
7. FUTURE INFRASTRUCTURE REQUIREMENTS

7.1 STATUS OF EXISTING MASTER PLANS

Previous master plans for Bulk Water and Wastewater Treatment were updated during 2005. Reticulation's Master Plans have not yet been integrated for CCT, although developed for most of the previous Administrative areas.

An integrated Master Planning Team has been set up during 2005 to improve integrated planning across the City and across the Departments.

7.2 OVERVIEW OF PROPOSED EXPANSION TO BULK INFRASTRUCTURE

7.2.1 Bulk water

Planning of the bulk water distribution (refer to Computer Model Analysis and Master Plan for Bulk Water Supply System, March 2001 held by the Bulk Water Department) system has been based on a future AADD of 1350 MI/d.

Conceptual planning of bulk water supply infrastructure has however been carried out up to an AADD of 1850 MI/d. The timing of the bulk water infrastructure required is dependent on the growth in water demand and the effectiveness of the WDM strategy being implemented.

Bulk Water Planning Investigations

The planning and development of major water resource schemes, like the Berg Water Project, is usually complemented by the planning and development of additional bulk water supply infrastructure needed to convey the raw water to water treatment plants, the treatment of the raw water into potable water and then the conveyance and bulk storage of the treated water.

Planning for all future bulk water supply infrastructure is currently being carried out in accordance with the Low Water Demand Curve of the City. The date for constructing a new 500 MI/day water treatment plant (see below) will be reassessed 2008 depending on whether water demand growth is below the low water demand curve.

The former CMC appointed specialist consultants in 1998 to conduct a Bulk Water Supply Master Plan (and development of a computer model) for the City. The objectives of the Study were to:

- optimize the operation of the existing bulk water supply system
- assist with the maximization of existing and future water resources
- assist in making optimal decisions when constraints on the bulk water supply system necessitate operational changes

- to assist in the planning and optimization of future capital works

The Bulk Water Master Plan identified that a new Water Treatment Plant (WTP) and associated bulk water pipelines and bulk reservoirs would have to be constructed within the next 8 years in order to meet the demand of water. The new water treatment plant would be linked to the Berg River Dam currently under construction.

In 2003, the Bulk Water Department initiated an environmental process as part of a feasibility study (including route selection and location of infrastructure) to ensure timeous development of a new 500 ml/d Water Treatment Plant (WTP), 300 MI bulk water supply reservoirs and associated pipe work in order to meet the future growth in water demand for the City.

Should the new WTP and associated infrastructure not be constructed timeously, water restrictions would have to be imposed in the dry summer months in order to ensure that the peak water demand does not exceed the CCT's available WTP capacity.

Areas that were identified for the possible location of a future water treatment plant include the Dwars River Valley, Franschoek, Klapmuts/Simondium, Wemmershoek, and Muldersvlei/ Joostenberg. The current preferred location for the new WTP is in the Muldersvlei\Joostenberg Vlakte\Klapmuts area.

A WTP abstracting water from the Dasbos Portal and the Berg River Dam is the preferred for the following reasons:

- A new WTP in the vicinity of the Berg River Dam will reduce the reliance which the CCT currently places on the RSE Tunnel System (security of supply);
- A WTP abstracting water from the Dasbos Portal and the Berg River Dam could cater for the growing water demands of Drakenstein and Stellenbosch Municipalities and make available currently under-utilised capacity in the existing pipeline from the Wemmershoek WTP;
- The WTP could feed the areas of high growth (i.e. Durbanville North) directly.
- It would provide an alternate source of supply to Glen Garry Reservoir and possibly enable the Wemmershoek WTP to be shut down for repairs or maintenance for a longer duration;
- Water from some of the sources could be gravitated to Glen Garry Reservoir
- Increased flexibility in the bulk supply system.

In addition to the proposed new Water Treatment Plant, additional bulk water reservoirs are required in the Blaauwberg area (Contermanskloof Reservoir) and in the Helderberg area (Steenbras Bulk Reservoir). Additional bulk water supply infrastructure may also be required in order to boost bulk water supply to Houtbay.

