



# University Western Sydney

## Capital Works and Facilities

**Revised WICA Application Vs 3  
21 March 2013**

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Environment and Risk Management  
21 March 2012



# Combined Application Form

Network Operator and Retail Supplier

*Water Industry Competition Act 2006*

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# Combined Application Form: Network Operator and Retail Supplier

## ***Application to become a licensee under the Water Industry Competition Act 2006***

### **Who should complete this form?**

This form is for corporations that wish to become licensees under the *Water Industry Competition Act 2006* (the WIC Act). A copy of the WIC Act is available on the Independent Pricing and Regulatory Tribunal (IPART) website, at <http://www.ipart.nsw.gov.au/water/private-sector-licensing/regulatory-framework.asp>.

### **What do you need to complete this form?**

It is essential that you refer to the 'How to Apply Guide' document <http://www.ipart.nsw.gov.au/water/private-sector-licensing/application-forms.asp> when completing this form. This document will guide you in answering every question. It is available on the IPART website.

If you have further questions about your application, you can contact the Utility Licensing team in IPART by:

emailing: [compliance@ipart.nsw.gov.au](mailto:compliance@ipart.nsw.gov.au), or

telephoning: (02) 9290-8400 (general number).

In general, IPART would also encourage you to discuss your licence application form and obtain assistance from the Utility Licensing team *prior* to formally submitting your application. Once we receive your application, we will assign you a Contact Officer, who will manage your application and remain in contact with you throughout the process.

### **Is there an application fee?**

If you are applying for both a Network Operator's Licence and Retail Supplier's Licence, the fee will be \$5,000.

### **How do you submit the application?**

When you have completed your application, you should mark it to the attention of the Utility Licensing team, and submit it to IPART in person, via email or via post:

In person	Via email	Via post
Attention: Utility Licensing Independent Pricing and Regulatory Tribunal Level 8 1 Market Street Sydney NSW 2000	Attention: Utility Licensing Independent Pricing and Regulatory Tribunal  <a href="mailto:compliance@ipart.nsw.gov.au">compliance@ipart.nsw.gov.au</a>	Attention: Utility Licensing Independent Pricing and Regulatory Tribunal PO Box Q290 QVB Post Office Sydney NSW 1230

The application should include:

one hard copy and one electronic copy of the completed application form and supporting documentation. The electronic copy should consist of separate files for the application and each appendix for the corresponding part of the application form. Where an appendix consists of more than one document, they should be combined into one electronic file, and

the appropriate licence application fee either by cheque made payable to the Independent Pricing and Regulatory Tribunal of NSW or by electronic transfer to:

Westpac Banking Corporation  
BSB: 032-001  
Account No: 205717

If payment is made electronically, please provide a copy of the electronic transfer receipt with your licence application.

## **Confidential information**

IPART uses open public processes to consider applications. Unless confidentiality is agreed, IPART treats applications as public documents. It publishes applications on its website and distributes them to interested parties as appropriate. Where confidentiality is agreed with IPART, applicants should provide separate confidential and public copies of their application. In particular, applicants should provide:

**a confidential application**, which is clearly marked “confidential” and clearly identifies the confidential information that should not be publicly released ; and

**a public application**, which does not contain confidential information, for publication and distribution by IPART.

Each of these versions should be provided in electronic and hard copy form.

IPART will furnish a copy of the confidential application to the Ministers prescribed by the WIC Act and regulations, in accordance with section 9(1)(b) of the WIC Act (refer to Part 5(b) of this application for further details). IPART will publish the public application on its website.

A request for access to confidential information will be determined in accordance with the *Freedom of Information Act 1989*.

## **Important note to applicants**

The granting of a network licence does not allow the licensee to bring any *new* water or sewerage infrastructure into immediate commercial operation. A licensee must also obtain separate approval from the Minister before commencing commercial operation of a new water or sewerage infrastructure (this is explained in further detail in the ‘How to Apply Guide’).

Please also note that the granting of a licence does not guarantee that the licensee will be financially successful in the marketplace.

## Part 1: Introduction

A network operator's licence authorises the licensee to construct, maintain and operate water industry infrastructure. A retail supplier's licence authorises the licensee to supply water (drinking or non-potable) or provide sewerage services by means of any water industry infrastructure. The information requested in this part of the Application Form is intended to provide a high-level overview of the activity that is to be the subject of the licence.

You must attach any additional information or supporting documentation in response to a question in the Application Form in an Appendix referenced Appendix A, B, C etc, with a title corresponding to the question. For example, your response to question 1(e) would be titled "Appendix X - Are any third parties providing services in relation to the activities to be authorised under the licence?".

### 1(a) What activities are to be licensed?

#### i. Network Operator

Tick the applicable box(es) below.

Activity being licensed	Network Operator's Licence
Water infrastructure – drinking water	<input type="checkbox"/>
Water infrastructure – non-potable water (including supply of recycled water)	X
Sewerage Infrastructure	<input type="checkbox"/>

#### ii. Are you constructing, maintaining and/or operating the infrastructure?

Tick the applicable box(es) below.

Drinking Water Infrastructure	Non potable Water Infrastructure	Sewerage Infrastructure
<input type="checkbox"/> Construct	X Construct	<input type="checkbox"/> Construct
<input type="checkbox"/> Maintain	X Maintain	<input type="checkbox"/> Maintain
<input type="checkbox"/> Operate	X Operate	<input type="checkbox"/> Operate

### iii. Retail Supplier

Tick the applicable box(es) below.

Activity being licensed	Retail Supplier's Licence
Supply of drinking water	<input type="checkbox"/>
Supply of non-potable water	<input checked="" type="checkbox"/>
Provision of sewerage services	<input type="checkbox"/>

### 1(b) Who is the applicant?

Corporation Name	University of Western Sydney
ACN	014 069 881
Place of Incorporation	NSW
Address of Applicant's Registered Office	Great Western Highway, Werrington NSW 2747
Address of Principal Place of Business (if different from Registered Office)	

### 1(c) Who manages the applicant corporation?

Provide the full name, date of birth and residential address of the Chief Executive Officer and Directors of the applicant corporation to assist ASIC and ITSA searches.

Full name	Board of Trustees of University of Western Sydney
Title	
Date of birth	
Residential address	



**1(d) Who is the contact person for the application?**

Contact Person	Roger Attwater
Title	Dr
Role	Senior Manager, Environment and Risk Management
Postal Address	Locked Bag 1797 Penrith South DC
State / Postcode	NSW 1797
Business Telephone Number	4570 1238
Mobile Telephone Number	0416 100 948
Fax Number	4570 1276
Email Address	r.attwater@uws.edu.au

*This should be a senior officer who is authorised to speak on behalf of the applicant corporation.*

**1(e) Third party activities**

- i. **Are any third parties providing services in relation to the activities to be authorised under the licence? No**

Provide details of any arrangements with third parties to provide services in relation to the activities authorised under the licence.

Name of third party	Address	Contact person	Describe the services provided by the third party	Describe the arrangements with the third party



ii. **Do you intend to perform all three functions of a network operator's licence (i.e. construct, maintain and operate)? Yes**

If no, then name the other companies involved in performing these activities and your relationship to them in the table below.

Name of third party	Address	Contact person	Describe the services provided by the third party	Describe the arrangements with the third party

## 1(f) Overview of infrastructure

i. **Provide details on the infrastructure in the table below**

<p>Briefly describe the type of infrastructure to be constructed, maintained and/or operated, including:</p> <ul style="list-style-type: none"> <li>the type of technology to be used</li> <li>key customer and supplier groups</li> <li>the purpose for which the infrastructure will be used</li> <li>expected volumes of water or sewage to be extracted, treated, collected and/or distributed</li> </ul>	<p>The Hawkesbury Water Recycling Scheme (HWRS) comprises a series of storage dams, transfer and irrigation pumps, supply pipelines, and associated treatment such as surface wetlands and UV disinfection. The purpose of this infrastructure is to store, transfer and utilise recycled water for irrigation, sourced from reclaimed water supplied from Sydney Water's Richmond STP, and stormwater harvested from the area of the Hawkesbury Campus and nearby Richmond suburbs (A general schematic of the infrastructure is provided in Attachment A).</p> <p>The HWRS supplies recycled water to water user groups both within the Hawkesbury Campus, and in neighbouring land areas. The key supplier of recycled water is Sydney Water Corporation, with whom UWS has an agreement for the supply of reclaimed water (Attachment B). Water users within the lands of the Campus include:</p> <ul style="list-style-type: none"> <li>UWS Capital Works &amp; Facilities (grounds irrigation);</li> <li>UWS School of Natural Sciences (agricultural and horticultural production for teaching and research)</li> <li>NSW Department of Primary Industries (Sydney Vegetable Demonstration Site);</li> <li>Greening Australia (nursery);</li> <li>Taronga Zoological Park (koala food plantations)</li> <li>Hawkesbury Skillshare (nursery).</li> </ul> <p>Water users neighbouring the Hawkesbury Campus include:</p> <ul style="list-style-type: none"> <li>Richmond TAFE (who have a history and preference for stormwater);</li> <li>Hawkesbury Race Club (recycled water to supplement stormwater used to maintain horse racing tracks)</li> <li>and possibly in future Richmond Showground.</li> </ul> <p>Infrastructure within the HWRS is used to receive / harvest, store, transfer and treat reclaimed water and stormwater used for irrigation.</p> <p>The SWC-UWS agreement stipulates the supply of a minimum of 500 ML per year of reclaimed water, and approximately 250 ML of stormwater is harvested. The supply off-campus is expected to be of the order of 50-100 ML to the Racecourse and 20-50 ML</p>
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	of stormwater to Richmond TAFE.
If relevant, describe the infrastructure that already exists in relation to the activity	Substantive infrastructure is established throughout the HWRS, as shown in Attachment A. There is approximately 600 ML of total dam storage, with 7 major dams, two series of constructed wetlands, and approximately 15 km of transfer pipelines. A number of transfer and irrigation pumps are established across the Scheme along with associated power supplies, with a UV disinfection unit on that which supplies grounds irrigation.
Does infrastructure need to be constructed? If yes, what is needed and when is construction expected to commence?	No new infrastructure is needed for current operation, though there is a continuing program of redesign and upgrading of core transfer infrastructure.
When is supply/service expected to commence?	Supply to water users within the Campus is ongoing, while supply to the Hawkesbury Racecourse is planned to begin in April 2013 and supply of stormwater to Richmond TAFE is planned to resume later this year.

**ii. Will the applicant own the infrastructure? Tick the applicable box below.**

☒ **Yes**

☐ **No**

If No, then explain who will own the infrastructure and the nature of your arrangements for accessing the infrastructure.

**1(g) Where will the infrastructure be located and why have you chosen that location?**

- i. Provide details of the site(s) where the different components of the infrastructure will be located. (SEE APPENDIX A)

Site Number	Site Name	Location	Type of Operation
1	Hawkesbury Campus	Richmond	Transfer and supply of recycled water across the campus to water users as outlined above.
2	Transfer line to Hawkesbury Racecourse	From UWS lands across Hawkesbury Showground and under Racecourse Rd Richmond	To enable supply of recycled water from HWRS to drainage system and established stormwater storages of Hawkesbury Race Club.
3	Transfer line to Richmond TAFE	From UWS lands onto Richmond TAFE.	To enable supply of recycled water / stormwater from HWRS to storage dam of Richmond TAFE.

**Briefly describe why you chose this location for the infrastructure.**

The HWRS has developed across the Hawkesbury Campus over the past 30 years, building upon earlier storages used for stormwater harvesting, and enabling the transfer of reclaimed water used for the irrigation of agricultural / horticultural areas. In the 1990s, State Stormwater Trust funds and federal NHT funds enabled the establishment of a substantive stormwater harvesting component to the Scheme, which Richmond TAFE was involved in developing. In 2003, funding through the NSW Water Savings Fund enabled the construction of a 2.5 km supply line to link the HWRS with the Hawkesbury Race Club and Hawkesbury Showground. Recent infrastructure improvements by UWS have included the provision of supply lines and associated UV disinfection to throughout the historical precinct of the campus and student villas.

**1(h) Map of the activities to be licensed?**

Please attach a map of the area of operations for the activities to be licensed in an Appendix. The map should provide a locational schematic of any pipe networks and identify points of interconnection with any other infrastructure, the location of customers or end user(s), the surrounding land use(s) within 100m of the non-pipe network infrastructure and (where relevant) any application areas, and any sensitive receiving environment(s). Please clearly identify legal property boundaries and the location of your infrastructure. Refer to Appendix A.

**1(i) Interconnections to the infrastructure**

Provide the identity of each licensed retail supplier or public water utility that has access to the infrastructure for the purpose of supplying water or sewerage services to its customers	Sydney Water Corporation operates the infrastructure to transfer reclaimed water to the designated point of supply at the Turkey Nest Dam, north of Blacktown Rd and adjacent to the Richmond STP.
Describe any other water or sewerage infrastructure connected to the infrastructure, including information on the type and function of each interconnection and explicitly identify who owns/controls valves at the	Detailed cross connection audit and the implementation of a series of backflow prevention devices has been established across the Hawkesbury Campus to ensure there is no interconnection between potable and recycled water lines. The point of supply from the HWRS pipeline to the Racecourse is the metered end point of the HDPE pipeline where it discharges

boundary	into the racecourse stormwater drainage located on the Racecourse property just east of Racecourse Rd. The point of supply to Richmond TAFE is the metered end point of the HWRS pipework which discharges into the TAFE storage dam.
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### **1(j) Agreements with public water utilities or other network operators**

Provide a list of each licensed network operator or public water utility from whose water or sewerage infrastructure the applicant will supply water or sewerage services to its customers	Agreement for the supply of reclaimed water for irrigation purposes between UWS and Sydney Water (Appendix B).
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Please provide documentary evidence or outline of any agreements that you have obtained or intend to obtain to access water or sewerage services infrastructure to meet your anticipated customer needs in an Appendix.

### **1(k) Who are the customers/end users?**

i. **Provide details on customers/end users in the table below.**

Type of customers/end users (eg, commercial, industrial, agricultural, residential)	For each type of customer/end user describe how the water will be used	Location of customers/end users	Number of customers/end users	Expected water demand or sewage discharge (kL/day)
Hawkesbury Race Club	Off peak supply of recycled water to top up stormwater reserves used to maintain condition of racetrack, and potentially in future enable playing fields inside the racetrack area. Water use agreement established and risk management plan in preparation (refer Appendix C).	Hawkesbury Racecourse	1	Off peak supply during winter months of 50-100 ML @ 1,500 kL/day
Richmond TAFE	Supply of stormwater to support irrigation of paddocks and gardens. Water use agreement and risk management plan in preparation.	Richmond TAFE	1	20-50 ML/year
NSW Department of Primary Industry	Irrigation utilising UV disinfected reclaimed water as part of vegetable growing demonstration. Water use agreement established and risk management plan in preparation.	Dept PI enclosure, Yarramundi Paddocks, Hawkesbury Campus	1	70 ML/year
UWS Capital Works	Utilise UV disinfected recycled water to irrigate lawns and gardens.	Built footprint, Hawkesbury Campus	1	Approx. 100 ML/year
UWS School of Natural Sciences	Irrigation of agricultural and horticultural areas for research and teaching	Extensive paddocks, Horticulture	A few	250-500 ML/year

		precinct Hawkesbury Campus		
Greening Australia	Irrigation of production nursery. Water use agreement TBA and risk management plan in preparation.	Horticulture precinct	1	10-30 ML/year
Hawkesbury Skillshare	Irrigation of nursery used for plant production and gardening as therapy.	Horticulture precinct	1	5-10 ML/year
Taronga Zoo	Irrigation of eucalypt plantation (2) for koala food	Horticulture precinct, Clarendon	1	10-20 ML/year

Please also provide documentary evidence or outline any discussions or agreements you have or intend to have with intended customers/end users for the services to be provided by the infrastructure in an Appendix.

## ii. Commencement of retail services

When are retail services expected to commence? If the introduction of retail services is in stages, then describe each stage and its timing.	Water use agreements have been signed with Hawkesbury Race Club (external to campus) and NSW Dept Primary Industry (within Campus). Further water use agreements are planned for Richmond TAFE and other user groups. A procedure for monitoring and invoicing water users has been established within UWS. Supply provision to Dept PI has already commenced, and distribution amongst most water users within the Campus has been ongoing for a number of years. Supply to Hawkesbury Racecourse is planned to begin in April 2013. Supply of stormwater to TAFE is planned to commence in late 2010 with establishment of new water use agreement.
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**iii. Supply to small retail customers**

Are any of your customers “small retail customers” within the meaning of clause 5 of the General Regulation? If yes, please provide details.	No
Describe the arrangements you have made, or will make, to join an approved ombudsman scheme	N/A

**1(l) Contestable or monopoly supply**

Will the supply of water and/ or sewage services to customers be contestable or subject to monopoly supply?	The supply of recycled water through the HWRS is one option to water users, while potable water use or investment in further rainwater / stormwater harvesting on a case by case basis are alternatives. In cases such as the supply of recycled water to the Hawkesbury Racecourse this merely tops up established stormwater harvesting and provides flexibility to reduce potable water for some uses.
If you are a monopoly supplier, specify the water supply or sewerage service, the area, and class of customers.	Na

**1(m) Quantity of Water or Sewage**

**i. Does your activity promote the production and use of recycled water?**

If yes, explain how	Yes. The Hawkesbury Water Recycling Scheme is based upon risk management to manage two complementary sources of recycled water (reclaimed water provided from Sydney Water and storm water harvested locally). The aim of the Scheme is to ensure this recycled water can be used effectively for a broad range of non potable uses, including irrigation of agricultural and horticultural areas, landscape irrigation and playing fields, and supply back up for maintaining the condition of race course.
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## ii. What is the volume of water or sewage available or to be managed?

<p>For each source from which the water or sewage handled by the infrastructure is drawn:</p> <ul style="list-style-type: none"> <li>describe the quantity and type of water or sewage that will be taken</li> <li>ensure you identify where the water or sewage is being sourced from a public water utility</li> </ul>	<p>Reclaimed water is supplied to UWS from the Sydney Water Richmond STP under an established agreement for a minimum of 500 ML per year. The recycled water product supplied by SWC is treated to achieve the quality required to meet the ANZECC (2000) guidelines for unrestricted irrigation of municipal open space. The point of delivery to UWS is the pipeline discharging into the northern side of the UWS Turkey Nest Dam, adjacent to the Richmond STP.</p> <p>Stormwater from a catchment area of approx. 400 ha of the Hawkesbury Campus and neighbouring Hobartville suburb is harvested, with approx. 250 ML harvested per year.</p>
<p>If the capacity of the water or sewage source(s) is known, what is the capacity of the source(s) as total daily volumetric flow rate (kL per day) and as average and peak demand flow rate?</p>	<p>Average dry weather flow (ADWF) of the Richmond STP to UWS is generally 1.8 ML/day. This varies due to reduced throughput in summer and the diversion of reclaimed for the Richmond Golf Club prior to transfer to UWS. Currently, the SWC Priority Sewerage Program is establishing increased input to the Richmond STP which will increase the ADWF. Peak flow rates in wet weather increase to three times ADWF beyond which bypass operations occur and high wet weather volumes are transferred to the stormwater system (and HWRS).</p>
<p>What is the expected extraction rate from the source(s) (kL/day)?</p>	<p>As described above, the supply rate from SWC is discharge from pipeworks into the UWS Turkey Nest Dam.</p>
<p>How, and for how long, has access to the water or sewage source(s) been secured?</p>	<p>Partnership arrangements between UWS and SWC have a long history since the 1970s. Formal water use agreements between SWC and UWS were first instigated in the 1980s, and the current agreement for the supply of reclaimed water was July 2007 to cover the period 1<sup>st</sup> May 2006 to 30<sup>th</sup> April 2016.</p>
<p>How have you addressed any 'time of use' mismatch, such as ensuring you have the physical capacity to store and/or treat, if required, and distribute the water?</p>	<p>The HWRS has substantive storage capacity, and infrastructure improvements continue to improve access to stored volumes. Given the large volumes which can be utilised in agricultural production effort for water use budgeting are a continuing component of risk management planning. Supply agreements such as that with Hawkesbury Races is for 'offpeak' supply to utilise their storage and balance seasonal needs.</p>

Please provide documentary evidence or outline any agreements, authorisations, contracts or licences that you have obtained or intend to obtain to access water or sewage source(s) and relevant infrastructure to meet your anticipated customer needs in an Appendix.



## 1(n) Public Interest Considerations

### i. How does your proposed activity address the following principles (if applicable), as set out in section 7 of the WIC Act?

The protection of public health, the environment, public safety and consumers	<p>Risk management planning, as supported through:</p> <ul style="list-style-type: none"> <li>The UWS-SWC Agreement underpins the agreement for the supply of reclaimed water. This includes water quality monitoring and reporting, and communication and management protocols with SWC and water users, if a hazard arises.</li> <li>Development of HWRS Risk Management Plan and associated User Risk Management Plans in a manner consistent with the National Guidelines for use of recycled water. The development and implementation of consistent risk management plans these is being overseen by a HWRS Risk Management Working Group, with membership reflecting all user groups.</li> </ul>
The encouragement of competition in the supply of water and the provision of sewerage services	The HWRS provides recycled water as a viable alternative to the use of potable drinking water supplies for non potable uses.
The ensuring of sustainability of water resources	The management regime contributes to the transformation of urban waste water and stormwater into valued water resources, reducing pressure on limited drinking water resources, and reducing discharges to the environment. Water recycling thus contributes to water resource security, environmental protection, and a buffering capacity to the impacts of climate change.
The promotion of production and use of recycled water	The promotion and utilisation of recycled water is a key principle of the HWRS, which is grounded upon the effective and complementary use of reclaimed water and stormwater.

### ii. Have you identified and addressed any other public interest considerations in developing your proposed activity?

If so, discuss these other considerations in relation to the activity	The HWRS provides a platform for a diverse range of water and land uses associated with the teaching and research roles of the University of Western Sydney. This role includes the development of partnership arrangements with State agencies (e.g. NSW Dept of Primary Industry), utility corporations (e.g. Sydney Water Corporation), regional commercial interest (e.g. Hawkesbury Racecourse, Greening Australia and Taronga Zoo) and local community organisations (e.g. Hawkesbury Skillshare).
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## 1(o) Stakeholder Considerations

Describe the stakeholder consultation processes you have undertaken, and any future public and government consultation that will be undertaken	<p>UWS liaise with Sydney Water, who has provided a dedicated contact, along with yearly reporting.</p> <p>Along with ongoing communication with all water users on a needs basis a newly formed Risk Management Working Group will provide a forum for discussion across all water use interests and incorporation of these views in our formal risk management planning.</p> <p>Applied research support from the UWS School of Science &amp; Health has focused on risk communication across both active water users and passive user groups (e.g. students and nearby residents).</p>
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**1(p)     *Additional information (optional)***

Is there any additional information you believe is relevant to your licence application that you have not already provided in response to any other question in this application form?

If so, please provide this information here

## Part 2: Technical Capacity

You are required to demonstrate that you have, and will continue to have the technical capacity to carry out the activities to be licensed, in accordance with section 10(4) of the WIC Act.

You must attach any additional information or supporting documentation in response to a question in the Application Form in an Appendix referenced Appendix A, B, C etc, with a title corresponding to the question. For example, your response to question 2(a) would be titled "Appendix X – Experience as a Network Operator and Retail Supplier".

### ***2(a) Experience as a Network Operator and Retail Supplier***

- i. **Do you have prior experience in the construction, maintenance and operation of water infrastructure or a utility business?**

Describe your corporation's current experience in the construction, maintenance and operation of water and/or other utility services, such as gas, electricity, and telecoms?

UWS operates across 6 major campus sites in Western Sydney with additional smaller sites across NSW. Supporting the operational and campus planning functions within UWS, Capital Works and Facilities manages a capital project budget of approximately \$100 million pa and an overheads budget of approximately \$20 million pa. Operations cover more than 500 buildings with all associated utility services.

<p>Does the CEO or do any of the Directors hold relevant professional qualifications or industry experience, particularly in the water industry?</p> <p>Please provide details including responsibilities, key outputs/achievements and evidence suitable for assessment of currency of that experience</p>	<p>The Executive staff and Trustees of UWS hold extensive experience in corporate, academic, and political spheres.</p> <p>The Director of Capital Works and Facilities, Mr John Bonanno, has extensive corporate and management experience. His position involves the management and administration of the capital works programs for the University and maintenance of all buildings, structures and facilities at all University of Western Sydney 11 campuses.</p>
<p>Please provide the relevant skills, qualifications and experience required of key personnel involved in the activities to be licensed</p>	<p>The Hawkesbury Water Recycling Scheme has been operating for over 30 years with oversight of infrastructure development by Capital Works &amp; Facilities.</p> <p>The operation of the Scheme comes under the portfolio of Dr Roger Attwater, Senior Manager, Environment and Risk. Dr Attwater has provided management support for the HWRS for the past 10 years, and has over 20 years experience in aspects of integrated catchment management. His qualifications include Honours degree in Agricultural Science and a Masters degree in Natural Resource Management from the University of Western Australia, and a PhD focusing on participatory catchment management from the Australian National University. Project management and operational responsibilities are overseen by Dr Lyn Anderson, Environmental Supervisor. Dr Anderson has a PhD from the University of Western Sydney which focuses on the geographic site of the Hawkesbury Campus.</p>

**ii. Do you have prior experience in the water industry /utility retailing?**

<p>Describe your corporation's water industry/ utility retailing experience, both in Australia and overseas</p>	<p>UWS has substantive experience in supporting the water industry through its research activities such as the CRC for Irrigation Futures. A core activity is not utility retailing, though current initiatives are being implemented to recover utility costs from lessees and commercial entities associated with UWS.</p>
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Describe the knowledge, expertise, qualifications and experience of key personnel involved in the operation and management of a utility retailing business	Na
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## 2(b) infrastructure?

## *What is the design of the*

Describe the process to be used to extract and/or treat water or sewage.	A quality assured recycled water product is supplied to UWS from Sydney Water Corporation into a first storage, which operates as a critical control point to isolate distribution if issues of treatment arise. Further treatment occurs within storage dams through natural processes, and monitoring points are established for the product supplied from these storages. Where recycled water is to be applied to landscape and garden areas of the main campus, UV disinfection of the water occurs subsequent to the last storage and prior to distribution and irrigation.
Describe, in bullet point form, the design of the infrastructure, including details of the life-span and system redundancy built into the infrastructure or system	<ul style="list-style-type: none"> <li>Storage dams and constructed wetlands have been installed over the past decades. Older dams have had geotechnical assessment undertaken over the past 18 months to determine any required structural remediation.</li> <li>Transfer pipelines include a range of types, with new pipes being HDPE with appropriate lilac stripe for recycled water. Older pipelines on the campus include those constructed of asbestos cement for which there is an ongoing program of replacement with HDPE.</li> <li>Pump infrastructure is being upgraded as part of a program of infrastructure improvement, along with appropriate electrical supplies and further treatment required (eg UV disinfection). A range of pump types across the Scheme are being upgraded based on priority of need, with a general design approach being a clear separation of transfer and irrigation function, and a preference for modular submersible pumps with variable speed drives to enable flexibility in volumes and pressure needs. A maintenance contract has been put in place to test all pumps and associated infrastructure.</li> </ul>
Is the process common industry practice? If not, please outline: <ul style="list-style-type: none"> <li>what aspects of the design or proposed operation are "innovative" by current industry standards;</li> <li>the research and development that has been undertaken in</li> </ul>	<p>Redesign of the infrastructure over the past few years has been undertaken utilising a leading irrigation design company Hydroplan Pty Ltd, to ensure modern functional and robust design. Continuing standardisation of design elements is being implemented, as while the infrastructure represents common industry practice, this has continued to change over the lifetime of the Scheme.</p> <ul style="list-style-type: none"> <li>The major aspect of innovative design is the combined utilisation of reclaimed water and stormwater, enabling flexibility in managing the supply dynamics of each, the</li> </ul>

<p>designing the process; and</p> <ul style="list-style-type: none"> <li>the validation and/or testing of the process in live operation, including the applicability to the particular quality characteristics of the water/sewage inputs and outputs of your activities.</li> </ul>	<p>water quality interactions, and a range of engineered and natural treatment processes in differentiated treatment trains.</p> <ul style="list-style-type: none"> <li>Research and development over the past decade has been considerable. The previously established supply of reclaimed water from a 1950s trickling filter STP has been updated with a state of the art IDAL treatment plant by Sydney Water; the addition in the late 1990s of \$4 million of stormwater harvesting and treatment to the Scheme; the establishment of a substantive ongoing program of capital works and expansion with associated redesign and upgrade; and the utilisation of a range of research projects to complement design and management (including 2 PhDs, one on stormwater harvesting and one on soil sustainability, and a portfolio of research associated with risk management and communication).</li> <li>Validation of processes is ongoing, with a standard system of water quality monitoring and critical control points for water supplied from each major storage within the system. All current infrastructure design is independently designed with construction QAs and commissioning to ensure design specifications are met. Risk management Plans are currently being developed with each water user so that these are consistent with overall risk management planning for the Scheme while being particular to the types of operations undertaken by each water user. Examples are shown in Appendix D.</li> </ul>
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Please provide a process flow diagram of the scheme (from source to end use), and identify the Critical Control Points in the process, specifications of key units and design, and a copy of any independent validation of process or value engineering assessment of the design and/or its suitability for use in the proposed activity to be licensed (if available) in an Appendix.

**2(c) *If applicable, what arrangements have been or will be made in relation to the construction of the infrastructure?***

Outline the timeframe and key milestones for the construction of the infrastructure.	<p>There is an ongoing program of infrastructure redesign and upgrade. Examples include:</p> <ul style="list-style-type: none"> <li>• Supply pipeline to Hawkesbury Racecourse implemented and commissioned in 2008, with final reporting to DECCW who funded this in June 2010.</li> <li>• Automated transfer line to Horticulture Precinct constructed and commissioned in 2009.</li> <li>• Supply lines, UV disinfection and irrigation systems for historical precinct and student villas implemented and commissioned in 2009-2010.</li> <li>• Upgrade of electrical supply to Turkey Nest Dam, implemented in 2010.</li> </ul>
Are any aspects of the proposed project contingent on future events? If so, please explain.	<p>Current design of irrigation application in particular areas of the Scheme are contingent upon the planning for research and development associated with subsurface irrigation by the School of Natural Sciences. This is a positive contingency, so that infrastructure development occurs in parallel with associated research development.</p>

**2(d) *Risk analysis and management***

**i. What events or circumstances could prevent you from carrying out the activity?**

Note: You are not required to provide the information requested in 2(d)(i) if your application is in relation to sewerage infrastructure and that infrastructure is the subject of a licence under the Protection of the Environment Operations Act 1997.

List the events and circumstances that could prevent you from carrying out the activities for which you are seeking the licence for the whole or any part of your operations	<p>Current risk management planning covers aspects of public health, environment, and resource security. General aspects identified include the following:</p> <ol style="list-style-type: none"> <li>1. Public health issue associated with water quality incident;</li> <li>2. Environmental impacts on lands and downstream;</li> <li>3. Resource scarcity due to insufficient capacity for user needs.</li> </ol>
What is the probability of the occurrence of any such event or circumstance?	<p>The probability of all these events resulting in substantive disruption is low as long as appropriate risk controls are maintained, along with vigilance of monitoring and effective management responses when a potential incident is identified.</p>
What measures are to be implemented to prevent or minimise the likelihood of any such event or circumstance or the impact of such event on the continuity of supply	<ul style="list-style-type: none"> <li>• Monitoring and management of critical control points for the supply of recycled water;</li> <li>• Ensuring compliance with water quality guidelines through quality of supply, additional treatment requirements, type of application used, and associated uses.</li> <li>• Risk management through induction and training, appropriate signage and plumbing standards, risk communication strategies with water users.</li> <li>• Standard operating procedures for field operations, infrastructure design and commissioning, water use budgeting across water users, and incident responses.</li> </ul>



**ii. What processes have been or will be implemented to ensure continuity of supply/service and secure alternative water supplies or sewerage services?**

What arrangements have been or will be implemented to ensure continuity of supply/service delivery?	<ul style="list-style-type: none"> <li>• Ongoing infrastructure improvement and maintenance.</li> <li>• Established suite of water quality monitoring at critical control points.</li> <li>• Established protocols for incident communication and management response between UWS and Sydney Water, and water users.</li> <li>• Risk management planning with all water users overseen by risk management working group.</li> <li>• Water use budgeting incorporating both reclaimed and stormwater supplies.</li> </ul>
What arrangements have been or will be made to secure alternative water supplies or sewerage services when the infrastructure is inoperable?	<ul style="list-style-type: none"> <li>• Maintenance contracts to ensure supply interruption is kept to a minimum.</li> <li>• Flexibility in infrastructure design to enable transfer from reclaimed water or stormwater to ring main arrangements of multiple storages.</li> <li>• Autofilling controls to ensure each storage is optimally filled to provide capacity if transfer and supply needs to be shut down.</li> </ul>

Please provide your risk management policy and risk management plan (including risk register) and documentary evidence of any agreements or discussions with other service providers to secure alternative water supplies or sewerage services in Appendix E.

**2(e) How will the infrastructure be maintained and operated?**

Describe the arrangements made for the maintenance, monitoring and reporting of standards of service for the infrastructure	<ul style="list-style-type: none"> <li>• Infrastructure condition is assessed on a continuing basis in relation to ongoing needs by technical staff and water users (both on an ongoing operational basis and through the risk management working group). This informs the priority works addressed through capital works, and triggers the utilisation of specialist designers to identify appropriate upgrades and provide quality assurance checks and commission new infrastructure.</li> <li>• A maintenance regime including the inspection of pumps and replacement of elements such as UV units, is now established through standard Capital Works hydraulic maintenance contracts. The standards of service for these maintenance contracts is monitored through the Maintenance Planning section of Capital Works.</li> <li>• See Appendix F for more information</li> </ul>
Describe arrangements for the continued safe and reliable performance of the infrastructure, including the arrangements for the renewal of the infrastructure	<ul style="list-style-type: none"> <li>• New infrastructure is designed for robust and flexible performance. An ongoing program of infrastructure renewal is funded through UWS capital projects, along with maintenance needs funded through overheads associated with environmental assets.</li> </ul>

Please attach a copy of your infrastructure operating plan (if available) to support your answers to the questions above in an Appendix.

## 2(f) How will you protect public health, water quality and the environment?

If the water to be supplied is drinking water, how will the 12 elements of the framework for the management of drinking water quality, as detailed in the Australian Drinking Water Guidelines, be addressed, implemented and maintained? Please provide an example or detailed description of your processes.	Na
If the water to be supplied is non-potable water, how will the 12 elements of the framework for the management of recycled water quality and use, as detailed in the Australian Guidelines for Water Recycling, be addressed, implemented and maintained? Please provide an example or detailed description of your processes.	The 12 framework of the 2006 national guidelines will be addressed through being followed as the structure of the Risk Management Plans currently being prepared for the Scheme as a whole and for each major water user. These elements have already been substantively addressed in different structures through the 2002 HWRS Environmental Management Plan (based upon an ISO 14000 Environmental Management System), and the 2012 UWS-SWC Agreement. The 12 point structure will combine and build upon these.
If the water to be supplied is non-potable water, what purposes will the water be used for and what purposes will the water not be used for (as determined in accordance with the 12 elements of the framework for the management of recycled water quality and use in the Australian Guidelines for Water Recycling)?	The recycled water, comprising reclaimed water and stormwater, will be used for irrigation of grounds within the University (ie urban recreational and open space), and irrigation for agricultural and horticulture. Dams containing recycled water are identified for the Rural Fire Service, so there is some possibility of use for fire protection, but not as a major component of fire protection systems for buildings. It will not be used for residential garden watering, car washing, toilet flushing or clothes washing, nor for industrial uses including cooling.
If the infrastructure involves treatment infrastructure or results in discharge of waste (including due to potential infrastructure failure), what arrangements have been made or will be made for the disposal of waste from the infrastructure? In the case of sewerage services, if effluent disposal is via subsurface irrigation, please discuss how you will address, implement and maintain the components detailed in DECCW's <i>Environment Guidelines: Use of effluent by Irrigation (2005)</i> to dispose of the effluent in a sustainable manner.	Discharges and application are managed through multiple barrier strategies. Discharges of reclaimed water due to wet weather or process bypass are captured and diluted as stormwater, which is then either treated via wetlands for reuse or discharge as environmental flows. During high rainfall events a pulse of environmental flow dilutes the reclaimed water and stormwater during discharge. Application for surface irrigation, and future plans for subsurface irrigation, are monitored in relation to loading rates and soil conditions, and discharges from perched groundwater into surface drainage is captured in the stormwater system for additional treatment and reuse.
If the infrastructure conveys, treats or disposes of sewage, in what manner will health and ecological assessments be undertaken and how will any concerns arising from such	Assessments relating to health and ecological risks have and continue to be undertaken by UWS researchers in parallel to management of the Scheme, with implications incorporated as part of adaptive management. Comprehensive risk assessments are being undertaken for both the Scheme in general, and for each particular water user in relation to the type of activity

assessments be addressed?	undertaken.
Please identify any potential environmental impacts of the activities to be licensed and provide details of how these activities would be conducted in a manner that would not present a significant risk of harm to the environment	Identified impacts on downstream environments relate to the levels of sodicity, marginal salinity, and turbidity of discharges of environmental flows. While water reclaimed from sewerage contributes to this, the local soils are inherently sodic, contributing to dispersive clays and turbidity. In general, the stormwater system is managed in a manner which mimics the hydrology of the original ecology.

Please attach a copy of your Preliminary Risk Assessment and, if available, your drinking water management plan, recycled water management plan or sewerage management plan in an Appendix. This documentation will be provided to NSW Health for review and assessment.

## **2(g) Management systems**

### **i. What processes and systems are in place (or will be implemented) for managing your interface with other service providers?**

What procedures have you implemented (or will you implement) to manage communication with other service providers?	A number of ongoing procedures are outlined in the 2005 Environmental Management Plan, associated Standard Operating Procedures, and the agreement with Sydney Water Corporation. These outline communication protocols with both Sydney Water and water users. Recently, a Risk Management Working Group has been established with representatives from all water users and key interest groups to oversee the development and implementation of Risk Management Plans.
Describe your dispute management protocol or proposed arrangements with other service providers	Formal means for discussion, auditing and reporting, and incident management with Sydney Water are set out in the SWC-UWS Water Use Agreement. Arrangements with water users is being formalised through Water Use Agreements along with opportunity for liaison and problem solving through the newly formed Risk Management Working Group.

Please attach a copy of your Dispute Management Protocol (if developed) in an Appendix.

**ii. What processes and systems are in place (or will be implemented) for managing your interface with customers?**

Describe your corporation's customer service policy, protocols and/or how you will ensure an appropriate standard of customer service	UWS and Capital Works & Facilities has clear professional standards and processes in relation to clients both within and external to the University. Formal agreements often provide the basis for business interactions, and in this case the Risk Management Working Group will provide an important locus for common communication and transparency.
Outline your process for establishing and maintaining customer accounts	UWS has clear financial processes along as those processes associated with procurement and probity, and internal audit. CWF has a sophisticated system for managing the finances relating to UWS overheads, Capital program and operations budgets.
Briefly describe your billing and collections process and systems	Billing will be undertaken by UWS Finance through the Oracle Financial Systems (see diagram in Appendix G)
Describe the arrangements you have made or propose to make in relation to complaint and debt recovery procedures	UWS has established procedures for general financial matters. In relation to water use and charging, these will be mediated through UWS legal staff interpretation of water use agreements and due process in following through issues should they arise. In most cases these will be managed at an operational level through the Environment and Risk Management Unit and the HWRS Risk Management Working Group.
Describe the arrangements you have made or propose to make in relation to any marketing activities	UWS has a separate marketing and public affairs unit who undertake and guide any marketing activities in a manner consistent with UWS policy and procedures.
Describe the arrangements you have made or propose to make for meter reading	A procedure has been established by the CWF Finance and Business Support Unit for quarterly reading of meters and subsequent invoices raised through standard UWS financial systems.

