatic life, there are unlikely to be adverse impacts. However, the lack of data in winter is a major concern. Although interviews with the locals and local UWSCG staff indicate adequate flow throughout the year, the following measures are suggested to ensure the source sustainability: conducting flow measurement in low flow period (winter) as part of detailed design; and limiting extraction to 2/3rd of absolute minimum flow.

176. Degradation of source water quality is identified as another risk that may have impacts on public health. Since there are no pollution sources or anthropogenic activities in the catchment, there is no future pollution risk. The water quality is good except turbidity, which is normally high during the heavy flow season. The movement of cattle/wildlife in the river may degrade the water quality. Although necessary filtration and disinfection facilities are part of the subproject, fencing the river banks near the headworks is suggested to avoid entry of animals. Regular monitoring of raw and treated water quality is also suggested.

177. There are no health and safety risks associated with the subproject, as the disinfection will be through chlorine in powdered form. Treatment facilities are limited to disinfection and simple filtration, no major waste generation is anticipated. The subproject is likely to have several positive benefits during operation. The citizens will be provided with a constant supply of better quality water, which will improve the quality of life. This will also support the tourism development.

178. To ensure that all the mitigation measures as suggested are implemented, a program of environmental monitoring is prepared. Department of Quality Management and Environmental Protection (DQMEP) of UWSCG will oversee and be responsible for implementation of mitigation and monitoring measures. Provided the mitigation and enhancement measures are implemented in full, there should be no significant negative environmental impacts as a result of

the subproject. There should in fact be positive benefits through major improvements in quality of life and individual and public health once the scheme is in operation.

2. Social Safeguards Compliance

179. The proposed sub-project entails the construction of a new water source located at Gvaldari, of a new 6.3 km-long HDPE pipeline and a new reservoir located at km 2.8 of the pipeline. From the reservoir the pipeline will be connected to the existing reservoirs at Lanchvali located downstream in the valley. A detailed Resettlement Plan provides specifics on the safeguard compliance, which includes:

- (i) The construction of the Gvaldari water source and of the Lanchvali reservoir will be carried out in public unused land and will not cause any impact.
- (ii) Pipeline construction will require instead the digging of a 2 m wide trench along existing roads or mountain meadows privately hold by local villagers as land and a source of hay. The sections of the pipeline along roads will not cause any impact but the sections along the meadows will temporarily affect the properties of the villagers.
- (iii) The area affected by the pipeline is divided in two sections. The first located near the headworks will entail impacts on 13 plots of village Kvemo Mulakhi. The second section will entail impacts on 14 plots owned by residents of Mestia.
- (iv) No structures, trees or other assets are located on any of the mentioned land plots. All of the affected land plots are land growing hay.
- (v) About GEL 8000 is required as compensation costs and is detailed in **Table 31** below.

Table 31: Aggregated Costs
(In GEL)

Item	Costs
Crops Compensation (3 year yield of hay)	5,716.65
Assets Compensation	25.00
Rehabilitation allowances	1,377.00
Vulnerable AH Allowances	870.00
Total	7,988.65

Source: PPTA estimates.

EXECUTIVE SUMMARY – INITIAL ENVIRONMENTAL EXAMINATIONS

I. MARNEULI

1. It is proposed to improve the water supply system in Marneuli under the Asian Development Bank (ADB) funded Urban Services Improvement Investment Program, which is under preparation stage. This Investment Program, implemented in six towns, including Marneuli, will develop the water and sanitation services, which will improve quality of life and optimize the social and economic development. Ministry of Regional Development and Infrastructure (MoRDI) is the Executing Agency (EA) and United Water Supply Company of Georgia (UWSCG) is the Implementing Agency (IA) of this Program. This subproject will be implemented from mid-2011 and likely to be completed by the end of 2012. Since the subproject is unlikely to have significant adverse impacts, it is classified as environment Category B, and accordingly an Initial Environmental Examination has been conducted. This is a summary of the IEE Report.

