



Coffs Harbour City Council

30 April 2014

ORDINARY MEETING

The above meeting will be held in the Council Chamber, Administration Building, corner Coff and Castle Streets, Coffs Harbour, on:

THURSDAY 8 MAY 2014

The meeting commences at **5.00pm** and your attendance is requested.

AGENDA

1. Opening of Ordinary Meeting
2. Acknowledgment of Country
3. Disclosure of Interest
4. Apologies
5. Public Addresses / Public Forum
6. Mayoral Minute
7. Mayoral Actions under Delegated Authority
8. [Confirmation of Minutes of Ordinary Meeting – 10 April 2014](#)
9. Notices of Motion
10. General Manager's Reports
11. [Consideration of Officers' Reports](#)
12. Requests for Leave of Absence
13. Matters of an Urgent Nature
14. Questions On Notice
15. Consideration of Confidential Items (if any)
16. Close of Ordinary Meeting.

Steve McGrath
General Manager



COFFS HARBOUR CITY COUNCIL
ORDINARY MEETING
COUNCIL CHAMBERS
COUNCIL ADMINISTRATION BUILDING
COFF AND CASTLE STREETS, COFFS HARBOUR
8 MAY 2014

Contents

ITEM DESCRIPTION

CITY PLANNING DEPARTMENT REPORTS

- CP14/9 DEVELOPMENT APPLICATION NO. 304/14 - DEMOLITION OF EXISTING BUILDINGS AND CONSTRUCTION OF HOTEL ACCOMMODATION (COMPRISING 83 ROOMS, RESTAURANT AND FUNCTION AREA) AND STRATA SUBDIVISION - LOT 1 DP 1183009 NO. 209 PACIFIC HIGHWAY, COFFS HARBOUR
- CP14/10 JRPP - ASSESSMENT REPORT FOR DEVELOPMENT APPLICATION NO. 332/14 - LOT 2 DP 607441, 211 PACIFIC HIGHWAY, LOT 31 DP 716388, 1 – 7 HURLEY DRIVE, LOT 1 DP 616809, 8 TOLHURST PLACE AND LOT 3 DP 607441, PUBLIC RESERVE PACIFIC HIGHWAY, COFFS HARBOUR
- CP14/11 WOOLGOOLGA TOWN CENTRE MASTERPLAN - PROJECT UPDATE
- CP14/12 HIGH VALUE HABITATS OF COFFS HARBOUR LOCAL GOVERNMENT AREA - HIGH VALUE ARBOREAL HABITAT
- CP14/13 REGIONAL WASTE MANAGEMENT – COLLECTION CONTRACT

The following item either in whole or in part may be considered in Closed Meeting for the reasons stated:

- CP14/14 TENDER: ORARA RIVER REHABILITATION PROJECT BUSH REGENERATION TENDER 2014-15 RFT-637-TO

A portion of this report is confidential for the reason of Section 10A (2):

- (d) commercial information of a confidential nature that would, if disclosed:
- (i) prejudice the commercial position of the person who supplied it, or
 - (ii) confer a commercial advantage on a competitor of the council, or
 - (iii) reveal a trade secret.

and in accordance with Section 10A (1) the meeting may be closed to the public.

ITEM DESCRIPTION

CORPORATE BUSINESS DEPARTMENT REPORTS

CB14/21 QUARTERLY BUDGET REVIEW STATEMENT FOR MARCH 2014

CB14/22 BANK BALANCES AND INVESTMENT FOR MARCH 2014

COMMUNITY DEVELOPMENT DEPARTMENT REPORT

CD14/8 EASTERN DORRIGO SHOWGROUND AND COMMUNITY HALL MANAGEMENT
COMMITTEE MEMBERSHIP

CITY INFRASTRUCTURE SERVICES DEPARTMENT REPORTS

The following item either in whole or in part may be considered in Closed Meeting for the reasons stated:

CIS14/16 SUPPLY AND DELIVERY OF SEALING AGGREGATES 2014-2016, CONTRACT
NO. RFT-624-TO

CIS14/17 CONTRACT NO. RFT-625-TO - SUPPLY & DELIVERY OF QUARRY PRODUCTS
2014-2016

CIS14/18 TENDER RFT-628-TO: SUPPLY OF ONE ASPHALT ROAD MAINTENANCE UNIT
ON A CREW CAB 15,000 KG GVM TRUCK

CIS14/19 TENDER RFT-630-TO: SUPPLY OF ONE BLOWER TYPE ROAD MAINTENANCE
UNIT ON A 22,500 KG GVM TRUCK

A portion of this report is confidential for the reason of Section 10A (2):

- (d) commercial information of a confidential nature that would, if disclosed:
 - (i) prejudice the commercial position of the person who supplied it, or
 - (ii) confer a commercial advantage on a competitor of the council, or
 - (iii) reveal a trade secret.

and in accordance with Section 10A (1) the meeting may be closed to the public.

CIS14/20 COFFS HARBOUR CITY COUNCIL DRINKING WATER POLICY & DRINKING
WATER QUALITY MANAGEMENT SYSTEM

CIS14/21 NSW WATER SUPPLY & SEWERAGE PERFORMANCE REPORT 2012/2013

CIS14/22 RELEASE OF RESTRICTION ON USE - 3B DUNLOP DRIVE, BOAMBEE EAST



COFFS HARBOUR CITY COUNCIL

ORDINARY MEETING

10 APRIL 2014

Present: Councillors D Knight (Mayor), J Arkan, N Cowling, R Degens, G Innes, B Palmer, K Rhoades and M Sultana

Staff: General Manager, Director City Infrastructure Services, Director City Planning, Director Community Development, Director Corporate Business and Executive Assistant

Leave of Absence: Councillor Townley

The meeting commenced at 5.02 pm with the Mayor, Cr D Knight in the chair.

We respectfully acknowledge the Gumbayngirr Country and the Gumbayngirr Aboriginal peoples who are traditional custodians of the land on which we meet and their Elders both past and present.

The Mayor reminded the Chamber that the meeting was to be recorded, and that no other recordings of the meeting would be permitted.

DISCLOSURES OF INTEREST

The General Manager read the following disclosure of interest to inform the meeting:

Councillor	Item	Type of Interest
Cr Knight	CIS14/15 - Update on Boat Ramp and Broader Issues with Sand Infilling of Coffs Harbour	Non Pecuniary Less Than Significant Conflict as her husband uses the boat ramp
Cr Palmer	CB14/20 - Tender RFT-606-TO - Advertising Services at Coffs Harbour Regional Airport	Non Pecuniary Less Than Significant Conflict as a member of an industry association who submitted a tender.
General Manager	MM14/1 - General Manager's Contract Renewal	Pecuniary as the report deals with his future employment.

APOLOGY

No apologies

PUBLIC ADDRESS

Time	Speaker	Item
5.00pm	Jo Sutherland	CD14/6 Entertainment/Performing Arts Facility – Community Engagement Plan
5.05pm	Cathy Mackay	CIS14/13 395 Coramba Road, Coffs Harbour – Bennetts Road Detention Basin
Cr Palmer left the meeting, the time being 5.18pm		
5.10pm	Barry Lee	CB14/20 Tender RFT-606-TO – Advertising Services at the Coffs Harbour Regional Airport
Cr Palmer returned to the meeting, the time being 5.27pm.		

CONFIRMATION AND ADOPTION OF MINUTES

- 90** **RESOLVED** (Palmer/Arkan) that the minutes of the Ordinary meeting held on 27 March 2014 be confirmed as a true and correct record of proceedings.

Cr Palmer requested that the minutes be amended as Cr Rhoades was on a leave of absence however was recorded as voting in a Division for CIS14/12.

COMMUNITY DEVELOPMENT DEPARTMENT REPORT

CD14/6 ENTERTAINMENT/PERFORMING ARTS FACILITY - COMMUNITY ENGAGEMENT PLAN

The purpose of this report is to establish Council's commitment to undertake a comprehensive community engagement program to assess the community's interest and willingness to pay for the provision and operation of a cultural facility/ies.

91 RESOLVED (Degens/Arkan) that:

1. Council undertakes a clear comprehensive community engagement process regarding the provision of an Entertainment Centre, Central Library and Regional Art Gallery.
2. A draft engagement strategy be developed and reported to Council for adoption.

AMENDMENT

MOVED (Cowling/Sultana) that:

1. A media campaign be commenced immediately with sufficient detail for an informed comment.
2. That the results of this campaign for a comprehensive consultation in the latter half of 2014 preferably not over the December / January period.
3. That a briefing be held with Councillors before a draft plan for the engagement strategy is reported to Council.

The **AMENDMENT** on being put to the meeting was **LOST**.

The **MOTION** on being put to the meeting was declared **CARRIED**.

DIVISION

92 MOVED (Rhoades/Arkan) that a division be called, and those members voting for and against the motion were recorded:

VOTED FOR

Cr Arkan
Cr Palmer
Cr Knight
Cr Degens
Cr Sultana
Cr Innes
Cr Rhoades

VOTED AGAINST

Cr Cowling

CITY INFRASTRUCTURE SERVICES DEPARTMENT REPORT

**CIS14/13 395 CORAMBA ROAD, COFFS HARBOUR - BENNETTS ROAD
DETENTION BASIN**

To update Council on the progress of property acquisition issues at 395 Coramba Road, Coffs Harbour.

MOTION

- 93 RESOLVED** (Arkan/Sultana) that negotiations continue for a further period of 4 months with the landowners of Lot 1, DP 134234 with the intention of purchasing that part of the property affected by the easement for inundation shown on DP 1177880 until a satisfactory fair and just compensation be awarded.

AMENDMENT

MOVED (Rhoades/Innes) that Council adopt the recommendation in the confidential attachment to this report.

The **AMENDMENT** on being put to the meeting was **LOST**.

The **MOTION** on being put to the meeting was declared **CARRIED**.

DIVISION

- 94 MOVED** (Palmer/Rhoades) that a division be called, and those members voting for and against the motion were recorded:

VOTED FOR	VOTED AGAINST
Cr Arkan	Cr Palmer
Cr Cowling	Cr Innes
Cr Knight	Cr Rhoades
Cr Degens	
Cr Sultana	

The Mayor noted that she was disappointed that the speaker addressing Council was aware of what was within the confidential recommendation.

CORPORATE BUSINESS DEPARTMENT REPORT

Cr Palmer declared an interest in the following item, vacated the chamber and took no part in the discussion or voting, the time being 6.21pm.

CB14/20 TENDER RFT-606-TO - ADVERTISING SERVICES AT COFFS HARBOUR REGIONAL AIRPORT

To report back to Council on options for the advertising at Coffs Harbour Regional Airport and recommend a way forward.

95 RESOLVED (Rhoades/Innes) that:

1. Council accept the tender of Interspace Airport Advertising Australia Pty Ltd ABN for Contract No. RFT-606-TO, Provision of Advertising Services at Coffs Harbour Regional Airport, for the lump sum of \$212,334.00 on the basis that:
 - 1.1 The tender is the most advantageous tender following the application of Council's Tender Value Selection System.
 - 1.2 The Tenderer has the necessary experience in similar works and its ability and performance are satisfactory.
 - 1.3 The Tenderer's financial capacity is acceptable.
2. The contract documents be executed under the Seal of Council.

AMENDMENT

MOVED (Cowling/Sultana) that this matter be deferred until a decision has been reached on this matter both at ICAC and Department of Local Government enquiry into the advertising tender at Coffs Harbour regional airport in 2008.

The **AMENDMENT** on being put to the meeting was **LOST**.

AMENDMENT

MOVED (Degens/) that following the provision and consideration of the additional information on options for Provision of Advertising Services at Coffs Harbour Regional Airport, Contract No RFT-606-TO, Council now resolves to manage this function within the airport operation or another service area of Council.

The Amendment lapsed in the absence of a seconder.

The **MOTION** on being put to the meeting was declared **CARRIED**.

Cont'd

CB14/20 Tender RFT-606-TO - Advertising Services at Coffs Harbour Regional Airport ...(Cont'd)

DIVISION

- 96** **MOVED** (Sultana/Rhoades) that a division be called, and those members voting for and against the motion were recorded:

VOTED FOR	VOTED AGAINST
Cr Arkan	Cr Cowling
Cr Knight	Cr Degens
Cr Innes	Cr Sultana
Cr Rhoades	

Cr Palmer returned to the meeting, the time being 7.01pm.

The General Manager declared a pecuniary interest in the following item, vacated the chamber and took no part in the discussion, the time being 7.02pm.

MAYORAL MINUTE

MM14/1 GENERAL MANAGER'S CONTRACT RENEWAL

For Councillors endorsement for the Mayor to sign the renewal of the contract of employment for the current General Manager in accordance with Councils discretion.

- 97** **RESOLVED** (Knight/Rhoades) that:
1. In accordance with Clause 5 of the Standard Contract of Employment for General Managers of Local Councils in New South Wales, that Council re-appoint Stephen Charles McGrath to the position of General Manager subject to:
 - 1.1 The contract being the Standard Contract of Employment for General Managers of Local Councils in New South Wales and under the existing terms and conditions.
 - 1.2 That the term be for a period of four (4) years.

Cont'd

MM14/1 General Manager's Contract Renewal ...(Cont'd)

AMENDMENT

MOVED (Cowling/) that:

1. That the General Manager's contract be put out to open market.
2. That this process be handled, in house, with all Councillors that wish to be involved, participate in the whole recruitment and selection process.

The Amendment lapsed in the absence of a seconder.

The **MOTION** on being put to the meeting was declared **CARRIED**.

DIVISION

- 98 MOVED** (Cowling/Rhoades) that a division be called, and those members voting for and against the motion were recorded:

VOTED FOR	VOTED AGAINST
Cr Arkan	Cr Cowling
Cr Palmer	
Cr Knight	
Cr Degens	
Cr Sultana	
Cr Innes	
Cr Rhoades	

SUPPLEMENTARY MOTION

- 99 RESOLVED** (Rhoades/Innes) that Cr Cowling be given to the rising of the next meeting of Council to apologise publicly for comments made regarding the integrity of the General Manager.

The **MOTION** on being put to the meeting resulted in a tied vote. The Mayor used her casting vote and the **MOTION** was declared **CARRIED**.

DIVISION

- 100 MOVED** (Rhoades/Innes) that a division be called, and those members voting for and against the motion were recorded:

VOTED FOR	VOTED AGAINST
Cr Knight	Cr Arkan
Cr Palmer	Cr Degens
Cr Innes	Cr Cowling
Cr Rhoades	Cr Sultana

The General Manager returned to the meeting, the time being 7.32pm.

GENERAL MANAGER'S REPORTS

GM14/12 GOVERNANCE AND AUDIT COMMITTEE - ANNUAL REPORT TO COUNCIL 2013

The purpose of this report is to inform Council on the activities of the Governance and Audit Committee for the calendar year 2013. The report of the committee is attached to this business paper.

- 101 RESOLVED** (Arkan/Palmer) that Council notes the activities of the Governance and Audit Committee for 2013 as outlined in the attachment.

GM14/13 DRAFT 2014/2018 DELIVERY PROGRAM AND DRAFT 2014/2015 OPERATIONAL PLAN

The Draft 2014/2018 Delivery Program and Draft 2014/2015 Operational Plan are presented for Council's consideration. The documents include the Draft 2014/2018 Budgets and the Draft Fees and Charges 2014/2015.

- 102 RESOLVED** (Palmer/Arkan) that:
1. Council adopt the following documents for public exhibition:
 - 1.1. Draft 2014/2018 Delivery Program;
 - 1.2. Draft 2014/2015 Operational Plan;
 - 1.3. Draft Division Budgets 2014/2018; and
 - 1.4. Draft Fees and Charges 2014/2015.
 2. Council note that the draft documents will be placed on public exhibition for a 28-day period from Friday 11 April 2014 until close of business on Friday, 9 May 2014, and that the community will be encouraged to provide feedback on the documents during that time.
 3. Council consider community submissions prior to adopting the final Delivery Program, Operational Plan, Division Budgets and Fees and Charges documents by 30 June 2014.
 4. Council note that the Draft 2014/2015 General Fund Budget will deliver a projected surplus of \$1,557, which includes Council's proposed Special Rate Variation (SRV), and preliminary investments and savings from the Transformation to Sustainability (T2S) Project.

CORPORATE BUSINESS DEPARTMENT REPORTS

CB14/17 MONTHLY BUDGET REVIEW FOR FEBRUARY 2014

To report on the estimated budget position as at 28 February 2014.

103 RESOLVED (Palmer/Degens) that:

The budget adjustments be approved and the current budget position be noted.

Estimated Budget Position as at 28 February 2014:

	General Account \$	Water Account \$	Sewer Account \$
Original Budget adopted 13 June 2013	426,307 (D)	4,553,442 (D)	3,165,226 (D)
Approved Variations to 31 January 2014	(408,707) (S)	(556,076) (S)	300,000 (S)
Recommended variations February 2014	15,000 (D)	Nil	Nil
Estimated result as at 28 February 2014	<u>32,600 (D)</u>	<u>3,997,366 (D)</u>	<u>2,865,226 (D)</u>

CB14/18 DEVELOPER CONTRIBUTION PLAN REVIEW

To present to Council a draft amended Road Network Developer Contributions Plan 2014. This report recommends that the draft Plan be placed on public exhibition for a period of 28 days.

104 RESOLVED (Palmer/Sultana) that:

1. The Draft Road Network Contributions Plan 2014 be placed on exhibition for a period of 28 days and the community be invited to make submissions.
2. Funds recouped under the Road Network Developer Contributions Plan continue to be accumulated in the Future Road Network Reserve for future funding of Hogbin Drive works.

CB14/19 PROPOSED LEASE TO AIR SERVICES AUSTRALIA TO ESTABLISH AIRPORT RESCUE AND FIRE FIGHTING SERVICES

Seeking authority for the execution of a lease between Coffs Harbour City Council (Lessor) and Air Services Australia (Lessee) to facilitate the provision of aviation and fire fighting services at Coffs Harbour Regional Airport.

105 RESOLVED (Sultana/Palmer) that:

1. The Council as registered proprietor Lot 146 in DP 1131927 (the demised premises) authorises the lease at a commencing rent of \$1.00 per annum an area of approximately 6300m² within the airport perimeter to Airservices Australia ABN 56 698 886 for a period of 20 (twenty) years and an option for two further periods of ten (10) years for the purposes of constructing, establishing and operating an Aerodrome Rescue and Fire Fighting service in accordance with the Civil Aviation Safety Regulation 1998.
2. Any necessary documents required to give effect to the lease of part Lot 146 in DP1131927 to Airservices Australia ABN 56 698 886 be executed under the common seal of Council.
3. All costs associated with the preparation, lodgment and registration of the lease and associated plans be the responsibility of Airservices Australia.

Premises	Part lot 146 in DP 1131927
Lessee:	Airservices Australia
ABN:	56 698 886
Lessee Address:	Tower Road, Tullamarine, Victoria 3043
Guarantor	N/A
Lease Term:	20 years plus 2 x 10 year options. Total lease period 40 years.
Commencement	To be advised
Use:	Provisions of Aviation Rescue and Fire Fighting services.
Rental:	\$1.00 per annum
Bank Guarantee	N/A
GST:	Not included
Outgoings:	Lessee responsible for all outgoings
Insurances:	Public Liability \$20 million
Lease Costs:	All lease costs to be met by the lessee including registration and plan survey lodgment and registration costs.
Maintenance and Repairs	Ground lease only. Lessee responsible for all general and structural M & R to facility
Other:	Other terms and conditions as required by Council's legal representative.

COMMUNITY DEVELOPMENT DEPARTMENT REPORT

CD14/7 MANAGEMENT OF SPORTZ CENTRAL, BRAY STREET, COFFS HARBOUR - UPDATE AND OPTIONS

To provide Council with further information regarding investigations into options for the ongoing management of Sportz Central.

106 RESOLVED (Innes/Sultana) that:

1. Council calls for Expressions of Interest from interested parties for the operation of Sportz Central using an exclusive licencing instrument.
2. Council continue to provide the current financial contribution of \$55,000 to Sportz Central of which \$30,000 be provided to the operator for internal maintenance and the remainder used to offset the existing loan commitment for the facility.
3. Upon commencement of the licence the Section 355/377 Management Committee delegations be amended and the Committee continue to operate as an advisory committee for the facility.

CITY INFRASTRUCTURE SERVICES DEPARTMENT REPORTS

CIS14/14 ACQUISITION OF LAND FOR RECONSTRUCTION OF SECOMBS BRIDGE, DAIRYVILLE ROAD, UPPER ORARA

Report seeking Council approval for the acquisition of land required for the reconstruction of Secombs Bridge on Dairyville Road at Upper Orara.

107 RESOLVED (Arkan/Palmer) that:

1. Council proceed to acquire the land as described in the report on the terms contained within the confidential attachment.
2. All necessary documents associated with the acquisition of the land be executed under the common seal of Council.
3. The land acquired by Council be dedicated as public road.

CIS14/15 UPDATE ON BOAT RAMP AND BROADER ISSUES WITH SAND INFILLING OF COFFS HARBOUR

To inform Council of the current status of actions to upgrade the Coffs Harbour Boat Ramp, and to discuss the broader issue of sand infilling that will continue to impact on the long term sustainable operation of the facility.

108 RESOLVED (Arkan/Degens) that:

1. Council note progress with the boat ramp upgrade.
2. Council note that a further \$40,000 will be sought for Boat Ramp Dredging in the monthly budget review when it next reported to Council.
3. Council note the broader issues associated with sand infilling in the harbour.
4. Council receive a further report regarding outcomes of the feasibility study into the option of a sand dredging / local sand placement program for the northern breakwater project.
5. Council endorse the submission of a grant application to the Reclaiming Our Waterways program for a \$500,000 dredging campaign with a funding commitment of \$100,000 from Council.
6. Council note the Crown Lands temporary closure, site remediation and interim emergency management proposal for the Coffs Harbour Slipway.
7. That Council acknowledges and commends the Coffs Harbour Deep Sea Fishing Club and its members for their part in assisting to secure the funds for the boat ramp.

REQUESTS FOR LEAVE OF ABSENCE

No requests for leave of absence.

MATTERS OF AN URGENT NATURE

MUN14/4 Roads to Recovery

Cr Rhoades advised that the Australian Local Government Association have received assurance from the Federal Government that the funding is secure for the Roads to Recovery.

MUN14/5 Curry Fest Signage

Cr Arkan requested RMS to provide temporary signage advising of the Curry Fest event.

MUN14/6 Curry Fest Funding

Cr Arkan requested consideration be given for extra funding for the Curry Fest event under Council's existing policy.

QUESTIONS ON NOTICE

No questions on notice.

This concluded the business and the meeting closed at 7.55 pm.

Confirmed: 8 May 2014

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Denise Knight
Mayor

DEVELOPMENT APPLICATION NO. 304/14 - DEMOLITION OF EXISTING BUILDINGS AND CONSTRUCTION OF HOTEL ACCOMMODATION (COMPRISING 83 ROOMS, RESTAURANT AND FUNCTION AREA) AND STRATA SUBDIVISION - LOT 1 DP 1183009 NO. 209 PACIFIC HIGHWAY, COFFS HARBOUR

Purpose:

The purpose of this report is to present Development Application 304/14 for Council's consideration, which is an application for demolition of the existing motel development known as the "Midway Motel" and associated structures and construction of a new hotel accommodation, comprising 83 rooms, associated restaurant and function centre and strata subdivision. The development site is identified in the locality plan included below.



At its meeting of 22 August 2013, Council adopted *Development Applications - Consideration by Council Policy* which outlined:

That development applications for approval involving substantial aspects of the following elements be referred to Council for determination:

- *Significant public interest and community input;*
- *Substantial non-compliance with relevant strategic controls;*
- *Significant land use;*
- *Major environmental issue(s);*

In accordance with this resolution and Planning and Infrastructure Circular PS08-014, 'Reporting Variations to Development Standards' the application is reported to Council for determination as it proposes a variation of greater than 10% to the Coffs Harbour LEP 2013 development standard for height of buildings.

Conditional approval of the application is recommended.

Description of Item:

The legal description of the land is Lot 1 DP1183009, No. 209 Pacific Highway, Coffs Harbour North. The site fronts the Pacific Highway, is bound to the south and east by tributaries of Coffs Creek, and is bordered to the north by the Coffs Village Caravan Park. The site is 8,533.5m² in area and slopes gently towards Tree Fern Creek and North Coffs Harbour Creek to the south and east respectively. The site presently supports a single storey motel.

The site is zoned B6 Enterprise Corridor under the *Coffs Harbour Local Environmental Plan (LEP) 2013*.

