



Ballina Shire Urban Water Policy Statement

1. Purpose of Policy

The purpose of this Urban Water Policy document is to set out the guiding principles and objectives that Ballina Shire Council will aspire to in the provision of water supply, wastewater and stormwater services to its consumers and customers.

This policy provides the direction for development and implementation of these services for Ballina Shire. The policy is based on feedback during the community consultation phase of the Urban Water Management Strategy development and best management practice for urban water services.

2. Guiding Principles

General

The guiding principles represent the basic rules which Ballina Shire Council will apply when determining plans for improved water supply, wastewater and stormwater services.

Guiding Principles

The following guiding principles will apply:

1. Customer Service
 - o Council will provide a service that equals or exceeds the agreed levels of service as detailed in the urban water strategic business plan
2. Protection of the Environment
 - o Council will not carry out any activity that could knowingly cause a significant impact on the environment
 - o Council will provide enhancements to the environment as part of providing urban water services wherever this is proved to be sustainable and affordable
 - o Council will monitor its activities to measure the potential impact on the environment
 - o Council will immediately respond to any identified potential for impact on the environment to reduce the risk of significant impact
3. Protection of Public Health and Employee Safety
 - o Council will not carry out any activity that could knowingly cause a negative impact on the public health or employee safety
 - o Council will monitor its activities to measure the potential impact on the public health or employee safety
 - o Council will immediately respond to any identified potential for risk to public health and employee safety due to its urban water service activities, to reduce the risk of significant effect
4. Integrated Approach
 - o Council will use an integrated approach at all times to develop urban water strategies and assess the costs and benefits of its urban water services

5. Resource Recovery
 - o Council recognises water as a valuable resource and will conserve and/or recycle this water wherever this proves to be sustainable and affordable
6. Affordability
 - o Council will provide high quality water services to its communities based on what it considers the community is willing to pay
7. Stakeholder Consultation
 - o Council will consult with its community regarding major decisions on the development and implementation of its urban water strategies
8. System Flexibility
 - o Council will ensure that sufficient system capacity is available to support contingency planning

3. Service Objectives

The separate objectives of the three water services are as follows.

Water Supply

The objectives of the water supply service are to:

- o Provide sufficient quantities of water to meet reasonable community needs during all foreseeable conditions
- o Promote wise use of water and investigate alternate sources in conjunction with the regional water supply authority, Rous Water.
- o Provide a water quality that is fit for its intended use and not harmful to human health
- o Restrict supply during drought conditions no more often than one year in ten and for no longer than 5% of this period
- o Provide emergency planning for unusual events that might significantly compromise service standards, cause damage to public health or the environment
- o Provide a safe working environment for Council personnel
- o Provide an affordable service

Wastewater

The objectives of the wastewater service are to:

- o Receive reasonable quantities of wastewater from all types of development and manage this in a way to ensure no significant risk to public health and the environment
- o Promote reduced volumes and higher quality of wastewater released to Council systems
- o Treat the wastewater and associated bio-solids as a resource where this is sustainable and affordable
- o Provide emergency planning for unusual events that might significantly compromise service standards, cause damage to public health or the environment
- o Provide a safe working environment for Council personnel
- o Provide an affordable service

Stormwater

The objectives of the stormwater service are to:

- o Receive reasonable quantities of stormwater from all types of development and manage this in a way to ensure no significant risk to public health, public property and the environment
- o Promote reduced volumes and higher quality of stormwater entering Council systems

- o Treat the stormwater as a resource where this is sustainable and affordable
- o Provide emergency planning for unusual events that might significantly compromise service standards, cause damage to public health or the environment
- o Provide a safe working environment for Council personnel
- o Provide an affordable service

Ballina Shire Urban Water Management Strategy

Strategy Initiatives – Recommended Actions Summary

1. Purpose of the Document

The purpose of this Urban Water Management Development Strategy document is to set out the planned initiatives that support the ongoing development and implementation of the Ballina Shire Urban Water Management Strategy.

The document is based on:

- the Strategy Options report exhibited in November 2002
- the supporting technical studies
- feedback in submissions from the community and government as a result of the exhibition, and
- some additional studies commissioned by the project team to address some issues raised in submissions
- industry best practice

The document defines the recommended actions that support the ongoing development and implementation of plans to provide water supply, wastewater and stormwater services for the Ballina Shire urban communities that are consistent with the guiding principles and support the service objectives outlined in the Urban Water Policy.

2. Summary of Recommended Actions

General

The process of development of the BSUWMS has identified some aspects of the proposed strategy where there is apparent strong agreement among stakeholders. There are a few areas where resolution of the specific strategy elements remains unclear and will require additional investigation before it is recommended that Council proceed down a preferred path.

If adopted by Council, strategy elements in the first category, where there is strong agreement, will proceed immediately to a concept definition, approval and detailed design phase before proceeding with construction.

If adopted by Council, strategy elements in the second category will proceed to additional investigation and concept development, before being further assessed for inclusion in the implementation phase of the final strategy or not.

This approach has benefits of allowing elements of the overall strategy, where there is strong agreement, to proceed without being hindered by the need to resolve relatively unrelated components of the strategy.

The list of recommended actions has been divided into two types of initiatives. These are:

- best management practice initiatives
- infrastructure initiatives to support a best management approach.

A detailed listing of the recommended actions is included as **Part 3** to this policy document.

Summary Best Practice Management Initiatives

The following actions are recommended under a best practice program:

General

- o Community Consultation - community consultation be extended into the next phase of the strategy development and implementation. This process must include a relevant approach to engaging the local Aboriginal communities.
- o Ongoing Monitoring of Technology Improvements - Council technical staff keep abreast of current developments in both overseas and Australian water and wastewater and stormwater technologies
- o Publication of Results of Urban Water Performance Monitoring – regularly publish on Councils website the results of monitoring of potable water, reclaimed water and environmental water quality. Monthly updating is recommended.

Wastewater

- o Retention of Both Lennox Head and West Ballina STW's – proceed with upgrade of both the Lennox Head and West Ballina plants for the longer term, irrespective of the reclaimed water management strategy adopted.
- o Reclaimed Water Irrigation of Public Open Space – review current Public Open Space reclaimed water reuse throughout the Shire and maximise the additional opportunities identified as sustainable
- o Reclaimed Water Salinity Reduction – proceed immediately to carry out identified infiltration/inflow rectification works with a priority for the reduction of saline water intrusions to the system
- o Infiltration/Inflow – commence further investigation of areas demonstrated as having high potential infiltration/inflow
- o Trade Waste Policy – continue the implementation of the provisions of the Trade Waste Policy and update the Policy as appropriate.
- o Dual Reticulation – develop and formalise a more comprehensive policy on the provision and servicing of dual reticulation systems in residential areas of Ballina/Lennox Head.
- o Endocrine Disruptor Research – Council technical staff keep abreast of current developments in both overseas and Australian research on the potential hazards associated with EDC's and other potentially harmful compounds.
- o Environmental Monitoring – review the current format of Council monitoring programs including the marine benthic monitoring program carried out by Southern Cross University in relation to the Skennars Head reclaimed water release.
- o Government Agency Liaison – establish and maintain liaison with key government agencies involved with integrated urban water, river health, catchment management, water sharing, environmental approvals and licencing.
- o Extension of Sewerage System - Develop a policy and program of work to extend the current centralised sewerage system to urban development where cost recovery is achievable.

Water Supply

- o Demand Management – partner with Rous Water in its program to implement a regional water efficiency program
- o Rainwater Tanks – Council review its current policy on rainwater tanks in existing and proposed residential areas.
- o Investigate Need to Acquire Land Now for Future Desalination Plant – In conjunction with other discussions with Rous Water, jointly explore the potential and need to acquire land, at an appropriate location for a possible future desalination plant.

Stormwater

- o Development and Implementation of Current Strategy – continue to develop and implement elements of the current Stormwater Management Strategy plus other

opportunities identified in the strategy review, including water sensitive urban design initiatives.

- o Stormwater Funding – explore options to support an appropriate level of funding for stormwater initiatives within the whole of the Shire including rural areas which contribute the greater share of pollutants to the rivers and estuaries.

