



## Water Management at QUT

(November 2006)

### Background

QUT is one of South-East Queensland's "Top 20" water consumers. In 2005 it cost the University almost \$1.2M to purchase and dispose of 377ML of water. Water restrictions in SEQ will escalate to "Level 4" on 1 November 2006 and, like all large businesses, QUT will be required to implement strategies aimed at reducing its water consumption by 25% (by April 2007). Facilities Management's Operations Section is responsible for ensuring that the University meets these new water consumption targets.

The purpose of this paper is not to discuss the current water crisis in SEQ but rather to report on the business impact of water restrictions on QUT and the myriad water management initiatives that have been implemented since 2003 to minimise the risk on the University. The paper also provides data on our performance against the new Queensland Water Commission's water consumption benchmarks. Details of the new restrictions can be found in the report "*Water Forever. Our South-East Queensland Water Saving Initiative*" (Refer: <http://www.waterforever.com.au/home>). A second report titled "*Water for South-East Queensland – a long-term solution*" explains the more complex water infrastructure issues facing the region (Refer: [www.nrm.qld.gov.au/water/water\\_infrastructure/pdf/long\\_term\\_solution.pdf](http://www.nrm.qld.gov.au/water/water_infrastructure/pdf/long_term_solution.pdf)).

### The Risks

Water, like electricity, is vital to business continuity. Loss of supply of either utility generally results in the shutting down of air-conditioning systems, computing equipment and critical research facilities (eg cold rooms, freezers, cooling systems, research experiments). However, the likelihood of loss of supply as a result of infrastructure failure is very low, as all QUT campuses have dual water supply feeds and most facilities have built-in, on-site redundancy to deal with this eventuality.

The other primary risks are loss of supply that might eventuate as a result of water rationing (ie the supply authority limits supply due to a severe water shortage) or as a penalty for not achieving water saving targets (as set by the Queensland Water Commission). The former risk is outside of QUT's control but the latter can be managed with appropriate water management strategies.

### Initiatives to minimise risks

Facilities Management's engineering section has actively been involved in water management for almost four years now. During this period a number of water saving initiatives have been implemented. These include:

- The development and implementation of a Water Efficiency Management Plan (WEMP). QUT was one of the first large organisations in SEQ to submit such a plan, which was approved by Brisbane Water in March 2003.
- An independent audit of all taps, showers and water-consuming fixtures (excluding laboratories). The audit provided a register of inefficient water fixtures. A program for the installation of water saving devices and fixtures commenced in early 2004.

- The installation of water management control systems on all cooling towers (from June 2005, on-going). Cooling towers, together with toilet facilities and irrigation, remain one of the three major consumers of water at QUT, each consuming around 25% of total water consumed during non-restriction periods. The re-engineering of cooling tower control systems has ensured that the minimum amount of water is consumed during operation.
- The installation of rainwater storage tanks, for use in irrigation and toilet flushing. To date the University has installed 14 such tanks (with a capacity of 242,000 litres) with a further 14 tanks (120,000 litres) planned in the near future (from late 2004, on-going).
- Engaging a sustainability consultant (Sustainable Solutions International) to work with us on water management strategies (2006). The independent consultant has confirmed that QUT is well advanced in dealing with water management issues.
- The submission of water grant applications under the Australian Federal Government Community Water Grant scheme (in 2005 (unsuccessful) and in 2006 (awaiting outcome)).
- A comprehensive review of the institution's building design standards and guidelines (2005, on-going). All new and refurbished buildings incorporate a range of water savings systems.
- The purchase and installation of 'wireless' water flow meters to accurately capture consumption data for business modelling purposes (commenced August 2006). By mid-2007 QUT's water consumption profile (by building and major consumer type) will be mapped.
- A comprehensive review of all air-conditioning run schedules to minimise system run times (August 2006, on-going).
- An awareness campaign, via email notices, to the University community. This important task will be more formally managed following the recruitment of an environmental officer in early 2007.
- Investigating opportunities to capture and re-use water lost in the routine preventive maintenance testing of fire hydrants and pumps (this includes reducing the testing times under the special provisions in Australian Standard AS1851).
- The use of re-cycled water only for building façade maintenance and cleaning works

Collectively, these initiatives have had a major impact on water usage at QUT (refer graphs below). FM will continue to investigate opportunities for further reducing water consumption on all University properties.

