

Client Name: Western Cape Government Department of Transport and Public Works

Project Value: R1 115 000-00 (incl. VAT)

Project Duration: September 2019 – February 2021

Location: Western Cape, South Africa

Project Description: The Western Cape Government (WCG) appointed Re-Solve to complete zoning, and leak detection to establish the location of a major leak at the Cape Teaching and Leadership Institute (CTLI).

1. Pre-Intervention State

The WCG appointed Re-Solve to assist them in lowering their excessive municipal water bill for the CTLI facility. In summary:

- The municipal water bill for the facility indicated an average consumption of 5.0 kl/hr or 120 kl/day.
- The municipal water bill averaged at a cost of R180 000 per month.
- The minimum night flows were 3.74 kl/hr which accounted for roughly 75% of the total flow rate.
- The borehole and Water Treatment Works on site was not used for potable drinking water and was not connected to the irrigation system. During non-drought conditions, the facility irrigated the sport fields with an average cost of R208 220 per month.
- During the investigations, Re-Solve also found that several valves are not functional and could not open and close correctly.

2. Proposed Solution

- **Logging** – A flow logger was installed on the bulk water meter and pressure loggers were installed in the different zonal areas.

- **Zoning** – Zoning exercises were executed to reduce the search area and verify that the information gathered was accurate.

- **Valve Replacement Project** – After the initial zoning investigation, a valve replacement project was proposed and approved by WCG. The valve replacements were to ensure that proper zone isolation could be done to determine in which areas the leaks were located.

- **Leak Detection** – Following the implemented of the valve replacement project and the completion of the zoning exercises, a thorough leak detection investigation was implemented by analysing the zoning data and using equipment such Acoustic leak detection, Valve Correlation and Vibration logging. A Ground Penetrating Radar was used to locate pipelines and infrastructure.

- **Leak Repair** – Leaks detected had to be excavated and repaired. The site also had to be reinstated to its original condition.

- **Irrigation System** – The borehole and Water Treatment Works was decommissioned, and it was proposed to construct a separate water distribution network from the Water Treatment Works to tie-in with the irrigation system.



Valve Replacements



Flow Logging



Pressure Logging



Zoning



Leak Detection Repairs



Irrigation from Borehole Water

3. Post-Intervention State

The proposed solutions have been implemented and a total of 27 broken valves were replaced. Several leaks were identified and repaired, thus significantly reducing the MNF. After the leak repairs, the facility's water wastage (MNF) was reduced by 80% and the water losses for the facility were deemed acceptable for a facility of this nature. The groundwater abstraction and Water Treatment Works was recommissioned and connected to the irrigation system.

4. Outcomes Achieved

The savings achieved can be summarised as follows:

- A reduction in water wastage (MNF) from 3.74kl/hr to 0.76kl/hr. This theoretically reduced water losses by 71.52kl per day.
- The borehole and Water Treatment Works can provide up to 78kl/day stored in a 120kl ground level reservoir which allows the facility to be independent from the municipal water supply for irrigation purposes.
- The billing of municipal water should reduce to an average of 2.02kl/hr or 48.5kl/day.
- The **estimated saving** of water and sewage on the municipal bill will be **R107 280-00** per month or R1 287 360-00 per annum.
- The **estimated saving** for irrigation on the municipal bill will be **R100 000-00** per month or R1 200 000-00 per annum.