Summary of Wastewater Infrastructure Initiatives

The following actions are recommended under an infrastructure development program:

Ballina - Lennox Head System

- o Pipelines and Pumping Station Upgrades – investigate potential under-capacity elements of the sewage transport system and correct these where it can be demonstrated to be justified from an economic, environmental and public health perspective.
- o Upgrade of Ballina STW – commence investigations to support the immediate upgrade the current Ballina STW and associated works in accordance with Strategy 2 of the Options report.
- o Interim Upgrade of Ballina STW – concept design for the interim works be confirmed following review of the concept designs already prepared for the upgrade of Ballina STW. Once the form of the interim upgrade is confirmed, a concept design and an EIA be prepared for discussion with EPA, Fisheries, and possibly the community prior to going to Council for consideration and approval. Detail design and construction of the interim works follow.
- o Constructed Wetlands at Ballina STW - Potential sites be identified immediately, and purchased opportunistically pending approval of the works upgrade
- o Stage 2 Upgrade of the Lennox Head STW – proceed immediately with the optimisation upgrade of the Lennox Head STW to 28,000 EP capacity and other associated works including application for an amended EPA licence.
- o Reclaimed Water Management Strategy – further investigate broad-acre cropping, and/or large-scale regeneration wetlands on low-lying coastal land to achieve reuse targets.
- o Enhancement Upgrade of the Lennox Head STW – proceed with detailed assessment of the benefits and costs of enhanced reclaimed water quality for that portion of reclaimed water in excess of the reuse volume, and which is released at Skennars Head.
- o Trial Irrigation Reuse Project – Identify and develop a 30-50 ha broad-acre reclaimed water reuse trial to receive reclaimed water from the upgraded Lennox Head STW.
- o Reuse Targets – irrespective of the preferred reclaimed water management strategy adopted, set reuse targets of:
 1. >40% reuse in dry weather by 2008
 2. >80% reuse in dry weather by 2013
- o Retention of Skennars Head Release – maintain the viability of the Skennars Head release as a precautionary treated effluent assimilation point, particularly in wet weather.

Alstonville-Wollongbar

- o Reuse Targets – irrespective of the preferred reclaimed water management strategy adopted, set reuse targets of:
 1. >80% reuse in dry weather by 2008
 2. 100% reuse in dry weather by 2013
- o Reclaimed Water Management Strategy – continue to develop and implement the current option for agricultural reuse by local users.
- o Upgrade of Alstonville STW – upgrade existing STW capacity and associated works to accommodate anticipated increased loads from current developments.

- Constructed Wetlands at Alstonville STW – review the need for increased removal of nutrients and thus the benefits of installation of constructed wetlands. Proceed with the concept of constructed wetlands if the need is established.

Wardell

- Reuse Targets – set reuse target of:
 1. 100% reuse in dry weather by 2008
- Reclaimed Water Management Strategy – further investigate a range of feasible options for management of reclaimed water to achieve reuse target including:
 1. trial reuse areas for testing techniques for other areas of the Shire
 2. other methods required to achieve target reuse levels including expansion of public open space irrigation.

Summary of Ballina Shire Biosolids Infrastructure Initiatives

The following actions are recommended under a Ballina Shire biosolids management Improvement program:

- Biosolids Reuse Target – set a beneficial reuse target of
 1. 50% reuse by 2008
 2. 100% reuse by 2013
- Biosolids Management for Lennox Head STW – upgrade the screening facilities at LH STW to support beneficial reuse of biosolids from the works.
- Biosolids Management for Ballina STW – as part of the upgrade of the plant, install screening at the STW to support beneficial reuse of biosolids from the works.
- Biosolids Management for Alstonville STW – expand sludge lagoon holding capacity to 6 months detention
- Biosolids Management for Wardell STW – investigate and reduce (if feasible) high copper levels in STW biosolids.
- Beneficial Reuse of Biosolids in Ballina Shire – carry out trial beneficial reuse studies and prepare tender documents and seek open tenders for 5 year contract for beneficial reuse of biosolids from those works able to support beneficial reuse.

Summary of Water Supply Infrastructure Initiatives

The following actions are recommended under an infrastructure development program:

Ballina - Lennox Head System

- Upgrade the Water Reticulation System.- upgrade the water pipeline network as indicated by hydraulic modelling outcomes
- Reservoir Capacity – upgrade the network of water reservoirs to ensure sufficient capacity in the appropriate locations.
- Desalination Land Acquisition – BSC have discussions with Rous water about the possibility of setting aside land now to facilitate the potential use of desalination technologies at some stage in the future.

Alstonville-Wollongbar

- Upgrade the Water Reticulation System.- upgrade the water pipeline and reservoir network to provide agreed levels of service pressure at the water demand levels nominated.

Wardell

- Water Quality Improvements.- investigate the upgrade of the water quality and in particular the effects of low alkalinity water on consumer and mains pipework.

Summary of Stormwater Infrastructure Initiatives

There are no new significant stormwater infrastructure initiatives proposed at this stage.

Strategy Initiatives – Recommended Action Details

	Recommended Actions and Purpose	Basis for Recommendation	Potential Opportunities/Constraints	Justification for Action/Other Details
	Best Management Practice in Integrated Urban Water			
	<i>General</i>			
BMP-G1	<p>Community Consultation - community consultation be extended into the next phase of the strategy development and implementation. This process must include a relevant approach to engaging the local Aboriginal communities.</p> <p><i>Purpose:</i> Ensure that solutions are relevant to the Ballina community, continue the process of developing trust with the community, manage potential conflict through early involvement of stakeholders during the solution development phase (Guiding Principle 6)</p>	<p>Results of feedback from groups during exhibition of the options and feedback from the final PRG meeting.</p> <p>The preferred form of consultation consists of a single long-term 'Water Policy Reference Group' supported by focus groups of limited life to provide input to development and implementation of particular aspects of the recommended strategy as required. This format would be reviewed as the work progressed.</p>	<p>ρ Reduces the risk of overlooking key community issues and the resulting re-work if the project is not supported in the EIA process</p> <p>ρ Provides more relevant and feasible solutions</p> <p>ρ Increases the cost of further strategy development and implementation</p>	<p>Ensure that community continues to provide feedback on the ongoing investigations for the strategy in the most effective way possible</p> <p><i>Programming:</i> ongoing throughout the strategy development, design and construction.</p>
BMP-G2	<p>Ongoing Monitoring of Technology Improvements - Council technical staff keep abreast of current developments in both overseas and Australian water and wastewater and stormwater technologies</p> <p>As a minimum this should include attendance at key industry forums throughout the year, visits to other water authorities with similar interests and issues etc</p> <p><i>Purpose:</i> Ensure that best practice opportunities are incorporated into the Shire urban water strategy in a timely manner to achieve the objectives of the strategy (Guiding Principles 1-5)</p>	<p>Standard approach in best practice organisations.</p> <p>Generally would involve:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Membership of appropriate organisations such as AWA <input type="checkbox"/> Attendance at conferences etc <input type="checkbox"/> Reporting say twice/year by Manager, W&S to GM Civil Services on emerging issues from these sources 	<p>ρ Credibility of Council in environment protection and protection of public health is raised</p>	
BMP-G3	<p>Publication of Results of Urban Water Performance Monitoring – regularly publish on Council's website the results of monitoring of potable water, reclaimed water and environmental water quality. Monthly updating is recommended.</p> <p><i>Purpose:</i> Build trust in the community and environmental/interest groups (Guiding Principle 3)</p>	<p>Results of feedback from groups during exhibition of the options and feedback from the PRG at various meetings.</p> <p>Likely to require input from specialists on the style of presentation.</p>	<p>ρ improve Council's image in the community as a responsive and environmentally responsible organisation</p> <p>o resources required to analyse data and include on the site on a monthly basis</p>	<p>Experience elsewhere has demonstrated that this approach may only be necessary for a short period before the community will understand that Council has nothing to hide. The approach could then be modified to reduce any excessive resource requirements.</p> <p><i>Programming:</i> monthly on Council's website: plus annual report. Review with the community after initial 12 month period.</p>
	Wastewater Systems			
BMP-WW1	<p>Retention of Both Lennox Head and West Ballina STW's – proceed with upgrade of both the Lennox Head and West Ballina plants for the longer term, irrespective of the reclaimed water management strategy adopted.</p> <p><i>Purpose:</i> provide greater flexibility to cater for a range of potential future reclaimed water management options with little increase in cost (Guiding Principle 7).</p>	<p>Results of feedback from community and interest groups during exhibition of the options and feedback from the PRG at various meetings.</p> <p>There is broad community support for this initiative.</p>	<p>ρ Satisfies perception in some community areas that expansion of a single plant restricts the potential disposal options in dry weather.</p> <p>ρ Added flexibility to transfer reclaimed water from Lennox Head STW to southern areas of the Shire.</p> <p>o Increased operating costs/monitoring costs for two plants</p> <p>o Redundancy of infrastructure installed in 1995</p>	<p><i>Programming:</i> transfer of current West Ballina precinct loads to the Ballina STW cannot occur until the upgraded Ballina STW is completed in about 2008.</p>
BMP-WW2	<p>Reclaimed Water Irrigation of Public Open Space – review current Public Open Space reclaimed water reuse throughout the Shire and maximise the additional opportunities identified as sustainable</p> <p><i>Purpose:</i> demonstrate council's commitment to resource recovery and environment protection through reduced releases to waterways and the ocean (Guiding Principle 1, 2, 3, 4 & 5)</p>	<p>Standard approach in best practice urban water management. Identified in Reference 2 as an element of all options.</p> <p>Review will include identification of additional areas suitable for reclaimed water irrigation as well as the current and proposed standard of treatment for this reclaimed water.</p>	<p>ρ Demonstrates Council's commitment to best practice urban water management</p> <p>o Due to high rainfall, most new opportunities will not replace use of potable water</p> <p>o Development of additional opportunities likely to involve significant costs</p> <p>o Higher reclaimed water standard (filtration) may be required to reduce exposure risks for the community</p>	<p>Use of reclaimed wastewater, preferable to reuse of stormwater.</p> <p><i>Programming:</i> recommend that the review be carried out in conjunction with the investigation of the irrigation trials associated with the upgrade of the Lennox Head STW.</p> <p>Any identified works to be carried out over a number of financial years commencing in 2004/2005.</p>

Note: The technical studies reference numbers used in these Tables are based on the list of technical studies attached at the end of the Tables.