The proposed development seeks approval for:

- Demolition of all existing buildings and structures on the site;
- Development of an 83 room hotel over three levels and two separate buildings; Comprising 29 studio rooms, 53 one bedroom rooms and 1 two bedroom unit;
- A total gross floor area of 4,960 m²;
- Strata title subdivision;
- Basement and at grade car parking (107 spaces);
- Ancillary hotel facilities including, 100 seat restaurant and alfresco dining area and 25 seat wine bar; 128sqm function area, pool, gym and cabana at rear;
- Associated landscaping and signage, site services and utility upgrades and augmentation;
- Access off a proposed service road;
- Three signs, including one public notice sign adjoining the road reserve, one stone wall sign and one under eave wall sign.

A copy of the plans is appended to this report (Attachment 2).

The development has a capital investment value of \$18,000,000.

Sustainability Assessment:

- **Environment**

The site contains areas of koala habitat and adjoins the Coffs Creek. Existing significant vegetation on the site is proposed for retention and embellishment. The application is accompanied by a Vegetation Management Plan and a Fauna Assessment. A relatively small area of vegetation will be removed within the site, most of this vegetation is comprised of non-native species associated with gardens within the existing motel, however, three trees will be removed; one non-endemic fig tree, one flooded gum tree and one swamp mahogany tree. Weed control and revegetation works are proposed under a Vegetation Management Plan. The submitted fauna assessment indicates the proposal will not have a significant impact on threatened fauna species, populations or endangered communities or their habitats.

During site works, appropriate sediment and erosion controls will be implemented. The project will incorporate rainwater tanks and water sensitive design inclusions. The design of the development incorporates a range of measures to maximise energy efficiency including address of solar aspect, energy efficient inclusions and smart metering. The project adequately addresses natural hazards including bushfire, acid sulfate soils and flood risk. The project has been designed to have regard to noise impacts from the adjacent Pacific Highway.

A full discussion of the likely environmental impacts of the proposed development is provided in the Section 79C Evaluation undertaken for the proposed development (Attachment 1).

- **Social**

The development will have a number of positive social impacts in the locality. The proposal will contribute to local tourism alternatives. Accessibility for persons with a disability is provided to and within the development. Security and crime prevention measures are addressed in the design and operation of the development. No adverse social impacts are likely to arise as a result of the proposed development.

There is potential that the development will result in short term impacts on the amenity of nearby residents during construction of the building. A number of conditions are recommended to be applied to the development consent to manage these impacts.

- **Civic Leadership**

The proposed development has been assessed in accordance with the provisions of the Environmental Planning and Assessment Act 1979 and all relevant Council controls and policies. The development of this site aligns to the aims of the Coffs Harbour 2030 Community Strategic Plan.

- **Economic**

Broader Economic Implications

The proposal when constructed will provide new, modern and additional hotel accommodation in the Coffs Harbour urban area and will see the removal of an aged motel. The proposal will provide construction related employment opportunities and ongoing employment benefits in relation to the staffing requirements of the development post construction. The development will support the tourism sector which is a significant component of the local economy. The proposal will provide economic benefits for the City.

Delivery Program/Operational Plan Implications

There are no implications for Council's Delivery Program/adopted Operational Plan.

Risk Analysis:

A risk analysis has been undertaken and it is considered that approval of the development application as recommended, does not pose a significant risk to Council.

Consultation:

- ***Community***

The application was advertised and notified from 13 November 2013 to 13 December 2013. One submission was received, which raises concerns in relation to the impact of the development on local flooding conditions.

A copy of this submission is a confidential attachment to this report (Attachment 4). This is a confidential attachment as it contains personal and private information that is not appropriate to be fully disclosed under the Privacy and Personal Information Protection Act.

The matters raised in this submission in relation to flooding are discussed in detail within the 'Issues' section of this report.

- ***Technical***

The application has been reviewed by Council's Engineering Services (flooding, traffic, services and landscaping), Building Services, Waste Services, Environmental Services (food premises, acoustic and acid sulfate soils), Sustainable Planning (Biodiversity) and Finance (contributions) divisions. The proposal has been conditionally supported and the advice received from all referral sections has been incorporated into the assessment of the proposed development and informs the recommended conditions of development consent (Attachment 3).

- ***Statutory Consultation***

The development application was referred to the Department of Primary Industries (NSW Office of Water) and the NSW Rural Fire Service as Integrated Development, requiring approval under the *Water Management Act 2000*, *Water Act 1912* and *Rural Fires Act 1997*. General Terms of Approval have been issued and inform the recommended conditions of development consent (Attachment 3).

The development application was also referred to the NSW Roads and Maritime Services (RMS) in accordance with *State Environmental Planning Policy (Infrastructure) 2007*. The RMS has provided comments for Council's consideration.

Comment on the proposed development has also been sought from the NSW Police in relation to Safer by Design principles and Liquor licensing. NSW Police has indicated they have no objection to the proposal.

The application has been reviewed by the Office of Environment and Heritage, the recommendations included in this response have been considered in the assessment of the application.

Related Policy and / or Precedents:

The application has been assessed in the normal manner, in accordance with statutory requirements.

Statutory Requirements:

Section 79C of the *Environmental Planning and Assessment Act 1979*, specifies the matters which a consent authority must consider when determining a development application. The consideration of matters is limited in so far as they must be of relevance to the particular application being examined.

The following planning controls are relevant to this development application and are required to be considered as part of the assessment:

- Coffs Harbour Local Environmental Plan 2013
- NSW Coastal Policy
- State Environmental Planning Policy No. 55 - Remediation of Land
- State Environmental Planning Policy No. 64 - Advertising Signage
- State Environmental Planning Policy No. 71 Coastal Protection
- State Environmental Planning Policy (Infrastructure) 2007
- Coffs Harbour Development Control Plan 2013

The relevant statutory instruments and controls are considered in detail in the Section 79C Evaluation appended to this report (Attachment 1).

Issues:

The following issues are relevant to the application:

• ***Flood Planning***

The development site is significantly flood prone and the engineering design of the building is responsive to the flood hazard. The original development proposal has been modified following concerns raised by Council in relation to flood impacts to adjoining properties. The flood modelling results for the revised design reduces the impacts on adjoining properties to accord with Council's Policy for development on flood prone land. The application demonstrates that the development is able to comply with Clause 7.3 'Flood Planning' of *LEP 2013* and Council's adopted Floodplain Development and Management Policy, subject to compliance with the proposed conditions of development consent.

• ***Car parking***

The development seeks a departure from the prescribed number of car parking spaces specified for this type of development under the Coffs Harbour Development Control Plan 2013. Component C2 of Council's Development Control Plan requires 123 spaces if applied without any consideration of common usage of facilities (i.e. hotel guests using the restaurant, bar, function area, etc). The development provides 107 spaces consisting of 92 spaces within the Basement and 15 at grade spaces.

The proposed car parking arrangements are considered adequate for the expected traffic generation and it is therefore recommended that Council support the requested variation to the DCP in regard to car parking.

- **Building Height**

Portions of the development do not conform to the height provisions of Coffs Harbour Local Environmental Plan (LEP) 2013. The height limit specified by the Height of Buildings Map for the site is 8.5m. The proposed maximum building height is approximately 13.5m, which occurs in a limited area at the rear of the development.

It is considered that the proposal will make a positive contribution to the locality, is responsive to the site and is consistent with the objectives of Clause 4.3 and it is therefore recommended that Council support the requested variation to the LEP in regard to height limits.

Implementation Date / Priority:

In the event that Council adopts the recommendation, a formal notice of determination will be issued for the development application and persons who made a submission will also be notified. A formal notice of determination is valid for five years and the applicant can act on the development consent at any time within that period, subject to meeting any relevant conditions of the consent.

Recommendation:

1. That the objection made pursuant to Clause 4.6 of Coffs Harbour Local Environmental Plan 2013 for the variation to the maximum building height under Clause 4.3(2) of Coffs Harbour Local Environmental Plan 2013 be supported in this particular case.
2. That Development Application 304/14 for demolition of existing buildings and construction of hotel accommodation comprising 83 rooms, associated restaurant and function centre and strata subdivision on Lot 1 DP1183009, No. 209 Pacific Highway, Coffs Harbour North be approved subject to conditions appended to this report (Attachment 3).
3. That persons who made submissions in relation to Development Application No. 304/14 be notified of the determination.

**Development Application No. 304/14
Section 79C Assessment**

a. the provisions of,

i. any environmental planning instrument, and

• State Environmental Planning Policy 55 – Remediation of Land

The subject site is not identified as potentially contaminated. The site has been used for the purposes of a motel within an established urban environment and no further contamination assessment is considered necessary.

• State Environmental Planning Policy (Infrastructure) 2007

The development fronts and gains access via the Pacific Highway and as such is subject to the provisions of Clause 101 “Development with frontage to classified road” and Clause 104 “Traffic-generating development” under this Policy.

The application has been referred to Roads and Maritime Services and relevant comments have been considered throughout the assessment process.

Clause 101(2) requires Council as consent authority to be satisfied of the following matters:

- (a) where practicable, vehicular access to the land is provided by a road other than the classified road, and
- (b) the safety, efficiency and ongoing operation of the classified road will not be adversely affected by the development as a result of:
 - (i) the design of the vehicular access to the land, or
 - (ii) the emission of smoke or dust from the development, or
 - (iii) the nature, volume or frequency of vehicles using the classified road to gain access to the land, and
- (c) the development is of a type that is not sensitive to traffic noise or vehicle emissions, or is appropriately located and designed, or includes measures, to ameliorate potential traffic noise or vehicle emissions within the site of the development arising from the adjacent classified road.

It is not practicable for the development to gain access by any other road. The design of access for the development ensures the safety, efficiency and ongoing operation of the Pacific Highway. The development will not generate smoke or dust emission post construction; the draft conditions will appropriately mitigate potential dust impacts during construction. The development incorporates appropriate measures to mitigate any potential traffic noise or vehicle emissions from the Highway.

Clause 104(3) requires Council as consent authority to give notice to Roads and Maritime Services and take into consideration the following matters:

- (i) any submission that the RTA provides in response to that notice within 21 days after the notice was given (unless, before the 21 days have passed, the RTA advises that it will not be making a submission), and
- (ii) the accessibility of the site concerned, including:

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- (A) the efficiency of movement of people and freight to and from the site and the extent of multi-purpose trips, and
- (B) the potential to minimise the need for travel by car and to maximise movement of freight in containers or bulk freight by rail, and
- (iii) any potential traffic safety, road congestion or parking implications of the development.

Written notice of the development application has been provided to the NSW RMS in accordance with the provisions of this clause. The submission received from NSW RMS has been considered during the assessment of the proposed development and informs the proposed conditions of development consent.

The accessibility and efficiency of access to and from the site has been comprehensively reviewed by Council's Engineering Services Division, a service road will be provided to service the development, and access within the site is suitable for the development. Council's Traffic Section has considered potential traffic safety, road congestion and parking implications of the proposed development. The proposed conditions of development consent will ensure that the provisions of this clause are satisfied.

- **State Environmental Planning Policy No. 71 – Coastal Protection**

The proposed development is considered to be consistent with the aims of the policy and satisfies the relevant matters for consideration. The clause of relevance is discussed further below:

Clause 7 – Application of Clause 8 Matters

Clause 7 of the SEPP requires Council to take matters as listed in Clause 8 into consideration when determining development applications. Clause 8 matters have been taken into consideration in the assessment of the proposed development.

- The proposal is considered to meet the aims of the Policy.
- The proposal will not impede or diminish public access to and along the coastal foreshore.
- The site is not subject to Aboriginal cultural heritage significance.
- The site does not contain any known items of heritage, archaeological or historic significance.
- The proposed development will not impact upon the scenic quality of the surrounding locality.
- The site is not subject to any coastal hazards.
- The site is located within an established commercial area and adjoins a mix of commercial and residential development. The proposed tourist development is considered suitable in type, location and design, given the context of the locality.
- The proposal will not result in any significant impacts to flora and fauna present on the site.

Clause 16 - Stormwater

A stormwater management plan was submitted in support of the development. The development will not result in any adverse stormwater impacts to the Coffs Creek and can be supported in relation to the provisions of this clause.

- **NSW Coastal Policy 1997**

The subject site is located in the Coastal Zone, and accordingly the provisions of the NSW Coastal Policy, the Coastline Management Manual and the North Coast Design Guidelines are relevant considerations. The site, whilst located in the Coastal Zone is distant from the foreshore. The proposal to redevelop the site for tourism purposes is consistent with the aims of the Coastal Policy. The Coastline Management Manual does not apply to this site. The development satisfies the design controls of the North Coast Design Guideline.

- **State Environmental Planning Policy No. 64 – Advertising and Signage**

This policy applies to all signage in NSW which is visible from a public place or public reserve; the signage proposed as part of the development is required to be considered against the provisions of the Policy. Clause 8 of the SEPP requires Council to be satisfied that:

- (a) the signage is consistent with the objectives of the Policy as set out in clause 3 (1) (a), and
- (b) the signage the subject of the application satisfies the assessment criteria specified in Schedule 1.

The proposed development incorporates three business identification signs; one public notice sign adjoining the road reserve, one stone wall sign and one under eave wall sign.

The proposed signage complies with the objectives of the Policy; it is compatible with the desired amenity and visual character of the area. The proposed signage is effective in its communication of the development as a hotel and is of high quality design and finish.

The development application is accompanied by an assessment of the criteria specified in Schedule 1 of the Policy, the proposed signage satisfies Schedule 1 for the following reasons:

- The proposed signage is not incompatible with the desired amenity and visual character of the area as a business precinct.
- The proposal is unlikely to compromise important views or vistas, and is unlikely to dominate the skyline.
- The proposed signage is appropriate in relation to streetscape, setting, and landscaping.
- The signage is compatible with the site attributes.
- Sign content and attributes directly relate to the nature of the proposed development.
- Illumination is proposed in accordance with relevant light emission standards.
- The signage is unlikely to pose a risk for traffic safety, pedestrians, or cyclists.

- **Planning Circular PS 08-014 – Reporting Variations to Development Standards**

In November 2008, the then Department of Planning (DoP) issued a Planning Circular outlining new requirements in relation to the determination and reporting of development applications involving variations to development standards under State Environmental Planning Policy No.1 – Development Standards (SEPP No.1) or similar provisions under the Standard Instrument (clause 4.6). The circular requires that all applications which propose a variation to development standards of greater than 10% under State Environmental Planning Policy No.1 –

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Development Standards or clause 4.6 of the Standard Instrument be determined by full Council rather than under delegated authority. The application is reported to Council in accordance with these provisions.

- **Environmental Planning and Assessment Act 1979 – Section 91 – Integrated Development**

The development application was referred to the Department of Primary Industries (NSW Office of Water) and the NSW Rural Fire Service as Integrated Development, requiring approval under the *Water Management Act 2000*, *Water Act 1912* and *Rural Fires Act 1997*. General Terms of Approval have been issued and inform the recommended conditions of development consent.

- **Coffs Harbour Local Environmental Plan 2013**

The land is zoned B6 Enterprise Corridor. The proposal is for “demolition” and construction of “hotel or motel accommodation” which is permissible with consent in this zone. The following clauses of the LEP are relevant to the proposal:

(1.2) Aims of Plan

The development is consistent with the aims of the Coffs Harbour Local Environmental Plan 2013, in particular, the development supports a strong and diverse economy, provides appropriate tourist development, is appropriate to its setting and relevant site attributes and incorporates a range of sustainable features.

(2.3) Zone objectives and land use table

The proposed tourist development is consistent with the objectives of the B6 Enterprise Corridor Zone, the use is compatible with the mix of uses along the Pacific Highway and reinforces the economic strength of the Central Business District by providing quality tourist accommodation in close proximity to the business and retail services provided within the City Centre.

(2.6) Subdivision – Consent Requirements

The application seeks approval for strata subdivision in accordance with this provision.

(2.7) Demolition Requires Development Consent

The application seeks development consent for demolition of the existing development on site. Appropriate conditions have been recommended in the draft consent to ensure demolition works and management of demolition waste will comply with relevant standards.

(4.3) Height of Buildings

The Maximum Building Height for this site as specified by the Height of Buildings Map is 8.5m. Portions of the development exceed the height limit and a variation is proposed (this proposed variation is discussed at length in relation to Clause 4.6 below).

(4.4) Floor Space Ratio

The Floor Space Ratio (FSR) for this site as specified by the Floor Space Ratio Map is 0.8:1. The proposed Floor Space Ratio of the development is 0.58:1 and is within the FSR limit.

(4.6) Exceptions to Development Standards

A request has been received from the applicant for consideration of a variation to the development standard for height. Planning Circular PS 08-003 allows Council to assume the Director-Generals concurrence in respect to an exception to the standard specified by clause 4.3.

The height limit specified by the Height of Buildings Map for this site is 8.5m. The proposed maximum building height is in the order of 13.5 metres. The height exceedence occurs at the rear of the development over 22% of the proposed development footprint and 13% of the overall site area.

The intent of the building height provision is to ensure that building height relates to the land's capability and maintains urban character and amenity. The applicant contends that the specified height of 8.5m is unreasonable in relation to the circumstances of the proposed development. The proposal will satisfy the 2 storey height limit adjacent to the public domain. The rear portion of the building is not highly visible from the public domain and the height does not block any views, or impact on the natural environment, the height of the building is consistent with the existing tree line in this locality.

It is recommended that Council support the variation request. It is considered that the proposal will make a positive contribution to the locality, is responsive to the site and is consistent with the objectives of Clause 4.3.

(5.5) Development within the Coastal Zone

In accordance with this clause development consent must not be granted to development on land that is wholly or partly within the coastal zone unless the consent authority has considered the matters outlined with Clause 5.5.

The development will not impede or diminish public access to (or along) the coastal foreshore, impact the amenity of the coastal foreshore, adversely impact the visual amenity of the coast or biodiversity and ecosystems. The proposed development will not be significantly affected by coastal hazards or have a significant impact on coastal hazards, or increase the risk of coastal hazards in relation to any other land. A stormwater management plan was submitted in support of the development. The development will not result in any adverse stormwater impacts to the Coffs Creek and can be supported in relation to the provisions of this clause.

(5.9) Preservation of trees or vegetation

The application seeks approval for tree removal in accordance with this provision. The proposed tree removal has been supported by Council's Biodiversity section subject to the imposition of appropriate development consent conditions.

(7.1) Acid Sulfate Soils

The proposed development is on land shown on the Acid Sulfate Soils (ASS) Map as being Class 3 and Class 4 potential acid sulfate soils. Clause 7.1(3) of Coffs Harbour LEP 2013 states that development consent must not be granted under this Clause for the carrying out of works which exceed 1m in depth or impact on the watertable, without an acid sulfate soils management plan.

An Acid Sulfate Soils Management Plan has been submitted and reviewed by Council's Environmental Services Division, a development consent condition requiring implementation of the management plan is included in the recommended conditions of consent.

(7.2) Earthworks

The development incorporates ancillary earthworks including excavation for the basement car park and filling of the site to achieve floor levels. In accordance with the provisions of this Clause Council has considered:

- the likely disruption of, or any detrimental effect on, drainage patterns and soil stability in the locality of the development,
- the effect of the development on the likely future use or redevelopment of the land,
- the quality of the fill or the soil to be excavated, or both,
- the effect of the development on the existing and likely amenity of adjoining properties,
- the source of any fill material and the destination of any excavated material,
- the likelihood of disturbing relics,
- the proximity to, and potential for adverse impacts on, any waterway, drinking water catchment or environmentally sensitive area,
- any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.

The proposed conditions of development consent will ensure that the provisions of this clause are satisfied.

(7.3) Flood Planning

Flooding is a major constraint for the site with the 'Tree Fern' tributary located on the south-western boundary and the Northern (Bray St) tributary located to the east. From the flood information provided with the application the maximum estimated 1% AEP flood level affecting the site for the Tree Fern tributary is 4.4m AHD and for the Northern tributary 3.8m AHD. Historical flood levels in the vicinity are 3.8m AHD - 1996 and 3.6m AHD - 2009. Floor levels on some of the existing units are approximately 3.2m AHD with ground levels on the site varying from approximately 1.5m to 3.4m AHD. The existing development was affected in the 1996 and 2009 flood events. From the 'Northern Tributaries of Coffs Creek Floodplain Risk Management Study, Nov 1997' the 5% AEP (20yr) flood level is 3.0m AHD and the 20% AEP (5yr) flood level is 2.7m AHD. Thus the site is affected in a wide range of flood events.

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Councils Engineering Services Division has assessed flooding impacts, by taking into account compatibility with adjoining land uses, flood levels and site constraints and recommended a minimum finished floor level of 5.0m AHD, the basement car park for the development will be flood proofed to 4.5m AHD. A condition of consent is recommended to ensure the building complies with this requirement. The development has been modified so as not to significantly adversely affect flood affectation of other development or properties and as such is not likely to result in unsustainable social and economic costs to the community as a consequence of flooding.

The development also incorporates appropriate measures to manage risk to life from flood, and is not likely to significantly adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.

(7.6) Riparian land and watercourses

The development is subject to the provisions of this clause as it is located on land that is within 40 metres of a watercourse identified on the Riparian Lands and Watercourses Map. In accordance with the provisions of this Clause Council is satisfied that the development is designed, sited and will be managed to avoid any significant adverse environmental impact on water quality and riparian areas.

(7.8) Koala Habitat

In accordance with the provisions of this clause, development consent must not be granted unless the development is in accordance with the Coffs Harbour City Koala Plan of Management. Two koala food trees are proposed for removal as part of the application.

The Koala Plan of Management maps part of the site as Primary Koala Habitat. This area is located on the southern boundary of the site and is approximately 85 metres long and up to 4 - 5 metres in width. The cleared areas within the study area adjoin primary koala habitat. The area mapped as Primary Koala Habitat on the study area and to the south of the study area is identified as a local koala corridor in the Koala Plan of Management.

The development has been reviewed against the management actions of the Koala Plan of Management. The proposal will not create a net loss of Primary Koala Habitat, nor increase threats to the local koala population. There are unlikely to be any impacts to adjacent Primary Koala Habitat, nor the adjacent area recognised as a local koala movement corridor. The proposal will not create a barrier to koala movement as it does not involve alteration to the existing boundary fencing. Revegetation works recommended by the VMP will involve replacement of koala food tree species. The proposal will not significantly alter or contribute to other threats to koalas recognised in the management actions for land adjoining primary koala habitat.

The proposed vegetation removal has been considered by Council's Sustainable Planning Division in reference to the fauna assessment and the VMP submitted as part of the application and will be approved as part of the development consent. The development will be subject to compensatory planting and vegetation restoration works. Once VMP works are implemented, the development will improve the ecological value of the site.

(7.11) Essential Services

Development consent must not be granted to development unless the consent authority is satisfied that those of the following services that are essential for the proposed development are available or that adequate arrangements have been made to make them available when required:

- a) the supply of water;
- b) the supply of electricity;
- c) the disposal and management of sewerage;
- d) stormwater drainage or on-site conservation;
- e) suitable vehicular access.

The subject land has relevant essential services available.

(7.12) Design Excellence

The proposed development addresses the design excellence provisions of this Plan.

The development is of contemporary design and style, incorporating a mixture of external finishes including rendered brickwork, glass, perforated metal screens and lightweight cladding. Existing view corridors are not adversely affected by the proposed development. The proposed development is compatible with the context and land use mix of the locality and the intention for the desired future character of the area as guided by Council's planning controls. The development is consistent with Council's controls for bulk, massing and modulation of buildings and solar access.

The development will incorporate a number of sustainable design features such as solar orientation, rainwater harvesting and reuse and energy and water efficient appliances and fixtures. The development will also improve the public domain by providing a landscaped street address and better facilitate pedestrian movement.

The height of the development, whilst departing from statutory controls, is endorsed and does not disadvantage the design outcome of the proposal.

(7.13) Central business district

The proposed hotel development will complement and contribute positively to the Central Business District as the principle business, office and retail hub of Coffs Harbour City.

- ii. **any draft environmental planning instrument that is or has been placed on public exhibition and details of which have been notified to the consent authority, and**

There are no draft planning instruments relevant to the application.

- iii. **any Development Control Plan (DCP)**

- **Coffs Harbour Development Control Plan 2013**

The following components of the DCP are relevant to the proposal:

(A2) Notification and Public Participation

The application was advertised and notified from 13 November 2013 to 13 December 2013. One submission was received, which raises concerns in relation to the impact of the development on local flooding conditions.