Describe any quality assurance systems, processes and certifications that you have implemented or obtained. Copies of Quality Assurance Certification should be provided where applicable	While not certified UWS has an Environmental Management System based upon ISO 14000 series, and CWF has a Quality Management System for procedures based upon ISO 9000 series. An associated document for the UWS-SWC Agreement is the 2005 Environmental Management Plan which has a structure which reflects an ISO 14000 EMS.
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Please attach a copy of your customer service charter, statement or policies in an Appendix.

**iii. What approvals have you obtained to ensure you can comply with NSW regulations?**

Is development consent necessary for the activity? If no, please provide details indicating why not If yes, and development consent has not been granted, please indicate when development consent is likely to be sought or obtained and who is the consent authority	Development Consent is not necessary. The Hawkesbury Water Recycling Scheme is an ongoing and functioning Scheme. For extension of the Scheme to supply the Hawkesbury Racecourse, informal written feedback was gained from Hawkesbury Council as the supply lines were bored under a minor road from one property to the other.
Briefly describe any other approvals that you have obtained or will obtain for the activity	The major ongoing approval is with Sydney Water as per the water use agreement for the supply of a recycled water product and the necessary management, reporting and auditing undertaken for this purpose. We understand that the Hawkesbury Water Recycling Scheme historically had a licence with the EPA, however when the licensing branch of EPA moved to Newcastle around 2000 the UWS licence was reviewed by EPA and UWS was notified that the licence was not necessary and therefore discontinued. The reasoning behind this was that the broader regulation was captured through our agreement with Sydney Water.

Please attach copies of any relevant approvals you have obtained in an Appendix.

**iv. What internal compliance monitoring and reporting procedures are in place (or will be implemented) to manage compliance with a Network Operator's and Retail Supplier's Licences, the WIC Act and regulations, and other regulatory requirements?**

What internal compliance monitoring and reporting procedures are in place (or will be implemented) to manage compliance with your regulatory requirements?	As per agreed procedures with Sydney Water Corporation, water and soil monitoring, reporting on incidents and in relation to management themes is undertaken. Further UWS compliance reporting is undertaken for procurement and project management for infrastructure development, maintenance systems, and incident reporting. Risk assessment is undertaken along with internal audits.
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Please attach a copy of your Compliance or Regulatory Management Strategy and documentary evidence of a performance management framework in an Appendix.

## Part 3: Organisational Structure and Capacity

You must attach any additional information or supporting documentation in response to a question in the Application Form in an Appendix referenced Appendix A, B, C etc, with a title corresponding to the question. For example, your response to question 3(c) would be titled "Appendix X – How have you allocated resources for the construction, commissioning, management and operation of the facility?".

### 3(a) Are you a disqualified corporation?

Under section 10(3) of the WIC Act, a licence may not be granted to a disqualified corporation.  
Are you a disqualified corporation?

☐ Yes  
☒ No

If no, please complete and attach in an Appendix the statutory declarations at Part 5 of this Application Form stating that the applicant corporation is not a disqualified corporation and that no director or person concerned in the management of the applicant corporation is or would be a disqualified individual within the meaning of the WIC Act. Unless agreed otherwise with IPART, the statutory declarations should be made by the Chief Executive Officer and a director of the applicant corporation (or where this is not possible, one statutory declaration can be provided by the sole director and Chief Executive Officer).

### 3(b) What is the structure of the applicant corporation?

List the corporations that own the applicant corporation, or hold an interest in it	Corporation Name	ACN
	University of Western Sydney	014 069 881

What other related entities, which are relevant to the activities, does the applicant own or hold an interest in?	Corporation Name	ACN

Please attach an organisational diagram in an Appendix. The diagram should clearly show all corporations that own your corporation, and all corporations that your corporation owns or holds an interest in.

### 3(c) *How have you allocated resources for the construction, commissioning, management and operation of the facility?* (Network Operator licence only)

Outline your Resourcing Plan for the activity to be licensed	Resourcing for the operation, maintenance and infrastructure improvements are addressed through components of the CWF Environment and Risk Unit's Business Plan. Management support is addressed through the responsibilities of the Environmental Supervisor and the Technical Field Officer positions. Maintenance, monitoring and related management actions are funded through UWS Overheads. Sections of the Environment & Risk Unit's Business Plan and CWF Organisational Structure are attached in Appendix F.
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Please attach the detailed Resourcing Plan for this activity in an Appendix.

## Part 4: Financial Capacity

You must attach any additional information or supporting documentation in response to a question in the Application Form in an Appendix referenced Appendix A, B, C etc, with a title corresponding to the question. For example, your response to question 4(a) would be titled "Appendix X – What is the applicant corporation's financial history?".

### **4(a) What is the applicant corporation's financial history?**

Does your corporation have a financial history? If not, explain why	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>
Summarise the performance of your corporation over the past 3 years	Under statutory requirements the NSW Audit Office, Level 15, 1 Margaret St, Sydney 2000 are our auditors.
If applicable, what is your corporation's credit rating?	University of Western Sydney was established under University of Western Sydney Act 1997 as a body corporate and is a corporation under Sec 57A of the Corporations Act 2001
Provide details of your debt/equity finance and any debt covenants on existing borrowings	

Where the applicant is an existing corporation, please provide the following documents in an Appendix:

Financial statements for the last three (3) years. It is preferable that these financial statements are audited. It is recognised that not all corporations are required to have their annual financial statements audited. However, where you are required to lodge audited financial statements with the Australian Securities and Investments Commission (ASIC), provide copies of these statements. (Note: consolidated accounts for the parent organisation or group to which the applicant corporation belongs would not be considered acceptable);

Where the latest annual financial statements are more than three (3) months old, the latest available management reports showing:

- a trading statement
- a profit and loss statement, and
- a trial balance.

Copies of tax returns for the last three (3) years.

Credit rating memorandum (e.g., Standard & Poor's, Moody's or Fitch), if available.

### **4(b) What is the projected financial performance of the proposed activities?**

Summarise the projected cash flows (net EBITDA), including key financial modelling assumptions, such as capex, for the first 5 years of operation (at minimum). If necessary, a longer period may be provided to demonstrate financial viability of the project	
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Please attach the following documents in an Appendix:

Projected cash flows for a minimum of the next five (5) years of operation (including projected closing balance sheets and profit and loss statements), taking into account the licensing agreements, with details of all key financial modelling assumptions.

#### **4(c) How will the applicant corporation finance the proposed activity?**

Describe the mechanisms by which your activities are financed or to be financed	Commonwealth and State government grants together with self funding
Please provide details of any financial guarantees or commitment of financial support	As above

Please provide, in an Appendix, a letter from a financial institution (being a bank, credit union or the government) confirming indicative financing of your activities, including:

the nature of finance (eg, bridging, long term, corporate debt, government funding)

type and limit of the facility

type and limit of any guarantee, and

terms and conditions.

Where the applicant is a new corporation, supported by one or more parent entities, also provide:

a copy of guarantee or cross deed of indemnity provided by the parent entity, and

financial statements for the parent entity for the last three (3) years.

Where the applicant is a new corporation financed through alternative arrangements (eg, debt or equity), also provide:

letter from financial institution (e.g., bank, credit union or the government) certifying an existing or proposed line of credit or financial support, and

a copy of guarantee or cross deed of indemnity provided by an entity such as a holding company or Director (provide financial statements providing the financial viability of the guarantor).

#### **4(d) Do you have appropriate insurance arrangements in place?**

What types of insurance do you have or intend to obtain?  Indicate the level (i.e. amount) of insurance you are covered or intend to be covered by for each type  Provide details of itemised inclusions and exclusions for each type of insurance you hold	Type of Insurance	Level and extent of Cover
	<input type="checkbox"/> Professional Indemnity Insurance <input type="checkbox"/> Public Liability Insurance <input type="checkbox"/> Workers' Compensation <input type="checkbox"/> Products Liability Insurance <input type="checkbox"/> Other [Please describe]: _____	\$20.0m each & every claim, but limited to \$80.0m in the aggregate. \$20.0m any one occurrence. All statutory requirements. \$20.0m in the aggregate.

Explain how the level of cover provided or proposed by your insurer is sufficient for the size and nature of your proposed activities	University's Division of Finance undertakes tenders to insurance brokers who then professionally advise the University regarding the appropriate insurance requirements
Have you ever applied for insurance, and had your application refused?  If so, provide details of the activity and the reasons why insurance was refused	No
Is the insurance company appropriate to insure this project?	Yes, Unimutal, our insurer is a substantial and successful insurer (refer Appendix G)

Please attach a certificate of currency for each type of insurance you hold in an Appendix. If this is not provided at the time of application, it will need to be provided prior to commercial operation.

#### **4(e) Do you have an accountant and external auditor?**

Does your corporation have an accountant?  If yes, what are your accountant's contact details?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  <b><u>Mahain Jayaram</u></b> , Accountant, Tax & Insurance, University of Western Sydney
Does your corporation have an external auditor?  If yes, what are your external auditor's contact details?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  NSW Audit Office, Level 15, 1 Margaret St, Sydney 2000
If required, may we contact your accountant and/or external auditor to clarify any information provided?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

#### **4(f) Are there any events that could affect your future financial capacity?**

Are there any events that could affect your corporation's future financial capacity?

Please tick the appropriate boxes and, if applicable, provide details of all such events relevant to your corporation for the last three (3) years from the date of this application. You must tick at least one box.

- ☐ Government or other investigation of the corporation or related entities
- ☐ Any significant change in the financial position of the applicant corporation since the financial statements provided with this application
- ☐ Contract terminated
- ☐ Factors which might impact on your corporation such as significant litigation, business commitments, contingent liabilities, collections by debt collection agencies on behalf of creditors or liquidation proceedings
- ☐ Any outstanding tax liabilities
- ☐ Any other particulars which are likely to adversely affect your corporation's capacity to undertake the services under the licence (if granted)
- ☒ No adverse information on the applicant corporation

## Part 5: Statutory Declaration & Acknowledgment

You must attach any additional information or supporting documentation in response to a question in the Application Form in an Appendix referenced Appendix A, B, C etc, with a title corresponding to the question. For example, your response to question 5(a) would be titled "Appendix X - Is the information that you have provided true and correct?".

### ***5(a) Is the information that you have provided above true and correct?***

Provide a statutory declaration from:

- (a) the Chief Executive Officer and a director of the applicant corporation; or
- (b) the sole director and Chief Executive Officer of the applicant corporation; or
- (c) such other person that IPART agrees may provide the statutory declaration/s;

to the effect that the information provided in the application is true and correct. For the purposes of Part 3 of this application form, the statutory declaration should also state that the applicant corporation is not a disqualified corporation and that no director or person concerned in the management of the applicant corporation is or would be a disqualified individual within the meaning of the WIC Act.

I, do solemnly and sincerely declare that:

1. We the Vice Chancellor and Director of Capital Works and Facilities, University of Western Sydney of the applicant (named in the application form accompanying this declaration);
2. The information provided in this application is true and correct to the best of my knowledge;
3. I am aware of the requirements under the *Water Industry Competition Act 2006* (NSW) (WIC Act) for the licence being applied for;
4. The applicant corporation is not a disqualified corporation within the meaning of the WIC Act;
5. No director or person concerned in the management of the applicant corporation is, or would be, a disqualified individual within the meaning of the WIC Act; and
6. I have the authority to make this application on behalf of the applicant (named in the application form accompanying this declaration);

and I make this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the *Oaths Act 1900* (NSW).

Name of person making the declaration: Professor Janice Reid

Title of person making the application: Vice Chancellor, University of Western Sydney

Signature of person making the declaration: \_\_\_\_\_

Declared at *[place]*: \_\_\_\_\_

On *[date]*: \_\_\_\_\_

Name of person making the declaration: Mr. John Bonanno

Title of person making the application: Director Capital Works and Facilities, University of Western Sydney

Signature of person making the declaration: \_\_\_\_\_

Declared at *[place]*: \_\_\_\_\_

On *[date]*: \_\_\_\_\_

In the presence of: \_\_\_\_\_

Signature of witness: \_\_\_\_\_

Title of witness: \_\_\_\_\_

*[Justice of the peace, Solicitor, other (specify)]*

## **5(b) Acknowledgement**

An acknowledgement should be provided by:

- (a) company secretary and a director, or
- (b) 2 directors, or
- (c) in the case of a sole director, the sole director, or
- (d) such other person that IPART agrees may provide the acknowledgement.

The applicant (named in the application form accompanying this acknowledgement) agrees to IPART furnishing a copy of the applicant's completed application form, including any confidential information contained in that application form, to:

the Minister administering the *Water Industry Competition Act 2006* (except Part 3)

the Minister administering the *Public Health Act 1991* (NSW)

the Minister administering Chapter 2 of the *Water Management Act 2000* (NSW)

the Minister administering the *Environmental Planning and Assessment Act 1979* (NSW), and

the Minister administering the *Protection of the Environment Operations Act 1997* (NSW),

in accordance with section 9(1) of the *Water Industry Competition Act 2006* (NSW) and clause 17 of the *Water Industry Competition (General) Regulation 2008* (NSW).

In the interest of expediting the processing of your application, would you please indicate below whether you agree to a copy of your completed application form (including any confidential information contained in that application form) being provided on a confidential basis directly to relevant departmental staff with responsibility to advise the Ministers named above on issues relating to the provision of water and sewerage services.

☒ I **agree** that a copy of my completed application form (including any confidential information contained in that application form) may be provided to relevant departmental staff as outlined above.

☐ I **do not agree** that a copy of my completed application form (including any confidential information contained in that application form) may be provided to relevant departmental staff as outlined above.

Name of person making the acknowledgement: \_

Professor Janice Reid

Title of person making the acknowledgement: \_

Vice Chancellor, University of Western Sydney

[Director / Company Secretary]

On [date]: 2013

Mr. John Bonanno

Title of person making the acknowledgement: \_

Director Capital Works & Facilities, University of Western Sydney

[Director / Company Secretary]

On [date]: 2013



# Pre-Lodgement Checklist

Use the following checklist to check that your Application Form has been completed correctly.

Item	Completed / Included?	Confirm Complete [Office Use Only]
<b>Part One: Introduction</b>		
Has the application fee been included with the application?	<input type="checkbox"/>	<input type="checkbox"/>
Have parts 1 (a) to 1 (p) of the Application Form been completed?	<b>X</b>	<input type="checkbox"/>
Have the following supporting documents been labelled and attached in an Appendix?		
<ul style="list-style-type: none"> <li>Map of the area of operations for the activities to be licensed</li> </ul>	X	<input type="checkbox"/>
<ul style="list-style-type: none"> <li>Documentary evidence of any agreements or discussions with other service providers to secure alternative water supplies or sewerage services</li> </ul>	X	<input type="checkbox"/>
<ul style="list-style-type: none"> <li>Documentary evidence or outline any discussions or agreements you have made or intend to make with intended customers/end users for the services to be provided by the infrastructure (where these exist at the time of application)</li> </ul>	X	<input type="checkbox"/>
<ul style="list-style-type: none"> <li>Documentary evidence or outline of any agreements, authorisations, contracts or licences that you have obtained or intend to obtain to access water or sewage source(s) and relevant infrastructure to meet your anticipated customer needs</li> </ul>	X	<input type="checkbox"/>
<b>Part Two: Technical Capacity</b>		
Have parts 2 (a) to 2 (g) of the Application Form been completed?	X	<input type="checkbox"/>
Have the following supporting documents been labelled and attached in an Appendix?		
<ul style="list-style-type: none"> <li>Process flow diagram of the scheme (from source to end use)</li> </ul>	X	<input type="checkbox"/>
<ul style="list-style-type: none"> <li>Independent validation of process or value engineering assessment of design (if available)</li> </ul>	X	<input type="checkbox"/>
<ul style="list-style-type: none"> <li>Risk management policy and risk management plan (including risk register)</li> </ul>	X	<input type="checkbox"/>
<ul style="list-style-type: none"> <li>Infrastructure operating plan (if available)</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> <li>Preliminary Risk Assessment (to be provided to NSW Health)</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> <li>Drinking water management plan, recycled water management plan or sewerage management plan, as relevant to your proposed activity (if available)</li> </ul>	X	<input type="checkbox"/>

Item	Completed / Included?	Confirm Complete [Office Use Only]
<ul style="list-style-type: none"> <li>Dispute Management Protocol (if available)</li> <li>Customer service charter, statement or policies</li> <li>Copies of any relevant environmental, planning or other approvals</li> <li>Compliance or Regulatory Management Strategy, including documentary evidence of a performance monitoring framework</li> </ul>	<input type="checkbox"/> <input type="checkbox"/> X X	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>Part Three: Organisational Structure and Capacity</b>		
Have parts 3 (a) to 3 (c) of the Application Form been completed	X	<input type="checkbox"/>
Have the following supporting documents been labelled and attached in an Appendix?		
<ul style="list-style-type: none"> <li>Statutory Declarations (refer to Part 5 below) that your corporation is not a disqualified corporation and no director or persons concerned in the management of your corporation is or would be a disqualified individual</li> <li>Organisational Diagram of your corporation, including the corporations that own your corporation, and the corporations that your corporation owns or holds an interest in</li> <li>Detailed Resourcing Plan</li> </ul>	X X X	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>Part Four: Financial Capacity</b>		
Have parts 4 (a) to 4(f) of the Application Form been completed?	X	<input type="checkbox"/>
Have the following documents been labelled and attached in an Appendix?		
<ul style="list-style-type: none"> <li>Financial statements for past 3 years (preferably audited)</li> <li>Where annual financial statements are more than 3 months old, the latest available management reports showing: a trading statement, a profit and loss statement and a trial balance.</li> <li>Copies of tax returns for the last 3 years</li> <li>Credit rating memorandum (Standard &amp; Poor's, Moody's, Fitch), if available</li> <li>Projected cash flows for the next 5 years of operation</li> <li>A letter from a financial institution confirming indicative financing of your activity</li> <li>A certificate of currency for each type of insurance obtained</li> <li>Details of itemised inclusions and exclusions for each type of insurance you hold</li> </ul>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>If you are a new corporation, supported by 1 or more parent entities, have the following documents been</b>		

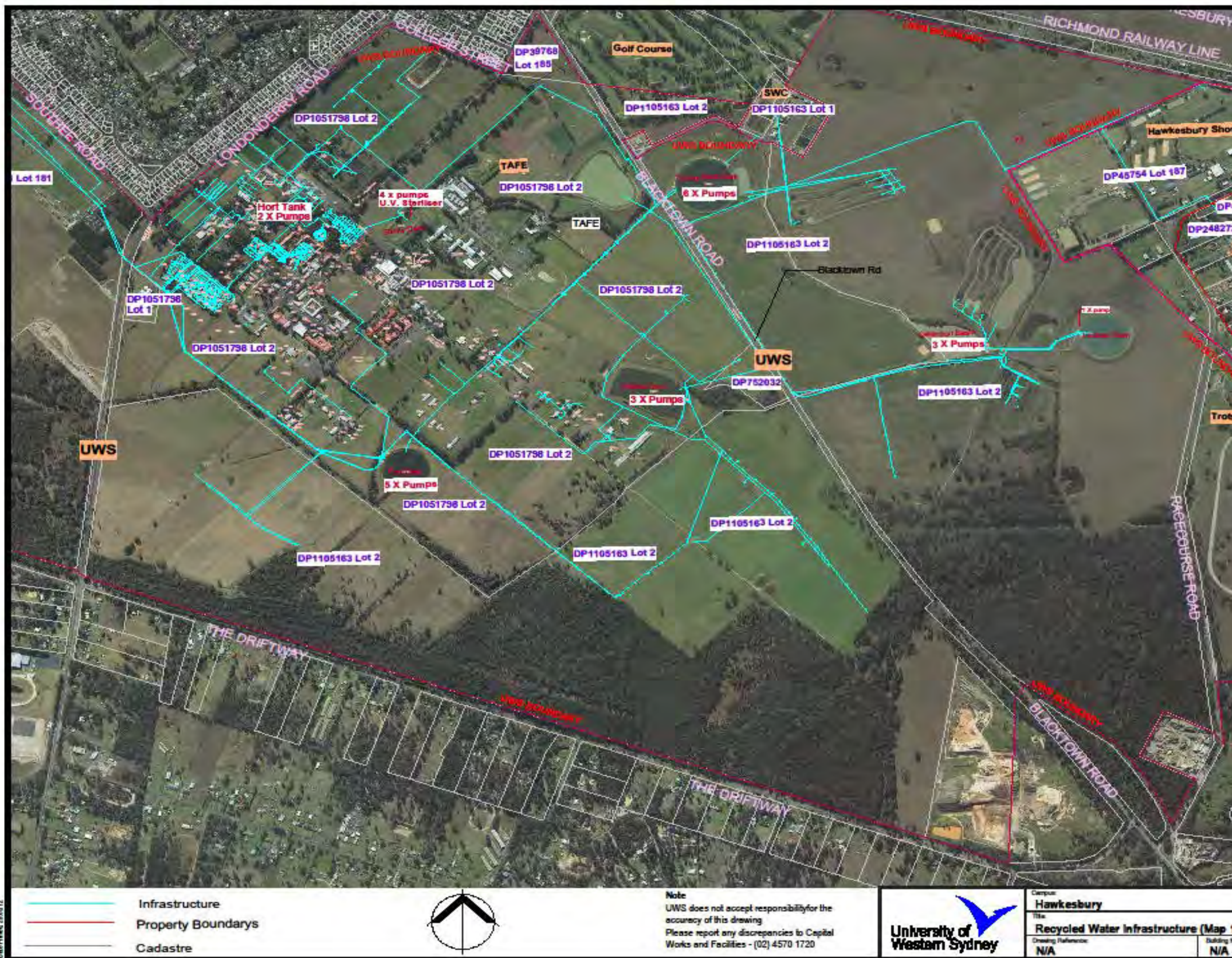
Item	Completed / Included?	Confirm Complete [Office Use Only]
<b>labelled and attached in an Appendix?</b>		
■ copy of guarantee or cross deed of indemnity provided from the parent entity	<input type="checkbox"/>	<input type="checkbox"/>
■ financial statements for the parent entity for the last 3 years	<input type="checkbox"/>	<input type="checkbox"/>
<b>Where you are a new corporation financed through alternative arrangements, have the following documents been labelled and attached in an Appendix?</b>		
■ a letter from a financial institution certifying an existing or proposed line of credit	<input type="checkbox"/>	<input type="checkbox"/>
■ copy of guarantee or cross deed of indemnity provided by an entity such as a holding company or a Director (including financial statements of the guarantor)	<input type="checkbox"/>	<input type="checkbox"/>
<b>Part Five: Statutory Declaration &amp; Acknowledgement</b>		
Have the following supporting documents been labelled and attached in an Appendix?		
■ Statutory Declarations (refer to Part 3 above)	X	<input type="checkbox"/>
■ Acknowledgements	X	<input type="checkbox"/>

# Appendix A. Mapping of Area

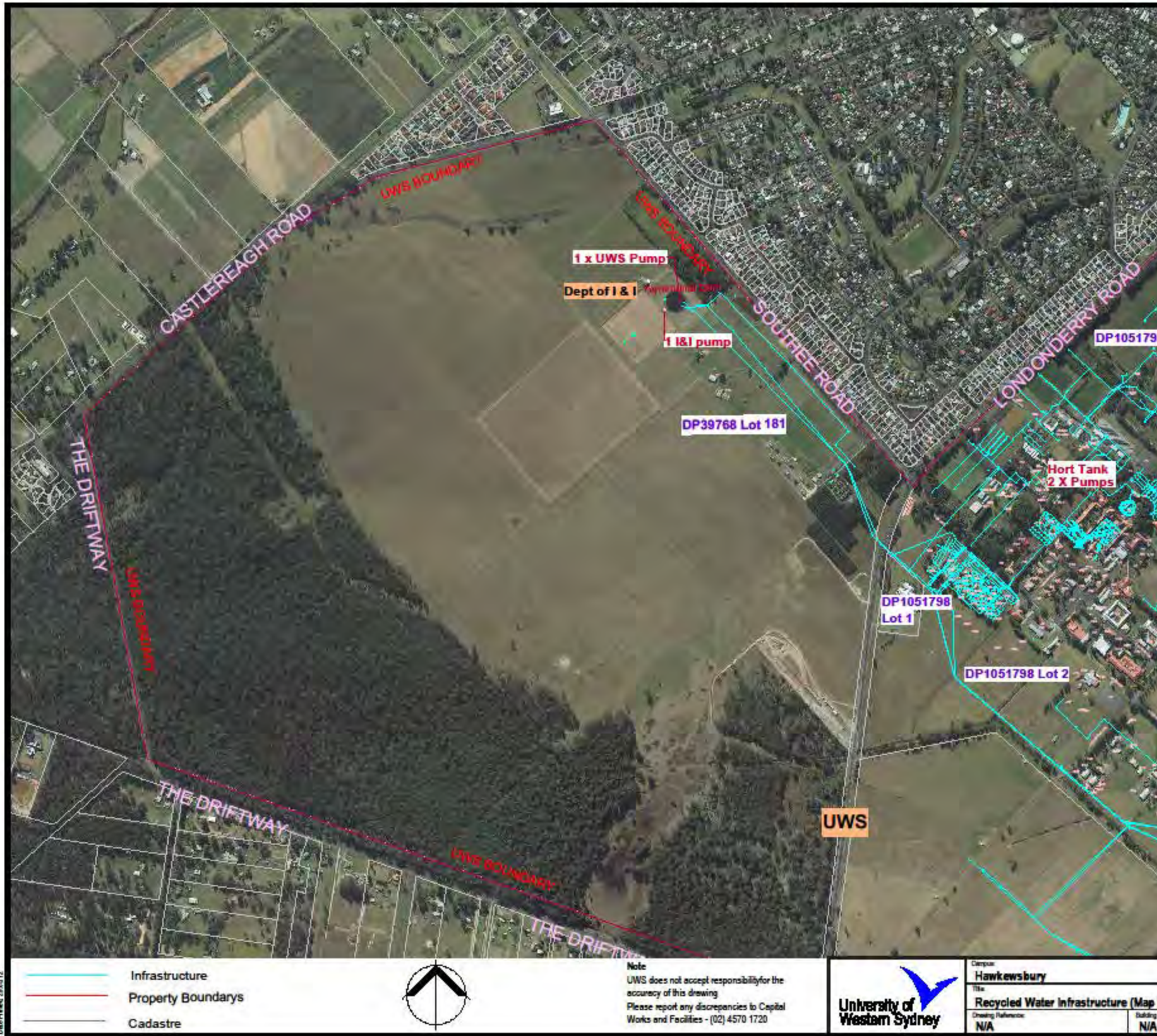
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## **1(g) Map of Infrastructure Location.**



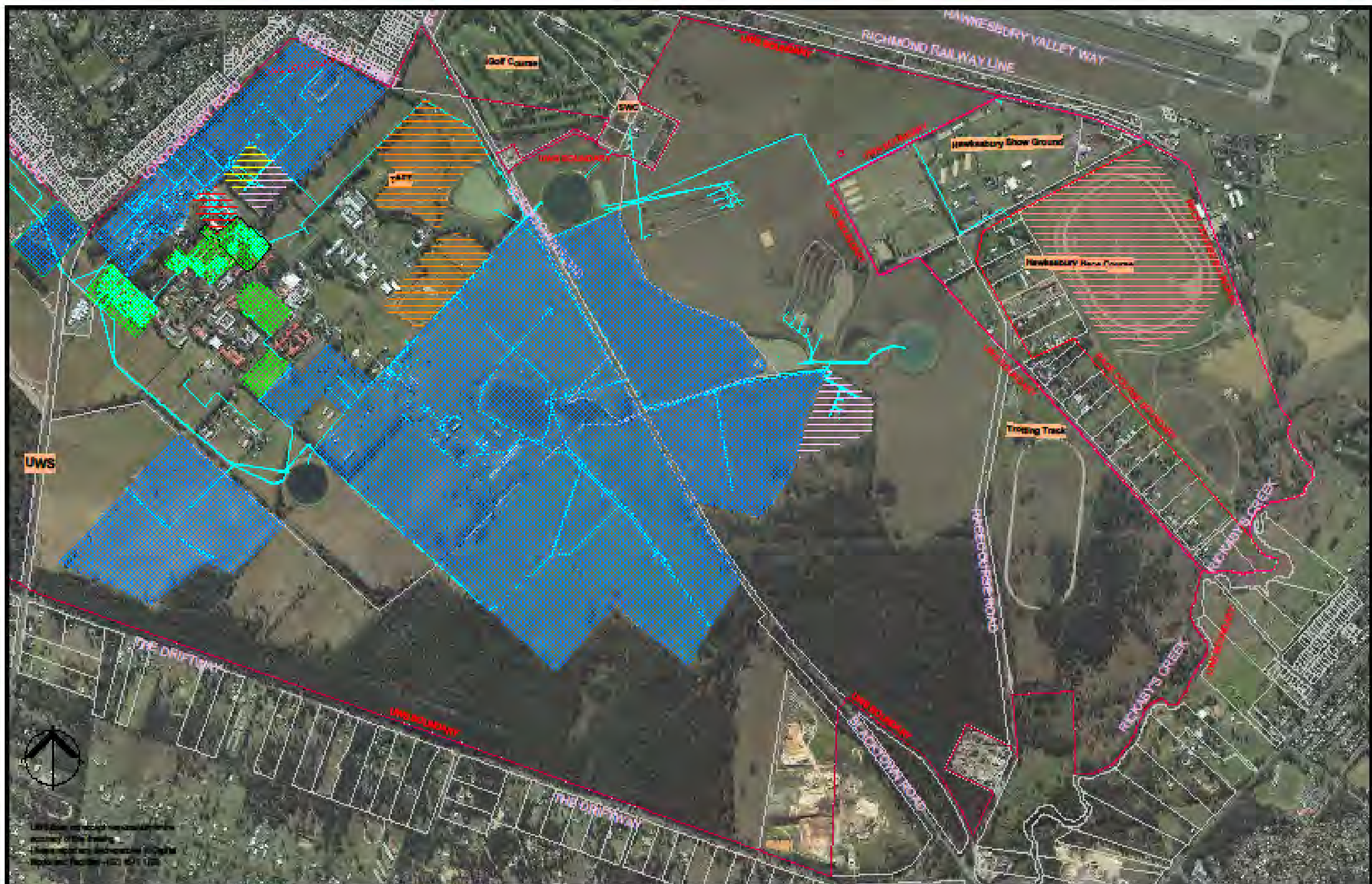






**1(h) Map of activities to be licensed.**












	Hawkesbury Race Course		TAFE		Secret Garden		UWS - Farm		UWS - Recreation
	Taronga Zoo		Greening Aust						

Campus: Hawkesbury		Leaflet: N/A	Scale: 1:13500
Title: End User Locations and area of use (Map1)		Created By: LA	Revised By: N/A
Drawn/Checked: N/A	Field Notes: N/A	Date Created: N/A	Date Revised: N/A





	Dept I & I		TAFE		Secret Garden	Note
	Taronga Zoo		Greening Aust		UWS - Farm	 UWS - Recreation



<b>Campus</b> Hawkesbury	<b>Location</b> N/A	<b>Scale</b> 1:10000
<b>Title</b> End User Locations and area of use (Map2)	<b>Created By</b> LA	<b>Reviewed By</b> N/A
<b>Drawing/Calculation</b> N/A	<b>Building Name</b> N/A	<b>Reviewed By</b> N/A
<b>Date Created</b> N/A	<b>Date Modified</b> N/A	<b>Reviewed By</b> N/A

File Path: 2016-07

# Appendix B. Agreements with Public Utilities

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**1 (j) Agreements with public water utilities or other network operators – Between Sydney Water Corporation and University Western Sydney. - Confidential**



# Appendix C. Agreements with end user/customer

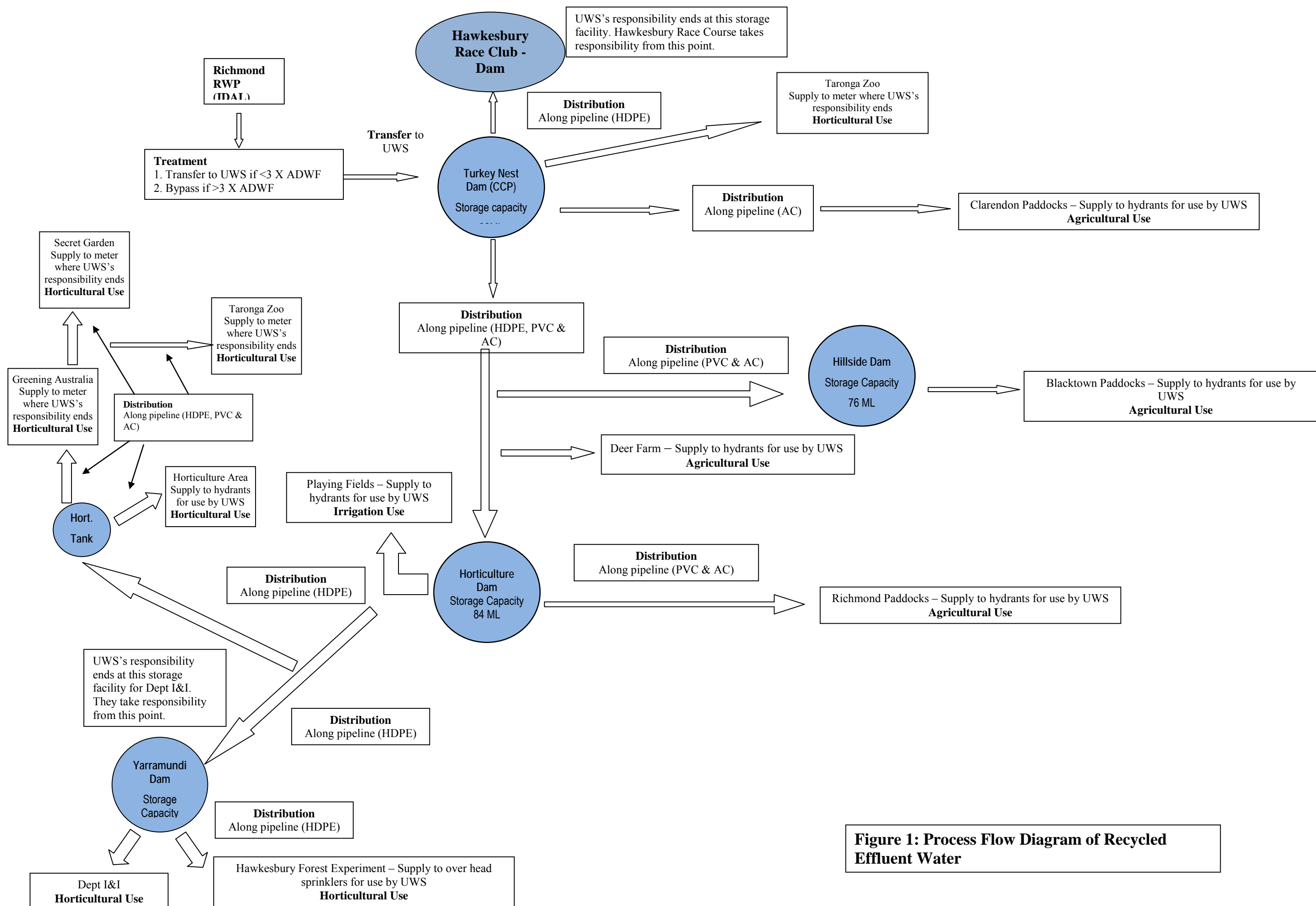
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**1(k) Who are the customers/end users – Agreement between UWS and other users - Confidential**

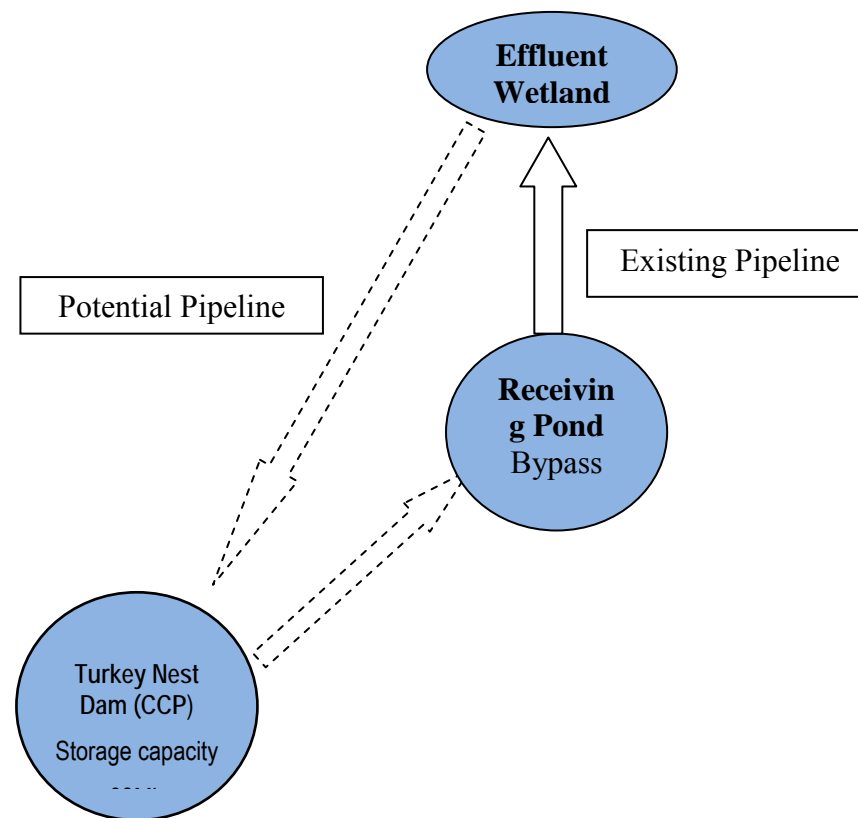
# Appendix D. Technical Capacity

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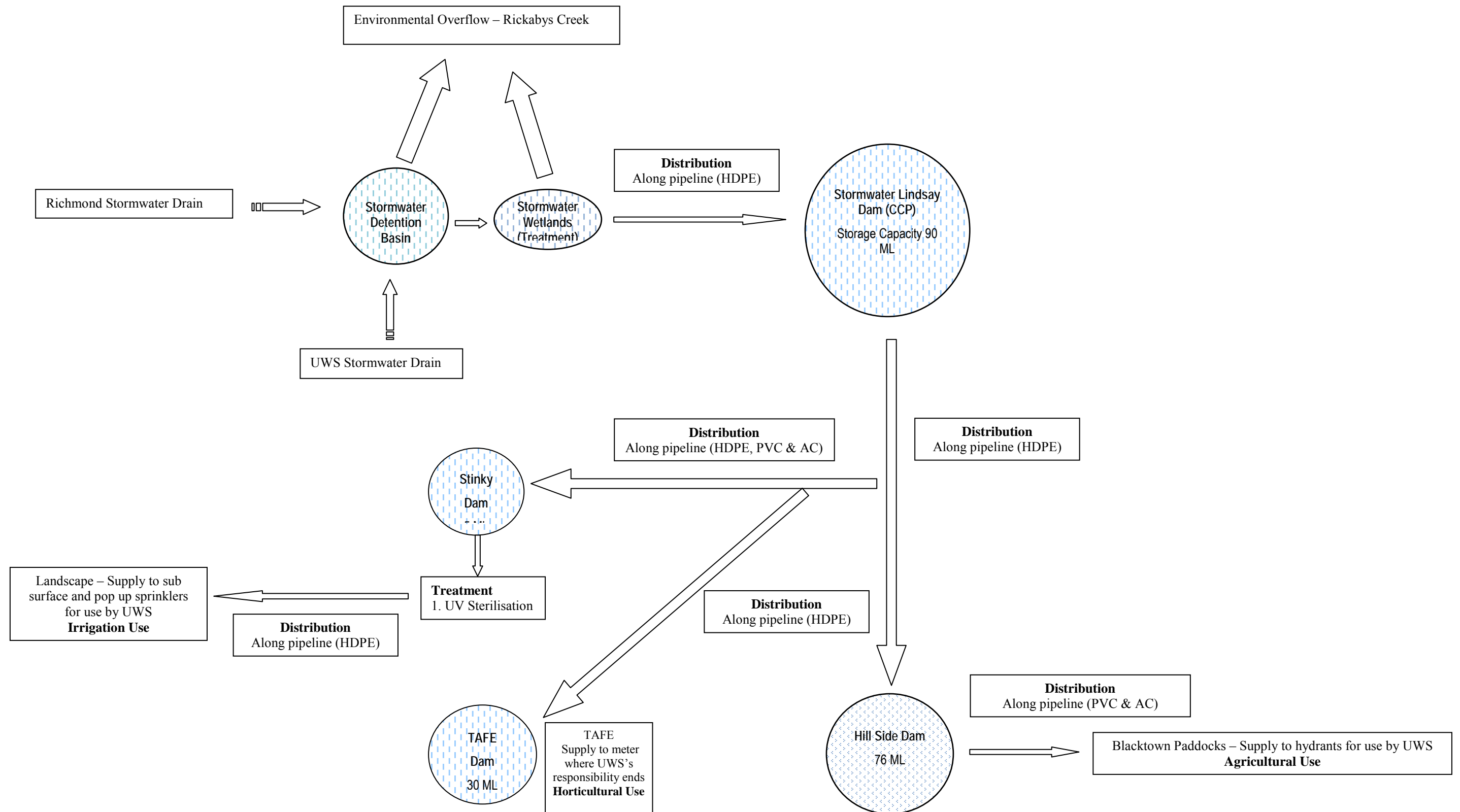
**2(b) Process flow diagram**



**Figure 1: Process Flow Diagram of Recycled Effluent Water**



**Figure 2: Process Flow Diagram of Potential Overflow/Bypass For Recycled Effluent Water**



**Figure 3: Process Flow Diagram of Stormwater Harvesting**



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# Appendix E. Risk Analysis

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## **2(d) Risk analysis and management – Risk Assessment**

## Risk Management Plan

DRAFT

2<sup>nd</sup> May 2012

# **University Western Sydney Recycled Water Risk Management Plan**

Prepared by Capital Works & Facilities – Environment and Risk Management Unit

---

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## Appendices

Historical water quality data

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## 1. Commitment to water quality management

This Risk Management Plan applies to the operation and management of the Hawkesbury Water Recycling Scheme (HWRS) at the Hawkesbury Campus of the University of Western Sydney (UWS). The purpose of this Risk Management Plan is to provide operational support to the UWS commitment to responsible use and management of recycled water in a manner which is consistent with the:

1. Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (2006), and previous national guidelines such as National Water Quality Management Strategy (2000) “Guidelines for Sewerage Systems, Use of Reclaimed Water”.
2. The UWS UWS-SWC Water Use Agreement, and associated objectives which address requirements under the Protection of the NSW Environment Operations (POEO) Act 1997 (Environmental Protection Licence number: 1726), and a requirement of the ‘Load Calculation Protocol’ referred to in the POEO (General) Regulations 1998.
3. The NSW Water Industry Competition Act (2006) and other relevant NSW guidelines (e.g. DEC 2004).
4. Water use agreements and associated risk management plans associated with the Hawkesbury Water Recycling Scheme, and coordinated through the HWRS Risk Management Committee.

