



General Business Information

Account Data	
Account Number	UNIOFQ
Water Service Provider	Esk Gatton & Laidley Water Board- Gatton Shire Council
Business Name	The University of Queensland
Address of Site	Warrego Highway- Gatton 4343
Telephone	07 3365 2794 (Director, Property & Facilities Division)
Date Account opened	Not known
Water connection size	150mm under Warrego Highway &-200mm to reservoir
Organisation Data	
Site Description	University
Organisation Description	Education and Research
Industry Sector Name	Educational
Nominated WEMP Officer	Leigh Thompson
Current Water Source	
Reticulated Potable	Esk/Laidley Water Board via Gatton Shire Council
Reticulated Raw	NIL
Reticulated Recycled	From Gatton Shire Council
On-Site Recycling	Campus STP to irrigation under EPA licence
Bore	Various bores for irrigation of sporting fields and crop irrigation
Bulk Raw	NIL
Other	Rainwater Tanks
Summary of Water using activities	See Section. Description of Activities
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
No. of Staff (2006) EFTSL	245
No. Students (2006) EFTSL	1021

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Water Efficiency Management Plan

Gatton Campus



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 Thompson and Mark Glindemann
Authorisation	Alasdair McClintock
Authority's Signature	
Position	Director, Property and Facilities Division
Date	

Checklist

Tick all that apply	WEMP Action Plan No.	University WEMP Action Plans	Includes Queensland Water Commission Requirements for WEMPs	Savings (ML per year)
<input checked="" type="checkbox"/>	1	Buildings –Section 1- Potable Water	WEMP Part 1A: Taps & Showers WEMP Part 1B: Toilets & Urinals WEMP Part 4: Processes and Other Water Uses	9.6 ML retrofitted prior to audit 3ML
<input checked="" type="checkbox"/>	1-2	Buildings Section 2 Alternate Water	No QWC Water Requirements for this Action Plan	
<input checked="" type="checkbox"/>	2	Construction Sites	No QWC Water Requirements for this Action Plan	
<input checked="" type="checkbox"/>	3-1	Outdoor Uses Section 1 Potable Water	WEMP Part 3: Outdoor Water Use WEMP – Sporting Facilities	Approximate savings only (based on water meter readings) Stock watering 4.5ML Washing down animal houses/shelters 3ML Nursery water reduction 2ML
<input checked="" type="checkbox"/>	3-2	Outdoor Use Section 2 Alternate Water	No QWC Requirements for this Action Plan	
<input checked="" type="checkbox"/>	4	Vehicle Washing	WEMP – Vehicle Wash Bay	
<input checked="" type="checkbox"/>	5	Infrastructure and Maintenance	No QWC Water Requirements for this Action Plan	

Note: There are savings in water consumption of 12 ML which are not accounted for and could be attributed to greater awareness of water issues, reporting of leaks and changes in work practices which have led to a reduction in water consumption. The total expected savings to June 2007 is 34ML based an average monthly reduction of 27% for this financial year.

Total Savings 34 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.

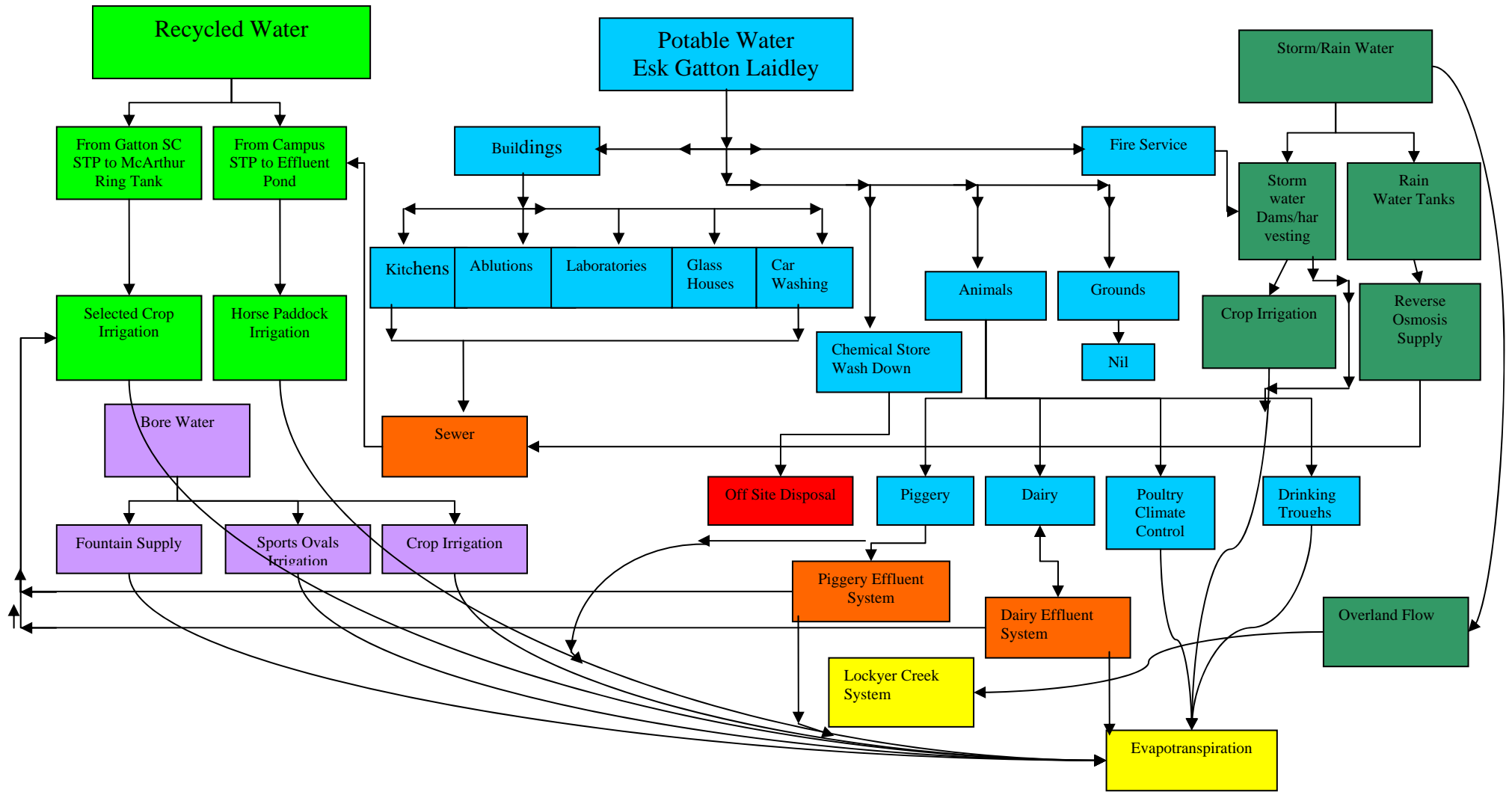
Individuals

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 2006-2007



1. Introduction

This document is the Water Efficiency Management Plan for The University of Queensland at its Gatton campus. The plan outlines water efficiency measures undertaken by the University as well as proposed efficiency measures to be progressively implemented by the University. The plan compliments the University's Environmental Management System.

The Water Efficiency Management Plan for 2007 year is the 2nd edition of the plan. The first Water Management Plan was developed in 2004 by Property & Facilities Division.

The actions listed in the Water Efficiency Management Plan for 2007 directly relate to the Environmental Management System (EMS) objectives and progress will be measured using Key Performance Indicators. Actions documented in the Water Efficiency Management Plan and progress made is monitored through the Environmental Sub Committee at Gatton.

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 operates under an Environmental Policy signed by the Vice Chancellor.

1.1 *Background*

The University of Queensland's Gatton Campus was established in 1897 as an Agricultural College making it the oldest campus for tertiary studies in Queensland. It is located 80 kilometres west of Brisbane on a 1000 hectare site in a rural agricultural setting. The campus has extensive landscaped grounds and playing fields.

This Water Efficiency Management Plan relates to all water that is managed by the Property and Facilities Division. Areas within the University that wish to operate outside restrictions should seek permission from the relevant local authority (Gatton Shire Council) and will be required to operate under a Water Efficiency Management Plan and display the relevant permission signs. Templates are available on the Queensland Water Commission website at www.qwc.qld.gov.au or contact the Environmental Engineer at Property & Facilities for further information.