(B3) Business Development Requirements

B3.1.2 – Setbacks

Note: see comments in relation to Component E3.

B3.3 – Offsite Infrastructure Requirements

Appropriate off-site infrastructure will be provided to support the development.

B3.5 - Office and Businesses in the B6 Enterprise Corridor Zone

The design quality of the development contributes positively to the overall architectural quality of the locality. The building layout minimises overlooking and overshadowing through appropriate side setbacks and building orientation. Car parking and traffic access are legible and are primarily within the basement, provision of parking forward of the building line is considered appropriate in this instance to allow accessible parking for patrons of the development and discourage the potential for vehicles to park along the Pacific Highway. Signage is integrated into the design of the development and is considered appropriate. Setbacks are generally consistent with those specified in Component E3.

(B7) Biodiversity Requirements

An ecological assessment and preliminary Vegetation Management Plan has been submitted in relation to the requirements of this component. Council's Sustainable Planning Division has reviewed these reports and provided recommended conditions for the development consent.

(C1) Design Requirements

C1.2.2 Building Design in Urban Areas

The development complies with the controls outlined within this section of the DCP. The design incorporates a mix of materials, appropriate articulation, modulation and landscaping and is compatible with surrounding development. Material selection incorporates durable and non-reflective finishes. Existing view lines will not be compromised by the development and direct overlooking of adjoining properties is minimised through appropriate side setbacks and building orientation. The bulk of car parking is located within the basement, and does not dominate the street frontage. Provision of parking forward of the building line is considered appropriate in this instance to allow accessible parking for patrons of the development and discourage the potential for vehicles to park along the Pacific Highway.

(C2) Access Parking and Servicing Requirements

C2.1 Road and Access Design

The development consent incorporates recommended conditions to provide appropriate road infrastructure.

C2.3 On-site Parking

The development provides 107 spaces consisting of 92 spaces within the Basement and 15 at grade spaces.

Component C2 of Council's Development Control Plan requires 123 spaces if applied without any consideration of common usage of facilities (i.e. hotel guests using the restaurant, bar, function area, etc.). The nature of the proposed development carries a degree of common usage which would reduce the overall parking demand. The proponent has modelled the estimated parking demand for each element of the complex for each hour of a typical weekday, peak holiday periods and on the weekend as determined by the percentage usage of various sections of the development complex at any one time to take account of overlapping and common usage. This modeling determined a demand for 98 spaces

Whilst acknowledging a common usage factor Council staff reviewed the traffic impact study and sought the provision of additional spaces for patrons of the restaurant facility. The proponent redesigned the development and achieved a total of 107 car parking spaces on the site – this parking response has been endorsed for the development.

In addition, the Pacific Highway road reserve in front of the Clog Barn provides some 40 parking spaces which can be used for overflow parking. The Highway road reserve at the frontage of the site also requires upgrading and this work will also incorporate overflow parking provision.

C2.4 Services

Appropriate utility and servicing arrangements are proposed to support the development.

(C3) Landscaping Requirements

The application is supported by a concept landscape plan that demonstrates sufficient area is provided to comply with relevant controls.

(C4) Signage Requirements

The proposed development incorporates three business identification signs; one public notice sign adjoining the road reserve, one stone wall sign and one under eave wall sign. The proposed signage is effective in its communication of the development as a motel and is of high quality design and finish.

The proposed signage is not incompatible with the desired amenity and visual character of the area as a business precinct and is unlikely to compromise important views or vistas or dominate the skyline. Sign content and attributes directly relate to the nature of the proposed development. Illumination of the signage is proposed in accordance with relevant light emission standards. The signage is unlikely to pose a risk for traffic safety, pedestrians, or cyclists.

(C7) Waste Management Requirements

The development incorporates appropriate waste management and bin storage areas, which comply with Councils requirements.

(D1) Sediment and Erosion Control

A stormwater management plan was submitted with the application to address sediment and erosion control. This plan is consistent with relevant DCP provisions. The recommended conditions of development consent ensure appropriate erosion and sediment control during construction.

(D3) Flooding and Coastal Hazard

The development has a proposed finished floor level of 5.0m AHD and the basement car park will be flood proofed to 4.5m AHD. These floor levels satisfy Council's flood policy and provide the proposed development with a high level of flood protection compared to the existing development. The original development proposal has been modified following concerns raised by Council in relation to flood impacts to adjoining properties. The flood modelling results for the revised design reduces the impacts on adjoining properties to accord with Council's Policy for development on flood prone land. The application demonstrates that the development is able to comply with Clause 7.3 'Flood Planning' of *LEP 2013* and Council's adopted Floodplain Development and Management Policy subject to compliance with the proposed conditions of development consent.

(E3) Coffs Harbour City Centre

E3.1 Planning Strategy

The development is consistent with the planning strategy and the objectives of the gateway character area.

E3.2 Building Form

a) *Building alignment and setbacks*

Table 1 specifies a 6m front setback for development in the B6 Zone, a 6m setback is provided to the building.

b) *Side and rear building setbacks and building separation*

Table 1 specifies a 3m side and rear setback for building up to 12 metres and a 6m side and rear setback for buildings above 12 metres in height. The setbacks of the proposed development are as follows:

- North (Pacific Highway) – 6m and variable
- East – 3m and variable
- West – 8m and variable
- South – 10m and variable

The setbacks accord with the provisions of Table 1 except for along the eastern boundary where the building encroaches within the 6m setback. This encroachment is considered to be acceptable given adequate separation is provided by the sewer pump station site and limited impact of overshadowing and privacy on Clog Barn residents as a result of landscaping and building design.

c) *Street frontage heights*

The site is not identified on Map 4, as such this provision does not apply to the subject proposal.

d) *Building Depth and Bulk*

The site does not have a specified street frontage height and the building height is not greater than 22 metres, as such the provisions of this clause do not apply to the subject proposal.

iv. the regulations (to the extent that may prescribe matters for the purposes of this paragraph), that apply to the land to which the development application relates,

Clause 92 of the Environmental Planning and Assessment Regulation 2000 requires Council to consider the provisions of the Coastal Policy 1997 and AS2601-1991 - Demolition of Structures. As previously detailed, the proposal satisfies these requirements.

b. the likely impacts of that development, including environmental impacts, on both the natural and built environments, and social and economic impacts in the locality,

• **Natural and built environment**

The rezoning of the Gateway Precinct to B6 Enterprise Corridor has encouraged redevelopment of a number of sites in this precinct to date. As such, the locality is one in transition and the design character of this locality is highly varied. Whilst the proposed development is taller than a number of surrounding buildings and does not seek to directly replicate any specific existing 'style' in the locality it is not considered to be inconsistent with local character and is endorsed with respect to design quality and built form.

Access is to be provided via a service road adjoining the Pacific Highway and is supported on traffic safety grounds. Sufficient on-site parking is to be provided to the development.

The proposal is unlikely to result in any significant impacts on flora and fauna, the VMP works will improve the ecological value of the land. Relevant environmental constraints are addressed for the development. There is sufficient area on site for waste storage facilities.

The potential exists for noise and amenity impacts to adjoining residents during construction. However, the imposition of proposed conditions in relation to sediment and erosion controls, dust management and hours of work seek to mitigate the potential for such impacts.

There are no cumulative issues of note given that the development is consistent with the objectives of the zone and the desired character of the locality.

• **Social and economic impacts**

The development will have a number of positive social impacts in the locality. The proposal will contribute to local tourism alternatives. Accessibility for persons with a disability is provided to and within the development. Security and crime prevention measures are addressed in the design and operation of the development. No adverse social impacts are likely to arise as a result of the proposed development.

There is potential that the development will result in temporary impacts on the amenity of proximal residents during construction of the building. A number of conditions are recommended to be applied to the development consent to manage these impacts.

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The proposal will provide construction related employment opportunities and ongoing employment benefits in relation to the staffing requirements of the development post construction. The development also supports continued growth in the tourism sector which is a significant component of the local economy. No adverse economic impacts are anticipated from this proposal.

There are no likely adverse cumulative impacts resulting from the development and it is considered that the development is consistent with the objectives of the zone and the desired character of the locality.

c. the suitability of the site for the development,

The proposed development is compatible with the context of the site and the desired future character of the area as guided by the Councils planning controls.

The development provides tourist accommodation in proximity to transport, infrastructure, services and business centres.

Relevant environmental constraints of the development have been considered in the design of the proposed development. Adequate access and services are available to the site.

The development will not result in any significant effects on any threatened species, populations, and/or their habitats or endangered ecological communities.

d. any submissions made in accordance with this Act or the regulations,

The application was advertised and notified from 13 November 2013 to 13 December 2013. One submission was received, which raises concerns in relation to the impact of the development on local flooding conditions. This submission was reviewed by Council's Engineering Services Division and the development has been modified to reduce the impacts to adjoining properties as a result of the development. The flood modeling results for the revised design reduces the impacts on adjoining properties to the satisfaction of Council's Flooding Section.

e. the public interest,

The proposed development does not present any issues that are contrary to the public interest. The proposal generally complies with Councils planning standards and approval of the development is recommended.

All issues raised by the community during the application process have been addressed.

Proposed Conditions Development Application No. 0304/14

Schedule of Conditions

ADMINISTRATIVE CONDITIONS

Development Description:

1. Development consent is granted only to carrying out the development described in detail below:
 - ***Demolition of Existing Buildings and Construction of Hotel or Motel Accommodation (comprising 83 rooms, restaurant and function area) and Strata Subdivision***

Prescribed Conditions:

2. The proponent shall comply with the prescribed conditions of development approval under Clauses 97A, 98, 98A - E of Environmental Planning and Assessment Regulation 2000 as are of relevance to this development.

Development is to be in accordance with approved plans:

3. The development is to be implemented in accordance with the plans set out in the following table except where modified by any conditions of this consent (Development Consent No. 0304/14).

Plan No/ Title	Rev	Prepared by	Dated
SD 101; SD 201; SD 202; SD 203; SD 204; SD 205; SD 301; SD 302; SD 601	J	Deicke Richards	11 April 2014
Proposed Plan of Subdivision (Strata) – Ground Floor	E	Deicke Richards	11 April 2014
Proposed Plan of Subdivision (Strata) – First Floor	E	Deicke Richards	11 April 2014
Proposed Plan of Subdivision (Strata) – Second Floor	E	Deicke Richards	11 April 2014
Proposed Plan of Subdivision (Strata) – Basement Car Parking	E	Deicke Richards	11 April 2014
Figure 3	3	Whitehead & Associates	24 January 2014

In the event of any inconsistency between conditions of this development consent and the plans referred to above, the conditions of this development consent prevail.

The approved plans and supporting documents endorsed with the Council stamp and authorised signature must be kept on site at all times while work is being undertaken.

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Development Application No. 0304/14

Schedule of Conditions

Development in Accordance with Documents:

4. The development shall be undertaken in accordance with the following documents:

Planning Documentation:

- (1) Statement of Environmental Effects, Signature Hotel, Lot 1 DP1183009 Pacific Highway, Coffs Harbour, prepared by GHD and dated October 2013.
- (2) Advice Letter, prepared by GHD and dated 25 October 2013.
- (3) Advice Letter and attachments, prepared by GHD and dated 7 November 2013.
- (4) Advice Letter and attachments, prepared by GHD and dated 15 January 2014.
- (5) Advice Letter and attachments, prepared by GHD and dated 29 January 2014.
- (6) Advice Letter and attachments, prepared by GHD and dated 27 February 2014.
- (7) Advice Letter and attachments, prepared by GHD and dated 25 March 2014.

Environmental Assessment Documentation:

- (8) Acid Sulfate Management Plan, prepared by GHD, dated January 2014.

Inconsistency between Documents:

5. In the event of any inconsistency between:
- (1) The conditions of this approval and the drawings/documents referred to in conditions 3 and 4, the conditions of this approval prevail; and
 - (2) Any drawing/document listed in conditions 3 and 4 and any other drawing/document listed in conditions 3 and 4, the most recent document shall prevail to the extent of inconsistency.

DEMOLITION AND VEGETATION CLEARING WORKS

Hoardings and site security:

6. Appropriate hoardings shall be installed around the perimeter of the site prior to the commencement of demolition, site preparatory works and vegetation clearing works.

Notice to be given prior to commencement of demolition works:

7. Neighbouring property occupiers shall be given at least 48 hours written notice prior to the commencement of demolition, site preparatory works and vegetation clearing works. The notice shall include the name of the site / project manager, responsible managing company (if applicable), its address and a 24 hours contact number to respond to any enquiries, including dust, noise and traffic issues.

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Erosion and Sediment Control Plan:

8. An erosion and sediment control plan, detailing soil erosion and sediment control measures, shall be prepared by a qualified environmental or engineering consultant in accordance with the document Management Urban Stormwater – Soils & Construction Volume 1 (2004) by Landcom, prior to commencement of demolition, site preparatory works, site remediation or vegetation clearing works.

Erosion and Sediment Control:

9. Prior to commencement of works on the site erosion and sedimentation control measures are to be installed and operational including the provision of a “shake down” area where required.

Demolition Bond:

10. A damage deposit and administration fee as determined by Council’s Fees and Charges Schedule shall be lodged with Council as a bond to cover possible damage to Council’s property that may result during the removal of demolition material from the site. The deposit is to be lodged with Council and arrangements made for a dilapidation survey to be undertaken to assess the condition of Council property adjoining the land prior to the commencement of demolition work.

Hours of Work:

11. Demolition activities are to be limited to the following hours:

Monday to Friday	7.00 a.m. - 6.00 p.m.
Saturday	7.00 a.m. - 1.00 p.m. if inaudible from adjoining residential properties, otherwise 8.00 a.m. - 1.00 p.m.

No construction work is to take place on Sunday and Public Holidays.

Dust Control Measures:

12. Adequate measures shall be taken to prevent dust from affecting the amenity of the neighbourhood during demolition and vegetation clearing works. In particular, the following measures must be adopted:
 - (1) All materials shall be stored or stockpiled within the site;
 - (2) Stockpiles are to be managed so as to prevent dust nuisance occurring at the boundary of the site;
 - (3) All vehicles carrying spoil or rubble to or from the site shall at all times be covered to prevent the escape of dust or other materials;
 - (4) Cleaning of footpaths and roadways shall be carried out if required or directed by Council;

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Impact of Sub-surface Works – Aboriginal Objects:

13. In the event that future works during any stage of the development disturb Aboriginal Cultural materials, works at or adjacent to the material must stop immediately. Temporary fencing must be erected around the area and the material must be identified by an independent and appropriately qualified archaeological consultant. The Office of Environment and Heritage (OEH), Northern Aboriginal Heritage Unit and the Aboriginal Stakeholder groups must be informed. These groups are to advise on the most appropriate course of action to follow. Works must not resume at the location without the prior written consent of OEH and Northern Aboriginal Heritage Unit and the Aboriginal Stakeholder groups.

Contractors parking and loading/unloading arrangements:

14. All persons associated with the works are to park on site. All loading and unloading activities are to occur within the site.

Demolition:

15. All works, including the handling and disposal of materials containing asbestos, are to be undertaken in accordance with the relevant requirements of WorkCover NSW, the Work Health and Safety Act 2011 and Australian Standard AS 2601-2001 *“The Demolition of Structures”*.

All demolition material and wastes shall be assessed in accordance with NSW Environment Protection Authority Waste Classification Guidelines (2009) prior to being removed from the site. Materials classified as waste shall only be disposed of to an appropriate NSW Environment Protection Authority licensed facility. All waste building materials shall be recycled or disposed of to an approved waste disposal facility.

No waste materials shall be crushed or processed on the site.

No demolition materials shall be sold from the site.

No burning of materials is permitted on site.

Waste stockpiles shall be positioned a minimum of 20 metres from site boundaries and incorporate appropriate sediment and erosion controls or to alternate locations to Council's satisfaction.

The sewer drainage system shall be appropriately sealed to prevent ingress of water and debris into the Council's main.

Waste Contamination:

16. The exportation of waste (including fill or soil) from the site must be in accordance with the provisions of the *Protection of the Environment Operations Act 1997* and the Office of Environment & Heritage *“Waste Classification Guidelines 2009”*.

All potentially contaminated soil shall be managed in accordance with NSW Environment Protection Authority's Contaminated Sites Guidelines.

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Pre Clearing Procedures:

17. Prior to commencement of tree removal, a search for the presence of threatened fauna is to be conducted in the area before commencement of operations each day by a suitably qualified and experienced Ecologist.

Presence includes both physical presence within the proposed tree removal area and occurrence of fresh scat materials.

- a) All hollows shall be searched and all checks shall be carried out a minimum distance of 50m from the tree clearing area.
- b) Koala faecal pellets (scats) check is required within a three metres radius of the base of all Koala Feed Trees.
- c) If a threatened arboreal species is located, the tree must be identified (flagged with tape). No further action shall occur until the animal has moved on of its own accord. If after two nights the animal has not moved the NSW Office of Environment and Heritage should be contacted for further advice.
- d) Physical removal of the animal is not an option and shall not be attempted.
- e) All injured animals shall be reported to WIRES immediately. To secure any wildlife which may be accidentally injured during clearing process a blanket, heavy duty gloves and a large bin is required on-site (note the bin lid must have holes to permit air passage).
- f) WIRES contacts: Coffs Harbour/ Woolgoolga: (02) 6652 7119.

Note: In relation to Koalas such search should include both lower branches and upper canopy in all listed koala food species (Tallowood, Swamp Mahogany, Broad-leaved Paperbark, Flooded Gum, Blackbutt, Forest Red Gum, Small-fruited Grey Gum, Forest Oak).

Tree Protection Plan:

18. A Tree Protection Plan prepared in accordance with Australian Standard AS 4970-2009 '*Protection of Trees on Development Sites*' being submitted to Council prior to the commencement of any works.

The Plan shall be prepared by a qualified Arborist and should identify all significant indigenous native trees, including all trees to be retained and removed. The Plan should also include a protection strategy for retained vegetation, amelioration measures if works are to be undertaken within the critical root zone and details relating to removal techniques.

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PRIOR TO THE ISSUE OF CONSTRUCTION CERTIFICATE**Construction Certificate:**

19. No building work is to commence on site until a Construction Certificate has been issued for the work and Council has been notified that a Principal Certifying Authority has been appointed.

Note: Separate Construction Certificates are to be obtained for the **building works** and any **civil works**.

Details of Materials, Colours and Finishes:

20. Final design details of the proposed external materials and finishes, including schedules and a sample board of materials and colours (including an A3 photographic reproduction), shall be submitted to and approved by Council **prior to the issue of a Construction Certificate**.

Landscape Plan:

21. A detailed landscaping plan for all unbuilt-on areas of the site being submitted to and approved by Council **prior to issue of the Construction Certificate**.

The Plan must be prepared and certified by a qualified architect, landscape architect or professional landscape consultant. The Plan is to comply with Council's Landscaping Guidelines, and is to incorporate measures to ensure the maintenance and survival of the landscaping.

Note:

- i) The Plan is to detail landscape and pavement treatment, including consideration to porous pavement treatments for parking areas located between the service road and the building.
- ii) The Plan is to take into consideration the approved Vegetation Management Plan.

Equitable Access:

22. The development is to be provided with access and facilities for people with disabilities.

The applicants' attention is directed to the *Disability (Access to Premises - Buildings) Standards 2010* and the Building Code of Australia.

Details indicating compliance must be submitted and approved by the certifying authority **prior to the issue of a Construction Certificate**.

Stormwater Management Plan:

23. A Stormwater Management Plan complying with the relevant controls of Council's Water Sensitive Urban Design Policy being submitted to and approved by Council **prior to issue of the Construction Certificate**.

Please refer to the WSUD Information Sheet, Policy and Guideline available on Council's web site www.coffsharbour.nsw.gov.au.

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Road Design and Services (Building):

24. The following works:

- a) Roads and driveways;
- b) Pedestrian network;
- c) Stormwater drainage including WSUD requirements;
- d) Street tree planting;
- e) Sewer,

shall be provided to serve the development with the works conforming with the standards and requirements set out in Council's Development Design and Construction specifications and relevant policies (Water Sensitive Urban Design).

Notes:

- (1) Construct a service road in the Pacific Highway road reserve to provide:
 - access to the proposed development from the existing driveway from the Pacific Highway to the frontage of this development,
 - access from the development to the southbound lane of the Pacific Highway,
 - access to and from the main entrance and the basement car park entry points,
 - to provide for appropriate overflow parking within the service road, road reserve area.
- (2) Construct a driveway grade hardstand on the eastern side of the service road in front of the development to provide access to on-site parallel parking spaces inside that frontage.
- (3) The sewer main being relocated clear of the building in accordance with Council's 'Building in the Vicinity of Sewer Mains Policy'.

Plans and specifications are to be submitted to Council and a separate Civil Works Construction Certificate issued **prior to the issue of a Construction Certificate for the building works**. Plan submissions are to be accompanied by payment of prescribed fee.

Plans and specifications submitted later than six (6) months from the date of development consent shall comply with Council's current specifications at a date six (6) months prior to submission.

All work is to be at the developer's cost.

Car Parking Plan:

25. A car parking plan providing for 107 car parking spaces, designed in accordance with the provisions of Australian Standard AS 2890.1 "Parking Facilities: Off-Street Car Parking" and the provisions of AS/NZS 2890.6:2009 "Parking Facilities: Part 6: Off-Street parking for people with disabilities" being approved by Council prior to approval of the Construction Certificate Application.

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Trade Waste:

26. *An Application for Approval to Discharge Liquid Trade Waste* under Section 68 of the Local Government Act, being submitted and approved by *Coffs Harbour Water* **prior to release of the Construction Certificate.**

All trade waste discharges are to conform with effluent acceptance criteria as stipulated in Coffs Harbour Water's Trade Waste Policy (Schedule A) and or any standards applied by the NSW Department of Environment, Climate Change and Water for the discharge.

Please Note: Depending upon your individual circumstances, some trade waste pre-treatment equipment may need to be incorporated into the building work.

Coffs Harbour Water (Trade Waste Section) should be contacted for the issue of a Liquid Trade Waste Application Form. Please note once all the relevant information has been supplied, up to 30 days is required for approval.

Erosion and Sedimentation Control Plan:

27. An erosion and sediment control plan, together with a management strategy, detailing soil erosion and sediment control measures, shall be prepared by a qualified environmental or engineering consultant in accordance with the document *Managing Urban Stormwater – Soils & Construction Volume 1 (2004)* by Landcom. Details being submitted and approved by the Certifying Authority **prior to issue of a Construction Certificate.**

Fill:

28. Contour plans indicating the location of proposed fill areas in the development being submitted and approved by Council **prior to issue of the Construction Certificate.**

Please refer to the requirements of condition 119 "Flood Management" of this consent.

Contour plans are to include a clear description of impact of changes proposed on water movement both to and from the site on all adjacent land and to show stormwater discharge points.

Construction Waste Management:

29. **Prior to issue of a Construction Certificate**, the proponent shall submit to the satisfaction of Council a Site Waste Minimisation & Management Plan prepared by a suitably qualified person in accordance with Council's DCP Component C7.

The Plan shall include the following provisions: all waste building materials shall be recycled or disposed of to an approved waste disposal depot; no burning of materials is permitted on site.

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Food Premises - Fitout:

30. The food premises fitout is to comply with the Food Act 2003 and the National Food Safety Standard 3.2.3 (Food Premises and Equipment) and Australian Standard AS 4674-2004 (Design, Construction and Fitout of Food Premises). Design details of the food premises fitout, conforming to this Act and Standards, are to be submitted to and approved by the Accredited Certifier as part of the relevant Construction Certificate application.

Section 94 Monetary Contributions:

31. Payment to Council of contributions, at the rate current at the time of payment, towards the provision of the following public services or facilities:

Note 1 - The contributions are to be paid **prior to release of any Construction Certificate** unless other arrangements acceptable to Council are made.

Note 2 - The rates will be adjusted in accordance with the procedures set out in Council's Section 94 Contributions Plans. The applicant is advised to confirm the contribution rate applicable at the time of payment as rates are revised quarterly.

Note 3 - If the development is to be staged, contributions are to be paid on a pro rata basis in respect of each stage.

	\$ Per Room
- Coordination and Administration	135.02
- Coffs Harbour Road Network	740.09
- Surf Rescue Facilities	24.20
- District Open Space	285.28

	\$ Per Unit
- Coordination and Administration	270.03
- Coffs Harbour Road Network	1,480.17
- Surf Rescue Facilities	48.40
- District Open Space	570.56

The Section 94 contribution is currently \$50,936.94 for the 82 room and one managers unit development. This includes a credit of \$46,198.62 for 39 existing rooms and \$3,384.52 for 1 existing dwelling.