The policy context for the management and use of recycled water is through the UWS Environmental Management Policy (2008) and associated UWS Environmental Management System. The UWS Environmental Management Plan incorporates a key program on Water Conservation, of which Objective 1.1 is *to develop and implement strategies to minimise water consumption*.

The format and structure of this Risk Management Plan is based upon the Risk Management Framework, as outlined in the 2006 national guidelines, providing:

1. *“a mechanism for identifying major hazards, risks and appropriate preventative measures (treatment and on-site controls);*
2. *An operational monitoring approach designed to detect faults before use of recycled water;*
3. *The use of verification (compliance) monitoring to ensure that the management systems function effectively;*
4. *Establishment of incident controls;*
5. *Implementation of supporting requirements including training, community involvement, documentation and reporting”* (EPHC 2006, p.15)

This document builds on historical management plans for the Hawkesbury Water Recycling Scheme including the HWRS Environmental Management Plan and the subsequent HWRS Reclaimed Water Management Plan.

## 2. Assessment of the Hawkesbury Water Recycling Scheme

### 2.1. *Intended uses and sources of recycled water*

The Hawkesbury Water Recycling Scheme comprises two key resource streams, as described below and shown in Figures 1 and 2:

- Reclaimed water supplied from Sydney Water Corporation's (SWC) Richmond Recycled Water Plant, and
- Stormwater harvested from the campus and the suburbs of Richmond Township.

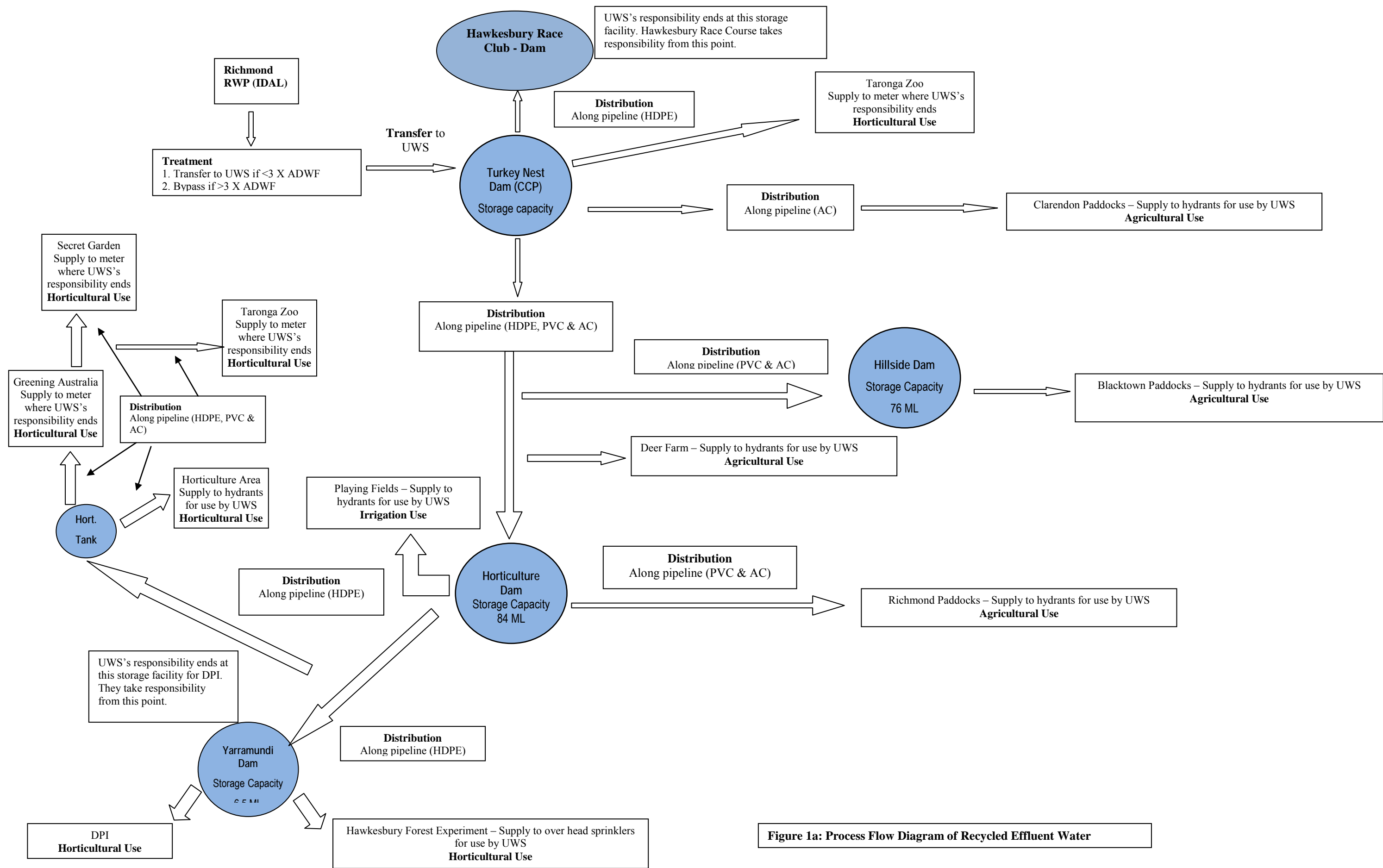
The intended use of the reclaimed water is primarily for agricultural and horticultural irrigation. There are a number of water users within the Hawkesbury campus, as outlined below, along with the provision of reclaimed water to the Hawkesbury Racecourse. The intended use of the stormwater is primarily for landscape irrigation across the Hawkesbury campus, along with a provision of stormwater to TAFE.

Richmond STP treats effluent to a tertiary disinfected quality (termed reclaimed water) that is suitable for irrigation with uncontrolled public access as defined in NWQMS (2000). The treatment process includes ammonia and nitrogen removal using the Intermittently Decanted Extended Aeration Lagoons (IDAL) process, Alum dosing for chemical phosphorous removal, tertiary dual media deep bed filtration and pathogen removal. The reclaimed water quality is monitored by SWC at DECCW Licence Point 17 (Licence No: 1726 refer to Appendix A). Reclaimed water is reused for irrigation of UWS lands (DEC licence point 13), *Richmond Golf Course (DECCW licence point 14)*, *internal plant processes (DEC licence point 4)*, and *tankering (DECCW licence point 18)*, with the remainder discharged to Rickabys Creek.

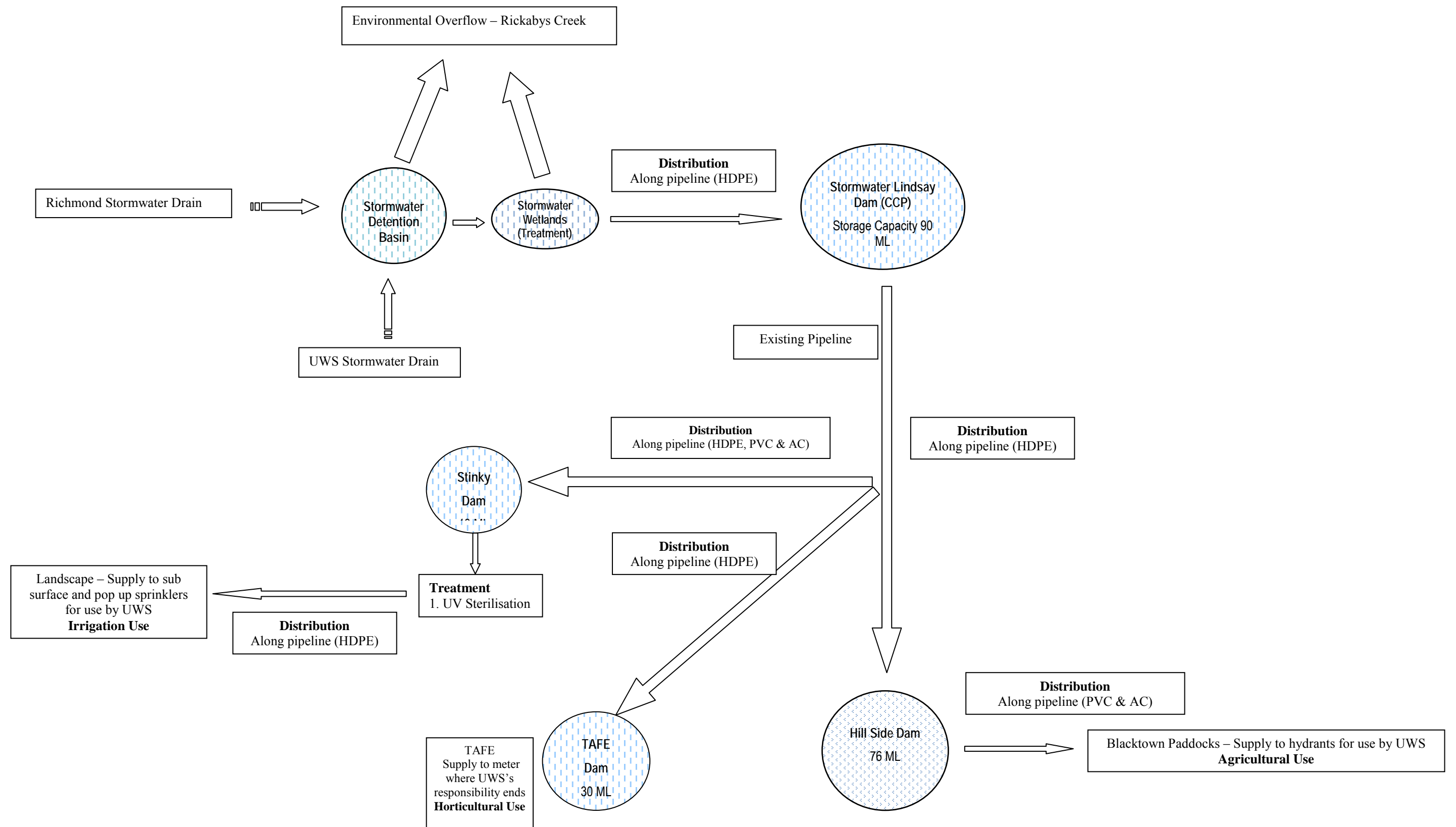
Reclaimed water is transferred directly to the first University storage, Turkey Nest Dam (capacity 93 ML). Any bypass flows are captured by the in-line stormwater detention pond (capacity 60ML), located approximately 1km further down the catchment. Once the treated effluent reaches the Turkey Nest Dam it becomes the responsibility of UWS to manage in accordance with the provisions of this Risk Management Plan. This storage also provides a critical control point for any treatment issues or microbial issues such as blue green algal blooms.

Treated effluent may be pumped from Turkey Nest to a wide range of storages and irrigation locations including principally:

- Horticulture Dam (capacity 84 ML)
- Hillside Dam (capacity 76 ML)
- College Street Dam (estimated capacity 16 ML)
- Stinky Dam (estimate capacity 13 ML)
- to the crop area north of Blacktown Rd, and on to the Taronga Zoological Gardens Koala Feed Plantation
- to the irrigation areas between Turkey Nest and Horticulture Dam, (where supply lines lead to the Deer Farm, Amenities Paddocks and Experimental Area)
- to irrigation areas beyond Hillside Dam and
- to irrigation areas along both sides of College Street.



**Figure 1a: Process Flow Diagram of Recycled Effluent Water**



**Figure 1b: Process Flow Diagram of Stormwater Harvesting**

Supply lines from Horticulture Dam include:

- irrigation line past the soccer field, football oval and G precinct
- irrigation line to the Horse Paddocks,
- irrigation line to paddocks east of Horticulture Dam
- transfer line to Yarramundi Dam (capacity 6.5 ML) and the two Horticultural areas (one area via the Horticulture Tank).

The Horticulture Tank (capacity 0.1 ML) supplies the older horticulture area, and the pressurised line supplies the other horticultural area adjacent to the Yarramundi Paddocks.

A 60ML Detention Basin has been constructed at the junction of the two main stormwater channels which drain the upper catchment of Rickabys Creek. A 90ML storage, Lindsay Dam has also been constructed to store stormwater which has passed through a series of constructed wetlands and into Pearce's Pond, a 25ML holding pond from which the treated stormwater can either be pumped for storage to Lindsay Dam or released to Rickabys Creek as environmental flows.

Stormwater is lifted from the Detention Basin to the stormwater constructed wetlands via two pumps with capacities of use ranging from 40 to 120 litres per second. The two pumps, each with pumping capacities of 40 and 80 litres per second, enable flexible and cost effective management of flows through the four one hectare wetlands (each with a maximum capacity of 8ML) to Pierces Pond which is 1.5 ha in area with an average depth of 2.1 metres. Should the need arise, Pearce's Pond can accommodate the entire 32 ML capacity of the wetlands.

Considerable additional infrastructure in the form of pipes and pumps have been installed to link the capture, treatment and storage elements for stormwater, with the Hillside Dam and upgraded infrastructure at Richmond TAFE.

The recycled water is used to irrigate portions of the 1332-hectare site, including: general landscape and gardens, agricultural areas and grazing pasture, horticultural areas, nurseries, and playing fields. The water users within the campus boundaries included:

- Capital Works & Facilities (landscape irrigation)
- School of Natural Sciences (including the Farm and Horticulture Units)
- NSW Dept Primary Industry (Sydney Vegetable Demonstration Site)
- UWS Connect (sports fields)
- Taronga Zoo (eucalypt plantations for Koala food);
- Greening Australia (production nursery);
- Hawkesbury Skill Share (community nursery);

Outside of the campus, recycled water is also supplied to:

- Richmond TAFE (stormwater use);
- Hawkesbury Racecourse;
- (Hawkesbury Showground supply to be developed).



A mapped aerial photo showing the different water users associated with the Scheme is shown in Figure 3.



- UWS Boundaries
- Recycled Water Infrastructure



**Note**  
 UWS does not accept responsibility for the accuracy of this drawing.  
 Please report any discrepancies to Capital Works and Facilities - (02) 9678 7020



Campus:	Hawkesbury
Title:	Location of Recycled Water
Scale @:	1:10000





Figure 3: These maps show the extent of the scheme and its users

## 2.2. Recycled water systems analysis

A HWRS Risk Management Committee (HWRS RMC) has been established to oversee coordinated risk management across the Scheme. The members of the HWRS RMC include invited representatives from:

- UWS Capital Works & Facilities Management
- UWS School of Science and Health
- Richmond TAFE
- Greening Australia Richmond Nursery
- Hawkesbury Race Club
- Hawkesbury Skillshare
- NSW Department of Primary Industry

A flow diagram of the treatment and end uses of reclaimed water and stormwater within the HWRS is shown below in Figure 4.

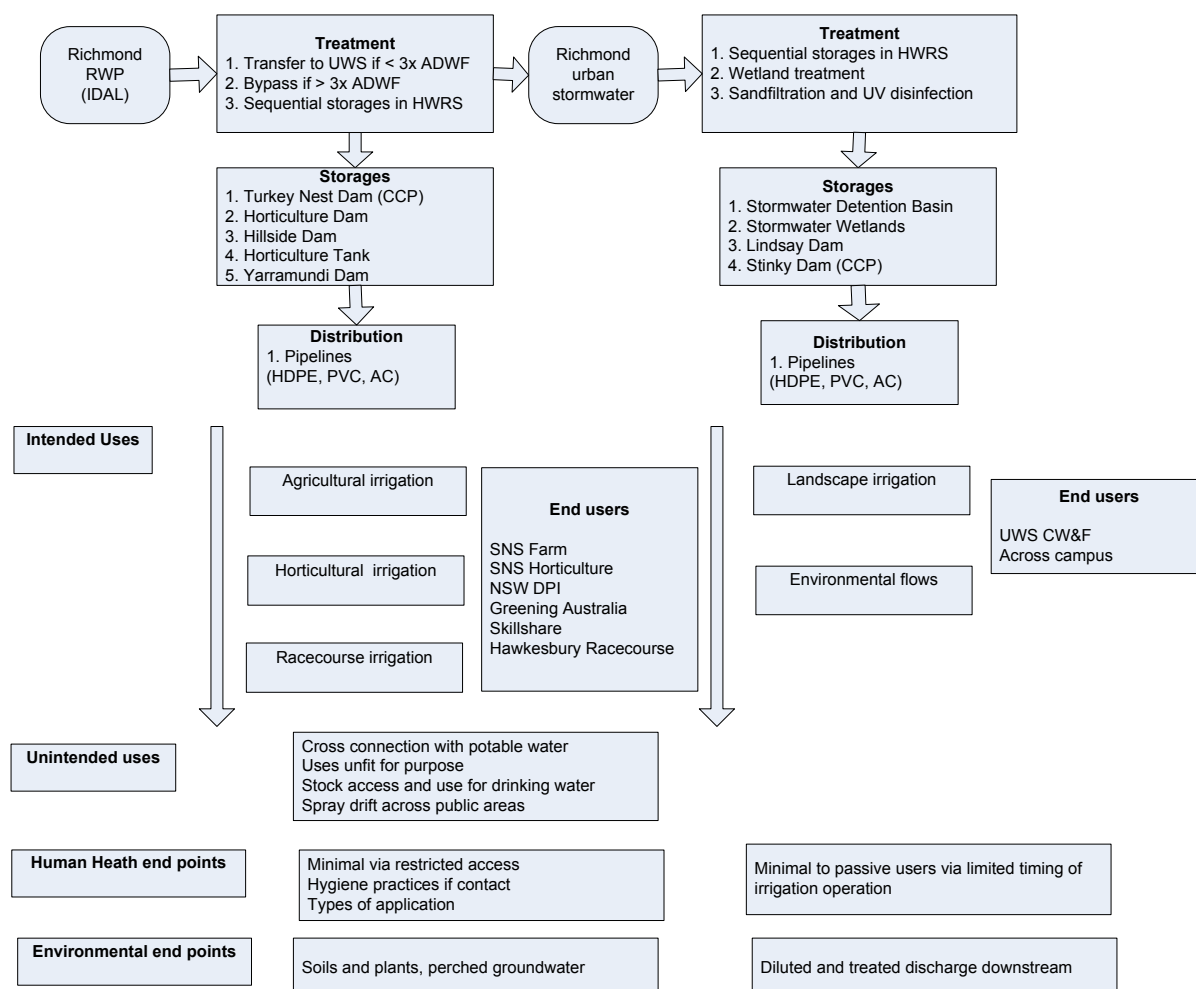


Figure 4. Flow diagram of sources, treatment and intended uses

### **2.3. Assessment of water quality data**

Analysis of water quality is undertaken both by Sydney Water Corporation and UWS. On the basis of communication protocols established in our Recycled Water Management Plan, notification of a quality issue from SWC prevents transfer beyond the first storage dam of UWS (Turkey Nest Dam), so this operates as a Critical Control Point (refer to Figure 1 for CCP).

Further monitoring points are established throughout the HWRS to monitor the quality of water transferred from these storages. Sampling taps are established for supply from the major storages (Turkey Nest Dam, Horticulture Dam).

The general suite of parameters and manner of assessment follows that developed in consultation with SWC as part of the established HWRS Reclaimed Water Management Plans, with analyses of samples undertaken by an accredited laboratory under standard conditions of a chain of custody. The following parameters are monitored include the following (as detailed in Tables 5 and 6):

1. Microbiological parameters (Faecal coliforms)
2. Physical parameters (pH, Electrical Conductivity, TDS, TSS, BOD<sub>5</sub>)
3. Chemical parameters (Total Phosphorus, Total Nitrogen, Cations)

Historical trend data to be attached.

## 2.4. Hazard identification and risk assessment

The identification of hazards and risk assessment associated with the use of recycled water has been undertaken utilising the standard UWS format for risk assessment, and is presented in Appendix x. For a range of key tasks across the HWRS, hazards and associated risks are identified, along with risk ratings based upon existing control measures, additional risk controls and risk ratings with these additional controls.

A summary of hazards and control measures are summarised for key tasks undertaken below in Table 1, with detailed risk assessments of control measures in Appendix x.

Task	Hazard	Control Measures
Supply of reclaimed water	<i>Supply specification issue</i>	<ul style="list-style-type: none"> <li>• Bypass to stormwater</li> <li>• Communication protocol</li> <li>• Containment at CCP</li> </ul>
Storage / distribution	<i>Public Health</i> <ul style="list-style-type: none"> <li>• Personal injury, or</li> <li>• Illness through ingestion</li> <li>• Toxic algal bloom</li> </ul>	<ul style="list-style-type: none"> <li>• Control of public access</li> <li>• Operational procedures</li> <li>• Signage in irrigation areas</li> <li>• Communication for staff</li> <li>• Water quality monitoring</li> <li>• Induction for staff contractors</li> <li>• Cross connection audit</li> </ul>
	<i>Supply disruption</i> <ul style="list-style-type: none"> <li>• Productivity/ financial impact</li> </ul>	<ul style="list-style-type: none"> <li>• Maintenance /upgrade</li> <li>• Alternate stormwater supply</li> </ul>
	<i>Resource scarcity</i> <ul style="list-style-type: none"> <li>• Productivity/ financial impact</li> </ul>	<ul style="list-style-type: none"> <li>• Water use budgeting</li> <li>• Alternate stormwater supply</li> </ul>
Irrigation of: <ul style="list-style-type: none"> <li>• Paddocks</li> <li>• Gardens</li> <li>• Nurseries</li> <li>• Lawns</li> <li>• Playing fields</li> </ul>	<i>Public Health</i> <ul style="list-style-type: none"> <li>• Personal injury, or</li> <li>• Illness through ingestion</li> </ul>	<ul style="list-style-type: none"> <li>• Additional treatment if unrestricted access</li> <li>• Signage and communication</li> <li>• Operational procedures</li> <li>• Method of application</li> <li>• Buffer zones</li> </ul>
	<i>Environmental impacts</i> <ul style="list-style-type: none"> <li>• Contamination / loading</li> <li>• Impact on ecological areas</li> </ul>	<ul style="list-style-type: none"> <li>• Monitoring soil / groundwater</li> <li>• Buffer zones</li> </ul>

- Consider inadvertent use or discharge
- Evaluate major sources of uncertainty



### 3. Preventative Measures for Recycled Water Management

#### 3.1. ***Preventative measures and multiple barriers***

Preventative measures for recycled water management across the Hawkesbury Water Recycling Scheme include:

- Complementary treatment processes for reclaimed water and stormwater
- Multiple barriers to public and environmental risk management
- Appropriate plumbing codes, signage, induction and communication
- Controls of type and timing of application
- Backflow prevention and cross connection controls
- Promote best practice management of irrigation.

##### *Complementary treatment processes for reclaimed water and stormwater*

Reclaimed water is supplied from treatment in an IDAL plant then transferred between consecutive storages where ongoing ecological competition, and UV disinfection occurs. Depending upon seasonal conditions, stratification and algal growth in subsequent storages can generate variability in water quality, necessitating monitoring. Reclaimed water supplied at a rate greater than distribution or utilisation is collected and diluted in the stormwater system, then treated in wetland systems before being transferred between storages. In areas of the campus where stormwater is used for irrigation of public areas additional filtration and UV disinfection is utilised.

##### *Multiple barriers to public and environmental risk management*

A multiple barrier approach is applied to many aspects of the HWRS, including:

- Reduction of risk associated with discharges of reclaimed water being discharged to the environment due to subsequent capture, treatment and reuse of stormwater
- Treatment trains for both reclaimed water and stormwater which incorporate sequential engineering and ecological treatment processes
- Changing degrees of public access and treatment through the Scheme, with reduced public access at earlier treatment and distribution stages of the Scheme
- Signage and induction processes for contractors and visitors to the site linked to differential levels of access.

The risk assessments in Appendix x reflect both current and additional potential control methods, reflecting a recognition of residual risk which is best addressed through overlapping multiple barrier strategies.

##### *Appropriate plumbing codes, signage, induction and communication*

Historically the distribution pipelines have utilised asbestos concrete (AC), PVC and more recent HDPE materials. All new works ensure that lilac striped HDPE pipeline is used for major and distribution lines. An ongoing program of works is decommissioning older pipeline materials such as AC lines. Signage has been put in place in entering the campus, areas where reclaimed water is used for irrigation, near water recycled water storages and plant, and where tap like fittings for off take occur. Specific inductions for access to areas where reclaimed water is utilised have been in place for a number of years, and is now incorporated in CW&F contractor inductions. Risk communication material interpreting water quality and hazard alerts are managed on an ongoing basis.

##### *Controls of type and timing of application*

Application depends upon the particular location, with:

- irrigation guns and booms used for pastures
- small irrigation guns used on playing fields
- microjet irrigation in horticulture precinct

- varying irrigation forms for demonstration at the I&I site
- pop up irrigation heads used to irrigate landscape areas and
- trickle irrigation systems in gardens.

Timing of application is managed for most areas through local farm or technical managers who oversee operations. In the case of landscape irrigation with stormwater, automated systems come on during the night to minimise contact.

*Backflow prevention and cross connection controls*

A comprehensive cross connection audit was undertaken with Sydney Water in 2007 with the result of a number of RPZ backflow prevention devices installed.

*Promote best practice management of irrigation*

The CW&F management team continue to liaise with farm and technical managers, researchers, and tenants to promote best practice management through appropriate planning and water use budgeting, the continuing improvement of appropriate technology, and improving the form of applications for which either reclaimed water or stormwater are used. The NSW Dept Primary Industry Sydney Vegetation Demonstration Block, which is one of the water users within the Scheme actively promote extension courses and field days relating to water efficiency and irrigation best practice.



### 3.2. Critical control points and monitoring control points

For the supply of reclaimed water, the first receiving storage (Turkey Nest Dam) is a critical control point whereby transfers can be contained if a quality issue is identified which is associated with the supply of reclaimed water. Further monitoring control points are established at the off take points of major storages to enable sampling and analysis of the recycled water transferred at these points. For the use of stormwater for irrigating public areas of the campus, a critical control point is established at Stinky Dam, whereby along with additional filtration and UV disinfection, irrigation controllers can disable further application when required.

INSERT MAP of locations of critical control points and monitoring control points

These critical control points and monitoring control points are integrally linked to operational control strategies. The target criteria and critical limits for triggering operational control strategies are summaries below in Table 2.

Table 2 Triggers for operational control

<b>Critical control point and location</b>	<b>Critical limit / Target criteria</b>	<b>Operational control</b>
Supply inflow to Turkey Nest Dam	<ul style="list-style-type: none"><li>• SWC real-time monitoring</li><li>• &gt; 3 x ADWF</li></ul>	<ul style="list-style-type: none"><li>• Bypass diverted to capture, dilution and treatment in stormwater system</li></ul>
Turkey Nest Dam	<ul style="list-style-type: none"><li>• Communication from SWC</li><li>• Observation of algal bloom</li></ul>	<ul style="list-style-type: none"><li>• Contain and monitor until condition stabilises</li><li>• Communication with water users</li></ul>
Monitoring control points (pipeline transfer after Turkey Nest Dam and Horticulture Dam, Lindsay Dam)	<ul style="list-style-type: none"><li>• Sampling and analysis of product supplied as per standard suite of parameters</li></ul>	<ul style="list-style-type: none"><li>• Monitoring of trends</li></ul>
Other storages	<ul style="list-style-type: none"><li>• Observation of algal bloom</li></ul>	<ul style="list-style-type: none"><li>• Contain and monitor until condition stabilise</li><li>• Communication with water users</li></ul>
Stinky Dam	Observation of algal bloom	<ul style="list-style-type: none"><li>• Contain and monitor until condition stabilise</li><li>• Alter irrigation controllers as appropriate</li></ul>

## 4. Operational Procedures and Process Control

### 4.1. Key responsibilities and operational procedures

The following table summarises the key responsibilities for operational control and risk management procedures within the Hawkesbury Water Recycling Scheme (Table 3).

Operation / process	Responsibility	Procedures
Risk management coordination	Senior Manager, Environment & Risk, CW&F	<ul style="list-style-type: none"><li>• Coordinate risk management with water users through Risk Mgt. Committee</li></ul>
Infrastructure and maintenance	Environmental Supervisor, CW&F	<ul style="list-style-type: none"><li>• Project management of infrastructure</li><li>• Oversight of maintenance</li></ul>
Operational monitoring/correction	Environmental Supervisor, CW&F	<ul style="list-style-type: none"><li>• Operational monitoring</li><li>• Liaise on operational and risk management matters</li></ul>
Supply of reclaimed water	Sydney Water	<ul style="list-style-type: none"><li>• Supply reclaimed water as per agreement</li><li>• Alert communications if issue arises</li></ul>
Transfer and use of reclaimed water on UWS farms	Farm Manager, School of Natural Science	<ul style="list-style-type: none"><li>• Manage transfers between storages</li><li>• Use according to best practice</li><li>• Liaise on operational and risk mgt.</li></ul>
Transfer and use of reclaimed water in UWS horticulture	Technical Manager School of Natural Sciences	<ul style="list-style-type: none"><li>• Manage transfers between storages</li><li>• Use according to best practice</li><li>• Liaise on operational and risk mgt.</li></ul>
Transfer and use of stormwater, and transfers off-site	Environmental Supervisor, CW&F	<ul style="list-style-type: none"><li>• Manage transfers between storages</li><li>• Use according to best practice</li><li>• Liaise on operational and risk mgt.</li></ul>
Use of reclaimed water on I&I site	NSW Dept. I&I	<ul style="list-style-type: none"><li>• Use according to best practice</li><li>• Liaise on operational and risk mgt.</li></ul>
Use of reclaimed water Hawkesbury Raceclub	Hawkesbury Raceclub	<ul style="list-style-type: none"><li>• Use according to best practice</li><li>• Liaise on operational and risk mgt.</li></ul>
Use of stormwater by TAFE	Manager College Operations Richmond TAFE	<ul style="list-style-type: none"><li>• Use according to best practice</li><li>• Liaise on operational and risk mgt.</li></ul>
Use of recycled water by Greening Australia	Nursery Manager Greening Australia	<ul style="list-style-type: none"><li>• Use according to best practice</li><li>• Liaise on operational and risk mgt.</li></ul>
Use of recycled water by Hawkesbury Skillshare	Nursery Manager Skillshare Nursery	<ul style="list-style-type: none"><li>• Use according to best practice</li><li>• Liaise on operational and risk mgt.</li></ul>
Use of recycled water by Taronga Zoo	Senior Horticultural Technician Taronga Zoo	<ul style="list-style-type: none"><li>• Use according to best practice</li><li>• Liaise on operational and risk mgt.</li></ul>

## **4.2. Operational procedures**

General operational control procedures include the following:

- Coordination and operational liaison
- Project management and infrastructure maintenance
- Transfers of recycled water
- Application and associated risk management

### *Coordination with water users and HWRS Risk Management Committee*

Staff of UWS Capital Works & Facilities oversee the operation and processes of the Scheme, including ongoing operational liaison with Sydney Water, water users and other external or internal stakeholders. Meetings with Sydney Water Corporation are convened to discuss any issues relating to the provision of recycled water, the SWC-UWS water use agreement, and associated risk management requirements.

Systematic liaison is coordinated by CW&F through the HWRS Risk Management Committee, the membership of which is defined by Table x relating to key operational and risk management responsibilities. Day to day operational liaison is maintained with water users on a needs basis.

### *Project management and infrastructure maintenance*

CW&F oversee project management of the design and delivery of infrastructure upgrades across the Scheme, including extensions of the scheme and upgrade of plant and equipment. Reactive and scheduled maintenance is also managed by CW&F as part of its standard maintenance procedures.

### *Transfers of recycled water*

For the transfer of recycled water, the Environmental Supervisor oversees core transfers of stormwater, transfers offsite such as to the Racecourse, and automated transfers of reclaimed water through the Scheme. As the major user of reclaimed water, transfers of reclaimed water are mainly undertaken by Farm and Technical Managers of the School of Natural Sciences to fit into their irrigation management.

### *Application and associated risk management*

Operational and risk management matters including those relating to the type and timing of irrigation application is the responsibility of each water user. Along with this overarching HWRS Risk Management Plan, similar Risk Management Plans for each specific water user is being developed. Operational planning for each water user will include:

- Water use budgeting and identification of critical supply needs;
- Choice of application types and timing, and related risk management practices as appropriate to each water user.

### 4.3. Operational monitoring and corrective actions

Operational monitoring and corrective actions follow the systematic need for effective supply and distribution of recycled water resources of a quality fit for purpose to water users to enable appropriate application of this resource for irrigation use. The following table outlines each task of operational monitoring, the trigger for corrective action and management response.

Table 4 Operational monitoring, trigger for corrective action and management response

Operational monitoring	Trigger for corrective action	Management response
Supply from SWC to UWS	<ul style="list-style-type: none"><li>Supply out of specification</li></ul>	<ul style="list-style-type: none"><li>Bypass to stormwater</li><li>Communication SWC to CWF</li><li>Containment if required</li><li>Communication to water users</li></ul>
Monitoring of control points and observation of storages	<ul style="list-style-type: none"><li>Analyses show trigger value</li><li>Observation of algal bloom</li></ul>	<ul style="list-style-type: none"><li>Containment if required</li><li>Communication to water users</li></ul>
Effective equipment and infrastructure operation and performance	<ul style="list-style-type: none"><li>Scheduled maintenance</li><li>Operational failure</li><li>Comm. &amp;F from water user</li><li>Audit by UWS</li></ul>	<ul style="list-style-type: none"><li>Communicated to CW&amp;F</li><li>Systematic maintenance of key treatment elements such as UV disinfection</li><li>Repair response by maintenance contractors scheduled on basis of criticality</li><li>Redesign and upgrade</li></ul>
Break in pipeline or infrastructure	<ul style="list-style-type: none"><li>Operational failure</li><li>Comm. from water user</li></ul>	<ul style="list-style-type: none"><li>Repair response by maintenance contractors scheduled on basis of criticality</li><li>Redesign and upgrade</li></ul>
Emerging need for new supply	<ul style="list-style-type: none"><li>Extension of irrigation</li><li>New landscape precinct</li><li>New water user or changed practices</li></ul>	<ul style="list-style-type: none"><li>Design and implementation of new infrastructure on basis of context and std design procedures</li></ul>
Emergency / incident reported	<ul style="list-style-type: none"><li>Incident (biological, natural, or human intervention)</li></ul>	<ul style="list-style-type: none"><li>Containment if required</li><li>Communication to water users</li><li>Further communication as appropriate</li><li>Incident investigation</li></ul>
Access of staff / contractors	<ul style="list-style-type: none"><li>New access required to areas of restricted public access</li></ul>	<ul style="list-style-type: none"><li>Induction requirements</li><li>Access controls</li></ul>
Effective irrigation application	<ul style="list-style-type: none"><li>Observation or reporting of irrigation fault</li></ul>	<ul style="list-style-type: none"><li>CW&amp;F respond if stormwater</li><li>Water user addresses irrigation application</li></ul>
Risk management practices	<ul style="list-style-type: none"><li>Audits of water use areas by CW&amp;F</li><li>Risk communication by CW&amp;F</li><li>Development of Risk Mgt Plans</li></ul>	<ul style="list-style-type: none"><li>Water users to identify and implement appropriate risk management actions</li><li>Liaise with UWS on operational and risk management responses</li></ul>
Access to operational control and monitoring	<ul style="list-style-type: none"><li>Identification of hazards in accessing areas</li></ul>	<ul style="list-style-type: none"><li>Induction and access controls</li><li>Slashing and mowing to ensure safe access</li></ul>

## 5. Verification of recycled water quality and environmental performance

### 5.1. Water quality monitoring and performance

The HWRS has an established series of control points whereby water samples can be taken for analysis of water quality. The water quality parameters and trigger values are shown below (Table 5 & 6.) for commonly analysed parameters. Sampling is undertaken as per a standard protocol with samples collected in bottles provided by an accredited laboratory that are used to undertake laboratory

analyses of key water quality parameters. The use of an external NATA accredited laboratory and the utilisation of sample bottles provided addresses quality assurance requirements.

