

G

General Business Information

| Account Data | |
|---|--|
| Account Number | 101022693600001 |
| Water Service Provider | Brisbane Water |
| Business Name | The University of Queensland |
| Address of Site | 342 Carmody Rd St Lucia 4072 |
| Telephone | 07 3365 2794 (Director, Property & Facilities Division) |
| Date Account opened | Not known |
| Water connection size | 225mm with 200mm meter |
| Organisation Data | |
| Site Description | University |
| Organisation Description | Education and Research |
| Industry Sector Name | Education |
| Commercial Activity | Higher Education |
| ANZICC Code | 8431 |
| Commercial Activity Measure | Student |
| Nominated WEMP Officer | Leigh Burgess |
| No. of Students (2007) | Equivalent full time student load 26922 |
| No. of Staff (2007) | Equivalent full time staff load 4294 |
| Hours of operation | General Staff from 6:00am to 6:00pm Research Staff 24hours a day/7 days a week Students 24 hours a day/7 days a week |
| Current Water Sources | |
| Reticulated Potable | 97.78% 435ML (from Brisbane Water) 2006/2007 figure |
| Reticulated Raw | |
| Reticulated Recycled | 1.83% 12ML (from Fairfield STP) |
| On-Site Recycling | .08% 0.5ML (Mansergh Shaw & Physics Annexe) |
| Bore | NIL |
| Bulk Raw | NIL |
| Rainwater | 0.4ML (P&F, Mansergh Shaw, GPN4, Boatshed) |
| Other | .31 2ML (Stormwater from Freshwater Lake) |
| Flow Rate | At 40L/second an alarm is sent to Engineering Manager and Engineering Project Officer – Hydraulic, to investigate infrastructure and/or other major leaks. |
| Summary of Water using activities | See Section 6 (p.19) |
| Contact | |
| Organisation Contact | Mr |
| Given Name (s) | Stuart |
| Surname | Green |
| Job Title | Environmental Engineer |
| Department | Property and Facilities Division |
| Telephone Number | 07 3365 1587 |
| Fax Number | 07 3365 1900 |
| Water Efficiency Management Policy | |
| Policy Number (if applicable) | See p.5 |

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|  THE UNIVERSITY OF QUEENSLAND AUSTRALIA | Water Efficiency Management Plan | | St Lucia Campus |
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WEMP Submission Form

| | |
|--------------------------|--|
| Name | The University of Queensland |
| ABN | 63942912684 |
| Contact Details | |
| Primary Contact for WEMP | Mr Stuart Green |
| Position in Company | Environmental Engineer, Property and Facilities Division |
| Mobile Phone Number | 0411 235 932 |
| WEMP Author | Leigh Burgess |
| Authorisation | Alasdair McClintock |
| Authority's Signature | |
| Position | Director, Property and Facilities Division |
| Date | February 2008 |

Checklist

| WEMP ACTION PLAN | AREA COVERED | USES COVERED- (including Queensland Water Commission requirements) | Savings (ML per year)/% of total savings |
|-------------------------|---------------------------------|--|--|
| WEMP Management | Covers management of all WEMP s | Leak management and maintenance, meter installations, data collection and monitoring, reporting, awareness and investigative actions | Approximately 24ML unaccounted for in 2007. Some of which was leakage. 4.6% of total consumption in 2007 |
| WEMP Action Plan No. 1A | Taps and showers | Hand basins Outdoor taps Cleaners sinks Showers | 95ML/40% |
| WEMP Action Plan No. 1B | Toilets and Urinals | All toilets and urinals at the St Lucia campus operated and maintained by The University of Queensland | 94ML/40% |
| WEMP Action Plan No. 2 | Cooling Tower Systems | Cooling Towers at the St Lucia campus operated and maintained by The University of Queensland. | 11ML/5% |
| WEMP Action Plan No. 4 | Processes and other uses | Buildings | 34.8ML/15% |

| | |
|----------------------|-----------------|
| Total savings | 234.8 ML |
| Total Losses | 24 ML |
| Net savings | 210.8 ML |

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Water Management Policy

Policy Number: 7.50.4
Policy Name: Water Management Policy
Contact Officer: Environmental Engineer, Property and Facilities Division
Date Approved by Senate: 27/3/2008
Date of Next Review: 27/3/2011
Related Policies: [7.50.2](#)

1. Overview

The University of Queensland acknowledges the importance of water as an essential resource for successfully meeting its operational objectives. The University also realises the need to use this resource responsibly in a manner that is sustainable and complementary to its Environmental Management Policy.

2. The Policy

In addressing this statement, the University will:

- Incorporate water efficiency measures into all new and refurbished facilities through best practice in water efficient design, the selection and sizing of plant and equipment, systems and other water infrastructure;
- Maintain all plant and equipment, and control and manage systems and water infrastructure in such a way as to maximise efficiency;
- Monitor and report on the University's water consumption at micro and macro levels and identify and implement opportunities for improved water efficiency;
- Promote awareness of the responsibility for water conservation to faculties, institutes, schools, centres, divisions, sections and individuals;
- Pursue the use of alternate water sources to supplement potable water use;
- Strive to meet our obligations as a member of the Global Community including legislative requirements and minimising environmental impact; and
- Strive to procure, distribute and maintain water resources at the lowest cost while addressing the items above.

The Property and Facilities Division has the additional responsibilities of:

- Acquisition of water;
- Design and construction of new, and maintenance of existing facilities and their fixed water infrastructure;
- Identification, development and implementation of awareness programs and
- Making available funding to support water conservation measures.

Faculties, Institutes, Schools, Centres and Divisions

UQ Business Units within their area of influence are encouraged to:

- Purchase water efficient plant and equipment;
- Consume water responsibly and within the South East Queensland Water restrictions;
- Ensure that every individual within the Business Unit is aware of this policy and their responsibilities to conserve water;
- Ensure that any third parties are accountable for the use of any water within The University of Queensland;
- Support, where appropriate, courses and programs, and research of alternate water sources, treatment, plant and equipment, systems and other water infrastructure; and
- Make available funding to support water conservation measures.

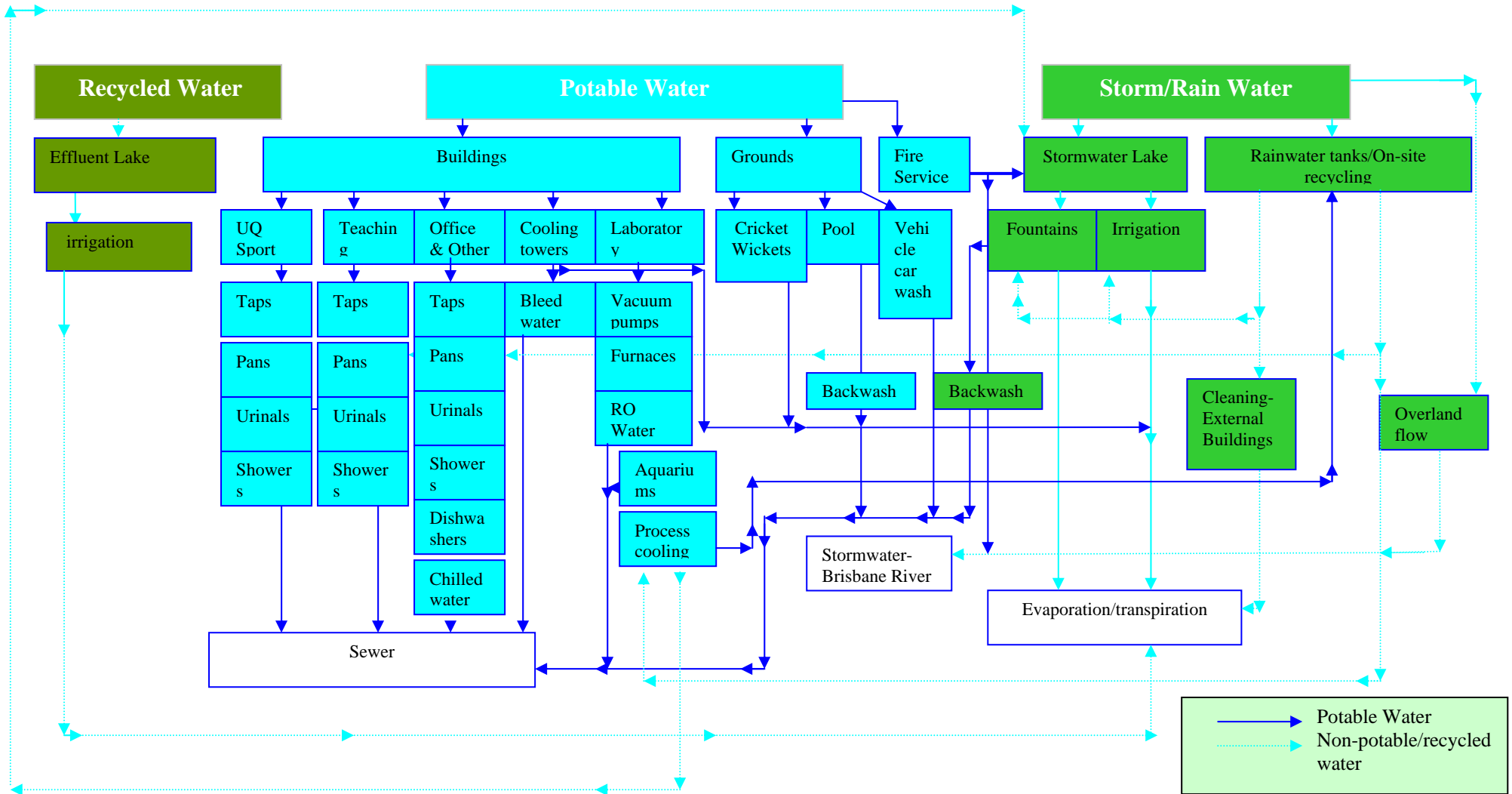
Individuals

The University Community is encouraged to:

- Use water in an efficient manner, including the operation of personal equipment and environment;
- Report any water leaks to the Property & Facilities Works Control Centre; and
- Comply with any policies and procedures for water management university wide and in their local area.

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Water Flow Diagram The University of Queensland St Lucia Campus 2007-2008





1. Introduction

This document is the Water Efficiency Management Plan (WEMP) for The University of Queensland St Lucia Campus. The Action Plans in section 8.0 outline water efficiency measures to be progressively implemented by the University. The plan complements the University’s Environmental Management System (EMS).

The Water Efficiency Management Plan for the 2007/2008 year is the 5th edition of the plan. The first Water Management Plan for the University was developed by *Commerce Queensland* in 2002. The Utilities Management Committee (water) has been meeting since May 2002 and has since identified, monitored and reported on a number of areas where water management strategies are being applied to ensure continuing water reduction. A review of actions undertaken since 2002 is available from Environmental Services Section, Property & Facilities Division and in Appendix 5.

The targets listed in the plan directly relate to the EMS objectives and are measured using Key Performance Indicators (KPI’s). Targets and actions documented in the WEMP Action Plans are measured and monitored by Environmental Services and reported to the Utilities Management Committee (UMC).

The University recognises its responsibility to the community and to the environment and has allocated resources to ensure that water is managed in an efficient and sustainable manner. The University has an Environmental Policy endorsed and signed by the Vice Chancellor.

1.1 **WEMP Purpose**

The WEMP is written to ensure that water at The University of Queensland St Lucia Campus is used in an efficient manner and that strategies are implemented to ensure best practice water consumption in accordance with The University of Queensland Water Management Policy and Brisbane Water and South East Queensland Water Guidelines. The University will;

- Ensure that all legislation and regulations are met and ensure all relevant approvals are gained;
- Monitor and measure water use to identify any potential problems with the network ; and
- Apply “Best Practices” in the overall management of water.

1.2 **Business and Site Data**

The University’s St Lucia Campus has large landscaped gardens, ovals, a swimming pool, sporting facilities, boating facilities, a car fleet, cooling towers, teaching and research facilities as well as over 100 buildings of varying size with water connected to them.

In 2007, there were 37,780 students attending the University with 34, 316 of them studying at the St Lucia Campus. Approximately 4% of those students are studying externally. The majority of the students enrolled are undergraduate students (82%) with the remaining 18% enrolled as postgraduates.

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In the same period 5661 staff were employed by The University with 4294 of them based at the St Lucia campus. Most staff were employed within academic activities with services sections making up 25% of staff employed. Services sections usually work between the hours of 6:00am to 6:00pm while there are likely to be research and academic staff working on campus 24 hours a day, seven days a week.

The University submitted WEMP's to the Brisbane City Council for the specific operations listed below in 2005. The Vehicle Wash Bay and irrigation for Sporting Facilities are managed by the Property and Facilities Division and the WEMP for the swimming pool is managed by UQ Sport. These areas operate under BCC Permit number CC20165408.

- The Swimming Pool (UQ Sport)
- Sporting Facilities Irrigation (Property and Facilities)
- Vehicle Wash Bay (Property and Facilities)

In addition, The University of Queensland has registered cricket wickets 2 & 7 as non-turf & other sports surfaces and submitted a soil & irrigation management plan for oval 1 (WEP Harris) Cricket wicket, which is registered as a major sports surface. The soil and Irrigation Management Plan for Oval 1 is the responsibility of the Senior Supervisor Grounds Section and was submitted as a separate document to this WEMP.

All contractors who use the University's water supply (regardless of source) for any project or job are required to fill in a Water Efficiency Management Plan and submit to the Project Manager with a copy to the Environmental Engineer. A template for the Water Efficiency Management Plan is available on the EMS website at www.pf.uq.edu.au/ems.html or in Appendix 4.

This WEMP is for The University of Queensland St Lucia Campus and considers all of the areas listed in the table below;

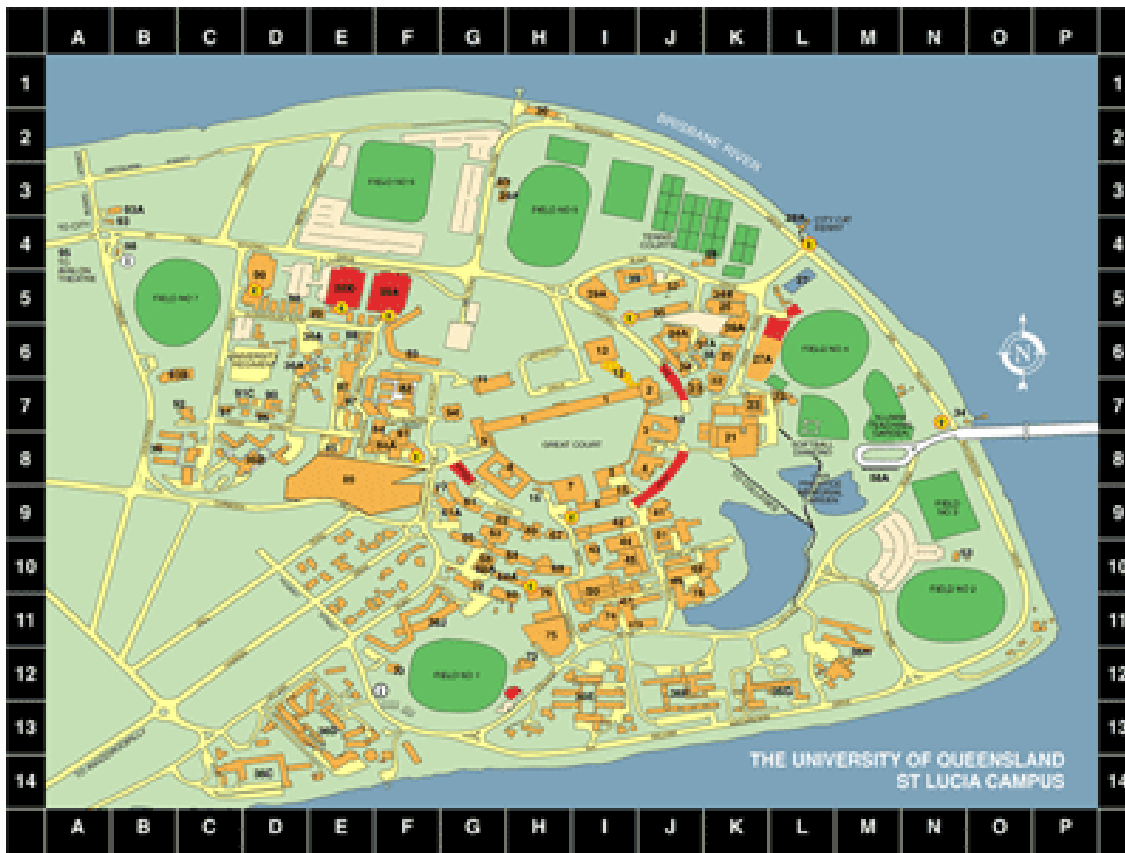
The University of Queensland has developed WEMP action plans based on SEQ Water Guidelines.