Contributions have been imposed under the following plans:

- Regional, District & Neighbourhood Facilities & Services 2013.
- Coffs Harbour Road Network 2013.
- Surf Rescue Facilities 2013.

The Contribution Plans may be inspected at the Council Administration Offices, 2 Castle Street, Coffs Harbour or on Council's web site, www.coffsharbour.nsw.gov.au.

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Water Management Act 2000:

32. **The Construction Certificate not being released** until a Certificate of Compliance pursuant to Division 5 of Part 2 of Chapter 6 of the Water Management Act 2000 evidencing that adequate arrangements have been made for the provision of water and sewerage services to and within the development is produced to Council.

The current contribution rate is:

	Amount/Motel Room	Total \$
Works to satisfy increased demand within the area for 82 motel rooms.		\$
Water	3,409.40	279,570.80
Sewer	3,260.35	<u>267,348.70</u>
Sub total		546,919.50
Less credit for 1 dwelling		19,056.44
Less Credit for 39 rooms		260,128.05
SUBTOTAL		267,735.01
Works to satisfy increased demand within the area for 1 managers unit		Per Unit
Water		6,818.80
Sewer		6,520.71
SUBTOTAL		13,339.51
Works to satisfy increased demand within the area for 128 square metres of commercial development – meeting room		
Water	29.03	3,715.84
Sewer	27.76	3,553.28
SUBTOTAL		7,269.12
Works to satisfy increased demand within the area for 304.85 square metres of commercial development - restaurant		
Water	97.41	29,695.44
Sewer	93.15	<u>28,396.78</u>
Sub total		58,092.22
Less credit for existing restaurant		47,641.12
SUBTOTAL		10,451.10

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Works to satisfy increased demand within the area for
88.15 square metres of commercial development - Office

Water	63.32	5,581.66
Sewer	60.55	5,337.48
 SUBTOTAL		 10,918.96
 <u>TOTAL AMOUNT PAYABLE</u>		 <u>309,713.70</u>

Noise Attenuation:

33. The proposed development shall be designed such that road traffic noise from the Pacific Highway is mitigated in accordance with the Development Near Rail Corridor & Busy Roads Interim Guideline (NSW Department of Planning 2008), Clause 102 of State Environmental Planning Policy (Infrastructure) 2007 and AS/NZS 2107:2000 (Acoustic-Recommended design sound levels and reverberation times for building interiors) A report detailing the proposed method of addressing the above requirements being submitted to and approved by Council **prior to issue of the Construction Certificate.**

PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS

Works within the Pacific Highway Road Reserve:

34. All works to be undertaken within the Pacific Highway road reserve being endorsed by the Roads and Maritime Services prior to commencement of construction with a written copy of this endorsement being provided to Council.

Site Notice:

35. Prior to commencement of works a site notice(s) shall be prominently displayed at the boundaries of the site for the purposes of informing the public of the development details including but not limited to:
- (1) Details of the Principal Contractor and Principal Certifying Authority for all stages of the development;
 - (2) The approved hours of work;
 - (3) The name of the site/project manager, the responsible managing company (if any), its address and 24 hour contact phone number for any inquiries, including construction noise complaints are to be displayed on the site notice; and
 - (4) To state that unauthorised entry to the site is not permitted.

Notice to be Given Prior to Commencement / Earthworks:

36. The Principal Certifying Authority and Council shall be given written notice, at least 48 hours prior to the commencement of earthworks on the site.

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37. The Principal Certifying Authority is to be given a minimum of 48 hours notice prior to any critical stage inspection or any other inspection nominated by the Principal Certifying Authority via the notice under Section 81A of the Environmental Planning and Assessment Act 1979.

Erosion and Sediment Control:

38. Prior to commencement of work on the site for each stage of the development, erosion and sedimentation control measures are to be installed and operational including the provision of a “shake down” area where required to the satisfaction of the Principal Certifying Authority.

Sanitary Plumbing and Draining:

39. A separate application is to be made to Council by the licensed plumber and drainer prior to the commencement of any sanitary plumbing and drainage work on site.

Water Meters:

40. A water reticulation plan is to be submitted to Coffs Harbour Water for approval prior to water fitting work commencing. Note, individual Council water meters are to be provided to all units and common areas.

DURING CONSTRUCTION**Approved Plans to be On-Site:**

41. A copy of the approved and certified plans, specifications and documents incorporating the conditions of approval and certification shall be kept on the site at all times and shall be readily available for perusal by any officer of Council or the Principal Certifying Authority.

Excavated Material:

42. Where excavated material is to leave the site it is to be disposed of at an approved landfill facility.

Alternatively, where it is proposed to dispose of the excavated material at another location no material is to leave the site until:

- Council has been advised in writing of the destination site(s); and
- Council has been advised of the quantity and makeup of the material; and
- Council has issued written approval for disposal to the alternate location(s).

Waste and Contamination:

43. The exportation of waste (including fill or soil) from the site must be in accordance with the provisions of the *Protection of the Environment Operations Act 1997* and the Office of Environment and Heritage “*Waste Classification Guidelines*”.

Any new information that comes to light during remediation, demolition or construction works which has the potential to alter previous conclusions about site contamination must be immediately notified to the Council and the Principal Certifying Authority.

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Construction Waste Management:

44. Compliance with the terms of approved site waste minimisation and management plan.

Fill:

45. All fill is to be placed in accordance with the requirements of Council's Development Design and Construction Specifications and the approved Sediment and Erosion Control Plan.

Importation of Fill:

46. The only fill material that may be received at the development is:
- a) Virgin excavated natural material (within the meaning of the Protection of the Environment Operations (POEO) Act);
 - b) Any other waste-derived material the subject of a resource recovery exemption under Clause 51A of the Protection of the Environment Operations (Waste) Regulation 2005 that is permitted to be used as fill material, excluding waste tyre.

Any waste-derived material the subject of a resource recovery exemption received at the development site must be accompanied by documentation as to the material's compliance with the exemption conditions and must be provided to the Principal Certifying Authority on request.

Erosion and Sediment Control:

47. All erosion and sediment control measures, as designed in accordance with the approved plans are to be effectively implemented and maintained at or above design capacity for the duration of the construction works for each stage of the project, and until such time as all ground disturbance by the works has been stabilised and rehabilitated so that it no longer acts as a source of sediment.

Dust Control Measures:

48. Adequate measures being taken to prevent dust from affecting the amenity of the neighbourhood during construction. In particular, the following measures must be adopted:
- (1) Physical barriers being erected at right angles to the prevailing wind direction or being placed around or over dust sources to prevent wind or activity from generating dust emissions;
 - (2) Earthworks and scheduling activities shall be managed to coincide with the next stage of development to minimise the amount of time the site is left cut or exposed;
 - (3) All materials shall be stored or stockpiled at the best locations;
 - (4) The work area being dampened slightly to prevent dust from becoming airborne but not to the extent that runoff occurs;
 - (5) All vehicles carrying spoil or rubble to or from the site shall at all times be covered to prevent the escape of dust or other materials;

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- (6) All equipment wheels shall be washed before exiting the site using manual or automated sprayers and drive through washing bays (if applicable);
- (7) Gates shall be closed between vehicle movements and shall be fitted with shade cloth; and
- (8) Cleaning of footpaths and roadways shall be carried out regularly by manual dry sweep or by use of a cleaning vehicle.

Hours of Work:

- 49. The hours of construction for all stages of the development, including delivery of materials to the site, shall be restricted as follows:
 - (1) Between 7:00am and 6:00pm , Mondays to Fridays inclusive;
 - (2) Between 7:00am and 1:00pm, Saturdays if inaudible from adjoining residential properties, otherwise between 8.00 a.m. and 1.00 p.m;
 - (3) No construction work on Sundays and Public Holidays.

Works may be undertaken outside these hours where:

- (1) The delivery of materials is required by the Police or other authorities; and/or
- (2) It is required in an emergency to avoid the loss of life, damage to property and/or to prevent environmental harm; and/or
- (3) The work is approved through the Construction Noise and Vibration Management Plan; and
- (4) Residents likely to be affected by the works are notified of the timing and duration of these works at least 48 hours prior to the commencement of works.

Disposal of Stormwater:

- 50. Any seepage or rainwater collected during construction shall not be pumped to the stormwater system unless separate prior approval is provided by Council.

Public Way to be Unobstructed:

- 51. The public way must not be obstructed by any materials, vehicles, refuse, skips or the like, under any circumstances.

Cultural Heritage:

- 52. In the event that future works during any stage of the development disturb Aboriginal Cultural materials, works at or adjacent to the material must stop immediately. Temporary fencing must be erected around the area and the material must be identified by an independent and appropriately qualified archaeological consultant. The Office of Environment and Heritage (OEH), Northern Aboriginal Heritage Unit and the Aboriginal Stakeholder groups must be informed. These groups are to advise on the most appropriate course of action to follow. Works must not resume at the location without the prior written consent of the OEH and Northern Aboriginal Heritage Unit and the Aboriginal Stakeholder groups.

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Acid Sulfate Soil Management Plan:

53. The Acid Sulfate Soil Management Plan prepared by GHD dated January 2014 and submitted with the application shall be implemented in full, with consideration to the following:
- (1) Consideration shall be given to impacts on adjacent areas of Potential Acid Sulfate Soils with regard to dewatering activities during earthworks and construction.
 - (2) Any stormwater collected within the bunded treatment area must not be discharged to the stormwater system without the results of quality testing which demonstrates that the water satisfies ANZECC and NEPM Guidelines, particularly with regard to suspended solids, pH, aluminium and related parameters (the water must not contain any visible sediments).
 - (3) All work undertaken on the site and with regard to implementing the Management Plan shall be undertaken in accordance with the sediment and erosion plan as per condition 8 of this approval.
 - (4) Approval for any variations/deviations from the Management Plan is to be sought from Council prior to implementation.

Floor Levels – Flood Impact:

54. The finished floor level of the ground floor of the building is to be a minimum of 5 metres Australian Height Datum. The basement car park is to be protected from flooding up to 4.5 metres Australian Height Datum. The gym and BBQ areas are to be constructed on piers at a minimum of 5 metres Australian Height Datum. A registered surveyor's certificate certifying levels is to be submitted to the Principal Certifying Authority prior to works proceeding beyond basement/ground floor construction.

Swimming Pool Fencing:

55. The immediate surrounds of the pool are to be enclosed with fencing and gate(s) complying with the *Swimming Pools Act 1992*.

Suitable temporary fencing being installed around the pool during construction to prevent unauthorised entry to the pool area. Temporary fencing is to remain in place until permanent fencing is installed.

Swimming Pool Fencing:

56. An inspection of the completed swimming pool barrier (complying with the *Swimming Pools Act 1992*) must be undertaken by the Principal Certifying Authority as soon as practicable after the barrier has been erected. No water shall be placed in the swimming pool unless appropriate temporary safety measures have been implemented pending the completion of a permanent complying safety barrier.

PRIOR TO ISSUE OF OCCUPATION CERTIFICATE OR COMMENCEMENT OF USE**Stormwater Management Certification:**

57. **Prior to the issue of an Occupation Certificate** the consultant design engineer shall issue a certificate to the Principal Certifying Authority to the effect that the stormwater treatment system has been installed and complies with the approved design.

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Road Design and Services:

58. The following works:

- a) Roads and driveways;
- b) Pedestrian network;
- c) Stormwater drainage including WSUD requirements;
- d) Street tree planting;
- e) Sewer,

being provided to serve the development with the works conforming with the standards and requirements set out in Council's Development Design and Construction specifications and relevant policies (WSUD).

These works are to be completed **prior to the issue of an Occupation Certificate**.

All work is to be at the developer's cost.

Access Works:

59. Sealed driveways being constructed over the footpath at right angles to the road in accordance with Council's standard drawings. Any existing driveways which are not required for the development are to be removed and the footpath reinstated. All such work is subject to a separate driveway application, fees and approval by Council.

These works are to be completed **prior to the issue of an Occupation Certificate** for the development.

Landscaping Works:

60. **Prior to the issue of an Occupation Certificate** a works as executed plan is to be submitted to the Principal Certifying Authority certifying that all landscape works have been carried out in accordance with the approved plan.

Food Premises – Registration:

61. The food premises being registered with Council and the NSW Food Authority **prior to the issue of an Occupation Certificate**.

Food Premises Fitout - Certification:

62. **Prior to the issue of an Occupation Certificate** the Principal Certifying Authority or a suitably qualified consultant shall issue a certificate to the effect that the food premises fitout works conform to the approved food premises fitout plans and specifications.

Food Premises - Food Safety Supervisor:

63. A Food Safety Supervisor being appointed and the NSW Food Authority being notified of such appointment **prior to the issue of an Occupation Certificate**.

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Car Parking Spaces:

64. 107 car parking spaces as shown on the plan approved in accordance with condition number 25 of this consent being provided on the development site **prior to the issue of an Occupation Certificate.**

All car parking and manoeuvring areas being constructed in accordance with the provisions of Australian Standard AS 2890.1 "Parking Facilities: Off-Street Car Parking" and the provisions of AS/NZS 2890.6:2009 "Parking Facilities: Part 6: Off-Street parking for people with disabilities".

Occupation Certificate:

65. A person must not commence occupation or use of the new building **prior to obtaining an Occupation Certificate** from the Principal Certifying Authority.

Liquid Trade Waste Approval:

66. Certification from the Trade Waste Section that a Liquid Trade Waste Approval has been granted and the pre-treatment equipment has been installed in accordance with the conditions of the approval is to be provided to the Principal Certifying Authority **prior to issue of the Occupation Certificate.**

Pool Waste Water (Sewer Areas):

67. All wastewater must be connected and disposed to Council's sewer main **prior to the issue of Occupation Certificate** via a suitable 100mm diameter gully trap. A minimum air gap of 100mm is to be provided between the discharge outlet and the gully grate.

Swimming Pool Notice / Resuscitation Chart:

68. A warning notice, incorporating information detailed in Clause 10 of the Swimming Pools Regulation 2008, must be permanently fixed and displayed in a prominent position within the pool surrounds area **prior to issue of an Occupation Certificate.**

Vegetation Management Plan:

69. The works (other than maintenance works) prescribed in the approved Vegetation Management Plan (VMP) being completed **prior to issue of the Occupation Certificate.** A report from the consultant who prepared the VMP or other suitably qualified consultant being submitted to the Principal Certifying Authority with the Subdivision Certificate application to the effect that the initial works have been completed in accordance with the approved VMP.

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PRIOR TO ISSUE OF SUBDIVISION CERTIFICATE**Certification – Inspection requirements under Section 30 Strata Schemes (Freehold Development) Regulation 2012:**

70. The **Subdivision Certificate for the strata plan not being released** until the Council or an Accredited Certifier issues a written certificate to the effect that:
- (i) The building and development common property areas around the building have been inspected by the relevant Council officer or Accredited Certifier; and
 - (ii) The floors, external walls and ceilings depicted in the proposed strata plan for the building correspond to those of the building as constructed; and
 - (iii) The floors, external walls and ceilings of the building as constructed correspond to those depicted in the building plans that accompanied the Construction Certificate for the building; and
 - (iv) Any facilities required by the relevant development consent (such as parking spaces, terraces and courtyards) have been provided in accordance with those requirements.

This certification is to accompany the application for Subdivision Certificate.

Bushfire Safety:

71. At the commencement of building works and in perpetuity the entire property shall be managed as an inner protection area (IPA) as outlined within section 4.1.3 and Appendix 5 of 'Planning for Bush Fire Protection 2006' and the NSW Rural Fire Service's document 'Standards for asset protection zones'.
72. To allow for emergency service personnel to undertake property protection activities, a defensible space that permits unobstructed pedestrian access is to be provided between the development and the bushfire hazard.
73. Water, electricity and gas are to comply with section 4.2.7 of 'Planning for Bush Fire Protection 2006'. In this regard an internal pillar fire hydrant and booster system, complying with AS 2419 — Fire Hydrant Installations, shall be installed so that no part of the development is greater than 70m from a hydrant.
74. Arrangements for emergency and evacuation are to comply with section 4.2.7 of 'Planning for Bush Fire Protection 2006'.
75. Construction of the accommodation units shall comply with Sections 3 and 5 (BAL 12.5) Australian Standard AS3959-2009 'Construction of buildings in bush fire-prone areas' and section A3.7 Addendum Appendix 3 of 'Planning for Bush Fire Protection'.
76. Construction on the northeast elevation of the restaurant/conference centre shall comply with Sections 3 and 7 (BAL 29) Australian Standard AS3959-2009 'Construction of buildings in bush fire-prone areas' and section A3.7 Addendum Appendix 3 of 'Planning for Bush Fire Protection'.

Development Application No. 0304/14**Schedule of Conditions**

77. Construction on the southwest, southeast and northwest elevation(s) of the restaurant/conference centre shall comply with Sections 3 and 8 (BAL 40) Australian Standard AS3959-2009 'Construction of buildings in bush fire-prone areas' and section A3.7 Addendum Appendix 3 of 'Planning for Bush Fire Protection'.
78. All new Class 10 structures as defined per the 'Building Code of Australia' attached to or within 10 metres of the accommodation or restaurant/conference centre shall be constructed in accordance with the appropriate bushfire construction requirements applicable to that building.
79. Landscaping to the site is to comply with the principles of Appendix 5 of 'Planning for Bush Fire Protection 2006'.

Certification (Construction Certificate):

80. The above works (as required by conditions 71 - 79) are to be completed **prior to the issue of Occupation Certificate**, with certification of satisfactory completion of works to accompany the application for Construction Certificate.

NSW Office of Water – S91 Water Management Act:

81. Prior to the commencement of any controlled activity (works) on waterfront land, the consent holder must obtain a Controlled Activity Approval (CM) under the Water Management Act from the NSW Office of Water. Waterfront land for the purposes of this DA is land and material in or within 40 metres of the top of the bank or shore of the foreshore identified.
82. The consent holder must prepare or commission the preparation of:
- (i) Vegetation Management Plan;
 - (ii) Erosion and Sediment Control Plan.
83. All plans must be prepared by a suitably qualified person and submitted to the NSW Office of Water for approval prior to any controlled activity commencing. The plans must be prepared in accordance with the NSW Office of Waters guidelines located at www.water.nsw.gov.au/Water-Licensing/Approvals/default.aspx.
- (I) Vegetation Management Plans;
 - (ii) Riparian Corridors;
 - (iii) Outlet structures.
84. The consent holder must (i) carry out any controlled activity in accordance with approved plans and (ii) construct and/or implement any controlled activity by or under the direct supervision of a suitably qualified professional and (iii) when required, provide a certificate of completion to the NSW Office of Water.

Development Application No. 0304/14**Schedule of Conditions**

85. The consent holder must ensure that no materials or cleared vegetation that may (i) obstruct flow, (ii) wash into the water body, or (iii) cause damage to river banks; are left on waterfront land other than in accordance with a plan approved by the NSW Office of Water.
86. The consent holder is to ensure that all drainage works (i) capture and convey runoffs, discharges and flood flows to low flow water level in accordance with a plan approved by the NSW Office of Water; and (ii) do not obstruct the flow of water other than in accordance with a plan approved by the NSW Office of Water.
87. The consent holder must stabilise drain discharge points to prevent erosion in accordance with a plan approved by the NSW Office of Water.
88. The consent holder must establish all erosion and sediment control works and water diversion structures in accordance with a plan approved by the NSW Office of Water. These works and structures must be inspected and maintained throughout the working period and must not be removed until the site has been fully stabilised.
89. The consent holder must ensure that no excavation is undertaken on waterfront land other than in accordance with a plan approved by the NSW Office of Water.
90. The consent holder must ensure that (i) river diversion, realignment or alteration does not result from any controlled activity work and (ii) bank control or protection works maintain the existing river hydraulic and geomorphic functions, and (iii) bed control structures do not result in river degradation other than in accordance with a plan approved by the NSW Office of Water.
91. The consent holder must establish a riparian corridor along Treefern and North Coffs Creeks in accordance with a plan approved by the NSW Office of Water.

NSW Office of Water – works requiring a license under the Water Act 1912:

92. Before commencing any works or using any existing works for the purpose of dewatering an approval under Part V of the Water Act 1912 must be obtained from the Department. The application for the approval must contain sufficient information to show that the development is capable of meeting the objectives and outcomes specified in these conditions.
93. An approval will only be granted to the occupier of the lands where the works are located, unless otherwise allowed under the Water Act 1912.
94. When the Department grants an approval, it may require any existing approvals held by the applicant relating to the land subject to this consent to be surrendered or let lapse.
95. All works subject to an approval shall be constructed, maintained and operated so as to ensure public safety and prevent possible damage to any public or private property.
96. All works involving soil or vegetation disturbance shall be undertaken with adequate measures to prevent soil erosion and the entry of sediments into any river, lake, water body, wetland or groundwater system.

Development Application No. 0304/14**Schedule of Conditions**

97. The destruction of trees or native vegetation shall be restricted to the minimum necessary to complete the works.
98. All vegetation clearing must be authorised under the Native Vegetation Conservation Act 1997, if applicable.
99. The approval to be granted may specify any precautions considered necessary to prevent the pollution of surface water or groundwater by petroleum products or other hazardous materials used in the construction or operation of the works.
100. A license fee calculated in accordance with the Water Act 1912 must be paid before a license can be granted.
101. If and when required by the Department, suitable devices must be installed to accurately measure the quality of water extraction or diverted by the works.
102. All water measuring equipment must be adequately maintained. It must be tested as and when required by the Department to ensure its accuracy.
103. The water extracted under the approval to be granted shall be used for the purpose of dewatering and for no other purpose. A proposed change in purpose will require a replacement license to be issued.
104. Works for construction of a bore must be completed within such period as specified by the Department.
105. Within two months after the works are completed the Department must be provided with an accurate plan of the location of the works and notified of the results of any pumping tests, water analysis and other details as are specified in the approval.
106. Officers of the Department or other authorised persons must be allowed full and free access to the works for the purpose of inspection and testing.
107. Any water extracted by the works must not be discharged into any watercourse or groundwater if it would pollute that watercourse.
108. The Department has the right to vary the volumetric allocation or the rate at which the allocation is taken in order to prevent the overuse of an aquifer.
109. The licensee must allow authorised officers of the Department, and it's authorised agents reasonable access to the licensed works with vehicles and equipment at any time for the purposes of:
 - i) inspecting the said work;
 - ii) taking samples of any water or material in the work and testing the samples.

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Development Application No. 0304/14**Schedule of Conditions**

110. The licensee shall within 2 weeks of being notified install to the satisfaction of the Department in respect of location, type and construction an appliance(s) to measure the quantity of water extracted from the works. The appliance(s) to consist of either a measuring weir or weirs with automatic recorder, or meter or meter(s) of measurement as may be approved by the Department. The appliance(s) shall be maintained in good working order and condition. A record of all water extracted from the works shall be kept and supplied to the Department upon request. The licensee when requested must supply a test certificate as to the accuracy of the appliance(s) furnished either by the manufacturer or by some person duly qualified.
111. The authorised work shall not be used for the discharge of polluted water into a river or lake otherwise than in accordance with the conditions of a licence granted under the protection of the Environment Operations Act 1997. A copy of the licence to discharge is to be provided to the Department.
112. The maximum term of this licence shall be twelve (3) months.
113. The authorised work shall not be used for the discharge of water unless the ph of the water is between 6.5 and 8.5, or the water has been treated to bring the ph to a level between 6.5 and 8.5 prior to discharge, or the water is discharged through the council's sewerage treatment system.
114. The licensee shall test the ph of any water extracted from the work prior to the commencement of discharge and at least twice daily thereafter and record the date, time and result of each test in the site log. A copy of the records of the ph testing is to be returned with the form 'AG'.
115. The work shall be managed in accordance with the constraints set out in an Acid Sulfate Soil Management Plan and Dewatering Management Plan approved by the Department.
116. The retention or holding pond must be lined with an impermeable material (such as clay or geotextile) to prevent seepage, leakage or infiltration of treated water.

OPERATIONAL MATTERS**Noise:**

117. Noise emanating from the premises shall at all times be in accordance with the provisions of the *Protection of the Environment (Operations) Act 1997*.

Swimming Pool Barrier:

118. Fences, gates, walls, etc. enclosing the general swimming pool area being maintained in good repair and condition at all times.

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Development Application No. 0304/14

Schedule of Conditions

Flood Management:

- 119. Existing ground levels are to be maintained between the basement footprint and the adjacent creeks.

The areas between the basement footprint and adjacent creeks are to be maintained free from large obstructions and in such a condition to permit free flow of flood waters at all times.

