HydroMail

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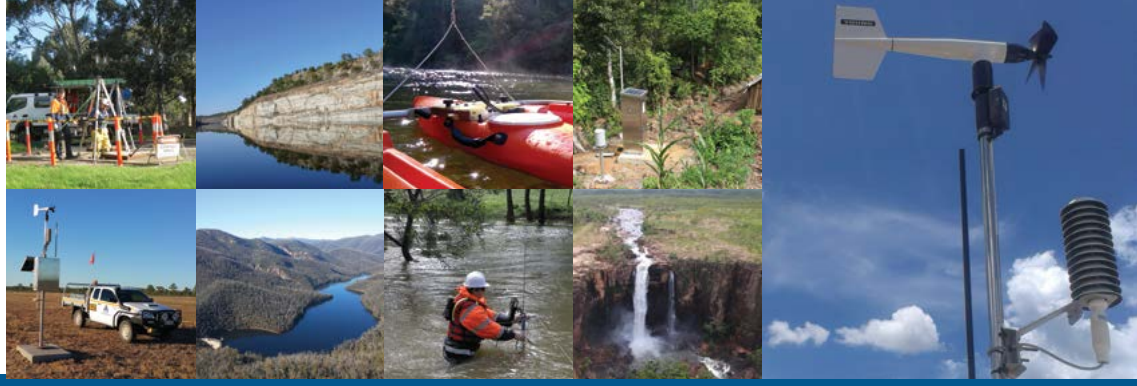


Reticulation Mains Monitoring in Canberra

Remote monitoring stations, delivering high quality data via telemetry networks are important tools for water supply operators. Utilities can not only use remote data to ensure a quick turnaround to resolve supply disruption but also identify distribution problems before disruption arises.

ALS recently completed a citywide project to provide Icon Water, a water and wastewater public utility, with a new District Metering Area (DMA) monitoring network. In total 42 locations throughout Canberra make up the DMA Network, comprising 6 flow monitoring stations and 38 pressure monitoring stations (Figure 1).

The flow monitoring stations collect consumption trends in the water supply drawn from key reservoirs across the ACT, whilst 38 strategically placed monitoring locations show pressure of the water mains, indicating supply pressure to residential areas on a suburb by suburb basis. The pressure data collected is used by Icon Water from an operational perspective to manage leakage control, identify burst water-mains, determine when supply reservoir head pressures are low and provide accurate figures to ensure they are meeting the minimum pressure requirements for the water supply network.

As the project was to upgrade an outdated DMA monitoring network with leading-edge monitoring technology and telemetry, ALS was faced with a number of challenges not least of which was due to the size of the existing station housings; requiring a custom compact retrofit to be designed and installed.

A new station enclosure removed the entire monitoring, charging and telemetry systems from moisture ingress that was present in the previous housings. The new updated system utilises the Campbell CR200X data logger which scans for changes onsite every 10 seconds and then stores any data that sits outside set parameters. The majority of the stations are powered by 240VAC mains with a battery backup however, for some of the remote sites a solar powered option was developed.

Advances in cellular telemetry systems have enabled ALS to develop ways of retrieving the data in real time through the 3G modem via ALS Secure RADIUS Server. Data is then automatically processed and stored in the ALS data management software Hydstra (Figure 2), then sent to Icon Water's server for their application.

Figure 1. Installed pressure monitoring station

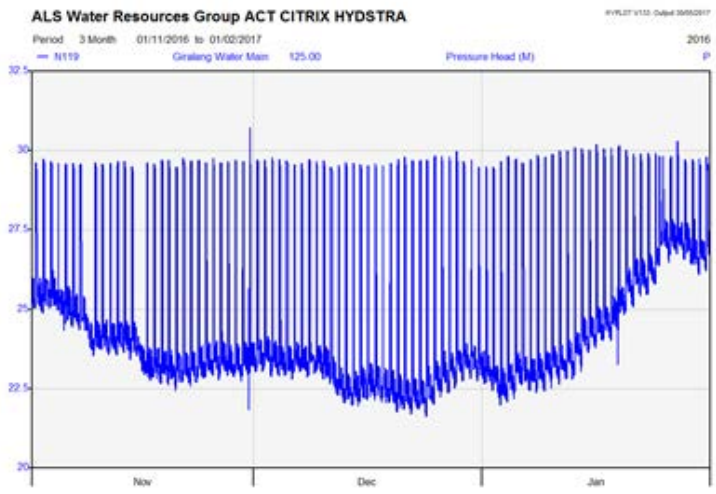


Figure 2. The plot demonstrates baseline water pressure in an ACT suburb. It is influenced by residential water demand and the local feeder reservoir's level. The minor spikes in this trace are from operational changes made by the Water Utility.

