

IN THIS ISSUE:

Welcome Message.....	1
The Correct Sample Bottle.....	1
Don't Compromise Your Results.....	1
Field Computers.....	2
Rapid Legionella.....	2
NATA Representation.....	3
Nutrient Analysis.....	3
Collaborations.....	3
Research and Development.....	4

WELCOME MESSAGE

Welcome to the 2nd Edition of the AWQC Newsletter, AQUATALK. We are now well established in our new facilities and many of you would have taken the opportunity to see and hear about what we do during a series of successful Open Days held in June. AQUATALK will continue to provide a regular update on the latest developments from both the analytical and research laboratories of AWQC and hopefully a few snippets of news that you will find of interest.

Karen Simpson, Manager Laboratory Services

Chris Saint, Manager Research, Development & Innovation

WaterScope Technical Support

Do you have a new report requirement or perhaps in need of a refresher training session in WaterScope? Contact your AWQC Account Manager to arrange all your WaterScope reporting needs.

www.waterscopereporting.sawater.com.au

THE CORRECT SAMPLE BOTTLE

When getting ready to collect samples the choice of sample container is of major importance. AS/NZS 5667.1:1998 - Water Quality Sampling provides guidance on:

Selecting the right container

- Minimise sample contamination by the container
- Reduce surface contamination
- Chemical and biological inertness

Preparing the container correctly

- Microbiological analysis has specific requirements
- Plastic versus glass
- When solvent wash glass is required
- Acid washed plastic and glass

All container preparation procedures should be validated using blanks and standards.



Above: Gary from AWQC's Field Laboratory Services Team preparing bottles for the day's collection run

Left: Storage of AWQC samples in a 4°C walk-in cold room

DONT COMPROMISE YOUR RESULTS

Appropriate sampling procedures, in terms of collection and transportation of samples to the laboratory, are critical to the outcome of the analysis of all water samples.

Field samples should be collected by a person trained in the correct sampling techniques. Every effort must be made to ensure that the samples collected are representative of the water under examination.

Where samples are being collected for chemical and microbiological analysis from the same source, the sample for microbiological analysis must be collected first. This is to avoid contaminating the sampling point prior to taking the microbiology sample which may lead to an error in sample results. If carrying out field tests (pH, chlorine and turbidity), take a separate sample for these tests. Do not use the microbiology sample for this testing, as the sample will become contaminated during the process and will be unsuitable for microbiological analysis. With so many parameters to consider it's recommended to have a copy of AS 5667.1:1998 or visit the AWQC website and review our Sample Packaging and Bottle Requirements Brochure which can be found in the customer assistance area of the AWQC website.

FIELD COMPUTER AND LIMS DATABASE UPDATES MEANS MOBILITY

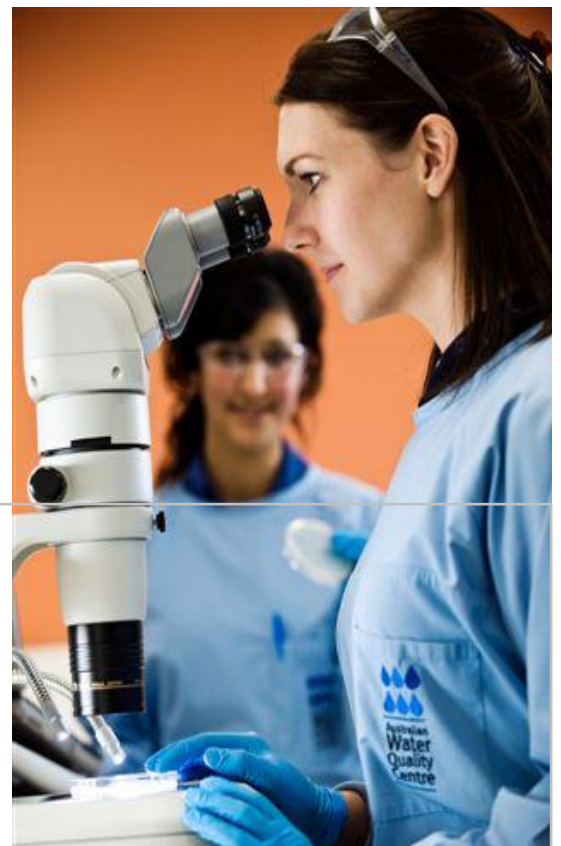
Water sample data collection took a significant step forward last month. The AWQC Field Services Team now has:

- new, more reliable and robust field computers
- the ability to send data directly from the field
- updates applied to the dedicated LIMS (Laboratory Information Management System), and
- field access to corporate information

Although a reliable way of collecting and storing water test field data was in place, there were a number of limitations including an inability to send data from the field, field computers prone to failure and no longer compatible with the corporate operating system and an inability to respond immediately to alerts resulting from field results.

The new ruggedized field Panasonic Laptops (designed to be more resistant to conditions that could be damaging such as high and low temperatures or shocks from knock or bumps) mean staff now have a stronger, more reliable tool to support field testing. Each Toughbook also has built in remote connection access providing users with the ability to send and receive data while in the field.

For the Field Laboratory Services Team these improvements will lead to improved customer service levels through faster, easier and more reliable data recording, transfer and analysis, and increase our ability to generate alerts created from field tests.



RAPID DNA- BASED LEGIONELLA ASSAY

Current testing for *Legionella* relies upon the use of traditional methodology that is time consuming. The AWQC has developed a method that couples standard bacterial culture techniques with DNA technology to allow more rapid detection. The developed method was compared to the current standard method (AS/NZS 3896:1998) in an extensive evaluation involving over 140 samples. The results indicate that the newly developed rapid method is as accurate as the standard method, but has a superior advantage in speed, with confirmed *Legionella pneumophila* counts available in as little as 3 days compared to 5-7 days by the standard method. These results have recently been published in one of the premier environmental journals, Applied and Environmental Microbiology.

The greatest advantage of the rapid test is the speed at which results can be delivered. Typically, depending on species, the turn-around-time is reduced by at least 3-4 days. The delivery of a timely result will therefore aid in the administration of remedial action much sooner than previously possible and potentially stop contaminated sources continuing to spread *Legionella*. Additionally, because the assay tests the DNA of the bacteria, it is highly sensitive and specific and reduces the chances of reporting an erroneous result.

The AWQC can offer this NATA accredited, rapid DNA-based *Legionella* assay at negotiated prices dependent upon a volume scale. The AWQC also offers a comprehensive suite of microbiological and chemical analyses that can assist in determining levels of fouling and corrosion in water systems. To find out more contact us using the details below.

AWQC REPRESENTATION ON NATA AQUATIC BIOLOGY TECHNICAL GROUP

AWQC has held NATA accreditation in all Chemistry, Microbiological and Biological water testing for over 30 years. Apart from the recognition that accreditation provides to the laboratory as a provider of high quality analytical services, the experience and expertise of individuals is also recognised from appointments as NATA signatories, NATA assessors of external laboratories and as members of NATA Technical Committees.

The Manager, Biology Services, Peter Baker, has been involved as a NATA assessor and technical advisor to NATA on algae accreditation and proficiency testing (phycology) for many years. In 2007, he was invited to become a member of the NATA Biological Accreditation Advisory Committee and subsequently to chair an Aquatic Biology Technical Group, encompassing the fields of testing in algae, micro-invertebrates and macro-invertebrates. The purpose of the ABTG is to provide technical advice, guidance and recommendations to the Advisory Committee and NATA technical assessors on matters relating to accreditation in aquatic biology.

The technical issues that have been addressed thusfar include a review of test classes, scopes of accreditation and benchmark methods, development of assessor checklists to ensure consistency across assessments, development of technical criteria for signatory status, development of proficiency testing guidelines and application of measurement uncertainty.

Other AWQC staff that are involved in external NATA activities are Bret Robinson (Protozoology Assessor), Karen Simpson, Qiong Huang, Dzung Bui (Chemistry Assessors) and Mira Banasiak (Member of Microbiology FT-20 Technical Group).