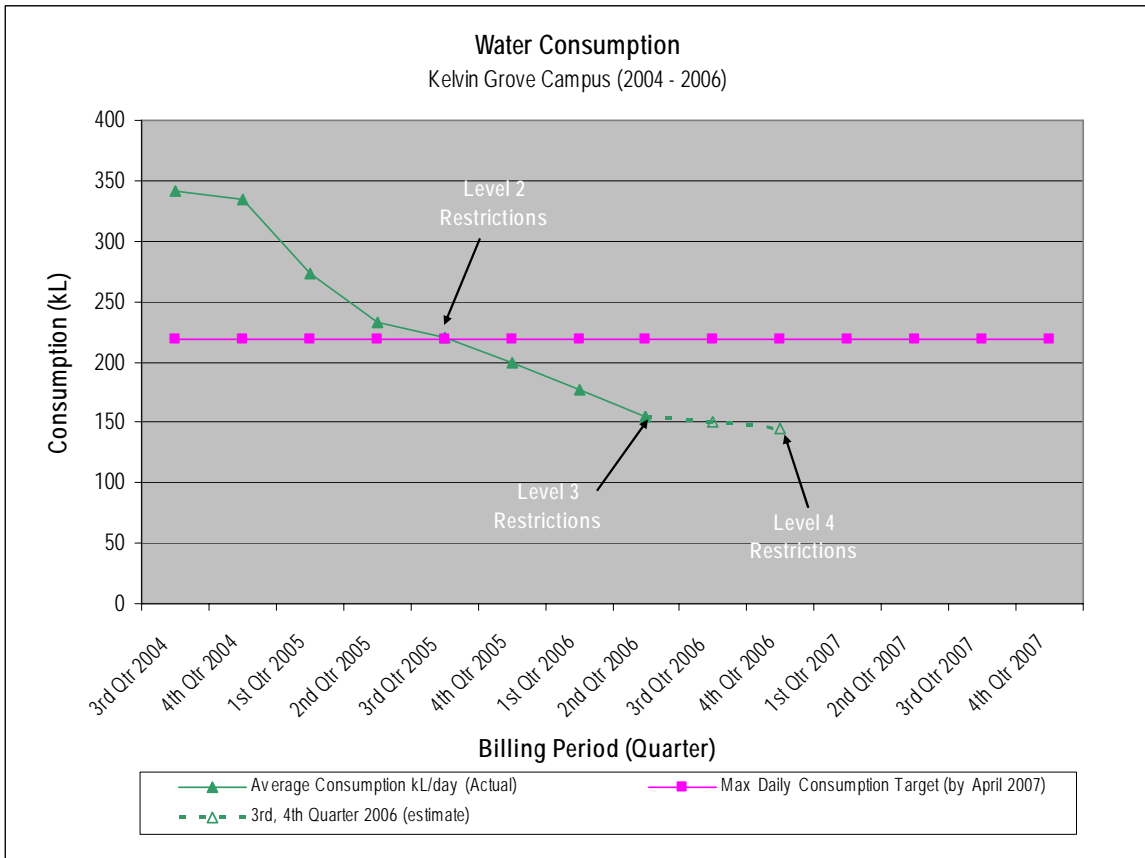
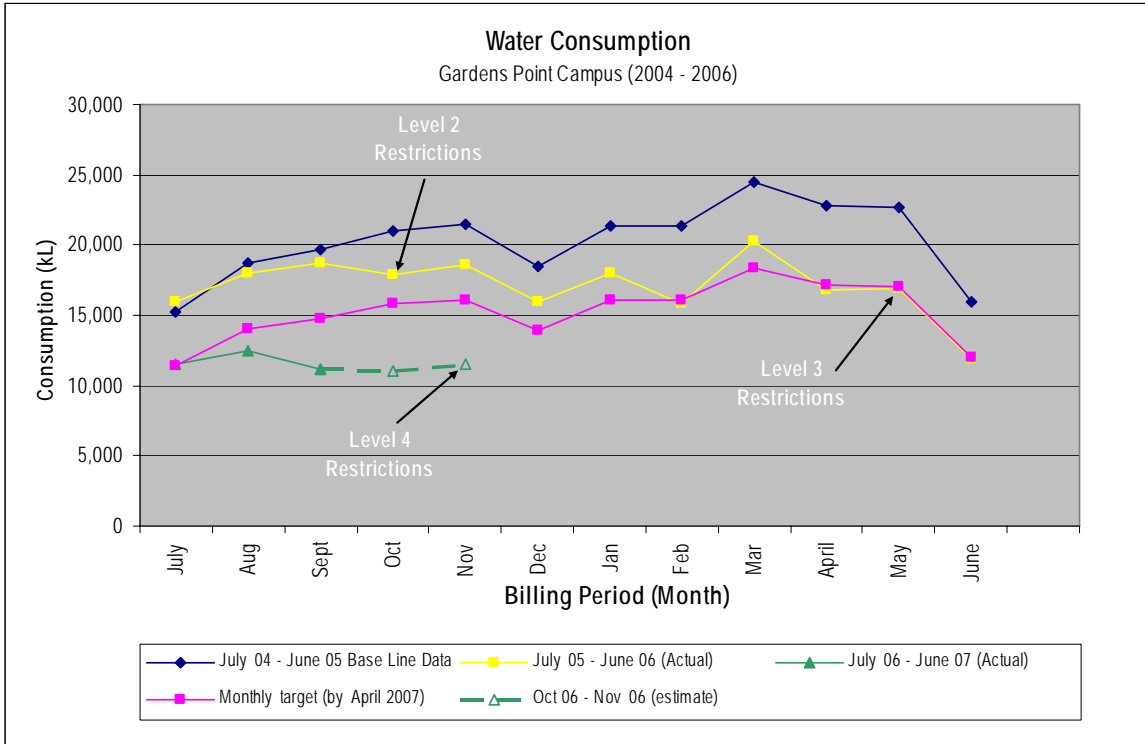
### **Benchmarking performance**

