ALTERNATIVE WATER SUPPLY: WESTERN CAPE GOVERNMENT

Case Study

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

Project Value: R7 590 000-00 (incl. VAT)

Project Duration: October 2018 – September 2019

Location: Western Cape, South Africa

Project Description: The Western Cape Government (WCG) appointed Re-Solve within a broader team of specialists in fields including borehole drilling, pump yield testing, water quality testing and hydrogeology. The purpose of the appointment was to secure an alternative potable water supply that meets the water demand of WCG facilities as part of Western Cape Government's Water Business Continuity Plan.

1. Pre-Intervention State

The WCG appointed geohydrologists and borehole drilling specialists to secure an alternative groundwater supply at selected WCG facilities. Re-Solve was appointed to implement water augmentation portion of the project. The pre-intervention conditions of the facilities are summarized below:

- The boreholes were drilled, tested and information regarding yield and water quality was already available.
- The facilities received their domestic water supply from the relevant water authority.
- The Western Cape was in drought conditions and 10 of these facilities (mostly health facilities), had to secure an alternative water supply as part of the Western Cape Government's Water Business Continuity Plan.

2. Proposed Solution

- **Detail Design Report** – The purpose of this report was to detail the proposal to secure an alternative water supply for the WCG facilities. This report contained information regarding the layout, storage, treatment, connection to the facility network, etc.
- **Civil Works** – the construction of retaining walls, concrete slabs, chambers, brick walls, fencing and roof structures, which were all required to house the water treatment plant, borehole pump, valves and water meters.
- **Borehole Development** – the installation of a borehole pump with all associated pipework, fittings and electrical connections.
- **Water Treatment Works** – the installation of a Water Treatment Works with all associated piping at each facility to treat groundwater for the intended use. At 7 of the facilities, the groundwater was treated for potable water use. At the other 3 facilities, the groundwater was of such bad quality that it could feasibly only be treated as a sanitary solution for the flushing of toilets and urinals. At these facilities, the entire plumbing system was reconfigured, to connect to the treated groundwater system.
- **Water Reticulation Network** – the excavation, laying, backfilling and connections of pipes from WTW to the water supply tie-in points. The installation of Reduced Pressure Zone (RPZ) Backflow Preventer valves to prevent treated groundwater from entering the municipal water distribution network.

Earthworks

Construction of Concrete Slab

Civil Works and Water Storage Tanks

Chamber and Borehole Pump Installation

Installation of Borehole Pump

Water Treatment Works

Retaining Wall

Water Reticulation Network

RPZ Chamber Construction

RPZ Valve Installations

3. Post-Intervention State

The proposed solutions have been implemented and the WCG now has Water Treatment Works (WTW) that they are using for either potable water supply or sanitary solutions. The treated groundwater is pumped from the WTW through a newly constructed pipeline where it ties in with the existing internal water reticulation network. The installation of RPZ valves prevent treated groundwater from entering the municipal water distribution network. The project reduced the reliance on municipal water supply. The water augmentation project provides WCG facilities with an alternative water source, enabling the WCG facilities to continue to operate normally should municipal supply be temporary unavailable or restricted.

4. Project Outcome

The savings achieved can be summarised as follows:

- The Water Treatment Works at the WCG facilities provide approximately 145kl/day or 4350kl/month of potable water.
- The Water Treatment Works at the WCG facilities provide approximately 25kl/day or 750kl/month of treated groundwater for sanitary solutions.
- The total billing of municipal water should reduce by an average of 5100kl/month.
- The **estimated saving** of water and sewage on the municipal water bill will be **R255 000-00 per month** or R3 0660 000-00 per annum.