

TURNKEY PROJECT FOR THE WATER CONSERVATION AND DEMAND MANAGEMENT AT THE GSDM FOR THE LEKWA LOCAL MUNICIPALITY

Name of Client: ZMG-Watech for Lekwa Local Municipality

Country: South Africa - Mpumalanga

Duration: 9 months

Start Date: October 2014

Completion Date: June 2015

Project Value: R20 175 438 (VAT exclusive)

Number of team members: 1 Engineer, 5 Technical Staff

Description of project

The purpose of the project was to implement a water loss control programme in the Lekwa Local Municipality, with particular focus on Standerton supply area.

A key focus of the project was to set up a hydraulic model for the Standerton water supply system with a view to developing a water master plan to address the current and future water supply problems.

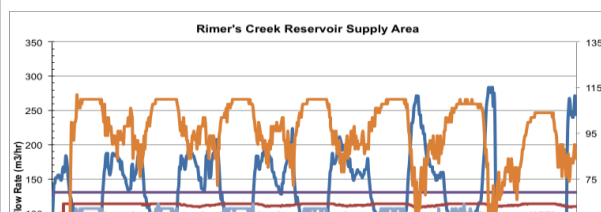
Description of services provided by Tlou Consulting

The Company was intimately involved in the Standerton Water Loss Control Programme:

- Sakhile Township Emergency Intervention;
- Situation Assessment through data collection and review;
- Pressure and flow logging (night flow analysis);
- Development of hydraulic model using Bentley's WaterGEMS;
- Hydraulic analysis of the water supply network system;
- Identification and implementation of Water loss interventions and water saving targets;
- Establishment of the District Meter Areas, including installation of district meters and pressure control valves;
- Implementation of an active leakage programme;
- Undertaking a benefit cost analysis of the water loss control programme.

Knowledge area applied

- Water Conservation and Demand Management
- Infrastructure Asset Management
- Infrastructure Planning, Design and Management
- Financial Analysis
- Project Management
- Research and Development



Benefits to the Client

- A GIS model of the existing water network that can be updated by the Municipality as infrastructure is developed.
- GIS software and training for Municipal officials.
- A hydraulic model of the supply network to enable real time
- Early warning system for pressure and leak detection
- Implementation of water infrastructure and zoning to enable a comprehensive Water Balance Assessment.
- Establishment of a consumer use baseline and water saving targets.
- Availability of a detailed water conservation and demand management programme
- Availability of a detailed Water Masterplan.

Development of a hydraulic model and analysis of the Standerton water supply scheme network

A calibrated, 48-hour Hydraulic Model of the Standerton potable water supply system was created using the Bentley Software - WaterGEMS. The ArcGIS files for the distribution system network provided by the Local Municipality were used as a base for creating the hydraulic model for this Water System Master Plan. The hydraulic model contains all pipelines and facilities (booster pumps, storage tanks, wells, and pressure reducing valves) present in the ArcGIS geodatabase that was developed by the project team using Planet GIS. The process that was followed in the integration of the GIS to the WaterGEMS model is illustrated below in Figure 1. The representation of the Standerton water supply system in the WaterGEMS hydraulic model is provided in Figure 2.

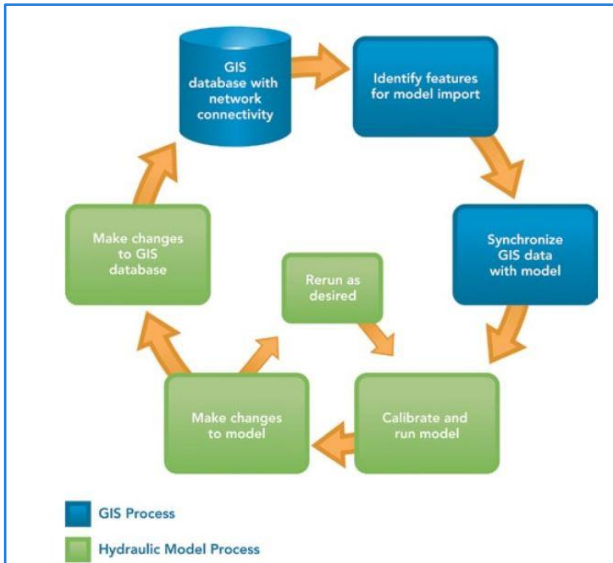


Figure 1. Lifecycle for sustainable hydraulic model

Such a model has numerous benefits to the Water Service Provider:

- Understand how the water supply system operates under various demand/flow scenarios, now and into the future.
- Assessment of deficiencies in the water supply system and condition and performance of the existing water system infrastructure.
- Assess performance of the water supply system in the event of various failures (e.g. critical asset failures or overflows).
- Identification of infrastructure requirements to improve performance of the water supply system and assessment of impacts of proposed operational modifications, augmentations or renewals.
- Determine measures to address water supply problems.
- Prepare Capital Improvement recommendations/ Capital Improvement Plan updates for implementation.
- Prepare a benefit cost analysis for upgrading the water network.

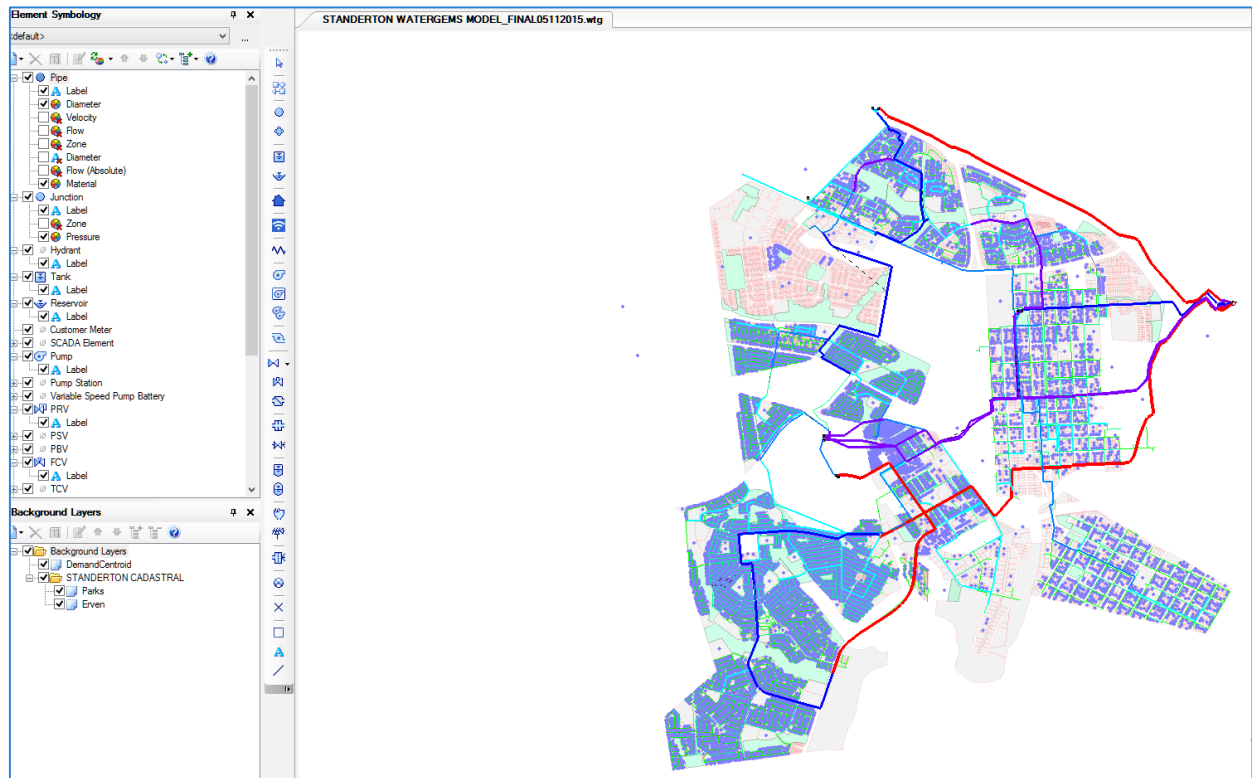


Figure 2: Standerton Water Supply System setup in WaterGEMS