Timing, Phasing and Cost of the new Infrastructure

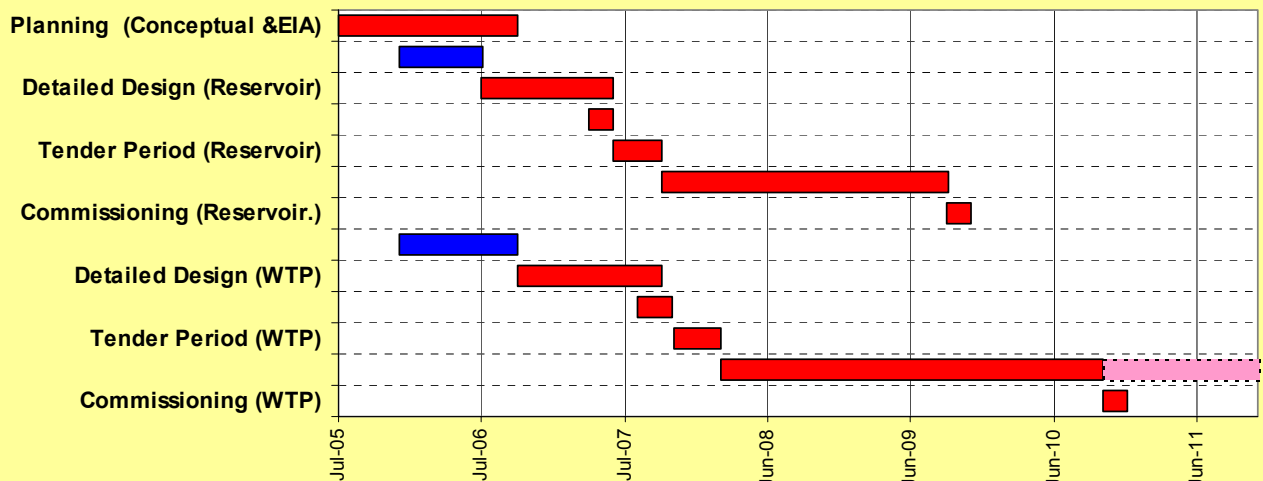
The timing and phasing of the construction of the new bulk water supply infrastructure would be dependent on the growth in peak week water demand in the area served by the bulk water supply infrastructure as well as factors such as security of supply. It is proposed that the infrastructure be phased in, in such a way so that it can be utilised as part of the bulk water supply system upon completion and commissioning.

It is currently estimated that a 300 MI bulk water supply reservoir (and associated interlinking pipe work) will be required to provide balancing storage on the Wemmershoek pipeline by the end of 2009. The completion of the proposed water treatment plant will be required by the end of 2010, with the remainder of the bulk water supply infrastructure connecting the proposed WTP to the proposed Spes Bona Transfer Reservoir and the existing Glen Garry Reservoir being required shortly after this point in time. ([Figure 7.1](#))

The cost of the new water treatment plant and associated bulk reservoirs and bulk pipelines (including the Voëlvlei to Glen Garry Transfer Scheme) is in the order of R1,4 Billion.

Should the imposition of the water restrictions in 2004 and the water demand management strategy put forward, change consumer behaviour with regards to water consumption, the implementation date of the new water treatment plant will have to be revised accordingly. This will however have to be monitored on an annual basis.