	Recommended Actions and Purpose	Basis for Recommendation	Potential Opportunities/Constraints	Justification for Action/Other Details
BMP-WW3	<p>Reclaimed Water Salinity Reduction – proceed immediately to carry out identified infiltration/inflow rectification works with a priority for the reduction of saline water intrusions to the system</p> <p><i>Purpose:</i> reduce costs of dealing with higher inflow, improve treatment efficiency and increase the range and effectiveness of potential reclaimed water. Ensure that best practice opportunities are incorporated into the Shire urban water strategy in a timely manner to achieve the objectives of the strategy (Guiding Principles 4 & 7)</p>	<p>Based on recommendations in Reference 9 which identifies potential point sources of highly saline infiltration.</p> <p>Some additional investigation will be required to review the current data, pinpoint these sources and correct them.</p>	<p>π There are few recognised constraints to this work proceeding as soon as possible other than BSC staff are unlikely to have the resource capability to proceed without external service provider support.</p> <p>ρ The sooner the work is completed, the sooner the effect on reducing reclaimed water salinity will be known and the range of possible cropping options can be refined.</p>	<p>Reduction in volume of inflow to be treated and volume to be released</p> <p>Reduction in salinity of influent and reclaimed water resulting in improved treatment and greater flexibility in irrigation crops</p> <p><i>Programming:</i> Recommend immediate engagement of a suitable consultant to review existing data, determine the scope of work and develop a procurement approach.</p>
BMP-WW4	<p>Infiltration/Inflow – commence further investigation of areas demonstrated as having high potential infiltration/inflow</p> <p><i>Purpose:</i> reduce costs of dealing with higher inflow, both in the collection and distribution, treatment and disposal processes (Guiding Principle 5).</p>	<p>Based on recommendations in Reference 9 which identifies potential high infiltration sewer sub-catchments.</p> <p>Activities recommended include:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Source detection program in the sub-catchments with higher than average infiltration <input type="checkbox"/> System inspection <input type="checkbox"/> Review of system element capacities to handle the likely flows, and <input type="checkbox"/> Development of a rehabilitation plan 	<p>π It is common for studies of this type to determine that repairs of sewer systems is less economic than accepting and treating the additional dry weather infiltration. Wet weather inflow tends to be more able to be economically addressed.</p> <p>ρ The studies can be carried out in conjunction with an assessment of the overall condition of the Shires sewer network.</p>	<p>Reduction in volume of inflow to be treated and volume to be released resulting in some cost reductions and a greater chance of achieving dry weather reuse targets.</p> <p><i>Programming:</i> Commencement in April 2004 is proposed to stagger the workload during the early phases of implementation of the strategy. Outcomes required to support the upgrade of the sewer pipeline and pumping station network.</p>
BMP-WW5	<p>Trade Waste Policy – continue the implementation of the provisions of the Trade Waste Policy and update the Policy as appropriate.</p> <p><i>Purpose:</i> provide continued protection of public health, the safety of Council's employees, protection of the environment and prevention of damage to the sewerage system. (Guiding Principles 1 & 2)</p>	<p>Standard for best practice organisations.</p>		<p>Should include investigation of link between trade waste and metals contamination of biosolids which restricts the range of reuse opportunities. A program of biosolids testing, monitoring and corrective action should be implemented.</p>
BMP-WW6	<p>Dual Reticulation – develop and formalise a more comprehensive policy on the provision and servicing of dual reticulation systems in residential areas of Ballina/Lennox Head.</p> <p><i>Purpose:</i> to determine the residential areas within Ballina Shire where dual reticulation is viable and to establish the requirements for the associated headworks infrastructure to service those areas that have already been agreed as viable or which may be determined as viable from the proposed study. (Guiding Principles 1, 3 & 4)</p>	<p>BSC has already adopted a policy of supporting dual reticulation in areas where this is considered viable including green field residential areas in Ballina Heights and Lennox Head.</p> <p>Due to the demand for reclaimed water on the Alstonville Plateau for other uses, the policy will not be extended to this area.</p> <p>Preliminary investigations have already been carried out by John Anderson on behalf of Rous Water for Ballina Heights. As well the same consultant has prepared supplementary advice in response to submissions to the exhibition of the Options Report. This is included in Appendix B.4 of the Exhibition Response report.</p>	<p>ρ Guidelines for use of recycled water in residential areas exist</p> <p>ρ Community reaction to an actual proposal to proceed is yet to be tested; there is some experience with the Rous Water development at Caniaba and elsewhere that supports the feasibility of the initiative</p> <p>ο Could be significantly higher costs associated with dual reticulation to improve water supply system yield compared with other possible sources such as Lismore Source and/or Dunoon dam</p> <p>π Additional costs may be able to be allocated to developers as part of the contribution to water and wastewater infrastructure to service new developments</p>	<p>Dual reticulation provides a means to conserve potable water supplies, beneficially use reclaimed water and minimise the environmental impact of new development in a sustainable manner</p> <p>The current position of Council on this matter has been clarified in recent resolutions:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Council has allocated \$437,500 in a 50/50 partnership with Rous Water to install dual reticulation pipework for Stages 1-8 of Ballina Heights <input type="checkbox"/> Council has resolved that “ Council apply a policy to all future developments where dual reticulation is considered viable, that the developer fund the installation of dual reticulation pipework and services.” <p>In addition, Rous Water has agreed to underwrite the developer of Ballina Heights for the cost of dual reticulation pipework for Stages 9-16. Rous Water have also included headworks charges, in terms of trunkmains and treatment facilities to support dual reticulation at Ballina Heights, in their new section 64 plan.</p> <p><i>Programming:</i> The study could be carried out in conjunction with the concept design for Lennox Head and/or West Ballina STW OR a separate study could be commenced on approval of the BSUWMS. Given Councils commitment to proceed with dual reticulation in the Lismore Heights Estate, there is an urgency attached to this action.</p>
BMP-WW7	<p>Endocrine Disruptor Research – Council technical staff keep abreast of current developments in both overseas and Australian research on the potential hazards associated with EDC's and other potentially harmful compounds.</p> <p><i>Purpose:</i> protection of public health and the environment (Guiding Principles 1 & 2)</p>	<p>Comments in report to Council responding to issues raised in PRG and submissions during the exhibition of the options.</p> <p>Refer pp 20-21 in Vol.1 PART B of the Exhibition Response Report.</p>	<p>ρ Improves Council credibility as a service provider committed to its guiding principles.</p>	<p>There are significant investments in research of this topic happening overseas. Ballina Council is not in a position to carry out this work itself, nor should it expend large amounts countering currently unknown potential effects.</p> <p><i>Programming:</i> Ongoing</p>

