



# Murweh Shire Water and Sewerage Schemes

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# Welcome to Murweh Shire

- Murweh Shire has an area of 41,000km<sup>2</sup>
- Population of 5,000 with low growth presently
- 3 main towns of Charleville, Augathella and Morven
- Charleville being the district centre for many services and government agencies has both water and sewerage services of a traditional design, such as the old favourite:

# Charleville Elevated Water Tower



# Charleville Water

- The water tower that almost every town has is really a thing of the past in today's modern age of pumping and if nothing else provide a good location for mobile phone transmitters
- Charleville water in the past operated 4 artesian bores pumping to the elevated tower
- Now operates 5 bores with in ground 11ML reservoir constructed with HDPE liner and VSD booster pumps



# Charleville Reservoir Construction





# Charleville 11ML Reservoir



# Charleville Bores

- Bore water sourced is from the Great Artesian Basin with water temperatures 40-55°C
- Bore 1 drilled in 1889 depth 417m
- Bore 2 drilled in 1923 depth 789m
- Bore 3 drilled in 1936 depth 827m
- Bore 4 drilled in 1967 depth 1109m
- Bore 5 drilled in 2005 depth 1048m
- Bore 5 free flow 49l/s & no flow static head 20m
- All in use and do not have any treatment

# Charleville Bores

- All bores free flow to the surface but do not provide adequate pressure for household use
- Bores 1-4 have been retrofitted with variable speed pump sets that have been set at the free flow delivery capacity of the bore
- Bore 5 flows directly to the in ground reservoir from which water is pumped into the network via the main booster pump station through the day when demand is highest