Table 1.0 WEMP Action Plans

| WEMP ACTION PLAN | AREA COVERED | INCLUSIONS |
|-------------------------|--------------------------------|--|
| WEMP Management | Covers management of all WEMPs | Leak management and maintenance, meter installations, data collection and monitoring, reporting, awareness and investigative actions |
| WEMP Action Plan No. 1A | Taps and showers | Hand basins Outdoor taps Cleaners sinks Showers |
| WEMP Action Plan No. 1B | Toilets and Urinals | All toilets and urinals at the St Lucia campus operated and maintained by The University of Queensland |
| WEMP Action Plan No. 2 | Cooling Tower Systems | Cooling Towers at the St Lucia Campus operated and maintained by The University of Queensland |
| WEMP Action Plan No. 4 | Processes and other uses | Buildings |

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Figure 1.0 The University of Queensland St Lucia Campus Site Plan 2007



1.3 Goals

Water reticulation and consumption at The University of Queensland St Lucia Campus is managed by the Property and Facilities Division. The campus has achieved its 2006/2007 goal of a 50% reduction in potable water consumption since 2004, achieving a 50.66% reduction at the end of June 2007.

To achieve this goal a number of technical and non-technical measures have been and continue to be implemented and these are outlined in the Action Plans in section 8.0.

The University Campus target is to maintain a $\text{kL/m}^2/\text{yr}(\text{GFA})$ consumption ratio of 1.1.

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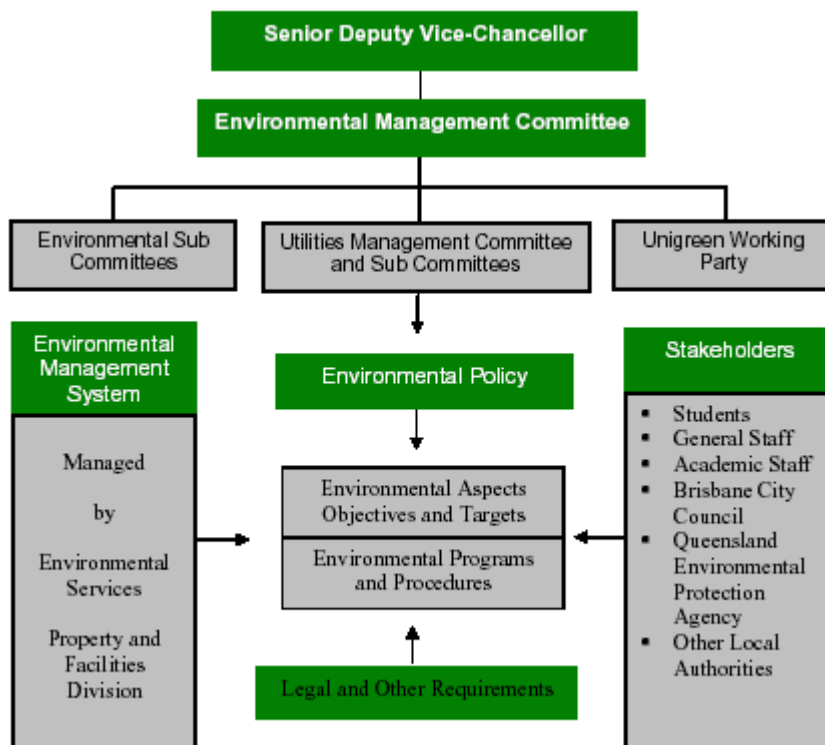
2. Management Review

2.1 *Committee Roles & Responsibilities*

The Environmental Management Committee (EMC) has overall responsibility for the implementation of The University of Queensland Environmental Management System (EMS) and other environmental activities. Composition of the committee includes Senior Deputy Vice Chancellor, four Executive Deans, Director; Occupational Health & Safety & Property and Facilities Division representatives. The Environmental Management Sub Committee at St Lucia are responsible for developing awareness of the EMS at Faculty and School levels and monitoring of EMS objectives and targets and training programs.

The Utilities Management Committee and Sub Committees are responsible for utilities management including monitoring water and energy projects. The composition of the committees includes Property and Facilities representatives from Engineering and Operations Sections and a representative from Finance and Business Services. The University also has a Unigreen Working Party which is responsible for promoting environmental management issues to and from the University community as well as external stakeholders.

Figure 2.0 Committee Structure



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2.2 Water Management and Resources

Property & Facilities Division has made water management a priority at The University of Queensland with the following measures being implemented and resources being allocated from 2006 to 2008;

- A Water Project Officer was appointed to ensure that compliance with SEQ water restrictions are achieved by the specified dates and to manage specific water efficiency projects for the University;
- A Water Management Policy was developed;
- Water awareness is now included in contractor inductions;
- A WEMP for contractors was developed and is now being used by contractors using UQ water;
- Additional funding has been made available for compliance with water restrictions and implementation of WEMP initiatives;
- 50/50 funding is available to Schools and Centres to implement water saving technologies across the campus during 2007 with funding being continued into 2008.

2.3 Financing WEMP Actions

The actions outlined in the WEMP Action Plans will be funded from various sources to ensure that they can be implemented. The majority of the funding for water management at the University of Queensland is managed by the Property and Facilities Division. Funding from the University include the University Improvement Fund and other Works Programs. Schools, Centres and Divisions also have a responsibility to ensure that the equipment that they purchase or use is water efficient.

Funding opportunities are sometimes gained from Government Grants and The University of Queensland has received several Community Water Grants for both operational and research projects. Operational funding has contributed to retrofitting buildings with water saving devices and will help to fund water tank installations.

2.4 Stakeholder Inclusion

The University of Queensland is a large educational facility with over 30,000 equivalent full time staff and students attending the campus. The University recognises the importance of being a community leader in water efficiency and has put strategies in place to achieve the goals that have been set. Property and Facilities Division realises the importance of stakeholder involvement in the management of water on campus and has identified key stakeholders across the campus and holds a water forum annually to gain input into how to achieve efficiencies in areas of research and laboratory water use as well as feedback on projects implemented. Stakeholders in water management at the University include all of the staff and students as well as the larger community.

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2.5 Awareness & Incentives

2.5.1 Unigreen

The Property & Facilities Division is responsible for the delivery of awareness programs through the Unigreen Working Party. A Unigreen Training and Awareness Management Plan has been developed to deliver a more comprehensive and effective training and awareness program in 2007 and 2008.

The Training and Awareness Management Plan includes improving awareness of water efficiency, expanding the Green Office Program which includes water efficiency and promoting the Water Efficiency Management Plan to the University community. Water awareness materials are available to Schools and Centres by download at www.pf.uq.edu.au/unigreen.html. Schools and Centres are encouraged to print section 3, post it on message boards and send to colleagues.

Property and Facilities is offering an incentive for Schools and Centres to replace/convert old inefficient technology with new water efficient technologies by providing up to fifty percent of the cost of converting to the newer technologies. Funding is limited and will be granted on a project by project basis, based on a project details being submitted to the Operations, Manager Maintenance Contracts. The incentive will be available until funding is exhausted. Contact Property and Facilities Division for more information and an application form.

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Water Efficiency Management Plan

3. Improving Water Efficiency in Schools and Centres

The following strategies when implemented will help to ensure water efficiency at the University of Queensland continues to improve. Reducing water consumption helps to ensure that the University can continue to provide a sustainable working, teaching, research and recreational environment for staff, students and the local community. University Staff are encouraged to put this page on notice boards and send to colleagues.

- Include Water Awareness in Staff and Student Training &/or inductions
- Be aware of current water restrictions
- See www.qwc.qld.gov.au for more information
- Report water leaks to Property & Facilities Division Works Control Centre on 52222 or email wcc@pf.uq.edu.au
- Be Water Wise and encourage others to be Water Wise too
- Ensure that new equipment is water efficient
- Replace old inefficient technologies with new water efficient technology
- When planning a new project, ensure that water efficiency is considered
- Download water awareness posters from www.pf.uq.edu.au/unigreen.html & post on notice boards
- Become a Green Office Representative and help to improve environmental awareness in your area
- Contact Environmental Service Section- Property & Facilities Division to find out how much water your building or campus uses

Contacts: Environmental Services Section, Property & Facilities Division Unigreen@pf.uq.edu.au
Environmental Engineer 51587, Environmental Project Officer 57580,
Environmental Coordinator 52076

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4. WEMP Management

4.1 *Review and Update of the WEMP*

The WEMP will be reviewed as required to ensure that it addresses issues and changes in legislation, policies and guidelines. This will be the responsibility of the Property and Facilities Division.

The WEMP has been developed as a document that will undergo periodic change in response to changes in the site operations, legislation, water restrictions and/or management procedures and policies of the University of Queensland.

Awareness of these changes and the requirement to update for superseded legislation and policy is the responsibility of the Property and Facilities Division.

4.2 *Emergency Situations*

Emergency situations other than those addressed in this WEMP are addressed using the emergency procedure listed in the Environmental Contingency program within the University's EMS. The list of emergency contacts is also shown in the Contingency program. It can be accessed at <http://www.pf.uq.edu.au/ems.html>

4.3 *Complaints*

Complaints can be registered on the incident form accessed on the EMS website as shown above. The complaint is then to be treated as an incident and investigated with corrective actions provided and implemented.

4.4 *Responsibilities*

The Environmental Engineer (EE) of the Property and Facilities Division oversees the requirements of the university's environmental responsibilities and will oversee implementation of the University's WEMP.

The Environmental Engineer:

- (1) Ensures that the plan is established and implemented;
- (2) Reports on its performance over time; and
- (3) Works with others to modify the plan as needed.

4.5 *Enquiries*

Any queries about the water management should be directed to;

| Area | Contact Person | Contact Number |
|----------------------------------|-------------------------------|----------------|
| Overall Operations | Environmental Engineer | 07 336 51587 |
| Water Efficiency Management Plan | Project Officer Environmental | 07 336 57580 |
| Grounds Operations | Senior Supervisor Grounds | 07 336 52747 |
| Motor Vehicle Wash Bay | Transport Officer Technical | 07 336 53317 |
| Awareness & Training | Environmental Coordinator | 07 3365 2076 |

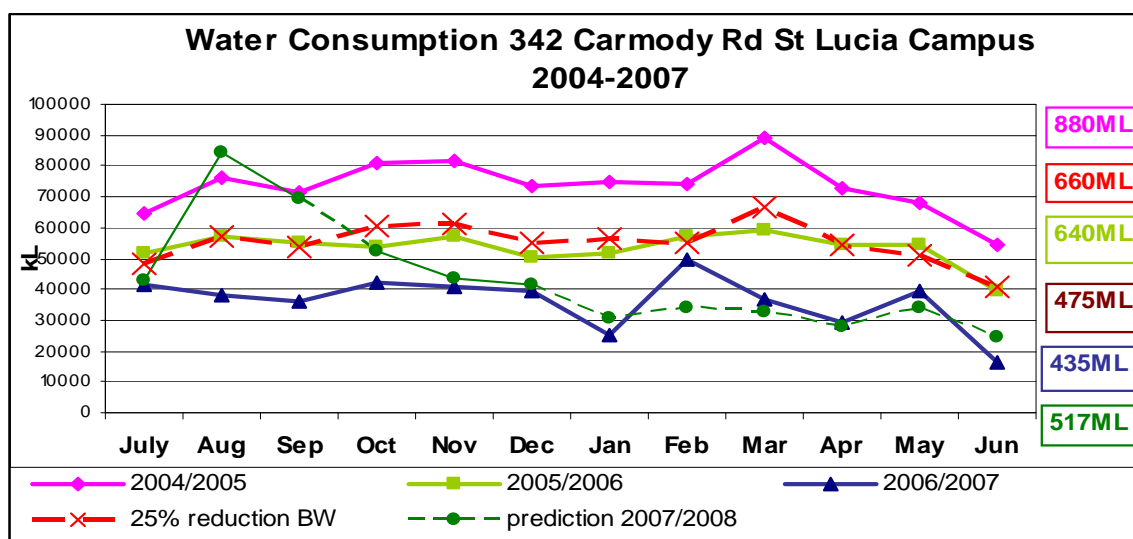
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5. Water Consumption Audit

5.1 Potable Water Consumption

The WEMP is based on consumption from the main meter at 342 Carmody Rd. The graph in Figure 3.0 shows the water consumption for the billing periods July 2004 to June 2007. The University reduced water consumption in 2006/2007 by 37% when compared to 2005/2006 and 50.6% from 2004 to 2007 through implementation of its Water Efficiency Management Plan. Due to leaks and two new buildings being commissioned in the next consumption period it is expected that total water consumption will rise slightly.

Figure 3.0 Monthly Water Consumption The University of Queensland St Lucia Campus



Note: Figures on the right show the total ML consumed for the corresponding year

5.1.1 Water Consumption End Use

The following graph and table is generated using data collected from water meters that have been installed at the University of Queensland St Lucia campus. The areas are broken down into space or use types. In areas where meters are not installed an approximation of total water consumption for that area is made based on available data, averages from similar building types etc. The data is becoming more accurate as a higher number of meters are installed. Currently the University has over 160 water meters installed and a program to complete sub metering by the end of 2008. The data shown is for the 2007 calendar year.

It is evident from the data collected that laboratory buildings are the largest water users on campus followed by the cooling towers. Cooling towers are arranged in precincts to save energy. Approximately 85% of buildings are now metered and the remaining 15% will be metered by the end of 2008. All cooling tower make-up and bleed lines are metered.

Of the 154 buildings on campus, 6 buildings have been identified as exceeding or potentially exceeding 10ML consumption. These buildings are all laboratory buildings. A detailed audit will be conducted for these

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buildings if they also exceed the average kL/GFA Benchmark. This will identify any equipment and processes that are large water users in the building so that opportunity assessments can be conducted.

Figure 4.0 – Graphic of water consumption breakdown St Lucia Campus 2007

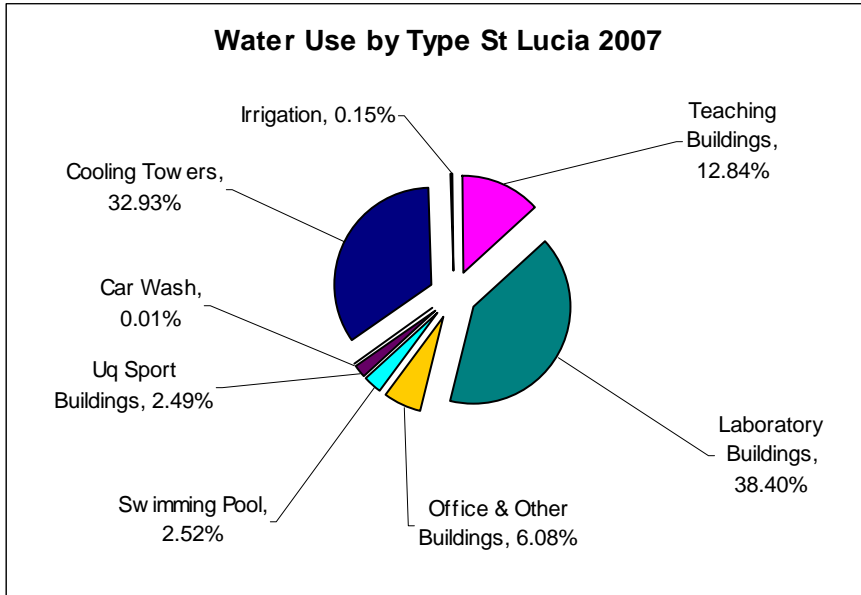


Table 2.0 Water Balance The University of Queensland St Lucia Campus 2007

| BUILDING TYPE | GFA | % of total GFA | % OF TOTAL CONSUMPTION | kL consumed 2007 (Jan-Dec) | kL/GFA | L/student+staff /day | average daily consumption kL |
|--------------------------------------|---------|----------------|------------------------|----------------------------|--------|----------------------|------------------------------|
| Teaching Buildings | 122,278 | 27.87% | 12.84% | 68,224 | 0.56 | | 189.51 |
| Laboratory Buildings | 162,895 | 37.12% | 38.40% | 204,011 | 1.25 | | 566.70 |
| Office & Other Buildings | 143,206 | 32.64% | 6.15% | 32,704 | 0.23 | | 90.84 |
| Swimming Pool | 270 | 0.06% | 2.52% | 13,390 | 49.59 | 74 | 37.19 |
| Uq Sport Buildings | 9,175 | 2.09% | 2.49% | 13,213 | 1.44 | 24.47 | 36.70 |
| Car Wash | 390 | 0.09% | 0.01% | 30 | 0.08 | 76.92 | 0.12 |
| Cooling Towers | | | 32.93% | 174,955 | 0.41 | 5.60 | 485.99 |
| Irrigation | | | 0.15% | 800 | | | 2.22 |
| Total building consumption | | | | 506,526 | | | 1407.02 |
| estimated + metered consumption 2007 | | | 100.00% | 507,326 | 1.16 | 45.14 | 1409.24 |
| actual consumption 2007 | | | 95.48% | 531,338 | 1.21 | 47.28 | 1475.94 |
| unaccounted /leaks | | | 4.52% | 24,012 | | | |

Notes: Car Wash is L/car/day not L/student + staff/day

Swimming Pool L/student + staff/day is based on an annual average entry of 500persons pr day

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5.1.2 Monitoring Specific Activities

In addition to WEMP's being required for water users over 10ML per year, Brisbane Water requires that WEMP's are submitted for certain activities such as;

- Swimming Pools
- Major Sports Fields
- Cooling Towers

Water consumption for each of these areas will be monitored weekly and Environmental Services Section will record and graph consumption monthly.