1.2 *WEMP Purpose*

The WEMP is written to ensure that water at The University of Queensland Gatton campus is used in an efficient manner and that strategies are implemented to ensure a reduction in potable water consumption in accordance with The University of Queensland Water Management Policy and the South East Queensland Water Restrictions as prescribed by Gatton Shire Council.

The University will;

- Ensure that all environmental 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 Environmental Practices" in the overall management of water.

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1.3 WEMP Scope

The WEMP scope is The University of Queensland Gatton Campus and considers all of the areas listed in the table below;

The University of Queensland has developed WEMP action plans based on campus areas where water is used. Uses identified by SEQ Water are included in the WEMP Action Plans as listed in table 1.0.

Table 1.0 WEMP Action Plan Outline

WEMP ACTION PLAN	AREA COVERED	USES COVERED
WEMP Action Plan No. 1. Section 1	Buildings – Potable Water	Taps and showers Toilets and Urinals Process and Other Water
WEMP Action plan No. 1 Section 2	Buildings – Alternate- Potable	Rain and Storm water harvesting for use in buildings
WEMP Action Plan No. 2	Construction Sites	Potable and non-potable water
WEMP Action Plan No.3 Section 1	Outdoor Water Use- Potable	Watering livestock
WEMP Action Plan No. 3 Section 2	Outdoor Water Use – Alternate	underground water and rain/stormwater
WEMP Action Plan No. 4	Transport -Vehicle Wash Bay	Potable water used to wash vehicles
WEMP Action Plan No. 5	Infrastructure – Leak detection and maintenance	Potable water reduction through leak detection and maintenance

Figure 1.0 The University of Queensland Gatton -Main Campus



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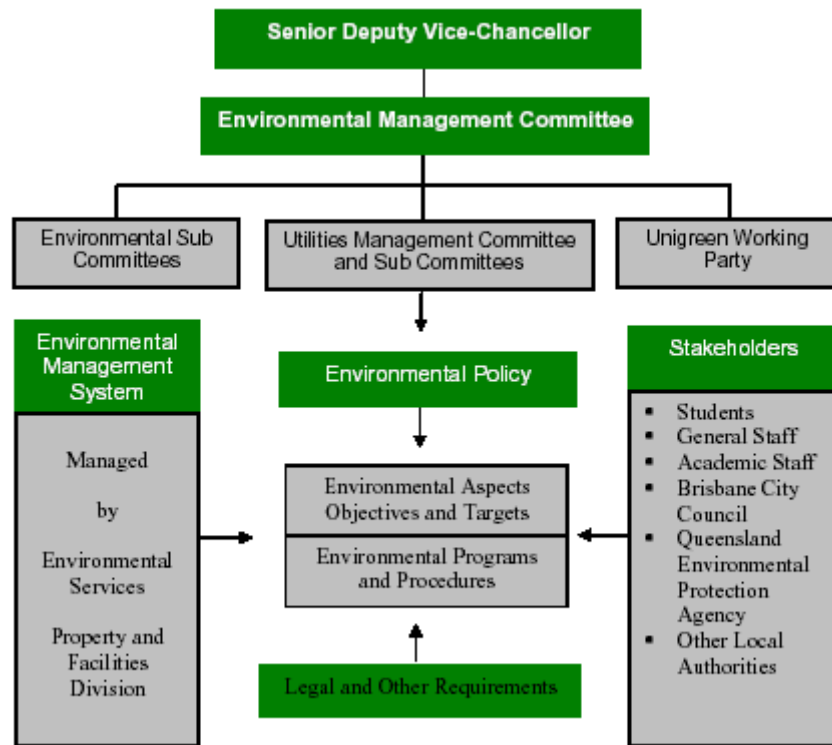
2. Management Review

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. There are environmental management sub committees at St Lucia and Gatton which 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. Water Management at the Gatton campus is discussed at the Gatton Environmental Sub Committee meetings.

Figure 2.0 Committee Structure



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 during 2006 and 2007;

- 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;
- Apprentice plumbers have been employed to expedite the retrofit program;
- Additional funding has been made available for compliance with water restrictions and implementation of WEMP initiatives.

Brisbane Water Rating

Brisbane water uses a diagnostic tool to evaluate the management systems of the top water users. A report which combines the outcomes and the benchmarking of the results with the industry sector (the University has been classified as commercial for the use of this tool) found that the University of Queensland currently achieves a rating of two out of five for its water management systems. The main areas for improvement were identified as;

- Understanding our performance and opportunities;
- Demonstrated corporate commitment;
- Operating procedures;
- Reporting, feedback and control systems.

To address these issues the University will;

- Continue to meter and monitor water consumption and use the data to identify opportunities for reduction in all areas;
- Submit the Water Management Policy to the Environmental Management Committee with the intent to get full Senate approval and the Vice Chancellors signature;
- Develop Operating Procedures for Water Management;
- Provide detailed reports on water management projects to the Utilities Management Committee and the Environmental Management Committee;
- Provide appropriate feedback to the University Community on water consumption and progress of the WEMP.

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 the Property and Facilities Division. The Finance and Business Services Section of the University is responsible for paying the utility bills and has in the past made extra funding available to Property and Facilities Division for water efficiency initiatives. This source of funding will continue to be sought. Other sources of funding from the University include the University Improvement Fund and other Works Programs.

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Funding opportunities are sometimes gained from Government Grants and the Property and Facilities Division has received a Community Water Grant for \$50,000. The funding is currently being used to help retrofit buildings with water saving devices. These funding sources will continue to be investigated.

2.4 Stakeholder Inclusion

The University of Queensland is a large educational facility with around 31,000 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 held a Water Forum to gain input into how to achieve efficiencies in areas of research and laboratory water use. Stakeholders in water management at the University include all of the staff and students as well as the larger community.

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.

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 Environmental Engineer. The incentive will be available until funding is exhausted. Contact Environmental Services, Property and Facilities Division for more information and an application form.

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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.

- 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, guidelines and other requirements. 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 operation, environmental legislation, water restrictions and/or environmental 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 what is 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 Reporting

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.

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

4.4 Complaints

Complaints can be registered on the incident form discussed in 4.3. The complaint is then to be treated as an incident and investigated with corrective actions provided and implemented.

4.5 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 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.

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4.6 Enquiries

Any queries about the water management should be directed to;

Overall Operation	Environmental Engineer	07 336 51587
Water Efficiency Management Plan	Project Officer Environmental	07 336 57580
Grounds Operations	Maintenance Officer Gatton/Ipswich	07 546 01545
Motor Vehicle Wash Bay	Campus Services Coordinator Gatton	07 546 01740

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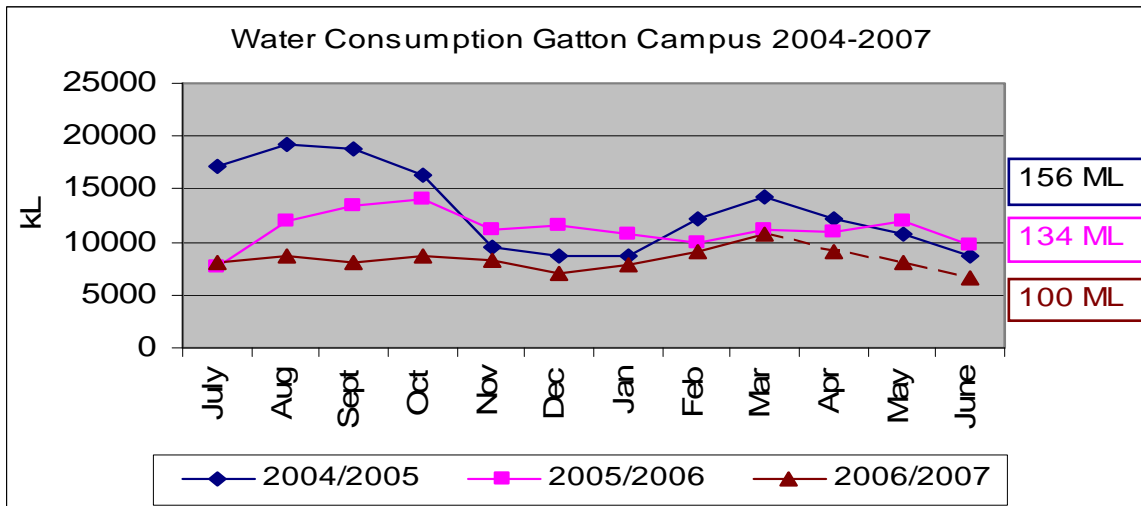
5. Water Consumption Audit

5.1 *Potable Water Consumption*

The Gatton Campus reduced water consumption by 30% from 2004 to 2005 and a further 15 % in 2006. The target is to reduce consumption by a further 25% by 2007.