# Typical Pump Set Bores 1-4





# Bore 5





# Charleville Booster Pump Station

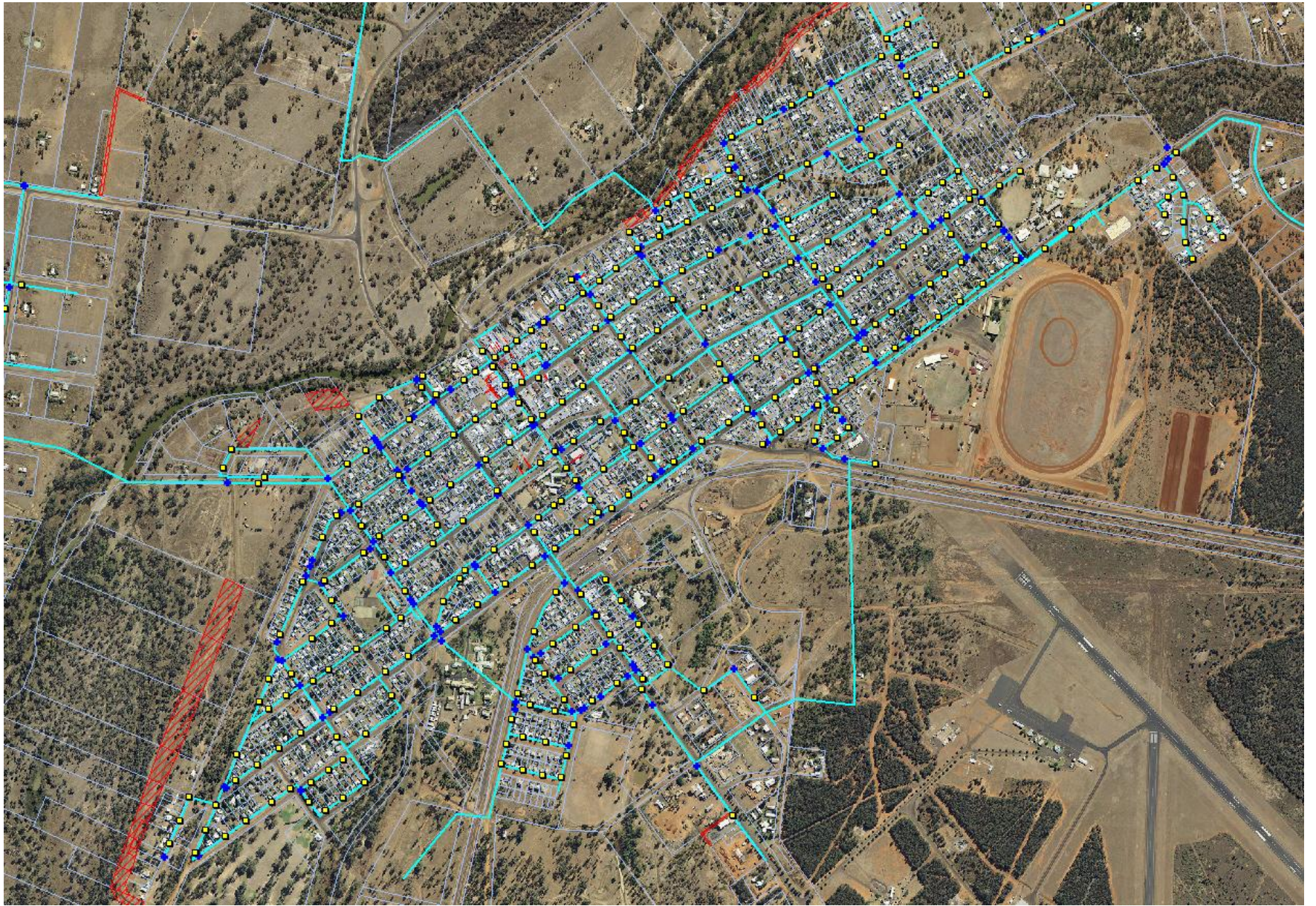




# Charleville Booster Pump Station



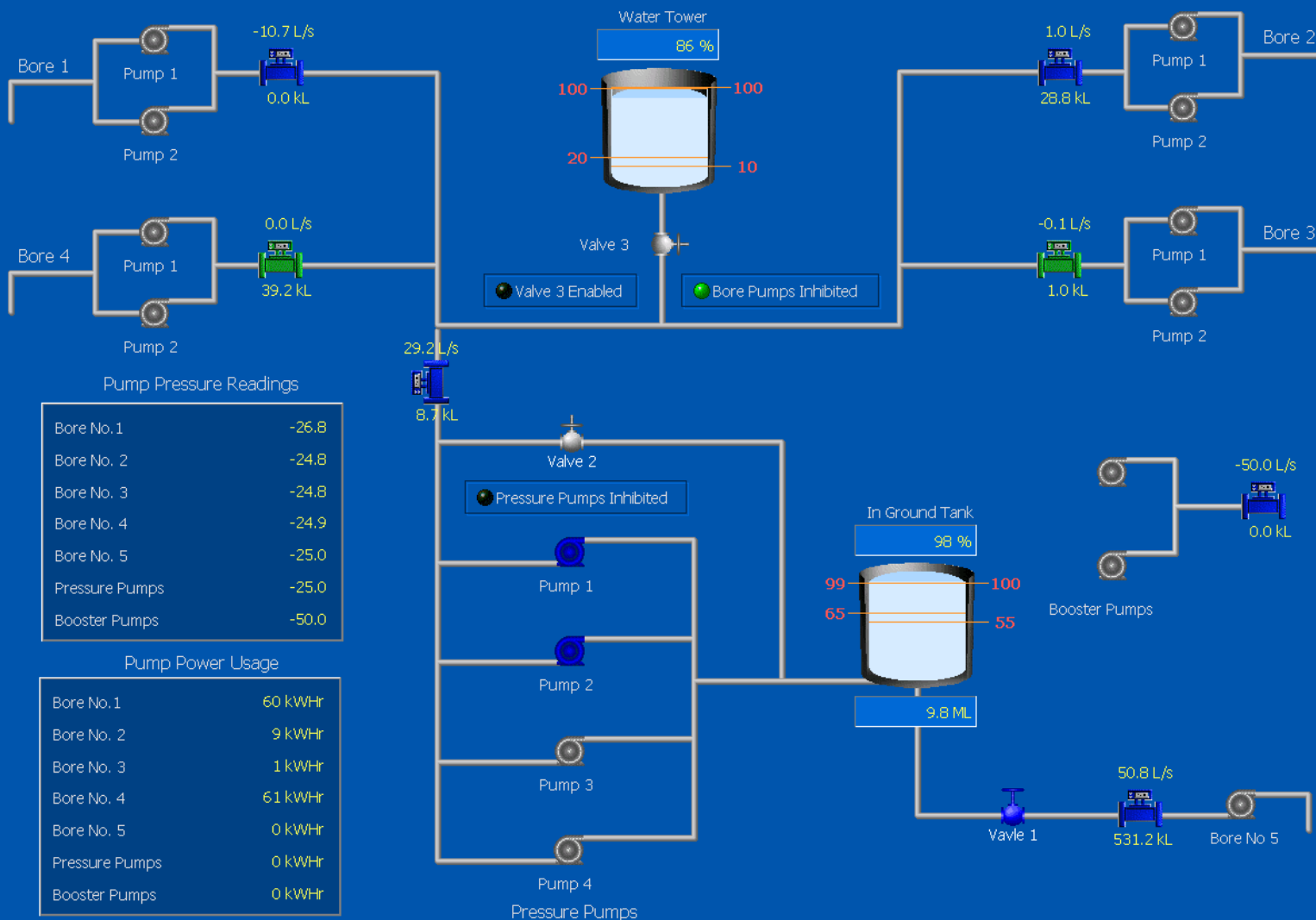






# System Control

- All operations of the Charleville water supply are controlled by Elpro SCADA-C telemetry system
- All stations in Charleville are via radio link to the Council office
- Augathella and Morven systems operate within the town via radio then back to the Charleville office via broadband connection
- All alarms are sent to technical staff via SMS
- Office staff can check and operate the SCADA system at their desk via remote desktop