Swimming Pool

Total Mains Water Consumption at the aquatic centre in the 2007 calendar year was 13390 kL. Included in this consumption, is a weekly (summer) to fortnightly (winter) backwashing procedure. Hosing using high pressure trigger operated nozzles of the change rooms is done for occupational health & safety purposes however it has been reduced to every second night instead of every night to improve water efficiency.

5.1.3 Water Consumption Predictions

The following financial year predictions are forecast from historic water consumption data since 1996 and the current building program for the University. Table 3.0 shows consumption for the periods 2004/2005 to 2006/2007 and predictions to 2009/2010. This takes into account the significant growth that the campus is experiencing from the construction program. It is expected in 2007/2008 that the KPI will increase slightly due to leaks that occurred in the mains infrastructure.

Table 3.0 Water Consumption and Predictions 342 Carmody Rd 2004-2010

| GFA | 438906 | 448688 | 459179 | 459179 | | |
|-----------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Billing | | | | | | |
| Period | 2004/2005 | 2005/2006 | 2006/2007 | 2007/2008 | 2008/2009 | 2009/2010 |
| July | 64338 | 51485 | 41797 | 42943 | 41033 | 43269 |
| Aug | 76026 | 57110 | 38165 | 84211 | 47773 | 50181 |
| Sept | 71281 | 54810 | 35943 | 69398 | 44144 | 45718 |
| Oct | 80818 | 53718 | 42460 | 52093 | 45748 | 47640 |
| Nov | 81739 | 56906 | 40897 | 43846 | 43445 | 45181 |
| Dec | 73637 | 50590 | 39246 | 41368 | 36770 | 36520 |
| Jan | 74868 | 51417 | 25313 | 30423 | 31786 | 31260 |
| Feb | 73815 | 56871 | 49523 | 33984 | 36790 | 37717 |
| Mar | 88778 | 59034 | 36422 | 32749 | 41105 | 42123 |
| Apr | 72678 | 54696 | 29475 | 27962 | 33679 | 32877 |
| May | 68068 | 54570 | 39120 | 34220 | 36381 | 36532 |
| June | 54624 | 39760 | 16159 | 24438 | 25080 | 24125 |
| Total kL | 880670 | 640967 | 434520 | 517635 | 463733 | 473143 |
| % Change | 9 | -27 | -32 | 19 | -10 | -2 |
| kL/GFA | 1.90 | 1.40 | 0.99 | 1.15 | 1.01 | 1.03 |

*Note: GFA= Gross Floor Area kL= Kilotres

5.1.4 WEMP Compliance Audits

Property and Facilities Division have conducted audits in all buildings at The St Lucia campus and of installation. These spreadsheets are filed with the Operations section of the Property and Facilities Division. The audit was carried out by Property & Facilities staff and plumbing contractors and the summary of

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expected savings to be achieved by retrofitting all showers, taps, hand basins, toilets and urinals (WEMP 1A & 1B) can be found in Appendix 1. On completion of retrofitting buildings a plumber will sign the audit sheets to demonstrate compliance with water restrictions. Laboratories were not included in the WEMP 1A & B Audit as they are specialised areas where the laboratory sinks are often used for volumetric uses such as washing galssware and for chemical dilution. These areas are currently being reviewed in consultaion with the Unviersity chemical manager and laboratory managers to ensure that any retrofitting is done in accordance with the specific requirements of the area.

Detailed information for Evaporative Cooling Systems is available in Appendix 2. While most of the information given is taken from meter readings and data collected from maintenance contractors who service the cooling towers, assumptions have been made where water meter data or other data was not available.

End use processes are described by building types and/or activity type and an estimation of laboratory tapware and savings expected from retrofitting is included here. Buildings are broken down into use types as described in figure 4.0. Consumption data will be made available for viewing by staff on the Property & Facilities website from March 2008.

5.2 Alternate Water Consumption

5.2.1 Rain and Storm Water

The University has reinstated existing and installed new water tanks in some areas. These tanks are used to store diverted rainwater and process cooling waters (such as through lasers) to recycle for cooling lasers and to service buildings. This water has also been used for cleaning external facades of buildings and construction and maintenance works. Stormwater is directed to a freshwater lake on campus and reused for irrigation on campus.

The total current storage capacity for storm/rain water on site is;

| | |
|---------------------------------------|-----------------|
| Freshwater Lake: | 33 ML |
| Steele Water Tanks: | 2 x 30,000L |
| Physics Annexe Water Tanks: | 2 x 20,000L |
| Mansergh Shaw Water Tanks | 2 x 60,000L |
| Property & Facilities Workshop Annexe | 1 x 20,000L |
| GPN 4 water tanks | 2 x 110,000L |
| Eric Freeman Boatshed Water Tanks | 2 x 13,000L |
| Total | 486,000L |

Property and Facilities Division is currently investigating a number of new options for harvesting, recycling and reusing water on campus. This includes investigating the options for harvesting more rainwater from roof areas and stormwater on the northern side of campus.

5.2.2 Recycled Water

The University of Queensland uses recycled water from the Fairfield Sewerage Treatment Plant to irrigate the sports ovals & limited other areas at the St Lucia campus.

The usable storage capacity of the recycled water lakes is 5.36 ML. The University of Queensland has an agreement with Indooroopilly Golf Course and Brisbane Water allowing UQ to take 6ML of recycled water per week from the Fairfield Sewerage Treatment Plant. The use of recycled water is managed under an Irrigation Management Plan.

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6. Scope and Description of Activities

6.1 *Scope and Description of Activities*

The campus's current operations are described below. The activities start with the management of water efficiency including monitoring, measuring and reporting, benchmarking and maintaining infrastructure as well as leak detection and reporting. All other activities include the use of water and the descriptions are broken down according to building type and or use as is shown in figure 4.0. The aim of reviewing these activities is to determine potential impacts and ensure that management strategies and corresponding action plans are put in place to manage them.

6.1.1 Monitoring

The University of Queensland has approximately 130 buildings at the St Lucia campus with water fixtures. All water meters are listed on a water meter reading sheet (PF427). The sheet is printed from the local network and manually filled out by Property and Facilities maintenance staff or contractors who read all meters on a monthly basis. The form is a controlled form managed under the Quality Management System. A procedure has been written and distributed to ensure that meters are read, data is entered into a spreadsheet and checked and PF reading forms are updated monthly.

Where the access to the meter location is restricted The University of Queensland uses the Elster Metering System incorporating the T210 Electronic Scancounter, remote display with pulse sensors. The system remotely connects the pulse capable water meter via a pulse sensor to the scancounter via a hard wired connection up to a length of 100 metres. The reader is programmed to reflect the current reading on the water meter.

This information can be read manually or retrieved by the reader programmer and uploaded to a P.C where the information can be shared and recorded. The system is in use on five building at our St Lucia Campus. The system also continuously monitors flow and shows a drip icon on the screen where there is no zero flow in 30 minute period. This will trigger an investigation.

6.1.2 Data Logging

A data logger has been installed on the main meter at the St Lucia Campus which enables Property & Facilities Division to monitor consumption at 15 minute intervals over a 24 hour period. Engineering Section of Property & Facilities Division is responsible for monitoring the data including daily consumption and peak and low flows. The meter has an alarm on it which sends an email to both the Engineering Manager and a Project Officer when the flow exceeds a predetermined flow rate. It is set on 40L/second.

6.1.3 AMR Pilot

A wireless automated water reading pilot using wavenis radio technology and coronis meter interface units. The pilot includes 43 meters on cooling tower makeup, bleed and buildings with cooling towers. These meter readings can be taken with a PDA on a laptop. The meters are logging on a daily interval.

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6.1.4 Measuring

The collected data is then entered into a spreadsheet by the Works Control Centre and checked by Environmental Services Section. The spreadsheet has been designed to highlight entries outside a pre-determined consumption band and generate graphs for each meter.

6.1.5 Reporting

These graphs generated will be uploaded to the Property and Facilities website and made available for staff viewing monthly from April 2008 and updated quarterly.

Any anomalies in the data are discussed with the plumbing supervisor. Leaks are reported to the Works Control Centre as necessary and work orders are generated to ensure that any problems or failures are resolved. If the problem is ongoing it is reported to the Utilities Management Sub Committee (water) and if required to the Utilities Management Committee for further action.

The Utilities Management Sub Committee (water) meets every month and discusses water consumption and the progress of actions in the water efficiency management plan. Results of monitoring and measuring are reported to this committee.

The Utilities Management Sub Committee (water) reports to the Utilities Management Committee bi-monthly. Representation on the committees is from the Property and Facilities Division and Finance and Business Services Section. The Utilities Management Committee reports to the Environmental Management Committee quarterly.

An Environmental Report is generated annually which includes a report on activities of the Utilities Management Committees. For further information about the Environmental Management System and to view the report see www.pf.uq.edu.au/ems.html

Under level 6 water restrictions, it is a requirement for the University to report quarterly on all sites using more than 10ML or sites with Cooling Towers. The following items will be required to be included in the quarterly reports.

Leaks: It is essential that leaks are reported to the Works Control Centre where they are logged and a work order generated so that it is attended to in a timely manner. The main meter has a data logger on it and any high flows trigger an alarm for further investigation. Any spikes recorded on the data logger and the remediation will be reported to Brisbane water quarterly.

Water Consumption: Consumption is monitored and recorded monthly and this data will be made available to Brisbane Water quarterly.

WEMP Actions: All actions outlined in the WEMP will be followed up monthly through the Utilities Management Sub Committee for water and reported to Brisbane Water quarterly.

Cooling Towers: Cooling tower water consumption has been monitored on a monthly basis, however this will be moved to weekly recording in line with the QWC Guidelines and cooling tower maintenance is undertaken according to contract agreements.

It is important that all personnel are familiar with the procedures for the reporting of issues that may result in environmental degradation whether the incident has occurred or may occur in the future. An environmental incident notification form is available on the EMS website www.pf.uq.edu.au/ems.html for the recording of such events. The issue is to be investigated with corrective actions assigned and implemented.

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To report leaks please contact the Works Control Centre at wcc@pf.uq.edu.au or telephone 3365- 2222.

6.1.6 Benchmarking

The University of Queensland is a member of the Tertiary Education Facilities Management Association (TEFMA). TEFMA conduct a benchmarking survey annually across all members which considers all aspects of facilities management including water consumption. Key Performance Indicators such as kilolitres/Gross Floor Area/annum (kL/GFA/yr) and kL/EFTSU/yr (Equivalent Full Time Student Units) /annum are recorded and the results are sent out to members so that they can benchmark against each other. The University of Queensland has improved its position in the Benchmark Survey significantly since 2004.

In addition to the TEFMA Benchmarking survey for the University, Property and Facilities Division is currently working on developing benchmarks for each building use type identified in Section 5.

6.2 Infrastructure & Maintenance Activities (including leak detection)

The Property and Facilities Division is responsible for maintaining the water infrastructure to a suitable standard. Leaks should be reported to the Works Control Centre who will then raise a work order to have the leak fixed. All leaks are recorded on a spreadsheet by the Works Control Centre, with details such as date reported, location of the leak, size of the leak (flow rate), approximate water loss and date fixed. Actions are outlined under the Management Action Plan in section 8.0.

6.3 Buildings

The University of Queensland's core activities are education and research. In the course of carrying out these activities a number of areas use water intensive processes and/or equipment or require specialised climate controlled facilities. All buildings will have cleaner's rooms with sinks for filling up mop buckets, bathrooms, kitchens and some buildings will have showers.

The University historically had a number of buildings at the St Lucia campus with 11 or 9 litre flush cisterns and continuous flush urinals installed within the bathrooms.

Current water restrictions require that water from the reticulated (town) supply system is not permitted to be used for bathroom, laundry, ablution or kitchen fittings except where:

- in relation to the premises it can be demonstrated that the internal water fittings on the premises comply with the following water efficiency standards being:
 - all the taps are water efficient taps;
 - all the showerheads are water efficient showerheads;
 - all the trigger sprays are water efficient trigger sprays; and
 - all urinals are water efficient urinals.

The University has implemented an extensive retrofit program to replace all of the 11 and 9 litre cisterns with cisterns or toilet suites which meet the requirements of current water restrictions. Urinals are also being retrofitted or replaced to reduce water consumption and comply with water restrictions. Flow restrictors and/or aerators are being placed on all hand basins, and showerheads are being replaced with water efficient alternatives. Desert cubes are being trialled in urinals in some areas and will be installed in appropriate areas if the trial proves successful. The University now monitors and measures around 160 water meters at the St Lucia campus and will continue to collect data, monitor and measure water consumption. Property and Facilities Division is responsible for maintaining toilets, urinals, taps and showers.

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While no individual building or activity on campus constitutes a major water user as per the definition in the QWC guidelines (15-85% of total consumption) all buildings will be metered and monitored on a monthly basis to ensure that they stay within an acceptable consumption range. Water consumption for all buildings can be found in Appendix 4.

The University has several food and beverage outlets which are run by The Student Union, Businesses or UQ Sport. Most of these outlets are part of a teaching, office or laboratory building. Where a lease agreement is in place, these outlets will usually be sub-metered. Student Union Food & Beverage outlets on campus include;

- | | |
|----------------------------------|-----------------------------|
| 1. The Main Refectory | Campbell Place |
| 2. The Physiology Refectory | Physiology Building |
| 3. Biological Sciences Refectory | Biological Sciences Library |
| 4. Café Grinders | Sir James Foots Building |
| 5. Darwins Café | Biological Sciences Library |
| 6. The Red Room | Campbell Place |
| 7. The Pizza Café | Campbell Place |
| 8. The Noodle Bar | Campbell Place |

Other food and beverage outlets on campus include;

- | | |
|----------------------------|-------------------------------------|
| 1. Merlo's | Duhig Building |
| 2. Genies | Queensland Biosciences Precinct |
| 3. Wordsmiths | Staffhouse Road |
| 4. 30/40 Café | Tennis Club |
| 5. Staff Club | Staffhouse Road |
| 6. BEL Faculty Coffee Shop | Roof Top – Colin Clark |
| 7. Coffee Shop | AIBN (pre-prepared food items only) |

These food outlets lease space from the University and water consumption is the responsibility of the individual business. Food and Beverage outlets may be open to Staff and Students as well as outside functions, conferences and training. These areas should refer to the Fact Sheet *Water Use in the Food Services Industry* for information on how to achieve water savings in these areas. Available at the Queensland Water Commission website at www.qwc.qld.gov.au

6.3.1 Teaching

Teaching buildings can be described as those in which the major use is teaching, whether in lecture theatres or in classrooms. These buildings may have some offices however the spaces are generally large and the population is transient. All teaching buildings will have ablutions and some will have showers.

6.3.1.1 Lecture theatres/Classrooms

Many buildings with large lecture theatres support infrastructure such as food outlets and host numerous seminars, conferences, workshops and commercial functions in non teaching times. While the lecture theatres generally do not have water in them, they may be connected to a kitchen for catering purposes. The size and frequency of use will influence the use of the ablutions in the building.

6.3.2 Laboratories/Workshops

Laboratory buildings can be described as those in which the major use is in laboratories. Some of the laboratory buildings are also teaching buildings and/or research buildings. Research requires specialised processes and equipment as well as micro managed climate control, cool rooms etc. These areas may also

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have wash down areas for staff and will have safety showers installed. When buildings are grouped by type it is clear that laboratory buildings are the largest water users on campus making up 38% of total campus consumption. It should also be noted that laboratories also have the largest percentage of floor area.

A number of areas have been identified as high water users by Property and Facilities Division and some of these areas have converted to more efficient technologies or processes. Water consumption in these areas is the responsibility of the School or Centre.

Laboratories often have equipment such as autoclaves and fume cupboards. Some fume cupboards use scrubbers to clean the air as it is emitted to the atmosphere and autoclaves use water to create steam which sterilises clinical and pathological waste streams. While the University has a list of this equipment, the lists are not yet detailed enough to determine water efficiency of the equipment. New contract agreements are currently being developed to ensure that detailed information and flow rates will be available for this equipment. The new contracts will be in place during 2008.

6.3.2.1 Animal Houses & Areas Involved with Animal Use

Those areas involved with animal use must have their holding pens or cages thoroughly washed for animal welfare purposes. Some animal holding rooms and surgeries require a 100% air exchange to limit animal dander and staff allergic reactions. In addition to animal houses there are aquarium areas. Cleaning and filling of aquariums should be carried out in accordance with best practice methods.

Washing down animal houses should be carried out in accordance with best practice methods whereby solids should be firstly swept up and collected in bins and disposed of in accordance with the University's waste management program. Potable water is not permitted to be used for animal husbandry purposes (including kennels, mobile animal washers, pounds or agricultural premises) except where the water is used for animal welfare and survival purposes including for the:

- Provision of drinking water for animals; or
- Washing of animals; or
- Cleaning of animal pens and enclosures with a high pressure cleaning unit that is connected to a trigger nozzle or which uses other water efficient methods (QLD Water Commission, Nov 2007)

Please note that any 'other water efficient methods' should be approved by the Environmental Engineer. In some instances water tanks will be installed by Property and Facilities Division for the purpose of watering animals and washing down.

All trigger nozzles must also meet the QWC flow requirements.

6.3.2.2 Glasshouses

The Central Glasshouse Services Unit (CGSU) is a University facility managed by the Faculty of Biological & Chemical Sciences on behalf of NRAVS & BACS Faculties and is used for research purposes.

