

PROJECT NAME

Upgrade and Extension of the Nomlacu Water Treatment Plant

CLIENT

Umgeni Water (Implementing Agent for Oliver Tambo District Municipality)

LOCATION

10 km's north-west of the town Mbizana in the Eastern Cape

PROJECT VALUE

R35 million

SERVICES

Preliminary design, detail design, tender and project management of the multi-disciplinary project

TIME FRAME

September 2008 to December 2011



This project forms an integral part of the Greater Mbizana Regional Bulk Water Supply Scheme, where it was found that the existing water treatment plant, with a capacity of 1 Mℓ/d, needed to be extended in order to meet future project demands. A phased extension of the water treatment capacity required an immediate 10 Mℓ/d extension with an eventual treatment capacity of 20 Mℓ/d. The brief received from Umgeni Water for the project was threefold namely:

- Maximum utilisation of the existing infrastructure and available land during the planning stage of the project;
- The selection of an appropriate process train and equipment for rural operating conditions; and
- Ensure the current plant remain in operation while adding an additional 10 Mℓ/d.

The focus point being the prominent existing office, laboratory and chemical make-up building will remain, whilst adding



two new clariflocculators, four new filters and a new service pumping station for the extended treatment plant. Aspects identified to improve the operation of the plant were the inclusion of additional on-site raw water storage capacity and a new intake structure accommodating liquid and powdered chemical make-up facilities for coagulant addition and stabilization of the raw water. A short-coming identified in the existing Plant was the disinfection process of the existing 1 Mℓ/d final water reservoir. CSV recommended that baffles be constructed to ensure plug flow conditions prevail ensuring a hydraulic efficiency value of 0.6 could be maintained. In order to accommodate the backwash of the new filters, a constant head tank was also introduced in the existing reservoir.

The new Plant's operation will be semi-automated with operator interaction for flow, chemical addition and the initiation of backwash. The installation of a SCADA system was recommended. The chemical dosing control will be by means of PLC and online instrumentation such as pH meters, flow meters, streaming current detectors and free chlorine sensors.

In line with the brief to apply appropriate technology, CSV selected a declining rate hydraulic control system for the filters. This approach forces clean filters to take more load while the hydraulic load on the dirty filters is reduced. This is achieved with no need to install expensive and complicated electrical and mechanical hydraulic control equipment.

The Plant construction is at an advanced stage with an anticipated commissioning date of October 2011. This will ensure that the rural community of Mbizana will have sufficient potable water for the foreseeable future.