As well as these standard water quality parameters the following monitoring occurs:

- Monitoring by SWC of supply quality by real time monitoring and scheduled monitoring
- Observational monitoring of storages, particularly in relation to potential algal blooms late in summer
- Observational monitoring by all water users, with communication to CW&F if any concerns or issues are noticed
- Long term monitoring of soil conditions and groundwater in relation to soil type and application history
- Assessment of stormwater quality in relation to both public health requirements for irrigation and discharge downstream to creek environments
- Volumetric monitoring of transfers between storages and to water users through both volumetric meters and pump run times.
- Application logs by water users.

Table 5. Water Quality Parameters

Parameter	Units	Guideline Criteria
Thermotolerant coliform	cfu 100 mL <sup>-1</sup>	<1 cfu 100 mL <sup>-1 2</sup>
Organic compounds (OCPs and PCBs)	mg L <sup>-1</sup>	<0.001 <sup>1</sup>
pH	pH units	6.5 – 8.5 <sup>1</sup>
Electrical Conductivity	dS m <sup>-1</sup>	<2.9 <sup>3</sup>
Total dissolved solids	mg L <sup>-1</sup>	<500 <sup>1</sup>
P: Total	mg L <sup>-1</sup>	<10 <sup>1</sup>
N: Total	mg L <sup>-1</sup>	<50 <sup>1</sup>
Total suspended solids	mg L <sup>-1</sup>	Not recommended
BOD <sub>5</sub>	mg L <sup>-1</sup>	< 40 <sup>1</sup>
Na	mg L <sup>-1</sup>	Not recommended
K	mg L <sup>-1</sup>	Not recommended
Mg	mg L <sup>-1</sup>	Not recommended
Ca	mg L <sup>-1</sup>	Not recommended
Cl	mg L <sup>-1</sup>	Not recommended
SO <sub>4</sub>	mg L <sup>-1</sup>	Not recommended
HCO <sub>3</sub>	mg L <sup>-1</sup>	Not recommended
CO <sub>3</sub>	mg L <sup>-1</sup>	Not recommended
SAR		< 6 <sup>1</sup>
Al,	mg L <sup>-1</sup>	Ref below. <sup>3</sup>
Cu	mg L <sup>-1</sup>	Ref below <sup>3</sup>
As	mg L <sup>-1</sup>	Ref below <sup>3</sup>
Cd	mg L <sup>-1</sup>	Ref below <sup>3</sup>
Pb	mg L <sup>-1</sup>	Ref below <sup>3</sup>
Cr	mg L <sup>-1</sup>	Ref below <sup>3</sup>

Zn	mg L <sup>-1</sup>	Ref below <sup>3</sup>
Ni	mg L <sup>-1</sup>	Ref below <sup>3</sup>
Hg	mg L <sup>-1</sup>	Ref below <sup>3</sup>
Herbicides	mg L <sup>-1</sup>	Ref below <sup>3</sup>

<sup>1</sup> DEC (2004). Environmental Guidelines: Use of Effluent for Irrigation, Department of Environment & Conservation (Table 5.1) Analysis method

<sup>2</sup> NWQMS (2000)

<sup>3</sup> ANZECC & ARMCANZ (2000). Australian & New Zealand Guidelines for Fresh & Marine Water Quality (Volume 3, section 9.2.5 for metals; Volume 1, Table 4.2.12 for herbicides)

<sup>4</sup> Metals tested for 2009-2010 were Al, As, Cd, Cr, Hg, Ni, and Zn. Parameters not analysed were Cu, Pb and B.

Table 6. Soil parameters

Parameter	Surface soil (0 – 40 cm) Guideline	Soil profile (40 – 100 cm) Guideline
Soil pH <sub>CaCl2</sub>	> 6	> 6
Elect. conductivity (dS/m)	< 2	<4
Nitrate (mg/L* - mg/kg)	Not recommended	Not recommended
Available P (mg/L* - mg/kg)	Not recommended	Not recommended
Exchangeable sodium percentage (ESP) (%)	< 5	<10
Total Phosphorus (mg/L* - mg/kg)	Not recommended	Not recommended
Phosphorus Sorption Capacity**(kg P/ha)	> 6,000	> 6,000
Total Nitrogen (mg/L* - mg/kg)	Not recommended	Not recommended

Note: DEC guidelines use mg / L though the common measure for soils is mg / kg. This may require a conversion on the basis of bulk density.

- Analyses of Total Phosphorus and Total Nitrogen as mg / L will require conversion according to assumptions of bulk density.
- In the calculation of Phosphorus adsorption, for each texture type an assumed soil density was applied. Values reported in mg/kg for comparison to the guideline and represent a 1 m depth / ha with bulk density of up to 1.5 t / m<sup>3</sup> as reported in 2006-2007.

## 5.2. Documentation and reliability

A clear and established strategy of sampling points (control points) is established for supply distribution of both reclaimed and stormwater. External laboratory assessment is undertaken to ensure valid assessment and quality assurance. Field based sampling equipment is regularly checked for appropriate measurement.

The data collected is summarised in relation to key trigger values, with yearly reporting associated with reclaimed water use provided to Sydney Water Corporation as a requirement of the SWC-UWS water use agreement.

## 5.3. Satisfaction of users

Satisfaction of water users is addressed through:

- Day to day operational liaison by CW&F to operational issues identified by water users
- Strategic development of water use agreements and associated risk management plans for each water user, operating under this umbrella document and coordinated through the HWRS Risk Management Committee.

Along with reporting and auditing of the Scheme and monitoring data by Sydney Water Corporation, the data collected is used by UWS researchers for publicly available research and peer reviewed publications. The use of the HWRS as a platform for teaching and research is a fundamental rationale, alongside the functional provision of recycled water resources, and is a core component of the ongoing adaptive management of the Scheme.

## **6. Management of incidents and emergencies**

### **5.1. Incident response protocols and communication**

Observation, monitoring, and day to day operational liaison with water users provide the basis for responses to minor operational incidents. For other incidents such as seasonally occurring hazards (e.g. algal outbreaks) or other unexpected supply issues a standard incident response strategy is put in place:

1. Immediate communication with water users
2. Containment and cease distribution and application until the cause and effect of the incident are determined and likely impact assessed.

The key people outlined for the HWRS Risk Management Committee are the critical individuals contacted in relation to any emerging issue. If these individuals cannot be contacted immediately, CW&F will take steps to mitigate and address the issue, most commonly through ceasing distribution and containment until cleared.

Awareness of the use of recycled water for the local general public is clearly indicated on public signage on Blacktown Road, along with signage at all entries to the campus.

### **5.2. Incident investigation**

*Most operational incidents are addressed as such, though CW&F do have established incident investigation procedures which can be triggered if a serious incident occurs. As well as those procedures established through CW&F there are also:*

- *Outdoor laboratory risk management procedures overseen by the School of Natural Sciences*
- *Broader contractor induction and campus access procedures established by CW&F and UWS Campus Safety and Security*
- OH&S Unit of UWS with its roles and responsibilities in relation to general UWS staff
- OH&S and related risk management procedures established on an organisational basis for water users and lessees such as NSE Department of Primary Industry, Greening Australia, Taronga Zoo, Hawkesbury Raceclub, etc.



## **6. Operator, contractor and end user awareness and training**

### **6.1. *Mechanisms to promote awareness and involvement***

Mechanisms and communication strategies for water users to promote awareness and involvement include day to day operational liaison and communication.

Participation by representative water users in the HWRS Risk Management Committee is being developed as the main forum for overseeing the design and implementation of operational and risk management strategies across the Scheme.

For contractors, aspects of working with recycled water are included in the UWS on-site operational protocols (inductions) required of all contractors who access the campus. This induction material includes general reference to OH&S, safe working methods and risk management from a practical perspective.

Particular end users are actively involved in the design and implementation of improvements in the Scheme, and external specialist irrigation designers are provided through CW&F.

Risk communication material has also been previously developed for the Scheme for passive water users and laypeople, translating the monitoring undertaken into graphic representations similar to traffic light representations of log. Graphs of microbial counts and bush fire hazard representations of the risk of algal blooms. This along with information drawn from MSDS material on recycled water has been provided as supporting material to induction procedures for staff, students and visitors being taken out to restricted access areas of the Scheme.

Research and teaching is also a critical means to increase participation and awareness by the broader campus community.

Refer to attached Induction

## **6.2.    *Training needs and resources***

An increasing range of training areas and resources are being developed, including:

- Risk Management
- Australian Guidelines for Recycled Water
- Water use budgeting and

The NSW Department of Primary Industry utilised it's Sydney Vegetation Demonstration Block on the campus as a focus on a broad range of irrigation management, including technologies

## **7. Validation, research and development**

### **7.1. Validation of processes**

Continuous improvement of the effectiveness of the infrastructure to support distribution and use, and risk management processes across the range of water users within the HWRS continues to be a key focus. Research and development is a core focus of the Hawkesbury Water Recycling Scheme. This is undertaken in a number of ways, including:

- Engagement with UWS researchers in relation to both areas of direct relevance to risk management and emerging or developing areas of operational utilisation
- Continuing redesign and adaptation of the Scheme, responding to the development drivers within the campus, and building upon the strengths of the Scheme
- Particular research and development contexts of the different water users, such as the School of Natural Sciences, and the NSW Department of Primary Industry.

Appendix x outlines the published works and research projects which continue to contribute towards the continuous improvement of the Scheme.



## Risk Assessment and Control Form



### Step 1: Who has conducted the Risk Assessment

Risk Assessment completed by (name): Lyn Anderson

Staff / Student Number: H0010415

Signature:

Date: 9-Mar-10

### Step 4: Documentation and initial approval

Authorised by (name):

Signature:

Date:

For additional information refer to the OHS Risk Assessment and Control Procedure, the OHS Risk Rating Procedure and the Hierarchy of Risk Controls.

### Step 2: Identify the activity

Faculty/School/Unit:	Location	Who may be at risk by the activity?
Capital Works & Facilities – Hawkesbury Water Recycling System	Hawkesbury Campus; <ul style="list-style-type: none"><li>• School of Natural Science</li><li>• Taronga Zoo Plantation</li><li>• Skill Share Nursery</li><li>• Greening Australia</li><li>• CW&amp;F</li></ul> Department of Innovation and Industry TAFE Richmond; Hawkesbury Race Course	Users of the recycled water scheme, their staff, students and visitors.

### Steps 3: Identify the hazards, risks, and rate the risks

1. An activity may be divided into tasks. For each task identify the hazards and associated risks.
2. List existing risk controls and determine a risk rating using the UWS Risk Rating Procedure.
3. Additional risk controls may be required to achieve an acceptable level of risk. Re-rate the risk if additional risk controls used.

Add additional lines if required

Tasks	Hazards	Associated risks	Risk rating with existing controls			Existing risk controls	Evaluation of existing control effectiveness*	Additional Risk Controls	Risk Rating with additional controls		
			L	I	R				L	I	R
Storage and Distribution	<ul style="list-style-type: none"> <li>Public Health</li> </ul>	<ul style="list-style-type: none"> <li>Personal illness or injury</li> <li>Ingestion</li> </ul>	2	4	8	<ul style="list-style-type: none"> <li>Compliance with all relevant regulatory and formal requirements.</li> <li>Controlling methods of application</li> <li>Controlling public access</li> <li>Restrict use</li> <li>Training of users</li> <li>Monitoring of water quality</li> <li>Using signage, labelling and communication to minimise accidental exposure</li> <li>Prevention of cross-connections and installation of backflow prevention devices</li> </ul>	Needs improvement / Deficient	Risk Assessment Plans Establishment of Critical Control Points Dose Response Use of new technology	1	1	1

Tasks	Hazards	Associated risks	Risk rating with existing controls			Existing risk controls	Evaluation of existing control effectiveness*	Additional Risk Controls	Risk Rating with additional controls		
			L	I	R				L	I	R
	○ Supply Disruption	○ <i>Loss of productivity</i> ○ <i>Financial Impacts</i>	3	4	12	■ Maintenance of equipment/infrastructure	Needs improvement / Deficient	Use of new technology	2	1	3
	○ Environmental Impacts	○ <i>Contamination/Concentration</i> ○ Loss of Biodiversity ○ Loss of nutrient balance ○ Odour	2	2	4	■ <i>Compliance with all relevant regulatory and formal requirements.</i> ■ Monitoring of ground water and soils ■ Prevent cross-connections and installed backflow prevention devices ■ The use of buffer zones to prevent accidental watering of non-targeted areas	Needs improvement / Deficient	Establishment of Critical Control Points Dose Response Use of new technology	2	1	3
	○ Resource Scarcity	○ <i>Loss of productivity</i> ○ <i>Financial Impacts</i>	2	4	8	■ Water budgeting			1	2	3
	○ Non-compliant Product, i.e. Microbial	○ <i>Loss of</i>	3	4	12	■ Containment of product and stop	Needs improvement /	Establishment of Critical Control Points	2	2	4

Tasks	Hazards	Associated risks	Risk rating with existing controls			Existing risk controls	Evaluation of existing control effectiveness*	Additional Risk Controls	Risk Rating with additional controls		
			L	I	R				L	I	R
	imbalance	<i>productivity</i> ○ Financial Impacts ○ Personal illness				use ■ Communication with users and Sydney Water ■ Use of alternative supply ■ Monitoring of water quality	Deficient	Establishment of withholding periods Dose Response Use of new technology			
<b>Irrigation of</b> • Paddocks • Vegetables/Fruit • Trees • Gardens • Lawns • Playing Fields	○ Environmental Impacts	○ Contamination/Concentration ○ Loss of plants ○ Loss of Biodiversity ○ Waterlogging ○ Odor ○ Pest and Disease ○ Toxicity ○ Salinity ○ Sodicity	2	2	4	■ Compliance with all relevant regulatory and formal requirements. ■ Monitoring of ground water and soils ■ Establishment of operational procedures ■ The use of buffer zones to prevent accidental watering of non-targeted areas ■ Prohibition of watering during adverse weather condition	Needs improvement / Deficient	Risk Assessment Plans Dose Response Use of new technology	2	1	3
	○ Public Health	Personal illness or injury	2	4	8	■ Compliance with all relevant	Needs improvement /	Risk Assessment Plans Dose Response	1	1	1



Tasks	Hazards	Associated risks	Risk rating with existing controls			Existing risk controls	Evaluation of existing control effectiveness*	Additional Risk Controls	Risk Rating with additional controls		
			L	I	R				L	I	R
		Ingestion				<i>regulatory and formal requirements.</i> <ul style="list-style-type: none"> <li>■ Establishment of operational procedures</li> <li>■ Controlling methods of application</li> <li>■ Controlling public access</li> <li>■ Restrict use</li> <li>■ Training of users</li> <li>■ Communication strategy</li> <li>■ Monitoring of water quality</li> <li>■ Using signage, labelling and communication to minimise accidental exposure</li> <li>■ Restrict use during adverse weather conditions</li> </ul>	Deficient	Use of new technology Establishment of Critical Control Points			
	<ul style="list-style-type: none"> <li>○ Supply Disruption</li> </ul>	<ul style="list-style-type: none"> <li>○ <i>Loss of productivity</i></li> <li>○ <i>Financial Impacts</i></li> </ul>	3	4	12	<ul style="list-style-type: none"> <li>■ Maintenance of equipment/infrastructure</li> <li>■ Communication strategy</li> </ul>	Needs improvement / Deficient	Establishment of Critical Control Points Use of new technology	2	1	3

*L = likelihood I= Impact R = risk rating from the UWS Risk Rating Procedure on the following page.*

Tasks	Hazards	Associated risks	Risk rating with existing controls			Existing risk controls	Evaluation of existing control effectiveness*	Additional Risk Controls	Risk Rating with additional controls		
			L	I	R				L	I	R

\* refer to section 4: Evaluation of Control Effectiveness

#### Step 5: Implement the risk controls

Indicate briefly what risk control was implemented, when and by whom. Add more lines if required.

1. Risk control: Risk Assessment Plans  
(Currently being implemented as part of the stakeholder agreements with UWS)

2. Risk control: Use of new technology.  
(Currently implemented as part of new additions to the HWRS)

3. Risk control: Establishment of Critical Control Points  
(Currently implemented within the RWMP)

4. Risk Control: Dose Response.  
(Proposed risk control to be implemented by Environment and Risk Management Unit)

## 1. Categories of Risk

Risk Category	Description
Academic (Course load/ logistics)	Student load by course and campus, Staff student ratios, teaching loads, admission processes and standards, student progression and retention rates , mode of delivery, changes of student profile and market demands, course and unit coordination capacity and load of academics, levels of administrative and technical support for academic course and unit delivery
Academic (Course curriculum / quality)	Quality/ standard of academic program/ course contents, planning strategy for course offerings, approvals and monitoring process for courses and units
Academic (Research)	Research income, research load, research work and staff, research capacity, Intellectual property, patents, ethical conduct in research etc.
Behaviour	UWS community's risk culture: staff & students' reckless (disasters), conservative (opportunities lost), observation of policies and procedures. Student demonstrations, terrorism, fraud, corrupt conduct, activists seeking to damage UWS.
Environmental	Water, soil, air contamination, asbestos, waste management, incidents causing damages, injury/ death, environmentally triggered emergencies.
Financial	Reductions in income, liquidity, financial loss, insurances, debt, budget overruns, tenders.
Infrastructure	The physical fabric of the University, buildings, roads, pathways, utilities (electricity, water).
International	Overseas ventures/ reputation/ program disaster, relationships with overseas universities.
Legal	Contracts and agreements, high profile litigation - financial and reputational impact.
Legislation	Breach, financial penalty/ impact on reputation, laws, regulations, codes, affecting UWS.
Organisation	Strength of policies and procedures, planning, staffing, morale, training, ethical culture, leadership and management.
Political	Ability to respond to major changes in education policies, level of government consultation.
Reputation (local/ international)	Damaging media reports, employability of graduates, research links, regional involvement.
Technology	Strategic direction of IT, reliance on ecommerce/ email/ internet, student records system, library.

## 2. Risk Rating Matrix

Impact	Likelihood				
	Rare	Unlikely	Possible	Likely	Almost certain
<b>Catastrophic</b>	moderate	moderate	high	critical	critical
<b>Major</b>	low	moderate	moderate	high	critical
<b>Moderate</b>	low	moderate	moderate	moderate	high
<b>Minor</b>	very low	low	moderate	moderate	moderate
<b>Insignificant</b>	very low	very low	low	low	moderate

## 3. Classification of Audit Recommendations and Risk Issues

Likelihood (L)	Impact (I)	Rating (L) X (I)	Definition
<b>(5) Almost certain</b>	<b>(5) Catastrophic</b> <ul style="list-style-type: none"> <li>Potential financial impact of \$500,000 (\$50,000)(a) or more</li> <li>Detrimental impact on operations or major projects</li> <li>Sustained loss in reputation ,</li> <li>Sustained impact on services or quality</li> <li>Loss of public confidence in the University</li> <li>Contractual, legislative or regulatory non-compliance with certain litigation, prosecution or penalties</li> <li>Life threatening</li> </ul>	<b>Critical</b> <b>&gt; 20</b>	Issue represents a control weakness which could cause a severe disruption to or have a severe adverse effect on operations and objectives
<b>(4) Likely</b>	<b>(4) Major</b> <ul style="list-style-type: none"> <li>Potential financial impact of \$200,000 (\$20,000) or more</li> <li>Major impact on operations or major projects</li> <li>Serious loss in reputation</li> <li>Serious impact on services or quality</li> <li>Probable loss of public confidence in the University</li> <li>Contractual, legislative or regulatory non-compliance with probable litigation, prosecution or penalties</li> <li>Extensive injuries</li> </ul>	<b>High</b> <b>≥ 13 &amp; ≤ 19</b>	Issue represents a control weakness which could cause a major disruption to or have a major adverse effect on operations and objectives

<b>(3) Possible</b>	<b>(3) Moderate</b> <ul style="list-style-type: none"> <li>Potential financial impact of \$100,000 (\$10,000) or more</li> <li>Moderate impact on operations or major projects</li> <li>Short-term loss in reputation</li> <li>Moderate decline in services or quality</li> <li>Possible loss of public confidence in the University</li> <li>Contractual, legislative or regulatory non-compliance with potential for litigation, prosecution or penalties</li> <li>Minor injuries</li> </ul>	<b>Moderate</b> $\geq 5 \text{ \& } \leq 12$	Issue represents a control weakness which could cause a disruption to or have an adverse effect on operations and objectives
<b>(2) Unlikely</b>	<b>(2) Minor</b> <ul style="list-style-type: none"> <li>Potential financial impact of \$50,000 (\$5,000) or more</li> <li>Minor impact on operations or major projects</li> <li>No loss in reputation</li> <li>Minor impact on services or quality</li> <li>No loss of public confidence in the University</li> <li>Contractual, legislative or regulatory non-compliance but unlikely to result in litigation, prosecution or penalties</li> <li>Potential for injury</li> </ul>	<b>Low</b> $\geq 3 \text{ \& } \leq 4$	Issue represents a minor control weakness which could cause a minimal but reportable effect on operations and objectives
<b>(1) Rare</b>	<b>(1) Insignificant</b> <ul style="list-style-type: none"> <li>Potential financial impact less than \$50,000 (&lt; \$5,000)</li> <li>Impact can be absorbed – insignificant effect on operations and objectives</li> </ul>	<b>Very Low</b> $\leq 2$	Issue represents an insignificant control weakness

#### 4. Evaluation of Control Effectiveness

Well Designed Control ?		Effectively Implemented ?	
<b>3</b>	Needs improvement	<b>3</b>	Deficient (b)
<b>2</b>	Adequate	<b>2</b>	Marginal
<b>1</b>	Strong	<b>1</b>	Effective

# Appendix F Infrastructure Maintenance

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## 2 (e) Infrastructure Maintenance

## Operation of Infrastructure

The infrastructure up to the various receiving points identified in Figures 1 and 3 are the property and responsibility of the University of Western Sydney, under the direct stewardship of Capital Works and Facilities.

Maintenance of pumps and associated equipment forms part of the Hydraulic Maintenance Contract and the specifications utilised to draft this are attached (refer to pages 8 to 11). This contract is currently up for renewal and as the tender has not been awarded at time of writing, remains a confidential document.

The current schedule for these activities is January the annual services is undertaken, with subsequent service scheduled six months after that. The time of these may alter dependant on weather and other environmental factors.

Pipe lines and associated valves are maintained on reactive bases. A work request from Capital Works is provided to a licensed plumber who takes the appropriate actions. Reactive actions of pump infrastructure flows a similar procedure.

Operation of the main transfer pumps are undertaken by Capital Works and Facilities, i.e. the Field Technical Officer or Environmental Supervisor, and the School of Science and Health, i.e. the Farm Manager. Individual irrigation pumps within the School are operated by Technical Staff within the appropriate area. All failures are reported to Capital Works and Facilities through the following process:

“To report a routine maintenance or facilities request, please complete a CW&F Client service request form ([http://www.uws.edu.au/capital\\_works\\_and\\_facilities/cwf/cwf\\_forms](http://www.uws.edu.au/capital_works_and_facilities/cwf/cwf_forms)) and email it to [facilities@uws.edu.au](mailto:facilities@uws.edu.au).

To report an urgent maintenance issue that requires immediate attention, please phone the UWS Contact Service Centre on 9852 5800 (Ext 5800). After hours calls regarding urgent maintenance issues will be transferred to the Duty Security Officer”



## **HYDRAULIC / PLUMBING SERVICES**

### **TECHNICAL SPECIFICATION**

#### **FOR**

#### **TESTING AND CERTIFICATION OF**

#### **ENVIRONMENT AND RISK ASSETS**

## 1. SCOPE OF WORK

Testing and Certification of the hydraulic / plumbing equipment as specified in the TECHNICAL EQUIPMENT LIST.

## 2. LOCATION

Location of the scope of work: University of Western Sydney, campuses:

- Richmond Hawkesbury

## 3. STANDARDS AND GUIDELINES

The relevant requirements of the standards and documents highlighted below shall be complied with when performing any work of installation, statutory maintenance and testing.

These rules and standards are applicable to all hydraulic / plumbing equipment or parts of equipment which form part of the hydraulic systems installed throughout the University of Western Sydney campuses.

- University Of Western Sydney guidelines;
- AS/NZS 3500 all parts - Plumbing and Drainage;
- New South Wales Code of Practice - Plumbing and Drainage;
- BCA – Building Code of Australia;
- AS 2845.3 – 1993 – Backflow prevention devices, Part 3 – Field testing and maintenance;
- NSW Work Cover Regulations;
- Local Council Guidelines and Regulations;
- Sydney Water Corporation Guidelines;
- Manufacturer's Recommendations.

Regulatory requirements: Attention is drawn to the relevant regulatory requirements with respect to:

- The qualification of persons permitted by law to do plumbing work;
- The administrative procedures to be followed by persons performing plumbing work;
- the authorization for certain materials, products, fittings, and other components to be connected to water supply systems in accordance with National Certification of Plumbing and Drainage Products Scheme in Australia.

#### 4. ABBREVIATION

The following abbreviations are used throughout this document:

- AS shall read "Australian Standards"
- BFPD shall read "backflow prevention devices"
- CWF shall read "Capital Works and Facilities"
- RPZD shall read "reduced pressure zone device"
- UV shall read Ultra-violet
- UWS shall read "University of Western Sydney"

## 5. SPECIAL REQUIREMENTS

- Obtain and read the manufacturer's instructions before testing any equipment;
- Exercise care when performing testing activity;
- Ensure all staff working on site have been given appropriate Occupational Health and Safety inductions
- Advise the UWS/CWF Maintenance manager of any maintenance work that might be required or is urgent;
- It is the responsibility of the Contractor to have his / her tools kit and any special tools that he / she might require to perform the work under this Contract.
- It is the Contractors responsibility to bring their own protective equipment, as part of their work environment, including but not limited to: gloves, protective glasses, protective clothing, ladder, and the like.
- The Contractor shall supply to UWS / CWF any tax invoices for spare parts and any technical parts required to complete their work, as proof for UWS / CWF compensation.

## 6. TECHNICAL EQUIPMENT LIST

The technical equipment included in the table below shall form part of the maintenance Contract:

Site Location	Barcode	Type	Manufacturer	Serial Number
Hort Dam	CWF0030391	Pump	Southern Cross	94596
Hort Dam	CWF0019578	Pump	Grundfos	98502
Hort Dam	CWF0019579	Pump	Grundfos	98502
Hort Dam	CWF0019580	Pump	Grundfos	B33500008 98345
Hort Dam	CWF0028168	Pump	Ajax Elite	2/2
Hort Tank		Pump	Southern Cross (green)	26327
Hort Tank		Pump	Southern Cross (grey)	94623
Hort Tank		Pump	Grundfos	16E97A 40
Hillside Dam		Pump	Grundfos	?
Hillside Dam		Pump	Southern Cross	76027
Hillside Dam		Pump	TKL KL 150 Compact	DK0383
Hillside Dam		Pump	Grundfos	181202
Turkey Nest Dam		Pump	TKL Hydro Titan	HT 10749

Turkey Nest Dam		Pump	Southern Cross	16A98A09
Turkey Nest Dam		Pump	All Pumps	Speck IEC 34-1
Turkey Nest Dam		Pump	Ajax	263273B
Turkey Nest Dam		Pump	Grundfos	SP95-4B-15 kW
Yarramundi Dam	CWF0020710	Pump	Southern Cross	03F92A007
Detention Basin		Pump	Ajax	38859
Detention Basin		Pump	Ajax	210445D
Detention Basin		Pump	Ajax	210434D
Lindsay Dam		Pump	Ajax	210442D
Stinky Dam		Pump	Davey	?
Stinky Dam		Pump	Davey	?
Stinky Dam		U.V. Steriliser	Steriflo	?
Building R1	CWF0024128	Pump	Davey	7298677249
Building R1	CWF0024113	Pump	Davey	7337687535
Building J9	CWF0024996	Pump	Onga	M07140416
Building J9	CWF0030052	Tank	N/A	N/A
Building M15	CWF0028099	Tank	N/A	N/A
Building M15	CWF0028120	Tank	N/A	N/A
Building M15	CWF0028121	Tank	N/A	N/A
Building M15	CWF0028122	Tank	N/A	N/A
Building M15	CWF0028123	Tank	N/A	N/A
Building M15	CWF0028125	Tank	N/A	N/A
Building M15	CWF0028126	Tank	N/A	N/A
Building M15	CWF0028128	Tank	N/A	N/A
Building M15	CWF0028130	Tank	N/A	N/A
Building P6	CWF0030414	Tank	N/A	N/A
Building P7	CWF0030415	Tank	N/A	N/A
Building P7	CWF0030416	Tank	N/A	N/A
Building R1	CWF0030419	Tank	Bluescope	N/A
Building R1	CWF0030420	Tank	Bluescope	N/A
Building R1	CWF0030421	Tank	Bluescope	N/A
Building R1	CWF0030422	Tank	Bluescope	N/A
Building S14	CWF0030430	Tank	Rapidplas	N/A
Building S19	CWF0030025	Tank	N/A	N/A
Building S33	CWF0030427	Tank	N/A	N/A
Building S33	CWF0030428	Tank	Team Poly	210110411M
Building S35	CWF0030425	Tank	Team Poly	3230516DG
Building Y1	CWF0030445	Tank	Australian Panel Tanks	N/A
Building Y1	CWF0030446	Tank	Australian Panel Tanks	N/A
Stinky Dam		Hunter ACC Controller	Hunter	N/A

**7. CIRCULATING PUMPS (RAINWATER HARVESTING PUMPS)**

**ANNUAL INSPECTION AND TESTING**

1. Check pump for any unusual sounds or excessive vibration.
2. Tighten electrical connections and ensure wiring shows no signs of deterioration.
3. Ensure joints are tight and leak free. Remake joints if required.
4. Remove in-line filter if fitted and clean. Replace if necessary.
5. Provide a report update for all pumps showing CWF barcode number, model, manufacturer, location and any faults and rectification work undertaken, as well as general condition, and any other comments deemed necessary. In the absence of any of the above information, C.W.F. shall be notified.

## **8. IRRIGATION PUMPS**

### **6-MONTHLY INSPECTION AND TESTING**

1. Log pump / motor run hours from pump starter in service book.
2. Clean exterior around pump / motor unit.
3. Ensure pump shed / room is in clean condition.
4. Inspect start switches for damage. Test start switch for smooth and correct operation
5. Install vacuum gauge on pump suction line and ensure gauge is operational.
6. Install liquid filled pressure gauge on discharge of pump outlet and before isolation valve. Ensure gauge is operational.
7. Fit water meter to discharge of pump assembly. Ensure meter is in operational.
8. Operate pump to closed head with pump discharge valve closed; ensure pump is capable of reaching shut of head as per manufacturers pump curve.
9. Open discharge pump and throttle back to three pre chosen pump duty points on pump curve ensure pump is capable of meeting manufactures duty points along curve with discharge pressure gauge, suction requirements with vacuum gauge and flow rates with water meter. Report and log in service book to refer to at next pump service.
10. Measure motor amperage against pump duty points. Log in service book.
11. Ensure suction line is holding prime.
12. Check foot valve and clean if necessary.
13. Inspect all pump suction and discharge pipe work for leaks repair as required.
14. Inspect pump/motor unit is secured to pump frame and ensure frame is secured correctly to concrete floor with dyna-bolts. Repair as required.
15. Close coupled motor pumps, inspect pump / motor coupling ensure coupling is fitted correctly and is tight.
16. For long coupled pump / motor units, ensure pump coupling is aligned and fitted correctly. Adjust if required. Replace worn pins, bushes and coupling rubbers as required.
17. Mechanical seal pumps ensure mechanical seal is not leaking. Replace if seal is leaking.

18. Gland packed pumps. Ensure gland is dripping at manufactures specified rate. Tighten as required. If gland continues to over drip or allows pump to lose prime replace gland packing.
19. For sealed bearings. Check against service record for hours run. Listen to operation of pump drive end bearing and pump end bearing. If bearings are running excessively hot or making excessive noise replace bearings. For sealed bearings in motors perform as above.
20. For grease bearings. Check against service record for hours run. Grease bearings as required. Listen to operation of pump drive end bearing and pump end bearing. If bearings are running excessively hot or making excessive noise replace bearings. Repeat for motor bearings.
21. Check pump discharge valving for leaks and operation. Service / replace as required.
22. Special valving eg pressure sustaining valves, pressure reducing valves etc. Inspect to ensure valves are operating as per manufacturers specifications. Service as per manufacturers specifications.
23. Filters if fitted. Check pressure on both sides of filter. Log in service book. Clean filter mesh / disc as needed. Media filters check against service log and ensure media is changed every two years. Ensure backwash assembly is operational. Ensure all sustaining valves and backwashing valves are operational. Service / replace valves as required.
24. Clean exterior of filters.
25. Check all bolts for corrosion. Apply corrosion inhibitor to all exposed bolts in pump shed. Replace damaged bolts, nuts and washers as required.
26. Inspect all pump protection equipment. Eg flow switches, float switches, pressure switches and transducers. Ensure protection equipment is operational as per manufactures recommendations. Repair / replace non operational equipment as required.
27. Inspect exposed pipe work in and around pump station for leaks, damage or corrosion. Repair / replace as required.
28. Check all "Non Drinking Water" signage repair or replaced damaged and missing signs.

#### ANNUAL INSPECTION AND TESTING

1. Carry out all 6-monthly maintenance items.
2. Check vibration isolators for deterioration.
3. Megger test motor windings; clean and paint any corroded sections.
5. Clean, flush and refill any pump with ring oil bearings.



6. Provide a report update for all pumps showing CWF barcode number, model, manufacturer, location and any faults and rectification work undertaken, as well as general condition, and any other comments deemed necessary. In the absence of any of the above information, C.W.F. shall be notified.

## 9. STERIFLO U.V. FILTRATION SYSTEM

### 6- MONTHLY INSPECTION AND TESTING

Testing and maintenance of the Steriflo U.V. treatment system should only be performed by suitably trained and experienced personnel.

1. Replace U.V. lamp (refer to spare parts schedule);
2. Remove quartz sleeve and clean with 10% hydrochloric solution on a clean cloth. (Methylated spirits is suitable for removing grease from handling sleeves and lamps),
3. Clean all filters
4. Clean UV sensor quartz window,
5. Clean chamber using methylated spirits,
6. Spray o-rings with silicone lubricant before reassembly,
7. Clean external body of control cabinet with mild detergent and damp cloth. Clean inside of control cabinet with vacuum cleaner and dry cloth,
8. Turn on and pressurise system. Run test and check for leaks/faults,
9. Fill in log sheet, noting lamp changes, cleaning operations and faults,

**10. HUNTER ACC CONTROLLER**

1. Clean controller cabinet with soft dry cloth. Remove dust and debris
2. Open cabinet and inspect wiring and terminals for damage, loose connections etc. Clean inside of controller cabinet with soft brush/dry cloth
3. Replace/reinstate damaged terminals and wiring as required
4. Check and tighten terminal connections
5. Replace 9V battery on Face pack remote power
6. Replace internal Face pack battery on real time clock (Lithium CR2032)

**11. STORMWATER DETENTION STORAGE TANKS - IN GROUND**

**ANNUAL INSPECTION**

1. Inspect tank access openings and surrounds for impact damage. Ensure all tank access openings are lockable;
2. Drain contents of tank and inspect internal tanks walls (where possible), for structural deformities, fractures, and overall condition. All possible attempts shall be made to utilise tank water in a responsible, environmentally friendly manner, i.e. watering landscaped areas, transfer to local dams/ponds etc;
3. De-sludge tank and clean tank walls as required;
4. Inspect first flush diverters (where fitted), and clean;
5. Clean filters on all inlet pipe work as required;
6. Provide a report update for all tanks showing CWF barcode number, model, manufacturer, location and any faults and rectification work undertaken, as well as general condition, and any other comments deemed necessary. In the absence of any of the above information, C.W.F. shall be notified.

**12. STORMWATER DETENTION STORAGE TANKS - ABOVE GROUND**

**ANNUAL INPSECTION**

1. Generally inspect tank for damage and visible water leaks;
2. Drain contents of tank and inspect internal tanks walls (where possible), for structural deformities, fractures, and overall condition;
3. Inspect first flush diverters (where fitted), and clean;
4. Clean filters on all inlet pipe work as required;
5. Drain and flush out tanks completely. All possible attempts shall be made to utilise tank water in a responsible, environmentally friendly manner, i.e. watering landscaped areas, transfer to local dams/ponds etc.
6. Open and close all outlet valves on tanks to check for correct operation. Replace valves if found to be faulty.
7. Provide a report update for all tanks showing CWF barcode number, model, manufacturer, location and any faults and rectification work undertaken, as well as general condition, and any other comments deemed necessary. In the absence of any of the above information, C.W.F. shall be notified.

13 ATTACHMENT 1– STERIFLO SERVICE  
INSTRUCTIONS

## 5. SERVICE

Includes lamp replacement and cleaning of quartz components.

### LAMP REPLACEMENT:

1. Turn off water flow to ensure that untreated water does not pass.
2. Switch off steriliser and mains supply.
3. Remove endcap after undoing nuts.
4. Lamp connectors are now exposed, disconnect and withdraw lamps.

<b>CAUTION: HOT. DO NOT TOUCH QUARTZ BODY OF LAMP EXCEPT WITH CLEAN CLOTH. HANDLE BY END PIECES.</b>
--

5. Reverse procedure with new lamp.

NOTE: Allow one hour running before finally resetting UV meter, full burn in takes up to 100 hours.

### QUARTZ SLEEVE REMOVAL:

1. Turn off water and lamps, isolate water flow, drain chamber and remove lamps as above.
2. Undo sleeve retaining caps, one at each end of chamber. The caps are retained with 4 socket head screws. Remove O-rings (inspect to check condition). Inside power end cap is a white pressure ring which must be retained. Do not reassemble without ring. To loosen O-rings twist sleeve at the opposite end to the power connections (closed end caps) and then push in 2-3mm to break seal.
3. Withdraw quartz sleeve, CARE - do not allow closed end of sleeve to drop into chamber - a dowel rod inserted into the sleeve is essential when dismantling and when reassembling to guide sleeve into position.
4. Clean with 10% Hydrochloric acid on a clean cloth. Methylated spirits is suitable for removing grease from handling sleeves and lamps.

When reinserting sleeve use silicone spray on o-rings to ease removal next time.

See section 8 for in place cleaning of quartz sleeves.

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5. If the quartz sleeve requires cleaning so will the UV sensor quartz window (see drawing AS50). Remove by unscrewing the large retaining nut and removing the sensor assembly.

**NOTE: IT WILL BE APPROPRIATE AT THIS STAGE TO CHECK INSIDE THE CHAMBER FOR DEPOSITS AND HOSE OUT ANY SEDIMENT.**

6. When reassembling insert sleeve using dowel. Replace the O-rings at each end and push into recess.

Fit cap at power end of quartz sleeve first. Before tightening push sleeve in until this end has 5-10mm left exposed outside chamber. Tighten the cap at this end. Following this procedure ensures that the end of the sleeve cannot be damaged by the cap as it is tightened as there is plenty of room inside the cap at the other end.

**NOTE: DO NOT FULLY TIGHTEN ENDCAP SCREWS - FINGER TIGHT PLUS HALF A TURN IS SATISFACTORY.**

#### CHAMBER CLEANING.

The chamber can be cleaned with most solvents and cleaning agents, except hydrochloric acid which is suitable for quartz cleaning only.