Figure 3.0 –Monthly Water Consumption The University of Queensland Gatton Campus 2004-2007

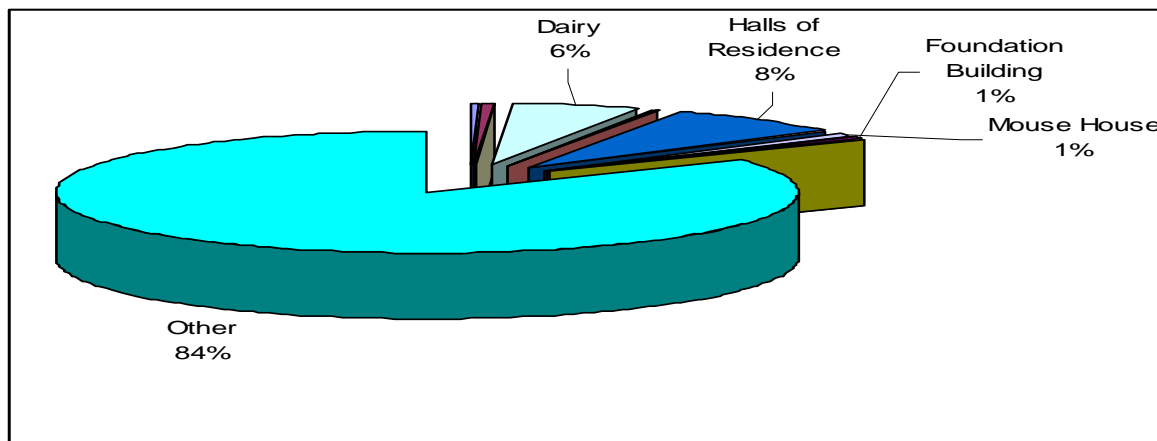
Notes: the figures on the right of the graph are annual consumption figures. The colours represent the year as indicated below the graph.



5.1.1 Water Consumption breakdown

The data in the following graph is generated using data collected from water meters that have been installed at The University of Queensland Gatton campus. Other water consumption includes water for stock watering, toilets and showers and the piggery. A meter installation program is underway and future plans should show a more detailed breakdown of consumption. The WEMP 1A & B audit sheet summary can be found in Appendix 1.

Figure 4.0 –Water Consumption Breakdown The University of Queensland Gatton Campus



5.1.2 Water Consumption Predictions

The following predictions are based on historic water consumption and the current building program for the University of Queensland Gatton Campus. Table 2.0 shows consumption for the period from 2004 to 2010 based on financial year. In 2008, the 1st Stage of the Centre for Advanced Animal Studies (CAAS) will be complete. It is expected that water consumption in the CAAS development will be from 35 – 70 kL a day when fully operational. This is an increase of between 12,000 and 25,000 kL per year for the Gatton campus. These figures are taken into consideration in 2008/2009 and 2009/2010 predictions with the campus increasing its water consumption but maintaining the KPI of kL/GFA at around 1.25

Table 2.0 Water Consumption Predictions The University of Queensland Gatton Campus to 2010.

	75791	75791	75791	75791	82691	89591
	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010
July	17250	7576	8132	6099	6160	6228
Aug	19124	12020	8715	6536	7991	8166
Sept	18824	13500	7981	5986	6207	7424
Oct	16345	13947	8624	6468	7823	8210
Nov	9414	11206	8280	6210	7054	8277
Dec	8769	11493	6995	5246	5449	5587
Jan	8759	10725	7908	10350	12405	14525
Feb	12198	9965	9148.5	9235	9637	9937
Mar	14214	11121	10660.5	10556	11413	11692
Apr	12247	10994	9185.25	9684	10599	10992
May	10717	11895	8037.75	9422	10507	11097
June	8711	9614	6533.25	7635	8511	8984
kL	156572	134056	100200	93426	103754	111118
kL/GFA	2.07	1.77	1.32	1.23	1.25	1.24

Note: italic font = prediction

5.1.3 WEMP Compliance Audits

In addition to the WEMP action plans, Property and Facilities Division have conducted infrastructure audits in all buildings on all sites and developed spreadsheets with detailed information on current fittings and fixtures, current water consumption and requirements for upgraded new fittings and fixtures, expected water savings and costs of installation. The audit was carried out by Property &

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Facilities staff and plumbing contractors. A summary of the data collected for WEMP 1A & 1B can be found in Appendix 1.

5.2 Alternate Water Consumption

5.2.1 Gatton Campus stormwater/rainwater

The majority of the storm water from roofs and hard surfaced car parks is not collected for further use. An investigation into the practicality of capturing and storing this water for landscape irrigation may result in a worthwhile reduction in consumption of the potable and underground water supply. An estimate of the combined roof and car park area in the core area of the campus is about 31,500m². Based on the long term average rainfall for the Gatton Campus this equates to a potential runoff of about 2.4 mega litres per annum (776 mm per annum).

A project to harvest some of the rainwater and use it for washing, animal water supply and cooling systems for animal houses is currently underway. In addition to water tanks the University has stormwater lakes used for irrigation. The total current storage capacity for stormwater on site is;

Lake Galletly	43 Megalitre
Lawes Ring Tank	240 Megalitre
Bates Ring Tank	40 Megalitre

Water Tanks

Poultry Unit	2 x 14,000L + 1 x 22,500L
Fire Pump House	1x 22,500L
Plant Industries	2 x 7480L
Glasshouses	2 x 8,000L
Dairy	2 x 22,000 L
Animal Industries	1 x 4500L
Cattle Research	1 x 5090L
Food Technology	2 x 22,500L
Nursery	2 x 22,730L

5.2.2 Gatton Campus Underground Water

Underground water may be taken from any of the licenses listed below in Table 2. An audit of the quantity and quality of this water is required. N.B. The only underground water extracted for Gatton Campus grounds irrigation is taken from either the Artesian or Gilbert 1 (Moonie) bores. It is only these two underground water supplies that will be tested for water quality. It is suggested that the water be tested for suspended solids and salinity as a minimum, on an annual basis. The water depth should also be monitored on an annual basis. It is recommended however that all of the underground water supplies be metered for quantity of water taken.

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Table 2.0 Water Works Licences- The University of Queensland Gatton Campus

LICENCE NO.	LOCATION	PURPOSE OF WORKS
MAIN CAMPUS		
17808	Artesian	Stock Watering ,Domestic
56349	Boussingault (DRY)	Irrigation
73674	Darwin Pressure Pump (DRY)	Stock Watering , Domestic
98087	Darwin	Irrigation , Domestic
56348	Gilbert 1 (Moonie)	Irrigation, Stock Watering, Domestic
73672 2	Gilbert	Irrigation
7535	Gilbert 4	Irrigation
56351	Orchard 1 (Horti)	Irrigation
73675	Orchard 1a	Irrigation
73676	Horti 2	Irrigation
73677	Horti 3	Irrigation
73671	Lawes 5	Irrigation
56350	Lawes 6	Irrigation
73670	Soutter East	Irrigation
56356Southern)	West (Soutter) (DRY)	Irrigation
56355	Stapeldon 6 (West)	Irrigation
56354	Stapeldon 7 (East)	Irrigation
DARBALARA FARM / PERSIMMION FARM		
75773	No.1	Irrigation
73226	No.2	Irrigation
98233	No.3 (Saline)	Irrigation
98231	House	Domestic

5.2.3 Gatton Campus Recycled Water

Recycled Water from Gatton Campus STP

Sewage at the Gatton Campus is treated at the on site sewerage treatment plant located on the northern side of the Warrego Highway. This University has an Environmental Authority issued to it for this activity by the EPA. Under this Environmental Authority the treated effluent from the STP can only be used for irrigation onto a defined area of 30 hectares of land where access is strictly controlled. It cannot be used for watering stock or irrigation onto crops which may enter the human food chain.