2. Marneuli, situated at 29 km southeast of Tbilisi, is the administrative centre of Marneuli District in Kvemo Kartli region. The service levels of water supply are very low with partial coverage, intermittent supply, unequal supply and low terminal pressure. This subproject will improve the service standards, with a daily supply of potable water in adequate quantity (200 lpcd) at requisite pressure. The subproject is design to meet the projected demand of 2040. This will be achieved by: (i) rehabilitating existing bore holes, reservoirs and pumping stations; (ii) constructing new reservoirs and pumping stations, (iii) laying of a new transmission from Orjonikidze headworks to Narimanov Pumping Station, and (iv) construction disinfection and laboratory facilities. These improvements will benefit Marneuli Town and villages in the urban periphery.

3. There are no sensitive environmental resources in the project area in general and near the subproject sites in particular. Most of the proposed infrastructure works will be located within the existing facilities of UWSCG, some of which are located within the town and some outside. Narimanov (reservoirs and pumping improvement works), Jhandari (reservoirs and pumping improvement works) and Garadakh (reservoir works) are located in the town, while Orjonikidze head works (bore well, reservoir and pumping improvement works) is located outside. Since the existing pumping main from Orjonikidze headworks to Narimanov runs through private agricultural lands, a new alignment alongside the field roads has been identified, to avoid the private land acquisition. There are no sensitive environmental features in the alignment.

4. The Marneuli water supply improvement subproject is relatively small in scale and involves straightforward construction and low-maintenance operation, in an environment that is not especially sensitive, so it is identified that there will be no major adverse impacts. The likely impacts are mostly short-term, localized and can either be easily avoided or mitigated.

5. Most of the predicted impacts are associated with the construction process, and are produced because that process is invasive, involving trenching and other ground disturbance. However the routine nature of the impacts means that most can be easily mitigated. Impacts mainly arise from generation of dust from soil excavation and refilling; and from the disturbance of residents, traffic and activities by the construction work. These are common impacts of construction in urban areas, and there are well developed methods suggested for their mitigation. These include: (i) Utilizing surplus/waste soil for beneficial purposes; (ii) Measures to

reduce/control dust generation (cover/damp down by water spray; consolidation of top soil, cover during transport etc); (iii) Providing prior public information and work planning in consultation; (iv) Planning transport routes/schedules carefully and awareness creation in drivers; (v) Following standard and safe procedures for public and worker safety, and (vi) Avoiding nighttime construction activities and enclosing the construction area at Garadakh, which is located within a residential neighborhood.

7. The improvement works will also involve replacement of old transformers, which are likely to contain PCBs. Therefore appropriate measures in terms of testing and disposal of PCB containing oil to authorized facilities has been suggested.

8. During operation of any activity, the impacts mainly arise from resource utilization and waste generation. The main risk of operating an improved water supply system is that increased abstraction of groundwater will deplete the water resource. Unsustainable extraction of groundwater may lead to degradation of groundwater quality, impacts on local vegetation, land subsidence and reduction in water holding, etc. Depletion of water resource will also lead to closure of the system and wastage of investment. There are no waste streams anticipated from this water supply system.

9. Situated on the banks of the Khrami River, Orjonikidze headworks is in the main aquatic horizon composed of "alluvial sediments closest to river bottom and floodplain", which is a very good groundwater source. However no further data on resource status, yield, draw-down, etc are available as groundwater is not subjected to monitoring, a main reason for which could be that the groundwater is fairly abundant, usage is limited, and there are no known events of groundwater degradation or land subsidence.

10. In the absence of recorded data, the following critical information collated from the local farmers and UWSCG staff, has been used to establish the source sustainability: (i) no decline in the water table since last 50 years, and (ii) Orjonikidze headworks is in operation since 1956, and in 1980s it supplied 24,000 m³ per day of water safely. The designed extraction of 10,800 m³ per day for subproject is just 45% of this safe yield. Regardless of this, certain safeguard measures are suggested to further ensure the sustainability: conducting aquifer pumping tests during design stage; selecting boreholes for rehabilitation based on drawdown curves; and controlling groundwater extractions in the vicinity through government licensing system.