#### CONTROL CABINET CLEANING

Outside: Use only mild detergents and a damp cloth with clean water.

Inside: Disconnect at mains. Clean with vacuum cleaner, wipe surface with dry cloth.

#### NON ROUTINE PROCEDURES

1. Internal quartz sleeve cleaning - to remove dirt in the quartz sleeves the inside of the sleeves should be cleaned using methylated spirits and a bottle type brush or rag on the end of a dowel rod.

2. Extended shut down - flush unit with fresh water and drain. If used with sea water or sewage rinse with fresh water.

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LOG SHEET

[illegible]

NB. Under notes, log lamp changes, cleaning operations, faults, water quality.



## 7. RECOMMENDED SPARES

The following should be held as spares as a minimum:  
Spare lamp, quartz sleeve, and 2 sleeve O-rings. Refer to table below for relevant part numbers.

<b>ACX</b>	
Lamp	GIA840NW
Sleeve	TT900
Ballast	S436
<b>ALX2 (all versions)</b>	
Lamp	GIA1554NW
Sleeve	TT1575
Ballast ALX2	S436

24V transformer	S352
Circuit board	S145
Quartz sleeve O-ring	S24 x 3S70 (4)
Sensor holder O-ring	S112S70 (2)
Sensor port quartz window	S141
Sensor port seal ring	S385
Viewing port O-ring	S112S70
View port glass window	S122
View port packer	S126
Quartz sleeve pressure ring	S113 (2)
UV sensor head	S109
Lamp Connector	S114/1

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#### 8. CHEMICAL CLEANING

If the steriliser is being used on a duty where fouling is likely, for example if the water contains iron, cleaning of the quartz sleeves may be frequent and time consuming.

Therefore we recommend the use of an in-situ chemical cleaning system. This involves the use of a chemical cleaning agent such as a mild acid, such as 5% Citric, Sulphamic acid or for severe mineral deposits, dilute Sulphuric acid. Do not use Hydrochloric acid.

A suitable cleaning system is shown in the drawings section. Cleaning will normally involve turning off the water flow and the steriliser, isolating the steriliser and then recirculating the acid for perhaps 30 minutes although mild acids like Citric can be left to soak indefinitely. Cleanliness can be checked by draining the acid and refilling the steriliser with water. Turning the steriliser back on and checking the monitor reading will allow verification of the effect of the clean.

##### Notes:

1. Goggles and gloves should be worn even when handling mild acids.
2. The acid can be used several times and so provision should be made for return to its container after use.
3. The acid can normally be disposed of into a sewer provided it is neutralised first. Check with the local authority to determine the allowed pH range. The pH should be measured with a meter or indicator paper. Alternatively a soakhole can be used.

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#### 9. TROUBLE SHOOTING GUIDE MULTILAMP UNITS

- 1) NO ILLUMINATION OF ON/OFF SWITCH - No mains power to unit
- 2) RED ALARM LIGHT ON WITH UV BELOW ALARM LEVEL AFTER START UP - Both lamp on lights green.

The UV meter 100% needs to be calibrated for the site water quality. To do this adjust the Zero pot on the S384 circuit board to 100% after 10 minutes operation (before if the UV reading is steady) and reset as necessary after 100 hours. Contact DWP if 100% is not obtainable.

#### 3) UV READING LOW:

- a) Lamp output low (old or faulty lamp).
- b) Poor water clarity.
- c) Fouling of quartz sleeve or window (S141) in front of UV sensor (S109).
- d) Entrained air bubbles (check through viewport)
- e) UV sensor fault (see 7).

#### 4) UV READING SLOW TO INCREASE BUT EVENTUALLY REACHES NORMAL READING.

Due to low temperature (below 10°C) or old lamps near the end of their service life. Normally the high output UV lamps take up to 4 minutes to reach normal output.

The lamp in LX systems is the GIA1554NW. Operating voltage is nominally 200 Volts. The ACX2 lamp (GIA840NW) operates at 100-120 Volts. This is the transformer output, not the mains voltage which should be 230-240. Operating current is 1.5A.

CAUTION - STRIKING (OPEN CIRCUIT) VOLTAGE IS 600 V.

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#### 5) LAMP LED EXTINGUISHED

Each lamp has a corresponding LED (Green) which indicates whether the lamp is on or not. The alarm will sound if a lamp is out. If one LED (and lamp) is out it can be a problem with a) the ballast and its wiring or b) the lamp and its wiring. If both lamps are out it is likely to be a ballast failure.

Should the lamp fail to strike check the lamp by switching its connector with the working lamp's connector. Should the lamp still fail to strike it should be replaced. If it does strike check its original connector and wiring for continuity and check that power is available at the connections for that lamp.

#### 6) EARTH LEAKAGE BREAKER TRIPS

This is most likely caused by water contacting lamp connections or a wiring fault causing grounding. To isolate the location of the fault the usual procedure is to disconnect all lamps and then reconnect one at a time to isolate the cause of the trip. If the fault is not traced then disconnect all lamp and transformer wiring. If the breaker still trips then there may be a ground fault in the cabinet or the ELB itself may be faulty.

#### 7) UV SENSOR FAULT FINDING

The UV sensor is a resistor sensitive to UV. Its resistance drops as UV intensity increases and its ability to pass a current rises. This current is shown on the %UV meter.

In the absence of a UV reading (Zero control turned all the way anticlockwise) there is likely to be a fault with a) the control circuit board b) the meter c) the wiring between the sensor and the control d) the sensor.

On initial set up, or after fitting of a new sensor the Zero pot (VR1) is used to set the range of the meter. The usual procedure is to factory set the span control. This can be recalibrated if necessary, check with Davey Water Products if required. The Zero is used to set 100% on the UV meter.

#### FAULT FINDING - LOW OR NO UV READING

a) Check resistance across UV sensor - should be high (>100kOhm) with the UV lamp off, dropping to less than 5,000 ohms with the lamp on. It is possible to get a meter reading up to around 15,000 Ohms although this can vary from sensor to sensor. If very high resistance with UV on replace sensor. This is usually due to water damage (blackens sensor face).

b) Control board check - bridge INT1 and INT2 with wire or needle nose pliers. Full scale reading should result - if not replace board if UV meter is OK (check c).

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c) Check output from board - connections from the S384 circuit board to the %UV meter should give up to 1mA (possibly more while bridging INT1 and INT2). The meter reading should correspond to the output at J4 (100% UV = 1mA).

d) Check continuity of wiring from INT1 and INT2 to sensor plug and the connections in both halves of the plug. Check no strands of cable shielding are touching contacts in plug, socket or at the terminal strip.

e) The small transformer below the UV meter should supply 12Vdc to the circuit board. Check this is present.

f) Take care when tightening nut on a new sensor that the cable gland around the wire is loose otherwise damage can occur due to rotation of the wires into the back of the sensor. Open circuit with lamp on can indicate a broken wire in the sensor in which case replacement is required.

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10. PARTS LIST AND DRAWINGS

CCL 248	APB-ACX2 circuit
CCL 110	SF LH/LX/CX/VX series installation
CCL 78	UV cleaning system
AS 79	UV sensor assembly triclamp
AS 38	Support stand
AS 06	Assembly drawing viewing port
AS 87	Assembly drawing end details GIA lamps

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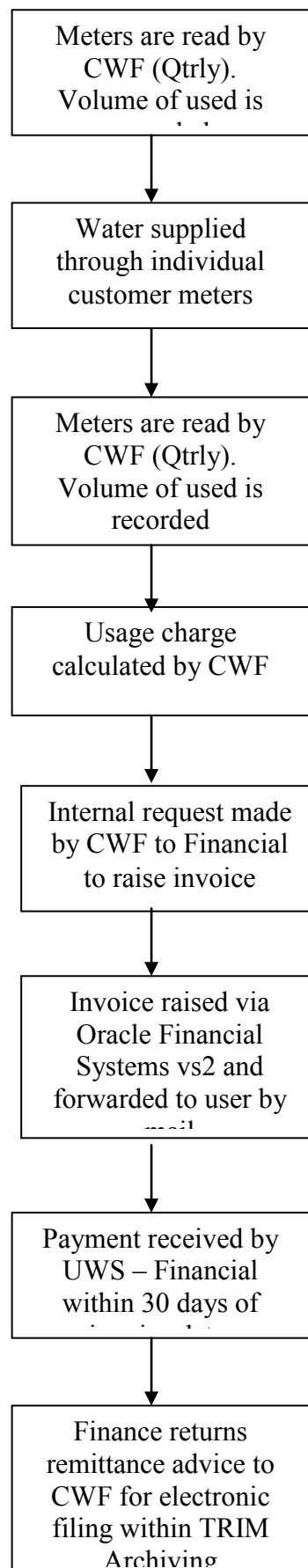
# Appendix G Management Systems

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## 2 (g) Management Systems

## Billing Process

University of Western Sydney has no customer service charter. There is no formal dispute management protocol.





# Appendix H. Organisational Structure

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**3(c) How have you allocated resources for the construction, commissioning, management and operation of the facility? –**

- **Business Plan - Confidential**
- **Organisational Structure – UWS - Confidential**
- **Organisational Structure – Capital Works And Facilities - Confidential**
- **Environmental Management Policy**
- **Environmental Management Plan;**
- **Environmental Management System;**
- **Greening UWS Action Plan**
- **Resourcing Plan - Confidential**



# Environmental Management Policy

## Section 1 - Purpose and Context

- (1) As a signatory to the [Talloires Declaration](#), the University has a clear obligation to plan and implement actions for a more sustainable future, and a clear role of leadership in the future sustainability of Western Sydney.
- (2) The University recognises its obligations under the law in regard to the need to effectively manage its activities in a way that protects and enhances the environment, as well as the potential implications for its reputation, image and future standing. The University also recognises that it has a duty of care to provide a safe environment for its employees, in this regard not only protecting them from potential environmental hazards, alerting them to possible damage to reputation and the possibility of prosecution.
- (3) In relation to environmental management and pollution prevention, legislative compliance and the demonstration of due diligence is required by legislation and common law. NSW Legislation includes the [Protection of the Environment Operations Act 1997](#), and related regulations and amendments.
- (4) Along with local and regional issues of environmental quality, the international agenda of sustainable development and global issues such as climate change have led to a recognised need for broad sustainability targets. These include conceptions such as carbon neutrality, and reductions in our ecological footprint.
- (5) The implementation of an [Environmental Management System](#) will assist the University in its due diligence in relation to statutory requirements for environmental management, along with supporting broad ranging sustainability programs and actions.
- (6) The purpose of this policy is to:
- explain the University's overarching environmental objectives and expectations;
  - provide a clear framework that enables its business activities to be carried out in a manner consistent with its stated environmental objectives and expectations;
  - explain the potential risks associated with environmental mismanagement.

## Section 2 - Definitions

- (7) For the purpose of this policy:
- Environment - means components of the earth, including:
    - land, air and water;
    - any layer of the atmosphere;
    - any organic or inorganic matter and any living organism;
    - human-made or modified structures and areas, and includes interacting natural ecosystems that include components referred to in (a)-(c).
  - Environmental Management System (EMS) ISO AS/NZS 14001 - means a framework that assists an organisation to identify and manage environmental issues in a structured manner through the allocation of resources,

assignment of responsibilities and ongoing assessment and improvement of practices, procedures and processes.

- c. Environmental Management System (EMS) Manual - means the environmental handbook that provides an overview of UWS activities and environmental commitment, outlines its management structure and responsibilities as well as its system and process procedures.
- d. Environmental Management Plan - means a suite of environmental management programs addressing key activity areas that addresses the organisations goals and objectives. These also include prioritised action plans to achieve these targets that are mapped against key performance indicators, with a timeframe and delegated areas of responsibility.
- e. Environmental Management Procedures - detail a chronological method of performing a particular task to achieve a result which conforms to environmental and occupational health and safety best practice and legislative requirements.

## Section 3 - Policy Statement

(8) The University of Western Sydney is committed to minimising the impacts of its activities on the environment and conserving and continually improving the natural, built and social environment of its campuses. In stating this commitment the University recognises that it has an ethical and legal responsibility to protect and enhance the environment and that this responsibility extends to the University's staff, students and visitors.

(9) The University will, as a minimum, meet its statutory requirements under the relevant legislation.

(10) Toward the fulfilment of its stated commitment the University will:

- a. promote awareness and understanding of and responsibility for environmental issues both within the University and the community;
- b. implement a University-wide [Environmental Management System](#) that allows significant environmental impacts to be identified and managed while also helping to foster implementation of environmentally responsible practices on all campuses;
- c. set objectives and targets for those activities which significantly affect the environment and measure performance against those targets over time;
- d. where necessary, refine practices and procedures to ensure the fulfilment of stated objectives;
- e. minimise waste production and pollution, as far as practicable and seek to re-use and recycle materials where possible;
- f. seek to reduce consumption of water and energy by promoting water and energy efficiency measures and by encouraging research within these areas;
- g. use best practice environmental management in conserving the biodiversity of its remnant bushland areas, including protected Cumberland Plain woodlands;
- h. communicate its environmental performance both within the University and the community; and
- i. ensure staff, students and visitors are informed and aware of their roles in implementing its environmental policy.

(11) The University expects its staff, students and visitors to comply with the principles of this policy and to support fulfilment of the University's stated environmental management objectives. To this end staff, students and visitors are expected to familiarise themselves with and support the efficient implementation of the University's [Environmental Management System](#), and to take appropriate action to ensure that their activities are carried out in an environmentally friendly manner.

(12) Individuals and/or groups who participate in activities that contravene this policy or the governing legislation may



find themselves subject to disciplinary and/or legal proceedings. Individuals should be aware that they can be personally pursued for crimes against the environment and that penalties for crimes against the environment include significant fines and incarceration.

## Section 4 - Procedures

(13) The University has developed an [Environmental Management System](#), that documents in detail the requirements placed on the University by relevant legislation. The [Environmental Management System](#) provides a detailed schedule of strategies to ensure that the University's practices are examined regularly with a view to compliance. Supplementary Environmental Procedures , guidelines and explanatory material related to specific areas of environmental management within the University will continue to be produced in accordance with the directions set in the [Environmental Management System](#).

(14) The [Environmental Management System](#) also contains links to relevant University procedures as well as information on how to achieve compliance on environmental management issues within the University. Where specific procedures are available they must be followed.

## Section 5 - Guidelines

(15) Further information about environmental management at UWS can be obtained via the University's Environmental Management web site. A range of very useful information and links can also be obtained from the:

- a. [NSW Department of Environment and Climate Change](#); and
- b. [Sydney Water](#).

## Status and Details

Status:	Current
Effective Date:	4th January 2008
Review Date:	4th September 2009
Approval Authority Policy:	Vice-Chancellor
Approval Authority Procedure/Guideline:	DVC Corporate Strategy and Services
Approval Date:	3rd January 2008
Expired Date:	To Be Advised
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# UWS ENVIRONMENTAL MANAGEMENT PLAN

## EXECUTIVE SUMMARY

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This Environmental Management Plan (EMP) outlines programs of actions which have been identified as part of the UWS Environmental Management System. These are required as part of due diligence and compliance with environmental legislation and regulations. A complementary program of actions which reflect broader aspirational objectives relating to sustainability are outlined in a similar format in the interim Greening UWS Action Plan.

Within each of the following programs, each objectives outlined below has identified actions, key performance indicators, timeframes, and responsibilities. This document will be reviewed and updated, as part of the philosophy of continuous improvement which underpins the UWS Environmental Management System.

### **1. Water Conservation and Management Program**

This program will ensure compliance with water saving action plans, and the assessment of water borne pollution discharged from UWS campuses.

*Objective 1.1:* Develop and implement strategies to minimise water consumption on the two campuses identified as designated water users (Kingswood / Werrington South and Hawkesbury).

*Objective 1.2:* Ensure surface water discharges from UWS Campuses is monitored, assessed and managed with respect to environmental values ANZECC (2000) Guidelines.

## **2. Waste Avoidance and Resource Recovery Program**

This program will promote waste avoidance and 'extended producer responsibility' in relation to key waste products.

*Objective 2.1:* Promote practical and responsible means and engagement in programs to avoid waste.

## **3. Hazardous Waste and Dangerous Goods Management Program**

This program will ensure compliance with all requirements for the use, storage and disposal of hazardous materials and dangerous goods.

*Objective 3.1:* Minimise environmental risk from the use and storage of hazardous materials and dangerous goods.

*Objective 3.2:* Achieve best practice in hazardous waste disposal ensuring legislative compliance, and complementing those requirements under OH&S legislation.

## **4. Biodiversity Management Program**

This program will support the use of best practice in conserving endangered ecological communities on UWS land.

*Objective 4.1:* Retain and protect existing Cumberland Plain communities on all campuses, and manage existing vegetation.

## **5. Environmental Awareness and Training Program**

This program will promote environmental awareness throughout the University.

*Objective 5.1:* To ensure awareness by staff and students of UWS Environmental Policies, Procedures and appropriate behaviours in their work environments.

## **6. Contractor and Lessee Environmental Impacts Program**

This program will ensure that all UWS contractors and lessees conduct their activities in an environmentally responsible manner and in compliance of legislation.

*Objective 6.1:* Encourage the wide scale use of engaging contractors with environmental certifications and to ensure that all contractors are environmentally inducted to a satisfactory level.

*Objective 6.2:* Ensure all UWS lessees are aware of their environmental responsibilities and are in compliance of legislation.

# INTRODUCTION

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According to the Protection of the Environment Operations Amendment Bill 2005, UWS is required to have a compliance plan in place. The UWS Environmental Management System will provide this function and show due diligence.

Using the ISO AS/NZS 14001:2004 **Environmental Management System** (EMS) framework this EMP contains a suite of specifically tailored environmental management programs. These individual programs address a wide range of key activity areas which have the potential to cause an environmental impact. Each program identifies UWS specific environmental goals and objectives in that activity area and outlines the proposed strategies and actions that will achieve these goals.

Where appropriate, action plans and procedures will be developed and implemented. Performance will be measured against a range of key performance indicators. Inherent in each program is a realistic timeframe, delegated areas of responsibility and a proposed budget.

The EMP programs are as follows:

- Water Conservation and Management Program;
- Waste Avoidance and Resource Recovery Program;
- Hazardous Waste and Dangerous Goods Management Program;
- Biodiversity Management Program;
- Environmental Awareness and Training Program; and
- Contractor and Lessee Environmental Impacts Program.

## **UWS Environmental Management System**

In order to effectively manage its activities UWS has committed to developing and implementing an Environmental Management System (EMS) aligned with ISO AS/NZS 14001/2004. The EMS is a framework that assists an organisation to identify and manage environmental issues in a structured manner through the allocation of resources, assignment of responsibilities and ongoing assessment and improvement of practices, procedures and processes. A number of UWS documents and processes comprise the EMS and include:

- Environmental Management Policy;
- Environmental Management Manual;
- Environmental Management Plan; and
- Environmental Management Procedures



It should be noted that an EMS is based on a cycle of monitoring, checking, corrective action, auditing, review and continuous improvement and this continual review is pivotal to successfully managing the UWS EMS.

**Objectives:**

- To continually improve the management of its environmental issues, to ensure legislative compliance and to mitigate against litigation by demonstrating due diligence.

**Targets/Actions:**

- The EMS Impacts and Aspects Register identifies individual UWS activities and allocates an inherent risk ranking to each activity. Existing control measures are examined and the identified UWS activities with the potential to cause environmental harm are analysed;
- Develop EMP programs that address the above key environmental issues. Included is the development of operational control procedures that will assist in streamlining environmental compliance issues. The measurement of performance will be carried out by conducting annual Environmental Audits.
- Implementation and assessment (ongoing).

**Key Performance Indicators:**

- Number of non-conformance issued raised and dealt with;
- Number of environmental procedures developed in response to audit; and
- Number of environmental programs implemented.

**Relationship to Greening UWS Strategy**

Similar targets for aspirational aspects of UWS activity are provided in a similar format in the Interim Greening UWS Action Plan.

# 1. WATER CONSERVATION AND MANAGEMENT PROGRAM

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Compliance requirements relating to water use include those relating to requirements set by the Department of Environment and Climate Change for water users which exceed 50 ML per year. Kingswood / South Werrington and Hawkesbury Campuses have been identified on this basis and are required to prepare Water Saving Action Plans as detailed in the Energy and Utilities Administration Act 1987 No 103.

Another compliance requirement is that water borne pollution discharged from UWS Campuses is monitored and assessed in relation to environmental values and ANZECC 2000 guidelines. This is a clear requirement of the Protection of the Environment Operations Amendment Bill 2005

UWS is also faced with the regime of mandatory water restrictions imposed by Sydney Water, and activities to provide alternative supplies such as rainwater, stormwater, and reclaimed water are outlined in the interim Greening UWS Action Plan.

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**GOAL:** Ensure compliance with water saving action plans, and the assessment of water borne pollution discharged from UWS campuses.

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**Objective 1.1: Develop and implement strategies to minimise water consumption on the two campuses identified as designated water users (Kingswood / Werrington South and Hawkesbury).**

**Actions:**

- Undertake actions to document and implement Water Savings Action Plans. The content of these is clearly stated in the Energy and Utilities Administration Act 1987 No 103, as follows:
    - "A description of the designated water user's current water usage;
    - A list of individual water saving measures prioritised in terms of water saved, cost effectiveness and potential benefits;
    - A statement concerning the water saving measures included on that list that the designated water user proposes to implement in the 4 year period following approval of the action plan (including initial set up costs and annual costs for each measure and time frames for implementation);
    - Any other matter prescribed by a savings order.
- (Paragraph 34R (1) (a-d))

**Key Performance Indicators:**

- Formulation and approval of Draft Water Saving Action Plans by UWS.
- Submission of to the Minister for approval;
- Implementation over a four year period.

**Timeframe:**



**Responsibilities:**

- Environmental Manager
- Senior Planning Engineer
- Manager, Capital Programs
- Manager, Asset Maintenance Services

**Legislation:**

- Energy and Utilities Administration Act 1987 No 103

**Objective 1.2: Ensure surface water discharges from UWS Campuses is monitored, assessed and managed with respect to environmental values ANZECC (2000) Guidelines.**

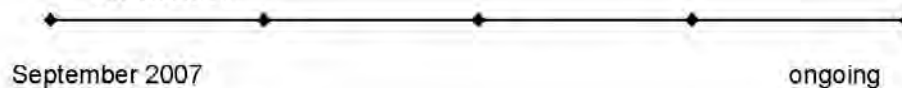
**Actions:**

- Identify locations of potential discharge of surface waters and assess in relation to environmental values as outlined in ANZECC (2000) National Water Quality Strategy.
- Plan and implement appropriate water treatment practices to manage potential discharges.

**Key Performance Indicators:**

- Identification of monitoring sites and established monitoring plan.
- Baseline assessment and ongoing monitoring programme.
- Planning and implementation of appropriate water quality management strategies.

**Timeframe:**



**Responsibilities:**

- Environmental Manager

**Legislation:**

- Protection of the Environment Operations Act 1997.
- Protection of the Environment Operations Amendment Bill 2005
- ANZECC (Agriculture and Resource Management Council of Australia and New Zealand, and Australian and New Zealand Environment and Conservation Council). "National Water Quality Management Strategy: Guidelines for Fresh and Marine Water Quality", NWQMS 4, 2000.

## 2. WASTE AVOIDANCE AND RESOURCE RECOVERY PROGRAM

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Management practices to minimise waste production and maximise the recovery of energy and materials through recycling are now becoming a fundamental need for every organisation. Similarly, there is now greater recognition of the need for responsible action in relation to all aspects of a product's life cycle.

The NSW Waste Avoidance and Resource Recovery Act 2001 promotes waste avoidance and resource recovery. It also promotes 'extended producer responsibility' in relation to all goods which result in waste products.

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**GOAL:** Promote waste avoidance and 'extended producer responsibility' in relation to key waste products.

---

**Objective 2.1: Promote practical and responsible means and engagement in programs to avoid waste.**

**Actions:**

- Clearly document and audit key waste products throughout UWS and recycling initiatives (eg. general waste, co-mingled waste, office paper, IT equipment).
- Involve UWS in programs focusing on recycling particular materials and equipment.
- Ensure that UWS business entities reflect an extended producer responsibility (eg. in relation to catering by-products.)

**Key Performance Indicators:**

- Proportions of material wastes and equipment recycled, and reductions in volumes to landfills.
- Involvement in broader industry recycling programs.
- Recognised strategy of 'extended producer responsibility' by UWS business entities.

**Timeframe:**



**Responsibilities:**

- Environmental Manager
- Grounds Manager

**Legislation:**

- Waste Avoidance and Resource Recovery Act 2001.

### 3. HAZARDOUS WASTE AND DANGEROUS GOODS MANAGEMENT PROGRAM

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Dangerous goods have an ability to cause immediate physical or chemical effects on the environment and/or people such as fires, explosions, poisoning and corrosion. There are nine classes of dangerous goods:

- explosives;
- gases;
- flammable liquids;
- flammable solids;
- oxidisers;
- toxic and infectious substances;
- radioactive substances;
- corrosives;
- miscellaneous dangerous goods.

All of these classes of dangerous goods are subject to strict regulations under the *NSW Occupational Health and Safety Act 2000* together with requirements under the *Dangerous Goods Act 1975*.

Hazardous wastes are both solid and liquid wastes that have either the short or long term potential to harm human health and/or the environment. Waste streams that are identified as hazardous include:

- any waste that meets the criteria for assessment as a dangerous good;
- pharmaceuticals and poisons;
- declared chemical waste;
- biological waste;
- cytotoxic waste;
- clinical waste;
- sharps waste; and
- liquid and non-liquid radioactive waste.

From an environmental perspective, these types of waste have the potential to contaminate soil and waterways if sent to landfill and are governed by both OH&S and environmental legislation and best practice guidelines.

As a party to the *Basel Convention on the Control of Trans-boundary Movement of Hazardous Waste* (an international treaty developed by the United Nations), Australia has strict laws governing the control, movement and environmentally sound disposal of hazardous waste. In NSW, the Department of Environment and Climate Change (DECC) has issued "Environmental Guidelines: Assessment, Classification & Management of Liquid and Non-liquid Wastes" in order to promote compliance with the *Protection of the Environment Operations (Waste) Regulation 1996 (Waste Regulation)*, made under the *Protection of the Environment Operations Act, 1997*.

UWS uses dangerous goods and generates hazardous wastes from various teaching and research activities, the majority of which originate from science laboratories. This program is intended to complement existing UWS Occupational Health and Safety site specific procedures and assist in meeting both environmental and OH&S legislation.

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**GOAL:** To comply with all requirements for the use, storage and disposal of Hazardous Materials and Dangerous Goods

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**Objective 3.1: Minimise environmental risk from the use and storage of hazardous materials and dangerous goods.**

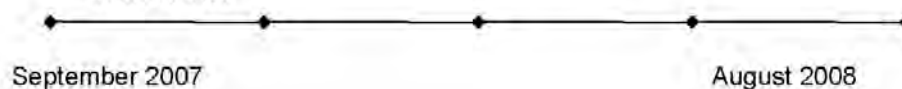
**Actions:**

- Audit all material storage practices/areas and assess compliance;
- Develop action plan to implement remedial measures with timeframe and responsibilities; and
- Deliver training to all relevant staff to ensure compliant working practices including emergency spill management and pesticide management.

**Key Performance Indicators:**

- Completion of hazardous chemical audit;
- Completion and implementation of action plan;
- Proportion of staff trained;
- Emergency spill management procedure in place; and
- Pesticide management procedure in place.

**Timeframe:**



**Responsibilities:**

- Environmental Manager
- UWS technical staff

**Legislation:**

- Protection of the Environment Operations Act 1997;
- The Protection of the Environment Operations (Waste) Regulation 1996;
- Environmentally Hazardous Chemicals Act 1985;
- AS1940:2004. The Storage and Handling of Flammable and Combustible Liquids.

**Objective 3.2:** Achieve best practice in Hazardous Waste Disposal ensuring legislative compliance, and complementing those requirements under OH&S legislation.

**Actions:**

- Identify hazardous waste sources across the university;
- Investigate current waste disposal practices; and
- Implement standardised and legislatively conforming Hazardous Waste procedures.

**Key Performance Indicators:**

- (WASTE INDICATOR 2: Completion of hazardous waste audit and total amount of hazardous waste produced per campus;
- Co-ordinated Hazardous Waste Register at each campus;
- Compliance with relevant legislation; and
- Hazardous Waste Disposal Procedures standardised across all campuses.

**Timeframe:**



**Responsibilities:**

- Manager OHS
- Environmental Manager
- UWS technical staff

**Legislation:**

- Protection of the Environment Operations Act 1997;
- The Protection of the Environment Operations (Waste) Regulation 1996;
- Environmentally Hazardous Chemicals Act 1985; and

## 4. BIODIVERSITY MANAGEMENT PROGRAM

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Protection of areas of high conservation value as identified through the Threatened Species Conservation Act is triggered as part of the planning requirements under the Environmental Planning and Assessment Act 1979.

The NSW Threatened Species Conservation Act 1995 has listed 12 of the 13 vegetation communities that comprise the Cumberland Plains as endangered and of a high conservation priority. Furthermore, the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 has also classified 2 of these 12 ecological communities as nationally endangered. Given the threatened status of these communities, the fragmented nature of their current distribution and the threat of land clearing due to continuing urbanisation in Sydney, private land holders have a vital role in contributing to the long term viability of retaining robust biodiversity in the bushland of western Sydney (DEC, 2005).

Another key legislative driver for vegetation management in Western Sydney is the Noxious Weeds Act 1993. This is structured on the basis of certain classes, each with particular requirements for eradication and/or control.

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**GOAL:** To use best practice in conserving endangered  
ecological communities on UWS land

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**Objective 4.1: Retain and protect existing Cumberland Plain communities on all campuses, and manage existing vegetation.**

**Targets and Actions:**

- Build upon an Identification of critical areas in the campus planning process and consult with appropriate land users within UWS and lessees; and
- Seek external funding opportunities for fencing and management through agencies such as the Hawkesbury-Nepean Catchment Management Authority and emerging initiatives such as biodiversity banking.
- Establish Weed Management Plans for UWS Campuses.

**Key Performance Indicators:**

- BIODIVERSITY INDICATOR 1: Area of land and location of significant ecological communities (hectares);
- % of vegetation protected; and
- Financial support received in external funding.

**Timeframe:**



September 2007

August 2009

Consultation with Pro Vice-Chancellor (Campus Development)

**Responsibilities:**

- Manager, Grounds
- Environmental Manager

**Legislation:**

- NSW Threatened Species Conservation Act 1995;
- Commonwealth Environment Protection and Biodiversity Conservation Act 1999;
- Environmental Planning and Assessment Act 1979
- Noxious Weeds Act 1993

## 5. ENVIRONMENTAL AWARENESS AND TRAINING PROGRAM

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The key piece of NSW environment protection legislation is the Protection of the Environment Operations Act 1997 (POEO Act) administered by the Department of Environment and Climate Change. The broad objectives of the Act are to protect, restore and enhance the quality of the NSW environment and to reduce risks to human health by promoting:

- pollution prevention and cleaner production;
- the reduction to harmless levels of the discharge of substances likely to cause harm to the environment;
- the elimination of harmful wastes and
- the reduction in the use of materials and the reuse or recycling of materials.

Under this Act, both individuals and organisations have a general duty of care towards the environment. The Act is supported by a three tier penalty regime, grants the DECC the authority to regulate environmental protection licences, has a scheme to make protection of the environment policies and has the power to issue environmental protection notices. The POEO Act has the power to issue substantial penalties as a result of wilful or negligent environmental offences which apply to both individuals and organisations. Pleading ignorance or "no knowledge" to the offence is no longer considered a defence based upon the 2005 Amendment Bill.

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**GOAL:** To promote environmental awareness throughout the University.

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**Objective 5.1: To ensure awareness by staff and students of UWS Environmental Policies, Procedures and appropriate behaviours in their work environments.**

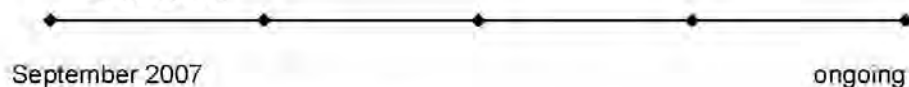
**Actions:**

- Create an interactive Environmental Management portal on the UWS website detailing Environmental Policies, Procedures and progress reports;
- Develop EMS and EMP training modules;
- Promote environmental awareness, and progress on environmental performance through staff and student orientation and induction training and literature;

**Key Performance Indicators:**

- Environmental Awareness Indicator 1: Number of visitors to the UWS Environmental Management Website;
- Percentage number increase in staff and students involved in sustainability initiatives;
- Number of staff and students who receive (1) EMS and EMP training modules through PDU and (2) environmental awareness induction training and literature handouts;

**Timeframe:**



**Responsibilities:**

- Environmental Manager
- Director, Professional Development Unit.

**Legislation:**

- Protection of the Environment Operations Act 1997.
- Protection of the Environment Operations Amendment Bill 2005

## 6. CONTRACTOR AND LESSEE ENVIRONMENTAL IMPACTS PROGRAM

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The UWS contractor workforce provides each campus with a wide range of contracted services that include:

- cleaning;
- building and plant maintenance works;
- emergency repairs and servicing;
- upgrades and new capital works;
- grounds and landscaping works;
- waste removal and recycling services;
- information technology services; and
- kitchen and catering services.

Likewise, UWS has a large number of lessees across its campuses that operate across a range of spheres from agricultural lessees to office lessees. With such a large contractor workforce and a number of different entities entering and operating on University grounds on a daily basis, it is imperative that UWS manage its contractors and lessees as effectively and responsibly as possible. Ensuring environmental legislative compliance and best environmental practice is one facet that can demonstrate effective management.

One way to ensure that contractors are environmentally aware is to encourage the engagement across UWS of ISO 14001 certified contractors and to assess contractors Environmental Management Policies and Plans.

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**GOAL:** To ensure that all UWS contractors and lessees conduct their activities in an environmentally responsible manner and in compliance of legislation.

---

**Objective 6.1: Encourage the wide scale use of engaging contractors with environmental certifications and to ensure that all contractors are environmentally inducted to a satisfactory level.**

**Actions:**

- Identify contractors by activity areas and assess their levels of environmental certification;
- Examine opportunities to engage environmentally certified contractors in those activity areas that are assessed to be lacking;
- To incorporate environmental inductions into existing UWS Occupational Health and Safety Inductions and OH&S Short Term Induction Passes; and
- To conduct spot audits to ensure contractors are performing duties in an environmentally responsible manner.

**Key Performance Indicators:**

- Number of environmentally accredited contractors by activity area;
- Number of UWS contractors inducted – CWF Register of Contractor Inductions; and
- Number of UWS contractors found to be non-compliant.

**Timeframe:**



**Responsibilities:**

- Manager, Grounds
- Environmental Manager
- Manager, Asset Maintenance Services
- All UWS Contractors

**Legislation:**

- Protection of the Environment Operations Act 1997.
- Protection of the Environment Operations Amendment Bill 2005



**Objective 6.2: Ensure all UWS lessees are aware of their environmental responsibilities and are in compliance of legislation.**

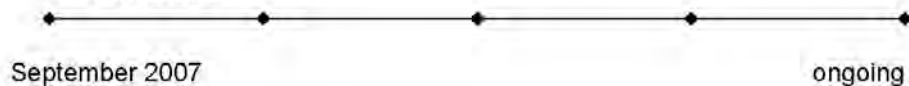
**Actions:**

- To review all existing UWS leases and assess that all environmental responsibilities are clearly laid out;
- To develop, if required, an environmental addendum; and
- To conduct spot audits to ensure lessees are environmentally compliant.

**Key Performance Indicators:**

- Number of UWS leases to total number of leases with environmental responsibilities;
- Number of environmental addendums added to existing leases; and
- Number of non-compliant issues identified.

**Timeframe:**



**Responsibilities:**

- Manager, Commercial Property
- Environmental Manager
- All UWS lessees and other business entities

**Legislation:**

- Protection of the Environment Operations Act 1997,
- Protection of the Environment Operations Amendment Bill 2005

# Environmental Management System

## Section 1 - Purpose and Context

(1) The Environmental Management System aims to ensure compliance and due diligence in relation to environmental legislation. It compliments aspirational targets set out in 'Greening UWS', within the overarching UWS 'Sustainability Framework'.

## Section 2 - Definitions

(2) There are numerous terms that have specific definitions within the context of Environmental Management and Sustainability. These are explained in the definitions section of the relevant policy and procedure documentation.

## Section 3 - Policy Reference

(3) The Environmental Management System sets out the structure for managing environmental risks and compliance issues and is underpinned by the University's [Environmental Management Policy](#) which sets the framework and overarching objectives for Environmental Management and Sustainability at UWS. It is supported by two key documents, being the:

- a. [Environmental Management Plan](#); and
- b. [Greening UWS Action Plan - Interim](#).

## Section 4 - Procedures

(4) Procedural requirements are guided by the provisions of the Environmental Management System Manual, with detailed procedures available for:

- a. [Environmental Management System Procedures](#); and
- b. [Environmental Management System Operational Control Procedures](#).

(5) Certain documents within the suite make reference to other task specific procedures and guidelines at an functional level.

## Section 5 - Guidelines

(6) To obtain a diagrammatic perspective of the overarching Environmental Management System that has been adopted by the University, refer to the [Sustainability Framework Diagram](#).

(7) Detailed information in relation to environmental risks and legal obligations are also available.

## Status and Details

Status:	Current
Effective Date:	4th January 2008
Review Date:	4th September 2009
Approval Authority Policy:	Vice-Chancellor
Approval Authority Procedure/Guideline:	DVC Corporate Strategy and Services
Approval Date:	3rd January 2008
Expired Date:	To Be Advised
Unit Head:	Name: John Bonanno (02) 9678 7025 Position: Director Capital Works and Facilities
Author:	Name: Roger Attwater (02) 4570 1623 Position: Grounds and Environment Manager
Enquiries Contact:	Name: Roger Attwater (02) 4570 1623 Position: Grounds and Environment Manager

# Environmental Management System Procedures

## Section 1 - Purpose and Context

(1) This document contains detailed procedures related to specific aspects of the University's [Environmental Management System \(EMS\)](#), including:

- a. Identification of Aspects and Impacts;
- b. Identification of Legal and Other Requirements;
- c. Environment Training;
- d. Environmental Communications;
- e. Non-Conformance and Corrective and Preventive Actions;
- f. Management Reviews; and
- g. Environment Management System Audits.

(2) These procedures apply to the conduct of environmental management activities on all UWS campuses and must be read in conjunction with the University's [Environmental Management Policy](#), [Environmental Management Plan](#), [Environmental Management Operational Control Procedures](#) and relevant statutes.

## Section 2 - Definitions

(3) For the purpose of these procedures:

- a. Environmental Aspect - is an element of an organisation's activities, products or services that can interact with the environment (e.g. application of pesticides and fertilisers).
- b. Environmental Impact - is any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products or services (e.g. air pollution, water pollution, contamination of soil and groundwater).
- c. Environmental Management System Audit - Is an audit carried out by the Audit and Risk Assessment Unit, which is a documented, systematic and independent verification process for examining and evaluating objective evidence to verify that all procedures relating to the system have been established, documented and effectively implemented.
- d. Environmental non-conformance - is non-fulfilment of a requirement e.g. a deficiency or error or problem that represents or results in an environmentally unacceptable situation, or a situation that does not comply with the Environmental Management System.
- e. Operational or Site Environmental Audit - is an audit carried out by Office of Capital Works and Facilities to identify the environmental aspects and impacts associated with the site activities and processes. This may include audits to determine environmental legislative compliance.

