Gravity pipeline and operational reservoir

The gravity pipeline also consists of a steel pipe with welded joints. Its first section, which links the Leeuwbosch break-pressure reservoir with the operational one, has a total length of 63 570m and a diameter of 1 700mm. The operational reservoir is located on the Zoutpan farm, south of Steenbokpan, and is sized to provide adequate storage security in the system – about eight hours of storage. It is also a lined earth-fill embankment with a capacity of 90 000m³, comprising three compartments of 30 000m³ each.

Other infrastructure

- Concrete access/valve chambers will be provided at roughly 500m intervals along the pipeline;
- Infrastructure to enable off-takes at the point/s of delivery;
- Electrical infrastructure;
- The Bierspruit and Sand rivers gauging weirs; and
- Accommodation, offices, workshops and security infrastructure.

RIVER MANAGEMENT SYSTEM

A river management system (RMS) is required to monitor, control and manage the releases into, the flows in and the abstractions from the river. The rivers to be included in the RMS are shown in Figure 3. The objective is to ensure that water can be abstracted at Vlieëpoort to enable the supply to MCWAP users at the required assurance of volume. The RMS will also include the management of all abstractions along the river.

SOCIO-ECONOMIC IMPACT

It is estimated that the project will employ at least 1 000 people during its implementation, with 50% of the engineers expected to be from a previously disadvantaged background. It will also offer learnerships and bursaries to mostly the same demographic from the local community. The procurement for the project will follow the prescribed legislation. The consultant is expected to allocate 70% of the value of the consultancy contract to 51% black-owned small and medium enterprises, and 30% to black women-owned small businesses. The consultant is also expected to spend 10% of consultants' fees on developing emerging engineering entities, and 5% of the expenditure must be on goods and services from beneficiaries of the small business development programme. TCTA, through its Corporate Social Investment commitments, will further identify key community projects that are aimed at improving the socio-economic conditions of communities that the implementation project affects.

FUNDING ARRANGEMENTS

The estimated capital cost of implementing MCWAP-2A amounts to R12.3 billion (April 2018 prices). TCTA is responsible for securing the funding for the commercial portion of the project, totalling 88.1% of the costs. The remaining 11.9%, the social part – which is allocated to domestic and general urban requirements – is to be funded from the fiscus, specifically through annual transfers from DWS. TCTA has been tasked with sourcing off-budget funding under the approved borrowing limit and the associated financing model. The organisation will integrate the capital it raises with the existing MCWAP-1 funding.

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MOKOLO AND CROCODILE RIVER WATER AUGMENTATION PROJECT

PHASE 2A (MCWAP-2A)

BACKGROUND

The Department of Water and Sanitation (DWS) first issued TCTA with a directive to implement MCWAP in 2010. The organisation successfully implemented Phase 1 of the project (MCWAP-1), and it has been operational since June 2015. In 2016, DWS instructed TCTA to proceed with MCWAP-2A. The MCWAP project developed out of a process to address the water-shortage challenge facing the Strategic Integration Project #1 (SIP-1) of the government's National Infrastructure Plan of 2012. SIP-1 aims to unlock the economic potential of the northern mineral belt in the Waterberg area of the Limpopo Province. The plan has 18 SIPs that include catalytic projects to fast track development. The following phases of the MCWAP project were formulated:

- **MCWAP-1:** Augmentation of supply from the Mokolo Dam to provide for the growing water use requirement for the interim period until a transfer pipeline from the Crocodile River (West) could be implemented. Project design and construction has been completed, and MCWAP-1 has been operational since June 2015.
- **MCWAP-2A:** Transfer of water from an abstraction point in the Crocodile River, just to the west of the town of Thabazimbi, to the Steenbokpan and Lephalale areas. These areas form the central hub of the new development zone. This phase of the project includes a river management system.
- **MCWAP-3:** An upstream pipeline to bypass the river if its conveyance losses are found to be excessive.
- **MCWAP-4:** A transfer scheme from the Johannesburg Klip River Wastewater Treatment Works to augment the flow of the Crocodile River (West) should it be found that the surplus in the river is insufficient to supply the scheme.

PROJECT OVERVIEW

TCTA began implementing MCWAP-2A in June 2019 to augment water supplies to the Lephalale Local Municipality, Eskom's Matimba and Medupi power stations, and Exxaro's Grootegeluk mine. MCWAP-2A aims to facilitate the development of mineral resources and power generation in the Waterberg region. Current and future water users have been identified, and demand determined. It was decided that the project will have a transfer capacity of 75 million m³/a. Releases from dams in the Crocodile River (West) upstream of the abstraction works at Vlieëpoort will supply the water requirements for MCWAP-2A. The dams identified as potential primary water sources are Hartbeespoort and Roodekopjes on the Crocodile River (West), Roodeplaat and Klipvoor on the Moretele (Pienaars) River and Vaalkop on the Elands River. All current users expect an increase in demand for water in the coming years. Future water users include possible new mines to be established to supply the export market and independent power producers specifically. MCWAP-2A is the second of a potential four phases identified for the overall scheme and is targeted for completion in May 2026.

INFRASTRUCTURE COMPONENTS

Vlieëpoort Abstraction works

The abstraction works will comprise a weir and a low-lift pump station on the Crocodile River (West) at Vlieëpoort, about 9km to the south-west of Thabazimbi. The weir will consist of a 4m to 6m high mass gravity concrete structure with a stepped central spillway to facilitate flow gauging. Energy dissipation will be done through a downstream roller bucket dissipator. Abstraction will take place at the weir using a low lift pumping station, containing two 2m³/s pump inlets and an additional unit available as a standby. From the low-lift pump station, the water will be conveyed to a sedimentation works, just upstream of balancing dams, utilising a rising main comprising two 1 300mm-diameter steel pipes with welded joints.

Sedimentation works and balancing reservoir

The sedimentation works will consist of eight concrete channels, each 120m long, 2.5m wide and 5m deep. The balancing reservoir is an earth-fill structure, sized 620m x 440m, and comprises five compartments, each 400m long, 100m wide and with a depth of between 10.5m and 13m. The capacity of the balancing reservoir is planned to be 680 000m³.

High-lift pump station

The high-lift pumping station houses the pumps required to propel the water over the high point between the extraction weir and the end-users in the Lephalale area. The building comprises a reinforced concrete, masonry and steel frame structure, and has a footprint of about 120m x 30m.

Rising main

The rising main consists of steel pipes with welded joints and has a length of approximately 29 000m, and a pipe diameter of 1 300mm. The pipeline is located in a permanent servitude, which also provides for the possible future doubling of the line.

Break-pressure reservoir

The break-pressure reservoir located on a Leeuwbosch farm is a lined earth-fill embankment comprising three compartments of 30 000m³ each.