Case Study

Potable Water Treatment Plant 500m^3 per/day

Background

Browns Aqua System was engaged to construct a water treatment plant to treat brackish bore water high in fluoride to produce up to 0.5ML/day of potable water. A high system recovery of 80% was required to maximise the efficiency of bore water utilisation and minimise wastewater volume.

Solution

The source water was from the Great Artesian Basin (GAB) with a temperature in excess of 50 degrees. A break tank was installed for pre-treatment to allow for gassing off the water which was then fed through to a heat exchanger to cool the water prior to media filtration for removal of suspended and colloidal particles in the source water. A multi layered sand bed was implement for the media filtration. A feed water SDI of 2.8 was achieved to the reverse osmosis plant.

A reverse osmosis system design comprising of two stages with a filtered water blend was adopted to maximise overall system recovery. The system recovery was initially set at 70% and increases to 80% over the proof of performance and commissioning stage. The filtered blend water addition was monitored closely for fluoride to ensure levels were maintained within guidelines.

Chemical dosing was a major part of the design to achieve compliance with the Australian Drinking Water Guidelines (ADWG). Chemical dosing skids were designed and constructed for Sodium Hydroxide (NaOH) and Calcium Chloride (CaCl). Analysers were installed to monitor the combined treated water for conductivity, pH, ORP and fluoride. The combined treated water was then transferred to the site reservoir where Sodium Hypochlorite (NaOCl) was undertaken for disinfection.

An onsite Clean in Place (CIP) plant was designed for the reverse osmosis plant along with bulk cleaning chemical dosing and storage.

Browns Aqua Systems employed a construction company for the construction/building phase prior to accessing site for the installation of the desalination plant.

Results

The Potable Water Treatment Plant was delivered with the following stages, after a solution/design was settled on with stakeholder representatives:

- Cooling tower/heat exchanger
- Multi-media filtration
- Reverse osmosis
- UV disinfection
- Cartridge filtration
- Water stabilisation

Reverse osmosis concentrate was sent to a solar evaporation pond.

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