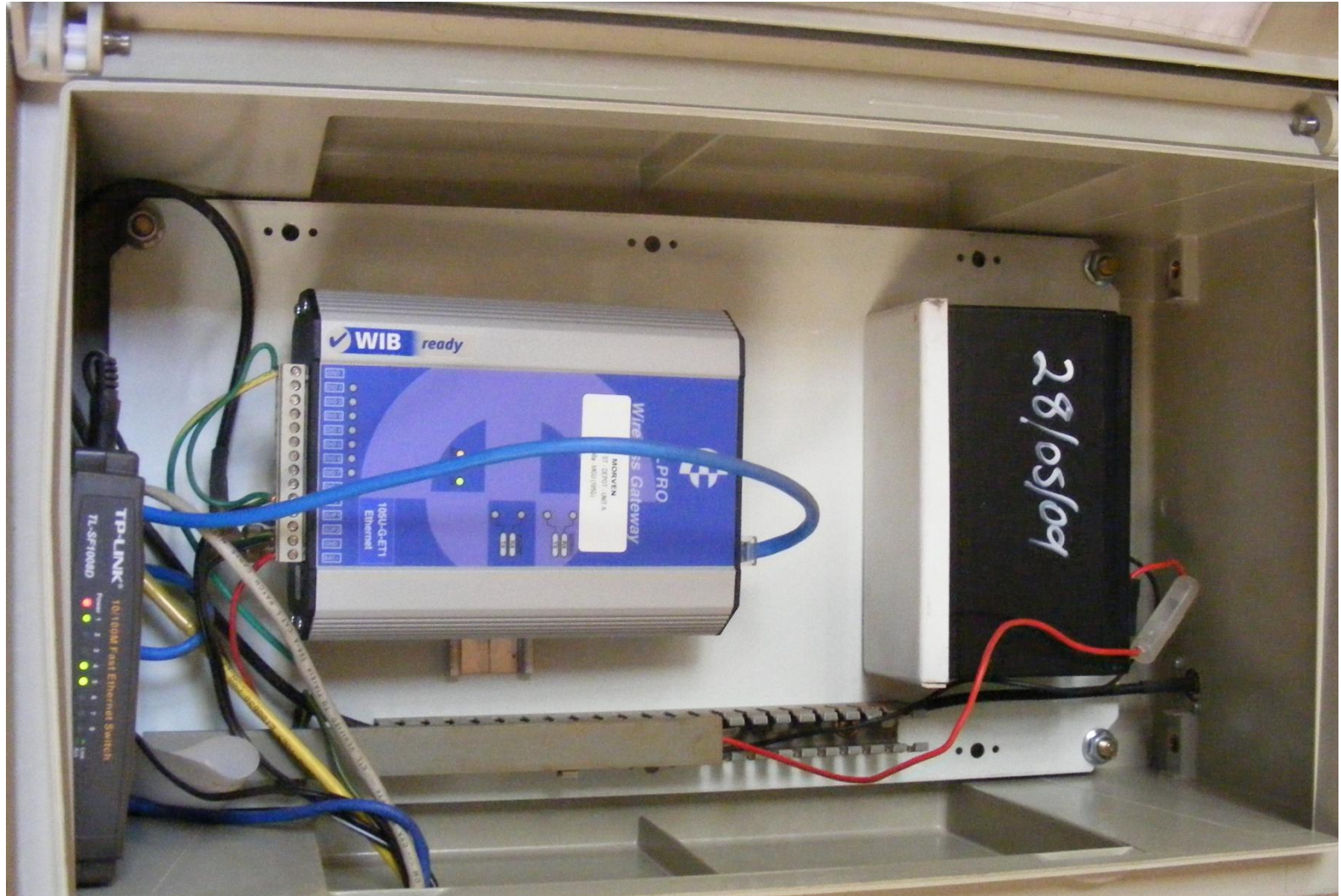


# Augathella and Morven

- Augathella and Morven also have water supply schemes that operate on the same principles as Charleville
- Augathella is also serviced by a common effluent drainage (CED) scheme that pumps to a sub-surface wetlands
- These towns are setup to operate standalone as well as linked to the main control computer



# Morven Link to Charleville





# Augathella Link



# Water Testing

- Council's EHO undertakes coliform and E.coli testing in house for Charleville water weekly and Augathella and Morven water monthly using the IDEXX Laboratories Colilert test
- Over the years, Council has had problems with contamination in Augathella and was dosing Sodium Hypochlorite for disinfection however this was not proving successful with water temperature and amount of hypo being used was excessive for the residual level being observed

# Augathella Disinfection

- In 2011, Council installed an in-line UV disinfection system to do away with the need for unreliable chlorination and also negate the taste issues associated with chlorine
- The unit has an intensity monitor and automated wiper system and lamp life is estimated to be one year with the high temperature of the water (yet to be proven)
- It will be linked to Council's telemetry system so that these critical elements can be monitored and alarms sent to technical staff