11. Degradation of source water quality is identified as another risk that may have impacts on public health. The present groundwater quality is good. Since the site is located on the banks of Khrami, the degradation of river quality could affect the groundwater, and therefore certain long-term sustainability measures are included: liaison with MoEPNR to establish a monitoring station on Khrami River at the headworks and regular monitoring of groundwater quality.

12. There is also an identified safety and health risk in operating chlorinators, and necessary measures are already included in the subproject. Few measures are suggested to enhance the subproject benefits through avoiding transformers and electric equipment containing harmful substances, and employing local people in construction work. The subproject is likely to have several positive benefits. The citizens will be provided with a constant supply of better quality water, which will improve the quality of life.

13. To ensure that all the mitigation measures as suggested are implemented, a program of environmental monitoring is prepared. Department of Quality Management and Environmental Protection (DQMEP) of UWSCG will oversee and be responsible for implementation of mitigation and monitoring measures. Provided the mitigation and enhancement measures are

Implemented in full, there should be no significant negative environmental impacts as a result of the subproject. There should in fact be positive benefits through major improvements in quality of life and individual and public health once the scheme is in operation.

II. ZUGDIDI

1. It is proposed to improve the water supply system in Zugdidi under the Asian Development Bank (ADB) funded Urban Services Improvement Investment Program, which is under preparation stage. This Investment Program, implemented in six towns will develop the water and sanitation services, which will improve quality of life and optimize the social and economic development. Ministry of Regional Development and Infrastructure (MoRDI) is the Executing Agency (EA) and United Water Supply Company of Georgia (UWSCG) is the Implementing Agency (IA) of this Program. This subproject will be implemented from mid-2011 and likely to be completed by the end of 2012. Since the subproject is unlikely to have significant adverse impacts, it is classified as environment Category B, and accordingly an Initial Environmental Examination has been conducted. This is a summary of the IEE Report.

2. Zugdidi, situated at 258 km west of Tbilisi, is the administrative centre of the Samegrelo-Zeda Svaneti Region. UWSCG's Zugdidi Service Centre operates the water supply system in Zugdidi City and a number of outlying small towns and villages. Traditionally, water supply to Zugdidi was from Rechko headworks located in Abkazia. With the 1992-93 Civil War, this source no longer available. At present, water supply is provided to only 7% of the population from local bore holes. This water supply improvement sub-project is therefore designed for a complete revival of the system to meet the present and future demands. Water will be tapped from the Enguri Dam.

3. With the government's focus on the coastal tourism, the coastal areas of the Zugdidi District are expected to generate a huge water demand. Taking the advantage of the dam source, besides Zugdidi, subproject will also cover Anaklia, Ganmukhuri and other en-route villages. The subproject will meet the demand of 2040. This will be achieved by: (i) desilting and providing a outlet to tap water from the Enguri Dam, (ii) construction of a Water Treatment Plant near Bashi, (iii) rehabilitating the existing storage reservoirs at Bashi, and (iv) laying of raw water and clear water transmission mains.

4. The project area extends over a length of 80 km from the Enguri Dam in the foothills of Central Caucasus to Anaklia and Ganmukhuri in the Black Sea Coast. The entire area is in the Enguri River Basin; the topography varies from hilly to flat towards the coast. Owing to its varied physical and geographic conditions, the vegetation in the project area is rich, diverse and consists of three types: (i) Oaks and broad leaved forest near the Dam, (ii) Foothill forests and Kolkheti low lands, and, (iii) Kolkheti marshes and swamp forests. Almost all the roads in project area are lined with avenue plantation; the trees include some species listed in the Red Book as "endangered".

5. The subproject activities will be located along the roads and vacant land parcels. The Enguri Dam is connected by Zugdidi-Dzvari-Mestia-Lasdili Road, along which the transmission line from the Dam to the WTP will be laid. Near the dam, the pipeline runs along the river bank. The WTP will be developed on a government-owned site near the Bashi Village. The transmission line from WTP to the Bashi Reservoir will be laid along an un-surfaced road. The transmission line from the Bashi Reservoir to Zugdidi will be laid along narrow roads through

sparingly developed areas. This line crosses into private fields for about 200 m. The Zugdidi – Anaklia, Ganmukhuri, Rukhi and Akhal Abastumani pipelines will be laid along the main roads.