The opportunity to use this water to supplement irrigation water on the Gatton Campus grounds is limited. Any further use of the water would be guided by the Queensland Guidelines for Recycled Water (2005). The total storage is;

Gatton STP Effluent Dam 2 Megalitres

Recycled Water from Gatton Campus Piggery

The water from the piggery is treated on site and is not recycled. It goes into the aerobic dam which is used as an evaporation pond.

Piggery Effluent aerobic dam 2 Megalitre
Piggery Effluent Storage Dam Megalitre

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Dairy Effluent Dam

The dairy at the Gatton campus recycles its effluent water for Bulk Floor wash down. The recycled water is topped up with potable water.

Recycled Water from Gatton Sewerage Treatment Plant

The University of Queensland receives 150 ML of recycled water per annum from the Gatton Waste Water Treatment Plant under a legal agreement. The use of this water is managed through an irrigation management plan managed by the School of Natural Resources, Agriculture and Veterinary Science.

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6. Monitoring, Measuring and Reporting

6.1 *Monitoring*

The University of Queensland has approximately 80 buildings at the Gatton campus. All water meters that are installed are added to a water meter reading sheet. Some of these buildings are sheds or shelters and do not have water connected to them. The water meter reading sheet is downloaded and manually filled out by Property and Facilities staff who read all meters on a monthly basis.

6.2 *Measuring*

The data collected by maintenance staff is then entered into a spreadsheet by the Environmental Project Officer. The spreadsheet has been designed to highlight entries outside a pre-determined margin of error and generate graphs for each meter. University staff can access the spreadsheet through the Property and Facilities website.

6.3 *Reporting*

Any anomalies in the data collected by the plumbers are discussed with the plumbing supervisor and reported to the Works Control Centre where necessary so that work orders can be generated to ensure that any problems are followed up. If the problem is ongoing it is reported to the Utilities Management Committee (water) and if required to the Utilities Management Committee for further action.

The Environmental Sub-Committee at Gatton meets every second month and discusses the progress of actions in the water efficiency management plan and any other issues that might arise. Results of monitoring and measuring are reported to this committee. The committee reports to the Utilities Management Committee bi-monthly. Representatives of the committees are from the Property and Facilities Division, Business Services as well as external stakeholders. 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. The report is approved by Senate and available for viewing on the Property & Facilities website at www.pf.uq.edu.au/ems.html

6.4 *Benchmarking*

The University of Queensland is a member of the Tertiary Education Facilities Management Association (TEFMA). TEFMA conduct a benchmarking survey annually for all members which looks at all aspects of facilities management including water consumption. KPI's such as kL/GFA and kL/EFTSU (Equivalent full time student units) are recorded and the results are sent out to members so that they can benchmark against each other.

7. Description of Activities- Performance and Opportunity Assessment

The site’s current operations are described below. The aim of reviewing these activities is to determine potential impacts, identify current practices and identify opportunities for improvement. Management strategies and corresponding action plans are then developed to manage the activities. Where the activities listed are not under the direct control of the Property and Facilities Division, water efficiency management plans, if required, will be the responsibility of the relevant School or Centre (see 1.1).

7.1 Buildings

7.1.1 Toilets, Taps and Showers

The University has a number of old buildings at the Gatton campus which have 11 or 9 litre flush cisterns and continuous flush urinals in the bathrooms. The University has implemented an extensive retrofit program to replace all of the old cisterns with the 3 star WELS (water efficiency labelling standard) rated 6/3 litre cisterns and is installing water efficient urinals. This is expected to reduce water consumption by up to 30% in each of the retrofitted buildings dependant on the usage pattern.

Flow restrictors are also being placed on all hand basins and showerheads are being replaced with water efficient alternatives.

The University now monitors and measures 13 water meters at the Gatton campus and will continue to collect data and monitor and measure its consumption. There is also a program to install meters to all buildings on campus to further aid in monitoring water consumption.

7.1.2 Laboratories/Workshops

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 or equipment including fume cupboards with scrubbers. A number of areas have already been identified as high water users and some areas have converted to more efficient technologies or processes. Water consumption in these areas is the responsibility of the School or Centre.

7.1.3 Animal Houses & Laboratories involved with animal use including Piggery & Dairy

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, Mar 2007)

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Please note that any 'other water efficient methods' should be approved by the Environmental Engineer.

7.1.4 Nurseries, Turf Farms and Market Gardens

Potable water is not permitted to be used for water commercial stock or production areas except where,

- a) the watering is conducted in accordance with a WEMP that has been submitted to the service provider responsible for the relevant local government area for approval and where a sign notifying submission of the WEMP is displayed on the premises; or
- b) the watering is conducted in accordance with an approved water efficiency management plan and where a service provider approved sign is displayed on the premises.

Schools and Centres operating nurseries are required to complete a Water Efficiency Management Plan. Templates are available on the Queensland Water Commission website at www.qwc.qld.gov.au

The School of Land and Food have completed an independent WEMP for the Nursery at the Gatton Campus to help to manage their water consumption. The WEMP is complementary to the Gatton Campus WEMP.

7.1.5 Glasshouses

Glasshouses at the Gatton Campus are operated by the School of Natural Resources Agriculture and Veterinary Science for teaching and research purposes. Currently two rainwater tanks are connected to the glasshouse roof and are being used in some laboratory areas. There exists an opportunity to use rainwater for evaporative cooling and recycling the water back into those coolers. There also exists opportunities for installing more rainwater tanks to help irrigate plants within the glasshouses. More than 90% of the watering is done via drip irrigation systems.

Glasshouses with an area of cultivation over 100 square metres are required to submit a WEMP as for Nurseries.

7.1.6 Kitchens/Dining Hall

The University has a Dining Hall and a Café which are run by the Halls of Residence. Water consumption within these facilities is the responsibility of the Halls of Residence. In addition to these facilities there is a Staff Club run by the faculty and the Campus Club which is run by the Gatton Student Association.

7.1.7 Alternate Water Sources for Building Use

The University is currently investigating opportunities for the use of water tanks to supplement potable water used in ablutions, research and irrigation. There are already a number of water tanks in use around the Gatton campus for RO water feeds.

7.2 Construction Sites & Construction Activities

The University of Queensland is in a period of growth and has 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 Mar 2007).

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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 2)

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.

7.3 Outdoor Uses

7.3.1 Stock Watering

The University of Queensland Gatton Campus has large and small animals which are kept by the School of Natural Resources and Veterinary Sciences. Most of these animals are currently watered using potable water. A number of suitable locations for placing tanks have been identified so that potable water can be substituted with rainwater for the stock watering troughs. It is estimated that large stock each consume 60-70 litres of water a day. The herd size of large animals (horses, dairy, and beef cattle, sheep and goats) at Gatton averages about 730 head.

7.3.2 Irrigation

The University has a variety of irrigation systems in place for its Gatton Campus grounds. The majority of irrigation occurs on the ovals, which are serviced by the bore water from the Moonie Bore. The rainwater collected in Lake Galletly is used to irrigate crops; McKay Low Energy Weir and the lake behind the carpark servicing the Halls of Residence are currently utilized for the Environmental Park. No irrigation throughout the Gatton Campus using potable water has been done since October 2005. The artesian bore system is used in the Central Campus Precinct and is metered by the Department of Natural Resources and Water. The majority of this irrigation was operated manually with the gardens using micro-spray irrigation and the lawn areas using sprinklers. Irrigation is all low pressure and operated all year as required. Water savings have been realised by introducing a total ban on using potable water for irrigation.

Further work to develop a landscape management plan will be done in 2007 focusing on;

- a) Use of drought tolerant plants.
- b) Reduction in the area of irrigated turf.
- c) Extensive use of appropriate garden mulch to reduce soil evaporation losses.
- d) Individual drippers onto trees inside of their watering tubes to reduce losses to evaporation and overspray.
- e) Use of alternative water supplies.

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.

All new landscaping should be incorporate water sensitive design.

7.3.3 Sporting Facilities

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The University of Queensland Gatton Campus has 3 ovals which are irrigated via Moonie Bore. The ovals are used by UQ Sport and the local community for recreational purposes.

7.3.4 Fountains

The University has a number of water fountains at the Gatton campus. Potable water is not permitted to be used to operate water fountains on campus. Fountains which are operational are topped up using lake water or rain water. The fountains are maintained by Property and Facilities.