## Section 3 - Policy Reference

(4) Refer to the University's [Environmental Management Policy](#).



## Section 4 - Procedures

### Part A - Identification of Aspects and Impacts

(5) It is a requirement of ISO 14001 that organisations must demonstrate a process of identifying its environmental aspects in order to determine those which can or have significant impacts.

(6) The purpose of this procedure is to ensure that UWS is able to determine the environmental aspects associated with all of its activities that have the potential for significant environmental impacts.

(7) This procedure is referred to in the UWS [Environmental Management System Manual](#) as Environmental Management System Procedure Part A (EMSP Part A)

(8) An initial assessment was conducted during the establishment of the [Environmental Management System](#) to identify environmental aspects and impacts associated with all facilities, and existing activities and services at UWS Campuses. The output of the initial assessment was input to the Environmental Aspects and Impacts Register for the UWS.

(9) An assessment and regular review of the environmental aspects and impacts of all UWS activities, products and services forms the basis for setting the environmental objectives and targets of the [Environmental Management Plan](#).

#### Responsibilities

Staff Member	Duties
Vice-Chancellor or	Endorse the Environmental Aspects and Impacts Register.
Environmental Manager	Co-ordinate the development and implementation of the Environmental Aspects and Impacts Register. Co-ordinate annual reviews of the Environmental Aspects and Impacts Register. Undertake relevant updates of the Environmental Aspects and Impacts Register. Ensure that significant impacts are identified and appropriate management processes are put in place. Consult with the relevant Executive Directors, Heads of Schools/Units to assess significance of environmental aspects.

(10) Identify all facilities and existing activities and services undertaken at all UWS Campuses.

(11) Identify all environmental aspects for the facilities and existing activities and services identified. This is the component of the activity that may interact with the environment and commonly involve spill, release, discharge, disturbance or emission.

(12) For each environmental aspect, identify the associated environmental impacts. The environmental impacts may be either actual or potential impacts. An environmental aspect may have multiple environmental impacts.

(13) Evaluate the significance of each environmental impact using table which incorporate both adverse and positive environmental aspects, evaluations of consequences, and evaluations of likelihood.

(14) The significance of environmental impacts is determined during the risk evaluation process. Environmental impacts are prioritised for management purposes as detailed in a [Risk Priority Scale](#). As a guideline, any environmental impact that has a score greater than 16 is identified as a Priority (A) impact. The assessment of significance is based on the following criteria:

- a. how often the impact is likely to occur;
- b. the potential severity of the impact; and
- c. the sensitivity of the environment which would be impacted upon either on or off site.

(15) The Environmental Aspects and Impacts Register is reviewed by the Environmental Manager on an annual basis as a minimum or earlier as required through regular management system reviews. If any changes are required, the Environmental Manager will consult with representatives of the relevant Executive Dean, Head of School /Head of Unit to assess significance of environmental aspects before amending the Register.

(16) Prior to the establishment of new activities, services and facilities at UWS Campuses, the environmental aspects and impacts of the new activities will be reviewed and updated, if necessary. Amendment to the Environmental Aspects and Impacts Register are made in consultation with representatives of the relevant Director, Head of School /Head of Unit. Appropriate control procedures will be developed to minimise the impact of new activities on the environment, where required.

## Records

(17) The Environmental Aspects and Impacts Register is held by the Environmental Manager, maintained in accord with the UWS [Records Management Policy](#). The register is retained until superseded by new assessments of environmental aspects and impacts.

## Part B - Identifying Legal and Other Requirements

(18) It is a requirement of ISO 14001 that organisations establish and maintain a procedure to identify and have access to legal and other requirements to which the organisation subscribes, and which are applicable to the environmental aspects of its activities, products and services.

(19) The purpose of this procedure is to describe the mechanism that UWS uses for identifying, updating and maintaining access to all relevant legal and other requirements to ensure that UWS is addressing all current legal requirements. This procedure is also designed to ensure that these requirements are understood, communicated and are readily accessible by all relevant UWS staff.

(20) This procedure is referred to in the UWS [Environmental Management System Manual](#) as Environmental Management System Procedure Part B (EMSP Part B).

## Responsibilities

Staff Member	Duties
University Legal Counsel	Regularly review legal requirements. Assess applicability to UWS related activities, services and facilities. Develop a Legal and Other Requirements Register to be used for all UWS Campuses activities, services and facilities. Communicate relevant legal and other requirements and associated changes to the Manager, Grounds and Environment.
Environmental Manager	Assist the development of the Legal and Other Requirements Register. Notify all relevant UWS staff of relevant legal and other requirements and associated changes.

(21) The University Legal Counsel prepares a Legal and Other Requirements Register that includes relevant Commonwealth and New South Wales Legislation and other requirements including Australian Standards and Codes of Practice, where relevant.

(22) The register includes all legislation and other requirements that apply to the activities, services and functions that are undertaken within the UWS Campuses boundaries as well as off site activities such as field work, waste and chemical transportation to and from site.

(23) Where applicable the legal and other requirements register includes a summary of the UWS obligation (this is the interpretation of how the Act or requirement applies to the site specific activity, service or function) associated with the legal requirement.



(24) The University Legal Counsel or delegate reviews on a (monthly/quarterly) basis relevant journals, web-sites and periodicals to determine all forthcoming new and altered environmental legislation that is applicable to UWS.

(25) The University Legal Counsel or delegate provides on a (monthly/quarterly) basis this information to the Environmental Manager.

(26) The Environmental Manager notifies all relevant UWS staff of these changes through the UWS Intranet.

(27) The University Legal Counsel or delegate updates the legal and other requirements register annually to reflect changes in legislation identified during the (monthly/quarterly) review process. Amendments to the legal and other requirements register are undertaken in consultation with the Environmental Manager to ensure any changes in environmental aspects are reflected, as required in the legal and other requirements register.

(28) UWS staff can gain access to the Legal and Other Requirements Register via the UWS Intranet.

### **Monitoring**

(29) The Legal and Other Requirements Register will be reviewed by the University Legal Counsel on an annual basis to identify, update and maintain access to all relevant legal and other requirements.

### **Training**

(30) Reference to the Legal and Other Requirements Register is included within the Environmental Awareness training that is provided for relevant UWS staff.

### **Records**

(31) The Legal and Other Requirements Register is provided on the UWS Intranet.

## **Part C - Environment Training**

(32) It is a requirement of ISO 14001 that organisations provide the appropriate training relevant to achieve environmental policies, objectives and targets to all personnel within an organisation. Personnel need to have the knowledge required to perform tasks in an efficient and competent manner and the knowledge of the impact of their activities on the environment.

(33) The purpose of this procedure is to provide a uniform and consistent system for induction and training of all UWS staff to ensure that all staff are aware of how their activities interact with the environment and to ensure that they are aware of their responsibilities in relation to the [Environmental Management System](#).

(34) This procedure covers all induction and training in relation to the [Environmental Management System](#) at all UWS Campuses.

(35) This procedure is referred to in the UWS [Environmental Management System Manual](#) as Environmental Management System Procedure Part C (EMSP Part C).

### **Responsibilities**

Staff Member	Duties
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Environmental Manager	Develop, coordinate and implement the General Environmental Management System Awareness Induction Program and the Specific Training Program. Ensure all UWS staff receive the General Environmental Management System Awareness Induction Program. Ensure relevant UWS staff receive the Specific Training Program as required. Update, review and implement any changes to the Specific Training Program in response to new practices, equipment and facilities. Nominate the General Environmental Management System Awareness Induction Program and the Specific Training Program provider. Consult with the representatives of relevant Executive Dean, Head of School /Head of Unit.
Director Professional Development	Assist in the Specific Training Program development, implementation and review process.
Executive Deans, Heads of Schools/ Units	Notify the Environmental Manager of new staff within their School/Unit. Identify the environmental training needs of UWS staff within their College/School/Unit and notify the Environmental Manager. Support the Environmental Manager in the implementation of the General Environmental Management System Awareness Induction training and the Specific Training.

## Development of Environmental Training Programs

### General Awareness Induction Training

(36) Prior to developing the General Environmental Management System Awareness Induction Training Program, the UWS Environmental Manager is to:

- a. Review roles and responsibilities;
- b. Identify operations and procedures;
- c. Identify associated impacts; and
- d. Identify training requirements for specific roles.

(37) The Environmental Manager is responsible for the development of the General Environmental Management System Awareness, Induction and Training Program.

(38) The Environmental Manager is to review the General Environmental Management System Awareness, Induction and Training Program considering the elements identified in Step 1 on an annual basis if necessary.

### Specific Training

(39) Prior to developing the Specific Training Program the Environmental Manager in consultation with representatives of the Executive Deans, Heads of Schools/Units is responsible for identifying training needs upon evaluation of:

- a. work practices;
- b. associated impacts; and
- c. competence for the tasks at recruitment in terms of existing experience, training and education.

(40) Based on the training needs identified in Step 1, the Environmental Manager, in consultation with the Director Professional Development develops a training needs matrix for specific roles (position descriptions) within the UWS organisation.

(41) Based on the training needs matrix and assessment completed in Step 1, the Environmental Manager develops the Specific Training Program for UWS staff whose activities have the potential to cause a significant environmental impact.

(42) The Environmental Manager reviews the Specific Training Program considering the elements identified in Step 1



on an annual basis and amends the Specific Training Program if necessary.

## **Implementation of Environmental Training Programs**

### **General Awareness, Induction and Training**

(43) Prior to the implementation of the General Environmental Management System Awareness, Induction and Training Program the Environmental Manager is to:

- a. identify staff that are required to undertake the training; and
- b. notify staff prior to undertaking the training.

(44) The Environmental Manager is responsible for the implementation of the General Environmental Management System Awareness, Induction and Training Program.

(45) The Environmental Manager the General Environmental Management System Awareness, Induction and Training provider that conducts the training.

(46) The training provider keeps the training attendance records.

(47) The General Environmental Management System Awareness, Induction and Training Program is to be undertaken by all UWS staff to ensure that they are aware of:

- a. the importance of compliance with the [Environmental Management System](#);
- b. the significant environmental aspects and impacts, either actual or potential, of their activities and the environmental benefits of improved personal performance; and
- c. their roles and responsibilities in achieving conformance with the [Environmental Management System](#).

(48) The Environmental Manager is responsible for ensuring all contractors attend the General Environmental Management System Awareness Induction Training Program.

(49) The Environmental Manager is responsible for ensuring all new staff undertake the General Environmental Management System Awareness Induction Training within 3 months of commencement.

(50) Human Resources are responsible for providing a list of all new staff to the Environmental Manager on a monthly basis, showing their unit and status.

(51) The Environmental Manager is responsible for ensuring all students receive an Induction Package which includes information on the [Environmental Management System](#) and the importance of conformance with the [Environmental Management System](#).

### **Specific Training**

(52) Prior to the implementation of the Specific Training Program the Environmental Manager is to:

- a. identify staff that are required to undertake the training; and
- b. notify staff prior to undertaking the training.

(53) The Specific Training Program is to be undertaken by all UWS staff whose activities have a direct influence on a significant environmental impact.

(54) The Specific Training Program is competency based. Competency requirements are developed by the Environmental Manager with assistance from the Director Professional Development. Competency assessment includes recognition for prior learning or experience.

(55) The Environmental Manager is responsible for the implementation of the Specific Training Program.

(56) The Environmental Manager is to nominate the Specific Training provider that conducts the training.

(57) The Specific Training provider is responsible for retaining records to demonstrate the competence of the UWS staff in terms of completion of the Specific Training.

(58) Office of Human Resources are responsible for providing a list of all new staff to the Environmental Manager.

(59) Representatives of the Executive Deans, Heads of Schools/Units will contribute to identifying the environmental training needs of UWS staff within their School/Unit in consultation with the Environmental Manager.

(60) The Environmental Manager is responsible for ensuring all staff undertake the identified Specific Training.

(61) The Environmental Manager is responsible for ensuring contractors are obliged via explicit contractual provisions to ensure that their personnel are also competent and that they are able to demonstrate this if required.

### **Monitoring**

(62) The Specific Training Program is reviewed by the Environmental Manager in consultation with the Director Professional Development on a yearly basis to ensure that any courses developed meet content and competency requirements.

(63) The Directors and Executive Deans, Heads of Schools/Units are responsible for ensuring those identified to attend the General Environmental Management System Awareness, Induction and Training Program, and the Specific Training Program, and have completed the identified training.

### **Records**

(64) Records of The General Environmental Management System Awareness, Induction and Training Program and Specific Environmental Training Program are held by the Environmental Manager.

(65) Training records and attendance records are held by the Training provider.

## **Part D - Environmental Communications**

(66) It is a requirement of ISO 14001 that organisations establish and maintain procedures for communication and reporting with regards to its environmental aspects and impacts and [Environmental Management System](#). The provision of appropriate information to employees and other interested parties serves to motivate employees and encourage greater public understanding and acceptance of the organisation's efforts to improve its overall environmental performance.

(67) This procedure outlines requirements for internal and external communication.

(68) This procedure is applicable to all UWS staff and applies to communication both internally and with external parties.

(69) This procedure is referred to in the UWS [Environmental Management System Manual](#) as Environmental Management System Procedure Part D (EMSP Part D).



## Responsibilities

Staff Member	Duties
Environmental Manager	Develop, coordinate and implement the Environmental Communication Procedure. Ensure all UWS staff are aware of the Environmental Communication Procedure. Consult with the relevant Directors, Heads of Schools/Units.
Executive Deans, Heads of Schools/Units	Identify the Environmental Communication needs/issues within UWS and externally. Support the Manager, Grounds and Environment in the implementation process of the Environmental Communication Procedure.

## Internal Communication

(70) The Environmental Manager is responsible for providing environmental information to all UWS staff or address queries regarding:

- a. environmental aspects and impacts;
- b. legislative and regulatory requirements;
- c. guidelines and standards;
- d. [Environmental Management System](#) requirements and amendments; and
- e. environmental performance.

(71) The Environmental Manager provides the environmental information identified in Step 1 to all UWS staff on a six monthly basis or as required through the UWS Intranet. The Internal Communications Manager will advise on the best internal communications channels to use.

(72) All UWS staff are responsible for communicating environmental issues or queries to the Environmental Manager, as required, by e-mail or by telephone.

(73) Where required, the Environmental Manager will consult with representatives of the Executive Deans, Heads of Schools/Units on environmental issues.

(74) The Environmental Manager coordinates an annual Management Review meeting (refer to EMSP Part F Management Review).

## External Communication

(75) All incoming external inquiries relating to environmental issues are attended to by the UWS Environmental Manager.

(76) Environmental inquiries conveyed by letters, emails or phone calls made by external stakeholders are forwarded to the Environmental Manager. External stakeholders include community groups or members, research partners, auditors or regulatory authorities.

(77) The Environmental Manager is responsible for responding to environmentally related inquiries and for keeping records of all incoming and outgoing correspondence. Correspondence is recorded in a register for external correspondence held by the Environmental Manager in accordance with UWS [Records Management Policy](#).

(78) Any legal enquiries relating to environment issues are attended to by the University Legal Counsel who is responsible for answering the enquiry in consultation with others (i.e. the Vice-Chancellor in the event of a major incident).

(79) Any media related inquiries are addressed to the UWS Executive Director, Engagement and Partnerships, or his delegate, who is responsible for responding to the enquiry made.

(80) External publicity related enquiries are addressed to the UWS Executive Director, Engagement and Partnerships who is responsible for responding to the enquiry made.

(81) The Environmental Manager is responsible for the provision of information on UWS environmental performance and environmental initiatives to the Executive Director, Engagement and Partnerships for inclusion in the annual report on the UWS Internet home page.

## Monitoring

(82) Environmental Communication Procedures are reviewed by the Environmental Manager on an annual basis to identify, update and maintain access to environmental information to all UWS staff and externally

## Records

(83) The UWS Environmental Manager records all incoming and outgoing environmental correspondence in the register of external correspondence.

## Part E - Non-Conformance and Corrective and Preventive Action Procedure

(84) It is a requirement of ISO 14001 that organisations establish and maintain a procedure for dealing with actual and potential non-conformance and for taking corrective action and preventive action.

(85) The purpose of this procedure is to establish and maintain systems for:

- a. assuring that non conformances in the [Environmental Management System](#) are identified, documented, evaluated and rectified; and
- b. mitigating any impacts caused and for initiating and completing corrective and preventive action.

(86) This procedure is referred to in the UWS [Environmental Management System Manual](#) as Environmental Management System Procedure Part E (EMSP Part E).

## Responsibilities

Staff Member	Duties
Environmental Manager	Manage the effective implementation of this procedure Manage the documentation and close-out of non-conformances raised in relation to the EMS. Regularly review the non-conformance report register.
Auditors	Identify environmental non-conformances and complete non-conformance report forms, as required.
All UWS Staff	Ensure completion of any corrective or preventive actions identified as a result of an audit, inspection or third party complaint.

## Identification of Non-Conformances

(87) Non conformances or potential non conformances or deficiencies may be identified in any of the following situations:

- a. as part of inspections, supervision or monitoring of routine or non-routine activities e.g. inspection of hazardous material storage areas.



- b. during audits conducted in accordance with procedure for Environmental Audit (EMSP Part G);
- c. observed during external system reviews of the environment records, processes, reports and procedures.
- d. following significant third party complaints either verbal or written.

## **Documentation of Non-Conformance and Corrective Action**

(88) Non conformances, in whatever situations they are observed, may be divided into two types:

- a. major non conformances - a non-conformance which requires large scale corrective action to ensure sound environmental management, e.g. a large scale contamination event, EMS procedure not followed.
- b. minor non-conformances - a non-conformance which requires small-scale corrective action to re-establish sound environmental management, e.g. a small contained spill, EMS form not completed correctly.

(89) All non conformances are recorded using a Non-Conformance Report Form (EMSP Part E - 1). Each Non-Conformance Report is given a unique reference number which is related to the audit, inspection or activity. The person responsible for identifying the non-conformance completes the Non-Conformance Report Form.

(90) All non-conformance report forms are copied to the Environmental Manager who co-ordinates and ensures that they are investigated and corrective and preventive actions are taken (see Management of Non-Conformance). The Environmental Manager maintains the Non-Conformance Report Register and ensures effective implementation and follow-up.

(91) Corrective and preventive actions are identified and recorded on the Non-Conformance Report Form. Corrective and preventative action provide the mechanism to:

- a. undertake corrective (reactive) action to eliminate the causes of non-conformance;
- b. undertake preventive (proactive) action to eliminate potential causes of non-conformances;
- c. handle third party complaints; and
- d. suggest improvements to the [Environmental Management System](#).

## **Management of Non-Conformance and Corrective Actions**

(92) The Environmental Manager or the person responsible for the audit or activity, (e.g. Department Head) reviews and investigates the non-conformance.

(93) The Environmental Manager in consultation with the auditee or person responsible for the activity shall determine:

- a. how the impacts can be successfully remedied to ensure sound environmental management;
- b. whether the regulatory authority eg. [Department of Environment and Climate Change](#), requires to be notified of the non-conformance.

(94) The agreed corrective actions are documented on the Non-Conformance Report (EMSP Part E-1) by the person responsible and are approved by the Environmental Manager.

(95) The agreed corrective actions must identify responsibility for completing the corrective action and the timescale to complete the action.

(96) The agreed corrective actions are implemented by relevant personnel. All corrective actions are rechecked to ensure compliance to the [Environmental Management System](#).

(97) The Non Conformance Register (EMSP Part E-2) is maintained by the Environmental Manager for ready reference and effective follow-up. The Environmental Manager verifies that the agreed corrective and/or preventive action is implemented.

(98) At regular intervals, the Environmental Manager reviews outstanding non-conformances, assesses progress or reasons for lack of, and arranges further actions as required, to ensure completion in a reasonable time frame.

(99) The Non-Conformance Report Form is signed off and closed if the follow-up action is satisfactory. If the results are not satisfactory, the new non conformance observed shall be treated as per this procedure.

### Monitoring

(100) The Environmental Manager undertakes regular reviews of the non-conformance register for tracking and measurement purposes.

### Records

(101) All completed Non-Conformance Report Forms and the Non-Conformance Report Register are held by the Environmental Manager, according to the UWS [Records Maintenance Policy](#).

## Part F - Management Review

(102) It is a requirement of ISO 14001 that organisations conduct a review of the [Environmental Management System](#) to ensure its continuing suitability, adequacy and effectiveness.

(103) The purpose of this procedure is to provide the process of undertaking an annual management review of the Environmental Management System to ensure its continual suitability, adequacy and effectiveness, and to provide a mechanism for reporting on UWS environmental performance.

(104) This procedure applies to all of the UWS Environmental Management System. The management review should be comprehensive and broad enough to address the environmental aspects or all UWS Campuses' activities, services and facilities.

(105) This procedure is referred to in the UWS [Environmental Management System Manual](#) as Environmental Management System Procedure Part F (EMSP Part F).

### Responsibilities

Staff Member	Duties
Vice-Chancellor	Vice-Chancellor or delegate is to attend the Environmental Management Review meeting. Endorse the Environmental Management Review Report.
Environmental Manager	Collate information and facilitate the Environmental Management Review meeting. Prepare the Environmental Management Review Summary Report. Update the Environmental Management System on a yearly basis, as required. Inform the relevant UWS staff of the Environmental Management System changes.
Executive Deans, Heads of Schools/Units	Participate in the Environmental Management System Review process.

(106) The Environmental Manager is to collate information including Audit Actions Reports and Incidents Reports to be discussed at the Management Review meeting that is to be set up with the following attendees:



- a. Vice-Chancellor or delegate;
- b. Director Audit and Risk Assessment;
- c. Environmental Manager;
- d. Manager Occupational Health Safety and Info Services;
- e. University Legal Counsel;
- f. Director Capital Works and Facilities; and
- g. Executive Deans, Heads of Schools/Units or delegates.

(107) Minutes shall be taken including recommendations that will be documented for actions and responsible parties.

(108) The Environmental Management System Review is conducted on a yearly basis.

(109) The review addresses the following:

- a. environmental performance of UWS such as incident reports and audit results;
- b. review of environmental aspects and impacts;
- c. need for amendments to the [Environmental Management Policy](#);
- d. progress towards achieving objectives and targets and amendments to the objectives and targets; and
- e. need for changes to elements of the [Environmental Management System](#).

(110) Based on the meeting outcomes, the Environmental Manager prepares the Environmental Management Review Report.

(111) The Environmental Management Review Report is sent to the Vice-Chancellor for endorsement.

(112) Once endorsement is received, the Environmental Manager makes the appropriate changes to the [Environmental Management System](#).

(113) The Environmental Manager is responsible for tracking completion of the actions identified in the Environmental Management Review Report.

(114) The Environmental Manager notifies the relevant UWS staff of the Environmental Management System changes.

## **Records**

(115) All Environmental Management System Review documents including Meeting Minutes and the Environmental Management System Review Reports are held by the Environmental Manager, in accord with the UWS [Records Maintenance Policy](#).

## **Part G - Environment Management System Audit**

(116) It is a requirement of ISO 14001 that organisations must establish and maintain programmes and procedures for periodic Environmental Management System audits to be carried out to ensure that the [Environmental Management System](#) is operating according to set parameters.

(117) The purpose of this procedure is to provide means for:

- a. assessing conformance with, and the effectiveness of the UWS [Environmental Management System](#);

- b. determining whether environmental performance standards are being maintained in all activities; and
- c. bringing audit findings to the attention of Management for timely action.

(118) This procedure is referred to in the UWS [Environmental Management System Manual](#) as Environmental Management System Procedure Part G (EMSP Part G).

## Responsibilities

Staff Member	Duties
Environmental Manager	Develop, implement and review the Environmental Management System Audit Program. Undertake relevant updates of the Environmental Management System Audit Program. Nominate a qualified auditor or a qualified lead auditor. Facilitate access to UWS staff, facilities and documentation during the audit. Notify UWS staff of the audit findings. Consult with the relevant Executive Deans, Heads of Schools/Units.

(119) Prior to the assessment of the Environmental Management System Procedures that are the subject of the biennial audit (every two years), the Environmental Manager considers current operational risks, giving priority to the higher operational risks, historic performance and past auditing frequency at UWS Campuses.

(120) Based on the above considerations the Environmental Manager assesses which procedures (e.g. Environmental Operational Control Procedures such as Waste Management Procedure, Pesticide Management Procedure or Environmental Management System procedures such as Identification of Environmental Aspects and Impacts) will be subject of the biennial audit.

(121) The Environmental Manager develops the Environmental Management System Audit Program that includes:

- a. audit subject/focus;
- b. where the audits are to be conducted;
- c. when the audit is to be timed; and
- d. who will be responsible for conducting and completing the audit.

(122) The Environmental Manager ensures that the Environmental Management System Audit program is implemented.

(123) Prior to the Environmental Management System Audit, the Environmental Manager nominates an auditor or auditors for each scheduled audit. For teams of two or more a lead auditor will be nominated.

(124) The Environmental Manager ensures that the nominated auditor is independent of having direct responsibility for the area being audited. Where practicable, an auditor from one division will audit another division.

(125) All environmental auditors shall be suitably qualified and have attended, as a minimum:

- a. the UWS environmental awareness training program; and
- b. an accredited auditor training course (quality or environment).

(126) Prior to the Environmental Management System Audit an auditor needs to:

- a. determine the scope of the audit such as to determine whether the UWS conforms to the requirements for environmental management in accordance with AS/NZ ISO 14001 and whether the UWS [Environmental Management System](#) is properly implemented and maintained;



- b. notify the Auditees; and
- c. develop an audit checklist.

(127) The nominated auditor(s) conduct an audit by:

- a. interviewing key UWS staff;
- b. observing practices;
- c. inspecting control infrastructure; and
- d. examining systems and processes that relate to the audit scope identified in clause (3)

(128) The nominated auditor/s:

- a. record audit results on the audit record.
- b. highlights non-conformances, opportunities for improvement and good practices in accordance with.
- c. formulates recommendations for preventive and/or corrective actions to address relevant audit findings.
- d. communicates findings with Auditees.
- e. prepares an Audit Summary Report that identifies any issues raised, corrective action to be taken and due date for corrective action.
- f. submits the Audit Summary Report to the Environmental Manager as well as to UWS staff responsible for carrying out corrective actions.

(129) The Environmental Manager:

- a. reviews and amends the Environmental Management System Audit Program based on audit findings.

(130) Audit findings and corrective actions are tracked to completion in accordance with.

(131) The Environmental Manager is responsible for:

- a. reviewing and amending the Environmental Management System Audit Programme on an annual basis; and
- b. documenting and providing the information on the results and audits to the relevant UWS staff.

## **Monitoring**

(132) The Environmental Management System Audit Program is reviewed by the Environmental Manager on an annual basis in consultation with the Director Audit and Risk Assessment to ensure the [Environmental Management System](#) is operating according to set parameters.

## **Training**

(133) For training refer to the UWS audit training requirements.

## **Records**

(134) All Environmental Management System Audit documents including Audit Summary Report and non-conformance reports/forms are held by the UWS Environmental Manager.

# **Section 5 - Guidelines**

(135) There are a considerable number of statutes which govern various elements of environmental management. Links to key pieces of legislation, University Policy and related documentation are available on the associated information page for the [Environmental Management Policy](#). A more detailed list of legislation, which summarises some of the key area of impact, is provided in the [Environmental Management Legal Register](#).

## Status and Details

Status:	Current
Effective Date:	
Review Date:	
Approval Authority Policy:	Board of Trustees
Approval Authority Procedure/Guideline:	Vice-Chancellor
Approval Date:	
Expired Date:	To Be Advised
Unit Head:	Name: John Bonanno (02) 9678 7025 Position: Director Capital Works and Facilities
Author:	Name: Roger Attwater (02) 4570 1623 Position: Grounds and Environment Manager
Enquiries Contact:	Name: Unknown Position: Unknown

# Environmental Management System Operational Control Procedures

## Section 1 - Purpose and Context

(1) This document contains detailed procedures related to specific aspects of the University's [Environmental Management System](#) (EMS), including:

- a. Waste Management Procedure;
- b. Pesticide Management Procedure;
- c. Emergency Preparedness and Response Procedure;
- d. Emergency Spill Response Procedure;
- e. Urban Wildlife Management Procedure; and
- f. Contractor management procedure.

(2) These procedures apply to the conduct of environmental management activities on all UWS campuses and must be read in conjunction with the University's [Environmental Management Policy](#), [Environmental Management Plan](#), [Environmental Management System Procedures](#), and relevant statutes.

## Section 2 - Definitions

(3) For the purposes of this procedure:

- a. air pollution - is "the emission into the air of any air impurity which includes smoke, dust (including fly ash), cinders, solid particles of any kind, gases, fumes, mists, odours and radioactive substances." ([POEO 1997](#))
- b. boiling point - is the temperature at which a liquid changes to a vapour state at a given pressure. Flammable materials with low boiling points generally present special fire hazards.
- c. emergency - is a sudden unforeseen crisis (usually involving danger) that requires immediate action.
- d. flashpoint - is the lowest temperature at which a liquid gives off enough vapour to form an ignitable mixture with air and burn when a source of ignition (sparks, open flames, cigarettes, etc.) is present.
- e. leak - is a slow discharge over time such as a drip at a join which is not tight, worn or under pressure.
- f. liquid waste: defined as a waste that does not meet the non-liquid waste criteria and is not a gas.
- g. material harm to the environment - "includes actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial or that results in actual or potential loss or property damage of an amount over \$10,000." ([POEO 1997](#))
- h. non-liquid waste - is defined as any waste that does not contain free flowing liquids (i.e. waste that can be moved with a shovel).
- i. pest - is "in relation to an animal, plant or thing - any animal, plant or other biological entity that injuriously affects the physical condition, worth or utility of the first-mentioned animal or plant or of that thing"
- j. pesticide (which includes herbicides and fungicides) - may also be a hazardous substance, a dangerous good, a scheduled poison and/or a fumigant and is an agricultural or veterinary chemical product that is used as a means



of directly or indirectly:

- i. destroying, stupefying, repelling, inhibiting the feeding of, or preventing infestation by or attacks of, any pest in relation to a plant, a place or a thing;
  - ii. destroying a plant;
  - iii. modifying the physiology of a plant or pest so as to alter its natural development, productivity, quality or reproductive capacity;
  - iv. modifying an effect of another agricultural chemical product; or
  - v. attracting a pest for the purpose of destroying it.
- k. protective action zone - is "the area in which people are at risk of harmful exposure." (The US Emergency Response Guide, 2000). Random changes in wind direction are factored into this zone and are assumed to confine the vapour plume to an area within 30 degrees on either side of the predominant wind direction. This results in a crosswind protective action distance equal to the downwind protective action distance.
- l. native wildlife - is wild fauna living in a natural, undomesticated state that is indigenous to or originating from Australia.
- m. non-native wildlife - is wild fauna living in a natural, undomesticated state that has been introduced from a country other than Australia.
- n. protected fauna - in NSW refers to all native wildlife including threatened species, endangered populations and endangered ecological communities
- o. spill - is a large discharge in a small time such as a hydraulic hose which splits or a drum which overturns. Several factors determine whether a spill is minor or major, such as the nature of the material, the volume of the spill and risk to the environmental and human health. As a rule of thumb and excluding quantities spilled in laboratories, minor spills can generally be categorised as spills involving quantities of 200 litres or less, while major spills are greater than 200 litres.
- i. major spill - is a spill where any of the following applies:
    - the responsible party and/or material spilled is unknown;
    - the material spilled is highly toxic;
    - a large (or undetermined) quantity was spilled;
    - a significant fire hazard may be present;
    - the material has the potential to reach the environment; and
    - advanced personnel protective equipment is required.
  - ii. minor spill - is a spill where all of the following applies:
    - the responsible party is at the scene;
    - the material spilled is known;
    - the material spilled is not highly toxic;
    - the quantity spilled is small;
    - there is no fire hazard;
    - the material has little or no potential to reach the environment (e.g., via a floor drain); and
    - advanced personnel protective equipment (i.e., more than gloves and a half-face respirator) is not needed.
- p. unprotected fauna refers to non-native wildlife. A comprehensive list of unprotected fauna can be found under Schedule 11 of the [NSW National Parks and Wildlife Act 1974](#).
- q. waste - is defined in the [Waste Minimisation and Management Act 1995](#) and [Protection of the Environment](#)

[Operations Act 1997](#) as "any discarded, rejected, unwanted surplus or abandoned substance" that could cause an environmental change due to its volume or composition.

- r. water pollution - is "introducing into or onto, waters (whether through an act or omission) any matter, whether solid, liquid or gaseous, so that the physical, chemical or biological condition of the waters is changed and makes, or is likely to make, the waters unclean, noxious, poisonous or impure, detrimental to the health, safety, welfare or property of persons, undrinkable for farm animals, poisonous or harmful to aquatic life, animals, birds or fish in or around the waters or unsuitable for use in irrigation, or obstructs or interferes with, or is likely to obstruct or interfere with persons in the exercise or enjoyment of any right in relation to the waters, and likewise polluting any drain, channel or gutter used or designed to receive or pass rainwater, floodwater or any water that is not polluted."["\(POEO 1997\)](#).

## Section 3 - Policy Reference

(4) Refer to the University's [Environmental Management Policy](#) and, with respect to Wildlife Management, refer to the University's [Animals on Campus Policy](#).

## Section 4 - Procedures

### Part A - Waste Management Procedures

#### Purpose and Context

(5) The purpose of this procedure is to define the UWS processes for the management, handling, treatment and disposal of waste substances and materials generated on site. The procedure identifies the waste streams likely to be generated across the UWS campus sites and the methods of control required to ensure that legislative requirements are not breached.

(6) This procedure provides the generic process that should be used across all UWS campuses. Campus specific waste streams not covered in this Procedure should be notified to the Grounds and Environment Manager for document amendment.

(7) This procedure applies to all campuses and sites where waste is generated and includes the use of recycled effluent and stormwater for commercial farming operations as part of the Hawkesbury Water Recycling Scheme at the Hawkesbury Campus. This procedure addresses the management of liquid, solid and hazardous wastes.

(8) This procedure is referred to in the UWS [Environmental Management System Manual](#) as Environmental Operational Control Procedure (Part A).

#### Waste Management Hierarchy

(9) The objective of waste management is to minimise the impact of wastes on the environment, UWS staff, students, contractors and the public.

(10) UWS has adopted the following hierarchy of waste management options and requires all staff and students to subscribe to it:

- a. reduce and avoid waste generation (the most effective environmental solution may often be to avoid the generation of waste i.e. reduction);
- b. reuse and recycle (where further reduction is not practicable, products and materials can sometimes be used again, either for the same or a different purpose (i.e. reuse). If reusing material is not possible, then the next option is through recycling, composting or energy recovery from waste); and
- c. treat and dispose (disposal is only the appropriate option if none of the above offers an appropriate solution).

## **Specific Waste Management Procedures**

(11) The following procedures relate to each of the key waste streams generated by UWS:

- a. general waste (office and kitchen waste that is solid and inert in nature including food waste);
- b. recyclable waste including:
  - i. paper, and cardboard;
  - ii. cans, plastic containers and glass bottles;
  - iii. imaging consumables;
  - iv. mobile phones;
  - v. green waste; and
  - vi. farming waste;
- c. hazardous waste (any waste of a chemical nature that is potentially hazardous including clinical waste and radioactive waste);
- d. maintenance and building waste, and
- e. asbestos, synthetic mineral fibre (SMF) and polychlorinated biphenyl (PCB) waste.

## **General Waste Procedure**

(12) This procedure applies to all UWS staff, students and contractors and covers all general waste streams (including office and kitchen waste that is solid and inert in nature) generated at all UWS sites and includes desk, kitchen, lecture room and laboratory waste bins.

(13) All general waste such as cans, bottles and plastic waste is to be placed in provided general waste bins. Putrescible waste (ie waste that may rot such as foodstuffs) is to be placed in bins located in kitchen and lunch room areas only.

(14) Contract cleaning staff empty general and paper recycling bins into outdoor bulk waste collection bins. General waste bins located in kitchen and lunch room areas and in high profile and high usage areas are emptied daily. General waste bins located in administrative areas are emptied three times a week or if more than two thirds full.

## **Recycling Procedures**

### **Office Paper and Cardboard Procedure**

(15) This procedure applies to all UWS office staff.

(16) Dedicated paper recycling bins are provided at all desks and in photocopier rooms. All paper suitable for recycling is to be placed in these paper recycling bins. This includes:

- a. photocopy paper;
- b. printing paper;
- c. note and writing paper;
- d. manila folders;
- e. envelopes; and
- f. text books.



(17) The following waste is not to be placed in paper recycling bins:

- a. waxed and un-waxed cardboard boxes;
- b. food scraps;
- c. food wrappers;
- d. plastics;
- e. glass;
- f. polystyrene;
- g. carbon paper; and
- h. metal.

(18) Confidential or sensitive material is to be shredded or alternatively placed in provided red Sulo Security Bins which are sent to a secure destruction facility then recycled.

(19) Contract cleaning staff empty desk, office and photocopier room paper recycling bins into dedicated blue recycling Sulo bins located within and outside of buildings. The bins are emptied daily in high profile and high use areas and three times weekly in administrative areas or when bins are more than two thirds full.

(20) Cardboard recycling bins are provided at centrally located areas at each UWS site.

(21) Cardboard boxes are to be flattened with small quantities left in office areas for removal by contract cleaning staff to designated bins and large quantities flattened and stored in a suitable area for collection. Collection can be arranged by telephone the Landscape Supervisor / Grounds Supervisor

(22) Waxed cardboard is not suitable for recycling and is not to be placed in cardboard recycling bins. Polystyrene and plastic wrapping is to be removed from cardboard boxes prior to flattening.

### **Co-mingled Recycling of Cans, Plastic Containers and Bottles**

(23) Recycling bays are being established to collect co-mingled aluminium cans, plastic containers, and glass bottles.

### **Imaging Consumables Recycling Procedure**

(24) Recycling of imaging consumables is done via Print Services Unit and Ricoh or "Close the Loop" Cartridge Collection Program. For further information on Ricoh cartridge recycling please contact Print Services Unit at Kingswood.

(25) Close the Loop Limited is a leading global recycler of inkjet cartridges, laser toner cartridges, drum units, copier bottles and more. All cartridges in this program are recycled with zero waste to landfill.

(26) Close the Loop Collection Starter Kits contain 1 x box with lid, 16 x black plastic bin liners, 8 zip ties and an Information pack. Boxes should be situated near printing equipment and facilities and lined with 2 plastic bin liners.

(27) Only imaging consumables from any laser printer, inkjet printer, fax machines and photocopiers are to be placed in "Close the Loop" boxes. When the bag is full remove the liners (2 x black bags) and tie off with provided zip tie. Insert new liners for subsequent collection and disposal. Take the bag to a nominated courier collection point.

(28) "Close the Loop" pickup can be arranged by phoning 03 9 465 4855 or via the internet. Further box liners can be obtained by ordering a Consumables Pack from Close the Loop.



## **Mobile Phone Recycling Procedure**

- (29) This procedure applies to all UWS staff issued with a UWS mobile work phone.
- (30) All mobile handsets, including batteries and accessories, are recyclable through the Mobile Phone Industry Recycling Program.
- (31) Any broken/damaged or old UWS phones that are not repairable should be returned to the IT Accounts Unit. Please make sure that the sim card has been removed and the phone is marked dead or working (if partially working).
- (32) Returned mobiles will be placed in the recycle bin for Vodafone to dispose of in an environmentally friendly manner.
- (33) For all UWS staff requiring further information please refer to the University's [Mobile Telephone Policy](#) and other related documentation available via the Information Technology Services web site.