# UV System



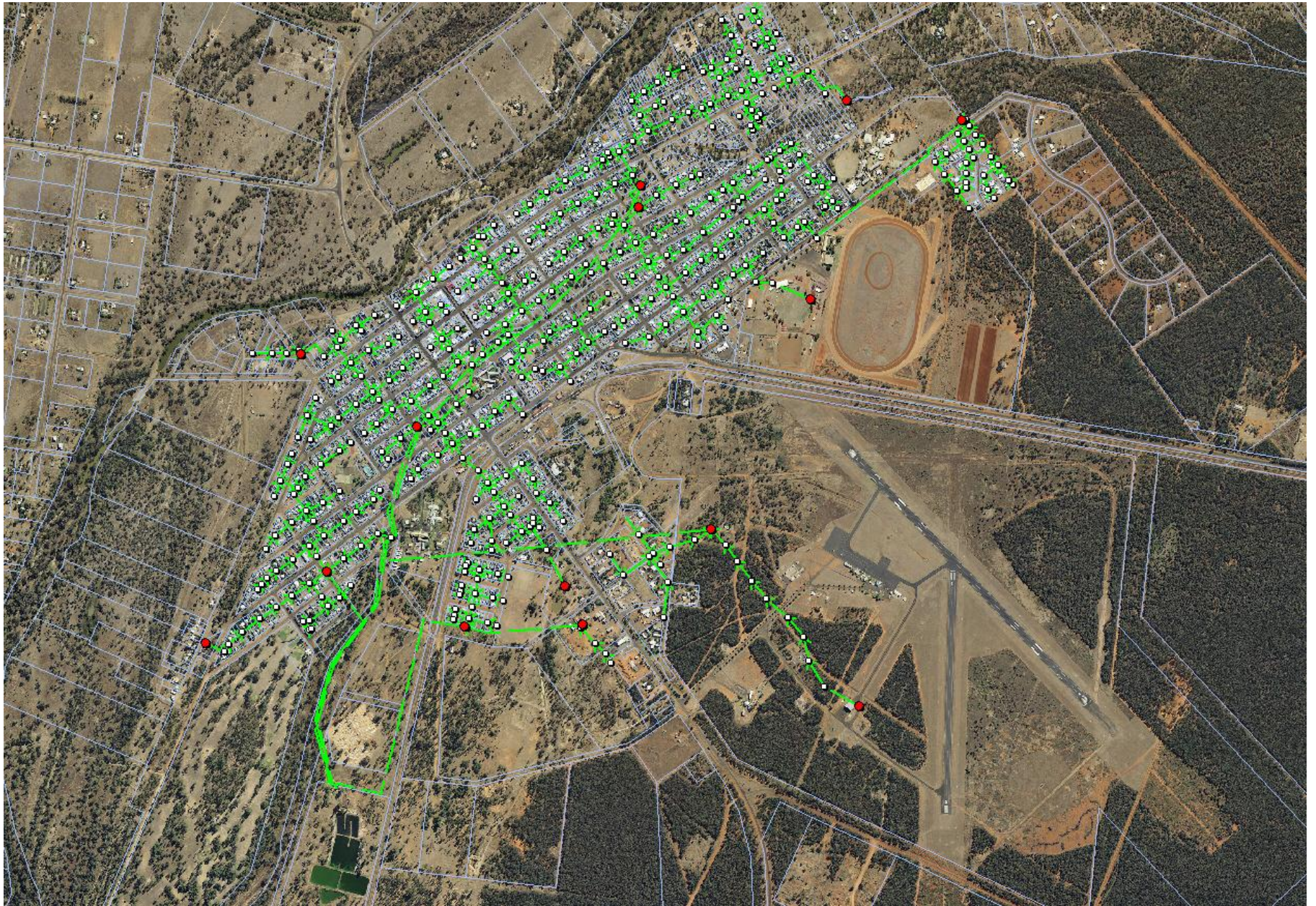
# Fluoridation Investigations

- Council is legislated to meet the minimum Fluoride levels of 0.6-0.8mg/L by 31 Dec 2011
- Council commissioned MJM Environmental to prepare the FCDR options for Charleville
- Formal exemption request submitted to Minister for Health July 2011 with no response provided to Council to date
- Centralised system capital cost \$2.2M, NPV \$2.6M over 25 years, annual operating cost \$30k
- Decentralised system capital cost \$1.7M, NPV \$3.3M over 25 years, annual operating cost \$120k
- Natural fluoride levels of between 0.3 and 0.6mg/L

# Charleville Sewerage

- Traditional gravity system however pump stations pump to STP via long pressure mains down Bradley's Gully and up into the tanks that are on a slightly higher area
- Ageing system and investigating option to have larger trunk gravity main through part of the town and just have a lift station at the STP to reduce pumping requirements and costs
- May have been constructed this way initially as there is no electricity at the STP
- After primary treatment, effluent discharges to a series of lagoons







# Primary Sewage Treatment





# Minor Flooding around Pump Stn