6. The Zugdidi water supply improvement subproject involves straightforward construction and low-maintenance operation. Although there are forests and marshy lands, none of the components will cross these areas and all the activities are planned along the roads and on vacant lands. Further, any disturbance will be limited to construction. The likely impacts are short-term, localized and can either be easily avoided or mitigated.

7. The dam desilting work is also not likely to have adverse impacts, because: the volume of material produced by the desilting is likely to be small as the main purpose is to allow free flow from the bottom sluices; silt contains no hazardous substances; it is unlikely to disrupt the water supply to power plant; and, the aquatic life in the reservoirs is very limited due to poor biomass content and there is no fishing activity. However considering the lack of specific information on volumes of material, its properties and dredging method, various measures are suggested including: conducting detailed investigations during the design for sediment bathymetry and volumes, and preparing a Silt Management Plan (with appropriate sediment collection and dewatering methods, dredged material management strategy including its beneficial utilization). Tree cutting along the pipeline alignment will be avoided. The Red Book species will be identified and marked during the alignment fine tuning. These trees will not be cut.

8. The other predicted impacts associated with the construction process, are produced because that process is invasive, involving trenching and other ground disturbance. However the routine nature of the impacts means that they can be easily mitigated. Impacts mainly arise from generation of dust from soil excavation and refilling; and from the disturbance of residents, traffic and activities by the construction work. These are common impacts of construction, and there are well developed methods suggested for their mitigation. These include: (i) Utilizing surplus/waste soil for beneficial purposes; (ii) Measures to reduce/control dust generation; (iii) Providing prior public information; (iv) Planning transport routes/schedules carefully and awareness creation in drivers; (v) Following standard and safe procedures for public and worker safety, and (vi) Avoiding nighttime construction activities.

9. The main risk of operating an improved water supply system is that increased water abstraction will deplete the water resource and will have impacts on the downstream ecosystem. However, for this subproject, water is abstracted from the Enguri dam, and the abstraction is just a fraction of total water storage. It will also not affect current uses (i.e. power generation). Present water quality is suitable for drinking after treatment to reduce turbidity and remove pathogens, and the necessary facilities are included. There are no major water pollution sources in the catchment.

10. The water treatment process will generate waste, such as sludge from sedimentation, chemical coagulation, etc, and from back washing of the filter media. Well developed methods such as the following are suggested for mitigation: providing arrangements for re-circulation of wash water; providing sludge collection, drying system and beneficial use of dried sludge. There is also an identified safety and health risk in operating chlorinators, and necessary measures are developed. Few measures are suggested to enhance the subproject benefits through avoiding transformers and electric equipment containing harmful substances, and employing local people in the construction work. The subproject is likely to have several positive benefits. The citizens will be provided with a constant supply of better quality water, which will improve the quality of life and will also support the tourism development.

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

III. MESTIA

1. It is proposed to improve the water supply system in Mestia under the Asian Development Bank (ADB) funded Urban Services Improvement Investment Program, which is under preparation stage. This Investment Program, implemented in six towns, including Mestia, will develop the water and sanitation services, which will improve quality of life and optimize the social and economic development. Ministry of Regional Development and Infrastructure (MoRDI) is the Executing Agency (EA) and United Water Supply Company of Georgia (UWSCG) is the Implementing Agency (IA) of this Program. This subproject will be implemented from mid-2011 and likely to be completed by the end of 2012. Since the subproject is unlikely to have significant adverse impacts, it is classified as environment Category B, and accordingly an Initial Environmental Examination has been conducted. This is a summary of the IEE Report.