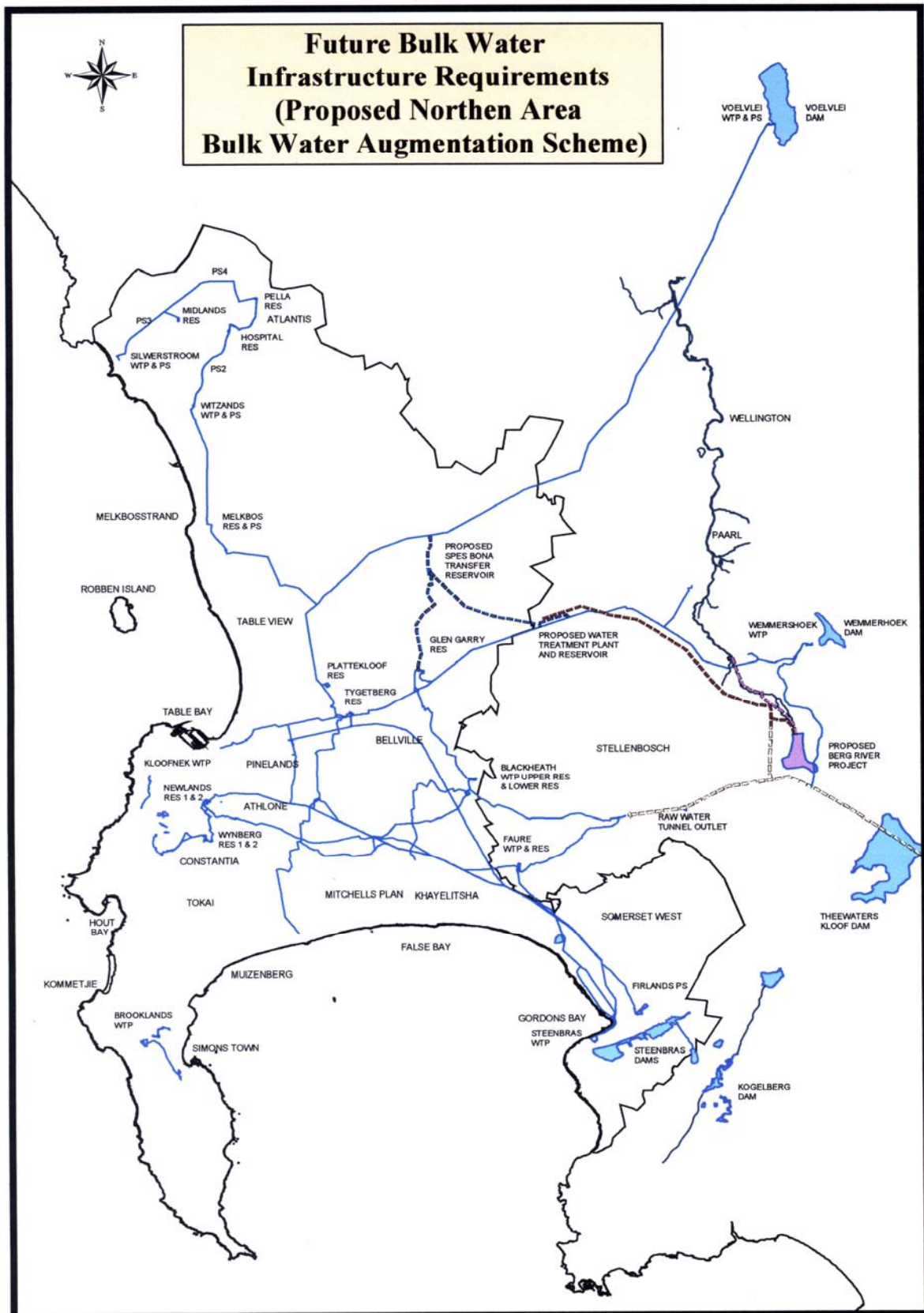
Figure 7.2 Programme to implement Bulk Water Infrastructure.



A Schematic layout description of required bulk water supply infrastructure is given in [Figure 7.2](#) while a detailed description is available at the offices of the Bulk Water Department.

It must be noted that the description, phasing and costing of the bulk water supply infrastructure described in all the text above is provisional and is also subject to the outcomes of various further planning initiatives.

Figure 7.2 Future Bulk Water Infrastructure Requirements



7.2.2 Wastewater

The Bulk Infrastructure Programme has been updated in the form of a Master Plan which summarises the sewage infrastructure requirements to meet future growth. Although it was previously an urgent requirement to adhere to the proposed 2010 standards, the implementation of these standards is currently being delayed by DWAF and each application for upgrading is being assessed on its merit and the reserve determination of the receiving water body.

Financial investment into wastewater treatment infrastructure has been lacking historically due to the high demand on capital throughout the city and this is affecting essential maintenance and upgrading which results in further deterioration of the infrastructure or “asset stripping”. If this tendency continues, a major problem would arise as far as future capital requirements are concerned since the demand escalates at a much higher rate while the investment backlog grows.

Where investment has taken place, benefits are notable from the improved effluent quality at these works for example at Macassar, Zandvliet, Wildevoëllei and Kraaifontein Wastewater Treatment Works effluent quality is now totally compliant with permit requirements. This in turn improves the re-use potential of wastewater effluent.

Staff reduction has continued over the past five years and increased use is made of consultants to implement capital improvements.

It is also foreseen that there are potential benefits in outsourcing some operational functions as is seen in the case of Zandvliet Wastewater Treatment Works, which is successfully operated by a private company. Such alternative service delivery mechanisms may be considered in future especially in the case of new treatment works.

During 2004/05 the Wastewater Department has experienced significant success in sludge-to-land/ composting as a means of beneficial sludge disposal. This project is an example of private-public partnership for mutual benefit and has led to soil enrichment of farming land as well as reduced the uptake of valuable space on landfill sites. This initiative is being carried out with the approval of DWAF.

Strategic Bulk Wastewater Study

The Strategic Bulk Wastewater Study (1999) ([GOTO 5.2](#)) assessed the performance of existing wastewater infrastructure, processes and management systems and identified where improvements were necessary for more effective performance. In addition the development predicted to take place in the CMA over the next 20 years, identified the need for facilities to be extended or new ones to be put in place. This study formed the basis of the more recent 10 Year Master Plan.