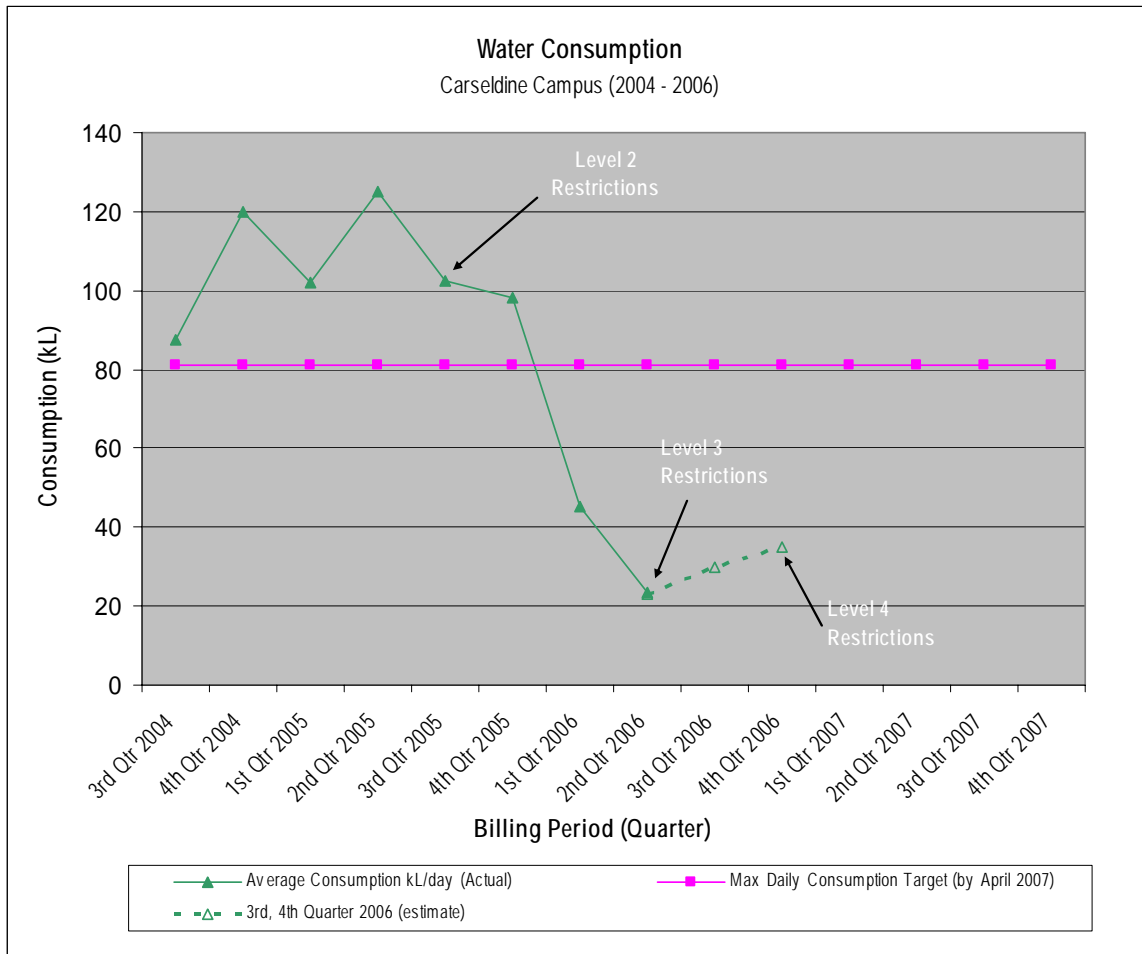
The most meaningful benchmark for water management performance for a business is its water consumption as measured against the new maximum consumption targets set by the Queensland Water Commission. These new targets will be introduced in conjunction with Level 4 water restrictions and come into effect from 1 November 2006. This maximum consumption benchmark has been set at 75% of the total water consumed by the business in the year ending 30 June 2005 (or put another way a minimum reduction of 25% in total water consumption is required). This new target comes into effect on 1 April 2007.