2. Situated in the north bordering Russia, Mestia is an important cultural and tourism centre in Georgia. The service levels of water supply are low with partial coverage, high system losses, and poor water quality at consumer end. With the government initiative to develop Mestia as a major tourist destination, the water demand is likely to grow significantly. This subproject will expand the system and improve the service standards, with a daily supply of potable water in adequate quantity (200 lpcd). The subproject is designed to meet the projected demand of 2040. This will be achieved by: (i) creating infrastructure to tap water from a new source (Gvaldi River); (ii) laying of transmission pipes and (iii) construction a water treatment plant, a reservoir and laboratory facilities.

3. Situated in the Caucasus, Mestia is surrounded by Greater Caucasus and Svaneti-Abkhazia Ranges. The elevation of the subproject area ranges between 1,400-3,600 m above the mean sea level, and forms upper part of the Enguri River Basin. The town is developed near the confluence of the Mukhura and Mestiachala rivers, tributaries of the Enguri. There are farmhouses and fields around the foothills and in the bottom of the valleys but the majority of the district is covered with forests. The region which lies below 1,800 m MSL is covered by mixed and coniferous forests; and from 1,800 meters to about 3,000 m consists of alpine meadows and grasslands, above which lie the zone of snows and glaciers.

4. The subproject activities are partly located in the town and partly in the surrounding hills. The Gvaldi River, the new water supply source, is a tributary of Mestiachala and joins just upstream of Mestia. It is proposed to tap water from the hilly upper reaches. An intake structure, consisting of an underground gallery, will be constructed in the river bed. A transmission pipeline from the intake to Water Treatment Plant site (which is located in lower hills outside the town) will be laid along existing tracks, surrounded by pasture and partly by forests. The pipeline in this section will be laid either above or underground as the topography permits. The pipeline from WTP to existing reservoirs will be buried along a road through the town.

5. The Mestia water supply improvement subproject is relatively small in scale and involves straightforward construction and low-maintenance operation. Although there are forest areas, none of the components will encroach into these areas and all the activities are planned along the existing access roads. Further any disturbance will be limited to construction period. Construction work in river bed is also not likely to have adverse impacts as there are no dependent population and limited aquatic value. The identified impacts are mostly short-term, localized and can either be easily avoided or mitigated.

6. Most of the predicted impacts are associated with the construction process. Impacts mainly arise from the: generation of dust from soil excavation and refilling; disturbance of residents, traffic and activities in the town; increase of silt load in the river; loss of top soil in pasture lands, removal of trees, and from the disturbance to wildlife due to trenches. These are common impacts of construction, and following methods are suggested for their mitigation: (i) Utilizing surplus/waste soil for beneficial purposes; (ii) Measures to reduce/control dust generation (cover/damp down by water spray; consolidation of top soil, cover during transport etc); (iii) Providing prior public information; (iv) conducting no construction in the river bed in fish breeding season and with minimum interference with the water quality; (v) restoring the top soil after construction, (vi) avoiding tree cutting through location alignment changes, and (vii) undertaking pipe laying work in segments so that work in each segment is completed in a day.

7. There are a number of development activities (for instance, road works) currently under implementation in Mestia. The following measures are suggested so that roads and inhabitants are not subject to repeated disturbance by work in the same area for different purposes: (i) scheduling construction in consultation with the other implementing agencies, and (ii) conducting the road work, where the transmission line is proposed, after the pipeline work.

8. During the operation, the main risk is that the water abstraction will deplete the water resource. Unsustainable reduction may affect downstream uses and may have ecological impacts. On the other hand, unsustainable source may also lead to closure of the system. Originating from a glacier and supplemented by rain and snow, the Gvaldi is a perennial but small river. With the total abstraction 0.073 m³/sec, which is 15% of measured flow (0.5 m³/sec, September), and with no downstream water uses and limited aquatic life, there are unlikely to be adverse impacts. However, the lack of data in winter is a major concern. Although interviews with the locals and local UWSCG staff indicate adequate flow throughout the year, the following measures are suggested to ensure the source sustainability: conducting flow measurement in low flow period (winter) as part of detailed design; and limiting extraction to 2/3rd of absolute minimum flow.