The CGSU provides a range of centralised plant growing facilities (an area of 1781m²) using Quarantine, PC2, temperature controlled and evaporative cooled glasshouses as well as services associated with the growing of plants. Irrigation systems that decrease water consumption are being implemented. For example a new pot that prevents roots escaping is being used in combination with a mat irrigation system. Studies have shown that water consumption using the new system can reduce water consumption by 69L/sqm/week in irrigation water and reduce runoff by 62 L/m²/wk when changing from an overhead system to a combined overhead and sub-irrigation mat system.

Other areas within the University also have glasshouses used for research purposes.

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6.3.3 Office & Other Buildings

Office buildings are predominantly offices used by staff and post-graduate students. These buildings may have teaching space and collaborative learning centres however the predominant use will be office space. Water use in these buildings is generally in bathrooms and tea rooms. Tea rooms may have dishwashers in them and some will have hot water systems installed.

Other buildings will include all those buildings not already identified such as businesses, the chaplaincy, some food outlets, art galleries, sheds and maintenance workshops not identified as laboratories and car parking. Most of these facilities will have at least one toilet and a basin some will also have kitchens and cleaners rooms.

6.4 Cooling Towers

There are currently 43 cooling towers on campus servicing the air conditioning requirements of most buildings. The towers service buildings within 11 chilled water precincts which are outlined below. Meters have been installed on all cooling system make-up and bleed lines so that Property and Facilities Division can measure and monitor water consumption. Property and Facilities Division is responsible for the management of cooling towers.

| | |
|-----------------------------|-----------|
| ▪ Central Precinct | 9 |
| ▪ Computer Science Precinct | 2 |
| ▪ Engineering Precinct | 5 |
| ▪ Ritchie Precinct | 3 |
| ▪ Commerce Hill Precinct | 3 |
| ▪ Therapies Precinct | 3 |
| ▪ GP South Precinct | 2 |
| ▪ HMS Precinct | 2 |
| ▪ QBP Precinct | 4 |
| ▪ McGregor Building | 1 |
| ▪ AIBN Precinct | 3 |
| ▪ QBI | 3 |
| ▪ Northern Precinct | 3 |
| Total | 43 |

Cooling Towers are required to be operated under a Water Efficiency Management Plan and actions for reducing consumption are included in Action Plan 2 in this WEMP. The completed initial assessment as required by The Queensland Water Commission for Evaporative Cooling Systems can be found in Appendix 2.

Maintenance of the cooling towers and air conditioning units is carried out by Property and Facilities maintenance staff and contractors as specified in maintenance schedules and contract agreements. These schedules and agreements are currently being reviewed to ensure that maintenance meets the requirements of the QWC. Cooling tower meters (both make-up and bleed) are to be read weekly. Conductivity readings should also be taken weekly.

6.5 Outdoor Uses

6.5.1 Construction Sites & Construction Activities

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The University of Queensland is in a period of growth and has a number of new buildings currently in construction or design stages. Water from the reticulated potable supply is not to be used for commercial construction on non residential premises (including concrete, masonry and general building activities) unless the water is used with a hose which has a trigger or twist nozzle or by using other water efficient methods and the construction site is attended at all times when the water is being used (Queensland Water Commission Nov 2007).

Alternate water supplies should be sought for work on construction sites where feasible. Construction is the responsibility of the Property and Facilities Division. All contractors who use the University's water supply (including rainwater, recycled water, potable water or water from any other University source) are required to complete a WEMP for Contractors and submit to the Property & Facilities Division Project Manager with a copy to the Environmental Engineer before work begins. (See Appendix 4)

Construction activities include concrete cutting, dust suppression and washing surfaces and any other construction type activity undertaken which may or may not be related to an actual construction site.

6.5.2 Cleaning

Property and Facilities Cleaning Section is responsible for ensuring that the University is cleaned to appropriate standards. External areas that are usually cleaned include;

- Windows;
- Some heavily cobwebbed areas in conjunction with window cleaning operations;
- Some pathways, such as those at the bus stop area and other undercover paved areas, where people congregate and or eat;
- Some paved building entrance areas;
- Spillages such as grease from BBQ; and
- External facades.

Water restrictions are in place for external cleaning and cleaners and cleaning contractors should be familiar with current water restriction guidelines. External cleaning may only be carried out if there is a material health or safety risk and it should be done using water efficient methods.

Rain water has been used to clean the external façade of some buildings where it is available. Please note that any 'other water efficient method' should be approved by the Environmental Engineer.

Cleaning contractors will be required to submit a Water Efficiency Management Plan (see Appendix 4) before undertaking any work requiring water. Alternative water sources should be used where feasible. Contractors should ensure that all trigger nozzles being used comply with the current QWC guidelines.

6.5.3 Fountains

The University has a number of water fountains at the St Lucia campus. Potable water is not permitted to be used to operate water fountains on campus. Due to water restrictions fountains which are operational are topped up using alternate water supplies such as rain water from storage tanks and lakes on campus. Fountains should be signed stating the water supply used. The fountains are maintained by Property and Facilities Division.

6.6 UQ Sport Facilities

The University has eight ovals which includes three turf cricket wickets. The facilities are used by University and Community groups and some are of international standard. All of the sporting facilities are irrigated

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using recycled water from Fairfield Waste Water Treatment Plant. The only exception is the cricket wickets which are required to be watered twice a week with potable water. The University has received permission from Brisbane City Council to water the wickets and operates under a permit and the active playing field guidelines. (See 1.1).

6.6.1 Major Sports Fields

The WEP Harris Cricket Wicket has been identified as a major sports surface. It has been registered with Brisbane Water and a soil and irrigation management plan has been submitted to Brisbane Water.

6.6.2 Non-Turf Sports- Cricket wickets

All other cricket wickets have been registered with Brisbane Water but are not considered major sports surfaces and do not require a management plan to be completed.

Alternate water sources have been investigated for use on the cricket wickets however good quality water is required to maintain the condition of the wickets and a suitable alternative is yet to be found.

Recycled water used for irrigation is controlled and managed under the irrigation management plan held by Environmental Services and Grounds and the Action Plan for recycled water in this document.

6.6.3 Landscape and Lawns

Established Areas

The University has landscaped gardens and lawns around the campus some of which are currently irrigated via a stormwater lake on campus and other areas are not being irrigated due to water restrictions. The Grounds are managed by Property and Facilities Grounds Section.

New Areas

Potable water is not permitted to be used for the watering of newly established gardens (including parks and gardens of significance) and lawns except where the watering occurs within the guidelines and times set out under current water restriction guidelines. If contractors are using University water to establish landscaping please ensure that they have completed a WEMP for contractors. All new landscaping should incorporate water sensitive design.

6.7 Vehicle Washing

The Motor Vehicle Workshop has a dedicated vehicle wash bay used to wash and detail the University fleet. Potable water from Brisbane City Council is used as permitted. It is operated in accordance with best practice guidelines. The water is disposed of to the BCC sewerage system. The vehicle wash bay is managed by Property and Facilities Transport Section. It is metered and data is recorded weekly at the Garage and sent to Environmental Services Section monthly.

6.8 Swimming Pool

The 50m Olympic standard pool at the University is operated by UQ Sport and the WEMP for the swimming pool is the responsibility of UQ Sport. Water consumption is monitored and measured by Property and Facilities Division monthly while UQ Sport is responsible for maintaining a weekly log. The pool is operational seven days a week from 5am to 8pm weekdays and from 6am – 6 or 7pm on weekends.

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The Aquatic Centre must operate in accordance to a WEMP and comply with current water restriction guidelines.

6.9 Summary of past and future water saving initiatives

During 2006 and 2007, Property and Facilities Division and Schools and Centres at The University of Queensland have implemented the following water savings;

- Retrofitted all hand basins and showers to WELS 3 star or better. Most taps are fitted with aerators which are 3L/minute.
- Replaced of retrofitted toilets reducing consumption from 11 and 9 litres a flush to 6/3 litres per flush.
- Replaced or retrofitted urinals from 11 and 19 litres plus/flush to 0.5 litres per flush.
- Pressure reduction has been implemented to several buildings on campus. This restricts the flow through the tap or valved outlet and reduces litres used.

Future water saving initiatives at the University of Queensland are reliant on funding availability and the outcome of a number of feasibility studies and investigations yet to be undertaken. The following is a list of possible future initiatives that will lead to further reductions in water consumption at the University of Queensland St Lucia Campus.

- Water reductions in laboratories and workshops through more efficient equipment, changes in practices, recycling and reusing water and/or reducing flows;
- Supplementing potable water used in cooling towers with lake water (storm water);
- Supplementing potable water used in toilets with rainwater;
- Supplementing potable water used for washing outboard motors with rainwater.

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7. Legal Requirements

7.1 *Environmental Aspects & Potential Impacts and Assessment*

An impact assessment has been carried out on those activities listed in Section 6. The outcome is shown in Table 4.0 below.

Table 4.0 Environmental Aspects and Potential Impacts and Assessments

| Activity/Description | Aspects | Potential Impact | Assessment |
|--|--|---|---|
| Particular activity that could result in an on-site or off-site environmental impact | A listing of the elements of the site's activities which could have an adverse impact on the environment | Impacts refer to the potential change that could take place in the environment as a result of the aspects | The determination of any actual or likely environmental impact as identified from monitoring or complaints received by the site |
| Buildings | | | |
| | Taps, Basins, Showers, Toilets and Urinals | Potable water use | Water efficient pans, urinals, taps and showerheads are being installed. Storm water is harvested in some areas for use in toilets and urinals. |
| | Labs/Workshops: process cooling, fume cupboards, furnaces, vacuum pumps | Potable water use | Opportunities for reducing consumption are being investigated. |
| | | Waste water | Currently to sewer, opportunities for recycling are being investigated. |
| | Animal Houses- wash down | Potable water consumption | All areas to use a hand held hose with trigger nozzle connected to a high pressure unit. |
| | Food outlets/Refectories | Potable water consumption | Ensure that equipment is water efficient |
| | | Waste water | Currently goes to sewer |
| Cooling Towers | | Potable water use | Opportunities for reducing consumption are to be investigated. |
| | | Waste water | Can contain biocides, Legionella, high TDS. Discharged to sewer. Opportunities for treatment & Reuse to be investigated. |
| Construction Sites | Washing down | Potable water use | Non-Potable water will be |

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| | surfaces | | used when available |
| | Cutting concrete and masonry | Potable water use | Non-Potable Water will be used where available |
| Outdoor Uses | Watering cricket wickets | Potable water use | A WEMP has been in place since 2005. Opportunities for switching to more water efficient sprinkler heads and sourcing alternate water for the cricket wickets are to be investigated. Recycled water is not suitable for this application |
| | Use of Recycled Water for Irrigation | Spray drift to areas with uncontrolled access | Irrigation is undertaken at night in accordance with the Irrigation Management Plan. |
| | Swimming Pool Topping up | Potable Water use | Recycling backflow and rainwater harvesting to be implemented to reduce consumption. |
| | Cleaning activities | Potable water use | Contractors are required to submit a WEMP before starting any work. Contractor inductions include water efficiency. Alternate water should be used where available. |
| Infrastructure | Maintenance: Flushing water pipes | Potable water use | Capture & Reuse to be investigated |
| | Broken Pipes | Potable water use | Controlled through a preventative maintenance program. |
| Vehicle Wash Bay | Washing the University Fleet | Potable water use | Water efficient triggers and nozzles used. Water consumption measured and monitored weekly. A WEMP has been in place since 2005 |
| Capture and Reuse of water | Rainwater/Stormwater use | Degradation of water quality | Where retention times are high water quality should be tested where there is a risk to human health or the environment. |
| Alternate Water Sources | Cooling tower bleed water | Risk to human health from bacteria in water | To be investigated |
| | Use of Recycled Water in Cooling Towers | Risk to human health from bacteria in water | To be investigated |

The table above lists the aspects specific to water consumption at the University of Queensland St Lucia site. The Environmental Engineer records all aspects and impacts for the University of Queensland and keeps a register.

| | | | | |
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AUSTRALIA

Water Efficiency Management Plan

St Lucia Campus

8. WEMP Action Plans

The WEMP Action Plans are designed to address potential impacts. The WEMP & its Action Plans complement the University of Queensland EMS which can be accessed at <http://www.pf.uq.edu.au/ems.html>

The following lists environmental issues based upon the potential impacts of the activities outlined in Section 7 and the requirements of SEQ Guidelines.

| | | |
|-------------|------------|--|
| Action Plan | Management | Managing leak maintenance, meter installations, data collection and monitoring, awareness and water efficiency investigations. |
| Action Plan | WEMP 1A | Taps and Showers |
| Action Plan | WEMP1B | Toilets and Urinals |
| Action Plan | WEMP 2 | Cooling Towers |
| Action Plan | WEMP 4 | Processes and Other uses |

To ensure the objectives of this WEMP are achieved, the WEMP Action Plans will be established as follows based upon the identification of potential impacts established in Section 8.

- Performance Objectives;
- Management Strategies;
- Water Saving Actions;
- Performance Indicators;

| | | | | |
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8.1 Management

This action plan is designed to identify management actions including investigative actions that are required before water reductions can be realised. The aim of the investigations is to identify opportunities for savings. It gives consideration to water management issues such as leak maintenance, meter installations, data recording and monitoring across all other action plans.

| | | | |
|---------------------------------|--|--|---------------------------|
| Performance Objective(s) | To meet the requirements of the Water Management Program in the University's Environmental Management System. To meet the requirements of the <i>Environmental Protection (Water) Policy</i> 1997. To meet the requirements of the <i>Plumbing and Drainage Act</i> 2002. To meet the requirements of the <i>Water Act</i> 2000. To identify opportunities that will help the University to reduce potable water consumption and operate at best practice. | | |
| Management Strategies | | Start Date & Completion Date or Frequency | Savings expected/% |
| | Provide financial assistance to Schools and Centres to implement improved technology to replace less efficient equipment where applications have been made, assessed and determined feasible options | Jan 2007- Dec 2008 | Not measurable |
| | Ensure that University Staff and Students are aware of their responsibility to save water under the current water restriction guidelines | Ongoing | Not measurable |
| | Identify and prioritise infrastructure replacement and upgrades as required | Ongoing | Not measurable |
| KPI | Maintain kL/m ² /yr at 1:1 | | |
| Water Saving Actions | Actions | Start & Completion Date or Frequency | Savings expected/% |
| | Awareness | | |
| | Design & install water awareness posters and plaques for bathrooms, notice boards and other strategic areas of buildings | Jan 2007- March 2008 | Not measurable |
| | Distribute water awareness packs to schools and centres in National Water Week | Annually | Not measurable |

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| Publish articles promoting water efficiency in Property Press and Unigreen Newsletters and UQ Update | Quarterly | Not measurable |
| Ensure that P&F contractor inductions include water management | From Jan 2007- monthly, ongoing | Not measurable |
| Make building water consumption data available for viewing by University staff | From March 2008, quarterly, ongoing | Not measurable |
| Ensure that all contractors using University water register their water use on a WEMP for Contractors form | Jan 2007 and Ongoing | Not measurable |
| Update Water Management Policy and ask for Senior Management endorsement | Mar -Dec 2008 | Not measurable |
| Distribute Water Management Policy and Water Management Plans to all senior executives and managers and make available on P&F website for all University staff and students | Mar –April 2008 | Not measurable |
| Ensure that water awareness is included in EMS update sessions | Jan 2008, ongoing | Not measurable |
| Identify and prioritise water metering requirements | March 2007- Dec 2007 | Completed |
| Installation of water meters according to the priority list | Dec 2008 | Not measurable |
| Read building water meters | Monthly | Not measurable |
| Enter PF427 meter reading data into spreadsheet | Monthly | Not measurable |
| Check PF 427 sheets for unusual water consumption patterns | Monthly | Not measurable |
| Record details of main meter data log including daily consumption and peak flow rates. Investigate peak flows over 40l/second. | At least weekly from Jan 2008 | Not measurable |
| Raise work orders for leaks | As reported | Not measurable |
| Regularly report on water usage and the financial savings associated with water efficiency Initiatives to the UMC (water) and the Utilities Management Committee | Bi-monthly | Not measurable |
| Report Water consumption to TEFMA as part of the benchmark report | Annually | Not measurable |
| Monitor WEMP Actions | Monthly at committee level , quarterly for Brisbane water | Not measurable |

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| | Monitor water consumption for all buildings | Monthly | Not measurable |
| | Monitor water consumption for cooling tower make-up and bleed lines | Weekly | |
| | Monitor Cooling tower performance as per the requirements of the QWC Guidelines | Quarterly – 1 st report April 2008 | Not measurable |
| | Ensure all reports are completed and sent to Brisbane Water quarterly as per the QWC Guidelines | Quarterly/Annually | Not measurable |
| | Develop a project management sheet for water efficiency retrofit projects to record project details including water savings | March 2008 | Not measurable |
| | Reducing Water Usage | | |
| | Investigate opportunities for the reuse of air conditioning condensate in at least one building on campus | Jan – June 2007 | Completed/Not feasible |
| | Maintain infrastructure and reduce water pressure to buildings where possible | Ongoing | Measured in WEMP 1A & 1B |
| Savings Expected | | | NIL/ |

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8.2 WEMP 1A Taps & Basins

The actions outlined in this plan are to be implemented to ensure compliance with QWC Guidelines for WEMP 1A and to help reduce water consumption in buildings at the St Lucia Campus.

| | | | |
|---------------------------------|--|---|---------------------------|
| Performance Objective(s) | To ensure that the University is managing water in accordance with industry best practice. To ensure compliance with level 4 and 5 water restrictions. | | |
| Management Strategies | | Start & Completion Date or Frequency | Savings expected/% |
| | Ensure that resources and funding are made available to retrofit or upgrade all showers, hand basins, taps & trigger sprays to comply with current water restrictions | 2006- 2008 | |
| | Ensure that above mentioned retrofitting is coordinated and, that on completion, each building is audited and signed off by a WEA or a licensed plumber to ensure compliance with current water restrictions | 2007- 2008 | |
| KPI | % compliance with QWC water restrictions | | |
| Water Saving Actions | Actions | Start & Completion Date/Frequency | Savings expected/% |
| | Retrofit existing, taps, showers and basins with water saving fittings compliant with water restriction guidelines | 2006- July 2008 | 95 ML /40% |
| | Install water tanks in locations identified in previous investigations where water is used for washing down rowing boats, outboards or other equipment | Jan-2007 - March 2008 | Completed |
| | Audit buildings to ensure compliance with water restrictions and submit evidence as required by Brisbane Water | Dec 07- 31 st March 2008 | Not measurable |
| Savings Expected | | | 95 ML/40% |
| | | | |

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|  THE UNIVERSITY OF QUEENSLAND AUSTRALIA | WEMP 1B Action Plan | | St Lucia Campus |
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8.3 WEMP 1B Toilets & Urinals

The actions outlined in this plan are designed to ensure compliance with WEMP 1B and best practice water consumption for University buildings.