Vegetation Management Plan:

- 120. The maintenance works nominated in the approved Vegetation Management Plan being completed in accordance with the terms of this Plan.

ADVISORY NOTES

Disability Discrimination Act:

- 121. This application has been assessed in accordance with the NSW *Environmental Planning and Assessment Act 1979*. No guarantee is given that the proposal complies with the *Disability Discrimination Act 1992*. The proponent/owner is responsible to ensure compliance with this and other anti-discrimination legislation. Australian Standard AS 1428 Parts 2, 3, & 4 provides the most comprehensive technical guidance under the *Disability Discrimination Act 1992* currently available in Australia.

**JRPP - ASSESSMENT REPORT FOR DEVELOPMENT APPLICATION NO. 332/14
- LOT 2 DP 607441, 211 PACIFIC HIGHWAY, LOT 31 DP 716388, 1 – 7 HURLEY
DRIVE, LOT 1 DP 616809, 8 TOLHURST PLACE AND LOT 3 DP 607441, PUBLIC
RESERVE PACIFIC HIGHWAY, COFFS HARBOUR**

Purpose:

**Hardware & Building Supplies Premises, Alterations to Vehicle Sales Premises
(Stormwater Drainage Works and Boundary Adjustment)
Lot 2 DP 607441, 211 Pacific Highway, Lot 31 DP 716388, 1 – 7 Hurley Drive, Lot 1
DP 616809, 8 Tolhurst Place and Lot 3 DP 607441, Public Reserve Pacific
Highway, Coffs Harbour**

To advise Councillors that a development assessment report for Development Application 332/14 has been lodged with the Joint Regional Planning Panel (Northern Region). A copy of the development assessment report that has been provided to the Panel is appended to this report. It is recommended that the content of this report be noted.

Description of Item:

• **Proposed Development**

Development Application 332/14 is an application for a hardware and building supplies premises (proposed new Masters Home Improvement Store) and alterations to an existing vehicle sales and hire premises (Geoff King Motors). The application includes proposed stormwater drainage infrastructure works and a boundary adjustment.

The development site consists of four land parcels known as;

- 211 Pacific Highway (Lot 2, DP 607441)
- 1 – 7 Hurley Drive (Lot 31, DP 716388)
- 8 Tolhurst Place (Lot 1, DP 616809)
- Public Reserve Pacific Highway (Lot 3, DP 607441)

The application was advertised and notified in accordance with the provisions of Council's Development Control Plan on 13 November 2013 with a submission period from 14 November 2013 to 27 November 2013. Two submissions were received as a result of original notification of the application.

The development assessment report provides a complete evaluation of the proposal including site and development particulars, results of community consultation, consideration of statutory requirements and provides a recommendation as required by the reporting and development assessment processes specified for Joint Regional Planning Panel applications.

- **Joint Regional Planning Panel Determination**

This application will be determined by the Joint Regional Planning Panel (Northern Region) and not Council. This is specified by requirements of *State Environmental Planning Policy (State and Regional Development) 2011* and the parameters of Schedule 4A of the *Environmental Planning and Assessment Act*. The relevant provision of Schedule 4A is clause 4 *Council related development over \$5 million*; "Development that has a capital investment value of more than \$5 million if... council is the owner of any land on which the development is to be carried out".

The application proposes works over Lot 3, DP 607441 which is a Council owned reserve; Council has consented to lodgement of the development application as owner of the land. This property is a strip of land that runs parallel to the Pacific Highway. Only stormwater drainage infrastructure works are proposed over this land parcel.

- **Process for Development Applications Determined by the Joint Regional Planning Panel**

Development applications which are determined by the Joint Regional Planning Panel are lodged with Council in the normal manner. Staff assess these applications following the normal process and as required by the Environmental Planning and Assessment Act and Regulations.

Staff then provide a development assessment report to the Panel for determination.

- **Assessment Report**

The Assessment Report is provided to the Panel Secretariat. The report is placed on Council's website (via a link) and the Regional Panel website prior to the Regional Panel meeting. A copy of the Assessment Report is appended to this report.

- **The Role of Councillors**

A number of operational procedures and fact sheets have been developed by the Joint Regional Planning Panel. The following information is relevant to Councillors role in applications determined by the Panel.

"The elected council has no role in approving, authorising or endorsing the assessment report."

"The elected Council has the opportunity to provide a submission to the Regional Panel on matters being determined in its area. Councillors (except any councillors that have been appointed to the Regional Panel) as members of the council, can determine to provide a submission to the Regional Panel about the matter to be determined. The Council is able to be represented at the Regional Panel meeting to address the meeting about its submission."

Recommendation:

That the content of this report be noted.

JOINT REGIONAL PLANNING PANEL REPORT

DEVELOPMENT ASSESSMENT REPORT DEVELOPMENT APPLICATION NO. 332/14

Hardware & Building Supplies Premises, Alterations to Existing Vehicle Sales Premises (Stormwater Drainage Works & Boundary Adjustment)

211 Pacific Highway (Lot 2, DP 607441), 1 – 7 Hurley Drive (Lot 31, DP 716388), 8 Tolhurst Place (Lot 1, DP 616809), Council Reserve (Lot 3, DP 607441), Coffs Harbour

PURPOSE:

This report provides an assessment of Development Application 332/14 for a hardware and building supplies premises and alterations to an existing vehicle sales premises (including stormwater drainage infrastructure and a boundary adjustment).

Approval of the application subject to conditions is recommended.

THE PROPOSAL

The proposed development is a hardware and building supplies premises and alterations to an existing vehicle sales (and hire) premises (including stormwater drainage infrastructure and a boundary adjustment).

The hardware and building supplies premises is a roughly rectangular building with approximate dimensions of 160 metres by 70 metres. It is proposed as a Masters Home Improvement Store. The internal covered floor area is 10 749 m² which is comprised of the following components:

- Plant nursery area 1246 m²
- Main floor area 6355 m²
- Administration area 360 m²
- Trade area 2125 m²
- Receiving area 662 m²

There is also a covered loading/unloading area of 285 m².

The highest point of the building is eleven metres. A total of 290 car parking spaces are proposed. Landscaping is proposed for the site, mostly located along the Pacific Highway frontage. A pylon sign of eleven metres by four metres is proposed at the frontage of the site. Other signs are proposed on the building itself in various locations.

Proposed operating hours are 6am to 9pm seven days a week. The development will receive stock deliveries during business hours. There is a manoeuvring area on site so that delivery vehicles can enter the site, unload and then leave in a forward direction.

The proposal also includes significant changes to existing stormwater drainage infrastructure. These changes necessitate a property boundary alteration and alterations to the existing vehicle sales and hire premises known as Geoff King Motors. The site contains an open drain which allows stormwater to flow from the Pacific Highway (and other land further west of the site) to existing stormwater drainage infrastructure to the east of the site in an adjoining public reserve. There is an easement over the existing drain which 'protects' Council's interest in this infrastructure.

It is proposed to move the easement, approximately fifteen metres to the north and reconstruct this stormwater drainage infrastructure as a new culvert consisting of two cells five metres wide by 1.5 metres high. The area over the culvert will be used as carparking and manoeuvring area but will remain as an overland flow path. This will allow construction of part of the Masters Home Improvement Store over the area of the existing easement which will become redundant.

To accommodate the new building and the altered stormwater drainage infrastructure arrangement it is proposed to alter the common boundary between the Geoff King Motors site and the site of the proposed Masters Home Improvement Store so that all of the new building (Masters or Geoff King), are contained to one lot. The proposed easement and stormwater drainage infrastructure will be located over both lots. Other proposed property title alterations include:

- dedication of land for road and intersection works
- consolidation of allotments so that the Masters Home Improvement Store is located on one lot
- easement over the Geoff King Motors property (in favour of Masters) for egress of fire trucks
- easement over a very small section of the Masters Home Improvement Store property (in favour of Geoff King Motors) for car parking

A plan of all proposed property title alterations is provided in Attachment A.

The alterations to the existing vehicle sales premises known as Geoff King Motors involves removing an existing vehicle service area (398 m²) and showroom area (96 m²) and 39 existing car parking spaces. This will be replaced by an additional vehicle service area (165 m² to the east of the existing area) and an additional showroom area (77 m² to the west of the existing area). Carparking will be relocated so that all carparking numbers will be retained.

Landform modification works are proposed that will level the site generally and raise the lowest part of the site by approximately one metre. There will be some retaining works on the eastern property boundary.

THE SITE:

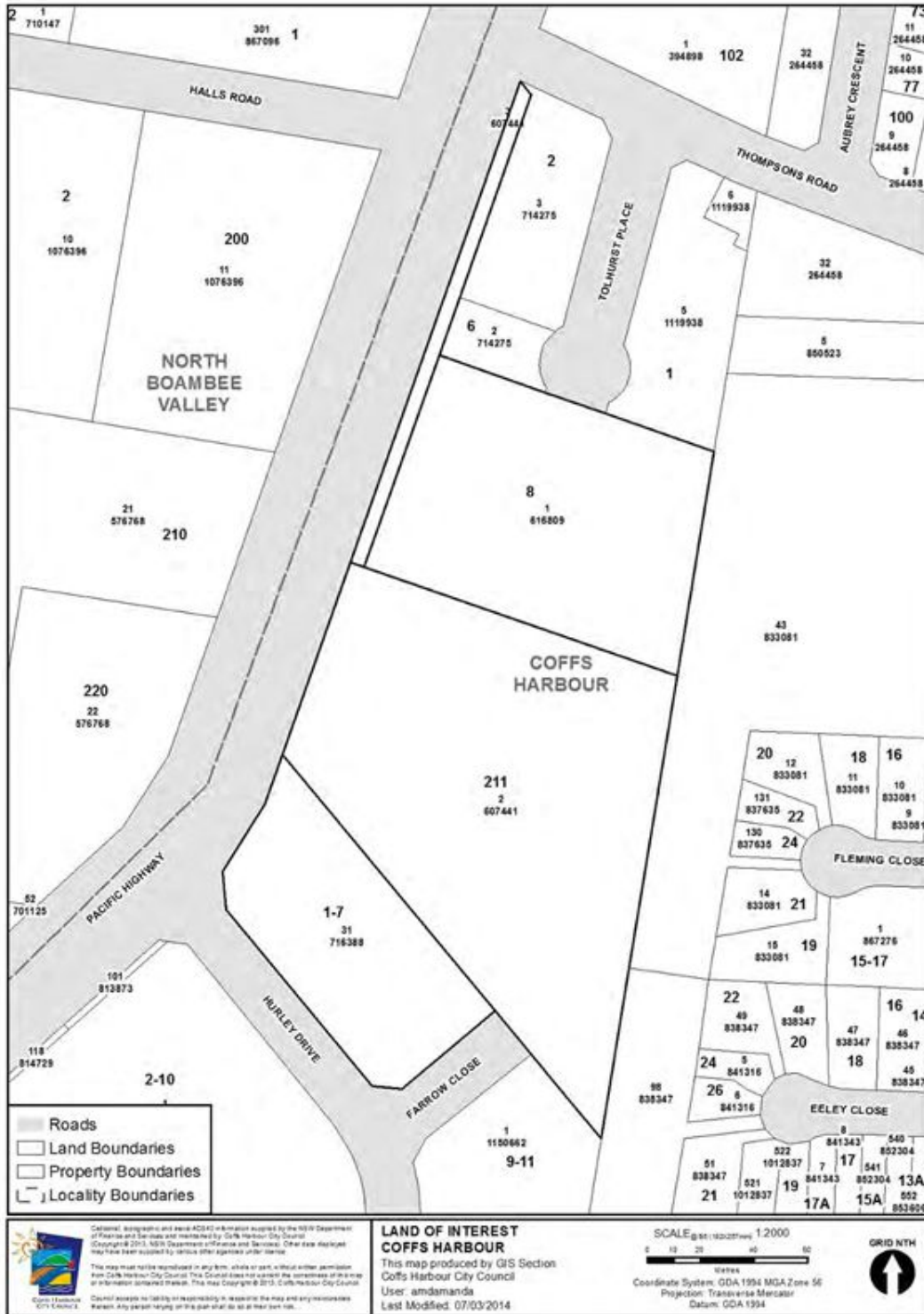
The development site consists of four land parcels known as:

- 211 Pacific Highway (Lot 2, DP 607441)
- 1 – 7 Hurley Drive (Lot 31, DP 716388)
- 8 Tolhurst Place (Lot 1, DP 616809)
- Council Reserve Pacific Highway (Lot 3, DP 607441)

The site is located approximately 1.6 kilometres from the Coffs Harbour City Centre. The Pacific Highway adjoins the west of the site and a public reserve is located to the east of the site. Lot 31, DP 716388 (1 – 7 Hurley Drive) also has frontage to Hurley Drive and Farrow Close.

The majority of the proposed hardware and building supplies premises will be built over 211 Pacific Highway (Lot 2, DP 607441) and 1 – 7 Hurley Drive (Lot 31, DP 716388). Eight Tolhurst Place (Lot 1, DP 616809) is the site of the existing vehicle sales and hire premises (known as Geoff King Motors) and Lot 3, DP 607441 is a Council owned property that runs along the frontage of the Pacific Highway.

No. 211 Pacific Highway (Lot 2, DP 607441) and No. 1 – 7 Hurley Drive (Lot 31, DP 716388) is zoned IN1 General Industrial under Coffs Harbour Local Environmental Plan 2013. No. 8 Tolhurst Place (Lot 1, DP 616809) and Council Reserve (Lot 3, DP 607441) is zoned B6 Enterprise Corridor under Coffs Harbour Local Environmental Plan 2013.





CONSULTATION:

Statutory Advertising and Notification

The application was advertised and notified in accordance with the provisions of Council's Development Control Plan on 13 November 2013 with a submission period from 14 November 2013 to 27 November 2013.

Two submission were received.

State Government Referrals

The application was referred to NSW Roads and Maritime Services, NSW Police Service and NSW Office of Water for comment. Only NSW Roads and Maritime Services raised issues of concern with the proposed development. An amended traffic impact assessment report was provided by the applicant in response to the concerns raised. The development is now considered satisfactory with respect to the issues raised subject to imposition of some conditions of development consent. The issue of traffic is considered further in the issues section of this report.

Council Departments

Council internal departments have provided comment on the development proposal and their recommended conditions/actions have been incorporated into the evaluation process. No comments were provided that prevent approval of the application.

Further Consultation

Council received a submission from the owners and operators of the business known as Ryans Bus Service. The 'Ryans Bus Depot' is located to the south of the development site adjoining Farrow Close. Council also received a submission from the Dealer Principal for Brown and Hurley Coffs Harbour. 'Brown and Hurley' is also located to the south of the site on the other side of Hurley Drive. Both submissions raised issues of traffic, traffic movement and car-parking in the area.

Council staff met separately with representatives from both these companies to discuss their concerns and provide them with further amendments to the development application. They were both provided with an additional opportunity to make a further submission on the application. Council received a further submission from Ryans Bus Service. No further submission was received from Brown and Hurley.

STATUTORY MATTERS:

The following Environmental Planning Instruments are relevant to assessment of this application.

- State Environmental Planning Policy No 55 - Remediation of Land
- State Environmental Planning Policy No 64 - Advertising and Signage
- State Environmental Planning Policy No 71 - Coastal Development
- State Environmental Planning Policy (Infrastructure) 2007
- State Environmental Planning Policy (State & Regional Development) 2011
- Coffs Harbour Local Environmental Plan 2013

Coffs Harbour Development Control Plan 2013 is relevant to assessment of this application.

The application is identified as “regional development” under State Environmental Planning Policy (State and Regional Development) 2011 and as a consequence the application is to be determined by the Joint Regional Planning Panel (Northern Region).

Section 79C of the Environmental Planning & Assessment Act 1979 specifies the matters which a consent authority must consider when determining a development application. The consideration of matters is limited in so far as they must be of relevance to the particular application being examined. All of the planning instruments and development control plans specified above are considered in detail in the Section 79C Evaluation provided Appended to this report.

ISSUES:

Traffic

Entry to the development is proposed from a slip-lane directly off the Pacific Highway and from Farrow Close. All egress from the site will be via Farrow Close. The development will result in additional traffic on Farrow Close, Hurley Drive and the Pacific Highway/Hurley Drive intersection.

The proposal, involving 290 car parking spaces, is identified as ‘traffic generating development’ under State Environmental Planning Policy (Infrastructure) 2007 and was consequently referred to the NSW Roads and Maritime Services for review and comment. The Service raised several concerns in response.

Following public exhibition, Council received two submissions on the application. Both raised concerns about traffic movement and carparking in the area.

Following the initial notification period and receipt of the response from NSW Roads and Maritime Services, the applicant provided an amended traffic impact assessment and proposed alterations to the development to address potential traffic impacts. The alterations focus on the entry/egress to the site from Farrow Close and the existing traffic regulation arrangement in Farrow Close and Hurley Drive. In summary the alterations include:

- Egress from the site moved (slightly) to the north on Farrow Close
- Addition of traffic islands within Farrow Close (at the entry/egress point)
- Kerb protection on the east and west corners of the Hurley Drive/Farrow Close intersection
- Median island to the Hurley Drive/Farrow Close intersection
- ‘No Parking’ regulations on the southern side of Hurley Drive (from the intersection with the Pacific Highway to the intersection with Farrow Close).
- ‘Keep Clear’ marking on the eastern side of Farrow Close (across the driveway of ‘Ryan’s Bus Service Depot’)
- Reconstruction of the driveway to ‘Ryans Bus Service Depot’.

The NSW Roads and Maritime Services provided further response that their concerns with the proposal ‘have now been addressed’ subject to the recommendations of the traffic impact assessment being carried out. The recommendations included the following works:

- Extension of the right turn bay from the Pacific Highway into Hurley Drive to 100 metres storage length; and
- Provision of two lanes 60 metres in length on the Hurley Drive approach to the traffic signals.

These works are required as a condition of development consent.

The amended entry/egress arrangement and proposed alterations to traffic regulation in Farrow Close and Hurley Drive has the advantages of:

- Clear delineation of traffic movement
- Increased vehicle queue area for vehicles exiting the development
- Vehicles keeping clear of the driveway crossover for Ryan's Bus Depot.
- Improved sight distances at the intersection of Hurley Drive and Farrow Close
- Less restricted traffic movement on Hurley Drive.

The proposed development is now considered satisfactory with respect to traffic matters subject to imposition of conditions of development consent.

Flooding

The major drainage / flooding work involved in this development application is the upgrade and relocation of drainage channel through the development site. The existing channel is a mixture of concrete lined and open channels. The open channel section has variable cross section and less capacity than the lined portion and also requires regular ongoing maintenance.

The proposed channel will be concrete boxed culverts with an increased capacity compared to the existing channel arrangement. The box culverts will be constructed within a drainage easement that will prohibit structures in the easement maintaining the overland flow path through the development site.

The proposed drainage / flood works satisfy the 'Flood planning' provisions of Coffs Harbour Local Environmental Plan 2013 and council's 'Floodplain Development and Management Policy'. A detailed assessment of the proposed works have been undertaken and there is no adverse flood impact predicted from the works. Flood levels and flood behaviour in the area is maintained in similar regime to existing conditions with no significant increase in flood risk to life or the environment.

Potential Amenity Impacts

A public reserve adjoins the development site to the east but further to the east of this reserve (approximately 30 metres from the development site) is a residential area. The development has potential to impact on the amenity of residents in this area.

An acoustic assessment was provided with the application. This report has been considered by Council's Environmental Health section and subject to some further clarification of matters within the report by the acoustic consultant, the development is considered acceptable with respect to noise.

A number of proposed conditions address potential amenity impact. These include conditions relating to;

- Hours of Operation
- Hours for Deliveries
- Control of External Lighting
- Noise Attenuation
- Noise Control

It is considered that the development is unlikely to result in any unacceptable amenity impacts with imposition of these conditions.

SUMMARY:

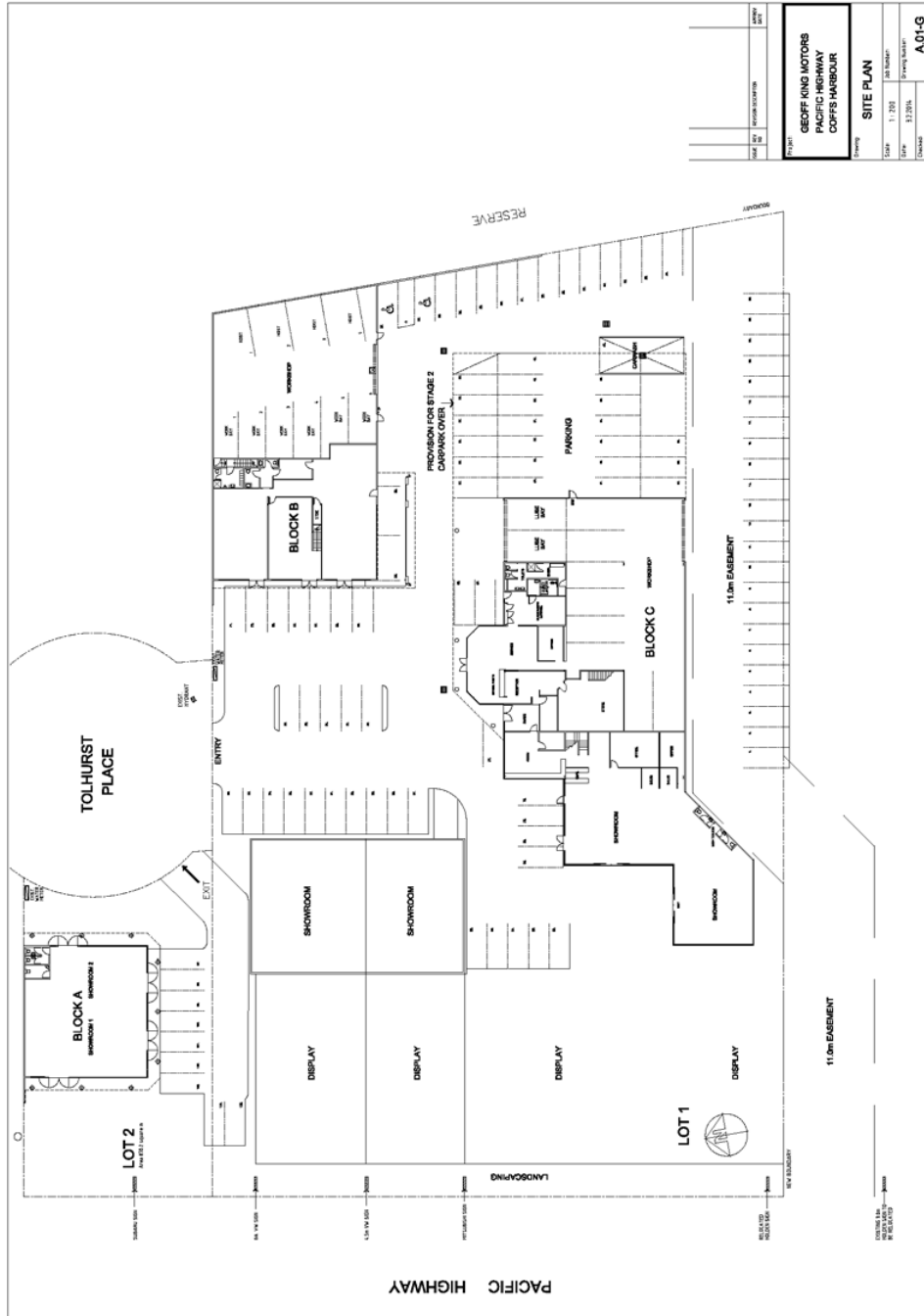
The proposal represents a significant commercial development in Coffs Harbour.