The University of Queensland uses recycled water from its own sewerage treatment plant and also the Gatton Sewerage Treatment Plant to irrigate areas at the Gatton campus under an EPA licence. The storage capacity of the effluent lake is ?

7.3.5 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 2) before undertaking any work requiring water. Alternative water sources should be used where feasible.

7.4 The Motor Vehicle Workshop

7.4.1 Vehicle Car Wash Bay

The Motor Vehicle Workshop is used to wash and detail the University fleet. Potable water from the Esk Laidley Water Board is used. It is disposed of to the University's sewerage system. The vehicle wash bay is managed by Property and Facilities Transport Section.

Water Consumption Data for Vehicle Washing Bay

Total Mains Water Consumption for 2004/2005	= Approx 33,500L
Average water consumption per number of vehicles washed	= 42L/per vehicle wash
	= 137L for a full detail
Average daily L (average daily usage = 3 washes or one full detail)	= 131.5L.

Water from the vehicle wash bay is not currently recycled.

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7.5 Infrastructure

The Property and Facilities Division is responsible for maintaining the water infrastructure to a suitable standard. Maintenance of water mains is carried out in accordance with a maintenance schedule managed by the Operations section. As well as infrastructure maintenance, the mains are flushed from time to time to clean them out. The flushed water is currently sent to stormwater.

7.6 Swimming Pool

The swimming pool at the Gatton campus is no longer operational.

7.7 Areas owned by the University of Queensland and Operated by Third Parties

There are areas within the University of Queensland Gatton Campus that are leased and operated by third parties. Overall water management in these areas is the responsibility of the third party. In some instances Property & Facilities Division will be responsible for maintenance and operational functions usually managed under a Service Level Agreement or other formal agreement.

Property & Facilities Division will assist third party areas, if required, to develop Water Efficiency Management Plans that compliment the University's Water Efficiency Management Plan.

At the time of writing this WEMP, Third party areas with WEMP's in place include;

The Department of Primary Industries and Fisheries.

7.8 Summary of future water saving initiatives

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 to be implemented that will lead to further reductions in water consumption at the University of Queensland Gatton Campus.

- Water reductions in through more efficient equipment, changes in practices, recycling and reusing water and/or reducing flows; and
- Rainwater harvesting and reuse across the campus.

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8. Legal Requirements

8.1 *Environmental Aspects & Potential Impacts and Assessment*

An impact assessment has been carried out on those activities listed in Section 3. The outcome is shown in Table 5.0 below.

Table 5.0 Environmental Aspects and Impacts Assessments

Activity	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.
Activity/Description	Aspects	Potential Impact	Assessment
Vehicle Car Wash Bay	Vehicle washing	Water use	High pressure hose with trigger nozzle used.
		Waste water	Solids settled out in pit and water goes to on site STP
Grounds Operations	Maintenance of Landscaped Gardens	Potable water use	Gardens are only irrigated where recycled water or stormwater can be used.
	Use of Fountains	Potable water use	Water is recycled and topped up with bore water
	Maintenance of sporting facilities	Potable water use	No potable water is used.
Building and Construction	Ablutions	Potable water use	Water efficient pans, urinals, taps and showerheads are being installed. Storm water harvesting in some areas is being investigated for use in cisterns and urinals.
		Potable water use	Opportunities for reducing consumption are being investigated.
	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.
Infrastructure Management	Animal Houses- wash down	Potable water consumption	All areas to use a hand held hose with trigger nozzle connected to a high pressure unit.
	Cooling for Poultry Houses	Potable Water	Use of rainwater being investigated.
	Kitchens/Refectories	Potable water consumption	Ensure that equipment is water efficient
		Waste water	Currently goes to sewer & on site STP
	Maintenance: Flushing water pipes	Potable water use	Capture & Reuse to be investigated
Cleaning	Broken Pipes	Potable water use	Controlled through a preventative maintenance program.
		Potable water use	No potable water to be used for cleaning whilst under level 4 and 5 water restrictions. .
Rainwater/Stormwater	Storage of water	Degradation of water	Where retention times are high water

use		quality	quality should be tested where there is a risk to human health or the environment.
Other water use	Use of air conditioning condensate	Yet to be investigated	Yet to be investigated

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

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9. WEMP Action Plans

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

The following areas require environmental management action plans based upon the potential impacts of the activities outlined in Section 3;

- Buildings (internal water use)
 - Potable Water
 - Alternate Water
- Outdoor Areas
 - Potable Water (livestock)
 - Alternate Water (Bore Water ,Underground Water &Storm/rain water)
- Construction Sites
- Motor Vehicle Workshop
- Infrastructure

To ensure the purpose of this WEMP will be achieved, the WEMP action plans will be established as follows based upon the identification of potential impacts established in Section 5.

- Objective(s) to be achieved;
- Management strategies;
- Water Saving Actions;
- Performance indicators;
- Monitoring and reporting;
- Corrective actions

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9.1 Buildings

Both potable and alternate water are used in the buildings at the Gatton campus. There are two sections to Action Plan 1; section one is an action plan for potable water and section two is an action plan for alternate water use in buildings.

9.1.1 Potable Water

This action plan is designed to reduce potable water consumption in buildings by increasing the efficiency of taps and showers, toilets, urinals and process water uses.

Performance Objective(s)	<p>To meet the water restriction requirements of the Queensland Water Commission.</p> <p>To meet the requirements of the Water Management Program in the University's Environmental Management System.</p> <p>To meet the requirements of the <i>Environmental Protection (Water) Policy 1997</i>.</p> <p>To meet the requirements of the <i>Plumbing and Drainage Act 2002</i>.</p> <p>To meet the requirements of the <i>Water Act 2000</i>.</p> <p>To reduce potable water consumption in buildings.</p>	
Management Strategies	<p>The performance objectives above will be achieved by the following management strategies:</p> <p>Awareness Design water awareness materials for distribution and display signs in strategic areas in all buildings.</p> <p>Monitoring and Measurement Install water meters where technically and economically feasible to do so.</p> <p>Reducing Water Usage Use of improved technology where economically feasible to replace less efficient equipment.</p>	
Water Saving Actions	<p>Actions</p> <p>Awareness Design & install water awareness posters and plaques for bathrooms, photocopy areas, notice boards and other areas of buildings.</p> <p>Distribute water awareness packs to schools and centres in National Water Week.</p> <p>Publish articles promoting water efficiency in Property Press and Unigreen Newsletters and UQ Update.</p> <p>Monitoring and Measuring Identify and prioritise water metering requirements.</p> <p>Install water meters according to the priority list.</p> <p>Read meters monthly and record data on a PF 427 reading sheet. Copy to POE to update Utilities Database.</p> <p>Reducing Water Usage Retrofit existing pans, tap & shower fixtures with water saving alternatives as specified in the SEQ water restrictions for level 4.</p> <p>Retrofit all urinals to be water efficient as per WELS ratings.</p> <p>Identify opportunities for water reuse in laboratories and workshops.</p>	<p>Completion Date/Frequency</p> <p>March 2007</p> <p>Annually</p> <p>Quarterly</p> <p>Dec 2006</p> <p>To be completed by 2007</p> <p>Monthly</p> <p>June 2007</p> <p>September 2007</p> <p>December 2007</p>
Performance Indicator	kL/GFA/annum	

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Monitoring and Reporting	Regularly report on water usage and the financial savings associated with water efficiency initiatives to the Gatton Environmental sub committee and the Utilities Management Committee. Report Water consumption to TEFMA annually as part of the benchmark report.
Corrective Actions	All complaints or incidents should be reported to the Environmental Engineer at the Property and Facilities Division on an Environmental Incident Notification Form available on the EMS website.

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Buildings (continued)

9.1.2 Buildings - Alternate Water

This management plan is designed to help reduce potable water consumption in buildings by replacing it with alternate water where safe to do while ensuring the most efficient methods of delivery.