The first new building on campus to have water tanks installed and plumbed into toilets is the General Purpose North 4 Building. Storage capacity is 220,000L. The building will be occupied in 2008 and the potable water replaced is expected to be approximately 2ML per year. While this is a savings in potable water consumption it will not be shown as a savings at the front door as the new building will contribute to a growth in floor area at the University. The water efficient design of the building however will help to maintain or reduce the University's KPI's and will keep the building KPI low.

| | | | |
|---------------------------------|---|--|---------------------------|
| Performance Objective(s) | To ensure compliance with Queensland Water Commissions water restriction guidelines. | | |
| Management Strategies | | Start & Completion Date/Frequency | Savings expected/% |
| | Ensure that resources and funding are made available to retrofit or upgrade all toilets and urinals to comply with current water restrictions | DEC 2006- July 2008 | Not measurable |
| | Ensure that retrofitting is coordinated and, that on completion, each building is signed off on by a WEA or a licensed plumber to ensure compliance with current water restrictions | July 2008 | Not measurable |
| KPI | % compliance with QWC water restrictions | | |
| Water Saving Actions | Actions | Completion Date/Frequency | Savings expected/% |
| | Retrofit or replace all toilets and urinals to be water efficient in accordance with QWC guidelines | July 2008 | 94ML/40% |
| | Ensure that new buildings have water tanks plumbed into toilets and urinals where water is required. (GPN 4 to be occupied in 2008) | As required on new building works | 2ML/NIL |
| | Audit buildings to ensure compliance with water restrictions and submit evidence as required by Brisbane Water | July 2008 | Not measurable |
| Savings Expected | | | 94ML/40% |

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8.4 Cooling Towers

This management plan is designed to ensure compliance with QWC water restriction guidelines and to help achieve best practice operation of cooling towers.

While the University targets 5 cycles of concentration in the cooling towers it should be noted that this is not always possible to achieve. The actual cycles of concentration are dependant on the conductivity of the incoming town water supply.

The University usually bleeds the cooling towers when the conductivity levels in the towers reach 2200-2500us/cm. Increasing TDS levels further may increase the risk of legionella and scaling which in turn increases maintenance and cleaning requirements.

It is usual for the University to install Variable Speed Fans on cooling towers and baffles to reduce splash and algae growth.

| | | | |
|---------------------------------|---|--|---------------------------|
| Performance Objective(s) | To achieve cycles of concentration of 5 for all cooling towers To ensure that the University is managing cooling tower water in accordance with industry best practice and relevant codes, standards and government regulations. | | |
| Management Strategies | | Start & Completion Date/Frequency | Savings expected/% |
| | Ensure that resources and funding are made available to implement a leak maintenance program for cooling towers | Ongoing | Not measurable |
| | Ensure that resources and funding is made available to assess cooling tower performance (cycles of concentration) | Ongoing | Not measurable |
| KPI | % of cooling towers maintaining TDS of 2200 or above before bleeding | | |
| Water Saving Actions | Action | Start & Completion Date/Frequency | Savings expected/% |
| | Investigate the current cycles of concentration and ensure that cooling towers are running as efficiently as possible according to <i>Best practice Guidelines for cooling towers in commercial buildings</i> | April 2007 & ongoing | 11ML/5% |
| | Report on cooling tower performance, including leaks, cycles of concentration, consumption and other issues affecting water management | Quarterly | Not measurable |
| | Maintain and clean cooling towers in accordance with manufacturer specifications, | As specified | Not measurable |

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| | QWC Guidelines and relevant codes, standards and government regulations | | |
| | Reduce the cooling load by carrying out building efficiency audits to identify and minimise wastage | March-May 2008 | Not yet measurable |
| | Take meter readings of all inlet and bleed lines | February 2008 and weekly | Not yet measurable |
| Savings Expected | | | 11ML/5% |

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8.5 Processes and other uses

This action plan considers buildings as end use processes. Buildings which are large water users within their building types will be investigated for further water reduction opportunities.

A summary of building by type shows the consumption for 2007 and the kL/ m²/yr for that building and group of buildings by type. It also shows the overall consumption per m² for the campus and per student and staff. Please note that the consumption is based on a calendar year.

It is acknowledged that The University of Queensland has other end uses such as fume cupboards and autoclaves which use water. While Property and Facilities Division does have a list of the equipment, it is not yet detailed enough to determine that each piece of equipment is efficient. Maintenance contracts for fume cupboards and autoclaves are being reviewed and updated in 2008 and the new contracts will require all items to be listed along with their water consumption or flow rates.

Laboratory buildings consuming water above a predetermined benchmark will be audited and opportunities for water savings identified. After the opportunities are identified the WEMP will be updated to include water saving actions and savings will be measurable.

In addition, Property and Facilities Division is offering Schools and Centres funding for water efficiency projects. Schools and Centres are required to complete an application form and have it approved by Property and Facilities, once approved the projects will be managed by Property and Facilities personnel. Savings shown in this plan are calculated based on the number of project applications received and approved at the time of writing. Additional savings will be realised in these areas as applications for funding are received and projects implemented.

Building water consumption has been calculated and is shown in Appendix 3. The buildings consuming over 10ML and also exceed the average kL/m²/yr indicated in this sheet will be audited to identify opportunities for water savings.

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| Performance Objective(s) | To operate buildings at best practice water consumption as benchmarked through the TEFMA benchmarking survey and other appropriate benchmarks for specific building types | | |
| Management Strategies | Action | Start & Completion Date/Frequency | Savings expected/% |
| | To make available funding and resources to ensure that large water users on campus are identified and that water reduction strategies are investigated and implemented where technically and economically feasible to do so | January 2008- Dec 2008 | Not measurable |
| KPI | % of buildings (with water fixtures) on campus with meters installed and monitored | | |
| Water Saving Actions | Action | Start & Completion Date/Frequency | Savings expected/% |
| | Project Manage the implementation of water saving projects for Schools and Centres as applications for funding are received and approved | Jan 2007- Dec 2008 As required | Not measurable |
| | Document each project undertaken using the water project template available from Environmental Services. | At completion of each project | Not measurable |
| | Make water consumption data available at building level for all staff to access to help increase awareness | Quarterly from April 2008 | Not measurable |
| | Audit all laboratory taps and retrofit where technically feasible | Jan -Dec 2008 | 34ML/15% |
| | Review maintenance schedules and contracts to ensure that all fume cupboards and autoclaves using water are identified and documented | Jan-Dec 2008 | Not yet measurable |
| | Audit Otto Hirschfeld Building & Ritchie Research Labs | June 2007 | Completed |
| | Audit laboratory buildings identified as large water users and implement water efficiency projects where feasible | Jan 2008- Dec 2008 | 0.8ML/0.3% |
| Savings Expected | | | 34.8ML/15% |

APPENDIX 1 ST LUCIA CAMPUS WEMP 1A & 1B Taps & Showers & Toilets & Urinals

| | |
|---|--------------|
| Background information (at time of audit)EFTSL based on 2007 figures | |
| total equivalent full time student load * | 26922 |
| total full time equivalent staff load * | 4294 |
| total student and staff equivalent full time | 31216 |
| number of buildings included in audit | 131 |
| calculations are based on 360 working days per annum | |
| <p>note for SHOWER calculations: numbers of people using UQ Sport Facilities and Numbers of person who ride to the University daily were sourced from UQ Sport and Traffic & Parking. Assumptions were made on the number of people who use the facilities and a % was added on for those who use the facilities without being UQ Sport customers or who ride to the University and enter at places other than where there are counters, taking into account that laboratory staff also use showers in some instances.</p> | |

* Source: *The University of Queensland*
<http://www.mis.admin.uq.edu.au/Xcelsius/Executive%20Dashboard/main.swf>

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WEMP 1A TAPS & SHOWERS

| WEMP 1A | flow rate l/min | convert to litres/second | number | number of persons | uses per day | minutes per use | convert to seconds/use | litres/day | Litres/annum (litres*360days) | kL annum | ML annum |
|------------------------------|-----------------|--------------------------|--------|-------------------|--------------|-----------------|------------------------|------------|-------------------------------|----------|-------------|
| showers | | | | | | | | | | | |
| total current use | 19 | 0.32 | 255 | 1487 | 1 | 4 | 240 | 112996.8 | 40678848 | 40679 | 41 |
| | 9 | 0.15 | 25 | 74 | 1 | 4 | 240 | 2676.24 | 963446 | 963 | 1 |
| total future use | 6 | 0.10 | 255 | 1487 | 1 | 4 | 240 | 35683.2 | 12845952 | 12846 | 13 |
| | 9 | 0.15 | 25 | 74 | 1 | 4 | 420 | 4683.42 | 1686031 | 1686 | 2 |
| expected savings | | | | | | | | | | | 30 |
| hand basins | | | | | | | | | | | |
| total current use | 19 | 0.32 | 1596 | 22788 | 2 | 0.20 | 12 | 173188.8 | 62347968 | 62348 | 62 |
| | 6 | 0.10 | 434 | 8428 | 2 | 0.20 | 12 | 20227.2 | 7281792 | 7282 | 7 |
| total future use | 3 | 0.05 | 1558 | 21851 | 2 | 0.20 | 12 | 26221.2 | 9439632 | 9440 | 9 |
| | 6 | 0.10 | 472 | 9365 | 2 | 0.20 | 12 | 22475.52 | 8091187 | 8091 | 8 |
| expected savings | | | | | | | | | | | 52 |
| Taps | | | | | | | | | | | |
| current use | 19 | 0.32 | 568 | 1842 | 1 | 2 | 120 | 69981 | 25193088 | 25193 | 25 |
| | 6 | 0.10 | 105 | 1280 | 1 | 2 | 120 | 15360 | 5529600 | 5530 | 6 |
| total future use | 9 | 0.15 | 173 | 780 | 1 | 2 | 120 | 14040 | 5054400 | 5054 | 5 |
| | 6 | 0.10 | 500 | 2342 | 1 | 2 | 120 | 28104 | 10117440 | 10117 | 10 |
| expected savings | | | | | | | | | | | 16 |
| Totals WEMP 1A | | | | | | | | | | | |
| total current use | | | | | | | | | | | 142 |
| total future use | | | | | | | | | | | 47 |
| total savings WEMP 1A | | | | | | | | | | | 95ML |

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WEMP 1B PANS & URINALS

| WEMP 1B | flow rate l/min | convert to litres/second | number | number of persons | uses per day | minutes per use | convert to seconds/use | litres/day | Litres/annum (litres*360days) | kL annum | ML annum |
|--|-----------------|--------------------------|--------|-------------------|--------------|-----------------|------------------------|------------|-------------------------------|----------|------------|
| Pans | | | | | | | | | | | |
| 11 litre flush + | 11 | | 219 | 2653 | 2.00 | | | 58374 | 21014611 | 21015 | 21 |
| 4/9 flush | 6.5 | | 72 | 936 | 2.00 | | | 12174 | 4382726 | 4383 | 4 |
| 6/3 flush | 4.5 | | 994 | 12018 | 2.00 | | | 108163 | 38938838 | 38939 | 39 |
| total future use | 4.5 | | 1285 | 15608 | 2.00 | | | 140472 | 50569920 | 50570 | 51 |
| expected savings | | | | | | | | | | | 14 |
| Urinals | | | | | | | | | | | |
| 10-12litre flush | 11 | | 220 | 7180 | 2.00 | | | 157953 | 56863066 | 56863 | 57 |
| 7-9 litre flush | 8 | | 73 | 2966 | 2.00 | | | 47448 | 17081395 | 17081 | 17 |
| 4-6 litre flush | 5 | | 88 | 3902 | 2.00 | | | 39020 | 14047200 | 14047 | 14 |
| 0-1.5 litre flush | 0.75 | | 80 | 1561 | 2.00 | | | 2341 | 842832 | 843 | 1 |
| total future use | 0.75 | | 461 | 15608 | 2.00 | | | 23412 | 8428320 | 8428 | 8 |
| expected savings | | | | | | | | | | | 80 |
| WEMP 1B | | | | | | | | | | | |
| total current use | | | | | | | | | | | 153 |
| total future use | | | | | | | | | | | 59 |
| total savings WEMP 1B | | | | | | | | | | | 94 |
| total expected savings WEMP 1A & 1B | | | | | | | | | | | 189 |

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| Water Efficiency Management Plan (WEMP) | G:\!Operations\!Environment\Water management\ManagementPlans\Web_docs\Wtr_St LuciaWEMP_web.doc | Issue 5 | 18/08/08 | 4 2 |
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APPENDIX 2 ST LUCIA CAMPUS WEMP 2 EVAPORATIVE COOLING SYSTEMS