QUT has been proactively pursuing water management opportunities (as outlined above) for several years and has already well exceeded the water reduction targets set by the Commission. The graphs below show the dramatic impact of water management initiatives to date on the three main campuses. Similar data is available for the University's smaller sites (IHBI, Creative Industries, K-Block (KG), etc).

#### **Notes for graphs:**

1. The pink lines on the graphs below indicate the maximum water consumption targets set by the Queensland Water Commission under Level 4 water restrictions. The new targets come into effect on 1 April 2007. The green lines show the University's performance against these targets.
2. GP water consumption is based on monthly meter readings and billing by Brisbane Water. KG and CA are based on quarterly meter readings and billing by Brisbane Water.
3. The data shown is actual water consumption in kilolitres and has not been normalised for changes in gross floor area. To date this has not been an issue but with the introduction of new buildings (eg SLSC) the data will need to be measured and reported in kL/m<sup>2</sup>GFA rather than simply consumption to accommodate growth.





## Summary

The FM Department is working with a range of stakeholders, both within and external to the institution, to address the water crisis in the region. In most cases, on most campuses, water consumption has been slashed by up to 50%. Harsh restrictions on irrigation have contributed significantly to the drop in water consumption on some campuses, but other initiatives have also had major impact. This can be seen at the Gardens Point campus, which is a high density complex with relatively little landscaping.

Level 5 water restrictions will come into force in the event that the aggregate available water supply in SEQ were to drop to 20% of total storage capacity. In the absence of normal rainfall, this milestone could be reached by around April 2007. Level 5 restrictions are yet to be made public, but would likely involve a total ban on the external use of water. This would impact on the external landscape of the University. Level 6 water restrictions, an unlikely but possible prospect, could occur in 2008 and would impact significantly on the University's normal operations. Level 6 restrictions would almost certainly impact on the operation of cooling towers and air-conditioning systems and would require the institution to look at alternate way to deliver its services.

Notwithstanding the possible longer term impacts on QUT, the risks to the University as a result of escalating water restrictions is currently being well managed and minimised by an active water management programme. The current risk to the institution remains low.

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**References:**

"Water for South-East Queensland – *a long-term solution*". Department of Natural Resources, Mines and Water (August 2006). [www.nrm.qld.gov.au/water/water\\_infrastructure/pdf/long\\_term\\_solution.pdf](http://www.nrm.qld.gov.au/water/water_infrastructure/pdf/long_term_solution.pdf)

"Water Forever. *Our South-East Queensland Water Saving Initiative*". Queensland Water Commission (August 2006). <http://www.waterforever.com.au/home>).