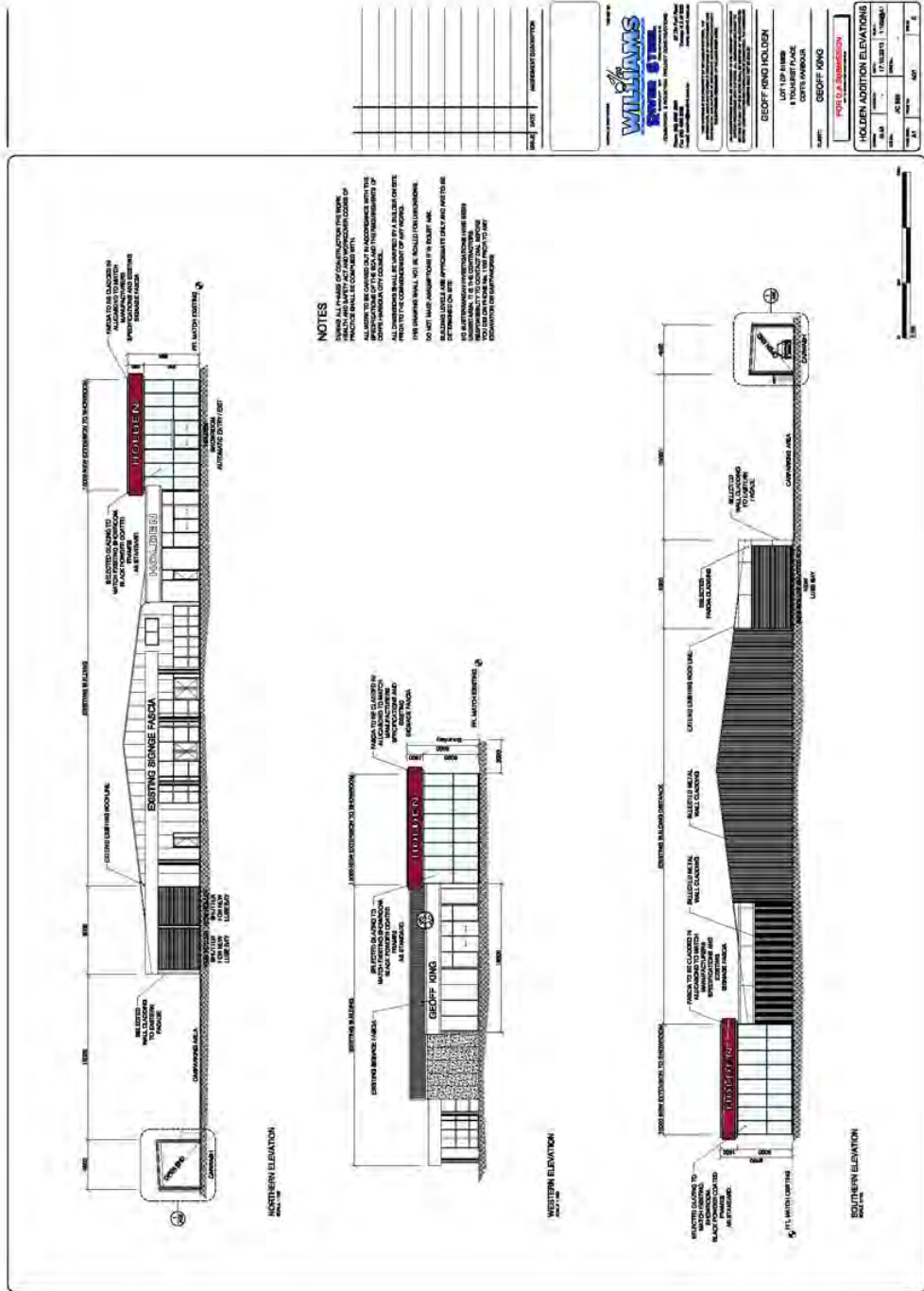
The proposed development is consistent with current planning controls that apply to the site. The main issues for the development are traffic, flooding and potential amenity impacts. The application is considered suitable for approval subject to conditions

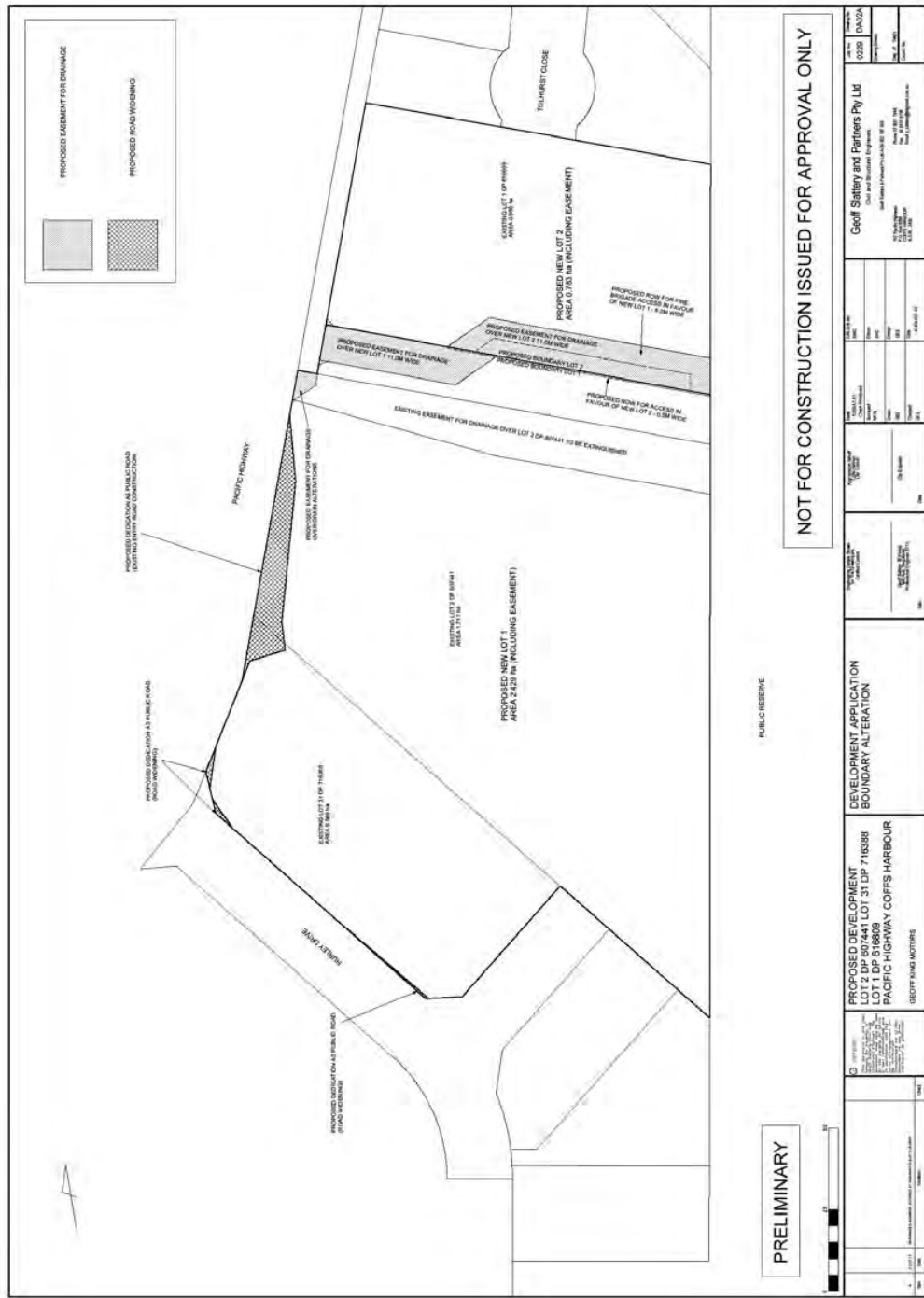
RECOMMENDATION:

- 1. That Development Application No. 332/14 for hardware & building supplies premises, alterations to existing vehicle sales premises (including stormwater drainage works & boundary adjustment) at 211 Pacific Highway (Lot 2, DP 607441), 1 – 7 Hurley Drive (Lot 31, DP 716388), 8 Tolhurst Place (Lot 1, DP 616809), Public Reserve (Lot 3, DP 607441) Coffs Harbour, be approved subject to conditions as appended to this report.**
- 2. That persons who have made submissions on the application be informed of the determination.**

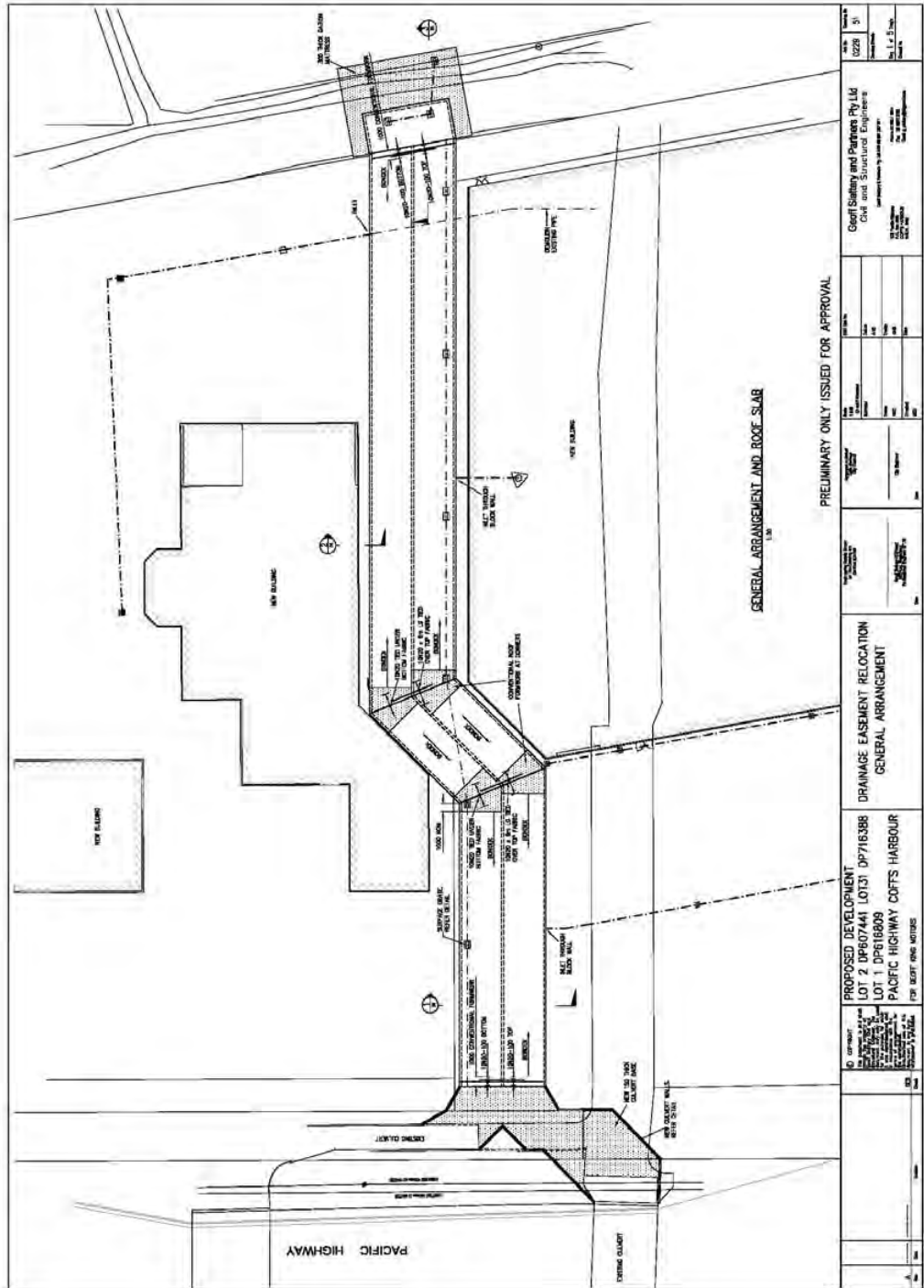
JRPP Attachment A







JRPP Attachment A



**Section 79C Evaluation
Development Application 332/14**

a. the provisions of,

i. any environmental planning instrument, and

• ***State Environmental Planning Policy No 55—Remediation of Land***

This state policy requires that the consent authority must not consent to the carrying out of any development unless it has considered whether the land is contaminated.

The land is not considered to be contaminated.

• ***State Environmental Planning Policy No 64—Advertising and Signage***

8 Granting of consent to signage

This state policy stipulates that the consent authority must not grant development consent to an application to display signage unless the consent authority is satisfied:

- a. that the signage is consistent with the objectives of the Policy (as set out in clause 3(1)(a))
- b. that the signage satisfies the assessment criteria specified in Schedule 1 of the policy

In accordance with the objectives of the policy, the proposed signage is considered compatible with the desired amenity and visual character of the area, that it provides effective communication in suitable locations, and is of high quality design and finish.

The proposed signage is considered acceptable with respect to all of the assessment criteria specified in Schedule 1.

• ***State Environmental Planning Policy (SEPP) No 71 - Coastal Development***

The proposed development is considered to be consistent with the aims of the policy and satisfies the relevant matters for consideration and development control provisions. Clauses of particular relevance are discussed further below:

Clause 7 – Application of Clause 8 Matters

Clause 7 requires that the consent authority take matters as listed in Clause 8 into consideration when determining development applications. Clause 8 matters have been taken into consideration in the assessment of the proposed development.

- The proposal is considered to meet the aims of the Policy.
- The proposal will not impede or diminish public access to and along the coastal foreshore.
- The development is considered suitable given its type, location and design and its relationship with the surrounding area.
- There are no matters pertaining to aboriginal cultural heritage of relevance for assessment of the application.

JRPP Attachment B

- There are no matters pertaining to items of heritage, archaeological or historic significance of relevance for assessment of the application.
- The proposed development will not adversely impact upon the scenic quality of the surrounding locality.
- The development is unaffected by issues of coastal hazards.
- The proposal will not result in significant impacts to flora and fauna present.

Clause 16 – Stormwater

Clause 16 specifies that the consent authority must not grant consent to development where stormwater will, or is likely to, be discharged untreated into the sea, a beach, an estuary, a coastal lake, a coastal creek or other similar body of water.

Stormwater will be directed to Council's reticulated stormwater system and the development must accord with the requirements of Council's WSUD (Water Sensitive Urban Design) Policy. This is required by a condition of development consent. The proposed development is considered satisfactory with imposition of this condition.

- **State Environmental Planning Policy (Infrastructure) 2007**

Relevant provisions of this state policy are Clause 101 *Development With Frontage To Classified Road* and Clause 104 *Traffic-Generating Development*.

Clause 101 stipulates that the consent authority must not grant consent to development on land that has a frontage to a classified road unless it is satisfied as to a number of specified matters. Clause 104 stipulates that the consent authority must give written notice of the application to the RTA (now Roads and Maritime Services (RMS)) and must take into consideration any submission that the RTA provides in response.

The application was referred to the NSW Roads and Maritime Services (RMS) who expressed concern about the development in an initial response. This resulted in an amended traffic impact assessment report that the RMS has provided further comment on.

The RMS has commented in general on all those matters specified in Clause 101 and Clause 104. The comments have been considered in the assessment of the application and incorporated as conditions of development consent as required.

- **State Environmental Planning Policy (State & Regional Development) 2011**

Clause 20 and 21 of this policy state that Council consent functions are to be exercised by regional panels for developments of a class or description included in Schedule 4A of the *Environmental Planning and Assessment Act*.

The relevant provision of Schedule 4A is clause 4 *Council related development over \$5 million*; "Development that has a capital investment value of more than \$5 million if... council is the owner of any land on which the development is to be carried out".

The application proposes works over Lot 3, DP 607441 which is a Council owned reserve; Council has consented to lodgement of the development application as owner of the land. This property is a strip of land that runs parallel to the Pacific Highway. Only stormwater drainage infrastructure works are proposed over this land parcel.

JRPP Attachment B

As a result the application will be determined by the Joint Regional Planning Panel (Northern Region) and not Council.

- ***Coffs Harbour Local Environmental Plan 2013***

2.2 Zoning of land to which Plan applies

No. 211 Pacific Highway (Lot 2, DP 607441) and No. 1 – 7 Hurley Drive (Lot 31, DP 716388) is zoned IN1 General Industrial under Coffs Harbour Local Environmental Plan 2013. No. 8 Tolhurst Place (Lot 1, DP 616809) and Public Reserve Pacific Highway (Lot 3, DP 607441) is zoned B6 Enterprise Corridor under Coffs Harbour Local Environmental Plan 2013.

2.3 Zone objectives and Land Use Table

The proposed development (the Masters Home Improvement Store) meets the definition of a Hardware and Building Supplies Premises. The Geoff King Motors development meets the definition of a vehicle sales and hire premises. Both uses are permissible in both the B6 Enterprise Corridor zone and the IN1 General Industrial zone.

4.1 Minimum subdivision lot size

There is no minimum lot size specified in the minimum lot size map. There are no matters to consider under this provision.

4.3 Height of buildings

This clause specifies that the height of a building on any land is not to exceed the maximum height shown for the land on the Height of Buildings Map.

The height of Buildings Map for the development site specifies

- 8.5 metres for 8 Tolhurst Place (Lot 1, DP 616809) and Public Reserve Pacific Highway (Lot 3, DP 607441) and
- 11 Metres for 211 Pacific Highway (Lot 2, DP 607441) and 1 – 7 Hurley Drive (Lot 31, DP 716388)

The proposed development meets these maximum heights.

4.4 Floor space ratio

This clause specifies that the maximum floor space ratio for a building on any land is not to exceed the floor space ratio shown for the land on the Floor Space Ratio Map.

The Floor Space Ratio Map for the development site specifies a 0.8 to 1 floor space ratio. The proposed development meets this requirement.

5.5 Development within the coastal zone

The matters under this clause have been addressed under State Environmental Planning Policy 71 – Coastal Development

7.1 Acid sulfate soils

The proposed development is not expected to result in works that will require preparation of an acid sulphate soils management plan in accordance with the provisions of this clause.

7.2 Earthworks

This clause specifies a number of matters that must be considered for development proposals that involve earthworks. The development is considered satisfactory on consideration of those matters.

7.3 Flood planning

The site is considered to have land at or below a flood planning level. The proposed development is considered satisfactory with respect to the number of matters specified in this clause.

The major drainage / flooding works involved in this development application is the upgrade and relocation of drainage channel through the development site. The existing channel is mixture of concrete lined and open channel. The open channel section has variable cross section and less capacity than the lined portion and also requires regular ongoing maintenance.

The proposed channel will be concrete boxed culverts with an increased capacity compared to the existing channel arrangement. The box culverts will be constructed within a drainage easement that will prohibit structures in the easement maintaining the overland flow path through the development site.

The proposed drainage / flood works satisfy the provisions of this clause and council's 'Floodplain Development and Management Policy'. A detailed assessment of the proposed works have been undertaken and there is no adverse flood impact predicted from the works. Flood levels and flood behaviour in the area is maintained in similar regime to existing conditions with no significant increase in flood risk to life or the environment.

7.11 Essential services

All services that are essential for the development are available and adequate as required by this provision.

7.12 Design excellence

This clause only applies to development in certain zones, including the B6 Enterprise Corridor zone. For the proposed development this is the alterations/additions to the Geoff King Motors operation.

The proposed development addresses the design excellence provisions of this Plan. The development is contemporary in design and style, incorporating a mix of external finishes. Existing view corridors are not adversely affected by the proposed development. The proposed development is compatible with the context and land use mix of the locality and the intention for the desired future character of the area as guided by the Coffs Harbour Local Environmental Plan and Development Control Plan 2013. The development is consistent with Council's controls that relate to building bulk, mass, modulation of buildings and solar access. The development addresses the public domain and pedestrian movement.

7.13 Central business district

This clause requires the primacy of the Coffs Harbour CBD to be considered. It is considered that the proposed development will maintain the primacy of the CBD as the principal business, office and retail hub of the Coffs Harbour City.

ii. The provisions of any draft environmental planning instrument

There are no draft environmental planning instruments that require consideration.

iii. any Development Control Plan (DCP)

- **Coffs Harbour Development Control Plan 2013**

A2 - Notification and Public Participation

The proposed development has been advertised and notified in accordance with the requirements of this component. Two submissions were received.

B1 - Subdivision Requirements

There are no specific requirements of this component that relate to the subdivision of land in a B6 Zone or an IN1 zone.

B3 – Business Development Requirements

This Component relates to business development in the Coffs Harbour Local Government Area that is located outside of the Coffs Harbour City Centre.

There are no specific building setbacks specified but these must be assessed on merit having regard to streetscape, amenity of surrounding properties, and setbacks of neighbouring development. The proposed development is considered acceptable with respect to these matters. There are no further requirements of this DCP component.

B4 - Industrial Development Requirements

This Component provides design considerations for industrial development.

It specifies that buildings are to be setback a minimum of six metres from the front boundary and three metres from side and rear boundaries. The proposed development meets these requirements.

Hours of operation of industrial activities should be between 6.00am and 6.00pm Monday to Saturday, with no work to be undertaken on a Sunday.

The proposed Masters Home Improvement Store is proposed to operate during the hours 6am to 9pm seven days. As this operation is not typical industrial noise, these operating hours are considered acceptable.

There are no further matters to consider under this DCP component.

C1 - Design Requirements

C1.2.2 Controls - There are some controls in this section of the DCP that relate to Commercial and Industrial Development. The proposed development is considered acceptable with respect to these matters.

C1.3 Pedestrian Access and Mobility – Equitable access will be provided to the proposed development.

C1.4 Safer By Design Evaluation – The proposed development is considered satisfactory with respect to the safer by design matters specified in this section.

C2 - Access, Parking and Servicing Requirements

C2.3 On-Site Parking – The proposed development complies with the on-site parking requirements specified of one space per 50 m² of gross floor area.

The development complies with all other requirements of the DCP component.

C3 - Landscaping Requirements

The proposed development complies with landscaping requirements.

C4 - Signage Requirements

The development complies with signage requirements of the DCP. For further consideration of signage refer to the section of this report that relates to State Environmental Planning Policy No. 64 – Advertising and Signage.

C7 - Waste Management Requirements

The proposed development can meet waste management requirements of the DCP.

Component D3 – Flooding and Coastal Hazards

The proposed development can meet with the flooding requirements of this DCP component.

iv. the regulations (to the extent that may prescribe matters for the purposes of this paragraph), that apply to the land to which the development application relates,

It is appropriate to consider whether Regulation 94 (Consent authority may require buildings to be upgraded) applies. This regulation only applies where:

- (a) the proposed building work, together with any other building work completed or authorised within the previous 3 years, represents more than half the total volume of the building, as it was before any such work was commenced, measured over its roof and external walls, or
- (b) the measures contained in the building are inadequate:
 - (i) to protect persons using the building, and to facilitate their egress from the building, in the event of fire, or
 - (ii) to restrict the spread of fire from the building to other buildings nearby.

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The proposed building construction work that is proposed for the Geoff King Motors site does not represent more than half the total volume of the building as determined under provision (a), and the measures within the building to facilitate egress from the building (in the event of fire) and to restrict the spread of fire from the building to other buildings nearby are considered adequate. As a result the clause does not apply to the proposed development.

v. any coastal zone management plan (within the meaning of the Coastal Protection Act 1979), that apply to the land to which the development application relates,

Council adopted the Coffs Harbour Coastal Zone Management Plan at its meeting of 14 February 2013. The plan provides the basis for future management and strategic land use planning of the Coffs Harbour coastal zone. The development sites are within the study area of the plan but are not within any area covered by specific management strategies contained within the plan.

The Coffs Harbour Coastal Processes and Hazard Definition Study 2010 was prepared prior to, and informed the Coastal Zone Management Plan and identified likelihood of hazards occurring, such as beach erosion, coastal inundation and the impacts of sea level rise on these hazards by 2100. The Hazard Study does not identify any coastal processes that would impact on the development sites.

b. the likely impacts of that development, including environmental impacts, on both the natural and built environments, and social and economic impacts in the locality,

1. The natural and built environment

The development has potential to impact on the environment during construction. A number of conditions of development consent are proposed to address potential 'during construction' impacts

There are proposed conditions that address

- Sediment and Erosion
- Stormwater Drainage
- Construction Impacts
- Appropriate disposal of Excavated Material
- Appropriate procedures in the event Aboriginal Objects are found during construction

It is considered that with imposition of these conditions the proposed development will not result in unacceptable impacts on the natural or built environment.

2. Social Impacts

There are a number of proposed conditions that will address issues relating to potential social impacts including impacts relating to

- Dust Control
- Loading and Unloading:
- Hours of Operation
- Hours for Deliveries

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- External Lighting impacts
- Noise Attenuation
- Noise Control

An acoustic assessment accompanied the application. This addressed noise impacts during construction and also potential noise impacts during operation. The report makes some recommendations. The proposed development is considered acceptable with respect to noise impact subject to compliance with these recommendations. This is required by a condition of development consent.

It is considered that, with imposition of this and other conditions that the proposed development will not result in unacceptable social impacts.

c. the suitability of the site for the development,

The site is considered well suited to the proposed development given its location relative to the city centre and the Pacific Highway.

d. any submissions made in accordance with this Act or the regulations,

The application was advertised and notified in accordance with the provisions of Council's Development Control Plan on 13 November 2013 with a submission period from 14 November 2013 to 27 November 2013. Two submission were received.