9. Degradation of source water quality is identified as another risk that may have impacts on public health. Since there are no pollution sources or anthropogenic activities in the catchment, there is no future pollution risk. The water quality is good except turbidity, which is normally high during the heavy flow season. The movement of cattle/wildlife in the river may degrade the water quality. Although necessary filtration and disinfection facilities are part of the subproject, fencing the river banks near the headworks is suggested to avoid entry of animals. Regular monitoring of raw and treated water quality is also suggested.

10. There are no health and safety risks associated with the subproject, as the disinfection will be through chlorine in powdered form. Treatment facilities are limited to disinfection and simple filtration, no major waste generation is anticipated. The subproject is likely to have several positive benefits during operation. The citizens will be provided with a constant supply of

better quality water, which will improve the quality of life. This will also support the tourism development.

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

SHORT RESETTLEMENT PLAN, MESTIA – EXECUTIVE SUMMARY

1. This Short Resettlement Plan (SRP) for the Mestia Water Source Pipeline sub-project (the sub-project) has been prepared by the United Water Supply Company of Georgia (UWSCG), the Implementation Agency (IA), for the Ministry of Regional Development and Infrastructure (MRDI), the Executing Agency (EA), under tranche 1 of the Georgia Urban Services Improvement Investment Program (the Investment Program). Its objective is to provide a comprehensive action plan for the compensation people affected by the sub-project in compliance with the requirement of the ADB Safeguards Policy Statement (SPS) 2009.

A. Sub-project Description

2. The proposed sub-project entails the construction of a new water source located at Gvaldari, of a new 6.3 km-long HDPE pipeline and a new reservoir located at km 2.8 of the pipeline. From the reservoir the pipeline will be connected to the existing reservoirs at Lanchvali located downstream in the valley.

- (i) The construction of the Gvaldari water source and of the Lanchvali reservoir will be carried out in public unused land and will not cause any impact.
- (ii) Pipeline construction will require instead the digging of a 2 m wide trench along existing roads or mountain meadows privately hold by local villagers as land and a source of hay. The sections of the pipeline along roads will not cause any impact but the sections along the meadows will temporarily affect the properties of the villagers.
- (iii) The area affected by the pipeline is divided in two sections. The first located near the headworks will entail impacts on 13 plots of village Kvemo Mulakhi. The second section will entail impacts on 14 plots owned by residents of Mestia.
- (iv) No structures, trees or other assets are located on any of the mentioned land plots. All of the affected land plots are land growing hay.

B. RP Related Conditionalities

3. This RP is relevant for the following sub-sub-project milestones:

- (i) Investment Program's Multi-tranche Financing Facility (MFF) first tranche appraisal: Conditional to preparation and disclosure of this RP.
- (ii) Provision of notice to proceed to contractors: Conditional to the full implementation of this RP (full delivery of compensation and rehabilitation) for the relevant sub-project. Such a condition will be clearly spelled out in the text of the civil works contract

C. RP Resettlement Classification

4. This sub-project will not severely affect any Affected People (AP). Its impact is limited to temporary disturbance to land and loss of hay within the pipeline corridor. Only for one land plot 5m of fence will be affected and will require restoration. No permanent land taking, no land acquisition and no resettlement of APs is required.

5. According to the ADB SPS 2009, this sub-project is thus classified as of category B and needs only the preparation of a Short Resettlement Plan (SRP).

II. IMPACT ASSESSMENT

A. Impacts Assessment

1. Temporary Crops Impacts / Structures Impacts

6. The pipeline will cross uncultivated land plots used for harvesting hay. The total length of the pipeline crossing land plots is 2.4 km. Section one of the pipeline is located near the head-works and crosses 13 land plots owned by the residents of village Kvemo Mulakhi. The second section is crossing 14 private land plots owned by residents of Mestia. Total number of affected land plots is 27. The corridor of impact is 10 m width. The impact is limited to temporary disturbance of land and loss of hay within the 10 m width corridor. The total area of hay land within the 10m width corridor of impact is 20,545 sqm. No structures, trees or other assets are located on any of the mentioned land plots.