2 Evaporative Cooling Systems (Cooling Towers)

| Site Reference | Key Inputs | | | | | | | | | | | | | | | | Proposed Water Efficiency | | | |
|--|-------------------------|---|--|-------------------------------|-----------------------|---------------------------|---------------------------------|--------------|------------|-------------------------|----------------------|----------------------|---------------------------|-------------------------------|--------------|--------------------|---------------------------|----------------------------------|------------|--|
| | Pump recirculation rate | Temperature of water entering cooling tower | Temperature of water leaving cooling tower | Conductivity of make-up water | Conductivity of bleed | Annual hours of operation | Current cycles of concentration | | ΔT | Theoretical evaporation | Total bleed | Total Consumption | Average Daily Consumption | Total Evap and Leakage Losses | | Water conserved | Percentage Saved | Proposed cycles of concentration | | |
| | L/s | °C | °C | µmhos | µmhos | hours/year | CO ₂ | Acceptable | °C | M ³ /year | M ³ /year | M ³ /year | M ³ /day | M ³ /year | Acceptable | M ³ /yr | % | CO ₂ | Acceptable | |
| Total Cooling Tower Component: | 136 | 36 | 30 | 513 | 2221 | 3616 | | 5 | 5.4 | 19,022.1 | 30,096 | 172,330 | 472 | 1,42234.6 | 13 | 1,0808.6 | 7% | 5 | 1.5 | |
| Central Chilled Water Precinct | 272.1 | 34 | 29.5 | 513 | 2818 | 3128 | 5.5 | Efficient | 4.5 | 28,387.6 | 7483.6 | 38045.3 | 104.2 | 30561.7 | Efficient | 853.9 | 2% | 5 | Efficient | |
| QEP Chilled Water Precinct | 426 | 36 | 29.5 | 513 | 2026 | 4366 | 4.0 | In-Efficient | 5.5 | 76,209.8 | 5943.9 | 31785.6 | 87.0 | 25841.9 | Efficient | 2104.2 | 7% | 5 | Efficient | |
| AIBN Chilled Water Precinct | 258.8 | 36 | 29.5 | 513 | 2529 | 3201 | 4.9 | In-Efficient | 5.5 | 39,770.2 | 2321.4 | 22251.8 | 60.9 | 19930.4 | Efficient | 79.2 | 0% | 5 | Efficient | |
| Engineering CHW Precinct Towers 1&2 | 66.8 | 36 | 29.5 | 513 | 2744 | 802 | 5.3 | Efficient | 5.5 | 2,183.9 | 1312.0 | 2940.7 | 8.1 | 1628.7 | Efficient | 48.0 | 2% | 5 | Efficient | |
| Engineering CHW Precinct Towers 3,4&5 | 105.8 | 36 | 29.5 | 513 | 2106 | 4774 | 4.1 | In-Efficient | 5.5 | 20,580.8 | 2071.0 | 8906.4 | 24.4 | 6835.4 | Efficient | 485.3 | 5% | 5 | Efficient | |
| GBI Chilled Water Precinct | 182.4 | 36 | 29.5 | 513 | 2690 | 3695 | 5.1 | Efficient | 5.5 | 29,961.2 | 2629.0 | 8295.0 | 22.7 | 5657.0 | Efficient | 27.9 | 0% | 5 | Efficient | |
| Commerce Hill Chilled Water Precinct | 121 | 36 | 29.5 | 513 | 1429 | 2774 | 2.8 | In-Efficient | 5.5 | 13,682.8 | 2518.5 | 14106.6 | 38.6 | 11588.1 | Efficient | 2803.5 | 20% | 5 | Efficient | |
| Northern Chilled Water Precinct | 133.4 | 36 | 29.5 | 513 | 2164 | 3609 | 4.2 | In-Efficient | 5.5 | 19,626.8 | 568.7 | 4328.3 | 11.9 | 3762.6 | Efficient | 200.5 | 5% | 5 | Efficient | |
| Theraps Chilled Water Precinct | 101.1 | 36 | 29.5 | 513 | 1996 | 1897 | 3.9 | In-Efficient | 5.5 | 7,818.1 | 97.2 | 6745.8 | 18.5 | 5788.6 | Efficient | 480.8 | 7% | 5 | Efficient | |
| Ritchie Chilled Water Precinct | 80.7 | 36 | 29.5 | 513 | 3352 | 941 | 8.5 | Efficient | 5.5 | 3,096.6 | 647.2 | 7183.2 | 19.7 | 6536.0 | In-Efficient | 421.6 | 6% | 5 | Efficient | |
| Computer Science CHW Precinct Tower 1 (No) | 76 | 36 | 29.5 | 513 | 1536 | 5543 | 3.0 | In-Efficient | 5.5 | 17,172.9 | 1065.9 | 4368.4 | 11.9 | 3292.5 | Efficient | 729.9 | 17% | 5 | Efficient | |
| Computer Science CHW Precinct Tower 2 (No) | 50 | 36 | 29.5 | 513 | 1536 | 4204 | 3.0 | In-Efficient | 5.5 | 8,568.7 | 164.8 | 10755.6 | 29.4 | 10590.8 | In-Efficient | 1801.4 | 17% | 5 | Efficient | |
| HMS Chilled Water Precinct | 63.2 | 36 | 29.5 | 513 | 3434 | 4834 | 6.7 | Efficient | 5.5 | 12,454.0 | 670.5 | 4509.1 | 12.3 | 3838.6 | Efficient | 285.3 | 6% | 5 | Efficient | |
| GPS Chilled Water Precinct | 79.6 | 36 | 29.5 | 513 | 2071 | 3395 | 4.0 | In-Efficient | 5.5 | 11,016.3 | 1632.4 | 7833.0 | 21.4 | 6200.7 | Efficient | 467.1 | 6% | 5 | Efficient | |
| MacGregor Chilled Water Precinct | 64 | 36 | 29.5 | 513 | 2016 | 6877 | 3.9 | In-Efficient | 5.5 | 1,794.2 | 113.6 | 295.0 | 0.8 | 181.4 | Efficient | 20.1 | 7% | 5 | Efficient | |

Expected Savings 11 ML/annum



APPENDIX 3 ST LUCIA CAMPUS WEMP 4 PROCESSES & OTHER USES –CURRENT CONSUMPTION

| BUILDING TYPE | GFA | % of total GFA | % OF TOTAL CONSUMPTION | kL consumed 2007 (Jan-Dec) | kL/GFA | L/student+staff /day | average daily consumption kL |
|---|---------|----------------|------------------------|----------------------------|--------|----------------------|------------------------------|
| Teaching Buildings | 122,278 | 27.87% | 12.84% | 68,224 | 0.56 | | 189.51 |
| Laboratory Buildings | 162,895 | 37.12% | 38.40% | 204,011 | 1.25 | | 566.70 |
| Office & Other Buildings | 143,206 | 32.64% | 6.15% | 32,704 | 0.23 | | 90.84 |
| Swimming Pool | 270 | 0.06% | 2.52% | 13,390 | 49.59 | 74 | 37.19 |
| UQ Sport Buildings | 9,175 | 2.09% | 2.49% | 13,213 | 1.44 | 24.47 | 36.70 |
| Car Wash | 390 | 0.09% | 0.01% | 30 | 0.08 | 76.92 | 0.12 |
| Cooling Towers | | | 32.93% | 174,955 | 0.41 | 5.60 | 485.99 |
| Irrigation (estimated) | | | 0.15% | 800 | | | 2.22 |
| Total metered consumption | | | | 506,526 | | | 1407.02 |
| estimated + metered consumption 2007 | | | 100.00% | 507,326 | 1.16 | 45.14 | 1409.24 |
| actual consumption 2007 | | | 95.48% | 531,338 | 1.21 | 47.28 | 1475.94 |
| unaccounted /leaks | | | 4.52% | 24,012 | | | |

| | | | | |
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| BUILDING TYPE | BUILDINGS AUDITED | | GFA | UFA | | | 2007 consu mption | kL/m2 |
|---------------|-----------------------------|---------------|--------|-------|-------------|---------|-------------------|-------|
| TEACHING | FORGAN SMITH BUILDING | ST LUCIA SITE | 11,551 | 7,572 | The Univers | P&F | 1463 | 0.13 |
| OFFICE & OTHE | DUHIG TOWER | ST LUCIA SITE | 7,527 | 4259 | The Univers | P&F | 3333 | 0.44 |
| LABS | STEELE BUILDING | ST LUCIA SITE | 7,552 | 5526 | The Univers | P&F | 6079 | 0.80 |
| LABS | STEELE HUT | ST LUCIA SITE | 228 | 196 | The Univers | P&F | 251 | 1.10 |
| OFFICE & OTHE | UNIVERSITY BOOKSHOP | ST LUCIA SITE | 1,902 | 1665 | The Univers | P&F | 399 | 0.21 |
| LABS | RICHARDS BUILDING | ST LUCIA SITE | 2,208 | 1597 | The Univers | P&F | 5500 | 2.49 |
| LABS | PHYSICS ANNEXE | ST LUCIA SITE | 3,053 | 2000 | The Univers | P&F | 1699 | 0.56 |
| LABS | PARNELL BUILDING | ST LUCIA SITE | 4,732 | 3382 | The Univers | P&F | 261 | 0.06 |
| LABS | GODDARD BUILDING | ST LUCIA SITE | 9,637 | 6713 | The Univers | P&F | 10601 | 1.10 |
| TEACHING | MICHIE BUILDING | ST LUCIA SITE | 8,295 | 5683 | The Univers | P&F | 1633 | 0.20 |
| OFFICE & OTHE | GREAT COURT TUNNEL & CLOIS | ST LUCIA SITE | - | 0 | The Univers | P&F | | |
| OFFICE & OTHE | JAMES AND MARY EMELIA MAYN | ST LUCIA SITE | 4,080 | 1606 | The Univers | P&F | 462 | 0.11 |
| OFFICE & OTHE | DUHIG NORTH | ST LUCIA SITE | 7,385 | 6344 | The Univers | P&F | 2092 | 0.28 |
| | DUHIG LINK | ST LUCIA SITE | 965 | 794 | The Univers | P&F | | - |
| OFFICE & OTHE | CREDIT UNION HUT | ST LUCIA SITE | 733 | 68 | The Univers | P&F | 154 | 0.21 |
| LABS | RADON LABORATORY | ST LUCIA SITE | 68 | 1745 | The Univers | P&F | | - |
| OFFICE & OTHE | UNION BUILDING | ST LUCIA SITE | 2,437 | 1576 | UQ Union | P&F | 4066 | 1.67 |
| OFFICE & OTHE | MAIN REFECTORY | ST LUCIA SITE | 1,932 | 3439 | UQ Union | P&F | | - |
| OFFICE & OTHE | AUNG SAN SUU KYI CONFERENC | ST LUCIA SITE | 4,840 | 902 | UQ Union | P&F | | - |
| OFFICE & OTHE | STUDENT SUPPORT SERVICES B | ST LUCIA SITE | 1,261 | 1781 | UQ Union | P&F | | - |
| OFFICE & OTHE | SCHONELL THEATRE | ST LUCIA SITE | 5,025 | 446 | UQ Union | P&F | 4196 | 0.84 |
| TEACHING | ABEL SMITH LECTURE THEATRE | ST LUCIA SITE | 528 | 3936 | The Univers | P&F | | - |
| TEACHING | SOCIAL SCIENCES BUILDING | ST LUCIA SITE | 5,501 | 3268 | The Univers | P&F | 1983 | 0.36 |
| OFFICE & OTHE | MCELWAIN BUILDING | ST LUCIA SITE | 4,408 | 3568 | The Univers | P&F | 766 | 0.17 |
| UQ SPORT | UQ SPORT & FITNESS CENTRE (| ST LUCIA SITE | 4,580 | 1725 | The Univers | P&F | 4158 | 0.91 |
| TEACHING | CONNELL BUILDING | ST LUCIA SITE | 2,528 | 889 | The Univers | P&F | 1213 | 0.48 |
| LABS | HUMAN PERFORMANCE LABORA | ST LUCIA SITE | 1,102 | 2514 | The Univers | P&F | 1212 | 1.10 |
| TEACHING | HUMAN MOVEMENT STUDIES BU | ST LUCIA SITE | 3,643 | 103 | The Univers | P&F | 683 | 0.19 |
| POOL | SWIMMING POOL 'DAVID THEILE | ST LUCIA SITE | 270 | 4349 | UQ Sport | P&F | 13390 | 49.59 |
| OFFICE & OTHE | UQ CENTRE | ST LUCIA SITE | 12,773 | 165 | The Univers | P&F | 1974 | 0.15 |
| UQ SPORT | TENNIS PAVILION | ST LUCIA SITE | 480 | 0 | The Univers | P&F | 600 | 1.25 |
| UQ SPORT | UQ SPORT TEMPORARY DEMOU | ST LUCIA SITE | 69 | 154 | The Univers | P&F | 86 | 1.25 |
| UQ SPORT | TENNIS CENTRE (30/40 café) | ST LUCIA SITE | 212 | 154 | UQ Sport | P&F | 769 | 3.63 |
| UQ SPORT | GRANDSTAND NO 5 OVAL | ST LUCIA SITE | 1,469 | 661 | The Univers | P&F | 1917 | 1.30 |
| UQ SPORT | ERIC FREEMAN BOATSHED | ST LUCIA SITE | 886 | 827 | The Univers | P&F | 221 | 0.25 |
| OFFICE & OTHE | SOCIAL SCIENCES ANNEXE | | 730 | | The Univers | P&F | 153 | 0.21 |
| OFFICE & OTHE | SBS TEMPORARY ACCOMMODA | ST LUCIA SITE | 333 | 0 | The Univers | P&F | 37 | 0.11 |
| TEACHING | GORDON GREENWOOD BUILDIN | ST LUCIA SITE | 4,759 | 3331 | The Univers | P&F | 1230 | 0.26 |
| OFFICE & OTHE | DEVELOPMENT OFFICE | ST LUCIA SITE | 735 | 407 | The Univers | P&F | 75 | 0.10 |
| TEACHING | CHAMBERLAIN BUILDING | ST LUCIA SITE | 5,623 | 3749 | The Univers | P&F | 1800 | 0.32 |
| TEACHING | JOYCE ACKROYD BUILDING | ST LUCIA SITE | 4,208 | 2788 | The Univers | P&F | 1497 | 0.36 |
| OFFICE & OTHE | CHAPLAINCY CENTRE | ST LUCIA SITE | 317 | 230 | The Univers | P&F | 67 | 0.21 |
| TEACHING | COLIN CLARK BUILDING | ST LUCIA SITE | 7,811 | 5135 | The Univers | P&F | 595 | 0.08 |
| TEACHING | GENERAL PURPOSE NORTH 3 | ST LUCIA SITE | 6,539 | 3957 | The Univers | P&F | 2139 | 0.33 |
| UQ SPORT | RUGBY CLUBHOUSE | ST LUCIA SITE | 644 | 432 | UQ Sport | P&F | 805 | 1.25 |
| OFFICE & OTHE | STAFF HOUSE | ST LUCIA SITE | 1,787 | 807 | Staff Club | Staff C | 1026 | 0.57 |
| OFFICE & OTHE | PRENTICE BUILDING | ST LUCIA SITE | 6,527 | 4741 | The Univers | P&F | 1371 | 0.21 |
| TEACHING | FRANK WHITE MINING & MET EN | ST LUCIA SITE | 2,661 | 1907 | The Univers | P&F | 30694 | 11.53 |
| LABS | FRANK WHITE MINING & MET EN | ST LUCIA SITE | 2,579 | 2143 | The Univers | P&F | 26428 | 10.25 |
| LABS | MANSERGH SHAW BUILDING | ST LUCIA SITE | 4,640 | 3756 | The Univers | P&F | 171 | 0.04 |
| TEACHING | AXON BUILDING | ST LUCIA SITE | 2,800 | 2017 | The Univers | P&F | 1344 | 0.48 |
| LABS | SIR JAMES FOOTS BUILDING | ST LUCIA SITE | 8,245 | 4314 | The Univers | P&F | 470 | 0.04 |
| LABS | CIVIL ENGINEERING STRUCTURE | ST LUCIA SITE | 1,404 | 1196 | The Univers | P&F | 1544 | 1.10 |
| LABS | CIVIL ENGINEERING HYDRAULIC | ST LUCIA SITE | 1,906 | 1804 | The Univers | P&F | 700 | 0.37 |
| LABS | CIVIL ENGINEERING CONCRETE | ST LUCIA SITE | 1,008 | 826 | The Univers | P&F | 888 | 0.88 |
| LABS | CIVIL ENG-OUTDOOR HYDRAULI | ST LUCIA SITE | - | 0 | The Univers | P&F | 3890 | |
| TEACHING | HAWKEN ENGINEERING BUILDIN | ST LUCIA SITE | 16,759 | 10856 | The Univers | P&F | 7476 | 0.45 |