Council received a submission from the owners and operators of the business known as Ryans Bus Service. The 'Ryans Bus Depot' is located to the south of the development site adjoining Farrow Close. Council also received a submission from the Dealer Principal for Brown and Hurley Coffs Harbour. 'Brown and Hurley' is also located to the south of the site on the other side of Hurley Drive. Both submissions raised issues of traffic, traffic movement and car-parking in the area.

Council staff met separately with representatives from both these companies to discuss their concerns and provide them with further amendments to the development application. They were both provided with an additional opportunity to make a further submission on the application. Council received a further submission from Ryans Bus Service. No further submission was received from Brown and Hurley.

The further submission expressed general support for the 'altered' traffic arrangements (for the intersection of Farrow Close and Hurley Drive) but raised a question about 'enforcement' of the 'keep clear' marking on Farrow Close and about opportunity for a 'Left Turn Permitted on Red Signal' at the Pacific Highway/Hurley Drive intersection. A left turn permitted on red signal is a matter that will need to be considered by Council's Traffic Advisory Committee at a future date. Keep clear markings have the same status as other traffic regulations and are enforceable in the same manner, neither matters affect assessment of this application. A separate response has been provided on these two issues.

e. the public interest:

The proposed development does not present any issues that are contrary to the public interest.

Proposed Conditions Development Application 0332/14

ADMINISTRATIVE CONDITIONS

Development Description:

1. Development consent is granted only to carrying out the development described in detail below:
 - hardware and building supplies premises
 - alterations to existing vehicle sales premises
 - subdivision (boundary adjustment)
 - demolition
 - stormwater drainage infrastructure

Prescribed Conditions:

2. The proponent shall comply with the prescribed conditions of development approval under Clauses 97A, 98, 98A - E of Environmental Planning and Assessment Regulation 2000 as are of relevance to this development.

Development is to be in accordance with approved plans:

3. The development is to be implemented in accordance with the plans and supporting documents set out in the following table except where modified by any conditions of this consent (Development Consent No. 0332/14).

Plan Title	Reference	Prepared by	Dated
Site Plan	A02	Williams River Steel	16 April 2014
Floor Plan	A03	Williams River Steel	11 October 2013
Elevations	A04	Williams River Steel	11 October 2013
Section	A05	Williams River Steel	11 October 2013
Construction Traffic Plan	A06	Williams River Steel	11 October 2013
Signage Details	A10	Williams River Steel	11 October 2013
Development Application Boundary Alteration	DA02A	Geoff Slattery and Partners Pty Ltd	3 October 2013
Development Application Stormwater Surcharge	DA08A	Geoff Slattery and Partners Pty Ltd	3 October 2013
Development Application Stormwater Culvert	DA09	Geoff Slattery and Partners Pty Ltd	3 October 2013

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Geoff King Motors Pacific Highway Coffs Harbour: Demolition Plan	A.02	Geoff Slattery and Partners Pty Ltd	3 February 2014
Geoff King Motors Pacific Highway Coffs Harbour: Site Plan	A.01-G	Geoff Slattery and Partners Pty Ltd	3 February 2014
Development Application Hurley Drive and Farrow Close Works	DA07C	Geoff Slattery and Partners Pty Ltd	31 March 2014

In the event of any inconsistency between conditions of this development consent and the plans/supporting documents referred to above, the conditions of this development consent prevail.

The approved plans and supporting documents endorsed with the Council stamp and authorised signature must be kept on site at all times while work is being undertaken.

Development in Accordance with Documents:

4. The development shall be undertaken in accordance with the following documents:
 - (1) Statement of Environmental Effects of Geoff Smyth Consulting and dated October 2013
 - (2) Flood Assessment of Bewsher Consulting Pty Ltd October 2013
 - (3) Traffic Impact Assessment of Roadnet Pty Ltd dated October 2013
 - (4) Water Management Plan of Geoff Slattery and Partners Pty Ltd dated October 2013
 - (5) Acoustic Assessment of RCS Acoustics dated October 2013
 - (6) Fire Safety Advice of RAWfire
 - (7) Site Waste Management & Minimisation Plan of Williams River Steel dated 17 January 2014
 - (8) Waste Management Plan of Hydrox Nominees Pty Ltd dated January 2014
 - (9) Amendment to Traffic Impact Assessment of Roadnet Pty Ltd dated 17 February 2014

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Schedule of Conditions

Inconsistency between Documents:

5. In the event of any inconsistency between:
 - (1) The conditions of this approval and the drawings/documents referred to in conditions 3 and 4, the conditions of this approval prevail; and
 - (2) Any drawing/document listed in conditions 3 and 4 and any other drawing/document listed in conditions 3 and 4, the most recent document shall prevail to the extent of inconsistency.

PRIOR TO THE ISSUE OF CONSTRUCTION CERTIFICATE

Construction Certificate:

6. No building work is to commence on site until a Construction Certificate has been issued for the work and Council has been notified that a Principal Certifying Authority has been appointed.

Note: Separate Construction Certificates are to be obtained for the **building works** and any **civil works**.

Landscape Plan:

7. A detailed landscaping plan for all unbuilt-on areas of the development site being submitted to Council and approved **prior to issue of the Construction Certificate for building works**.

The plan is to include details of street tree planting along the Hurley Drive and Farrow Close frontages where appropriate. The Plan is to include details of the proposed tree pits within the car park.

The Plan must be prepared and certified by a qualified architect, landscape architect or professional landscape consultant. The Plan is to comply with Council's Landscaping Guidelines, and is to incorporate measures to ensure the maintenance and survival of the landscaping.

Equitable Access:

8. The building is to be provided with access and facilities for people with disabilities.

The applicants' attention is directed to the *Disability (Access to Premises - Buildings) Standards 2010* and the Building Code of Australia.

Details indicating compliance must be submitted and approved by the certifying authority **prior to the issue of a Construction Certificate for building works**.

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Stormwater Management Plan:

9. A Stormwater Management Plan complying with the relevant controls of Council's Water Sensitive Urban Design Policy being submitted to and approved by Council **prior to issue of the Construction Certificate**.

Please refer to the WSUD Information Sheet, Policy and Guideline available on Council's web site www.coffsharbour.nsw.gov.au.

The design is to incorporate a detention system that achieves compliance with the Coffs Harbour City Council WSUD Policy targets. Design details are to include calculations showing the effect of the proposed development on design stormwater run-off flow rates and the efficiency of proposed measures to limit the flows.

The design shall be accompanied by an Operation and Maintenance Plan for the system.

Road Design and Services (Building):

10. The following works:
- (a) Road works including;
 - i) Upgrade of the Farrow Close / Hurley Drive intersection in accordance with the plan titled 'Development Application Hurley Drive and Farrow Close Works', dated 31 March 2014 and prepared by Geoff Slattery and Partners; and
 - ii) Reconstruction of Farrow Close in accordance with the plan titled 'Development Application Hurley Drive and Farrow Close Works', dated 31 March 2014 and prepared by Geoff Slattery and Partners.
 - (b) Footpaths;
 - (c) Water supply;
 - (d) Sewerage;
 - (e) Flood mitigation works;
 - (f) Rebuilding of Council's stormwater system (channel);
 - (g) Pacific Highway intersection upgrade works to enable:
 - i) Extension of the right turn bay from the Pacific Highway into Hurley Drive to 100m storage length; and
 - ii) Provision of 2 lanes 60m in length on the Hurley Drive approach to the traffic signals.

shall be provided to serve the development with the works conforming with the standards and requirements set out in Council's Development Design and Construction specifications and relevant policies (Water Sensitive Urban Design).

Plans and specifications are to be submitted to Council and a separate Civil Works Construction Certificate issued **prior to the issue of a Construction Certificate for the building works or at some other time acceptable to Council**. Plan submissions are to be accompanied by payment of prescribed fee.

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Plans and specifications submitted later than six (6) months from the date of development consent shall comply with Council's current specifications at a date six (6) months prior to submission.

All work is to be at the developer's cost.

Property Title Alterations:

11. All property title alterations (including lot consolidation) as shown on the plan of Geoff Slattery and Partners Pty Ltd titled 'Development Application Boundary Alteration' and dated 3 October 2013, are to be registered with the Land Titles Office. Evidence of lodgement of a plan of title being submitted to Council and the certifying authority **prior to issue of the Construction Certificate.**

Trade Waste:

12. *An Application for Approval to Discharge Liquid Trade Waste* under Section 68 of the Local Government Act, being submitted and approved by *Coffs Harbour Water* **prior to issue of the Construction Certificate.**

All trade waste discharges are to conform with effluent acceptance criteria as stipulated in Coffs Harbour Water's Trade Waste Policy (Schedule A) and or any standards applied by the Environment Protection Authority for the discharge.

Please Note: Depending upon your individual circumstances, some trade waste pre-treatment equipment may need to be incorporated into the building work.

Coffs Harbour Water (Trade Waste Section) should be contacted for the issue of a Liquid Trade Waste Application Form. Please note once all the relevant information has been supplied, up to 30 days is required for approval.

Erosion and Sedimentation Control Plan:

13. An erosion and sediment control plan, together with a management strategy, detailing soil erosion and sediment control measures, shall be prepared by a qualified environmental or engineering consultant in accordance with the document *Managing Urban Stormwater – Soils & Construction Volume 1 (2004)* by Landcom. Details being submitted and approved by the Certifying Authority **prior to issue of a Construction Certificate.**

Fill:

14. Contour plans indicating the location of proposed fill areas in the development being submitted and approved by Council **prior to issue of the Construction Certificate.**

Contour plans are to include a clear description of impact of changes proposed on water movement both to and from the site on all adjacent land and to show stormwater discharge points.

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Water Management Act 2000:

15. **The Construction Certificate not being released** until a Certificate of Compliance pursuant to Division 5 of Part 2 of Chapter 6 of the Water Management Act 2000 evidencing that adequate arrangements have been made for the provision of water and sewerage services to and within the development is produced to Council.

Outdoor Lighting:

16. All outdoor lighting shall comply with, where relevant, AS/NZ 1158.3:1999 "*Pedestrian Area (Category P) Lighting*" and Australian Standard AS 4282:1997 "*Control of the Obtrusive Effects of Outdoor Lighting*". Details demonstrating compliance with these requirements being submitted to the satisfaction of Council or the accredited certifier prior to issue of the **Construction Certificate**.

PRIOR TO COMMENCEMENT OF WORKS

Site Notice:

17. Prior to commencement of works a site notice(s) shall be prominently displayed at the boundaries of the site for the purposes of informing the public of the development details including but not limited to:
- (1) Details of the Principal Contractor and Principal Certifying Authority for all stages of the development;
 - (2) The approved hours of work;
 - (3) The name of the site/project manager, the responsible managing company (if any), its address and 24 hour contact phone number for any inquiries, including construction noise complaints are to be displayed on the site notice; and
 - (4) To state that unauthorised entry to the site is not permitted.

Notice to be Given Prior to Commencement / Earthworks:

18. The Principal Certifying Authority and Council shall be given written notice, at least 48 hours prior to the commencement of earthworks on the site.
19. The Principal Certifying Authority is to be given a minimum of 48 hours notice prior to any critical stage inspection or any other inspection nominated by the Principal Certifying Authority via the notice under Section 81A of the Environmental Planning and Assessment Act 1979.

Contact Telephone Number:

20. Prior to the commencement of the works for each stage of the development, the proponent shall forward to Council a 24 hour telephone number to be operated for the duration of the construction works.

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Erosion and Sediment Control:

21. Prior to commencement of work on the site for each stage of the development, erosion and sedimentation control measures are to be installed and operational including the provision of a "shake down" area where required to the satisfaction of the Principal Certifying Authority.

Hoardings and Site Security (Demolition):

22. Appropriate hoardings shall be installed around the perimeter of the buildings to be demolished prior to commencement of demolition works.

DURING CONSTRUCTION

Approved Plans to be On-Site:

23. A copy of the approved and certified plans, specifications and documents incorporating the conditions of approval and certification shall be kept on the site at all times and shall be readily available for perusal by any officer of Council or the Principal Certifying Authority.

Excavated Material:

24. Where excavated material is to leave the site it is to be disposed of at an approved landfill facility.

Alternatively, where it is proposed to dispose of the excavated material at another location no material is to leave the site until:

- Council has been advised in writing of the destination site(s); and
- Council has been advised of the quantity and makeup of the material; and
- Council has issued written approval for disposal to the alternate location(s).

Note: The exportation of fill or soil from the site must be in accordance with the provisions of the Protection of the Environment Operations Act (POEO) 1997 and the Office of Environment and Heritage "Waste Classification Guidelines" and shall comply with the terms of any approval issued by Council.

Fill:

25. All fill is to be placed in accordance with the requirements of Council's Development Design and Construction Specifications and the approved Sediment and Erosion Control Plan.

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Importation of Fill:

26. The only fill material that may be received at the development is:
- a) Virgin excavated natural material (within the meaning of the Protection of the Environment Operations (POEO) Act);
 - b) Any other waste-derived material the subject of a resource recovery exemption under Clause 51A of the Protection of the Environment Operations (Waste) Regulation 2005 that is permitted to be used as fill material, excluding waste tyre.

Any waste-derived material the subject of a resource recovery exemption received at the development site must be accompanied by documentation as to the material's compliance with the exemption conditions and must be provided to the Principal Certifying Authority on request.

Erosion and Sediment Control:

27. All erosion and sediment control measures, as designed in accordance with the approved plans are to be effectively implemented and maintained at or above design capacity for the duration of the construction works for each stage of the project, and until such time as all ground disturbance by the works has been stabilised and rehabilitated so that it no longer acts as a source of sediment.

Dust Control Measures:

28. Adequate measures being taken to prevent dust from affecting the amenity of the neighbourhood during construction. In particular, the following measures must be adopted:
- (1) Physical barriers being erected at right angles to the prevailing wind direction or being placed around or over dust sources to prevent wind or activity from generating dust emissions;
 - (2) Earthworks and scheduling activities shall be managed to coincide with the next stage of development to minimise the amount of time the site is left cut or exposed;
 - (3) All materials shall be stored or stockpiled at the best locations;
 - (4) The work area being dampened slightly to prevent dust from becoming airborne but not to the extent that runoff occurs;
 - (5) All vehicles carrying spoil or rubble to or from the site shall at all times be covered to prevent the escape of dust or other materials;
 - (6) All equipment wheels shall be washed before exiting the site using manual or automated sprayers and drive through washing bays (if applicable);
 - (7) Gates shall be closed between vehicle movements and shall be fitted with shade cloth; and
 - (8) Cleaning of footpaths and roadways shall be carried out regularly by manual dry sweep or by use of a cleaning vehicle.

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Hours of Work:

29. The hours of construction for all stages of the development, including delivery of materials to the site, shall be restricted as follows:

- (1) Between 7:00am and 6:00pm , Mondays to Fridays inclusive;
- (2) Between 7:00am and 1:00pm, Saturdays if inaudible from adjoining residential properties, otherwise between 8.00 a.m. and 1.00 p.m.;
- (3) No construction work on Sundays and Public Holidays.

Works may be undertaken outside these hours where:

- (1) The delivery of materials is required by the Police or other authorities; and/or
- (2) It is required in an emergency to avoid the loss of life, damage to property and/or to prevent environmental harm; and/or
- (3) The work is approved through the Construction Noise and Vibration Management Plan; and
- (4) Residents likely to be affected by the works are notified of the timing and duration of these works at least 48 hours prior to the commencement of works.

Cultural Heritage:

30. In the event that future works during any stage of the development disturb Aboriginal Cultural materials, works at or adjacent to the material must stop immediately. Temporary fencing must be erected around the area and the material must be identified by an independent and appropriately qualified archaeological consultant. The Office of Environment and Heritage (OEH), Northern Aboriginal Heritage Unit and the Aboriginal Stakeholder groups must be informed. These groups are to advise on the most appropriate course of action to follow. Works must not resume at the location without the prior written consent of the OEH and Northern Aboriginal Heritage Unit and the Aboriginal Stakeholder groups.

Finished Floor Level:

31. The finished floor level of the ground floor of the building is to be a minimum of 4.2 metres Australian Height Datum and a registered surveyor's certificate certifying such level is to be submitted to the Principal Certifying Authority prior to works proceeding beyond ground floor level.

Contractors parking and loading/unloading arrangements:

32. All persons associated with construction works are to park on site. All loading and unloading activities are to occur within the site.

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Demolition:

33. All works, including the handling and disposal of materials containing asbestos, are to be undertaken in accordance with the relevant requirements of WorkCover NSW, the Work Health and Safety Act 2011 and Australian Standard AS 2601-2001 "*The Demolition of Structures*".

All demolition material and wastes shall be assessed in accordance with NSW Environment Protection Authority Waste Classification Guidelines (2009) prior to being removed from the site. Materials classified as waste shall only be disposed of to an appropriate NSW Environment Protection Authority licensed facility. All waste building materials shall be recycled or disposed of to an approved waste disposal facility.

No waste materials shall be crushed or processed on the site.

No demolition materials shall be sold from the site.

No burning of materials is permitted on site.

Waste stockpiles shall be positioned a minimum of 20 metres from site boundaries and incorporate appropriate sediment and erosion controls or to alternate locations to Council's satisfaction.

The sewer drainage system shall be appropriately sealed to prevent ingress of water and debris into the Council's main.

PRIOR TO ISSUE OF OCCUPATION CERTIFICATE

Occupation Certificate:

34. A person must not commence occupation or use of the new building **prior to obtaining an Occupation Certificate** from the Principal Certifying Authority.

Access Works:

35. Sealed driveways being constructed over the footpath at right angles to the road in accordance with Council's standard drawings. Any existing driveways which are not required for the development are to be removed and the footpath reinstated. All such work is subject to a separate driveway application, fees and approval by Council.

These works are to be completed **prior to the issue of an Occupation Certificate** for the development.

Stormwater Management Certification:

36. **Prior to the issue of an Occupation Certificate** the consultant design engineer / landscape architect shall issue a certificate to the Principal Certifying Authority to the effect that the stormwater treatment system has been installed and complies with the approved design.

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Road Design and Services:

37. The following works:

- (a) Road works including;
 - i) Upgrade of the Farrow Close / Hurley Drive intersection in accordance with the plan titled 'Development Application Hurley Drive and Farrow Close Works', dated 31 March 2014 and prepared by Geoff Slattery and Partners; and
 - ii) Reconstruction of Farrow Close in accordance with the plan titled 'Development Application Hurley Drive and Farrow Close Works', dated 31 March 2014 and prepared by Geoff Slattery and Partners.
- (b) Footpaths;
- (c) Water supply;
- (d) Sewerage;
- (e) Flood mitigation works;
- (f) Rebuilding of Council's stormwater system (channel);
- (g) Pacific Highway intersection upgrade works to enable:
 - i) Extension of the right turn bay from the Pacific Highway into Hurley Drive to 100m storage length; and
 - ii) Provision of 2 lanes 60m in length on the Hurley Drive approach to the traffic signals.

Note:

- (1) Consultation with relevant affected property owners is to be carried out prior to work commencing.

being provided to serve the development with the works conforming with the standards and requirements set out in Council's Development Design and Construction specifications and relevant policies (WSUD).

These works are to be completed **prior to the issue of an Occupation Certificate.**

All work is to be at the developer's cost.

Landscaping Works:

- 38. All landscaping works, in accordance with the approved plan, are to be completed, with certification of completion (by a works as executed plan) being provided to Council and the Principal Certifying Authority, **prior to issue of an Occupation Certificate.**

- 12 -

Development Application No. 0332/14

Schedule of Conditions

Noise Attenuation:

39. Noise attenuation methods specified in the acoustic report of RCA Acoustics titled 'Proposed Masters Home Improvement Store; Lot 2, DP 607441, Lot 31, DP 716368 & Lot 1, DP 616809, Pacific Highway, Coffs Harbour, NSW' and dated October 2013 being implemented in the development and the completed works subsequently certified by an acoustic consultant **prior to issue of an Occupation Certificate**. A copy of the certification being provided to Council and the Principal Certifying Authority **prior to issue of an Occupation Certificate**.

Car Parking Spaces:

40. All 290 car parking spaces as shown on the plan approved in accordance with condition number three of this consent being provided on the development site **prior to the issue of an Occupation Certificate**.

All car parking and manoeuvring areas being constructed in accordance with the provisions of Australian Standard AS 2890.1 "Parking Facilities: Off-Street Car Parking" and the provisions of AS/NZS 2890.6:2009 "Parking Facilities: Part 6: Off-Street parking for people with disabilities".

Liquid Trade Waste Approval:

41. Certification from the Trade Waste Section that a Liquid Trade Waste Approval has been granted and the pre-treatment equipment has been installed in accordance with the conditions of the approval is to be provided to the Principal Certifying Authority **prior to issue of the Occupation Certificate**.

Rainwater Tanks:

42. A separate application being submitted to Coffs Harbour Water for assessment and registration of the proposed rain water tank(s) and associated plumbing works, prior to their installation. Evidence of registration is to be confirmed by the Principal Certifying Authority **prior to the issue of Occupation Certificate**.

Note: A testable backflow prevention device is required with underground water storage tanks.

Note: an application form may be downloaded from Council's web site www.coffsharbour.nsw.gov.au

Anti-Graffiti Treatment - Eastern Boundary:

43. The eastern boundary fence on the development (precast panels) adjoining the drainage swale is to be finished in a recessive anti-graffiti treatment. This is to be completed **prior to issue of an Occupation Certificate** unless other arrangements acceptable to Council have been made.

/13

- 13 -

Development Application No. 0332/14

Schedule of Conditions

Easement to Drain Water:

44. An easement to drain water in favour of Council, being created over the stormwater drainage works and registered with the Land Titles Office prior to **issue of an Occupation Certificate**.

Fencing to Boundary:

45. Solid fencing to a height of 1.8m is to be provided to the eastern boundary of the new development **prior to issue of an Occupation Certificate**.

OPERATIONAL MATTERS

Loading and Unloading:

46. All loading and unloading activities associated with the use of the premises being carried out wholly within the site at all times.

Car Parking Areas:

47. All car parking spaces and manoeuvring areas, approved in accordance with condition number three, are to be maintained in a serviceable condition at all times.

Noise:

48. Noise emanating from the premises shall at all times be in accordance with the provisions of the *Protection of the Environment (Operations) Act 1997*.

External Lighting:

49. External lighting shall comply with *Australian Standard AS 4282: 1997 Control of Obtrusive Effects of Outdoor Lighting*. Upon installation of lighting, but before it is finally commissioned, the Applicant shall submit to Council evidence from an independent qualified practitioner demonstrating compliance in accordance with this condition.

Landscape Works:

50. Landscaping is to be maintained in accordance with the approved landscape plans at all times.

Waste Management:

51. Provision being made on the site (*or within the premises*) for the separation of recycling and organic waste, including food waste and other putrescible wastes from the general waste stream in accordance with Council's requirements. The waste management practices of the premises should provide for the continued separation of recycling and organic waste from the general waste stream.

/14

Development Application No. 0332/14

Schedule of Conditions

Days and Hours of Operation:

- 52. The development is only to operate during the hours:
 - 6:00 AM to 9:00 PM Monday to Sunday

Days and Hours for Deliveries:

- 53. Deliveries are only to occur during the hours:
 - 7:00 AM to 6:00 PM Monday to Saturday.
 - 8:00 AM to 6:00 PM Sundays and Public Holidays

PRIOR TO ISSUE OF SUBDIVISION CERTIFICATE

Part 4A Certificate:

- 54. Prior to the registration of final subdivision plan in the Office of the Registrar-General, a Part 4A Certificate shall be obtained under section 109D(1)(d) of the *Environmental Planning and Assessment Act 1979* for each stage of the subdivision.

ADVISORY NOTES

Other Approval Permits:

- 55. The Applicant shall apply to the Council for all necessary permits including crane permits, road opening permits, hoarding or scaffolding permits, footpath occupation permits and/or any other approvals under Section 68 (Approvals) of the Local Government Act, 1993.
- 56. The applicant shall (as required) enter into a works authorisation deed (WAD) with Roads and Maritime Services for the extension of the right turn lane on the Pacific Highway, prior to the works commencing.

Development Application No. 0332/14

Schedule of Conditions

Days and Hours of Operation:

52. The development is only to operate during the hours:

- 6:00 AM to 9:00 PM Monday to Sunday

Days and Hours for Deliveries:

53. Deliveries are only to occur during the hours:

- 7:00 AM to 6:00 PM Monday to Saturday.
- 8:00 AM to 6:00 PM Sundays and Public Holidays

PRIOR TO ISSUE OF SUBDIVISION CERTIFICATE

Part 4A Certificate:

54. Prior to the registration of final subdivision plan in the Office of the Registrar-General, a Part 4A Certificate shall be obtained under section 109D(1)(d) of the *Environmental Planning and Assessment Act 1979* for each stage of the subdivision.