Performance Objective(s)	<p>To meet the water restriction requirements of the Queensland Water Commission.</p> <p>To meet the requirements of the Water Management Program in the University's Environmental Management System.</p> <p>To meet the requirements of the <i>Environmental Protection (Water) Policy</i> 1997.</p> <p>To meet the requirements of the <i>Plumbing and Drainage Act</i> 2002.</p> <p>To meet the requirements of the <i>Water Act</i> 2000.</p> <p>To meet the requirements of the <i>Health Act</i> 1937.</p> <p>To meet the requirements of the <i>Workplace Health & Safety Act</i>, 1995.</p> <p>To reduce potable water consumption in buildings.</p>	
Management Strategies	<p>The performance objectives above will be achieved by the following management strategies:</p> <p>Awareness Design water awareness materials for distribution and display signs in strategic areas in all buildings.</p> <p>Monitoring and Measurement Install water meters where technically and economically feasible to do so.</p> <p>Reducing Water Usage Substitute potable water use with alternate supplies where safe to do so and where technically, economically feasible.</p> <p>Improve practices so that they are water efficient.</p>	
Water Saving Actions	<p>Actions</p> <p>Awareness Design & install water awareness posters and ensure correct signage on all alternate water supplies.</p> <p>Publish articles promoting the use of alternative water supplies in Property Press & Unigreen Newsletters and UQ Update.</p> <p>Monitoring and Measuring Record water consumption from alternative sources via metering or other method.</p> <p>Reducing Water Usage Identify opportunities for alternative water use in laboratories and workshops.</p> <p>Install water tanks where technically and economically feasible to do so to replace potable water consumption.</p>	<p>Completion Date/Frequency</p> <p>Dec 2007</p> <p>Quarterly</p> <p>June 2007</p> <p>December 2007 and ongoing</p> <p>June 2008</p>
Performance Indicator	<p>kL Potable:kL Alternate (replacing potable)</p>	
Monitoring and Reporting	<p>Regularly report on water usage and the financial savings associated with water efficiency initiatives to the Gatton Environmental sub committee and the Utilities Management Committee.</p>	
Corrective Actions	<p>All complaints or incidents should be reported to the Environmental Engineer at the Property and Facilities Division on an Environmental Incident Notification Form available on the EMS website.</p>	

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9.2 Construction Sites & Construction Activities

This management plan is designed to help reduce potable water consumption on construction sites and in construction activities and ensure that non-potable water is used in an efficient manner.

Performance Objective(s)	<p>To meet the water restriction requirements of the Queensland Water Commission.</p> <p>To meet the requirements of the Water Management Program in the University's Environmental Management System.</p> <p>To meet the requirements of the <i>Environmental Protection (Water) Policy 1997</i>.</p> <p>To learn and manage how water is consumed on construction sites.</p>																											
Management Strategies	<p>The performance objectives above will be achieved by the following management strategies:</p> <p>Awareness Include water awareness in contractor induction.</p> <p>Monitoring and Measurement Install water meters where technically and economically feasible to do so.</p> <p>Reducing Water Usage Use of improved technology where economically feasible to reduce water consumption</p>																											
Water Saving Actions	<table border="1"> <thead> <tr> <th data-bbox="435 846 970 880">Actions</th> <th data-bbox="970 846 1423 880">Completion Date/Frequency</th> </tr> </thead> <tbody> <tr> <td colspan="2" data-bbox="435 880 1423 918">Awareness</td> </tr> <tr> <td data-bbox="435 918 970 1019">Promote water awareness on construction projects and activities to Construction Section and Project Managers.</td> <td data-bbox="970 918 1423 1019">Mar 2007</td> </tr> <tr> <td data-bbox="435 1019 970 1115">Ensure that Project Officers are aware of alternate water available for construction projects and activities.</td> <td data-bbox="970 1019 1423 1115">Ongoing</td> </tr> <tr> <td data-bbox="435 1115 970 1193">Update Contractor inductions to include water savings at UQ.</td> <td data-bbox="970 1115 1423 1193">Jan 2007</td> </tr> <tr> <td data-bbox="435 1193 970 1294">Ensure that contractors complete a <i>WEMP for Contractors</i> before completing any work where University water is to be used.</td> <td data-bbox="970 1193 1423 1294">Ongoing</td> </tr> <tr> <td colspan="2" data-bbox="435 1294 1423 1332">Monitoring and Measurement</td> </tr> <tr> <td data-bbox="435 1332 970 1411">Install water meters on all new construction projects.</td> <td data-bbox="970 1332 1423 1411">Dec 2007</td> </tr> <tr> <td colspan="2" data-bbox="435 1411 1423 1449">Reducing Water Usage</td> </tr> <tr> <td data-bbox="435 1449 970 1527">Establish baseline water usage on construction sites.</td> <td data-bbox="970 1449 1423 1527">Ongoing</td> </tr> <tr> <td data-bbox="435 1527 970 1628">Ensure that trigger nozzles and high pressure units or other water efficient methods are used where water is required.</td> <td data-bbox="970 1527 1423 1628">As required</td> </tr> <tr> <td data-bbox="435 1628 970 1666">Regularly check nozzles for leaks.</td> <td data-bbox="970 1628 1423 1666">At least weekly</td> </tr> <tr> <td data-bbox="435 1666 970 1760">Offer alternative water supplies to contractors carrying out construction activities requiring water when and where it is available.</td> <td data-bbox="970 1666 1423 1760">As required</td> </tr> </tbody> </table>	Actions	Completion Date/Frequency	Awareness		Promote water awareness on construction projects and activities to Construction Section and Project Managers.	Mar 2007	Ensure that Project Officers are aware of alternate water available for construction projects and activities.	Ongoing	Update Contractor inductions to include water savings at UQ.	Jan 2007	Ensure that contractors complete a <i>WEMP for Contractors</i> before completing any work where University water is to be used.	Ongoing	Monitoring and Measurement		Install water meters on all new construction projects.	Dec 2007	Reducing Water Usage		Establish baseline water usage on construction sites.	Ongoing	Ensure that trigger nozzles and high pressure units or other water efficient methods are used where water is required.	As required	Regularly check nozzles for leaks.	At least weekly	Offer alternative water supplies to contractors carrying out construction activities requiring water when and where it is available.	As required	
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Awareness																												
Promote water awareness on construction projects and activities to Construction Section and Project Managers.	Mar 2007																											
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Regularly check nozzles for leaks.	At least weekly																											
Offer alternative water supplies to contractors carrying out construction activities requiring water when and where it is available.	As required																											
Performance Indicator	kL/GFA/Annum																											
Monitoring and Reporting	Regularly report on water usage and the financial savings associated with water efficiency initiatives to the Gatton Environmental sub committee and the Utilities Management Committee.																											
Corrective Actions	All complaints or incidents should be reported to the Environmental Engineer at the Property and Facilities Division on an Environmental Incident Notification Form available on the EMS website.																											

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9.3 Outdoor Water Use

9.3.1 Potable Water

There are two sections to the Action Plan for Outdoor Water Use. Action plan one for outdoor water use- potable water. It outlines actions which will help to reduce potable water consumed in outdoor areas at the Gatton Campus. The particular focus is on potable water used for stock watering as it has been identified as potentially one of the largest consumers on campus.