	Recommended Actions and Purpose	Basis for Recommendation	Potential Opportunities/Constraints	Justification for Action/Other Details
BMP- WW8	<p>Environmental Monitoring –review the current format of Council monitoring programs including the marine benthic monitoring program carried out by Southern Cross University in relation to the Skennars Head reclaimed water release.</p> <p><i>Purpose:</i> ensure monitoring provides outcomes that achieve the objectives of maintaining an adaptive management approach to avoiding any significant impacts on the environment or public health resulting from Councils urban water activities (Guiding Principles 1 & 2)</p>	<p>In the most recent sampling and analysis report for marine biota at the release site, SCU recommended such a review.</p> <p>Inclusion of key community groups such as the Lennox Branch of Surfider may be considered to support the credibility of the environmental monitoring.</p> <p>The work might be linked to the environmental impact assessment process for those facilities requiring such an approach.</p>	<p>ρ Supports a due diligence approach given the community concern expressed in the exhibition submissions and the most recent monitoring report by SCU on the release which suggested potential improvements to the testing methodology</p> <p>o If the need for a statistically valid program emerges, the cost of monitoring could increase significantly despite the fact that Council intends to greatly increase its dry weather reuse volumes</p>	<p>Council advocates an adaptive management approach.</p> <p>This and the need for a due diligence approach to the environment and requires ongoing assessment of technologies, potential pollutants, monitoring methodologies and testing capabilities.</p> <p><i>Programming:</i> to be reviewed in conjunction with the EIA for the Ballina facility or the licence review process for other STW upgrades</p>
BMP- WW9	<p>Government Agency Liaison – establish and maintain liaison with key government agencies involved with integrated urban water, river health, catchment management, water sharing, environmental approvals and licencing.</p> <p><i>Purpose:</i> ensure that the further development and implementation of the Ballina Shire Integrated Urban Water Management Strategy proceeds in a way that allows the maximum opportunity for key agencies to have input on issues related to their portfolios. (Guiding Principles 3 & 6)</p>	<p>Lessons learned from past experience.</p> <p>This could proceed as part of a Technical Committee process established in conjunction with other processes to progress the development and implementation of the BSUWMS.</p>	<p>ρ Provides a better understanding of the government position on certain issues and thus reduces the risk of proceeding in a way that may be contrary to the agencies position on some matters</p> <p>ρ Reduces the risk of re-work</p> <p>ρ Reduces risk a missing important steps in the process of achieving agency approvals, licence permits etc for the project</p> <p>ρ Facilitates subsequent approvals for the project by providing a better understanding</p> <p>Increases the cost of the project through the need to communicate effectively with the agencies</p>	
BMP- WW10	<p>Extension of Sewerage System - Develop a policy and program of work to extend the current centralised sewerage system to urban development where cost recovery is achievable.</p> <p><i>Purpose:</i> reduction in the number of on-site systems where economically viable, to support improved environmental and public health outcomes. (Guiding Principles 1, 2, 5)</p>	<p>Standard approach in 'best practice'</p>	<p>ρ Potential for improved bacteriological outcomes in rivers and creeks in Ballina Shire</p> <p>ρ Greater volume of reclaimed water for beneficial reuse</p>	<p>Many previous studies have supported the contribution of poorly managed on-site sewerage systems to adverse public health outcomes and environmental effects.</p> <p>This is a preference of both NSW Health and EPA.</p> <p><i>Programming:</i> target for completion and implementation of policy in 2004/2005</p>

	Recommended Actions and Purpose	Basis for Recommendation	Potential Opportunities/Constraints	Justification for Action/Other Details
	Water Supply Systems			
BMP-WS1	<p>Demand Management – partner with Rous Water in its program to implement a regional water efficiency program</p> <p><i>Purpose:</i> support achievement of the objectives of the Water Efficiency Program across the region. (Guiding Principles 1, 3, 5)</p>	<p>This is an already stated aim of BSC.</p> <p>There was significant feedback in submissions to the Options Report seeking BSC to adopt water efficient policies and practices.</p>	<p>ρ Supports achievement of Councils credentials within the community as an environmentally aware and responsible organisation.</p>	<p>This includes the House Tune-Up and Shower Head Program</p>
BMP-WS2	<p>Rainwater Tanks – Council review its current policy on rainwater tanks in existing and proposed residential areas.</p> <p><i>Purpose:</i> support achievement of the objectives of the Rous Water Efficiency Program across the region. (Guiding Principles 1, 3, 4 & 5)</p>	<p>Relevant reference documents are Reference 1, Appendix B.4 in Vol.1 PART B of the exhibition Response report and the Rous Water commissioned study.</p> <p>Strong community response on the value of rainwater tanks to supplement other supplies and reduce peak stormwater flows. See pp 17-18 of the Vol.1 PART B of the Exhibition Response report.</p> <p>The review needs to be carried out in the light of the Rous Water policy on rebates for rainwater tanks, the Ballina Shire Policy on dual reticulation in new developments in the Ballina-Lennox Head urban area and the potential loss of rainwater tank supply effectiveness in areas where dual reticulation is installed.</p>	<p>ρ Potentially, supports more effective application of dual reticulation and rainwater tank policies in residential areas</p> <p>ρ Supports the current Rous initiative in regard to rebates for installation of rainwater tanks in residential areas</p> <p>o May not cater to a strong community desire for use of rainwater tanks to maximise use of local rainfall as a resource.</p>	<p>EPA has been critical of the wide range of divergent outcomes from studies on the use and value of rainwater tanks. As the outcomes need to be tailored to the specific region and the interaction with other integrated urban water policies, a more critical study to address the Ballina Shire is warranted. This should draw on as much of the work done to date as possible.</p> <p>While rainwater tanks help preserve potable water supplies, there is no associated beneficial use of reclaimed water. The policy needs to be reviewed jointly with possible review of the Rous Water policy on rainwater tank rebates.</p> <p><i>Programming:</i> Given the advanced state of the Rous Water policy on rainwater tank rebates and the Ballina Shire policy on dual reticulation, this should happen as soon as practicable after the adoption by Ballina Shire of a more comprehensive dual reticulation policy.</p>
BMP-WS3	<p>Investigate Need to Acquire Land Now for Future Desalination Plant – In conjunction with other discussions with Rous Water, jointly explore the potential and need to acquire land, at an appropriate location for a possible future desalination plant.</p> <p><i>Purpose:</i> ensure development pressures don't compromise the ability to implement desalination strategies in the future (Guiding Principles 1, 3, 5 & 7)</p>	<p>Based on an approach from Rous Water in its submission to the options exhibition phase and a significant community interest in the potential benefits desalination technology might offer including reduced extraction of freshwater from rivers and creeks.</p> <p>Refer pp 75-76 of Vol.1 PART B of the Exhibitions Response report.</p>	<p>ρ Commences the process early to explore reservation of lands for future water security; demonstrates pro-active approach by Rous Water and constituent Councils</p> <p>π Also needs to involve other coastal Councils such as Byron and Richmond Valley</p>	<p>Council technical staff need to keep abreast of current developments in desalination technology, both overseas and in Australia. This should be done jointly with Rous Water.</p> <p>As a minimum this should include attendance at key industry forums throughout the year, visits to other water authorities with similar interests and issues etc</p> <p><i>Programming:</i> It is understood that the Ministry of Energy and Utilities proposes investigating the potential for desalination technologies for North Coast. If this is the case, the discussions with Rous Water should follow this assessment. Otherwise discussions in 2003/2004 are proposed.</p>

