



A new word for water

Corporate Brochure

Message from the CEO

Trans-Caledon Tunnel Authority (TCTA) has served South Africans well over the past three decades and is poised to continue doing so for many years to come. It remains a valuable vehicle for the government to fulfil its constitutional obligation of ensuring that all citizens have access to adequate water. TCTA has contributed immensely to water security in the country, particularly in the major economic hubs, the nodes of electricity generation, the agricultural sector and elsewhere. It occupies an important niche in the infrastructure development landscape and has successfully performed the role for which the government established it in 1986. However, there are developments in the water sector that require a relook at how TCTA has traditionally operated.

The confluence of several trends is diminishing national per capita water availability while demand is edging up because of population and economic growth. Furthermore, climate uncertainty is slowly eroding confidence in the assured yield of the surface water systems. The situation is particularly dire in metropolitan areas, raising fears that this may become the new normal, especially after the water security crisis in recent years in the south-western parts of the country. At the same time, there is evidence that opportunities for building new dams are limited. Seventeen of South Africa's 19 river systems have been extensively developed, and existing dams already hold 66% of the mean annual run-off of all our rivers. Even when all dams are full, they still hold less than 900kl per capita, which is well below the water scarcity threshold of 1 000kl per capita.

The surface water system can no longer provide adequate guarantee of supply, which underscores South Africa's vulnerability to drought conditions. The country will require water augmentation through the reclamation and reuse of wastewater, and, where possible, seawater desalination. Simultaneously, water conservation and demand management will need to bring down consumption per unit of economic output. These developments call for a fundamental shift in the composition of the TCTA project portfolio. Demand for dams and pipelines it has typically implemented in the past is progressively declining. In their place, South Africa will have to build large-scale wastewater treatment plants.

We already have the first of this new generation of projects in the rehabilitation of Acid Mine Drainage (AMD) on the Witwatersrand. This presents an opportunity to expand the role of TCTA beyond the initial planning and construction phases of projects and to develop the capacity for a comprehensive asset life-cycle approach. With large-scale water reclamation or desalination plants being more complicated to operate and maintain than dams or pipelines, it is usually necessary to either outsource such services or to develop internal capacity. TCTA has assessed strategic options and favours an approach under which a short-term contractor transfers the required competencies and knowledge. During the transitional period, it will develop the capability to finance, build and operate alternative water resources infrastructure. TCTA's role in water security must evolve.





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OUR VISION

World-class enabler of sustainable infrastructure for a water-scarce South Africa.

OUR MISSION

To plan, finance and implement sustainable and accessible water resource infrastructure.

OUR VALUES

Excellence

We consistently give our best, deliver excellent work with agility, and think innovatively and creatively to improve our performance.

Integrity

We conduct ourselves honestly and transparently, stimulating constructive action, truly walk the talk, and gain trust and credibility through fairness and mutually cooperative relationships.

Respect

We acknowledge and embrace diversity, and we are responsive to one another's needs and those of our communities, stakeholders and the environment.

Unity

We are committed through a common vision and goals, effective team-work and partnerships, and we contribute positively to the team's performance, spirit and morale.

Growth

We willingly share knowledge and information with each other, we are innovative and proactive in thought and in action, and we support, encourage and provide opportunities for individual and collective growth.

INTRODUCTION

TCTA is a state-owned entity responsible for financing and implementing bulk raw water infrastructure projects. It is an agency of the National Department of Water and Sanitation (DWS), which handles the country's water resources in respect of usage, equitable allocation and distribution. TCTA helps the government in its pursuit of water security for South Africa and in realising its constitutional obligation of ensuring universal access to this essential resource for all citizens.

South Africa is a water-scarce country, requiring a dedicated focus on ensuring adequate water storage and transfer capacity. To this end, TCTA designs bankable projects, raises funding in capital markets, manages debt and implements infrastructure rollouts. It is a specialised liability management entity that the government uses to finance and build dams and transfer schemes off budget while within an acceptable risk framework and in the most cost-effective manner. This financing mechanism reduces the borrowing requirements of the government and allows it to pass the cost of infrastructure onto the end user in line with the "user-pay principle".

The government founded TCTA in terms of a Notice of Establishment published on 12 December 1986. The initial mandate was to finance and build the South African part of the Lesotho Highlands Water Project (LHWP), which delivers water to the Vaal River System in South Africa. It was meant to be a special purpose vehicle for South Africa to use to fulfil its treaty obligations to Lesotho in respect of this project. However, in 2000, the government amended the Notice of Establishment, resulting in the TCTA being able to undertake other water-related projects.



