

TECTA™ B16 Success Story
Monash University

Rec Water Testing

Bays, inlets and rivers provide essential ecological, economical and recreational value to the communities they serve. However, they are under constant and increasing pressure from urbanization, population growth and a changing climate. In coastal and inland regions around the world, fecal contamination remains the primary cause of closure for recreational use. Melbourne's Yarra River and Port Phillip Bay are no exception, very often under scrutiny for their pathogen levels.

The study focused on Melbourne's recreational waters, with 233 samples collected over the 2014–2015 swimming season for analysis by four methods.

Also compared were estimated costs, operator times and reporting times for the methods.

Challenge Detected

Substrate Culture testing techniques, such as the IDEXX methods, have commonly been used to quantify Total Coliform and E.coli levels because of their perceived low price, familiarity with lab technicians and for ultimately providing evidence that links such levels to human illness. Over time they have become the effective industry standard in Melbourne, Australia. However, these methods have at least three drawbacks:

- They take a minimum 18 hours to complete, meaning risks are slow to be reported back to the community.
- Lab personnel are required to interpret results the following day, making Friday samples problematic due to staffing issues.
- They rely heavily on visual interpretation of colour or fluorescence, increasing the risk of user bias and systematic or arbitrary error.

Solution Detected

Addressing and eliminating above concerns and limitations of such traditional methods, the TECTA™ B16 automated process has effectively removed all human error while providing more accurate and objective test result (regardless of how turbid the water); all in a fraction of the time required by traditional cell-culture techniques.



Monash University TECTA-PDS Evaluation Conclusions:

- *Easy to use*
- *Quick to perform*
- *Automated result*
- *13 hour turnaround time*
- *Accurate results*
- *20% cost savings*

Success Detected

During this study the researchers from Monash University highlighted that the TECTA™ B16 system was very easy to use and did not require extensive training typical of other methods. The sample handling steps were extremely simple, limited to just adding water to the test cartridge which already contained all necessary ingredients for the test. The TECTA cartridges were then easily loaded into the TECTA™ B16 instrument. They concluded that the TECTA™ B16 was by far the fastest method in terms of sample handling, needing only five minutes per day.

Unlike IDEXX and other traditional methods, no time was needed to interpret results since the TECTA™ B16 continuously monitored enzyme activity through fluorescent markers and results were automatically translated by the instrument into a concentration of colony forming unit per 100mL (cfu/100 mL) for Total Coliforms and E.coli. These reports were immediately sent by email from the TECTA™ B16 to the operators.

The mean detection time by the TECTA™ B16 method was 13 hours for total coliforms and 12 hours for E. coli, against the 24 hours necessary for both IDEXX methods; a significant time savings that provides decision makers essential early warnings, meaning better safety and true cost reductions for the community.

As for accuracy, TECTA™ B16 CFU/100mL results were correlated with IDEXX MPN/100mL results for all recreational water sites studied. The IDEXX method was limited to an upper detection limit of 20820 MPN/100 mL, while the TECTA™ B16 method never reached its upper detection limit. The results of TECTA™ B16 vs IDEXX followed a 1:1 relationship, showing that neither method consistently over- or under-estimated the sample concentrations with respect to one another.

Costs of consumables for the TECTA™ B16 tests were found to be equivalent to those for IDEXX. Yet, with sample processing times considered, TECTA™ B16 was found to be 80% of the cost of IDEXX.

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