	Recommended Actions and Purpose	Basis for Recommendation	Potential Opportunities/Constraints	Justification for Action/Other Details
	Stormwater Systems			
BMP-SW1	<p>Development and Implementation of Current Strategy – continue to develop and implement elements of the current Stormwater Management Strategy plus other opportunities identified in the strategy review, including water sensitive urban design initiatives.</p> <p><i>Purpose:</i> support achievement of the objectives of the current Stormwater Management Strategy. (Guiding Principles 1, & 2)</p>	References 19 and 20 and p 38 of Vol.1 PART B of the Exhibition Response report provide the background to this recommendation.	<ul style="list-style-type: none"> ρ supports improved environmental and public health outcomes ρ funding remains a constraint to program implementation and extension of the program into the installation of structural components 	<p>There was not strong support for reuse programs or other significant initiatives, other than 'fixing' a number of known stormwater 'hotspots'.</p> <p><i>Programming:</i> Ongoing in accordance with the current strategy and Council funding limitations</p>
BMP-SW2	<p>Stormwater Funding – explore options to support an appropriate level of funding for stormwater initiatives within the whole of the Shire including rural areas which contribute the greater share of pollutants to the rivers and estuaries</p> <p><i>Purpose:</i> support achievement of the objectives of the current Stormwater Management Strategy and allow other structural issues to be addressed where these are demonstrated to be of value. (Guiding Principles 1, 2 & 5)</p>	Recent report by Healthy Rivers Commission (North Coast Rivers – Final Report March 2003) and submissions to the Options exhibition seeking improved funding to address stormwater hotspots.	<ul style="list-style-type: none"> ρ Potential to achieve best value for investment of funding in stormwater management o The political will to address rural issues and to invest urban rates in this way may not be strong o There is a need to address the financial burden created by the ongoing operation and maintenance of structural stormwater works 	<p>There is currently little data available and no government subsidy program to support identification and implementation of priority catchment stormwater works. A range of State and Federal grant funding are available in various forms. Council should continue to seek such funding to support these initiatives.</p> <p>The recent Healthy Rivers Commission report on North Coast rivers supports the creation of a separate stormwater fund, similar to that used to fund water and sewerage infrastructure.</p> <p><i>Programming:</i> Not an urgent matter at this stage; 2004/2005</p>
	Wastewater Infrastructure			
	Ballina-Lennox Head Wastewater System			
WWI-BLH1	<p>Pipelines and Pumping Station Upgrades – investigate potential under-capacity elements of the sewage transport system and correct these where it can be demonstrated to be justified from an economic, environmental and public health perspective.</p> <p><i>Purpose:</i> reduce risks to the environment and public health due to system overflows (Guiding Principles 1 & 2)</p>	<p>Based on recommendations in Reference 9 which identifies potential high infiltration sewer sub-catchments.</p> <p>Activities recommended include:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Review of system element capacities to handle the likely flows, and <input type="checkbox"/> Development of a rehabilitation plan <p>The assessment will need to be based on an agreed acceptable overflow frequency.</p>	<ul style="list-style-type: none"> ρ Reduced overflow incidences and associated notification and clean-up requirements o An acceptable overflow frequency may be difficult to determine without appropriate environmental and human health risk studies. o This study could not commence until a separate study to identify and correct infiltration/inflow sources for the system, has been completed.. 	<p>The reference identifies several parts of the sewage transport system that is likely to have insufficient storage capacity or pump station capacity to handle anticipated wet weather flows.</p> <p><i>Programming:</i> This is not an urgent work; commencement of the assessment in 2005/2006 is proposed after rectification of the major infiltration/inflow sources is achieved.</p>
WWI-BLH2	<p>Upgrade of Ballina STW – commence investigations to support the immediate upgrade the current Ballina STW and associated works in accordance with Strategy 2 of the Options report.</p> <p><i>Purpose:</i> provide additional STW capacity for current planned growth (Guiding Principles 1 & 2)</p>	<p>Based on the broadly supported Strategy 2 in the Options report and the exhibition submissions supporting the upgrade proceeding as soon as possible.</p> <p>The issue of when the plant should proceed is addressed in comments pp 34-35 Vol.1 PART B of the Exhibition Response Report.</p> <p>Activities associated with the upgrade to include:</p> <ul style="list-style-type: none"> <input type="checkbox"/> confirmation and preparation of concept designs <input type="checkbox"/> preparation of an environmental impact assessment (EIA) <input type="checkbox"/> construction of the works as soon as possible after approval is obtained <input type="checkbox"/> this to include the transfer of loads from the West Ballina, and Ballina Heights development precincts to the Ballina STW when completed. 	<ul style="list-style-type: none"> ρ A report on a possible arrangement for the interim works and a potential long-term upgrade of the Ballina STW, has been developed by Commerce (or the then DPWS). Hunter Water have been engaged to review this and recommend alternative arrangements o There is a cost associated with starting ahead of when the works is technically required. Based on a 7% discount rate this is estimated to be \$ ρ The benefits of proceeding immediately are considered to outweigh the cost of a deferred start. 	<p>Once the Lennox Head upgrade is completed, the upgrade of Ballina STW is not required until 2011 based on projected STW loads.</p> <p>Given it will likely require 5 years to complete the necessary concept designs, EIA, detailed designs and construction of the works, a 3 year deferral of the start of planning is not considered warranted.</p> <p><i>Programming:</i> Commence planning for the upgrade as soon as practicable taking account of the results from the Hunter Water study now underway.</p>
WWI-BLH3	<p>Interim Upgrade of Ballina STW – concept design for the interim works be confirmed following review of the concept designs already prepared for the upgrade of Ballina STW.</p> <p>Once the form of the interim upgrade is confirmed, a concept design and an EIA be prepared for discussion with EPA, Fisheries, and possibly the community prior to going to Council for consideration and approval.</p> <p>Detail design and construction of the interim works follow.</p> <p><i>Purpose:</i> upgrade works to a standard where it complies with the current EPA licence and allows the maximum opportunity for use of the interim works as part of a future upgrading. (Guiding Principles 1, 5 & 7)</p>	<p>There is an existing Pollution Reduction Program (PRP) agreed with EPA.</p> <p>The current PRP U2.1 specifies that "The licensee must develop and adopt a preferred option for implementation of the long term sewerage strategy for the Ballina/Lennox Head area. The strategy must address the future role of the Ballina STW including proposed effluent treatment standards to be achieved and effluent management options to be implemented within a specified timeframe." The due date is 28th November 2003.</p> <p>Maximum opportunity will be taken to ensure the interim works can be used as part of the final plant design or the interim works can be re-used at another plant, such as Lennox Head or Alstonville STW.</p>	<ul style="list-style-type: none"> ρ A report on a possible arrangement for the interim works and a potential long-term upgrade of the Ballina STW, has been developed by DoC (or the then DPWS). ρ Hunter Water have been engaged to review the proposed plans for the interim works in conjunction with the long-term upgrade with the purpose of confirming the most suitable arrangement for the interim upgrade. This should be discussed with EPA. o EPA are pressing to have the interim works proceed as soon as possible, and there is a risk that despite the best intentions at this early stage, the long-term plans for upgrade of the Ballina STW may change in the future for several reasons 	<p>The interim upgrade is required to reduce the suspended solids in the discharge to below the EPA licence requirements.</p> <p>Confirmation of the design is required to ensure that the interim works can, as much as possible, be integrated with the proposed long-term upgrade of Ballina STW and/or be re-located as part of some other element of the Shire wastewater management system.</p> <p><i>Programming:</i> Commence planning for the interim upgrade as soon as practicable taking account of the results from the Hunter Water study now underway and any further requirements of the EPA. Target completion within the next 12-18 months.</p>

	Recommended Actions and Purpose	Basis for Recommendation	Potential Opportunities/Constraints	Justification for Action/Other Details
WWI-BLH4	<p>Constructed Wetlands at Ballina STW - Potential sites be identified immediately, and purchased opportunistically pending approval of the works upgrade</p> <p><i>Purpose:</i> avoid the loss of an opportunity to reserve land for a wetland located at the most strategically advantageous site. (Guiding Principles 5 & 7)</p>	<p>Based on Options report findings and community submissions which support the use of this technology at this site, and known pressures on land in the area surrounding the works.</p>	<ul style="list-style-type: none"> o Until the EIA is carried out any pre-purchase ahead of the approval of this upgrade, creates the potential for waste of public funds. o EPA have questioned the capacity of wetlands to cope with wet weather flows. ρ However, in this case, there seems to be little to lose even if EIS does not eventually support the upgrade of Ballina STW. Re-sale of any land, pre-purchased to support a constructed wetland, is unlikely to result in a significant net cost. ρ Demonstrates commitment to meet community expectations. ρ Supports the concept of 'convoluted path' which has wide community support. 	<p>Wetlands technology has a demonstrated capacity to remove nitrogen to low levels. Studies by SCU suggest that this is likely to be required, particularly during dry weather discharge to the estuary, to minimise the potential impacts of nutrients on the estuary.</p> <p><i>Programming:</i> Implement immediately.</p>
WWI-BLH5	<p>Stage 2 Upgrade of the Lennox Head STW – proceed immediately with the optimisation upgrade of the Lennox Head STW to 28,000 EP capacity and other associated works including application for an amended EPA licence.</p> <p><i>Purpose:</i> avoid the potential overload of the works and reduced capability to achieve licenced reclaimed water standards and provide a lower cost solution (Guiding Principles 1, 5 & 7)</p>	<p>Based on Strategy 2 in the Options report and the need to continue to achieve reclaimed water standards for reuse on public space and residual release at Skennars Head.</p> <p>Works to proceed in accordance with the optimisation upgrade option in the Lennox Head Treatment Technology Report (Reference 13) and the outcomes of current investigations by Hunter Water.</p>	<ul style="list-style-type: none"> ρ A report on a recommended arrangement for the Stage 2 upgrade of the Lennox Head STW, has been developed by DoC (or the then DPWS). ρ Hunter Water have been engaged to review the proposed plans with the purpose of confirming the most suitable arrangement for the upgrade. ρ Meets project objectives of no overload of STW ρ Avoids potential moratorium on development which would not prevent an overload due to ongoing loads from already committed development. ρ Required no matter what the outcome of further analysis of reclaimed water management options 	<p>Provides an upgrade of capacity to 28,000 EP and avoids an overload of the works expected to occur within the next 12 months.</p> <p>Provides a significantly reduced cost and shorter implementation timetable than the current strategy.</p> <p><i>Programming:</i> Implement immediately with a target staged completion within 12-36 months.</p>
WWI-BLH6	<p>Reclaimed Water Management Strategy – further investigate broad-acre cropping, and/or large-scale regeneration wetlands on low-lying coastal land to achieve reuse targets.</p> <p><i>Purpose:</i> supports a process for minimising the release of treated effluent to waterways and the ocean during dry weather (Guiding Principles 2)</p>	<p>During the Option exhibition there has been a strong community response against the release of reclaimed water as a substitution for environmental flows in Emigrant Creek. Additional preliminary studies have also shown that a higher level of treatment, than originally allowed may be necessary. A similar situation exists at Maguires Creek and there is government agency support to proceed to the next stage of investigation.</p> <p>There is strong local opposition at least, to the Emigrant Creek option and further investigation will be involved and complex.</p> <p>The same situation is likely to apply to the option of recharge of the Alstonville Plateau groundwater.</p> <p>However, unless an option is demonstrated as not being sustainable, its early abandonment may represent a risk to achieving approval of an alternative reclaimed water management option and the need to revisit the viability of the option at some future time. This could result in significant delay and additional costs for re-work.</p> <p>Despite this Council not wish to pursue the more problematic options for reclaimed water such as Emigrant Creek and Alstonville Plateau, due to cost, complexity and apparent lack of community support in some areas.</p>	<ul style="list-style-type: none"> ρ Not pursuing the more problematic options, is likely to result in less adverse publicity for the final strategy. ρ Additional investigation costs will be reduced, as only one significant reuse option is to be explored. o Does not supports a rational and justifiable process of option elimination and selection of a preferred option. This may put council in a weak position to support whatever the final preferred option may prove to be, especially if there are objections from other parts of the community. 	<p>There is no compelling case for any single option to be selected or eliminated at this stage.</p> <p>Although there are community objections to release to Emigrant Creek and government agency objections to Alstonville Plateau aquifer recharge, these two options offer the highest value uses of reclaimed water as a resource, and the capacity to readily achieve the target re-use levels.</p> <p>Without further community and agency discussions, it may not be possible to establish a robust foundation for any future EIA for the cropping/regeneration wetlands option, by demonstrating that all feasible options have been adequately explored. This increases the risk that a possible future campaign against the preferred option due to perceived adverse localised impacts will successfully argue inadequate consideration of other options.</p> <p><i>Programming:</i> Implement immediately with a view to resolving details of the preferred option within 12 months. After this investigation, further wetland development should await the outcome of the proposed trials.</p>
WWI-BLH7	<p>Enhancement Upgrade of the Lennox Head STW – proceed with detailed assessment of the benefits and costs of enhanced reclaimed water quality for that portion of reclaimed water in excess of the reuse volume, and which is released at Skennars Head.</p> <p><i>Purpose:</i> supports the community aspirations for a high level of treatment (beyond that necessarily required to only meet statutory standards) for reclaimed water from Lennox Head STW that is released to the environment.</p>	<p>Based on the broad community support for a high level of treatment of reclaimed water released to the environment demonstrated in the comments on the Options report.</p> <p>The assessment will include review of potential interim improvements where it is expected there will be a significant period before the final reclaimed water management strategy is resolved.</p> <p>It is noted that Council is committed to dual reticulation, which requires that reclaimed water be filtered. Thus the assessment should be carried out in conjunction with the</p>	<ul style="list-style-type: none"> o Higher cost than the minimum required to achieve statutory standards ρ Increased flexibility to comply with more stringent standards in the future ρ Higher degree of sustainability in relation to the 'precautionary principle' ρ Potential for reduced monitoring costs ρ Lower management costs and greater flexibility for reuse of reclaimed water on open public space ρ Increased credibility of Council in listening and responding to community aspirations 	<p>Suspended solids due to algae impacts the aesthetic quality of the reclaimed water released at Skennars Head. Typical technologies that could address this as well as improve some other reclaimed water standards include:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Flotation <input type="checkbox"/> Sand filtration, and <input type="checkbox"/> Microfiltration <p><i>Programming:</i> Implement immediately after the Hunter Water study is completed and in parallel with the investigation of</p>