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The amended notice, issued in terms of the National Water Act of 1998, replaced the old one when the government published it in the Government Gazette on 24 March 2000. It articulates TCTA's mandate and allows periodic directives on new deliverables from the government. The Authority has a highly-skilled, multidisciplinary team with core competencies including project financing and implementation, and liability management. Over the years, it has built a solid record of accomplishment in structuring, financing, and implementing big water infrastructure projects, earning its financing instrument attractive credit ratings. It has further demonstrated the ability to optimise development impact in terms of job creation, corporate social responsibility initiatives, skills development, and broad-based black economic empowerment. Industry bodies have recognised TCTA for its engineering and environmental management excellence with several merit awards.

The engineering principles behind this success include compliance of design criteria with international best practice and benchmarks, and technical reviews of planning designs to ensure the implementation of cost-effective and appropriate structures. TCTA thoroughly reviews alternatives, ensures value for money through the optimisation of infrastructure types and structures, and applies lessons from previous projects to current ones. Furthermore, it complies with environmental legislation and international best practice and benchmarks, approval conditions, and involves communities in project rollouts.

PRODUCTS AND SERVICES

TCTA undertakes varied tasks in the execution of its mandate. These include structuring and raising project finance, debt and risk management, land acquisitions, construction, and operation and maintenance. However, the following four functions summarise the work that TCTA does:

Liability Management

TCTA structures and raises project finance for each of its water infrastructure projects. It funds its projects through long-term loans from local and foreign commercial banks and capital markets, which it then repays from the revenue generated from the sale of bulk water. The Authority also funds all its projects off-budget, meaning that they do not receive direct allocations from the national fiscus. It caters for its short-term capital requirements through the issuance of commercial paper. Furthermore, each project is ring-fenced and, as a result, has a separate bank account, general ledgers, and borrowing authority and guarantees from the government. Each project also has a different income agreement between DWS and bulk-water off-takers.

Project Design and Management

TCTA determines the project features, structure and criteria for success and major deliverables needed to achieve the goals of the Ministerial Directives that it receives. It undertakes all initiation, planning, execution, monitoring and control, and closure during the infrastructure build programme. However, the Authority's role sometimes continues beyond build closure as it then becomes responsible for the operation and maintenance of the completed water infrastructure.

Advisory Services

TCTA began offering advisory services in 2004 when the government amended its mandate to allow it to advise water management institutions and water boards on financial and treasury management services. The capacity to carry out this function grew in 2009 with the formation of the Knowledge Management Division, which houses the Advisory Services Unit. TCTA is now a knowledge-rich organisation that can offer high-value advisory services to projects including those on large-scale seawater desalination and water reuse. The Authority expects growing demand for its advisory services given the strategic nature of the water sector. Other factors that it hopes will increase demand include the increasing need for sustainable solutions to South Africa's water-scarcity problem, which could prove a constraint on economic growth if not managed effectively.

Knowledge Management

TCTA has set up a knowledge hub for large-scale desalination and water reuse within its Knowledge Management Division. This initiative draws on the guidelines the national strategy of the Department of Water and Sanitation provides on these two related subjects. The strategy envisages reputable water management institutions managing the implementation of large-scale projects. The Authority is well-positioned for this role. It has over the years made considerable progress in building a knowledge base in all aspects of such projects. The initiative will continue to develop relevant insights and capacity in anticipation of an era when the bulk-water infrastructure build programme will contain significant elements of seawater desalination and water reuse.



INFRASTRUCTURE PROJECTS

Over the years, TCTA has initiated, financed and managed a wide range of water infrastructure projects that are now at different stages of development. DWS determines the role the Authority plays in each project, and it can involve one or a combination of any of planning, funding, implementation, operation and maintenance, advisory, and payment agency services. To date, TCTA has been involved in projects that include:

Lesotho Highlands Water Project (LHWP)

LHWP is an iconic bi-national water resource development project between the governments of the Republic of South Africa and the Kingdom of Lesotho. It diverts water from the Senqu River System in Lesotho to South Africa's economic heartland, Gauteng. The countries formalised the project through the LHWP Treaty signed in 1986. The agreement, among other things, sets out the institutional arrangements for implementing the project on behalf of the two governments. The first phase of the project (LHWP-I) was completed in 2003 and delivers 780 million m³ of water to South Africa. TCTA operates and maintains the South African portion of the Delivery Tunnel North of LHWP. Water deliveries to South Africa are as per the Water Delivery Plan. In the implementation of phase two (LHWP-II), comprising a water delivery system to augment the supply of water to South Africa and a Lesotho-based hydropower generation component, TCTA's role is limited to raising funding for the project. The parties to the Treaty expect that total cross-border delivery will increase to 1 200 million m³ per annum on completion of LHWP-II. The two countries signed an agreement to implement Phase II of the project in August 2011. The project commenced in 2018.