ANALYSING FOR NUTRIENTS IN WATER

When choosing a laboratory to undertake your nutrient analytical work, the first thing to be considered is whether the laboratory is accredited by NATA (National Association of Testing Authorities). This is a minimum assurance that analyses will be carried out in accordance with ISO17025. Additional certification to ISO9001:2008 will also ensure business processes are systematically reviewed and improved.

There are a number of other quality assurance measures that a best practice laboratory will carry out. A proficiency program providing natural pristine and impacted samples sourced from fresh, estuarine and seawater environments has been established by the ENCT Committee (Environmental Nutrient Collaborative Trial) formerly the National Low Level Nutrient Collaborative Trial (NLLNCT) which has been providing these samples to laboratories since 1995. Joanne Clark, Team Leader of the Nutrients Laboratory at AWQC, is a member of the ENCT Committee. This has enabled AWQC to better keep abreast of trends in nutrient analysis both in Australia and overseas. AWQC is committed to providing a high quality analytical service in nutrient analysis hence its participation in the ENCT committee.

AWQC has continued to improve their service by purchasing two discrete analysers and a flow injection analyser (FIA). These instruments are capable of faster processing times and lower limits of reporting compared to the older segmented flow analysers.



COLLABORATIONS

Visiting Chinese Academic



Professor Dongsheng Wang (Director State Key Laboratory of Environmental Aquatic Chemistry) in China visited the AWQC to collaborate with our Water Treatment Group. Professor Wang's research interests are in the fields of aquatic chemistry, environmental engineering, and coagulation science and technology.

The collaboration between Professor Wang and the AWQC has been very productive. Since 2007, six grant applications have been submitted, six manuscripts published and six conference papers produced in the coagulation area. Professor Wang's knowledge in the coagulation field is particularly useful for some of South Australia's drought related water treatment challenges.

Professor Wang assisted the Water Treatment Group in the coagulant development and real-time process optimisation components related to the Premiers Science Research project "Development of materials engineering solutions for treatment of Murray-Darling Basin sourced water supplies". This visit also included discussion on further collaboration and research directions.

WINNING QUADRELLA FOR RESEARCH

In June 2009, AWQC's reputation for high quality research was further enhanced when we received acknowledgement that four (of four) applications recently submitted to the Australian Research Council (ARC) Linkage Project were successful in securing funding in 2009. This is a remarkable achievement considering that ARC grant applications are highly competitive with less than 30% successful.

Success is testament to our ability to prepare operationally/industry focussed project proposals and the willingness to collaborate with other water utilities, research institutions and universities to develop practical outcomes to address the challenges confronting the water industry. These projects have provided us with excellent funding leverage and should be considered an outstanding achievement.

- *Optimising dissolved air flotation (DAF) for algal removal by bubble modification in drinking water and advanced wastewater systems* - project values at \$621,000 over three years, with the ARC contributing \$390,000 – Richard Stuetz (University of New South Wales) and Gayle Newcombe.
- *Using Environmental Genomics to monitor water quality and improve system operation* - project involves a number of partners who in total are contributing more than \$1M cash and \$5M in-kind over three years with the ARC contributing \$0.5M – Alan Cooper (University of Adelaide), Chris Saint and Paul Monis.
- *Chemical sustainability data for the water industry* - \$676K over three years, with the ARC contributing \$189K (final amount to be confirmed) - Greg Peters (University of New South Wales) and Tim Kelly.
- *Early warning of harmful algal blooms in drinking water reservoirs by means of evolutionary algorithms* - \$357K over three years, with the ARC contributing \$198K – Friedrich Recknagel (University of Adelaide) and Mike Burch.



Algal bloom in the River Torrens

The Bolivar DAFF plant



Further Information and Feedback

For further information on any of the articles in this newsletter please email awqc@sawater.com.au or phone 1300 65 33 66 or fax 1300 883 171. Any comments or suggestions for future newsletters are welcome by contacting Lena Marchesan, AWQC 61 8 7424 2124.