	Recommended Actions and Purpose	Basis for Recommendation	Potential Opportunities/Constraints	Justification for Action/Other Details
	<i>(Guiding Principles 5, 6 & 7)</i>	further review of both dual reticulation and public open space irrigation requirements.		reclaimed water reuse options such as dual reticulation and irrigation of public open space.
WW1-BLH8	<p><i>Trial Irrigation Reuse Project</i> – Identify and develop a 30-50 ha broad-acre reclaimed water reuse trial to receive reclaimed water from the upgraded Lennox Head STW.</p> <p><i>Purpose:</i> - to gain knowledge about the community acceptability, practical management needs and costs of this technology and minimise any increase in dry weather reclaimed water releases at Skennars Head in the short to medium term <i>(Guiding Principles 1 & 4)</i></p>	Based on the outcomes of the exhibition of the options, there is community support for reuse of this type. There is also a desire within the community to avoid increased releases to Skennars Head as a result of the Lennox Head STW upgrade.	<ul style="list-style-type: none"> o If the trial involves the regeneration of wetlands, and these wetlands become reliant on the irrigated reclaimed water for survival, there could be a case in the future for not diverting such reclaimed water to other 'higher' purposes, due to potential environmental effects if the wetland vegetation was impacted. o Such a proposal is likely to require an EIA (possibly an EIS) before it can proceed. Key issues are likely to involve seepage of reclaimed water to groundwater and mosquitoes. There is no guarantee that this project would be approved. ρ If higher value uses of the reclaimed water are not available (eg substitution for Emigrant creek dam releases) then there is community support for this type of reuse. ρ Such a project, if carried out in conjunction with the upgrade of Lennox Head STW to 28,000 EP, would generally prevent any significant increase in dry weather discharges to the ocean at Skennars Head. ρ A 30-50 ha trial is also of sufficient scale to provide suitable data on costs and issues associated with scaling this up to 300 ha if this proves necessary. ρ Supports the position taken by EPA that a licence for Lennox Head STW would be contingent on no net increase in pollutants to Skennars Head release. 	<p>While there is little scientific evidence to support the need to reduce discharges from the Skennars Head reclaimed water release, there is thought to be a majority community preference for this in lieu of allowing the dry weather discharges to the ocean to increase. As well, despite the apparent lack of scientific logic, there appears to be a stronger preference for reduced ocean releases rather than reduced release to the estuary. There is little doubt that EPA would have greater concern about an estuarine release over an ocean release, for a reclaimed water of the same quality.</p> <p>Some issues to consider as part of this recommendation are:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Land availability and soil types <input type="checkbox"/> Choice of crop types <input type="checkbox"/> Relationship to mop-crop trials <input type="checkbox"/> Reliance of wetlands on continuous supply of reclaimed water <input type="checkbox"/> Approval process <input type="checkbox"/> Community consultation <input type="checkbox"/> Availability of grant funding <p><i>Programming:</i> commence investigations immediately with target for commencement of operation within 3 years</p>

	Recommended Actions and Purpose	Basis for Recommendation	Potential Opportunities/Constraints	Justification for Action/Other Details
WWI-BLH9	<p>Reuse Targets – irrespective of the preferred reclaimed water management strategy adopted, set reuse targets of:</p> <ul style="list-style-type: none"> ∇ >40% reuse in dry weather by 2008 ∇ >80% reuse in dry weather by 2013 <p><i>Purpose:</i> - to support current best practice approach and the community desire to handle reclaimed water as a resource and to reduce the release of treated wastewater to waterways and the ocean. (Guiding Principles 1 & 4)</p>	<p>Strong community expectation for use of reclaimed water as a resource.</p> <p>High level of outrage about release of reclaimed water to the ocean.</p> <p>Options Report indicates 80% reuse is achievable based on irrigation for cropping or regeneration wetlands. This assumes the necessary areas of land can be identified and acquired. The addition of dual reticulation reduces the risks that unidentified issues may limit the reuse capacity of irrigation options alone, however other than this there are no other options that would support achievement of target reuse levels.</p>	<ul style="list-style-type: none"> ρ Proposed targets are ahead of published catchment blueprint targets o May be more expensive than negotiated reclaimed water reuse credits with a more inland Council such as Lismore or Casino. In conjunction with these targets, the potential to gain reuse credits through funding reuse in other more effective areas of the catchment should be explored. o Achievement of targets will be challenging as only a single reuse option, irrigation, has been adopted. 	<p>The current estimated level of reuse in dry weather is estimated to be about 20%.</p> <p><i>Programming:</i> commence investigations immediately in conjunction with trial irrigation reuse scheme linked to the upgrade of the Lennox Head STW.</p>
WWI-BLH10	<p>Retention of Skennars Head Release – maintain the viability of the Skennars Head release as a precautionary reclaimed water release point, particularly in wet weather.</p> <p><i>Purpose:</i> - to support the managed and sustainable release of reclaimed water to the environment in wet weather when reuse is not practicable or not allowed. (Guiding Principles 1,5 & 7)</p>	<p>This has been broadly accepted both by the community and the agencies, given that no other feasible options are available.</p> <p>Preliminary analysis suggests no major upgrade of the existing release infrastructure is required to support this for the upgraded works capacity (Reference 13). This needs to be reviewed in conjunction with the EPA licence review for the upgraded Lennox Head STW.</p>	<ul style="list-style-type: none"> ρ Reduced risk of impact on the estuarine environment ρ Preferred by licencing agencies o Opposed by some community groups o Additional pipeline upgrading works may prove necessary following discussions with EPA as part of the STW operating licence review. 	<p>Preferable to releasing the reclaimed water to a more confined waterway such as North Creeks.</p> <p><i>Programming:</i> after completion of the Hunter Water preliminary studies, review previous study and initiate discussions with EPA on the hydraulic design criteria for the Lennox Head STW.</p>