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|-------------|---------------------------------|-------------|--------|-------|------------|-------|-------|-------|
| TEACHING | ZELMAN COWEN BUILDING | ST LUCIA SI | 6,232 | 4473 | The Univer | P&F | 2991 | 0.48 |
| TEACHING | COLLABORATIVE DESIGN LABORAT | ST LUCIA SI | 211 | 211 | The Univer | P&F | 101 | 0.48 |
| UQ SPORT | PAVILION NO'S 2 AND 3 OVALS | ST LUCIA SI | 179 | 31 | The Univer | P&F | 4283 | 23.93 |
| OFFICE & OT | SEWERAGE PUMP HOUSE | ST LUCIA SI | 22 | 0 | The Univer | P&F | | - |
| OFFICE & OT | BUILDING 54 | ST LUCIA SI | 231 | 184 | The Univer | P&F | | - |
| OFFICE & OT | P & F RIVERSIDE COMPOUND | ST LUCIA SI | 18 | 18 | The Univer | P&F | 4 | 0.21 |
| OFFICE & OT | LIQUID WASTE STORE | ST LUCIA SI | 38 | 38 | The Univer | P&F | 8 | 0.21 |
| OFFICE & OT | STORAGE SHED | ST LUCIA SI | 65 | 65 | The Univer | P&F | | - |
| OFFICE & OT | MACHINERY SHED | ST LUCIA SI | 42 | 42 | The Univer | P&F | 9 | 0.21 |
| OFFICE & OT | SUBSTATION NOS. 01 & 24 | ST LUCIA SI | 276 | 0 | The Univer | P&F | | - |
| OFFICE & OT | SUBSTATION NO. 06 | ST LUCIA SI | 35 | 0 | The Univer | P&F | | - |
| OFFICE & OT | SUBSTATION NO. 07 | ST LUCIA SI | 59 | 0 | The Univer | P&F | | - |
| OFFICE & OT | SUBSTATION NO. 11 | ST LUCIA SI | 49 | 0 | The Univer | P&F | | - |
| OFFICE & OT | SUBSTATION NO. 15 | ST LUCIA SI | 69 | 0 | The Univer | P&F | | - |
| OFFICE & OT | SUBSTATION NO. 20 | ST LUCIA SI | 29 | 0 | The Univer | P&F | | - |
| LABS | GEHRMANN LABORATORIES | ST LUCIA SI | 6,225 | 4277 | The Univer | P&F | 3996 | 0.64 |
| OFFICE & OT | SPACE BANK 2 | ST LUCIA SI | 83 | 46 | The Univer | P&F | 17 | 0.21 |
| OFFICE & OT | J.D. STORY ADMINISTRATION BUILD | ST LUCIA SI | 6,747 | 4925 | The Univer | P&F | 856 | 0.13 |
| OFFICE & OT | BRIAN WILSON CHANCELLERY | ST LUCIA SI | 2,512 | 1350 | The Univer | P&F | 500 | 0.20 |
| LABS | JOHN HINES BUILDING | ST LUCIA SI | 4,403 | 3123 | The Univer | P&F | 4449 | 1.01 |
| TEACHING | PHYSIOLOGY LECTURE THEATRES | ST LUCIA SI | 2,266 | 1344 | The Univer | P&F | | - |
| OFFICE & OT | PHYSIOLOGY REFECTORY | ST LUCIA SI | 708 | 566 | The Univer | P&F | 1200 | 1.69 |
| LABS | SIR WILLIAM MACGREGOR BUILDIN | ST LUCIA SI | 5,825 | 4010 | The Univer | P&F | 4209 | 0.72 |
| LABS | RITCHIE RESEARCH LABORATORIE | ST LUCIA SI | 4,371 | 2597 | The Univer | P&F | 7093 | 1.62 |
| LABS | SKERMAN BUILDING | ST LUCIA SI | 2,642 | 1977 | The Univer | P&F | 2906 | 1.10 |
| TEACHING | PRIESTLEY BUILDING | ST LUCIA SI | 3,433 | 2033 | The Univer | P&F | 2573 | 0.75 |
| LABS | CHEMISTRY BUILDING | ST LUCIA SI | 9,659 | 7598 | The Univer | P&F | 6445 | 0.67 |
| TEACHING | COMPUTER SCIENCE BUILDING | ST LUCIA SI | 5,799 | 3656 | The Univer | P&F | 2474 | 0.43 |
| UQ SPORT | PAVILION NO 1 OVAL | ST LUCIA SI | 455 | 288 | UQ Sport | P&F | 122 | 0.27 |
| OFFICE & OT | CUMBRAE STEWART BUILDING | ST LUCIA SI | 1,270 | 993 | The Univer | P&F | 267 | 0.21 |
| OFFICE & OT | CAMPUS KINDY | ST LUCIA SI | 366 | | The Univer | P&F | 424 | 1.16 |
| LABS | CHEMICAL ENGINEERING | ST LUCIA SI | 5,110 | 340 | The Univer | P&F | 14856 | 2.91 |
| LABS | AUST INST FOR BIOENGINEERING & | ST LUCIA SI | 4,752 | 3655 | The Univer | P&F | 9956 | 2.10 |
| LABS | MOLECULAR BIOSCIENCES | ST LUCIA SI | 9,478 | 0 | The Univer | P&F | 10426 | 1.10 |
| OFFICE & OT | SPACE BANK 1 | ST LUCIA SI | 392 | 7240 | The Univer | P&F | 82 | 0.21 |
| | BUS SHELTERS | ST LUCIA SI | - | 0 | The Univer | P&F | | |
| TEACHING | GENERAL PURPOSE SOUTH | ST LUCIA SI | 10,645 | 7126 | The Univer | P&F | 2857 | 0.27 |
| LABS | QUEENSLAND BRAIN INSTITUTE (TE | ST LUCIA SI | - | 8693 | The Univer | P&F | 576 | 0.07 |
| LABS | QUEENSLAND BIOSCIENCE PRECIN | ST LUCIA SI | 36,553 | 23175 | The Univer | P&F | 15042 | 0.41 |
| LABS | CSIRO CONTROLLED ENVIRONMEN | ST LUCIA SI | 1,493 | 0 | CSIRO | CSIRO | | - |
| | CSIRO CAR PARK | ST LUCIA SI | - | 0 | CSIRO | CSIRO | | |
| LABS | OTTO HIRSCHFELD BUILDING | ST LUCIA SI | 5,605 | 4169 | The Univer | P&F | 35807 | 6.39 |
| LABS | SEDDON - SOUTH BLOCK | ST LUCIA SI | 1,601 | 901 | The Univer | P&F | 9560 | 1.28 |
| LABS | SEDDON - CENTRE BLOCK | ST LUCIA SI | 1,507 | 915 | The Univer | P&F | | ##### |
| LABS | SEDDON - NORTH BLOCK | ST LUCIA SI | 1,636 | 1267 | The Univer | P&F | | - |
| TEACHING | SEDDON - LECTURE THEATRE | ST LUCIA SI | 1,153 | 873 | The Univer | P&F | | - |
| TEACHING | SEDDON - WEST BLOCK | ST LUCIA SI | 2,063 | 1558 | The Univer | P&F | | - |
| TEACHING | KATHLEEN LAMBOURNE BUILDING | ST LUCIA SI | 84 | 84 | The Univer | P&F | 0 | - |
| LABS | SEDDON - STUDENT LAB BLOCK | ST LUCIA SI | 595 | 482 | The Univer | P&F | | - |
| LABS | SEDDON - VET ANATOMY EXTN | ST LUCIA SI | 97 | 76 | The Univer | P&F | | - |
| LABS | SEDDON - VET PATHOLOGY EXTN | ST LUCIA SI | 324 | 301 | The Univer | P&F | | - |
| LABS | SEDDON - SMALL ANIMAL HOSPITAL | ST LUCIA SI | 896 | 750 | The Univer | P&F | | - |
| LABS | SEDDON - SMALL ANIMAL CLINIC | ST LUCIA SI | 418 | 257 | The Univer | P&F | | - |
| LABS | HARTLEY TEAKLE BUILDING | ST LUCIA SI | 8,449 | 6020 | The Univer | P&F | 5594 | 0.66 |

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|---------------|------------------------------|---------------|--------|------|-------------|-----|--------|---------|
| TEACHING | THERAPIES BUILDING | ST LUCIA SITE | 1,442 | 1225 | The Univers | P&F | 720 | 0.50 |
| TEACHING | THERAPIES ANNEXE | ST LUCIA SITE | 5,744 | 3889 | The Univers | P&F | 2757.1 | 0.48 |
| OFFICE & OTHE | INDUSTRIAL CENTRE | ST LUCIA SITE | 1,212 | 572 | The Univers | P&F | 1395 | 1.15 |
| CAR WASH | UNIVERSITY VEHICLE WASH BAY | ST LUCIA SITE | - | | The Univers | P&F | 30 | |
| OFFICE & OTHE | STORAGE FACILITY | ST LUCIA SITE | 192 | 73 | The Univers | P&F | | - |
| OFFICE & OTHE | P & F GARDENERS COMPOUND | ST LUCIA SITE | 521 | 239 | The Univers | P&F | | - |
| OFFICE & OTHE | P & F MAINTENANCE WORKSHO | ST LUCIA SITE | 1,387 | 1129 | The Univers | P&F | 284 | 0.20 |
| OFFICE & OTHE | P & F SECURITY ANNEXE | ST LUCIA SITE | 826 | 427 | The Univers | P&F | | - |
| OFFICE & OTHE | P & F SERVICES HUT | ST LUCIA SITE | 96 | 79 | The Univers | P&F | 1075 | 1.17 |
| LABS | GLASSHOUSE NO 1 | ST LUCIA SITE | 110 | 102 | The Univers | P&F | 8996 | 16.48 |
| LABS | GLASSHOUSE NO. 2 | ST LUCIA SITE | 201 | 201 | The Univers | P&F | | - |
| LABS | GLASSHOUSE NO 4 | ST LUCIA SITE | 88 | 88 | The Univers | P&F | | - |
| LABS | GLASSHOUSE NO 7 (TO BE DEMO | ST LUCIA SITE | 207 | 0 | The Univers | P&F | | - |
| LABS | GLASSHOUSE NO 8A/B (TO BE D | ST LUCIA SITE | 346 | 0 | The Univers | P&F | | - |
| LABS | GLASSHOUSE NO 9 | ST LUCIA SITE | 224 | 224 | The Univers | P&F | 372 | 0.34 |
| LABS | GLASSHOUSE NO 10 | ST LUCIA SITE | 224 | 224 | The Univers | P&F | 76 | 0.34 |
| LABS | GLASSHOUSE NO 11 | ST LUCIA SITE | 224 | 224 | The Univers | P&F | | - |
| LABS | GLASSHOUSE NO 12 | ST LUCIA SITE | 195 | 195 | The Univers | P&F | | - |
| LABS | GLASSHOUSE NO 13 | ST LUCIA SITE | 229 | 229 | The Univers | P&F | | - |
| | GLASSHOUSE NO 20 (DEMOLISH | ST LUCIA SITE | - | 0 | The Univers | P&F | | #DIV/0! |
| LABS | GLASSHOUSE NO 14 | ST LUCIA SITE | 65 | 48 | The Univers | P&F | | - |
| LABS | GLASSHOUSE No 15 | ST LUCIA SITE | 153 | 148 | The Univers | P&F | | |
| | GLASSHOUSE PODIUM & AQUAR | ST LUCIA SITE | - | 0 | | P&F | | |
| | GLASSHOUSE SERVICES BUILDI | ST LUCIA SITE | - | 0 | The Univers | P&F | 0 | #DIV/0! |
| OFFICE & OTHE | ANIMAL HOUSE | ST LUCIA SITE | 135 | 21 | The Univers | P&F | | - |
| OFFICE & OTHE | P & F BUSH HOUSE | ST LUCIA SITE | 21 | 197 | The Univers | P&F | | - |
| LABS | EROSION PROCESSES LABORAT | ST LUCIA SITE | 197 | 22 | The Univers | P&F | 3475 | 15.94 |
| LABS | GROWTH ROOM | ST LUCIA SITE | 22 | 324 | The Univers | P&F | | - |
| LABS | CENTRAL GLASSHOUSE BUILDIN | ST LUCIA SITE | 409 | 0 | The Univers | P&F | 483 | 1.18 |
| OFFICE & OTHE | BOATING AND DIVING FACILITY | ST LUCIA SITE | 603 | 387 | The Univers | P&F | 19 | 0.03 |
| OFFICE & OTHE | HOUSE - 54 WALCOTT ST (CNR H | ST LUCIA SITE | 325 | 122 | The Univers | P&F | 68.25 | 0.21 |
| OFFICE & OTHE | SEMINAR BUILDING - HOOD STR | ST LUCIA SITE | 131 | 389 | The Univers | P&F | 44 | 0.34 |
| OFFICE & OTHE | HOUSE - 50 WALCOTT ST (ALUM | ST LUCIA SITE | 473 | 70 | The Univers | P&F | 60 | 0.13 |
| OFFICE & OTHE | ALUMNI HUT (REAR 50 WALCOT | ST LUCIA SITE | 70 | 36 | The Univers | P&F | | - |
| UQ SPORT | PAVILION NO 7 OVAL | ST LUCIA SITE | 201 | 0 | The Univers | P&F | 251.25 | 1.25 |
| OFFICE & OTHE | GROUND S SHED NO 7 OVAL | ST LUCIA SITE | 26 | 137 | The Univers | P&F | | - |
| OFFICE & OTHE | BIOLOGICAL SCIENCES LIBRARY | ST LUCIA SITE | 3,132 | 289 | The Univers | P&F | 1697.5 | 0.54 |
| OFFICE & OTHE | HOUSE - 2 ROCK ST (CNR HOOD | ST LUCIA SITE | 369 | 178 | The Univers | P&F | 300 | 0.81 |
| OFFICE & OTHE | BUILDING 97 | ST LUCIA SITE | 233 | 22 | The Univers | P&F | | - |
| OFFICE & OTHE | INFORMATION BOOTH | ST LUCIA SITE | 47 | 182 | The Univers | P&F | 10 | 0.21 |
| OFFICE & OTHE | MULTI-LEVEL CARPARK STAGE 1 | ST LUCIA SITE | 16,955 | 268 | The Univers | P&F | 3561 | 0.11 |
| OFFICE & OTHE | MULTI LEVEL CARPARK STAGE 2 | ST LUCIA SITE | 14,459 | 0 | The Univers | P&F | | - |
| OFFICE & OTHE | OVAL 6 PARKING STATION | ST LUCIA SITE | 4,480 | 102 | The Univers | P&F | 253 | 0.06 |
| OFFICE & OTHE | CONIFER KNOLL PARKING STAT | ST LUCIA SITE | 12,378 | 6961 | The Univers | P&F | 60 | 0.00 |
| OFFICE & OTHE | WAREHOUSE, BOOK REPOS & S | ST LUCIA SITE | 7,369 | 0 | The Univers | P&F | 250 | 0.03 |
| OFFICE & OTHE | SPACE BANK TOILETS | ST LUCIA SITE | 23 | 0 | The Univers | P&F | 90 | 3.93 |
| COOLING TOW | HAWKEN ENGINEERING BUILDIN | ST LUCIA SITE | | | | | 29270 | |
| COOLING TOW | QBI | ST LUCIA SITE | | | | | 232 | |
| COOLING TOW | GPN3 | ST LUCIA SITE | | | | | 14319 | |
| COOLING TOW | SOCIAL SCIENCES | ST LUCIA SITE | | | | | 37389 | |
| COOLING TOW | QBP | ST LUCIA SITE | | | | | 31468 | |
| COOLING TOW | AIBN | ST LUCIA SITE | | | | | 22151 | |
| COOLING TOW | OTTO HIRSCHFELD BUILDING | ST LUCIA SITE | | | | | 6306 | |
| COOLING TOW | RITCHIE RESEARCH LABS | ST LUCIA SITE | | | | | 8118 | |
| COOLING TOW | THERAPIES | ST LUCIA SITE | | | | | 341 | |
| COOLING TOW | COMPUTER SCIENCE BUILDING | ST LUCIA SITE | | | | | 9364 | |
| COOLING TOW | HUMAN MOVEMENTS | ST LUCIA SITE | | | | | 4311 | |
| COOLING TOW | GPS | ST LUCIA SITE | | | | | 7722 | |
| COOLING TOW | McGREGOR BUILDING | ST LUCIA SITE | | | | | 1095 | |
| COOLING TOW | COLIN CLARK BUILDING | ST LUCIA SITE | | | | | 2869 | |

| | | | | |
|---|--|---------|----------|--------|
| Water Efficiency Management Plan (WEMP) | G:\!Operations\!Environment\Water management\ManagementPlans\Web_docs\Wtr_St LuciaWEMP_web.doc | Issue 5 | 18/08/08 | 4 7 |
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Note: Red font = estimated consumption

Red shading = building not audited at the time the table was completed

Yellow Shading = Entity indicated responsible for infrastructure

Grey shading = Buildings with no water fixtures

Blue Font = Buildings using more than 10ML per annum

LABORATORY BUILDINGS – expected savings

| Laboratories | flow rate l/min | convert to litres/second | number | number of persons * | uses per day | minutes per use | convert to seconds/use | litres/day | Litres/annum (litres*360 days) | kL annum | ML annum |
|-------------------------|-----------------|--------------------------|--------|---------------------|--------------|-----------------|------------------------|------------|--------------------------------|----------|-----------|
| Laboratory Taps | | | | | | | | | | | |
| current use | 19 | 0.32 | 1500 | 3657 | 2 | 1 | 60 | 138966 | 50027760 | 50028 | 50 |
| total future use | 6 | 0.10 | 1500 | 3657 | 2 | 1 | 60 | 43884 | 15798240 | 15798 | 16 |
| expected savings | | | | | | | | | | | 34 |

Notes: Number of persons is based on number of students enrolled in the Biological and Chemical Sciences Faculty. There are also other areas with laboratories and also Institutes with research staff. Number of laboratory taps is an estimate only and more accurate data will be included after the laboratories have been audited.

Expected savings is based on estimated numbers of fixtures and uses and should not be viewed as an accurate measure of savings to be gained from retrofitting laboratory taps.

| | | | | |
|---|---|---------|----------|----|
| Water Efficiency Management Plan (WEMP) | G:\!Operations\!Environment\Water management\ManagementPlans\Web_docs\Wtr_St Lucia WEMP_web.doc | Issue 5 | 18/08/08 | 48 |
|---|---|---------|----------|----|

APPENDIX 4 WEMP TEMPLATE FOR CONTRACTORS

The University of Queensland is required to reduce water consumption at all sites. All contractors should use water responsibly and under the current water restriction guidelines.

Important Information regarding the use of this Water Efficiency Management Plan template

This template has been developed for contractors who plan to use the University of Queensland's water for work on any University sites, regardless of water type.

Please complete and forward a copy to the Property and Facilities Project Manager responsible for the work or project that the plan relates to.

If completing more than one job/project that will require the use of the University's water, please fill out a plan for each job/project.

The author of the plan is responsible for all actions within the plan.

The information within the plan is intended for internal use within the Property and Facilities Division of the University to ensure that water is used safely and efficiently.

Water Restrictions are currently being enforced throughout south east Queensland and contractors should be aware of their responsibilities under the current restrictions.

For further information on current water restrictions please refer to the Queensland Water Commission website @ www.qwc.gov.au

All breaches of the *Environmental Protection Act* or other relevant environmental legislation are required to be reported to the Environmental Engineer on 3365 1587 and an Environmental Incident Notification Form is required to be completed and forwarded to the Environmental Engineer, Property and Facilities Division.