## **Farming Waste Recycling Procedure**

- (34) This procedure covers recyclable farming waste streams that stem from a number of UWS agricultural activities based primarily at the Hawkesbury campus. Compostable manure/green streams originate from UWS's beef, sheep, deer and equine activities.
- (35) This procedure applies to those UWS staff working in outdoor farm laboratories at UWS Hawkesbury and applies only to those waste streams that occur when livestock are intensively housed. For free range livestock, manure is left to decompose in the paddocks.
- (36) Manure is to be collected daily from stables and yards by UWS outdoor technical officers and stockpiled in a purpose built compound at the Equine Unit. When required it is to be collected by the officers from the Horticulture Unit, composted and reused as organic fertilizer.

## **Green Waste Recycling Procedure**

- (37) This procedure covers all green waste produced at UWS campuses. Green waste refers to urban landscape waste generally consisting of leaves, grass clippings, weeds, yard trimmings, wood waste, branches and stumps and other miscellaneous organic materials.
- (38) Green wastes at UWS originate from the activities associated with grounds maintenance and landscaping, UWS Connect sports facilities maintenance and horticulture. This procedure applies to all UWS grounds and landscape staff and contractors.
- (39) All mowers fitted with mulching decks are to leave mulched grass left where it is cut unless it is in windrows or impacts on high profile areas.
- (40) Green waste resulting from tree lopping, pruning and removal is to be chipped on site and used as garden bed and tree mulch on site. This aids moisture retention and reduces potable water consumption for irrigation.

## **Hazardous Waste Operating Procedure**

- (41) This procedure applies to all hazardous wastes. Hazardous wastes are both solid and liquid wastes that have either the short or long term potential to harm human health and/or the environment. This procedure is in addition to promulgated Occupational Health and Safety Hazardous Waste Policies and Procedures.
- (42) Waste streams that are identified by UWS Technical Officers as hazardous include

- a. any waste that meets the criteria for assessment as a dangerous good;
- b. pharmaceuticals and poisons;
- c. declared chemical waste;
- d. biological waste;
- e. cytotoxic waste;
- f. clinical waste;
- g. sharps waste and
- h. liquid and non-liquid radioactive waste.

(43) From an environmental perspective, these types of waste will contaminate soil and waterways if sent to landfill and are governed by both OH&S and environmental legislation and best practice guidelines.

### **Hazardous Liquid Waste**

(44) The [NSW Department of Environment and Climate Change](#) has issued "Environmental Guidelines: Assessment, Classification & Management of Liquid and Non-liquid Wastes" in order to promote compliance with the [Protection of the Environment Operations \(Waste\) Regulation 2005](#), made under the [POEO Act, 1997](#).

(45) According to these guidelines and legislation liquid waste should be classified according to the following types and labelled and stored appropriately. Please refer to the Occupational Health and Safety [Laboratory Safety Guidelines](#) and [Hazardous Substances and Dangerous Goods Procedures](#).

(46) Wastes (liquid) that are classified as hazardous include:

- a. Group A - Non-aqueous liquid and controlled aqueous liquid waste;
- b. Group B - Liquid food waste and liquid grease-trap waste resulting from the preparation or manufacturing of food;
- c. Group C - Liquid waste from human waste storage facilities or waste treatment devices and
- d. non-controlled aqueous liquid.

### **Maintenance Waste Operating Procedure**

(47) This procedure applies to all UWS Office of Capital Works and Facilities (OCWF) Project Managers and Building Contractors and covers all building rubble resulting from demolition on all UWS campuses. Building rubble or building and demolition waste refers to all material (such as bricks, concrete, paper, plastics, glass, metal and timber) resulting from the demolition, erection, construction, refurbishment or alteration of buildings and/or infrastructure-type development.

(48) This operating procedure does not apply to asbestos waste.

(49) Office of Capital Works and Facilities Project Managers have a responsibility to recycle building rubble where practicable. Each site will be assessed on its own merits by the respective Project Manager and only as a last resort will mixed building rubble be sent as contaminated material to a mixed landfill.

(50) Building Contractors that include recycling of materials in the tender process should be given preferable consideration if all other evaluation factors are equal. Once the tender and approval for the demolition from council is granted, it is the building contractors' responsibility to dispose of all building rubble as per the terms of the contract.

(51) Brick, concrete, timber, steel and soil waste from building and demolition works are to be sorted on site by the Building Contractor and sent to dedicated recycling facilities.

## **Asbestos, SMF and PCB Material Waste Operating Procedure**

(52) This procedure is to be read in conjunction with the UWS Occupational Health and Safety Policies and Procedures.

(53) This procedure applies to all UWS Office of Capital Works and Facilities Project Managers and Building Contractors.

(54) This procedure covers all asbestos and asbestos related materials, all synthetic mineral fibre (SMF) material and all polychlorinated biphenyl (PCB) material waste.

(55) Asbestos waste means any waste that contains asbestos - the common name for a variety of silicate minerals within either the amphibole or the serpentine groups that are fibrous in structure and more or less resistant to acid and fire. Asbestos is classed both as a hazardous substance and a class 9 miscellaneous dangerous good - inhaling the fibres may cause asbestosis or lung cancer.

(56) SMF waste means any waste that contains SMFs - a general term used to describe man-made amorphous (non-crystalline) silicate fibres which are manufactured from minerals such as glass, rock, alumina and silica. SMFs are classified as a hazardous substance and a non-dangerous good. Short-term exposure to SMFs may result in skin, eye and upper respiratory tract irritation and long-term exposure is possibly carcinogenic.

(57) PCB waste means any waste that contains PCBs - a group of toxic organo-chlorine compounds. While they vary in form, PCBs usually occur as non-flammable oils in electrical equipment such as transformers and capacitors. PCBs are classified as a hazardous substance and a class 9 miscellaneous dangerous good. Exposure to leaking PCBs can result in a range of health problems from nausea and eye irritations to bronchitis, liver complications and chloracne. From an environmental perspective, PCBs are non-degradable and can therefore bio-accumulate in the food chain.

(58) Details of existing asbestos, SMF and PCB material locations in UWS buildings are kept in the Office of Capital Works and Facilities HAZMAT Register.

(59) Generally the majority of asbestos, SMF and PCB containing materials on UWS campuses have been assessed by an independent consultant to be in a stable condition with no remedial action required and does not present a significant health risk.

(60) Prior to undertaking any major or minor Capital Works, the Project Manager responsible for the project must check the Office of Capital Works and Facilities Hazardous Materials Register (HAZMAT) section of the Facilities Information Management System for the presence of asbestos, SMF and PCB containing materials. If any of these materials are present and require removal, the Project Manager is responsible for factoring into the administration of the tender process the procurement of an appropriately licensed contractor to safely remove and dispose of the material.

(61) The Project Manager is to manage the awarded contract and to ensure that the contractor is fulfilling the terms of the contract by conducting spot audits.

(62) The Project Manager is responsible for collating and filing all the necessary documentation including proof of correct disposal of asbestos, SMFs and PCB containing materials and is to notify the Manager Building Services once the job is completed of what substances have been removed in order to update the HAZMAT register.

(63) The Manager Building Services is to maintain and update as required the HAZMAT register.

(64) All contractors must be licensed hazardous material removalists (if appropriate)\* and must comply with all state and national environmental and occupational health and safety legislation and codes of practice.

(65) In situations where these materials need to be removed from UWS buildings no disturbance of these substances is



to occur and discovery is to be immediately to the Manager Building Services, Office of Capital Works and Facilities.

(66) The collection, handling and disposal of asbestos and asbestos waste by the contractor must strictly adhere to the requirements as stipulated in NSW Environmental Protection Authority's [POEO \(Waste\) Regulation 2005](#). The contractor must forward the appropriate documentation from a licensed landfill site to the Project Manager.

(67) The collection, handling and disposal of SMF's by the contractor must strictly adhere to the requirements as stipulated in The National Standard for Synthetic Mineral Fibres [NOHSC:1004 (1990)] and National Code of Practice for the safe use of Synthetic Mineral Fibres [NOHSC:2006 (1990)].

(68) In NSW, SMF waste is accepted at nominated landfills and usually must be booked a day in advance. The building contractor who is responsible for the correct collection and disposal of SMF containing material must forward the appropriate documentation from a licensed landfill site to the Project Manager.

(69) Scheduled PCB material and waste must be transported in accordance with the Australian Dangerous Goods Code and any other legislative requirements. The contractor who is responsible for the correct collection and disposal of PCBs must forward the appropriate documentation from a licensed landfill site to the Project Manager.

(70) All workers involved in the transport of PCB wastes should be fully informed of the hazards of PCBs and trained in the correct procedures required for the safe transport of these hazardous materials. PCB waste is classified according to the level of concentration present in the PCB containing material.

## Monitoring

(71) The Environmental Manager and the Grounds and Environment Manager are responsible for implementing a programme of waste audits to ensure that waste streams are being controlled and disposed of in accordance with this procedure and are in accord with legislative and regulatory requirements.

(72) The Waste Management Register will be reviewed by the UWS Environmental Manager and the Grounds and Environment Manager on a bi-annual basis to determine areas to be targeted for waste reduction or improved management.

## Training

(73) Waste management training is included within the Environmental Awareness Training that is provided for UWS staff and students. Waste management responsibilities for contractors are covered in the compulsory UWS Occupational Health and Safety Contractor Induction course.

## Records

(74) All waste management documents are held by the Environmental Manager and the Grounds and Environment Manager, and will be maintained in a manner according to the UWS [Records Management Policy](#).

(75) Waste management documents include:

- a. waste management register;
- b. waste contracts;
- c. waste transfer notes (waste dockets from landfill);
- d. copies of waste contractors licences; and
- e. discharge and other consents.

## Guidelines

### Paper and Cardboard Recycling Timetables

(76) Contract cleaning staff transport blue paper recycling Sulo bins and red security Sulo bins to designated kerbside collection points and move them back to their original location. Paper recycling bins are collected weekly and security bins are collected fortnightly.

(77) The Visy Sulo paper recycling bins are taken out weekly to their collection points by the contract cleaners on the following days:

Campus	Day
Bankstown	Tuesday
Blacktown	Thursday
Campbelltown	Friday
Hawkesbury	Tuesday
Kingswood	Monday
Parramatta	Tuesday
Werrington North	Monday
Werrington South	Monday

(78) Visy Security bins are collected fortnightly on a Monday at Bankstown, Blacktown and Campbelltown Campuses, on alternating Fridays at North and South Parramatta, and on Friday at all other Campuses.

## Part B - Pesticide Management Procedures

### Purpose and Context

(79) While pesticides can have economic, social, public health and environmental benefits there are significant risks associated with pesticide use. Many pesticides, due to their levels of toxicity, flammability or combustibility are classified as dangerous goods and/or hazardous substances.

(80) The purpose of this procedure is to define the UWS processes for the management of pesticides employed as a consequence of building maintenance, farming, horticultural and grounds maintenance activities conducted by the university. This procedure identifies the standard operating procedures for the safe handling, management, use and disposal of pesticides to ensure that legislative requirements are not breached.

(81) This procedure has been developed with reference to the following Statutes and Regulations (and associated amendments) and UWS Policies, Procedures and Guidelines:

- a. [Pesticides Act 1999](#);
- b. [Pesticides Regulation 1995](#);
- c. [Pesticides Amendment \(User Training\) Regulation 2003](#);
- d. [Protection of the Environment Operations Act \(POEO Act\) 1997](#);
- e. [Occupational Health and Safety \(OHS\) Act 2000](#);
- f. [WorkCover NSW Code of Practice for Safe Use and Storage of Chemicals \(Including Pesticides and Herbicides\) in Agriculture](#);
- g. [UWS Farm Safety Guidelines](#);
- h. [UWS Guidelines for the Storage and Handling of Fertilisers and Fertiliser Blends](#); and



i. [UWS Hazardous Substances and Dangerous Goods Procedures](#).

(82) The principles embodied in this document are generic and are to be applied to the management of pesticides and herbicides by UWS staff and external contractors at all UWS sites. This procedure addresses the management of all types of liquid and solid pesticides and herbicides.

(83) While this procedure is primarily concerned with minimising the negative environmental impacts that the use of pesticides entails, it has also been written to ensure consistency with Occupational Health and Safety Regulations where relevant.

(84) This procedure is referred in the UWS [Environmental Management System Manual](#) as Environmental Operational Control Procedure (Part B).

## Legislative Responsibilities

(85) The Australian Pesticides and Veterinary Medicines Authority (APVMA) currently require that all pesticides sold in Australia be approved and registered.

(86) In NSW, the [Pesticides Act 1999](#) permits only the use of approved registered pesticides (unless specific authorisation is granted for the use of an unregistered pesticide). The Act also requires all users to adhere to the approved label or permit directions. The Pesticides Act also sets out current record keeping and training requirements. The [Department of Environment and Climate Change](#) (DECC) is the state agency that currently enforces the proper use of pesticides in NSW.

(87) This Act controls and regulates the use of pesticides in New South Wales. The focus of this legislation is to protect human health, the environment, property and trade while safeguarding responsible pesticide use.

(88) It is an offence under the Act: to:

- a. use a pesticide in a manner that:
  - i. injures or is likely to injure another person;
  - ii. damages or is likely to damage any property of another person or harms any non-target animal or plant; and/or
  - iii. harms any animal or plant if there is no approved label or permit for the pesticide;
- b. wilfully or negligently use a pesticide in a manner that causes material harm to threatened species or protected animals;
- c. possess or use an unregistered pesticide without a permit;
- d. fail to read an approved label or permit before using a registered pesticide;
- e. use a registered pesticide contrary to the approved label;
- f. keep registered pesticides in a container without an approved label; and/or
- g. possess or use a restricted pesticide without being authorised by a certificate of competency or a pesticide control order.

(89) The [Pesticides Amendment \(User Training\) Regulation 2003](#) requires users of pesticides for commercial and occupational purposes, or in connection with agricultural, farming or forestry operations to complete competency based training in pesticide use, transport, handling and storage and to make and keep records of pesticide use.

## Pesticide Application Requirements

(90) Prior to undertaking pesticide spraying UWS staff and contractors should take a precautionary approach in recognition of the limited knowledge of environmental consequences resulting from the widespread use, transport, persistence and degradation impacts of pesticide application.

(91) Persons engaged in pesticide transport, handling, storage, preparation and application on UWS property are required to:

- a. be qualified in accordance with requirements of the [Pesticides Amendment \(User Training\) Regulation 2003](#);
- b. ensure that a Register of Hazardous Chemicals is available and up to date;
- c. ensure that Material Safety Data Sheets are available, current and not more than five years old;
- d. have access to an approved Spill Kit and equipment required to clean up any spill;
- e. ascertain that climatic conditions are conducive to applying the pesticide, taking into account wind drift, run off and rain;
- f. ensure that the required and approved signage is prominently displayed;
- g. wear the stipulated PPE as promulgated on the MSDS;
- h. ensure that people, animals, water bodies, vehicles etc will not come into contact with pesticide application operations;
- i. ensure that the pesticides are used in a manner that does not unreasonably interfere with the quality of life, health or property of other people. Effective communication is a good way to minimise conflict between pesticide users and neighbours;
- j. ensure that the pesticides used do not move beyond the targeted application area;
- k. comply with legislative requirements and follow the label instructions to ensure that pesticides are transported, stored, mixed and used effectively and do not have a negative impact upon the environment, health, safety and trade. Always consider the circumstances when applying pesticides;
- l. ensure that containers and apparatus are thoroughly cleaned after use and residue is collected in an approved container for legislatively compliant disposal;
- m. enter details of the pesticide application in the Pesticide Application Register; and
- n. consider an Integrated Pest Management Approach as a means of controlling pests without relying totally on chemical insecticides.

(92) From an environmental perspective inappropriate use of pesticides, particularly those classified as dangerous, hazardous or poisonous, can lead to environmental harm. Different levels of harm (ranging from nuisance to serious) can arise from the incorrect use of pesticides. UWS staff and contractors engaged in pesticide use are to ensure that pesticides do not:

- a. enter stormwater systems, inland waters, ground water, estuarine or marine waters;
- b. pollute soils outside the target area;
- c. impact on non-target organisms, including plants or animals or damage ecosystem functions;
- d. harm turf, gardens or crops of neighbours due to spray drift;
- e. cause excessive noise during pesticide application or subjecting neighbours to spray drift that causes discomfort, illness or nuisance due to odour, irritation or toxicity;
- f. contribute to the development of resistance in pests; and
- g. contaminate agricultural produce.

## Recordkeeping



## Pesticide Registers

(93) A register is a listing of all hazardous substances in the workplace. This includes a list of the chemicals kept in a central store or a pest control vehicle. WorkCover NSW recommends that the minimum information which must be included in a register is a list of all hazardous substances used or produced in the workplace, and the relevant Material Safety Data Sheet (MSDS).

## Pesticide Usage Records

(94) The [Pesticides Amendment \(Records\) Regulation](#), part of the [Pesticides Act 1999](#) and in force from July 2002, requires that the use of pesticides must be correctly recorded with the following information:

- a. who applied the pesticide;
- b. what was applied; when, how and where it was applied;
- c. what it was applied to; and
- d. how much was applied, and, if the pesticide was applied outdoors by spray equipment, an estimate of wind speed and direction;

(95) The record must be made within 24 hours of use and kept for three years. Environment Protection Authority officers may check these records at any reasonable time and penalties may apply if the records have not been kept in accordance with the new law.

## Monitoring

(96) The Pesticide Application Register will be reviewed by the Environmental Manager and the Grounds and Environment Manager on a quarterly/six monthly basis to determine areas to be targeted for pesticide reduction or improved management techniques.

## Training

(97) The [Pesticides Act 1999](#) makes training compulsory for commercial users of pesticides. A person who is 'trained' has a qualification that shows that they have achieved a specific level of competency in pesticide use. Holders of Farmcare, ChemCert or SMARTtrain qualifications are considered already qualified under the Act. The qualification remains valid for five years from the date it was completed. People who are qualified have to be re-assessed every five years.

## Guidelines

### Material Safety Data Sheets (MSDS)

(98) An MSDS provides information on hazardous substances additional to that on a label. Methods to control exposure and exposure standards can also be found in the MSDS. An MSDS for a substance provides information on:

- a. identification;
- b. health hazard information;
- c. precautions for use at application strength, including the exposure standard;
- d. safe storage and handling information;
- e. all the hazardous ingredients, not just the "active constituent";
- f. where a chemical may release another hazardous substance during normal use such as when reacting with other common materials or when heated; and

- g. emergency procedures (to assist planning).

(99) Use the MSDS for guidance on the safe use and storage of chemicals. Other persons working in the area where the chemical is being used may also need to see the MSDS.

## **Part C - Emergency Preparedness and Response Procedures**

### **Purpose and Context**

(100) To effectively manage UWS's activities, potential generic emergency situations that have a negative environmental impact have been identified and appropriate responses documented. This procedure addresses reasonably foreseeable environmental emergency situations that could arise through these activities. However, it must be borne in mind that potential emergencies and responses are specifically related to site conditions and therefore generic response procedures need to be adapted to each project.

(101) Responsibility for identification of potential emergencies, adaptation of generic response procedures and implementation of response procedures is at a number of levels.

(102) The procedures in this document have been developed with reference to the following Statutes and Regulations (and associated amendments) and UWS Policies, Procedures and Guidelines:

- a. NSW [Protection of the Environment Operations Act 1997 \(POEO Act\)](#);
- b. NSW [Protection of the Environment Operations Amendment Bill 2005](#);
- c. NSW [Environmentally Hazardous Chemicals Act 1985](#);
- d. NSW Environmental Protection (Water Quality) Policy 2003;
- e. [NSW Occupational Health and Safety Act 2000 \(OHS Act\)](#);
- f. [UWS Accident, Injury, Incident, Hazard Reporting and Investigation Policy](#);
- g. [UWS OHS Emergency Management Program](#); and
- h. [UWS Dangerous Weapons Policy](#).

(103) This procedure has been developed for use across all UWS campuses.

(104) This procedure will review and identify all foreseeable emergency situations for environmental releases and detail generic emergency responses to these situations. Emergency preparedness and responses will outline:

- a. UWS Emergency Contact Numbers and Equipment;
- b. UWS Emergency Procedures;
- c. Fire - protected areas and farmlands;
- d. Hazardous spills and/or leaks; and
- e. Explosions - gas leaks etc.

(105) This procedure is referred in the UWS [Environmental Management System Manual](#) as Environmental Operational Control Procedure (Part C).

(106) UWS Occupational Health Safety and Information Services Unit has a comprehensive Emergency Preparedness Program that outlines a framework to enable line managers, in consultation with other stakeholders, to establish effective emergency management plans that are appropriate for their respective areas of responsibility. These procedures have been developed with this framework in mind. In addition, this website has a number of generic



emergency management instructions that the reader is referred to.

## Legislative Responsibilities

(107) The [Protection of the Operations Act 1997](#) (POEO Act) is the key piece of environment protection legislation administered by the [NSW Department of Environment and Climate Change](#) (DECC). Under this legislation an organisation has a duty of care to notify the DECC where "a pollution incident occurs in the course of an activity so that material harm to the environment is caused or threatened." The [NSW Ozone Protection Act 1989](#) and [NSW Ozone Protection Regulation 1997](#) was implemented to enable the state to meet its obligations under the Montreal Protocol to phase out production and consumption of ozone depleting substances including CFCs. It is a Tier 1 offence under section 117 of the [NSW Protection of the Environment Operations Act 1997](#) to wilfully or negligently cause certain ozone-depleting substances to be emitted into the atmosphere contrary to the Regulation in a manner that harms or is likely to harm the environment.

## Emergency contact numbers/equipment

(108) This following section is as per Occupational Health Safety and Information Services Unit.

(109) The emergency telephone number is ext 2300.

(110) This number when dialled from an internal UWS phone will connect directly to security staff on the campus on which the caller is located.

(111) Emergency internal telephones will only be used in emergency situations and are strategically located throughout the University. To obtain assistance simply lift the handset and dial '2300'.

(112) When using an internal telephone to phone the emergency services ('000') the caller must first dial '0' in order to obtain an outside line.

(113) There will be a slight delay when dialling the '000' emergency number before the phone begins ringing.

(114) The UWS emergency vehicles contain equipment which can be used in an emergency. Security staff are responsible for ensuring that the equipment is carried in the vehicle at all times and is maintained in a serviceable condition.

## UWS Emergency Procedures

(115) Key UWS Emergency Procedures addressing fire, evacuation, bomb threats, chemical and gas spills, medical emergencies and loss of essential services have been documented by the OHS Risk Management Unit and produced in poster format. This poster (UWS OHS Emergency Procedures) has been widely distributed throughout all public buildings and offices across all campuses.

(116) The UWS [Emergency Management Program](#) contains key duties and responsibilities for staff undertaking first response type roles in relation to emergencies on and around any UWS campus.

## Fire and Explosions

(117) In case of emergencies which typically may include fire, explosion, leakage of noxious gases/liquids etc: CALL '000', then:

- a. remain calm;
- b. quickly assess the extent of the emergency;

- c. notify personnel in the immediate area;
- d. do not attempt any action that would jeopardise your safety or the safety of any other person;
- e. contact the University's Security personnel on ext 2300 and provide the following information:
  - i. who is calling and your present location;
  - ii. the specific nature and location of the emergency;
  - iii. the phone extension you are calling from; and
  - iv. if known, the nature and extent of any injuries to persons;
- f. if it is safe to do so, and your assistance is not required at the emergency site, remain at the phone you are calling from until assistance arrives;
- g. when instructed to evacuate the area, proceed in a calm, orderly manner to the designated safe areas;
- h. do not assemble near any building or other structure;
- i. take your personal belongings eg coat, handbag, briefcase with you;
- j. don't lock doors as you leave;
- k. under no circumstances re-enter the buildings until authorised to do so by the Emergency Controller or their representative; and
- l. in the interests of your own personal safety and the safety of others please ensure that you know the:
  - i. emergency management plan for your local area;
  - ii. location of the building emergency exits; and
  - iii. location of emergency equipment e.g. first aid kits, fire extinguishers etc as this knowledge may be critical in an emergency situation.

## **Fire - Protected Areas and Farmland**

(118) For fire management in protected areas please refer to UWS' Remnant Bushland and Biodiversity Management Program in the UWS [Environmental Management Plan](#) which has as one of its actions plans to develop both a hazard and ecological fire management plan.

## **Hazardous Spills and Leaks**

(119) There are a number of areas that have the potential to make a negative environmental impact in terms of spills and leaks:

- a. Petrol spills;
- b. Polychlorinated biphenyl (PCB) leaks;
- c. Chlorine spills;
- d. Diesel spills; and
- e. Oil spills including hydraulic oil, engine oil and brake fluids.

(120) See Environmental Operational Control Procedure Part D Emergency Spill Response Procedure and OHS UWS Emergency Procedures.

## **Part D - Emergency Spill Response Procedure**

### **Purpose and Context**



(121) While accidental spills and leaks can occur UWS recognises that their impacts need be minimised and that the appropriate procedures are in place to protect both human health and the environment.

(122) The purpose of this procedure is to define the UWS processes for the emergency management of hazardous spills and leaks as a consequence of general business activities conducted across all spheres of the university. This procedure applies to all UWS staff, students, contractors and lessees and has been developed for use across all UWS campuses.

(123) The procedure identifies the standard operating procedures for the safe containment and disposal of hazardous spills and leaks to ensure that UWS's environmental responsibility and legislative requirements are met.

(124) The procedures in this document have been developed with reference to the following:

- a. NSW [Protection of the Environment Operations Act 1997 \(POEO Act\)](#);
- b. NSW [Protection of the Environment Operations Amendment Bill 2005](#);
- c. NSW [Environmentally Hazardous Chemicals Act 1985](#);
- d. NSW Environmental Protection (Water Quality) Policy 2003;
- e. NSW [Ozone Protection Regulation 1997](#);
- f. Australian Chlorofluorocarbon Management Strategy 2001;
- g. NSW [Occupational Health and Safety Act 2000 \(OHS Act\)](#);
- h. The Australian Dangerous Goods Code (ADG Code); and
- i. Manufacturer's Material Safety Data Sheets (MSDS).

(125) This procedure addresses the emergency management spill response to the major and most likely types of hazardous pollutants on UWS grounds such as: petroleum; diesel; oil lubricants and products; chlorine; polychlorinated biphenyl (PCBs), chemical spills in laboratories; Chlorofluorocarbons (CFC) leaks and gas leaks.

(126) This procedure applies to both liquid and gaseous substances.

(127) While this procedure is primarily concerned with minimising the negative environmental impacts that an accidental spill or leak may entail, it has also been written to ensure consistency with Occupational Health and Safety Regulation where relevant.

(128) There are three major ways that a hazardous spill or leak can impact on the environment:

- a. Water pollution - according to the NSW Environmental Protection Authority stormwater pollution is the biggest source of water pollution in urban areas. In Sydney, the cumulative effect of oil spills results in 60,000 litres of oil washed from the road network down the stormwater drain after heavy rain. Avoiding stormwater pollution is thus a major environmental consideration in the development of these procedures. Please note that under the POEO Act 1997 it is against the law for a person to pollute any waters.
- b. Air pollution - toxic emissions released to air from any fires that result from major hazardous spills are also of environmental concern because of the possibility of exposure to air-borne contaminants as is the release of ozone depleting substances.
- c. Land contamination - major hazardous spills also run the risk of land contamination.

(129) This procedure is referred in the UWS [Environmental Management System Manual](#) as Environmental Operational Control Procedure (Part D).

## Legislative Responsibilities

(130) The [Protection of the Environment Operations Act 1997](#) (POEO Act) is the key piece of environment protection legislation administered by the NSW Department of Environment and Climate Change (DECC).

(131) The Act has a three tier penalty regime for Environmental Offences:

- a. Tier 1 offences are considered the most serious offences which include the wilful or negligent disposal of waste causing or likely to cause harm to the environment (section 115), wilfully or negligently causing a substance to leak, spill or otherwise escape in a manner that harms or is likely to harm the environment (section 116), and the wilful or negligent emission of an ozone-depleting substance in breach of the Ozone Protection Regulations in a manner that harms or is likely to harm the environment (section 117 [POEO Act, 1997](#)). Under the [POEO Amendment Bill 2005](#) the penalties for these offences have been increased to up to \$5 million for corporations and \$1 million and/or seven years gaol for individuals.
- b. Tier 2 offences consist of all other offences under the Act and regulations, including water pollution, air pollution, land pollution (eg littering) and noise pollution offences. These offences are generally categorised as 'strict liability' offences i.e. the prosecution is not required to prove intent. The maximum penalties under the Amendment Bill 2005 for Tier 2 offences are up to \$1 million in the case of a corporation and \$250,000 for individuals. Daily penalties apply to continuing offences. Under this tier it is also an offence to:
  - i. emit offensive odour from scheduled activities;
  - ii. unlawfully transport waste; and
  - iii. failure to comply with the duty to notify the EPA or relevant council certain pollution incidents where "material harm" to the environment is threatened or caused. (This duty to notify applies to the person or employee carrying on the activity and the occupier of premises where the incident occurs).
- c. Tier 3 offences are dealt with by penalty notices or 'on-the-spot fines'. These notices impose a fine that can be paid or can be defended in court.

(132) Under this legislation an organisation has a duty of care to notify the EPA where "a pollution incident occurs in the course of an activity so that material harm to the environment is caused or threatened." This regime obviously makes it in any organisations interests to be vigilant in all areas of environmental management.

## **Part E - Generic Spill Response Procedure**

(133) In the event of a major spill on any UWS campus Security/Emergency must be immediately notified on extension 2300. A Security representative will attend the scene of the spill as soon as possible.

(134) Depending on the circumstances and nature of the spill the NSW Fire Brigade should also be called (000) by either those responsible for the spill if there is an immediate fire or pollution risk or will be called by Security upon arriving and assessing the situation. When it is safe to do so, the generic procedure to follow is as follows.

### **Protective Action Zones**

(135) In the case of major hazardous spills, protective action zones will need to be established. If the spill occurs in an outside environment note the wind direction and then establish the protective action zone. Specific distances will depend on the material spilled and are detailed in each specific operating procedure.

(136) Steps to take to create a protective action zone are as follows:

- a. Establish the initial isolation distance from the spill and direct all persons to move, in a crosswind direction, away from the spill to the distance specified.
- b. Establish the protective action zone downwind distance relevant to the material spilled. For practical purposes, the protective action zone is a square, whose length and width are the same as the downwind distance.



- c. Initiate protective actions (i.e. steps taken to preserve the health and safety of both the public and responders to the incident) to the extent possible, beginning with those closest to the spill site and working away from the site in the downwind direction.

## **Part F - Specific Emergency Spill Response Operating Procedures**

(137) Specific Emergency Spill Response Operating Procedures are outlined below for the following:

- a. Petrol leaks spills;
- b. Polychlorinated biphenyl (PCB) leaks and minor spills;
- c. Chlorine spills;
- d. Diesel leaks and spills;
- e. Oil leaks and spills;
- f. Laboratory spills;
- g. CFC leaks; and
- h. Gas leaks.

(138) Please note, unless otherwise specified all responses are as per MSDS instructions for each material as found on Chemwatch.

### **Petrol Leak and Spill Response Operating Procedure**

(139) This operating procedure applies to both leaded and unleaded petroleum products (also commonly referred to as motor fuel and/or gasoline) across all UWS campuses. Both leaded and unleaded petrol are classified as a hazardous substance and a Class 3 dangerous good according to the criteria of National Occupational Health and Safety Code and the Australian Dangerous Good code. Unleaded petrol is a lead free motor fuel used for internal combustion engines, 2-stroke and 4-stroke engines. It has a flashpoint of less than or equal to 30 degrees Celsius and a boiling point of greater than 30 degrees Celsius. It is anticipated that the majority of petrol related incidents will relate to spills and leaks from vehicles.

#### **Petrol Leaks**

(140) Petrol leaking from vehicles can occur particularly during hot weather when heat expands the petrol in fuel tanks. Leaking petrol is a serious risk and care should be taken with petrol spills to prevent the danger of ignition or explosion (OFM, Griffith University).

(141) These are the protective actions that need to be taken in the event of a petrol leak:

- a. remove all ignition sources;
- b. notify security on ext 2300 if any petrol leaks are identified;
- c. security will attempt to contact owner of vehicle; and
- d. as per minor spill procedure.

#### **Minor Petrol Spills (less than 200 litres) - Call Fire Brigade '000'**

(142) These are the protective actions that need to be taken in the event of a minor petrol spill:

- a. remove all ignition sources;

- b. clean up all spills immediately;
- c. avoid breathing vapours and contact with skin and eyes;
- d. control personal contact by using protective equipment;
- e. contain and absorb small quantities with vermiculite or other absorbent material;
- f. wipe up; and
- g. collect residues in a flammable waste container

### **Major Petrol Spills (greater than 200 litres) - Call Fire Brigade '000'**

(143) Notify Security on extension 2300 internally as the spill may be violently or explosively reactive.

(144) Establish an isolation distance of 25 metres and downwind protection distance of 300 metres as indicated in the [Protective Action Zone Diagram](#).

(145) These are the protective actions that need to be taken in the event of a major petrol spill:

- a. Clear area of personnel and move upwind.
- b. Wait to Fire Brigade arrive and advise them of location and nature of hazard.
- c. Wear breathing apparatus plus protective gloves.
- d. Prevent, by any means available, spillage from entering drains or water course.
- e. No smoking, naked lights or ignition sources.
- f. Increase ventilation.
- g. Stop leak if safe to do so.
- h. Water spray or fog may be used to disperse / absorb vapour.
- i. Contain spill with sand, earth or vermiculite.
- j. Use only spark-free shovels and explosion proof equipment.
- k. Collect recoverable product into labelled containers for recycling.
- l. Absorb remaining product with sand, earth or vermiculite.
- m. Collect solid residues and seal in labelled drums for disposal.
- n. Wash area and prevent runoff into drains.
- o. If contamination of drains or waterways occurs, advise emergency services.

### **Polychlorinated biphenyl (PCB) Leak and Spill Response Operating Procedure**

(146) This operating procedure applies to metal capacitors containing polychlorinated biphenyl (PCB) material that are at Hawkesbury Campus, Parramatta North Campus, Parramatta South Campus, Kingswood Campus and Westmead Campus. All of the capacitors containing PCBs have been assessed by a professional and independent survey as "in a good and stable condition at the time of inspection with no action currently required."

(147) PCBs are classified as a hazardous substance and a class 9 miscellaneous dangerous good. Exposure to leaking PCBs can result in a range of health problems from nausea and eye irritations to bronchitis, liver complications and chloracne.

(148) From an environmental perspective, PCBs are recognised internationally to be a major environmental pollutant. They are non-degradable and their persistence can cause ecological damage via water pollution and bio-accumulation.

in the food chain. The loss of these materials to the environment must be avoided at all costs. Given the limited amount of PCBs on UWS campuses there is not enough PCB material to constitute a "major" spill. As such this procedure relates only to PCB leaks and minor spills.

### **PCB Leaks and Minor Spills - Call Fire Brigade '000'**

(149) These are the protective actions that need to be taken in the event of a PCB leak or minor spill:

- a. Avoid breathing vapours and contact with skin and eyes.
- b. Wear protective clothing, impervious gloves and safety glasses.
- c. Contain spill with sand, earth or vermiculite.
- d. Wipe up and absorb small quantities with vermiculite or other absorbent material.
- e. Place spilled material in clean, dry, sealable, labelled container.
- f. Call Capital Works and Facilities Manager Electrical Services to arrange disposal.

### **Chlorine Leak and Spill Response Operating Procedure**

(150) This operating procedure applies to the chlorine chemical stores and chlorinated water in UWS swimming pools at Hawkesbury and Blacktown campuses. Both UWS Hawkesbury and Blacktown campuses have stores of sodium hypochlorite - liquid pool chlorine. Sodium Hypochlorite is used for the purification of water and as a swimming pool disinfectant. It is classified as a hazardous substance and a Class 8 (corrosive) dangerous good. As an alkaline and a corrosive, sodium hypochlorite will damage living tissue, goods or equipment on contact by chemical action. It is not highly flammable but is considered to be an "ecotoxin" i.e. a toxicant that can adversely affect ecosystems.

### **Minor Chlorine Spills (less than 200 litres) Call Fire Brigade '000'**

(151) These are the protective actions that need to be taken in the event of a minor chlorine spill.

- a. Avoid breathing vapours and contact with skin and eyes.
- b. Wear protective clothing, impervious gloves and safety glasses.
- c. Neutralise with sodium metabisulfite or sodium thiosulfate (to minimise evolution of chlorine gas).
- d. Wipe up and absorb small quantities with vermiculite or other absorbent material.
- e. Place in suitable containers for disposal.
- f. Wash spill area with large quantities of water.

### **Major Chlorine Spills (greater than 200 litres) - Call Fire Brigade '000'**

(152) Notify Security on extension 2300 internally.

(153) Establish an isolation distance of 25 metres and downwind protection distance of 250 metres as indicated in the Protective Action Zone Diagram.

(154) These are the protective actions that need to be taken in the event of a major chlorine spill:

- a. Clear area of personnel and move upwind.
- b. Wait to Fire Brigade arrive & advise them of location and nature of hazard.
- c. Wear full body protective clothing with breathing apparatus.
- d. Prevent, by any means available, spillage from entering drains or water courses;

- e. Increase ventilation.
- f. Stop leak if safe to do so.
- g. Contain spill with sand, earth or vermiculite.
- h. Collect recoverable product into labelled containers for recycling.
- i. Neutralise with sodium metabisulfite or sodium thiosulfate.
- j. Absorb remaining product with sand, earth or vermiculite.
- k. Collect residues and seal in labelled drums for disposal.
- l. Wash spill area with large quantities of water.
- m. After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.

## **Diesel Leak and Spill Response Operating Procedure**

(155) This operating procedure applies to all diesel spills and leaks across all UWS campuses. Diesel is synonymous with a number of terms including: "automotive diesel fuel oil", "distillate dieselene", "diesel oil", "diesel fuel", "diesel oil, light" and "summer diesel". Diesel is a distillate fuel suitable for use as a fuel for trucks, ships and other automotive equipment. It is classified as a hazardous substance and a non-dangerous good. Diesel is stored in bulk in a number of areas at UWS for use in farming equipment. Diesel is also transported onto campuses by semi-trailers.

### **Diesel Leaks and Minor Spills (less than 200 litres) - Call Fire Brigade '000'**

(156) These are the protective actions that need to be taken in the event of a minor diesel spill:

- a. Remove all ignition sources.
- b. Clean up all spills immediately.
- c. Avoid breathing vapours and contact with skin and eyes.
- d. Control personal contact by using protective equipment.
- e. Contain and absorb spill with sand, earth, inert material or vermiculite.
- f. Wipe up.
- g. Place in a suitable labelled container for waste disposal.

### **Major Diesel Spills (greater than 200 litres) - Call Fire Brigade '000'**

(157) Notify Security on extension 2300 internally.

(158) These are the protective actions that need to be taken in the event of a major diesel spill:

- a. Clear area of personnel and move upwind.
- b. Slippery when spilt.
- c. Wait for Fire Brigade to arrive and advise them of location and nature of hazard.
- d. Wear breathing apparatus plus protective gloves.
- e. Prevent, by any means available, spillage from entering drains or water course.
- f. No smoking, naked lights or ignition sources.
- g. Increase ventilation.

- h. Stop leak if safe to do so.
- i. Water spray or fog may be used to disperse / absorb vapour.
- j. Contain or absorb with sand, earth or vermiculite.
- k. Collect recoverable product into labelled containers for recycling.
- l. Collect solid residues and seal in labelled drums for disposal.
- m. Wash area with detergent and water and prevent runoff into drains.
- n. After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- o. If contamination of drains or waterways occurs, advise emergency services.