	Recommended Actions and Purpose	Basis for Recommendation	Potential Opportunities/Constraints	Justification for Action/Other Details
	Alstonville/Wollongbar Wastewater System			
WWI-AW1	<p>Reuse Targets – irrespective of the preferred reclaimed water management strategy adopted, set reuse targets of:</p> <ul style="list-style-type: none"> ∇ >80% reuse in dry weather by 2008 ∇ 100% reuse in dry weather by 2013 <p><i>Purpose:</i> - to support current best practice approach and the community desire to handle reclaimed water as a resource and to reduce the release of treated wastewater to waterways.</p> <p>(Guiding Principles 1 & 4)</p>	<p>Strong community expectation for use of reclaimed water as a resource.</p> <p>Current investigations with local irrigators demonstrate that a high level of reuse in dry weather is achievable within the next 5 years.</p>	<p>ρ High targets support community aspirations for reuse of reclaimed water</p> <p>ρ Proposed targets are ahead of published catchment blueprint targets</p>	<p>The only reuse currently occurring is through indirect reuse by irrigators pumping from Maguires Creek downstream from the Alstonville STW release point.</p> <p>There is a greater demand on the Plateau for freshwater sources including reclaimed water, for nursery and horticultural use.</p> <p>This should enable higher targets for dry weather reuse to be achieved and sooner.</p>
WWI-AW2	<p>Reclaimed Water Management Strategy – continue to develop and implement the current option for agricultural reuse by local users.</p> <p><i>Purpose:</i> - to support achievement of nominated reuse targets in the most cost effective and sustainable way.</p> <p>(Guiding Principles 1&4)</p>	<p>Positive response from irrigators in the area around the Alstonville STW and submissions to the option exhibition.</p> <p>During the implementation, consideration should be given to the submission to the options exhibition regarding reuse by downstream users and the potential ecological impacts on Maguires Creek of removing the reclaimed water release during dry weather.</p>	<p>ρ Few constraints to achievement of reuse targets</p> <p>o Potential for complaints from downstream users if reclaimed water is removed from Maguires Creek during dry weather.</p> <p>o Some higher value uses may be prevented due to high agricultural demand eg dual reticulation.</p> <p>o The current creek is benefiting from the increased flows over a significant part of its length</p>	<p>Opportunity to achieve 100% reuse based on agricultural demands already identified.</p> <p>Because of the greater demand on the Plateau for reclaimed reuse water, those purposes that better value the water as a resource should have priority provided these are proved to be sustainable and affordable.</p> <p><i>Programming:</i> continue the implementation of the irrigation reuse program with target completion by September 2004. Review the outcomes of the SCU investigations on Maguires Creek and implications for a likely EIA for the reuse implementation.</p>
WWI-AW3	<p>Upgrade of Alstonville STW – upgrade existing STW capacity and associated works to accommodate anticipated increased loads from current developments.</p> <p><i>Purpose:</i> avoid the potential overload of the works and reduced capability to achieve licenced reclaimed water standards</p> <p>(Guiding Principles 1,2,4 & 5)</p>	<p>Required to support key project objective of avoiding overload of STW capacity.</p> <p>Upgrading options are presented in Reference 15.</p> <p>Activities likely to include:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Review previous studies and confirmation of proposed upgrade strategy <input type="checkbox"/> Preparation of STW upgrade concept designs <input type="checkbox"/> Prepare environmental impact assessment (EIA) for upgrade of the works 	<p>ρ A report on a recommended arrangement for the upgrade of the Alstonville STW, has been developed by DoC (or the then DPWS).</p> <p>ρ Hunter Water have been engaged to review the proposed plans with the purpose of confirming the most suitable arrangement for the upgrade.</p> <p>ρ Meets project objectives of no overload of STW</p> <p>ρ Required no matter what the outcome of further analysis of reclaimed water management options</p>	<p>Hunter Water has been engaged to review the loads on Alstonville STW and to confirm the previously identified need for an immediate upgrade of the works. The review also includes the concept of optimisation as promoted in previous consultant studies.</p> <p>The success of the reuse program could influence the treatment standards required.</p> <p><i>Programming:</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> confirm the upgrade needs and the program based on the results of the Hunter Water testing. <input type="checkbox"/> review the outcomes of the SCU investigations and implications for a likely EIA for the Alstonville STW. <input type="checkbox"/> if program results allow, in 2005 review the outcomes from the agricultural reuse program. Pending the outcomes from these activities, determine the proposed upgrade of the Alstonville STW and the likely scope of further investigations.
WWI-AW4	<p>Constructed Wetlands at Alstonville STW – review the need for increased removal of nutrients and thus the benefits of installation of constructed wetlands. Proceed with the concept of constructed wetlands if the need is established.</p> <p><i>Purpose:</i> to reduce the current identified impacts on Maguires Creek due to higher than desirable nutrients in reclaimed water releases</p> <p>(Guiding Principle 1)</p>	<p>Wetland technology capable of achieving high levels of nitrogen removal and has community support. (see Reference 12)</p>	<p>o Until the review is carried out any pre-purchase ahead of the possible upgrade should not occur.</p> <p>o EPA has questioned the capacity of wetlands to cope with wet weather flows.</p> <p>ρ Proceeding with wetlands demonstrates commitment to meet community expectations.</p> <p>ρ Proceeding with wetlands supports the concept of 'convoluted path' which has wide community support.</p>	<p>Wetlands technology has a demonstrated capacity to remove nitrogen to low levels. Studies by SCU suggest that this is likely to be required, particularly during dry weather discharge to the creek, to minimise the potential impacts of nutrients.</p> <p>If 100% agricultural reuse can be achieved in dry weather, the need for greater levels of nitrogen removal may not exist.</p> <p><i>Programming:</i> proceed when the scope and timetable of the STW upgrade have been determined and if the upgrade is proposed in the immediate future.</p>
	Wardell Wastewater System			
WWI-W1	<p>Reuse Targets –set reuse target of:</p> <ul style="list-style-type: none"> ∇ 100% reuse in dry weather by 2008 <p><i>Purpose:</i> - to support current best practice approach and the community desire to handle reclaimed water as a resource and to reduce the release of treated wastewater to waterways during dry weather.</p> <p>(Guiding Principles 1 & 4)</p>	<p>Community expectation for use of reclaimed water as a resource.</p> <p>Current investigations on public space irrigation demonstrate that a high level of reuse in dry weather is achievable within the next 5 years.</p>	<p>ρ High targets support community aspirations for reuse of reclaimed water</p> <p>ρ Proposed targets are ahead of published catchment blueprint targets</p>	<p>Peak monthly reuse of 55% for public open space irrigation was achieved in January 2002.</p> <p>There is only a small quantity of reclaimed water available for re-cycling which supports the target of 100% within the next 5 years esp. if trial irrigation systems are established to test some crops for use elsewhere in the Shire.</p>