Performance Objective(s)	<p>To meet the water restriction requirements of the Queensland Water Commission.</p> <p>To meet the requirements of the Water Management Program in the University's Environmental Management System.</p> <p>To meet the requirements of the <i>Environmental Protection (Water) Policy 1997</i>.</p> <p>To meet the requirements of the <i>Plumbing and Drainage Act 2002</i>.</p> <p>To meet the requirements of the <i>Water Act 2000</i></p> <p>To manage potable water in a way which ensures long term sustainability.</p>											
Management Strategies	<p>The performance objectives above will be achieved by the following management strategies:</p> <p>Awareness Distribute water awareness materials to Schools and Centres.</p> <p>Monitoring and Measurement Install water meters on all water sources used where technically and economically feasible to do so.</p> <p>Reducing Water Usage Install water efficient irrigation and watering systems where technically and economically feasible.</p>											
Water Saving Actions	<table border="1"> <thead> <tr> <th>Action</th> <th>Completion Date/Frequency</th> </tr> </thead> <tbody> <tr> <td>Awareness Design and Display water awareness posters around the School of Animal Studies and Veterinary Science Facilities.</td> <td>June 2007</td> </tr> <tr> <td>Communicate water consumption to Schools of Animal Studies and Veterinary Science staff.</td> <td>Monthly</td> </tr> <tr> <td>Monitoring and Measurement Monitor and Record water consumption data.</td> <td>Monthly</td> </tr> <tr> <td>Reducing Water Usage Install rainwater tanks as per priority list to replace potable water consumption for stock watering.</td> <td>Dec 2007</td> </tr> </tbody> </table>	Action	Completion Date/Frequency	Awareness Design and Display water awareness posters around the School of Animal Studies and Veterinary Science Facilities.	June 2007	Communicate water consumption to Schools of Animal Studies and Veterinary Science staff.	Monthly	Monitoring and Measurement Monitor and Record water consumption data.	Monthly	Reducing Water Usage Install rainwater tanks as per priority list to replace potable water consumption for stock watering.	Dec 2007	
Action	Completion Date/Frequency											
Awareness Design and Display water awareness posters around the School of Animal Studies and Veterinary Science Facilities.	June 2007											
Communicate water consumption to Schools of Animal Studies and Veterinary Science staff.	Monthly											
Monitoring and Measurement Monitor and Record water consumption data.	Monthly											
Reducing Water Usage Install rainwater tanks as per priority list to replace potable water consumption for stock watering.	Dec 2007											
Performance Indicator	<p>% stock watering areas supplied by non-potable water.</p>											
Monitoring and Reporting	<p>Regularly report on water usage and the financial savings associated with water efficiency initiatives to the Gatton Environmental sub committee and the Utilities Management Committee.</p>											
Corrective Actions	<p>All complaints or incidents should be reported to the Environmental Engineer at the Property and Facilities Division on an Environmental Incident Notification Form available on the EMS website.</p>											

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Outdoor Water Use –

9.3.2 Alternate Water

This action plan is the second section of the Action Plan for outdoor water use and outlines actions which will lead to a reduction in potable water consumption and a more efficient use of non-potable water consumed at the Gatton campus.

Performance Objective(s)	<p>To meet the water restriction requirements of the Queensland Water Commission.</p> <p>To meet the requirements of the Water Management Program in the University's Environmental Management System.</p> <p>To meet the requirements of the <i>Environmental Protection (Water) Policy 1997</i>.</p> <p>To meet the requirements of the <i>Plumbing and Drainage Act 2002</i>.</p> <p>To meet the requirements of the <i>Water Act 2000</i></p> <p>To manage alternate water in a way which ensures long term sustainability</p>																			
Management Strategies	<p>The performance objectives above will be achieved by the following management strategies:</p> <p>Awareness Distribute water awareness materials to the Grounds Section.</p> <p>Monitoring and Measurement Install water meters on all water sources used where technically and economically feasible to do so.</p> <p>Reducing Water Usage Install water efficient irrigation and watering systems where technically and economically feasible.</p>																			
Water Saving Actions	<table border="1"> <thead> <tr> <th>Action</th> <th>Completion Date/Frequency</th> </tr> </thead> <tbody> <tr> <td>Awareness Develop and Display water awareness posters around the Grounds Compound.</td> <td>June 2007-04-16</td> </tr> <tr> <td>Communicate water consumption to Grounds staff.</td> <td>Monthly</td> </tr> <tr> <td>Monitoring and Measurement Monitor and Record water consumption data where possible.</td> <td>Monthly</td> </tr> <tr> <td>Monitor water quality in the bores and artesian wells to ensure the sustainable application of water to land.</td> <td>Ongoing</td> </tr> <tr> <td>Reducing Water Usage Ensure that all grounds irrigation using bore and underground water is water efficient design.</td> <td>June 2008</td> </tr> <tr> <td>Ensure that any grounds areas using bore and underground water are using best practice methods to reduce consumption</td> <td>June 2007</td> </tr> <tr> <td>Investigate opportunities for the installation of rainwater tanks for the Gatton Campus for irrigation and for stock watering.</td> <td>April 2007</td> </tr> <tr> <td>Install rainwater tanks as per priority list.</td> <td>Dec 2007</td> </tr> </tbody> </table>	Action	Completion Date/Frequency	Awareness Develop and Display water awareness posters around the Grounds Compound.	June 2007-04-16	Communicate water consumption to Grounds staff.	Monthly	Monitoring and Measurement Monitor and Record water consumption data where possible.	Monthly	Monitor water quality in the bores and artesian wells to ensure the sustainable application of water to land.	Ongoing	Reducing Water Usage Ensure that all grounds irrigation using bore and underground water is water efficient design.	June 2008	Ensure that any grounds areas using bore and underground water are using best practice methods to reduce consumption	June 2007	Investigate opportunities for the installation of rainwater tanks for the Gatton Campus for irrigation and for stock watering.	April 2007	Install rainwater tanks as per priority list.	Dec 2007	
Action	Completion Date/Frequency																			
Awareness Develop and Display water awareness posters around the Grounds Compound.	June 2007-04-16																			
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Ensure that any grounds areas using bore and underground water are using best practice methods to reduce consumption	June 2007																			
Investigate opportunities for the installation of rainwater tanks for the Gatton Campus for irrigation and for stock watering.	April 2007																			
Install rainwater tanks as per priority list.	Dec 2007																			
Performance Indicator	Reduction in potable water used in outdoor areas. kL/ha																			
Monitoring and Reporting	Regularly report on water usage and the financial savings associated with water efficiency initiatives to the Environmental sub committee and the Utilities Management Committee.																			
Corrective Actions	All complaints or incidents should be reported to the Environmental Engineer at the Property and Facilities Division on an Environmental Incident Notification Form available on the EMS website.																			

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9.4 Gatton Motor Vehicle Workshop- Vehicle Wash Bay

This management plan is designed to help reduce potable water consumption through the vehicle wash bay at the University's Gatton Garage.

Performance Objective(s)	<p>To meet the water restriction requirements of the Queensland Water Commission.</p> <p>To meet the requirements of the Water Management Program in the University's Environmental Management System.</p> <p>To meet the requirements of the <i>Environmental Protection (Water) Policy 1997</i>.</p> <p>To meet the requirements of the <i>Plumbing and Drainage Act 2002</i>.</p> <p>To meet the requirements of the <i>Water Act 2000</i></p>															
Management Strategies	<p>Awareness Distribute awareness posters to the Garage and Transport areas.</p> <p>Communicate water consumption to the Environmental sub-committee.</p> <p>Monitoring and Measurement Accurately measure water consumption at the vehicle wash bay.</p> <p>Reducing Water Usage Employ water efficient technologies where economically and technically feasible to do so.</p>															
Water Saving Actions	<table border="1"> <thead> <tr> <th data-bbox="434 1010 967 1066">Action</th> <th data-bbox="967 1010 1401 1066">Completion Date/Frequency</th> </tr> </thead> <tbody> <tr> <td data-bbox="434 1066 967 1151">Awareness Display water awareness posters around the transport section and garage.</td> <td data-bbox="967 1066 1401 1151">June 2007</td> </tr> <tr> <td data-bbox="434 1151 967 1236">Display signs at Vehicle wash bay stating water type being used and approval from the Gatton Shire Council where required.</td> <td data-bbox="967 1151 1401 1236">At all times the vehicle wash bay is in use</td> </tr> <tr> <td data-bbox="434 1236 967 1321">Monitoring and Measurement Install water meter on the car wash bay to accurately measure water consumption.</td> <td data-bbox="967 1236 1401 1321">June 2007</td> </tr> <tr> <td data-bbox="434 1321 967 1406">Monitor and Record Water Consumption</td> <td data-bbox="967 1321 1401 1406">Monthly</td> </tr> <tr> <td data-bbox="434 1406 967 1491">Reducing Water Usage Regularly check the pressure cleaning nozzle</td> <td data-bbox="967 1406 1401 1491">Weekly as required</td> </tr> <tr> <td data-bbox="434 1491 967 1547">Investigate options for alternative water for vehicle washing.</td> <td data-bbox="967 1491 1401 1547">December 2007</td> </tr> </tbody> </table>	Action	Completion Date/Frequency	Awareness Display water awareness posters around the transport section and garage.	June 2007	Display signs at Vehicle wash bay stating water type being used and approval from the Gatton Shire Council where required.	At all times the vehicle wash bay is in use	Monitoring and Measurement Install water meter on the car wash bay to accurately measure water consumption.	June 2007	Monitor and Record Water Consumption	Monthly	Reducing Water Usage Regularly check the pressure cleaning nozzle	Weekly as required	Investigate options for alternative water for vehicle washing.	December 2007	
Action	Completion Date/Frequency															
Awareness Display water awareness posters around the transport section and garage.	June 2007															
Display signs at Vehicle wash bay stating water type being used and approval from the Gatton Shire Council where required.	At all times the vehicle wash bay is in use															
Monitoring and Measurement Install water meter on the car wash bay to accurately measure water consumption.	June 2007															
Monitor and Record Water Consumption	Monthly															
Reducing Water Usage Regularly check the pressure cleaning nozzle	Weekly as required															
Investigate options for alternative water for vehicle washing.	December 2007															
Performance Indicator	Reduction in L/wash when compared to the previous 12 months data.															
Monitoring and Reporting	Environmental Services to regularly report on water usage and the financial savings associated with water efficiency initiatives to the Environmental sub committee and the Utilities Management Committee.															
Corrective Actions	All complaints or incidents should be reported to the Environmental Engineer at the Property and Facilities Division on an Environmental Incident Notification Form available on the EMS website..															