Acid Mine Drainage (AMD) projects

DWS designed this project for execution in two phases, AMD Short-Term Intervention (AMD-STI) and AMD Long-Term Solution (AMD-LTS). The first phase, AMD-STI, has been completed. Its objectives were to prevent acid mine water from decanting in the Western Basin and the breaching of the environmental critical level (ECL) in the Central and Eastern basins catchment area. To this end, AMD-STI comprised an upgrade of the Rand Uranium water treatment plant and associated infrastructure in the Western Basin. The short-term intervention resulted in an increase in treatment capacity from 12MI/pd to 30MI/pd. In the Central and Eastern basins, TCTA managed the construction of high-density sludge water treatment plants with respective capacities of 84MI/pd and 110MI/pd. At present, the Authority oversees the operation and maintenance of these three AMD treatment plants. The AMD-LTS project came about following a DWS feasibility study that recommended the construction of desalination plants to treat to a potable or industrial standard the water abstracted via the short-term intervention infrastructure. It aims to provide a permanent solution to the impact of acid mine drainage. Implementation of the long-term AMD project will remove the need for dilution releases from the Vaal Dam. Desalinated AMD from the Witwatersrand will augment water supplies to the Vaal River System. Even more importantly, it will delay the need for further augmentation until 2030 as per current demand projections.





Berg Water Project (BWP)

A directive for the project was received in May 2002 and involved building the Berg River Dam and the supplement scheme. BWP augments the yield of the Western Cape water supply system by 18% (86 million m³ of water per annum) to 523 million m³ per annum. Its components comprised advance infrastructure in the form of a permanent access road and housing and the Berg River Dam, a 62m high concrete faced rockfill dam with an embankment with a volume of 4 million m³ and a gross storage capacity of 130 million m³. The supplement scheme comprised two pump stations with capacities of up to 6 m³/s and total installed power of 25 MW, an abstraction works comprising a weir, sediment exclusion works, balancing dam and revetments as well as 12km of 1 500mm diameter steel pipelines. The project is complete and is fully operational. BWP has received four major awards to date.



Vaal River Eastern Subsystem Augmentation Project (VRESAP)

The project was commissioned to transfer 160 million m³ of water 121 km from the Vaal Dam to the Knoppiesfontein near the Secunda area. It consists of abstraction works located at the Vaal Dam, including a low-lift pump station, a dual-purpose de-silting works-cum-balancing dam, a high lift pump station, 121km of 1,9 m diameter pipeline, a 10 000 m³ surge tank and the upgrading of the existing diversion structure at Knoppiesfontein. The augmentation of the existing Vaal River Eastern Subsystem, which supplies water to the coal fields of eastern Mpumalanga, was necessary due to the expansion of Eskom and Sasol activities in that region. VRESAP has been completed and has been operational since June 2009. TCTA is now responsible for the management of the debt its implementation incurred. Project costs will be recovered by 31 May 2029 from the revenue the sale of water to Eskom, Sasol and the Vaal River Eastern Subsystem users generates.



Mooi Mgeni Transfer Scheme – Phase 2 (MMTS-2)

MMTS-2 is complete and fully operational. It entailed the construction of a 37,7m high dam with 139,5 million-m³ storage capacity, a pump station and 14,9km pipeline including 8,3km of Umgeni Water portable pipe. Furthermore, it involved the refurbishment of infrastructure built in the first phase, MMTS-1. DWS directed TCTA in November 2007 to execute MMTS-2 with a view to augmenting the yield of the Mgeni System by 60 million to 394 million m³ per annum. MMTS-2 entailed the construction a new Spring Grove Dam on the Mooi River, Water Transfer System from the dam to the Mpofana River and a fish barrier upstream of the dam. The additional water benefits eThekweni Metropolitan, uMgungundlovu District, Ugu District, Ilembe District and Msunduzi Local municipalities, which collectively represent the economic hub of KwaZulu-Natal. MMTS-2 has increased water security in the area.



Olifants River Water Resources Development Project – Phase 2 (ORWRDP-2)

The second phase has several sub-phases. TCTA's role essentially involves funding and managing debt for Phase 2B to 2G, which entail building a bulk distribution system. However, DWS has further charged the Authority with implementing 2C and 2B in addition to funding them. Work on Phase 2C has been completed and involved a 40km pipeline from De Hoop Dam to Steelpoort that will improve the water supply to Jane Furse/Nebo Plateau and for mining activities in the Steelpoort-Burgersfort area. DWS executed and has completed Phase 2A, the construction of De Hoop Dam. It is also implementing other phases. Work on Phase 2C has been completed and involved a 40km pipeline from De Hoop Dam to Steelpoort to improve water supply to Jane Furse and Nebo Plateau, and the mines in the Steelpoort-Burgersfort area. Phase 2B, which is yet to start, will augment the water supply to the Mogalakwena Local Municipality for use by the mines and residents.



