Iron and Manganese Issues in the Mundubbera Water Supply

By Tim Merrett, Water and Wastewater Treatment Operator, North Burnett Regional Council

Background

The township of Mundubbera is located approximately 200km west of Hervey Bay. The water supply scheme serves a population of 1261 persons through 573 connections. Water is sourced from the Burnett River with water quality issues including hardness, iron, and manganese. The treatment process includes clarification, filtration, pH adjustment and activated carbon treatment. Disinfection is achieved through liquid chlorine injection.

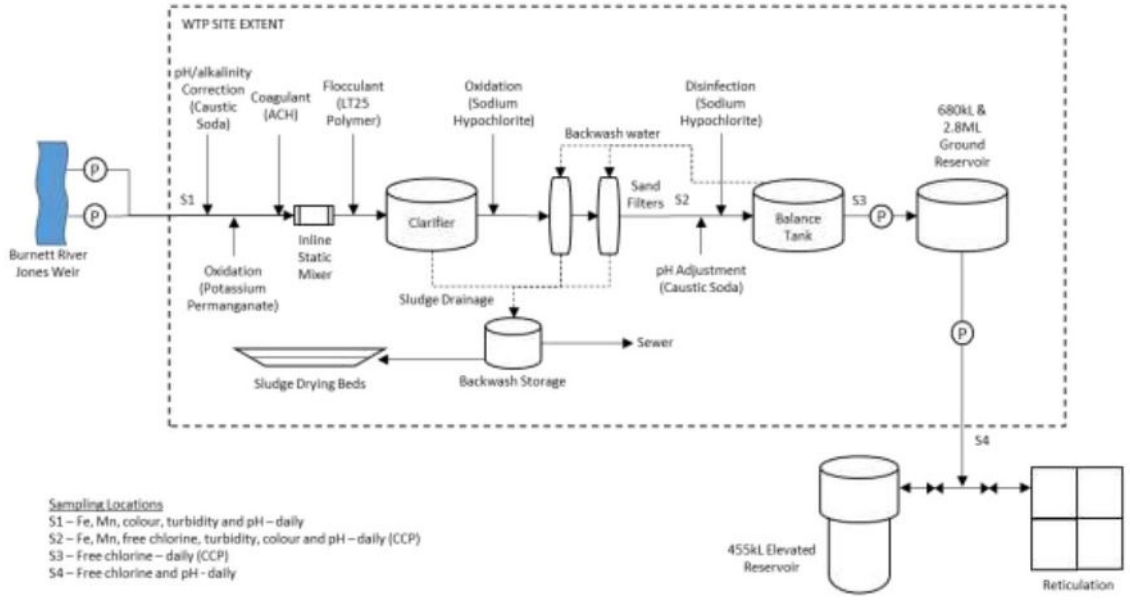


Figure 1 Mundubbera Water Supply Scheme Schematic

The Problem

In September 2021, Council received a call from the Mundubbera Hospital advising that they had no water pressure, and that this had been an ongoing problem for several months. When the water crew arrived to investigate, the pressure had returned to normal.

The issue was discussed in the office and it was identified that other properties in the vicinity of the elevated reservoir were also experiencing periodic pressure issues during periods of high demand. A check of SCADA indicated that the elevated reservoir had not run out of water when the pressure issues were occurring.

The elevated reservoir was constructed in 1967. The vertical 150mm dia. CICL inlet/outlet main and a short horizontal section through the base of the structure are original pipework. The reticulation network up to the base of the elevated storage has been upgraded. The network issues indicated a restriction in this pipework. An elbow was removed at the base of the elevated storage and significant iron and manganese scaling was found internally.

The Solution

Option considered included replacing the pipe, constructing a new outlet line, or trying to descale the existing pipe.

To identify descaling options a Google search was undertaken. A YouTube video showing pipes being descaled using descaling chains looked promising. The company was contacted and they provided the contact of a plumber in Bundaberg who had recently purchased the equipment. Contact was made with the plumber who made the trip to Mundubbera to inspect the job.

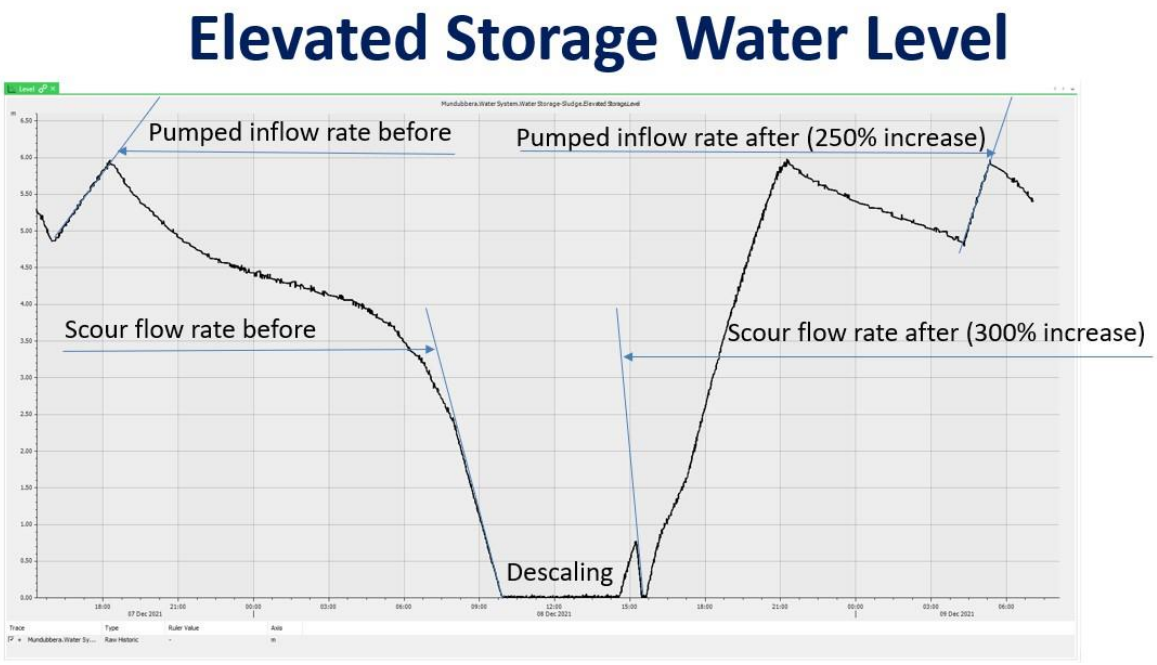
A day was set in December 2021 to undertake the job. The plumber, a vac truck, and a 30 tonne crane were engaged. Under clear skies, the reservoir was isolated from the network and drained. The horizontal section of pipe was the first to be descaled. The vac truck was used to collect the material removed from the pipe lining.

The vertical section of pipework was next to be descaled. The descaling tool needed to be launched from inside the elevated reservoir. This required crews, equipment and vacuum hoses to be craned the 30m vertical distance to undertake the work. Safety issues that needed to be considered included working at heights, confined space entry and working in the vicinity of telecommunications equipment.

Weather was another safety issue. An approaching thunderstorm cut short the vertical descaling after 2 passes were completed.

The Results

The reservoir was partially filled and flushed before being returned to service. The following SCADA plot of the storage levels indicates the system performance improvements achieved by the descaling work.



Pumped inflow rate showed a 250% improvement, while the gravity outflow rate improved by 300%.

In Summary

The descaling project cost $12000. This was about 1/10th of the estimated cost of replacing the pipework.

No pressure or supply issues have been reported since the work was undertaken.

Tim Merrett