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This management plan is designed to help reduce potable water consumption through infrastructure leaks.

Performance Objective(s)	<p>To meet the water restriction requirements of the Queensland Water Commission.</p> <p>To meet the requirements of the Water Management Program in the University's Environmental Management System.</p> <p>To meet the requirements of the <i>Environmental Protection (Water) Policy</i> 1997.</p> <p>To meet the requirements of the <i>Plumbing and Drainage Act</i> 2002.</p> <p>To meet the requirements of the <i>Water Act</i> 2000.</p> <p>To reduce potable water consumption through leaks in water infrastructure.</p>											
Management Strategies	<p>The performance objectives above will be achieved by the following management strategies:</p> <p>Awareness Distribute water awareness materials to University areas which encourage people to report leaks.</p> <p>Monitoring and Measurement Use of leak detection equipment where technically and economically feasible.</p> <p>Reducing Water Usage Use of improved technology where economically feasible to detect leaks in the system</p>											
Water Saving Actions	<table border="1"> <thead> <tr> <th data-bbox="435 936 970 969">Actions</th> <th data-bbox="970 936 1422 969">Completion Date/Frequency</th> </tr> </thead> <tbody> <tr> <td data-bbox="435 969 970 1115"> <p>Awareness</p> <p>Distribute water awareness which includes information on reporting leaks during National Water Week.</p> </td> <td data-bbox="970 969 1422 1115">Annually</td> </tr> <tr> <td data-bbox="435 1115 970 1238"> <p>Monitoring and Measuring</p> <p>Investigate the opportunity for implementing a leak detection program.</p> </td> <td data-bbox="970 1115 1422 1238">June 2007</td> </tr> <tr> <td data-bbox="435 1238 970 1317"> <p>Reducing Water Usage</p> <p>Identify and prioritise infrastructure replacement.</p> </td> <td data-bbox="970 1238 1422 1317">Ongoing</td> </tr> <tr> <td data-bbox="435 1317 970 1384"> <p>Maintain infrastructure.</p> </td> <td data-bbox="970 1317 1422 1384">Ongoing</td> </tr> </tbody> </table>	Actions	Completion Date/Frequency	<p>Awareness</p> <p>Distribute water awareness which includes information on reporting leaks during National Water Week.</p>	Annually	<p>Monitoring and Measuring</p> <p>Investigate the opportunity for implementing a leak detection program.</p>	June 2007	<p>Reducing Water Usage</p> <p>Identify and prioritise infrastructure replacement.</p>	Ongoing	<p>Maintain infrastructure.</p>	Ongoing	
Actions	Completion Date/Frequency											
<p>Awareness</p> <p>Distribute water awareness which includes information on reporting leaks during National Water Week.</p>	Annually											
<p>Monitoring and Measuring</p> <p>Investigate the opportunity for implementing a leak detection program.</p>	June 2007											
<p>Reducing Water Usage</p> <p>Identify and prioritise infrastructure replacement.</p>	Ongoing											
<p>Maintain infrastructure.</p>	Ongoing											
Responsibilities	<p>The management of the WEMP for Infrastructure is the responsibility of the Environmental Services Section, Property and Facilities Division.</p>											
Performance Indicator	<p>N/A</p>											
Monitoring and Reporting	<p>Regularly report water leaks to the Environmental sub committee and the Utilities Management Committee.</p>											
Corrective Actions	<p>All complaints or incidents should be reported to the Environmental Engineer within the Property and Facilities Division on an Environmental Incident and Feedback Reporting Form available on the EMS website.</p>											

Appendix 1.0 Gatton Campus WEMP 1A & 1B Taps & Showers and Toilets & Urinals

Background Information (based on 2006 figures)	
total equivalent full time student load	684
total full time equivalent staff load	245
total staff and students	929
total number of buildings on campus	145
Number of buildings listed on space inventory with no water connected	81
number of buildings included in audit	64

*Reference: The University of Queensland,
<http://www.mis.admin.uq.edu.au/Xcelsius/Executive%20Dashboard/main.swf> accessed
 23/03/07*

The University of Queensland Gatton Campus has several buildings listed on the University's space inventory which are carports, sheds, pump stations etc. Most of these smaller buildings do not have any infrastructure connected to them.

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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	153	232	1	7	420	30889.25	11120130	11120.13	11.12
total future use	9	0.15	153	232	1	7	420	14631.75	5267430	5267.43	5.27
expected savings											5.85
hand basins											
total current use	19	0.32	263	344	2	0.2	12	2612.35	940445.28	940.45	0.94
	3	0.05	373	585	2	0.2	12	702.324	252836.64	252.83664	0.25
total future use	3	0.05	636	929	2	0.2	12	1114.8	401328	401.328	0.40
expected savings											0.54
Taps											
	19	0.32	281	36	1	2	120	1376.78	495640.08	495.64	0.50
	6	0.10	433	57	1	2	120	680.03	244810.08	244.81	0.24
total current use											0.74
total future use	6	0.10	714	93	1	2	120	1114.8	401328	401.328	0.40
expected savings											0.34
Totals WEMP 1A											
total current use											12.80
total future use											6.07
total savings WEMP 1A											6.73

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WEMP 1B	flow rate l/min	convert to litre/seconds	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											
current use	11		107	334	2			7357.68	2648764.8	2648.7648	2.65
4/9 flush	6.5		36	111	2			1449.24	521726.4	521.7264	0.52
6/3 flush	4.5		156	483	2			4347.72	1565179.2	1565.1792	1.57
total current use					2						4.74
total future use	4.5		299	929	2			8361	3009960	3009.96	3.01
expected savings											1.73
Urinals											
10-12litre flush	11		38	255	2			5620.45	2023362	2023.362	2.02
7-9 litre flush	8		25	167	2			2675.52	963187.2	963.1872	0.96
4-6 litre flush	5		6	42	2			418.05	150498	150.498	0.15
0-1.5 litre flush	0.75				2			0	0	0	0.00
total current use								0			3.14
total future use	0.75		69	465	2			696.75	250830	250.83	0.25
expected savings											2.89
Totals WEMP 1B											
total current use											6.15
total future use											3.26
total savings WEMP 1B											2.89
total expected savings WEMP 1A & 1B											9.62

Appendix 2.0 WEMP Template for Contractors

WATER EFFICIENCY MANAGEMENT PLAN TEMPLATE

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

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This form is to be completed and signed by the contractor

Water Efficiency Management Plan	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
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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

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Appendix 3.0 Progress Report WEMP Actions 2005-2006.

Year	Area of Improvement	Action
2005	Management Strategies	Awareness
		<ul style="list-style-type: none"> ▪ Developed a Water Management Plan for the Gatton Campus
		<ul style="list-style-type: none"> ▪ New spreadsheets developed to help generate information from meter reading data.
		<ul style="list-style-type: none"> ▪ Water Awareness Posters Distributed & water awareness kits were distributed by Cleaning Auditors to all Schools and Centres during National Water Week.
		<ul style="list-style-type: none"> ▪ Water Information available on Unigreen Website
2006	Management Strategies	Awareness
		<ul style="list-style-type: none"> ▪ Awareness Plaques for bathrooms developed and purchased to be put into all bathrooms as retrofitted
		<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 14th November. Technical Officers and Site Managers were invited to hear Howard Karl from the Gatton Shire Council & 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 ▪ Halls of Residence were retrofitted with water saving devices.

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