ALS Data Management – Overview

In the first of a series of articles highlighting our expertise in data management, an overview of the reasons for, and process of managing, a monitoring network's data is discussed below. Following from this discussion in later issues of HydroMail, articles will be presented on automated data management, value adding to client data reporting and finally an introduction of the new ALS developed electronic field sheet and its impact on the data management process.

Environmental monitoring data is inherently partly erroneous when it is collected. Despite a stringent calibration and maintenance regime, there are inescapable factors continuously affecting data quality when monitoring the natural environment. Sensors drift, sensors are affected by siltation and algal growth, water level sensors are affected by atmospheric conditions, natural flow control conditions change, electronic instrumentation generates spikes, batteries run flat, internal clocks lose time to name a few.

It is vital for data that is archived and used for reporting purposes to be as representative as possible to true values. In many cases the raw data is improved by the appropriate correction and editing, and when it can't be, an appropriate quality code is assigned to each individual point of data using pre-determined quality coding structure to highlight the accuracy of the data. This allows the data's quality and usability to be considered by decision makers. The end goal is to ensure measurements are scientifically valid, legally defensible and of known acceptable precision and accuracy.

The Australian Government's National Industry Guideline for Hydrometric Monitoring Part 5: Data Editing Estimation and Management (WISBF GL 100.05–2013) was developed with the purpose to "...provide guidelines for recommended practice to ensure traceability of all data editing and estimation and to set minimum requirements for hydrometric data management."

Section 2.2 of that document refers to editing data and states that:

"a) Stored hydrometric data shall be validated to match the original field data prior to the data being assigned an appropriate quality code; and

b) Data validation shall check measured values against a calibrated reference value, and shall check time in data logger against local time. Comments recorded with the original data shall be reviewed as part of the validation process."

A basic example of how ALS will process, edit, quality code, comment on, and validate data to ensure maximum benefit for our clients can be seen in Figure 3.

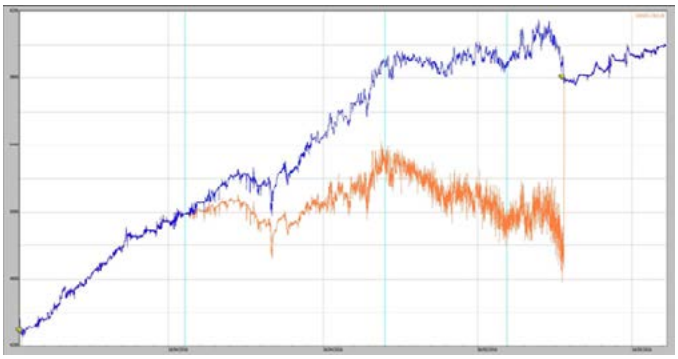


Figure 3. Example of Electrical Conductivity data pre and post data editing, using Hydstra software.

NB: Raw data = orange, edited data = blue

In Figure 3 the effects of sediment and significant algal growth have impacted the data extensively, identified during routine maintenance and calibration activities.

The data for this period has been filtered and slope adjusted to the in-situ readings of the calibrated conductivity sensor deployed during the service visit. Quality codes have been assigned accordingly as part of the data processing procedure. The data is also commented appropriately, so that all adjustments and corrections can be readily identified and referred back to if required.

ALS combines years of experience and expertise to provide the best possible data management and reporting options for clients, using a range of software packages including Hydstra, Aquarius and Vista Data Vision. A large variety of data management services are offered, with solutions available for both in house and on site solutions, tailored specifically to meet individual client requirements.

Local Government Association of Queensland Disaster Management Conference

ALS attended the May 2017 Local Government Association of Queensland (LGAQ) Local Disaster Management Group (LDMG) conference hosted by Mackay Regional Council.

ALS held an exhibitor booth (Figure 4) at the LGAQ LDMG conference between May 9th and 11th. The aim of the attendance was to improve brand awareness of ALS within Queensland local and state governments. With the recent impacts of tropical cyclone Debbie still front of mind for the disaster management teams, ALS's expertise in the areas of stream and rainfall monitoring for flood warning purposes was well received.

Over 30 councils and disaster management entities were represented at the conference, with the ALS booth in prime position to meet with the majority of attendees.

As industry leaders in the field of hydrography, ALS are able to provide a diverse range of robust monitoring solutions to meet the needs of disaster management groups. With metropolitan and regional offices throughout Australia (Figure 5) the delivery of monitoring stations for any purpose can be done in a cost effective manner, while adhering to local content charters maintained by governments' procurement departments.