Environmental Incident Notification Forms are available at www.pf.uq.edu.au/ems.html

Report leaks or other infrastructure problems to the Property and Facilities Works Control Centre at wcc@pf.uq.edu.au or telephone;

| | | |
|--------------------|-----------|----------------|
| St Lucia | 3365 2222 | internal 52222 |
| Gatton and Ipswich | 546 01226 | internal 50226 |

| | | | | |
|---|---|---------|----------|--------|
| Water Efficiency Management Plan (WEMP) | G:\!Operations\!Environment\Water management\ManagementPlans\Web_docs\Wtr_St Lucia WEMP_web.doc | Issue 5 | 18/08/08 | 4 9 |
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This form is to be completed and signed by the contractor

| | |
|---|--------------------------------------|
| WATER EFFICIENCY MANAGEMENT PLAN FOR CONTRACTORS | Project _____ |
| | P&F Project Manager _____ |

1.0 Declaration

I declare that the information given in the Water Efficiency Management Plan is true & correct.

| | |
|------------|--|
| Name | |
| Position: | |
| Signature: | |
| Date: | |

2.0 Business Information

| | |
|------------------|--|
| Name of Business | |
| Contact Person | |
| Position | |
| Mobile | |
| Fax | |
| Email | |
| No. of Employees | |

3.0 Baseline Information

Project Description _____

Project Start Date _____ Project Completion Date _____

Indicate the source/s of water you will be using

- | | | |
|-------------------------------------|---|---------------------------------------|
| <input type="checkbox"/> Mains | <input type="checkbox"/> Treated wastewater | <input type="checkbox"/> Bore water |
| <input type="checkbox"/> Stormwater | <input type="checkbox"/> Rainwater tank | <input type="checkbox"/> River/stream |
| <input type="checkbox"/> Dam | Other _____ | |

Indicate the type of equipment or specific areas where water will be used, how it is used and known or estimated consumption per unit of production or per day.

| Water Source (e.g. mains, rainwater) | How will the water be used? (e.g. high pressure unit with trigger hose) | L/unit of production or L/day |
|--------------------------------------|---|-------------------------------|
| | | |
| | | |
| | | |

If known, indicate total expected water consumption for the project _____ Litres

Will you be recycling water used in the project? Yes No
 If yes what % _____

Can the project be completed without the use of water? Yes No
 Comments _____

Please indicate if you require water to be tested for appropriate reuse. (This may be the case if you are using water from rainwater tanks or from the lakes) Yes No

| | | | | |
|---|--|---------|----------|--------|
| Water Efficiency Management Plan (WEMP) | G:\!Operations!\Environment\Water management\ManagementPlans\Web_docs\Wtr_St LuciaWEMP_web.doc | Issue 5 | 18/08/08 | 5 0 |
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APPENDIX 5 PROGRESS REPORT ST LUCIA CAMPUS WEMP ACTIONS 2002-2007

| Year 2002 | |
|---------------------------------|--|
| Area of Improvement | Action |
| Management Strategies | <ul style="list-style-type: none"> ▪ set up utilities management committee for water |
| | <ul style="list-style-type: none"> ▪ Gained funding for retrofit project from Financial and Business Services Section ▪ Water audits conducted in high use areas and plan developed for retrofitting pans and urinals ▪ two hour timers purchased for grounds |
| Awareness | <ul style="list-style-type: none"> ▪ Water issues discussed regularly at meetings ▪ Water awareness articles in Property Press and UQ Update |
| Water Reduction Actions | <ul style="list-style-type: none"> ▪ Pilot Project- Priestley Building retrofitted with 6/3 litre pans replacing the old 11 litre flush and sensors installed on urinals |
| Monitoring and Measuring | <ul style="list-style-type: none"> ▪ Water meter installed before the retrofit of Priestley Building to monitor before and after consumption. This building is to be used as a case study to help gain funding for further work |
| Year 2003 | |
| Area of Improvement | Action |
| Management Strategies | <ul style="list-style-type: none"> ▪ Water discussed at Environmental Management Committee Meetings, Utilities Management Committees and Unigreen Committee Meetings ▪ Requirements for ablutions identified and scheduled ▪ Design guidelines reviewed and updated to include water efficient fittings and water meters |
| Awareness | <ul style="list-style-type: none"> ▪ The publication <i>Improving our Environment at UQ</i> completed, published and distributed to all staff at the St Lucia campus. The publication included information on water, energy and waste management ▪ Water awareness information on the Unigreen website ▪ Unigreen Awareness Day held at the UQ Centre. Whizzy the waterdrop involved. Brisbane Water and the EPA also involved. The day was attended by the Environment Minister and the UQ Chancellor as well as staff, students and visitors. The day promoted environmental management at UQ and also included a trade fair. ▪ Don't be a Drip Poster supplied by Brisbane Water distributed throughout St Lucia Campus ▪ A water competition was held on Unigreen Awareness Day. The prize was a family pass to Seaworld. ▪ A Public Lecture entitled <i>Our Water Our Future</i> was held on Unigreen Awareness Day. Speakers included Tickey Fullerton from the ABC, Stuart White from the Institute for Sustainable Futures at University of Technology Sydney, Tor Hundloe from the University of QLD. The lecture was chaired by Deputy Vice Chancellor Professor Paul Greenfield |
| Water Reduction Actions | <ul style="list-style-type: none"> ▪ 200 micro-irrigation nozzles were installed ▪ two hour timers installed on irrigation systems ▪ Stage One Retrofit Project completed -10 buildings retrofitted with 6/3 litre cisterns, sensors on urinals and in-line flow restrictors on hand basins |
| Monitoring and Measuring | <ul style="list-style-type: none"> ▪ Water meter identification & documentation began |
| Year 2004 | |
| Area of Improvement | Action |

| | | | | |
|---|--|---------|----------|--------|
| Water Efficiency Management Plan (WEMP) | G:\!Operations\!Environment\Water management\ManagementPlans\Web_docs\Wtr_St LuciaWEMP_web.doc | Issue 5 | 18/08/08 | 5 1 |
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| | |
|---------------------------------|---|
| Management Strategies | <ul style="list-style-type: none"> ▪ Gained funding to retrofit a further 10 buildings with water efficiency fittings and fixtures |
| | <ul style="list-style-type: none"> ▪ A feasibility study for the capture and reuse of storm water on the Northern side of Campus began |
| | <ul style="list-style-type: none"> ▪ A new meter reading sheet was developed to aid the identification and documentation of meters and to also help with meter readings. |
| | <ul style="list-style-type: none"> ▪ A database for Utilities Management was investigated to help manage utilities data |
| | <ul style="list-style-type: none"> ▪ A business case for the second stage of the building retrofit program was submitted to Business Services and funding received |
| Awareness | <ul style="list-style-type: none"> ▪ Water Awareness Posters Distributed |
| | <ul style="list-style-type: none"> ▪ Information available on Unigreen Website |
| | <ul style="list-style-type: none"> ▪ Information given out on UQ Market Days |
| Water Reduction Actions | <ul style="list-style-type: none"> ▪ Stage two of the building retrofit program complete |
| Monitoring and Measuring | <ul style="list-style-type: none"> ▪ 28 new water meters installed |
| | <ul style="list-style-type: none"> ▪ Plumbers started to use the P&F reading sheet to read meters and pass on to POE to put into excel spreadsheet and generate graphs etc for monitoring consumption and to discuss at meetings |
| Year 2005 | |
| Area of Improvement | Action |
| Management Strategies | <ul style="list-style-type: none"> ▪ The first stage of a utilities database was developed |
| | <ul style="list-style-type: none"> ▪ New spreadsheets developed to help generate information from meter reading data. |
| | <ul style="list-style-type: none"> ▪ Water mains upgraded |
| Awareness | <ul style="list-style-type: none"> ▪ Water Awareness Posters Distributed |
| | <ul style="list-style-type: none"> ▪ Water Information available on Unigreen Website |
| | <ul style="list-style-type: none"> ▪ Water Management included in the internal auditor training. |
| | <ul style="list-style-type: none"> ▪ Water Awareness packs were distributed by Unigreen Volunteers to all Schools and Centres during National Water Week |
| | <ul style="list-style-type: none"> ▪ Information given out on UQ Market Days |
| Water Reduction Actions | <ul style="list-style-type: none"> ▪ Stage three of the building retrofit program complete |
| | <ul style="list-style-type: none"> ▪ Mansergh Shaw Roof Replacement Project included the capture and reuse of rainwater for use in the building and for a laser lab. Pans and urinals were upgraded to water efficient types |
| | <ul style="list-style-type: none"> ▪ Physics Annexe - waste water from a laser cooling system was captured in a tank for reuse in the system and for irrigation. |
| Monitoring and Measuring | <ul style="list-style-type: none"> ▪ 30 new water meters installed |
| KPI | <ul style="list-style-type: none"> ▪ 1.7 kL/m² (GFA) |
| Year 2006 | |
| Area of Improvement | Action |
| Management Strategies | <ul style="list-style-type: none"> ▪ Gained Funding via Community Water Grant to help with retrofit project |
| | <ul style="list-style-type: none"> ▪ Gained funding from Business Services to help with retrofit project |
| | <ul style="list-style-type: none"> ▪ Upgrade mains infrastructure |
| | <ul style="list-style-type: none"> ▪ Desert Cubes trialled in 10 urinals to determine their suitability in high use areas |
| | <ul style="list-style-type: none"> ▪ A student was employed to help to identify projects to help reduce water consumption |
| | <ul style="list-style-type: none"> ▪ A temporary position was created for a Water Project Officer to ensure that the University is compliant with level 4 water restrictions by the due date. |
| | <ul style="list-style-type: none"> ▪ Excel Spreadsheet for the Management of Building Audits and to track progress of retrofits developed |
| | <ul style="list-style-type: none"> ▪ Water tanks included in the design of new General purpose Building (GPN4) |

| | | | | |
|---|--|---------|----------|--------|
| Water Efficiency Management Plan (WEMP) | G:\!Operations\!Environment\Water management\ManagementPlans\Web_docs\Wtr_St LuciaWEMP_web.doc | Issue 5 | 18/08/08 | 5 2 |
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|---------------------------------|--|-------------------------------|--------------------|--------------|-----------|----------|---------------------|-----------------------------|----------------------------|-------------------------------|-------------|---------------|--|---------|------------------|--|------|--------------------------|--|-----|-------------------------------|--|---------|-----------|--|------------------|-------------|--|--------------|----------------|--|----------|---------------|--|
| | <ul style="list-style-type: none"> Stage 2 of Utilities Database being developed by student | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Awareness | <ul style="list-style-type: none"> Water Awareness Posters Distributed | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <ul style="list-style-type: none"> Information available on Unigreen Website. Website updated. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <ul style="list-style-type: none"> Water Management included in the internal auditor training. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <ul style="list-style-type: none"> Information given out on UQ Market Days | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <ul style="list-style-type: none"> Water Awareness packs were distributed by Unigreen Volunteers to all Schools and Centres during National Water Week | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <ul style="list-style-type: none"> Posters were developed for trial of new waterless urinal systems- using desert cubes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <ul style="list-style-type: none"> Water awareness articles included in Property Press and UQ Update | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <ul style="list-style-type: none"> The Green Office Program was launched. Included in the program are monthly newsletters & quarterly update sessions One session this year focused on water saving initiatives and awareness. The Green Office Program Promotes good environmental practice and 25 areas at the St Lucia Campus were involved in 2006 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <ul style="list-style-type: none"> Aqua-Click restrictors designed with UQ Logo and <i>Save Water at UQ</i> message | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <ul style="list-style-type: none"> Building Audits began to identify buildings already retrofitted, those to be completed and requirements for each. Audit includes pans, urinals, basins, showers and hoses. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <ul style="list-style-type: none"> A water forum was held on the 18th October. Technical Officers and Site Managers were invited to hear Brisbane Water, Jurg Keller from the Advanced Wastewater Treatment Centre and Property & Facilities Division talk about water issues and initiatives as well as funding availability for projects identified that will help to reduce water consumption. A workshop was held where ideas were exchanged and discussed | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Water Reduction Actions | <ul style="list-style-type: none"> Stage four retrofit program in progress. At the end of 2006, 250 11 and 9 litre cisterns replaced with 6/3 litre cisterns. 90 urinal sensors installed and 390 in-line flow restrictors installed on hand basins. The following buildings have been retrofitted <table border="1"> <tr> <td>Frank White</td> <td>Frank White Annexe</td> <td>Space Bank 2</td> </tr> <tr> <td>Priestley</td> <td>JD Story</td> <td>P&F Security Annexe</td> </tr> <tr> <td>Biological Sciences Library</td> <td>Abel Smith Lecture Theatre</td> <td>Conifer Knoll Parking Station</td> </tr> <tr> <td>Chamberlain</td> <td>Joyce Ackroyd</td> <td></td> </tr> <tr> <td>Goddard</td> <td>Gordon Greenwood</td> <td></td> </tr> <tr> <td>Axon</td> <td>P&F Maintenance Workshop</td> <td></td> </tr> <tr> <td>QBP</td> <td>Biological Sciences Refectory</td> <td></td> </tr> <tr> <td>Parnell</td> <td>Chemistry</td> <td></td> </tr> <tr> <td>William McGregor</td> <td>Colin Clark</td> <td></td> </tr> <tr> <td>Forgan Smith</td> <td>Hartley Teakle</td> <td></td> </tr> <tr> <td>Prentice</td> <td>Mansergh Shaw</td> <td></td> </tr> </table> | Frank White | Frank White Annexe | Space Bank 2 | Priestley | JD Story | P&F Security Annexe | Biological Sciences Library | Abel Smith Lecture Theatre | Conifer Knoll Parking Station | Chamberlain | Joyce Ackroyd | | Goddard | Gordon Greenwood | | Axon | P&F Maintenance Workshop | | QBP | Biological Sciences Refectory | | Parnell | Chemistry | | William McGregor | Colin Clark | | Forgan Smith | Hartley Teakle | | Prentice | Mansergh Shaw | |
| Frank White | Frank White Annexe | Space Bank 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Priestley | JD Story | P&F Security Annexe | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Biological Sciences Library | Abel Smith Lecture Theatre | Conifer Knoll Parking Station | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Chamberlain | Joyce Ackroyd | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Goddard | Gordon Greenwood | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Axon | P&F Maintenance Workshop | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| QBP | Biological Sciences Refectory | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Parnell | Chemistry | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| William McGregor | Colin Clark | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Forgan Smith | Hartley Teakle | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Prentice | Mansergh Shaw | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Monitoring and Measuring | <ul style="list-style-type: none"> Approximately 50 water meters have been installed since May 2005 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <ul style="list-style-type: none"> Water harvesting and reuse at the James and Mary Amelia Mayne Centre investigated. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| KPI | 1.4 kL/m ² | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Year 2007 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Area of Improvement | Action | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Management Strategies | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <ul style="list-style-type: none"> Temporary position created for a Water Project Officer to ensure that the University is compliant with level 4 water restrictions carried over to 2007 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <ul style="list-style-type: none"> Excel Spreadsheet for the Management of Building Audits and to track progress of retrofits developed and completed | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <ul style="list-style-type: none"> Water tanks installed in the General purpose Building (GPN4) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <ul style="list-style-type: none"> Utilities Database development progressed | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <ul style="list-style-type: none"> PB undertook water audit on Otto Hirschfeld and Ritchie Research buildings | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Awareness | <ul style="list-style-type: none"> Water Awareness Posters Distributed | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <ul style="list-style-type: none"> UQ won best water saver in Brisbane | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <ul style="list-style-type: none"> Plaques for bathrooms were designed, made and installed to highlight water saving fixtures and contacts for reporting leaks | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <ul style="list-style-type: none"> Information available on Unigreen Website. Website updated. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <ul style="list-style-type: none"> Water Management included in the internal auditor training | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| Water Efficiency Management Plan (WEMP) | G:\!Operations\!Environment\Water management\ManagementPlans\Web_docs\Wtr_St LuciaWEMP_web.doc | Issue 5 | 18/08/08 | 5 3 |
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Commercial in Confidence

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| | <ul style="list-style-type: none"> ▪ Information given out on UQ Market Days |
| | <ul style="list-style-type: none"> ▪ Water Awareness packs were distributed by Unigreen Volunteers to all Schools and Centres during National Water Week |
| | <ul style="list-style-type: none"> ▪ Posters were developed for level 6 water restrictions |
| | <ul style="list-style-type: none"> ▪ Water awareness articles included in Property Press , UQ Update, UQ News and EPA Compass Magazine |
| | <ul style="list-style-type: none"> ▪ The Green Office Program continued its success with 55 areas now part of the program. Monthly newsletters & quarterly update sessions are held. Water saving initiatives and awareness were discussed. The Green Office Program Promotes good environmental practice at UQ |
| | <ul style="list-style-type: none"> ▪ Building Audits completed |
| | <ul style="list-style-type: none"> ▪ A water forum was held on the 24th October. Technical Officers and Site Managers were invited to hear Brisbane Water, Professor Paul Greenfield and Property & Facilities Division talk about water issues and initiatives as well as funding availability for projects identified. |
| | <ul style="list-style-type: none"> ▪ Water Efficiency Management Plans for contractors were developed and put onto the website for use. Contractors are made aware of these through the contractor inductions and through P&F Project Managers. ▪ P&F Project Managers were updated on water restrictions and WEMP requirements at a works coordination meetings throughout the year |
| Water Reduction Actions | |
| | <ul style="list-style-type: none"> ▪ Retrofitting of all taps, showers and pans complete (apart from some missed items picked up in a recent follow up audit- which are currently being retrofitted) |
| Monitoring and Measuring | |
| | <ul style="list-style-type: none"> ▪ There are 160 meters now installed at the St Lucia campus |
| | <ul style="list-style-type: none"> ▪ Water meters were installed on all cooling tower make up water and bleed lines |
| | <ul style="list-style-type: none"> ▪ Water meters were installed on non-potable uses – GPN 4 rainwater tanks and the freshwater lake. |
| | <ul style="list-style-type: none"> ▪ Procedure for reading, entering data and monitoring water consumption was reviewed and documented. |
| KPI 2006/2007 | 0.99kL/GFA |

Note: KPI's based on financial year consumption figures.

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