Komati Water Scheme Augmentation Project (KWSAP)

The project transfers water from the Vaal River Eastern Sub System's Rietfontein weir to Eskom's electricity generation plants in Mpumalanga province. It yields 57 million m³ per annum for the benefit of Matla and Duvha power stations. The construction involved an additional pump station at the Rietfontein weir and pipelines from there to the Duvha and Matla power stations respectively about 58,4km and 12,9 km away. The project was completed in June 2013 and has been operational since. At present, TCTA only manages the debt its implementation incurred.



Mokolo and Crocodile Water Augmentation Project (MCWAP)

TCTA is implementing Phase 2 of MCWAP (MCWAP-2) following the successful completion of the first phase (MCWAP-1), which is fully operational. MCWAP-1 consisted of a 43km pipeline and a pump station. It augments bulk raw water supply by 30 million m³ per annum from the Mokolo Dam to Medupi and Matimba power stations, an Exxaro coal mine and Lephalale Local Municipality. Additional water from MCWAP-2 is required to provide Medupi and Matimba with enough to respectively operate an additional three and six Flue Gas Desulphurisation units, which the MCWAP-1 pipeline cannot supply. It will also provide the Lephalale municipality with water for a growing population that is already using volumes above the allocated MCWAP 1 capacity. MCWAP-2 will also unlock coal resources in the Waterberg region for export and industrial development, and electricity generation by independent power producers and Eskom's power stations. The project scope covers the construction of an abstraction weir, pump stations, a river management system and a 160km pipeline to transfer water from the Crocodile River to the Lephalale area.



Mzimvubu Water Project (MWP)

This project aims to develop water resources in the Mzimvubu River catchment area to provide an economic stimulus in one of the poorest and least developed areas in the Eastern Cape province. When completed, the MWP will supply potable and raw water for domestic use, irrigation, industrial purposes and hydropower generation. The government expects that water infrastructure development will catalyse the economy of the region; hence it deems MWP a strategic project. A significant spinoff for the area will be in terms of job creation in sectors such as electricity generation, tourism and agriculture. The new water infrastructure will also create operation and maintenance jobs when completed and temporary ones during construction. MWP involves building advance infrastructure including roads, the development of Ntabelanga Dam, water treatment works and a bulk distribution system. Furthermore, its scope caters for the implementation of irrigation, hydropower infrastructure, roads and houses for the staff. The rollout has four stages, namely: Advance infrastructure; Ntabelanga Dam and water treatment works; Bulk distribution system; and Irrigation and hydropower infrastructure, roads and staff houses. DWS has directed TCTA to provide project management and advisory services for Stage 1. The department's Construction Unit and infrastructure development Branch are the Contractor and the implementer respectively. TCTA is responsible for efficient project preparation, roll-out and delivery to specifications, on time and within budget. Stage 1 involves the construction of advance infrastructure, mainly an access road and staff housing, and the estimated project budget is: R728 million.

Kriel Project

The project aims to provide a backup water supply to the Mpumalanga town of Kriel. It consists of the construction of a 3km offtake pipeline connecting from the Komati Water Supply Augmentation Project (KWSAP) Duvha pipeline and an upgrade of the existing Kriel water treatment works. The off-take pipeline will provide backup when the water supply pipeline from Jericho Dam is out of service for scheduled repairs. Guaranteed supply is essential, particularly to ensure uninterrupted water supply to the community in the town of Kriel. TCTA is responsible for the planning, design, environmental work and providing project management in support of DWS, which is building the works itself.



Berg River Voëlvei Augmentation Scheme (BRVAS)

BRVAS) project has been identified as the surface water development that can satisfy the augmentation requirement of the Western Cape Water Supply System (WCWSS). The system serves the City of Cape Town, its surrounding urban centres and irrigators along the Berg, Eerste and Sonderend rivers. The Reconciliation Strategy for the WCWSS shows that it is in deficit and needs urgent augmentation to avert a serious shortfall. The failure of the supply system to deal with the 2015 drought in Cape Town demonstrated this need. The Reconciliation Strategy explored various interventions but settled on BRVAS as the best surface water intervention to meet the shortfall in the short term. DWS directed TCTA in May 2017 to undertake work to abstract winter flows from the Berg River and pump them into the existing Voëlvei Dam. The project scope covers the construction of a weir, abstraction works and a pump station on the Berg River. It also included building a 6,3km-long pipeline to deliver water to the Voëlvei Dam. The BRVAS project has the potential to satisfy the augmentation requirement as it will increase the yield by 23 million m³ a year in the medium to long term. The scheme makes extensive use of existing infrastructure, namely the Voelwei Dam, water treatment works and Cape Town's pipeline from the treatment works as well as existing infrastructure of the West Coast District Municipality. The Minister of Human Settlements, Water and Sanitation has appointed TCTA to implement the BRVAS on a fast-tracked basis on behalf of government. The cost to construct BRVAS is estimated at about R728 billion, which the Minister tasked TCTA with securing.

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