## **Oil Spill/Leak Response Operating Procedure**

(159) This operating procedure applies to all oil spills and leaks across all UWS campuses. "Oil" is used as a generic term and refers to all hydraulic oil, engine oil and brake fluid. All these oils are classified as a non hazardous substance and a non dangerous good according to the criteria of National Occupational Health and Safety Code and the Australian Dangerous Good code.

### **Oil Leaks and Minor Spills (less than 200 litres)**

(160) These are the protective actions that need to be taken in the event of a minor oil spill:

- a. Remove all ignition sources.
- b. Clean up all spills immediately.
- c. Avoid breathing vapours and contact with skin and eyes.
- d. Control personal contact by using protective equipment.
- e. Contain and absorb spill with sand, earth, inert material or vermiculite.
- f. Wipe up.
- g. Place in a suitable labelled container for waste disposal.

### **Major Diesel Spills (greater than 200 litres) - Call Fire Brigade '000'**

(161) Notify Security on ext 2300.

(162) These are the protective actions that need to be taken in the event of a major oil spill:

- a. Remove all ignition sources, but only if safe to do so.
- b. Clear area of personnel.
- c. Wait to Fire Brigade arrive and advise them of location and nature of hazard.
- d. Control personal contact by using protective equipment as required.
- e. Prevent spillage from entering drains or water ways.
- f. Contain spill with sand, earth or vermiculite.
- g. Collect recoverable product into labelled containers for recycling.
- h. Absorb remaining product with sand, earth or vermiculite and place in appropriate containers for disposal.
- i. Wash area and prevent runoff into drains or waterways.



- j. If contamination of drains or waterways occurs, advise emergency services.

## **Laboratory Spill/Leak Response Operating Procedure**

(163) This operating procedure applies to all spills and leaks across all UWS laboratories.

(164) In laboratories the definition of minor and major spills changes substantially.

## **Chlorofluorocarbon (CFC) Leak Response Operating Procedure**

(165) Chlorofluorocarbons (CFCs) are man made gas compounds that contain carbon, chlorine and fluorine. As gases at room temperature CFCs are easily liquefied by compression - they are also stable and non-toxic. Prior to 1989 CFCs have been widely used as working fluids in refrigerators and air conditioners, propellants in spray cans for paints etc and foaming agents.

(166) CFCs are also one of the most ozone depleting substances available. Due to their stability they remain in the atmosphere for a significant amount of time after release - it is estimated that one chlorine atom can destroy over 100,000 molecules.

(167) CFCs are still used at UWS in the universities air conditioning systems. CFC leaks can be detected two ways. If an air conditioning system is not functioning the maintenance contractor is called and any leaks can be identified and rectified. The second is via the monthly routine maintenance checks conducted by the contractor.

## **Gas Spill/Leak Response Operating Procedure**

(168) UWS has a number of different types of gases in store across its campuses. Gases which have been compressed, liquefied or dissolved under pressure are classified as a Class 2 dangerous good. Under this classification there are three categories of gases:

- a. Class 2.1 - Flammable Gases: eg hydrogen, acetylene, liquefied petroleum gas (LP Gas);
- b. Class 2.2 - Non-flammable, non-toxic gases: eg oxygen, nitrogen air and argon; and
- c. Class 2.3 - Toxic gases: gases liable to cause death or serious injury to human health if inhaled - e.g. ammonia, chlorine, carbon dioxide.

(169) In the case of a gas spill and /or leak the procedure to follow is as per UWS Emergency Procedures.

- a. Alert people in immediate vicinity.
- b. Notify security on ext 2300 stating exact location and nature of spill/leak.
- c. Only attempt to contain the spill/leak if you are aware of the appropriate safe handling procedures for the spill.
- d. Send someone to nearest road to direct emergency services.
- e. Evacuate danger areas (remain upwind) and proceed to safe assembly area.
- f. Co-operate with emergency wardens and services on their arrival.
- g. Do not re-enter buildings until instructed by emergency controller.
- h. Do not attempt any action that puts your life or anyone else's life in danger.

## **Part G - Wildlife Information and Procedures**

### **Purpose and Context**



(170) As Sydney's most geographically dispersed university, UWS has a number of varying urban, quasi rural and agricultural landscapes to manage. Inherent in all these landscapes are both native and non-native wildlife populations.

(171) The purpose of this procedure is to document the University's methods on managing these populations to ensure compliance with conservation and animal welfare objectives while at the same time safeguarding the health and safety of all UWS students, employees and visitors.

(172) This procedure has been developed for use across all UWS campuses.

(173) The procedures in this document have been developed with reference to the following:

- a. [NSW National Parks and Wildlife Act 1974](#)
- b. [NSW Department of Environmental and Conservation - National Parks and Wildlife Service \(NPWS\)](#)
- c. [NSW NPWS Policy: Management of Native Birds that Show Aggression to People \(August 2003\)](#)
- d. [NSW Wildlife Information and Rescue Service \(WIRES\)](#)

(174) This procedure is referred in the UWS [Environmental Management System Manual](#) as Environmental Operational Control Procedure (Part E).

## Legislative

(175) All native mammals, birds, reptiles and amphibians and many species of native plants are protected in NSW by the [National Parks and Wildlife Act 1974](#) and under this act it is an offence to harm any protected fauna. The only exemptions to this Act relate to certain native birds in specified parts of New South Wales where they are deemed to be either agricultural or pastoral pests.

(176) Under the NSW, [National Parks and Wildlife Act 1974](#) the NPWS Head Office Wildlife Licensing has the authority to issue a general licence (s120) and an occupiers licence (s121) to authorise the harm of a specified number and species of native wildlife.

(177) When a native species is deemed to pose a danger to either the health or safety of the UWS human community, contractors are required to have the appropriate s120 licence. If UWS is to carry out the destruction of native wildlife an s121 licence is required.

(178) Any destruction of native wildlife is to be carried out as humanely as possible.

(179) The objective of this document is to outline the management response for:

- a. snakes and reptiles;
- b. nesting and seasonally aggressive native birds;
- c. possums; and
- d. non-native wildlife.

## Snake and Reptile Information

(180) UWS recognises that snakes and reptiles are an intrinsic part the Australian landscape and have a role to play in many different types of ecosystems.

(181) All native Australian snakes and reptiles are protected by law in NSW and it is an offence to harm or kill them.

(182) The most commonly encountered snakes in Western Sydney are the red-bellied black snake and the eastern brown snake. Both are venomous and potentially dangerous to humans. It is best to treat all snakes as if they are venomous and if one is sighted to keep at a safe distance and do not disturb it.

(183) In summer snakes are more active and have been found at all UWS campuses but are especially prevalent at Blacktown, Campbelltown, Hawkesbury and Penrith. Individuals working and/or walking in bushland areas are advised to wear sturdy boots and long pants and to avoid dense undergrowth where visibility is reduced.

### **Management Procedures**

(184) Snakes are to be managed in accordance with the University's [Animals on Campus Policy](#) (Part E), which generally requires individuals to leave snakes alone. The provisions of that policy should also be applied to reptiles. Individuals should note that snakes/reptiles are often timid and will not become aggressive unless provoked. Statistics show that over 90% of people who are bitten by snakes are trying to kill or catch them. Accordingly, individuals should maintain a safe distance where a snake/reptile is sighted.

### **Nesting and Seasonally Aggressive Native Birds Management Procedure**

(185) The University has a responsibility to ensure both the wellbeing of both its bird and human populations.

(186) Across UWS campuses the following native bird species can exhibit seasonally aggressive behaviour which is usually associated with nesting:

- a. Magpies;
- b. Kookaburras;
- c. Butcherbirds; and
- d. Masked Lapwings (Plovers).

(187) This seasonal behaviour often occurs during spring and can be intimidating. While most birds only swoop and call loudly, a small proportion of birds may actually come into contact with people in an attempt to deter the perceived threat to their nests and young.

(188) Where possible, UWS will seek to educate its community about these situations, display temporary signage where appropriate and encourage UWS staff and students to avoid nesting locations during the season where possible via notification by email.

(189) In exceptional circumstances and in line with the NSW NPWS policy UWS considers that a bird(s) can be assessed as a risk to public safety and dangerous when it:

- a. has/have caused actual personal injury or damage;
- b. attacks the head (striking from the ground upwards and from the front of the person);
- c. hovers above the head for a prolonged period, attacking the head and face;
- d. constantly swoops, or attacks in an area frequented by elderly and/or disabled persons and/or young children;
- e. swoops, or attacks in a location that might endanger the victim through their response (e.g. along a busy road)

(190) If any UWS students and/or staff consider a bird to be dangerous please contact Campus Security for an assessment. Alternatively, the Environmental Manager can be contacted at the beginning of the nesting season (August) to discuss any other concerns.

(191) The following species are found nesting around UWS campus buildings:



- a. Fairy Martins;
- b. Welcome Swallows; and
- c. Pigeons (non-native please see pest management)

(192) Nesting birds around buildings and eaves pose a number of other problems for the human populations that cohabit with them.

(193) If any UWS students and/or staff consider a nesting bird to be a threat to their health please contact the Environmental Manager or the Manager Occupational Health Safety and Info Services for an assessment.

## **Possum Management Procedure**

(194) UWS has resident brush tail possum populations at Hawkesbury, Penrith and Campbelltown campuses. Possums have adapted well to urbanisation and can take up residence in the roof of buildings.

(195) In cases such as these UWS recommends, where possible, waiting until the possum has vacated the area and blocking access. If this is not successful WIRES can trap the possum and release it outside the building.

(196) UWS does not recommend relocating possums for the following reasons:

- a. Relocating is rarely successful as possums are territorial and if the offending possum is released in another possums' area it will likely be chased on.
- b. A resident possum discourages other possums from taking up residence which often happens in an area known for its possum populations.

(197) UWS does not recommend feeding possums but encourages them to fend for themselves. If a possum is causing a problem contact the appropriate Facilities Services Officer to arrange for appropriate management action.

## **Non-Native Wildlife Pest Management Procedure**

(198) UWS has the following non-native wildlife populations on campus:

- a. Sparrows
- b. Pigeons
- c. Starlings
- d. Rats and Mice
- e. Dogs and Cats

(199) Where non-native wildlife populations are considered to be pests (i.e. pose a threat) they should be managed in accordance with the University's [Animals on Campus Policy](#). Additional advice should also be obtained from the relevant Facilities Services Officer Office of Capital Works and Facilities, with respect to contracting the services of a licensed pest controller to deal with specific problems (e.g. infestation, spread of disease).

(200) UWS advocates the use of the most humane treatment available

## **Part H - Contractor Procedures**

### **Purpose and Context**

(201) UWS has a large contractor workforce that provides each campus with a wide range of contracted services

including:

- a. cleaning;
- b. building and plant maintenance works;
- c. emergency repairs and servicing;
- d. upgrades and new capital works;
- e. grounds and landscaping works;
- f. waste removal and recycling services;
- g. information technology services; and
- h. kitchen and catering services.

(202) The purpose of this procedure is to outline UWS contractor requirements in order to ensure environmental compliance across all UWS campuses.

(203) The procedures in this document have been developed with reference to the NSW [Protection of the Environmental Operations Act, 1997](#).

(204) Other relevant and supporting documentation UWS Contractor Health and Safety Procedure

(205) This procedure is referred in the UWS [Environmental Management System Manual](#) as Environmental Operational Control Procedure (Part F).

## Procedures

(206) All contractors must be made aware of their environmental responsibilities and obligations via compulsory attendance at the UWS OHS Contractor Induction Course, run by Office of Capital Works and Facilities.

(207) Contractors are required to follow the outlined environmental instructions as per the OHS&E Contractor and Environmental Safety Information Handbook . This Handbook is issued to each contractor at the completion of their attendance at the UWS OHS Contractor Induction Course,

(208) Environmental Instructions cover:

- a. Waste Management:
  - i. general waste instructions;
  - ii. asbestos waste;
  - iii. chemical wastes;
  - iv. construction and demolition waste;
  - v. electrical wastes;
  - vi. contaminated wastes;
  - vii. metal wastes;
  - viii. polychlorinated biphenyl (PCB) material waste;
- b. Pollution:
  - i. water pollution;
  - ii. air pollution;

- iii. noise pollution; and
- iv. erosion and sediment controls;
- c. Hazardous Substances;
- d. Steps to follow if a chemical spill occurs; and
- e. Protection of Bushland and Landscaped Areas.

(209) For contractors that may only visit the campus once or very infrequently a Short Term Induction Pass is issued. In this case it is the responsibility of the University representative to outline the environmental instructions that the contractor is required to follow.

(210) A register of all contractors that have attended the UWS OHS Contractor Induction Course is kept by Office of Capital Works and Facilities as is a register of all Short Term Induction Passes that are issued.

(211) Furthermore UWS advocates that contractors are also to have the following environmental credentials:

- a. ISO 9001 Quality Assurance and ISO14001 Environmental Management System;
- b. Safe work method statements in place that take into consideration environmental impacts.

### **Procedure for Reporting Environmental Incidents**

(212) A contractor is required to immediately report any accident, incident or occurrence which has or has the potential to cause environmental harm to UWS property or adjoining properties.

(213) Notification is to be to the Environmental Manager or to the Facilities Services Officer. Incidents such as a chemical spill, leak or inappropriate disposal of waste should be contained pending clean-up or containment action.

(214) The OH&S Contractor Induction Card contains details of emergency contact numbers on the back. Likewise the Short term Induction Pass is issued with UWS Emergency Procedures on the back of the ticket.

### **Status and Details**

Status:	Current
Effective Date:	4th January 2008
Review Date:	4th September 2009
Approval Authority Policy:	Vice-Chancellor
Approval Authority Procedure/Guideline:	DVC Corporate Strategy and Services
Approval Date:	20th December 2007
Expired Date:	To Be Advised
Unit Head:	Name: John Bonanno (02) 9678 7025 Position: Director Capital Works and Facilities
Author:	Name: Roger Attwater (02) 4570 1623 Position: Grounds and Environment Manager
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# GREENING UWS ACTION PLAN - INTERIM -

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## EXECUTIVE SUMMARY

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This interim Greening UWS Action Plan outlines programs of actions which have been identified as part of the UWS Environmental Management System. These are aspirational objectives relating to UWS commitment towards sustainability. A complementary program of actions which reflect due diligence and compliance requirements are outlined in a similar format in the UWS Environmental Management Plan.

Within each of the following programs, each objectives outlined below has identified actions, key performance indicators, timeframes, and responsibilities. This document will be reviewed and updated, as part of the philosophy of continuous improvement which underpins the UWS Environmental Management System.

### 1. Energy Conservation Program

This program aims to effectively manage and reduce energy consumption at all UWS campuses

*Objective 1.1:* Manage 20% reduction in energy consumption per 2006 Equivalent Full time Students Unit (EFTSU) benchmarked against the Sydney Metropolitan Universities' TEFMA average, or achieve a 10% improvement in energy consumption per EFTSU over three years based on UWS overall 2006 energy consumption.

*Objective 1.2:* Demonstrate best practice in energy efficient design for new buildings and upgrades.

*Objective 1.3:* Manage CO<sub>2</sub> equivalent emissions in line with acceptable benchmarks for academic institutions, and seek to achieve reductions as appropriate.



*Objective 1.4:* Evaluation trial of petrol/electric powered hybrid vehicles to identify reductions in greenhouse gas emissions and reduction in fuel consumption.

## **2. Water Conservation Program**

This program aims to reduce water consumption at UWS.

*Objective 2.1:* Manage 20% reduction in water consumption per 2006 EFTSU benchmarked against the Sydney Metropolitan Universities' TEFMA average, or achieve a 10% improvement in water consumption per EFTSU over three years based on UWS overall 2006 water consumption.

*Objective 2.2:* Improve water recycling and stormwater harvesting across UWS sites.

## **3. Waste Minimisation and Recycling Program**

This program aims to reduce waste generation at all UWS campuses.

*Objective 3.1:* Achieve a 5% reduction in waste to landfill each year, assessed in relation to appropriate benchmarks for academic institutions.

*Objective 3.2:* Achieve a 5% reduction in office paper consumption each year, and a 5% increase each year in recycling, assessed in relation to appropriate benchmarks for academic institutions.

## **4. Biodiversity Management Program**

This program aims to promote biodiversity conservation across the University, and to promote and encourage the use of this unique resource as a living classroom for its students.

*Objective 4.1:* Implement ecological restoration processes to manage of Cumberland Plain bushland.

## **5. Sustainability Awareness Program**

This program aims to promote environmental, sustainability and conservation awareness throughout the University and the wider community.

*Objective 5.1:* To disseminate UWS Environmental Policies, Procedures and sustainability initiatives to the UWS and wider community.

*Objective 5.2:* Provide the University community with a feedback mechanism for comment on environmental management issues

*Objective 5.3:* Promote and support opportunities for research and teaching activities conducted at UWS regarding environmental management and sustainability.

# INTRODUCTION

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The University of Western Sydney (UWS) is committed to minimising the impacts of its activities on the environment and conserving and continually improving the natural, built and social environment of its campuses. In stating this commitment, the University recognises that it has an ethical and legal responsibility to protect and enhance the environment and that this responsibility extends to University staff, students and visitors. As a signatory to the **Talloires Declaration**, the Association of University Leaders for a Sustainable Future, UWS has a clear obligation to plan for a more sustainable future. The University of Western Sydney Environmental Management Plan (EMP) outlines its environmental direction. The EMP will assist the University in meeting its legislative requirements and also in demonstrating the organisation's commitment to best practice environmental management and ecological sustainable development.

The environmental performance indicators outlined in these programs have been developed in conjunction with Environment Australia's **Triple Bottom Line** reporting guidelines, which in turn are in line with global sustainability reporting initiatives. The indicators used will allow UWS to provide robust environmental information about its performance and enable it to clearly track its sustainability initiatives.

The Greening UWS programs are as follows:

- Energy Conservation Program;
- Water Conservation Program;
- Waste Minimisation and Recycling Program;
- Biodiversity Management Program; and
- Sustainability Awareness Program.

## **Background to Sustainability**

The term "*sustainable development*" hit the world stage in 1987 with the release of the Brundtland Report issued by the United Nations established World Commission on Environment and Development. Concerned by the negative impact of human activity on the planet Gro Harlem Brundtland suggested that the solution was sustainable development i.e.:

*"development that meets the needs of the present without compromising the ability of future generations to meet their own needs."*(Brundtland Report, 1987)

The term was progressively accepted by governments, communities and businesses around the world as a way to balance the driving force of economic gains against social needs and environmental impacts. Since the

Rio Earth Summit in 1992, many definitions of the term have emerged along with a range of international declarations, charters and commitments. **The Tallories Declaration** initiated by the Association of University Leaders for a Sustainable Future is one such charter and commits its signatories to a path of environmental responsibility. UWS became a signatory to this declaration and its 10 Point Action Plan in 1994.

### **Ecological Sustainable Development**

In 1990 the Commonwealth Government tabled its National Strategy for Ecological Sustainable Development (ESD). This strategy set the scene and policy framework in an attempt to ensure that Australia's future development is ecologically sustainable. The Strategy defined ESD as:

*"using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased."*

Built into this strategy were three core objectives and seven guiding principles in order to achieve a co-ordinated approach to ecological sustainable development.

### **Triple Bottom Line Reporting**

Triple Bottom Line (TBL) reporting, taken at its narrowest meaning can be defined as:

*"a framework for measuring and reporting corporate performance against economic, social and environmental parameters"*

In practical terms TBL reporting means expanding the traditional reporting framework to take into account not just financial outcomes but also environmental and social performance. It provides the framework for an organisation to assess where it stands, what the issues are and where they need to make improvements. TBL is a comprehensive starting point that provides a reasonable portal into a complex issue.

# 1. ENERGY CONSERVATION PROGRAM

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Since energy use is fundamental to most activities in modern industrial societies, its efficient application makes strong economic and environmental sense. At UWS energy is used for a variety of functions:

- Electricity for cooling, heating, lighting and office/laboratory/teaching equipment;
- Gas for heating and in certain teaching laboratories; and
- Petrol/diesel for fleet vehicles, transport, grounds maintenance and agricultural and horticultural activities.

Energy sources are derived from both renewable and non renewable sources. Renewable energy sources are produced from sources such as solar and wind power. Non renewable energy sources are from fossil fuels such as petrol, diesel, gas, coal, kerosene and wood and account for the largest portion – some 94% - of energy consumed in Australia. The environmental cost of using these resources is high. Burning fossil fuels increases the concentration of greenhouse gases in the atmosphere and contributes to the so called 'greenhouse effect' and thus global warming. Among these greenhouse gases, carbon dioxide (CO<sub>2</sub>) emissions are widely acknowledged as the largest contributor to climate change. There is a great deal of international and national emphasis on this particular gas as a reliable indicator to systematically assess energy performance. Its' importance can be demonstrated by a 2004 Senate inquiry, which recommended that the Commonwealth Government set national targets to reduce its current level of CO<sub>2</sub> emissions to 60% by the year 2050. However, there are also a range of other greenhouse gas emissions that are often overlooked:

- methane (CH<sub>4</sub>);
- nitrous oxide (N<sub>2</sub>O);
- hydro fluorocarbons (HFC);
- per fluorocarbons (PFC); and
- sulphur hexafluoride (SF<sub>6</sub>).

The UWS Energy Management Program takes a two pronged approach to its energy consumption and focuses on finding the balance between environmental and economic efficiency. Effective management involves minimising both energy costs and CO<sub>2</sub> equivalent emissions while still maintaining a quality service.

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**GOAL:** To effectively manage and reduce energy consumption at all UWS campuses

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**Objective 1.1: Manage 20% reduction in energy consumption per 2006 Equivalent Full time Students Unit (EFTSU) benchmarked against the Sydney Metropolitan Universities' TEFMA average, or achieve a 10% improvement in energy consumption per EFTSU over three years based on UWS overall 2006 energy consumption.**

**Actions:**

- Establish baseline data for electricity consumption at each campus;
- Identify high energy use areas using a comparative campus/whole of building approach;
- Use power factor corrections to reduce demand and increase savings;
- Identify and evaluate energy saving measures; and
- Implement energy savings measurements to achieve reduction such as movement sensors for lighting and cooling/heating and efficient timing systems for air conditioning.

**Key Performance Indicators:**

- ENERGY INDICATOR 1: Kilowatt hours used per campus and equivalent kilojoules - Direct electricity energy used = Kilowatt hours per capita per campus;
- ENERGY INDICATOR 2: Energy used to produce and deliver electricity - Indirect energy used = electricity purchased from a supplier/electricity generator;
- ENERGY INDICATOR 3: Number of energy saving initiatives implemented - Initiatives to use renewable energy sources and increase energy efficiency;
- Cost-benefit analysis of intervention strategies; and
- Development and implementation of an Air Conditioning Policy and Procedures.

**Timeframe:**



September 2007

August 2010

**Responsibilities:**

- Pro Vice-Chancellor (Quality)
- Environmental Manager
- Senior Planning Engineer
- Manager, Capital Programs
- Manager, Asset Maintenance Services

**Objective 1.2: Demonstrate best practice in energy efficient design for new buildings and upgrades.**

**Actions:**

- Determination of external design conditions for heating, ventilation and air conditioning systems for all new and/or upgraded UWS buildings;
- Determination of internal design conditions in the allocated space for heating, ventilation and air conditioning systems for all new and/or upgraded UWS buildings;
- Identification of suitable systems for air conditioning – such as timetabling linked to a computerised Building Management System (BMS) in order to mechanically control indoor air quality and keep within an acceptable temperature range;
- Use of embodied mass in all new buildings to regulate temperature;
- Use of best practice in energy efficient lighting in new and/or upgraded buildings; and
- Consider working towards Australian Building Greenhouse Rating.

**Key Performance Indicators:**

- Development of guidelines for architecture and building services;
- Number of new buildings that meet best practice standards/total number of new buildings;
- Number of upgraded buildings that meet best practice standards/total number of upgrades; and
- CO<sub>2</sub> equivalent emissions and energy cost savings in upgraded buildings.

**Timeframe:**



**Responsibilities:**

- Pro Vice-Chancellor (Quality)
- Senior Planning Architect
- Senior Planning Engineer
- Manager, Capital Programs
- Environmental Manager



**Objective 1.3: Manage CO<sub>2</sub> equivalent emissions in line with acceptable benchmarks for academic institutions, and seek to achieve reductions as appropriate.**

**Actions:**

- Determine acceptable benchmarks for CO<sub>2</sub> equivalent emissions for academic institutions;
- Establish baseline data on CO<sub>2</sub> emissions for each campus;
- Investigate opportunities for reductions based on outcomes in Objective 1; and
- Examine opportunities to purchase energy from renewable energy production sources.

**Key Performance Indicators:**

- GREENHOUSE INDICATOR 1: CO<sub>2</sub> equivalent emissions per campus – Total greenhouse gas emissions equivalent. CO<sub>2</sub> equivalent emissions per capita per campus;
- GREENHOUSE INDICATOR 2: Reduction targets for emissions - Benchmarks and initiatives aimed at reducing greenhouse gas emissions; and
- ENERGY INDICATOR 3: Initiatives to use renewable energy sources and increase energy efficiency - % energy purchased from renewable sources.

**Timeframe:**



**Responsibilities:**

- Pro Vice-Chancellor (Quality)
- Environmental Manager
- Senior Planning Architect
- Senior Planning Engineer
- Manager, Asset Maintenance Services

**Objective 1.4: Evaluation trial of petrol/electric powered hybrid vehicles to identify reductions in greenhouse gas emissions and reduction in fuel consumption.**

**Actions:**

- Capital Works and Facilities fleet vehicle purchase of hybrid vehicles;
- Vehicle trial over 40,000 kms (or two years); and
- Vehicle trade-in to determine financial cost.

**Key Performance Indicators:**

- Comparative fuel consumption/cost analysis between the hybrid vehicle and traditional fleet vehicles;
- GREENHOUSE INDICATOR 2: Initiatives aimed at reducing greenhouse emissions - Comparative CO<sub>2</sub> emissions analysis between the hybrid vehicle and traditional fleet vehicles; and
- Final vehicle trade in price.

**Timeframe:**



**Responsibilities:**

- Pro Vice-Chancellor (Quality)
- Manager Logistics
- Environmental Manager

## 2. WATER CONSERVATION PROGRAM

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Fresh water is one of the world's most valuable resources - it is essential to support human life and the natural environment. It is estimated that if our present rate of water consumption continues, that two out of every three people on the planet will live in water stressed conditions by 2025. As one of the driest continents on the planet and one of the wealthiest, Australians have a duty of care to take a proactive stance on water management and water minimisation schemes.

UWS practises responsible water conservation strategies, which comply with the regime of mandatory water restrictions imposed by Sydney Water. These initiatives include the provision of rainwater tanks, and the use of recycled water. The University, in conjunction with Sydney Water, operates the Hawkesbury Water Recycling Scheme at the Hawkesbury Campus. Reclaimed water from effluent and harvested stormwater is used for fodder irrigation and in the Horticulture precinct. Approximately 1100 mega litres of recycled water is available yearly for reuse.

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**GOAL:** To reduce water consumption at UWS

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**Objective 2.1: Manage 20% reduction in water consumption per 2006 EFTSU benchmarked against the Sydney Metropolitan Universities' TEFMA average, or achieve a 10% improvement in water consumption per EFTSU over three years based on UWS overall water consumption.**

**Actions:**

- Conduct water consumption analyses on a building/precinct basis at each campus by reading existing meters and installing additional meters;
- Examine water supply infrastructure to determine significant water loss requiring maintenance intervention. Determine a baseline water consumption figure (the point where water consumption is at a minimum); and
- Conduct separate assessments of initiatives identified and pilot these.

**Key Performance Indicators:**

- Potable water use per campus = Kilolitres/\$ per capita; and
- Number of leaks requiring maintenance.

**Timeframe:**



**Responsibilities:**

- Pro Vice-Chancellor (Quality)
- Environmental Manager
- Senior Planning Engineer
- Manager, Capital Programs
- Manager, Asset Maintenance Services

**Objective 2.2: Improve water recycling and stormwater harvesting across UWS sites.**

Rationale: Recycling through reclaimed water from treated effluent and stormwater harvesting is clearly a valuable resource and reduces potable water consumption.

**Actions:**

- Identify available alternative water sources at all UWS campuses;
- Identify all areas across UWS currently reusing water from surface water sources;
- Identify all areas across UWS with potential to reuse water from surface water sources;
- Identify best practice water recycling/reuse for all new buildings; and
- Identify and implement opportunities for water reuse.

**Key Performance Indicators:**

- **WATER INDICATOR 1:**  
Total water use per campus = potable water + surface water + ground water, *where:*
  - Potable water = potable water received from a local supplier.
  - Surface water = water obtained from surface water sources including treated effluent, stormwater and collected runoff.
  - Ground water = water obtained from ground water sources such as wells and bores;
- **WATER INDICATOR 2:** % water reused (including HWRS);
- Number of areas where water reuse practices are in place;
- Number of potential target areas for water recycling/reuse;
- Development of guidelines for architecture and building services; and
- Number of new buildings that meet best practice in water conservation standards/total number of new buildings.

**Timeframe:**



**Responsibilities:**

- Pro Vice-Chancellor (Quality)
- Environmental Manager
- Senior Planning Engineer
- Manager, Grounds

### 3. WASTE MINIMISATION AND RECYCLING PROGRAM

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Waste generation and its subsequent management impose a number of negative environmental impacts. These include landfill use and land contamination, the possibility of air and/or water pollution and – perhaps less conspicuously – unsustainable resource consumption. While substantial improvements have been made in NSW with regards to waste recovery, treatment and recycling over the past decade this falls far short of original projected expectations. (Per capita waste disposal levels in NSW were 16% less in 2001 than in 1990 – the target set by the NSW State Government had been 60%). Disposal of waste to landfill is fast becoming an emerging issue in NSW as landfill capacity approaches its physical limits due to continuing high disposal levels. Achieving a reduction in waste generation and turning waste into a recoverable resource should therefore be a priority for us all. Within NSW, the Sydney Metropolitan Area produces the bulk of the state's waste.

As the largest and most geographically dispersed University in this area, UWS has a social and environmental responsibility to demonstrate best practice in waste management and has made a commitment to this, as embodied in its Environmental Policy Statement. In line with the NSW Waste Avoidance and Resource Recovery Strategy, UWS has adopted the following hierarchy of waste management options, as outlined below:

- avoid and reduce waste generation;
- reuse and recycle;
- treatment; and
- as a last resort – disposal.

The waste hierarchy suggests that the most effective environmental solution may often be to avoid the generation of waste i.e. reduction. However where further reduction is not practicable, products and materials can sometimes be used again, either for the same or a different purpose i.e. reuse. If reusing material is not possible, then the next option is through recycling, composting or energy recovery from waste. Disposal is only an option if none of the above offer an appropriate solution. The prime objective of the UWS Waste Management Program is to minimise the impact of wastes on the environment, UWS staff, students, contractors and the public. Wastes in this particular context can be defined as: *"unwanted solid material which no longer serves a purpose in the production or service delivery operations of an organisation ... includes waste to landfill, waste to be recycled or reused but excludes hazardous waste"* (Environment Australia).



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**GOAL:** To reduce waste generation at all UWS campuses

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**Objective 3.1:** Achieve a 5% reduction in waste to landfill each year, assessed in relation to appropriate benchmarks for academic institutions.

**Actions:**

- Conduct ongoing assessments and audits to provide qualitative and quantitative data on all waste streams for each campus;
- Review UWS waste management program for each campus, and identify waste reduction initiatives;
- Develop programs and implement waste reduction initiatives; and
- Implement waste reduction program.

**Key Performance Indicators:**

- WASTE INDICATOR 1: Total amount of solid waste by type and destination – tonnes;
- WASTE INDICATOR 2: Number of programs/initiatives to reduce waste;
- Waste management procedure approved and in place; and
- Monthly % reduction in waste figure and financial savings.

**Timeframe:**



**Responsibilities:**

- Pro Vice-Chancellor (Quality)
- Environmental Manager
- Manager, Grounds
- All UWS staff
- Students
- Contractors

**Objective 3.2: Achieve a 5% reduction in office paper consumption each year, and a 5% increase each year in recycling, assessed in relation to appropriate benchmarks for academic institutions.**

**Actions:**

- Determine paper usage at each campus and identify high consumption areas;
- Identify paper use reduction measures (including purchasing procedures with an emphasis on recycled content materials); and
- Deliver paper use minimisation training sessions.

**Key Performance Indicators:**

- Completion of paper audit;  
WASTE INDICATOR 1: Campus/area specific paper action plan;
- Number of staff attending training sessions; and
- % reduction in paper usage per campus.

**Timeframe:**



**Responsibilities:**

- Pro Vice-Chancellor (Quality)
- Environmental Manager
- Manager, Grounds
- All UWS staff

## 4. BIODIVERSITY MANAGEMENT PROGRAM

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UWS is rich in its natural resources. It is a geographically dispersed university with a number of campuses spread over western Sydney and consequently the Cumberland Plain. The bushland of this Plain has been extensively cleared since European settlement and is now considered among the most threatened in NSW. In western Sydney only 12% of this bushland remains as vegetation remnants and less than 7% of this is in conservation reserves (DEC, 2005).

The UWS campuses have remnant stands of Cumberland Plain ecological communities (NSW NPWS, 2003). The major vegetation communities on the campus land are:

- Cumberland Plains Woodland (scheduled as an endangered ecological community at both state and national levels);
- Shale Plains Woodland;
- Shale Gravel Transition Forest (scheduled as endangered in NSW); and
- Sydney Coastal River-flat Forest – alluvial woodland (scheduled as endangered in NSW).

There are also smaller stands of:

- Castlereagh Scribbly Gum Woodland;
- Freshwater Wetlands; and
- a small pocket of Cooks River/Castlereagh Ironbark Forest (scheduled as endangered in NSW).

In addition, the bushland is host to a range of threatened species. Four threatened flora species, listed under the Threatened Species Conservation Act 1995, have been recorded:

- *Dillwynia tenuifolia* (Vulnerable);
- *Pultenaea parviflora* (Endangered);
- *Persoonia nutans* (Endangered) and
- *Micromyrtus minutiflora* (Endangered).

There are also records of threatened fauna species including:

- Superb Parrot (Vulnerable);
- Green and Golden Bell Frog (Endangered); and
- Grey-Headed Flying Fox (Vulnerable).

The NSW Department of Environment and Climate Change (DECC) has identified three key steps to the better management and conservation of remnant Cumberland Plain vegetation retain, protect and manage.

The crucial first step is to retain all existing vegetation where possible. Secondly, DECC recommends protecting retained vegetation by fencing so it can be managed as a separate unit.

The third step is to actively manage all retained and protected native vegetation. Active management regimes may include:

- fencing;
- weed suppression;
- bush regeneration;
- appropriate fire management regimes;
- rubbish and dumping control; and
- feral animal control.

UWS's vision for its Cumberland Plains communities is not only to do its best to conserve them but also to promote and encourage the use of this unique resource as a living classroom for its students.

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**GOAL:** To promote biodiversity conservation across the University, and to promote and encourage the use of this unique resource as a living classroom for its students.

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**Objective 4.1: Implement ecological restoration processes to manage of Cumberland Plain bushland.**

**Targets and Actions:**

- BIODIVERSITY INDICATOR 1: Site assessment including planning for native habitat to determine the most appropriate restoration approach;
- BIODIVERSITY INDICATOR 3: Preparation of a Bush Regeneration Action Plan based on robust information from site assessment;
- Explore the use of regeneration 'triggers';
- BIODIVERSITY INDICATOR 3: Preparation of a Fire Management Action Plan based on robust information from site assessment; and
- Seek funding support for implementation.

**Key Performance Indicators:**

- Identification of endangered/threatened species;
- Bush regeneration action plans and implementation processes;
- Fire management action plan and implementation processes;
- Other indicators:
  - % and/or m<sup>2</sup> of bushland regenerated;
  - Number of fires – ecological and hazard reduction;
  - Financial support secured; and
  - Number of people involved in regeneration works.

**Timeframe:**



September 2007

August 2009

Consultation with Pro Vice-Chancellor (Campus Development)

**Responsibilities:**

- Pro Vice-Chancellor (Quality)
- Environmental Manager
- Manager, Grounds

## 5. SUSTAINABILITY AWARENESS PROGRAM

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UWS is committed to ensuring the highest standard of environmental engagement amongst its community. An environmental awareness and promotional program is central in achieving this commitment. Achieving environmental objectives is dependent upon educating, informing and involving the community. Without 'grass roots' level involvement and support of UWS staff and students, the UWS suite of environmental programs may not reach their full potential.

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**GOAL:** To promote environmental, sustainability and conservation awareness throughout the University and the wider community.

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**Objective 5.1: To disseminate UWS Environmental Policies, Procedures and sustainability initiatives to the UWS and wider community.**

**Actions:**

- Create an interactive Environmental Management portal on the UWS website detailing sustainability initiatives and progress reports;
- Seek staff and student participation in sustainability initiatives such as recycling and landcare activities;
- Promote environmental awareness through sustainability and conservation initiatives and reporting progress on environmental performance;
- Promote environmental programs, initiatives and progress via UWS intranet, publications such as Around UWS, email and awards for excellence in sustainability and conservation practice; and
- Promote UWS campuses as environmental educational resources within the University and the wider community.

**Key Performance Indicators:**

- Environmental Awareness Indicator 1: Number of visitors to the UWS Environmental Management Website;
- Percentage number increase in staff and students involved in sustainability initiatives;
- Number of environmental articles published internally and in external media, number of intranet advices published and number of emails sent; and
- Percentage increase in the number of visitors to UWS environmental sites, programs and projects.

**Timeframe:**



**Responsibilities:**

- Pro Vice-Chancellor (Quality)
- Environmental Manager
- Senior Planning Engineer
- UWS staff
- Students

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**Objective 5.2: Provide the University community with a feedback mechanism for comment on environmental management issues.**

**Actions:**

- Build a feedback mechanism such as a previously proposed "Environmental Management at UWS" website.

**Key Performance Indicators:**

- Number of comments/feedback compared to number of visitors to the website; and
- Number of emails/phone calls received at Capital Works and Facilities as a result of other environmental awareness and promotional activities.

**Timeframe:**



**Responsibilities:**

- Pro Vice-Chancellor (Quality)
- Environmental Manager
- Senior Planning Engineer

**Objective 5.3: Promote and support opportunities for research and teaching activities conducted at UWS regarding environmental management and sustainability.**

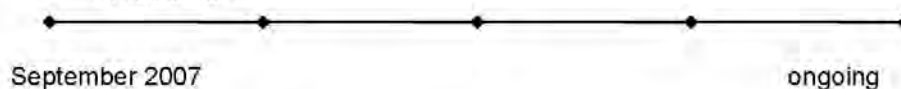
**Actions:**

- Promote collaboration and communication with staff and students engaged in broad aspects of environmental management and sustainability; and
- Regular email notification of activities.

**Key Performance Indicators:**

- Number of research programs and researchers;
- Number of teaching activities and students;
- Number of promotional activities; and
- Financial support from research funding/grants.

**Timeframe:**



**Responsibilities:**

- Pro Vice-Chancellor (Quality)
- Environmental Manager
- Appropriate Colleges and Schools
- Academic Supervisors
- All UWS staff

# Appendix I. Insurance Documentation

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**4(a) Financial capacity – excerpts of financial annual reports for 2011, 2010 & 2009 – Confidential**

**4(d) Do you have appropriate insurance arrangements in place? – Confidential**