The Wastewater Department's Master Plan was compiled as an easy reference document giving general information on Departmental issues, the comprehensive Bulk Wastewater Strategic Study organizational structures and flow predictions. The document reflects the latest statistical information and includes a 10 year capital programme which is based on prioritizations to achieve improved compliance of effluent quality and/ or increased treatment capacity to keep pace with development.

The Master Plan is a living document which will be updated on a regular basis as priorities change and issues emerge which influence strategic plans. It is a useful tool especially with regards to flow predictions and capital improvement intentions and will serve the Department well as a basic planning document.

7.3

OVERVIEW OF PROPOSED EXPANSION TO RETICULATION INFRASTRUCTURE

The growth rate of the City is driving the need for new infrastructure. However, over the last few years the financial situation and priorities of the City of Cape Town has created a scenario where it is not in a position to timeously provide the required bulk pipeline infrastructure. During 2004, mostly at the insistence of the Water Services and Transport Directorates, a City-wide Development project process was started to address the situation. A key element of this current initiative is a partnership approach with developers, to ensure that development can continue. Development contributions from the developers are determined and agreed on for each Development Node or Corridor and which funds can be used to provide the required infrastructure.

The development areas are described below.

7.3.1 West Coast/Parklands development corridor

This is one of the fastest growing areas in the City of Cape Town. The Services Master Plan for this area is updated on a regular basis through a Bureau system.

Apart from the normal reticulated infrastructure internal to the development parcels, a number of larger pipes are required.

Water

A 1000mm diameter main feeder from a new connection on the bulk Voëlvlei pipeline will be constructed within the next 2 years, leading to 1 or 2 new reservoirs as described under Bulk Water. General upgrades and extension of networks will continue, to match parcel development.

Sewer

Various upgrades are still required in the system, while phase 1 of the bulk sewer to Potsdam WWTW was completed. When – is this part of the 47MI/day cap? The 2nd phase will start in the next financial year. The need to convey

wastewater to Melkbos is under investigation as it will drain the Western area of Parklands/Sunningdale.

7.3.2 De Grendel / N7 development corridor

This area is one of the latest development corridor additions. The area is on the East of the N7 between Platteklouf township and Contermanskloof. The proposed developments in this area are intended to be fast-track and the Master Plans for this area are nearing finalisation.

Water

The need for a reservoir will be confirmed at a later stage. Water will be supplied via the Voëlvlei system.

Sewer

The area will drain to the Potsdam WWTW and all spare capacity in the existing infrastructure will be optimally utilised. The need to cross the N7 with one new sewer pipe is under investigation. A Master Plan for this new area is in progress.

7.3.3 Northern development corridor

This area north and north-east of Durbanville and Kraaifontein is in desperate need of infrastructure in order to continue with development.

Water

The Master Plan for this area was implemented over the last few years. Two reservoirs will need replacement in future. The new supply system from the Voëlvlei pipe is already in operation.

Sewer

The need for the new Fisantekraal WWTW has reached a critical stage as discussed under Wastewater Treatment. A bulk pipe is needed to convey sewerage to the new Plant. Its design will start in the 2005/06 financial year. Major upgrades will take place at bottlenecks in built-up areas to reduce overflows.

7.3.4 Bottelary development corridor

This area between Brackenfell and Kuilsriver along the Bottelary Road was one of the first identified nodes.

Water

A reservoir, feeder main and new bulk connection will be constructed soon. Apart from the normal reticulation required as per the Master Plan, a number of bulk connections will be required.

Sewer

The Master Plan for this area is up-to-date and indicates that major infrastructure is required. A new bulk sewer, a new bulk pump station and upgrading of the Bellville WWTW will be required. Scoping for these projects has started.

7.3.5 Maccassar / AECI development corridor

The development of this area has already been delayed due to a lack of infrastructure. The area is vast and major infrastructure is required.

Water

The Master Plan for this area is updated on a regular basis to ensure that required infrastructure is identified timeously. In general, the water reticulation can cater for this area.

Sewer

Major infrastructure is required to provide capacity for the proposed development as well as backlog capacity for existing areas already approved. The existing infrastructure is in a very bad condition and major pipe collapses occurred in sensitive areas during the last year. The planning of new infrastructure has been delayed and will commence soon.

7.3.6 Fast-track and In-fill housing projects

The City's priority N2 Gateway housing project opens up a number of places where new infrastructure is required. The development in Delft where more than 9 000 houses need to be built has highlighted the need for a new bulk sewer to serve the entire catchment. The planning process for providing the required infrastructure has started.

The proposed development at Wingfield will require the completion of the final phase of the Northern area sewer to Langa Pump Station.