WATER SECTOR

2025

Western Urban Bulk Water Supply Project

Project description

The Guma Valley Water Company's (GVWC) second priority bulk water supply project aims to provide water to the Western Urban area of Sierra Leone, benefiting a current population of c.1.2 million. This project involves the construction of a dam to create the Hamilton Reservoir, the establishment of a new water treatment plant and the development of a transmission system to enhance the water distribution network as shown in the figure below.

Figure 1. Development of a transmission system to enhance the water distribution network



The project will benefit a population of c.2.17 million by 2050 in the following areas: Hamilton, Mambo, Mile 13, Sussex, Lakka, Ogoo Farm, Angola, Adonkia, Goderich, Juba and Lumley.

The capacity of the reservoirs and catchment areas are shown below. The new water treatment plant will be located in Hamilton.

Dam parameter	1. Full	2. Excl. U. Sussex	Comments
Estimated storage volume	18.78 Mm^3		Estimate based on satellite imagery 5 m DTM purchased in 2020 (COBA)
Catchment area	4.66 km^2	3.26 km^2	Estimate based on satellite imagery 5 m DTM purchased in 2020 (COBA)
Dam height/TWL	70 m/330 masl		Proposed by COBA/SMEC
	80 m/340 masl		
Yield (95% assurance)–70 m height	56 ML/day	47 ML/day	Based on 42 years of flow sequence using WEAP hydrological model
Yield (95% assurance)–80 m height	63 ML/day	50 ML/day	
Proposed dam wall material	Earth/rock-fill with clay core		Recommended by Atkins/Howard Humphries

Investment proposition

The project is currently in the pre-feasibility stage and forms an integral part of the GVWC master plan.

In response to the pressing water supply crisis, GVWC is actively seeking a partner to facilitate the bulk supply of potable water to the western rural communities of Hamilton, Mambo, Mile 13, Sussex, Lakka, Ogoo Farm, Angola, Adonkia, Goderich, Juba, Lumley and others. This involves the construction of a new dam at Hamilton to create a reservoir with an average capacity of 7.7 million cubic meters, along with the development of a new raw water transmission system to the proposed water treatment plant in Hamilton.

GVWC favours a private-public partnership model, specifically the design, build, operate and transfer under a sub-concession to GVWC. However, alternative options, including a full concession to directly supply the communities, remain under consideration. In the event of insufficient private sector investment, the Government of Sierra Leone (GoSL) is committed to seeking funding through concessional loans or donor grants for the design and feasibility stage of the project.

The estimated funding requirements for the project are as follows:

- Design and feasibility: US$1.5 million
- Dam construction: US$122 million
- Water treatment plant: US$39 million
- Transmission pipeline: US$20 million
- Total: US$182.5 million

The distribution pipeline and storage costs associated with the project amount to US$21 million and GVWC intends to pursue concessional loans or grants for this component in parallel with private sector investment. Should a private sector investor express interest in assuming full concession for water supply to the communities, the distribution cost would be integrated.

Revenue to cover capital and operating costs will be generated through payment for the bulk supply of water to GVWC. Tariff proposals will be subject to political and regulatory approval at each stage before the project progresses further.

The GoSL is steadfast in its commitment to ensuring cost-reflective pricing of water supply, with any affordability needs addressed through targeted subsidies exclusively. GoSL further acknowledges the urgent need to protect water resources and has established the National Water Resources Management Agency to prevent encroachment during the design and planning phases. GoSL is also committed to addressing environmental concerns and any resettlement costs related to the Western Urban Bulk Water Supply Project.

The weighted average tariff approved by the Sierra Leone Electricity and Water Regulatory Commission in 2021 was US$1.09. Currently, losses occur through weak transmission and distribution pipelines, amounting to 30% of production. Additionally, an estimated 20% of loss is due to water theft and other sources of unbilled authorised consumption, resulting in a total system loss of 50%. It is assumed that when planned water supply interventions are implemented, physical losses will be eliminated, and other non-revenue water including water theft and unbilled authorised consumption will be reduced to about 3% in 2035.

A financial analysis was conducted during the pre-feasibility studies using the approved tariff at discount rates of 4%, 5%, and 6% per annum, with operational expenditure fixed at 3% of capital outlay.

Project revenues to meet capital and operating costs will be derived from the bulk supply of water to GVWC. Tariff proposals will be subject to political and regulatory approval at each stage before the project progresses to the next stage. The proposed stages include feasibility (technical and commercial), detailed design and implementation planning, procurement and contracting, construction and operationalisation with an implementation period of three years.

The GVWC master plan indicates a need to double existing tariffs for the capital investment to be recovered.

Benefits of bulk water supply projects

This project is one of several bulk water projects identified, which combined will lead to significant socio-economic benefits including:

- Bulk water supply is positioned as the most promising within the water, sanitation and hygiene sector.
- Revenue from the sale of water is poised to significantly offset investment costs in most areas.
- According to the GVWC master plan, the increased supply of high-quality water is expected to significantly drive economic activity, leading to substantial job creation and growth across multiple industries and sectors such as drink and beverages production, hospitality and tourism.

The projects will effectively reduce the time the population spends, particularly women and children, searching for water. They will also decisively lower overall household expenses and improve household health outcomes.

- It is confidently estimated that these indirect benefits will save more than US$72 million annually by 2035 for all planned water supply investments of which these are part, with a specific intervention estimated to save US$8 million per year. This represents the significant productivity gains achieved when adequate water supply allows women and children to engage in other productive activities.