7. Only one land plot (L2) is fenced from one side. The affected fence length is 5m.

8. No permanent land acquisition is required.

B. Affected Persons Census

9. The Affected households (AH) are 25. The Affected Persons (APs) are 162 out of which 64 are males and 72 are females.

III. SOCIO-ECONOMIC CENSUS

10. **Average family composition.** The average family composition is 6.48 members. The male-female ration is 1:1.12.

11. **Main source of livelihood.** All the AH engage in cattle breeding and/or hay cultivation as main livelihood activity. A few families have members in government or private employment in Mestia town.

12. **Income:** The income spread of the AP is detailed in **Table 1** below.

Table 1: Affected Population's Main Income Source

Main Source of Income for AH	Number of AH
Agriculture	11
Small business (shops, small guesthouses)	5
Regular wages/salary	2
Wages for casual labour	3
Non-waged earnings (rent, pension, and remittances)	5 (for 2 of pensioners agriculture is also important source of income)
Social assistance	1

13. **Severely affected and vulnerable AH.** The sub-project does not severely affect any AH. Only one AH is vulnerable. This family lives below poverty level and currently receives social assistance from the Government.

IV. COSTS

A. Cost of Compensation for Temporary Impacts on Crops

14. Land users will receive compensation for temporary impacts on crops. Two of the land owners will receive compensation for two land plots. Two other land users will receive compensation for one owned and one leased land plots. Two landowners will not receive compensation as their plot is leased to two other APs who are eligible for crop compensation.

Table 2: Compensation Rates for Crops / Temporary Land Impacts

Crop Type	Area affected (sq. m)	Hay Market value (GELx sq. m)	Total (GEL)	Total x 3 years (GEL)
Hay	20,545	0,09275	1905,55	5,716.65

B. Costs of compensation for fence repair

15. One land owner will receive compensation required for repair of 5m length destroyed section of wire fence. The price for rehabilitation of 1m length of iron wire fence on wooden pale is estimated as GEL5. The total compensation cost is GEL25.

C. Cost of Rehabilitation Allowances for Land Registration

16. Twenty-five (25) land owners will receive rehabilitation allowances for registration of 27 land plots in NAPR equal to GEL1,377.

D. Cost of Rehabilitation Allowances for Vulnerable AP

17. There is only one vulnerable AH. Based on the policy for this sub-project the vulnerable household will receive allowance equivalent to 3 months of minimum subsistence income (GEL290 x 3 = GEL870).

E. Summary Costs

18. The aggregated summary of costs is provided in Table 3 below.

Table 3: Aggregated Costs

Crops Compensation (3 year yield of hay)	Assets Compensation	Rehabilitation allowances	Vulnerable AH Allowances	Total
GEL 5,716.65	GEL25	GEL1,377	GEL870	GEL 7,988.65

Annex 7
GENDER ACTION PLAN (GAP)¹

Objective	Actions and Description	Target/Indicator and Timeframe	Institutional Responsibility
Component 2: Institutional Effectiveness 1. Knowledge of consumer behavior of male and female headed households gained 2. Management capacity of UWSCG enhanced and human resource management gender mainstreamed	- Train staff working on MIS and accounting system on sex-disaggregated data collection - Establish sex-disaggregated consumer database	- Sex-disaggregated consumer database created for UWSCG (2011) - UWSCG Annual Report on consumer profile informed by gender analysis of sex-disaggregated consumer data base (2012)	UWSCG
	- Maintain equal employment opportunities for women and men in UWSCG, and facilitate their career development - Conduct capacity development on gender equality at the workplace - Inform annual report on human resources of UWSCG with gender analysis	- Women representation in key management staff of UWSCG is ensured (approximately 30% by 2013) - At least 30% of staff in Investment Program town customer service care centers are women (2013) - Sex-disaggregated data base introduced for human resource management (2011) - Yearly report on human resource development informed with gender analysis (2012) - UWSCG staff trained on financial management and accounting (30% number of women)	
Component 3: Project Implementation Support			
1. Public Relations (PR) campaign of UWSCG is informed by survey on household water management, household needs and knowledge gaps 2. UWSCG PR campaign is supported by country wide information, education and communication (IEC) campaigns	- Conduct survey on household water management and sanitation practices - Analyze knowledge gaps of households (especially women as household managers) on water, hygiene, sanitation, environmental impact of sewage, consumer rights, and efficient water use	- Results of survey are analyzed in report (2011) - Public awareness program is informed by survey results (2011)	UWSCG, Apex NGOs, and local NGOs
	- Develop IEC material on water, hygiene, sanitation, customer rights and water usage efficiency based on consumer needs and knowledge gaps - Train staff of customer care centers as hygiene and sanitation advocates - Roll out public awareness program from Mameuli and Mesia (pilot area) to the 6 Investment Program towns	- Apex NGO contracted and IEC material on water, hygiene and sanitation practices, consumer rights, complaint mechanisms is disseminated in the 6 Investment Program towns (2011- continuous) - Local women NGOs and female community leaders are involved in IEC material distribution and are trained to conduct public awareness program (2011-continuous) - All staff of customer care centers are trained on water, hygiene, sanitation practices, customer rights and complaint mechanisms (2011- continuous) - Feedback mechanism on effectiveness of IEC campaign through women determined	
3. Complaints redressed	- Establish complaint mechanism and database in customer care centers and identify consumer service requirement (targeting the needs of women in specific)	- Annual report on quantity and redress of complaints published (2011-continuous)	