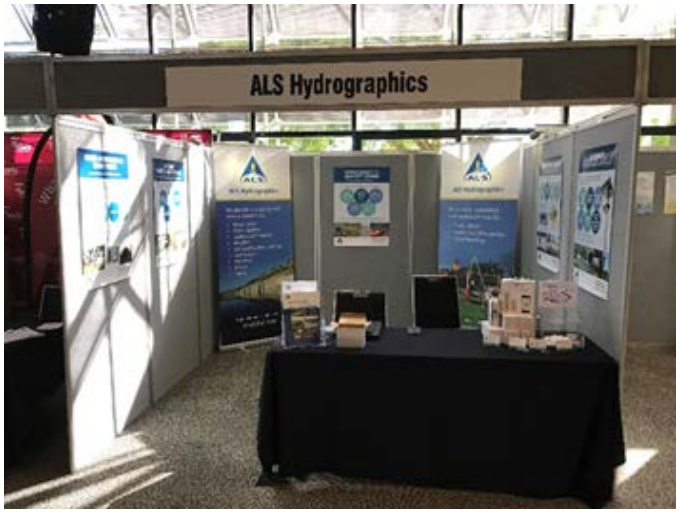
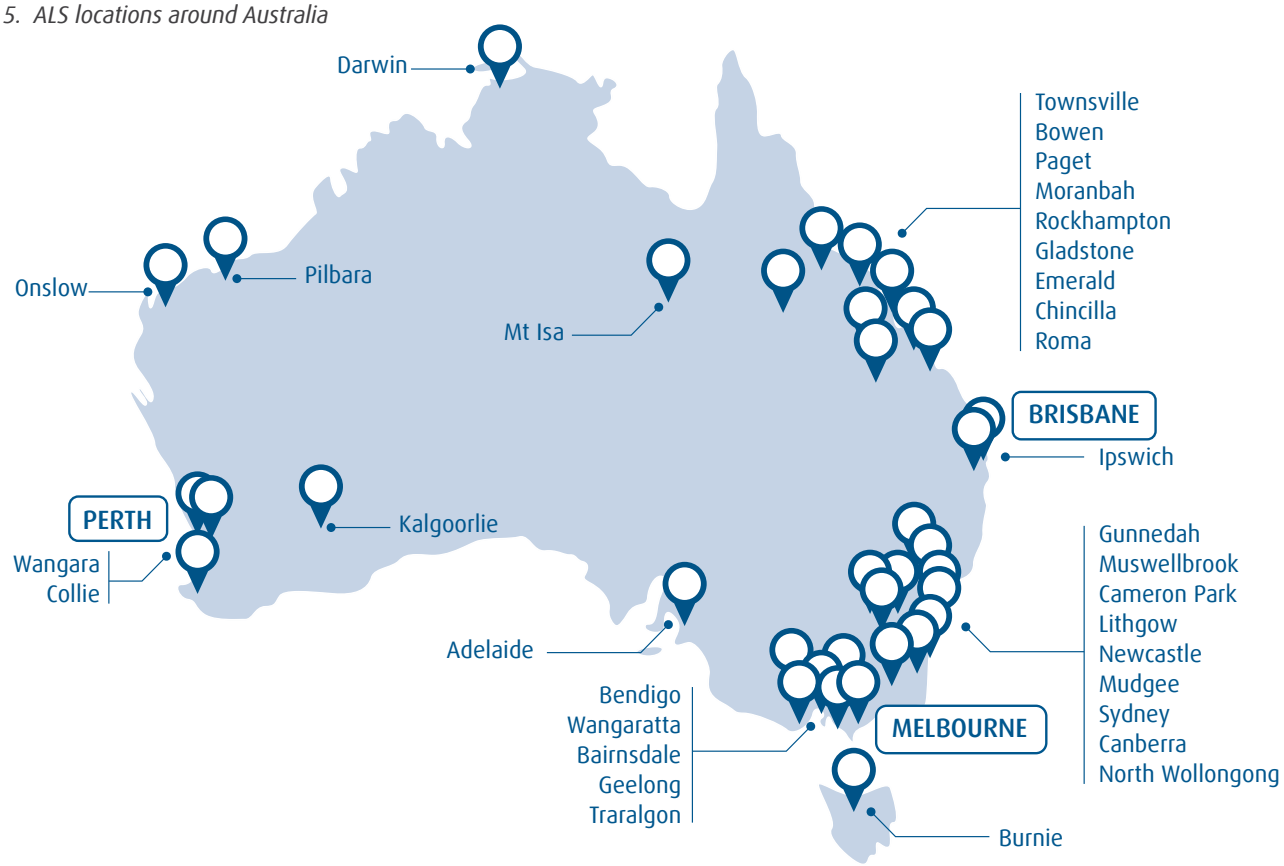


Figure 4. The ALS exhibitors booth

Figure 5. ALS locations around Australia



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