	Recommended Actions and Purpose	Basis for Recommendation	Potential Opportunities/Constraints	Justification for Action/Other Details
WW1-W2	<p>Reclaimed Water Management Strategy – further investigate a range of feasible options for management of reclaimed water to achieve reuse target including:</p> <ul style="list-style-type: none"> ∇ trial reuse areas for testing techniques for other areas of the Shire ∇ other methods required to achieve target reuse levels including expansion of public open space irrigation. <p><i>Purpose:</i> - to support achievement of nominated reuse targets in the most cost effective and sustainable way. (Guiding Principles 1&4)</p>	<p>Positive response to irrigation of public space in the Wardell village and submissions to the option exhibition.</p> <p>Further initial reuse is likely to focus on the area of land owned by Council surrounding the STW.</p>	<ul style="list-style-type: none"> ρ Few constraints to achievement of reuse targets o Best practice public space irrigation requires reclaimed water filtration which has a high cost for such a small installation o May be insufficient reclaimed water volumes and/or comparable soil types to other areas of the Shire to enable valid trials 	<p>Further opportunities for public open space irrigation may become available as the village develops.</p> <p><i>Programming:</i> In conjunction with reclaimed water reuse investigations across the Shire, determine the most useful reuse trials that could be carried out to complement the investigations into the most appropriate means of achieving target reuse levels.</p>
Ballina Shire Bio-Solids Strategy				
BSB-1	<p>Biosolids Reuse Target – set a beneficial reuse target of</p> <ul style="list-style-type: none"> □ 50% reuse by 2008 □ 100% reuse by 2013 <p><i>Purpose:</i> - to support current best practice approach and the community desire to maximise resource recovery. (Guiding Principles 4)</p>	<p>Standard approach in 'best practice' organisations.</p> <p>There was limited feedback on biosolids from the community during the PRG and options exhibition phase</p>	<ul style="list-style-type: none"> ρ increased life of existing landfill ρ meets community expectations for recovery of a resource o Could involve greater costs compared with existing approach 	<p>There is currently no beneficial reuse of biosolids practiced in Ballina Shire.</p>
BSB-2	<p>Biosolids Management for Lennox Head STW – upgrade the screening facilities at LH STW to support beneficial reuse of biosolids from the works.</p> <p><i>Purpose:</i> - to support achievement of nominated reuse targets. (Guiding Principles 4)</p>	<p>As per recommendations in Reference 14 to support move to beneficial reuse of biosolids within Ballina Shire.</p>		<p><i>Programming:</i> In conjunction with the concept development and implementation of the upgrade of the plant. Due for completion by 2004.</p>
BSB-3	<p>Biosolids Management for Ballina STW – as part of the upgrade of the plant install screening at the STW to support beneficial reuse of biosolids from the works</p> <p><i>Purpose:</i> - to support achievement of nominated reuse targets. (Guiding Principles 4)</p>	<p>As per recommendations in Reference 14 to support move to beneficial reuse of biosolids within Ballina Shire.</p>		<p><i>Programming:</i> In conjunction with the concept development and implementation of the upgrade of the plant. Due for completion by 2008. Alternatively, if interim screening improvements can be installed, this could proceed in conjunction with the upgrade of the other plants and be included with the works to be tendered for beneficial biosolids reuse.</p>
BSB-4	<p>Biosolids Management for Alstonville STW – expand sludge lagoon holding capacity to 6 months detention</p> <p><i>Purpose:</i> - to support achievement of nominated reuse targets in the most cost effective and sustainable way. (Guiding Principles 4)</p>	<p>As per recommendations in Reference 14 to support move to beneficial reuse of biosolids within Ballina Shire.</p>	<ul style="list-style-type: none"> ρ Additional opportunity for agricultural reuse based on relationships established with local farmers under the reclaimed water reuse program. 	<p><i>Programming:</i> Could proceed independently of other upgrade works to be considered as part of the overall upgrade of the plant. Program to suit availability of Council construction team.</p>
BSB-5	<p>Biosolids Management for Wardell STW – investigate and reduce (if feasible) high copper levels in STW biosolids.</p> <p><i>Purpose:</i> - to support achievement of nominated reuse targets in the most cost effective and sustainable way. (Guiding Principles 4)</p>	<p>As per recommendations in Reference 14 to support move to beneficial reuse of biosolids within Ballina Shire.</p>	<ul style="list-style-type: none"> π Could proceed in conjunction with water quality investigations and options for Wardell water supply. ρ Biosolids reuse could be included as part of the plan of management for the land surrounding the STW at Wardell. 	<p><i>Programming:</i> Proceed as soon as practicable in conjunction with Wardell water supply investigations.</p>
BSB-6	<p>Beneficial Reuse of Biosolids in Ballina Shire – carry out trial beneficial reuse studies and prepare tender documents and seek open tenders for 5 year contract for beneficial reuse of biosolids from those works able to support beneficial reuse.</p> <p><i>Purpose:</i> - to support achievement of nominated reuse targets in the most cost effective and sustainable way. (Guiding Principles 4)</p>	<p>As per recommendations in Reference 14 to support move to beneficial reuse of biosolids within Ballina Shire.</p> <p>Requires the installation of hardstand areas for mobile de-watering equipment and may require allocation of stockpile areas for de watered sludge depending on the option selected.</p> <p>Interest has been expressed by local cane farmers; could be reliable outlet for the entire biosolids production of Ballina Shire</p>	<ul style="list-style-type: none"> ρ Allows market test of cost/benefits of the various options available. ρ Share the approach with adjoining local government areas. o Industry may not be ready for this type of approach in regional areas. o Requires the development of an innovative tendering document 	<p>Prior to tendering there may be advantages in carrying out trial studies for:</p> <ul style="list-style-type: none"> □ applications to sugar cane farming □ composting at Alstonville Tree Farm (subject to planning considerations) □ composting at landfill □ vermiculture <p><i>Programming:</i> Some trial reuse studies have commenced, others to proceed as soon as practicable. Tendering following upgrade of the biosolids facilities at each STW to support achievement of standards suitable for beneficial biosolids reuse and when outcomes of trial studies known. Not likely to commence before December 2004.</p>

	Recommended Actions and Purpose	Basis for Recommendation	Potential Opportunities/Constraints	Justification for Action/Other Details
Water Supply Infrastructure				
Ballina-Lennox Head System				
WSI-BLH1	<p><u>Upgrade the Water Reticulation System</u>.- upgrade the water pipeline network as indicated by hydraulic modelling outcomes</p> <p><i>Purpose:</i> - to provide agreed levels of service pressure at the water demand levels nominated. (Guiding Principles 2)</p>	Based on the outcomes of the network hydraulic analysis and the agreed levels of consumer service.		<i>Programming:</i> Investigations and upgrading is ongoing to suit maintenance of service standards.
WSI-BLH2	<p><u>Reservoir Capacity</u> – upgrade the network of water reservoirs to ensure sufficient capacity in the appropriate locations.</p> <p><i>Purpose:</i> - to provide the agreed standards for fire fighting, daily demand fluctuations, system maintenance etc. (Guiding Principles 2)</p>	Based on the outcomes of the network hydraulic analysis and the agreed levels of consumer service.		<i>Programming:</i> Investigations and upgrading is ongoing to suit maintenance of service standards.
WSI-BLH3	<p><u>Desalination Land Acquisition</u> – BSC have discussions with Rous Water about the possibility of setting aside land now to facilitate the potential use of desalination technologies at some stage in the future.</p> <p>Liaise with MEU re progress on the proposed desalination study as part of the discussions on land acquisition.</p> <p><i>Purpose:</i> - to support current best practice approach and the community desire to handle reclaimed water as a resource and to reduce the release of treated wastewater to waterways. (Guiding Principles 1 & 4)</p>	<p>Based on the recommendations in Reference 18 and the need for contingency planning. There is community support for further investigation of desalination as a means of protecting rivers from over-utilisation.</p> <p>It is understood that the Ministry of Energy and Utilities proposes to do a study of the potential for use of desalination on the North Coast.</p>	<p>ρ Supports the ability to implement desalination if this proves viable in the future</p> <p>ρ Opportunity to combine reservation of lands for desalination and purchase of land for irrigation reuse.</p> <p>π Low potential for any loss of investment if desalination technology doesn't become viable or competitive, as the land can be re-sold.</p>	<i>Programming:</i> Discussion should proceed in conjunction with the further development of the Reclaimed Water Management Strategy for Ballina-Lennox Head.
Alstonville-Wollongbar System				
WSI-AW1	<p><u>Upgrade the Water Reticulation System</u>.- upgrade the water pipeline and reservoir network to provide agreed levels of service pressure at the water demand levels nominated</p> <p><i>Purpose:</i> - to provide agreed levels of service pressure at the water demand levels nominated. (Guiding Principles 2)</p>	Based on the outcomes of the network hydraulic analysis and the agreed levels of consumer service.		<i>Programming:</i> Investigations and upgrading is ongoing to suit maintenance of service standards.
Wardell System				
	<p><u>Water Quality Improvements</u>.- investigate the upgrade of the water quality and in particular the effects of low alkalinity water on consumer and mains pipework.</p> <p><i>Purpose:</i> - to avoid damage to reticulation pipework and residential plumbing, and the contamination of sewage biosolids with higher than acceptable levels of certain metals (Guiding Principles 1, 4 & 7)</p>	<p>Based on the results of water quality testing and biosolids analysis.</p> <p>Investigations to consider other options for supply such as connection to Rous Water where this proves more cost effective and retention of the Marom Creek system as a drought emergency supply.</p>	<p>ρ Reduced damage to Council infrastructure</p> <p>ρ Reduced risk of paying compensation for direct and collateral damage to household plumbing and contents</p>	<p>Study should include consideration of expanded use of the Marom Creek supply to supplement regional headworks capacity other than in droughts.</p> <p><i>Programming:</i> Investigations to proceed as soon as practicable.</p>
Stormwater Infrastructure				
	<u>No New Infrastructure Initiatives are Proposed.</u>	Until alternative funding arrangement can be implemented, the cost of major infrastructure upgrading is beyond the capacity of the General Rates funding to accommodate.		

Note: The technical studies reference numbers used in these Tables are based on the list of technical studies attached at the end of the Tables.