¹ Applied to all tranches.

Gender Development Strategy

1. To support the primary goal of the Investment Program in ensuring effective and sustainable WSS systems, gender development will be addressed in a twofold approach in this Investment Program. A gender and social development consultant will be hired to assist UWSCG in implementing the GAP and reaching the targets.

- (i) One approach is to improve career and employment opportunities in the UWSCG. This will be facilitated by introducing a sex-disaggregated database for human resource management, which will provide information for an annual gender analysis of the staff development, improve management support for gender balanced human resource management and staff development. Additionally, employment opportunities for women will be created in customer care centers. According to UWSCG's human resource department, around 35% of women are employed in the UWSCG with a large proportion in administrative tasks. In the top management, 4 out of 14 department heads are women (30%). An improved database will be developed to monitor career development for women at UWSCG.
- (ii) The second approach is to improve the outreach of the UWSCG to communities and in doing this, particularly address women as household managers and water collectors. There is a clear lack of knowledge, information and awareness of water and sanitation related issues such as health, household expenses, customer rights, and environmental issues. For that reason, the Investment Program will develop an information, education and communication (IEC) campaign in all appropriate languages to educate communities on the above issues and inform them about the Investment Program benefits. Before rolling out a country wide IEC, the content and mode of delivery of the IEC will be tested in the urban centers of Mestia and Marneuli.

2. Through a pilot project in Mestia and Marneuli, baseline data on household water management and sanitation practices will be created by conducting a household survey. A post-intervention survey will be conducted after the IEC campaign and compared with the baseline. This will show if and why households were convinced to access the water and sanitation services of the UWSCG. Household survey and IEC will be conducted by an apex NGO with an extensive experience of working on gender issues and dissemination of information throughout the country. The Apex NGO will work through local NGOs to address gender issues within the Investment Program. Besides delivering the IEC campaign and the survey, the involvement of NGOs will facilitate better participation of communities, will improve grievance and complaint mechanism and improve awareness of the communities about the Investment Program. Impact assessment of the public awareness program in Mestia and Marneuli will expand UWSCG's country wide PR campaign.

3. Additional capacity building support for the UWSCG for designing a marketing campaign catering to women's needs as household managers is envisaged to optimize the utilization of the information gathered in the pilot project.

4. The pilot project will be partly financed through Output 3 of RETA-7563: Promoting Gender Inclusive Growth in Central and West Asia, in which the development and implementation of a pilot project in each developing member country including Georgia is planned to showcase effective gender mainstreaming in infrastructure projects. The subprojects may include customer services and client-oriented project development and marketing and other country-specific project proposals that promote gender equality and women's empowerment. The gender specialist, financed through the RETA, will develop the detailed project design for the pilot project and will supervise its timely implementation by the apex NGO.