ADVISORY NOTES

Other Approval Permits:

55. The Applicant shall apply to the Council for all necessary permits including crane permits, road opening permits, hoarding or scaffolding permits, footpath occupation permits and/or any other approvals under Section 68 (Approvals) of the Local Government Act, 1993.

56. The applicant shall (as required) enter into a works authorisation deed (WAD) with Roads and Maritime Services for the extension of the right turn lane on the Pacific Highway, prior to the works commencing.

WOOLGOOLGA TOWN CENTRE MASTERPLAN - PROJECT UPDATE

Purpose:

To provide Council with an update of progress on the Woolgoolga Town Centre Study Review Masterplan project and to provide findings of the first round of community engagement.

Description of Item:

At the Council meeting of 13 June 2013, Council adopted a Project Plan to allow the Woolgoolga Town Centre Study 1996 to be reviewed and updated in the form of a Masterplan. At this time it was resolved that:

1. *Coffs Harbour City Council endorse the attached Woolgoolga Town Centre Study Review Project Plan.*
2. *Coffs Harbour City Council engage an appropriately qualified consultant to provide economic, strategic planning, and built form advisory services to Council for the project.*
3. *Coffs Harbour City Council endorse the attached Consultant Brief Request for Quotation for the Woolgoolga Town Centre Study Review Consultant Advisor.*
4. *Review a specific parking plan for Woolgoolga to be incorporated into the Masterplan.*
5. *Council continues to lobby NSW Roads and Maritime Services and the Minister for Roads for funds towards development of a Socio-Economic Bypass Action Strategy, to further inform the Woolgoolga Town Centre Study Review.*

Work is now well underway in accordance with the resolution of Council. Council has engaged Bennell and Associates (in conjunction with their sub-consultants Renaissance Planning) to act as a Consultant Advisor for the economic, strategic planning and built form aspects of the project.

The first round of community engagement involved creation of the WoolgoolgaWOW.com.au website as a portal for information to the community. Three engagement activities have been undertaken to date, including:

1. A Community Vision Night on 25 February 2014;
2. A confidential Business Confidence Survey, which closed on 9 March 2014; and
3. An online Ideas Map on which the community could place their ideas and comments in the study area, which closed on 31 March 2014.

Council staff have had several meetings with the Woolgoolga and Northern Beaches Chamber of Commerce in recent months to discuss the project. Council has again lobbied the NSW Roads and Maritime Services and Minister for Roads.

The results of these community and stakeholder activities are discussed later in this report. Preliminary results show that there is a high degree of business confidence in Woolgoolga as a place to undertake business; and that the vision for the Woolgoolga Town Centre (which was previously stated in the Woolgoolga Township Marketing Action Plan 2011 as “to grow Woolgoolga in a way that does not affect its unspoilt and unhurried beachside character, but that is proactive in supporting business growth”) has been confirmed by the community engagement exercises.

It is important that the land use strategies within the Woolgoolga Town Centre Masterplan reflect this vision. The second phase of the project is now underway, whereby Council staff and the Consultant Advisor will undertake preparation of the draft Plan. This work will include a parking assessment for the town centre in accordance with Resolution 4. A Community Reference Group workshop will be held to help to refine the draft prior to finalisation for reporting to Council. It is anticipated that the draft Masterplan will be prepared later in 2014 to seek Council's endorsement for exhibition later in the year.

Sustainability Assessment:

- **Environment**

Environmental factors are being considered in the development of the revised and updated Woolgoolga Town Centre Study.

- **Social**

The development of a viable Woolgoolga Town Centre will assist in the development of a stronger social fabric and a vibrant community. The project involves ongoing consultation with the community regarding their vision for the Town Centre.

- **Civic Leadership**

Council is working closely with representatives of the Woolgoolga and Northern Beaches Chamber of Commerce and the broader community in the development of this Town Centre Study.

- **Economic**

Broader Economic Implications

The project involves analysis of economic implications for businesses in the defined Woolgoolga Town Centre study area. The intent of the revised Woolgoolga Town Centre Study is to create a document in the form of a Masterplan to guide the viable and vibrant development of Woolgoolga in the long term.

Delivery Program/Operational Plan Implications

The costs associated with the revision and updating of the Woolgoolga Town Centre Study are already allocated within Council's adopted Delivery Program and 2013/14 Operational Plan.

Risk Analysis:

The development of the draft Masterplan prior to exhibition has involved extensive community engagement. The draft Plan and draft Implementation Strategy will also be placed on exhibition prior to their final adoption, thus providing further opportunity for stakeholder and community engagement and reducing risks. Detailed design and environmental assessments will be undertaken in future years to ensure additional risk analysis is undertaken prior to spending funds.

Consultation:

There has been extensive consultation for the project thus far. The WoolgoolgaWOW website has received over 4900 views from mid-February to present. Results of this engagement are outlined in the following. It is proposed to publish the results of the community engagement activities on the WoolgoolgaWOW website after the reports are viewed by Council.

The results and feedback from the community will be used to inform the content and design of the draft Woolgoolga Town Centre Masterplan, which will be developed in the next phase of the project.

1. Community Vision Night

A total of 67 people attended the Community Vision Night on 25 February 2014. Attendees included residents, business-owners and stakeholders. The purpose of the night was to identify key values and aspirations held by the community and stakeholders for the future of Woolgoolga. A summary of the night and key findings are outlined in Attachment 1.

The Community Vision Night identified that maintaining and enhancing a local village environment and ambience is very important to the community. The beach, the local environment and the amenity of the town were key unifying values that were consistently supported by workshop participants.

2. Business Confidence Survey

The early consultation phase included the completion of a confidential Business Retention and Expansion (BRE) Survey, to establish how confident businesses were with Woolgoolga now that the highway bypass has occurred; and also for the coming year. The survey consisted of 25 questions addressing a range of issues on business confidence, trade and patronage characteristics and perceptions of the township. Questions were prepared by Council's Consultant Advisor.

A total of 46 businesses responded to the survey. Results of the survey are summarised in brief in Attachment 1, but provided as a detailed report in Attachment 2. The survey has indicated that the business community has confidence in Woolgoolga as a place to do business and confidence for their business in the town. There was a strong positive feedback on potential initiatives that Council could undertake to assist improve business prospects, including facilitating residential growth to increase population, street beautification works, new major retail development, improved walkways and cycleways, and new tourist development.

3. Ideas Map

An online Ideas Map was provided on the WoolgoolgaWOW website for people to 'pin' a comment or an idea in relation to a specific location. This map was live on the website from mid-February to 31 March 2014. A total of 2150 hits were made on the Ideas Map, with a total of 1032 people visiting the map in the six weeks that it was open for comment. A total of 451 comments were made on the Ideas Map. These comments have been assessed and analysed thematically and an overview report is provided as Attachment 3. Further analysis of comments made on the Ideas Map will be undertaken during the development of the draft Masterplan, to ensure the community's vision and opinion is captured.

4. Discussions with Woolgoolga and Northern Beaches Chamber of Commerce

Several meetings have been held to date with the Woolgoolga and Northern Beaches Chamber of Commerce, including a presentation about the Woolgoolga Town Centre Study Review and Masterplan at a Chamber breakfast on 6 March 2014. Council has actively engaged with the Chamber to promote the project and information on the WoolgoolgaWOW website.

5. Negotiations with NSW Roads and Maritime Services

Council has continued to lobby NSW Roads and Maritime Services (RMS) in accordance with Resolution 5, to seek funding to address possible social and economic impacts from the Woolgoolga bypass as part of the Pacific Highway Sapphire to Woolgoolga project. Council staff wrote to RMS on 11 April 2013 and the Minister for Roads on 20 June 2013. A response was received from RMS on 25 July 2013 and from the Minister for Roads on 9 August 2013 (copies of these letters are included as Attachment 4).

The response from the Government was that a socio-economic assessment was undertaken as part of the environmental assessment of the upgrade, and that conditions of the project approval do not require RMS to prepare an additional economic study. RMS has advised further that *"it would be pleased to work with Council, the Woolgoolga Chamber of Commerce and the community to help identify opportunities for the local economy following the opening of the bypass project to traffic"*. The RMS has subsequently agreed in principal to fund additional urban design work as part of the Woolgoolga Town Centre Review focusing on the change in role and function of the bypassed section of the Pacific Highway through Woolgoolga. Council also continues to work with the Chamber and RMS on the content and positioning of location markers and signposting at the Woolgoolga off-ramps on the new section of Highway and, on landscaping and road treatment of the Solitary Islands Way road corridor as part of the handover of the Old Pacific Highway to Council.

Strategic Alignment:

This project aligns with Council's 2030 Plan in relation to the provision of a vibrant Woolgoolga Town Centre and also in relation to Council undertaking consultation with the community.

Related Policy and / or Precedents:

Coffs Harbour City Council is committed to the ongoing development and revitalisation of the entire city. Woolgoolga was defined by the Department of Planning in the Mid North Coast Regional Strategy 2009 as a major town. Council sees the Woolgoolga Town Centre playing a pivotal role in the ongoing growth and development of the Woolgoolga and Northern Beaches locality, through the creation of economic, social and cultural opportunities. This project involves the review and updating of the Woolgoolga Town Centre Study 1996.

Council's Business Centres Hierarchy Review Final Report 2012 identified the importance of assisting the Woolgoolga Town Centre improve its attractiveness as a tourist destination with an improved relationship with the beach and coastal area (which is a significant asset of the Centre). It also identified the need for a comprehensive Business Retention and Expansion (BRE) Survey to supplement the results of the Woolgoolga Township Marketing Action Plan 2011 and findings of the previous economic studies.

A related project is the draft Plan of Management for the Woolgoolga Beach Reserve. The draft Woolgoolga Beach Reserve Trust Plan of Management was endorsed by Council on 10 October 2013, for forwarding to NSW Crown Lands to seek approval for exhibition. No approval has yet been forthcoming. This is discussed further in the Issues section of this report.

Statutory Requirements:

There are no statutory requirements in relation to preparing the revised Woolgoolga Town Centre Study and Masterplan. Once completed, recommendations of the final adopted study may be used to inform amendments to Coffs Harbour LEP 2013 and associated DCP.

Issues:

1. Sense of Place

This first phase of community engagement activities in relation to the Woolgoolga Town Centre Study Review and Masterplan has identified there is significant community interest in the ongoing development of the Woolgoolga Town Centre. The beach and seaside village charm appear to be key values and aspirations held by the local community and stakeholders, along with the natural environment. It is considered that the vision of the Woolgoolga Township Marketing Action Strategy 2011 (being to grow Woolgoolga in a way that does not affect its unspoilt and unhurried beachside character, but that is proactive in supporting business growth) is widely accepted by the community.

Woolgoolga has a distinctive lifestyle and community, with a unique culture and heritage, and development of the Town Centre Masterplan needs to be sympathetic to this character and 'sense of place'. It is important that the land use strategies in the final draft Plan reflect this vision.

2. Woolgoolga Beach Reserve and draft Plan of Management

The Woolgoolga Beach Reserve has been the subject of many comments made by the community during the Phase One consultation exercise for the Town Centre Masterplan. The Beach Reserve, which also contains the Woolgoolga Beach Holiday Park, is adjacent to the Beach Street Town Centre.

As stated previously, a draft Plan of Management for the Woolgoolga Beach Reserve Trust was endorsed by Council (as the Trust Manager) on 10 October 2013, for forwarding to NSW Crown Lands to seek approval for exhibition. No approval has yet been forthcoming because of delays with NSW Crown Lands.

The main elements of the draft Woolgoolga Beach Reserve Trust Plan of Management include reducing the current caravan park site availability by 10% and converting the land back to public open space; the creation of promenades and vistas to link the Town Centre to the foreshores and beach; upgraded public facilities including playground, cycle/walkway, public recreation areas, public art and improved pedestrian access; relocation of parking to areas not suitable for public recreation; upgrading cabins at the site; creating pedestrian/cycle links through the reserve; improving access to Woolgoolga Beach, Woolgoolga Lake and Woolgoolga Headland; relocation of Woolgoolga Marine Rescue to a location in Arrawarra; relocation of Woolgoolga Surf Life Saving Club to the vacated Marine Rescue site; and enhancing the natural environment at the site. It should be noted that of the total 451 comments received on the Ideas Map, a total of 126 of these comments relate to the Woolgoolga Beach Reserve (28% of all comments received).

Whilst the community is aware that the draft Plan of Management will be subject to its own exhibition process, they appear frustrated that its exhibition has not yet occurred. They have used this preliminary consultation phase for the Town Centre Masterplan to make their thoughts known in relation to the draft Plan of Management which was reported to Council on 10 October 2013.

It is important that Council review and give consideration to community feedback relating to the Woolgoolga Beach Reserve, which was received during the Town Centre Masterplan project. This will be considered as part of the public exhibition and consideration of the Woolgoolga Beach Reserve Plan of Management.

Implementation Date / Priority:

This project is well underway, with funds available in the current Operational Plan. It is anticipated that a draft Woolgoolga Town Centre Masterplan will be reported to Council in late 2014.

Recommendation:

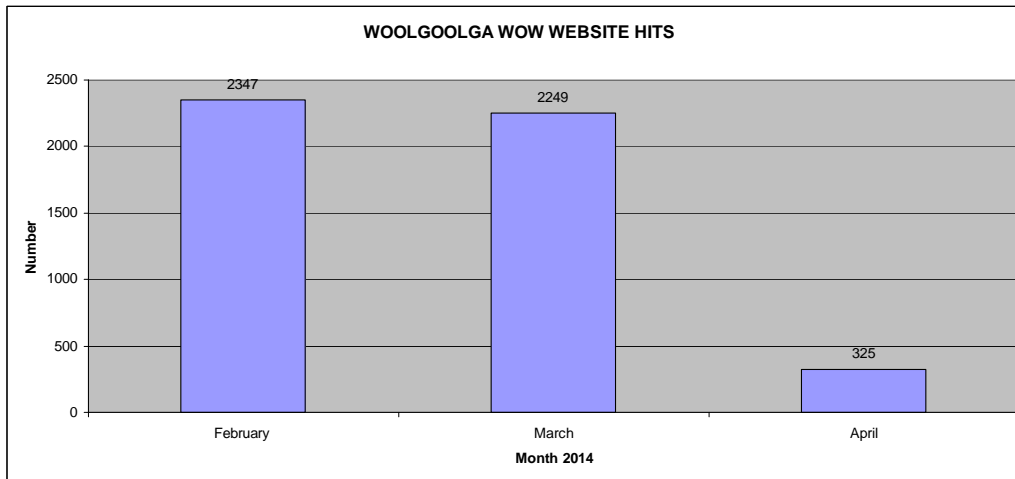
- 1. That Coffs Harbour City Council note the findings of the Phase One Community Engagement for the Woolgoolga Town Centre Study Review and Masterplan.**
- 2. That a draft Woolgoolga Town Centre Masterplan be reported to Council in the second half of 2014.**
- 3. That Coffs Harbour City Council review and give consideration to feedback received during the Woolgoolga Town Centre Masterplan that relates to the Woolgoolga Beach Reserve, as part of the public exhibition and consideration of the Plan of Management for Part of Reserve 63076 for Public Recreation and Resting Place and reserve for Public Recreation (Southern section of Woolgoolga Beach Reserve).**

WOOLGOOLGA TOWN CENTRE MASTERPLAN PHASE ONE COMMUNITY ENGAGEMENT OVERVIEW

1. INTRODUCTION

The preliminary community engagement phase of the Woolgoolga Town Centre Study Review has now concluded. The first round of community engagement involved creation of the WoolgoolgaWOW.com.au website as a portal for information to the community. The website has received over 4900 views from mid February to present (refer Table 1).

TABLE 1



A comprehensive community engagement package was prepared for Phase One of the project. This has given a strong call to action for community participation. A number of methods were undertaken to advise the community of their options for participation, including:

- Frequent media releases (3 press releases were written between mid February and late March 2014), providing updates about the project moving forward and the number of hits on the Ideas Map.
- Large advertisements and stories run in both local papers, providing coverage of the project, the Community Visioning Night and the Ideas Map.
- Two stories on local evening NBN news promoting Ideas Map and the Community Visioning Night.
- Media that has also promoted that the Ideas Map is a new community engagement tool that Council is trialling, which may be purchased for other projects if its use on this project is successful.
- A community newsletter which was distributed to all businesses in the 3 business centres of town and copies left in local cafes.
- Posters and flyers at Woolgoolga Library, Neighbourhood Centre, Seniors Centre and Visitors Information Centre containing same information as the community newsletter.
- Promotion on the WoopiWave Facebook page (around 700 members).
- A dedicated branded website with a front page time clock counting down to closure of the Ideas Map.
- Speaking engagement by the Project Manager to the Woolgoolga and Northern Beaches Chamber of Commerce, to promote the project and the Ideas Map.
- Attendance by the Project Manager at the Chamber of Commerce prior to launch of the project to promote the project.
- Powerpoint presentation at the Community Visioning Night, addressing the aims of the project overall, and providing educational information about how to use the Ideas Map.
- Attendance by the Project Manager at the Woolgoolga Library, with training of Library staff in how to access the Ideas Map and how to assist the community with entering their ideas.

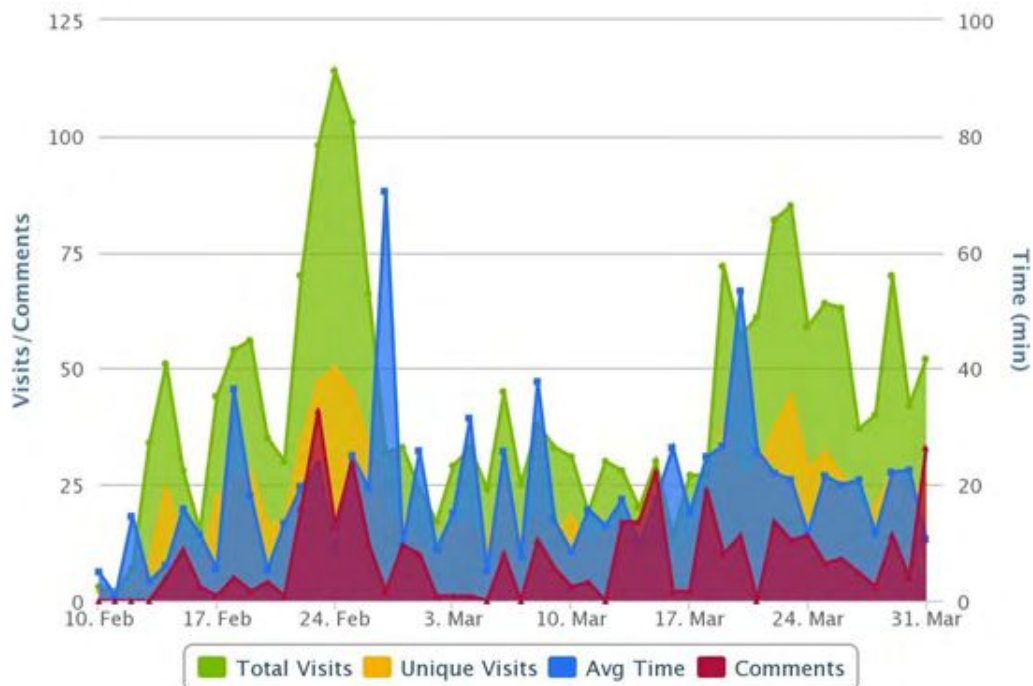
Outcomes of the three Phase One community engagement activities are presented in more detail in following sections of this report.

A total of 67 people attended the Community Vision Night. The feedback has been analysed, as outlined in Section 2. A key finding from the night would appear to be the notion of the need to retain the village ambience of the town and to enhance links to the beach.

A total of 46 businesses responded to the Business Confidence Survey. The final report has been received from the Consultant Advisor, which indicates that the business community has confidence in Woolgoolga as a place to do business and has confidence for their business in the town. An overview of findings is outlined in Section 3 of this report, and the entire Business Retention and Expansion Survey Results is included as Council Report Attachment 2.

A total of 2150 hits were made on the Ideas Map, which was visited by 1032 people over the six weeks it was able to be viewed, and a total of 451 comments were made. The analysis of the Ideas Map is included as Council Report Attachment 3.

IDEAS MAP SUMMARY STATISTICS



2. COMMUNITY VISION NIGHT RESULTS

A Community Vision Night was held on 25 February 2014 at the Woolgoolga Public School Hall. The night was widely publicised in local media, via an advertisement in both the Woolgoolga Advertiser and the Coffs Harbour Advocate, via the WoolgoolgaWOW website and by flyers and posters in the Woolgoolga Library and local cafes, businesses and community centres. A flyer was also emailed to local residents and businesses via the Woolgoolga Facebook page. A total of 67 persons attended the night, comprising residents, business owners and stakeholders.

The workshop was aimed to identify key values and aspirations held by the local community and stakeholders. A 15 minute presentation was provided by Council staff at the start of the night to outline the proceedings. It was clearly stated that one of the key aims of the night was to test the vision for the Woolgoolga Town Centre (which was previously stated in the Woolgoolga Township Marketing Action Plan 2011 as *“to grow Woolgoolga in a way that does not affect its unspoilt and unhurried beachside character, but that is proactive in supporting business growth”*) with the community.



There were three open questions presented by survey for individual response on the night. These questions were:

1. What makes Woolgoolga special to you?
2. What do you want people to think about when they hear the name Woolgoolga? List three things.
3. What do you most value that you would want to see here in 30 years time?

A further three questions were asked of workshop participants, who were gathered around eight tables for discussion. These questions were:

1. GROUP EXERCISE: Make a list of guiding design principles – what’s important to reinforce the vision in the Masterplan?
2. GROUP EXERCISE: List some quick “wins” – things that can perhaps be easily built / created without a lot of time or money.
3. GROUP EXERCISE: Make a list of your WOW ideas (Projects? Themes?) to achieve the vision.

Attendees were given the opportunity to place their vote (via a sticky dot voting process) adjacent to their favourite idea for their table. They were further given the opportunity to place another sticky dot against their favoured idea for all other groups after the group presentation at the end of the night.

Responses have been analysed thematically, and a comparative analysis was made between thematic groupings. Each dot was counted as an additional vote.

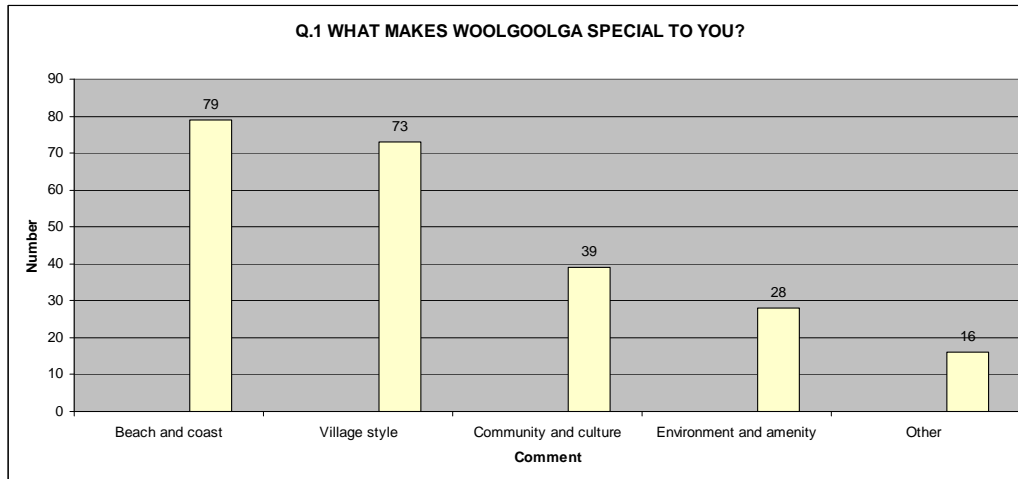
It is considered that the workshop has identified a clear consistent theme: **the notion of maintaining and enhancing a local village environment and ambience and the role of the beach linked to local environment and amenity** are the key unifying values that run through the workshop.

It would appear that this workshop has identified a number of supporting values to this theme:

- Woolgoolga is an attractive place with a distinctive lifestyle and community.
- Woolgoolga is a great holiday and retirement destination.
- Woolgoolga as a place has unique culture and heritage.
- Woolgoolga needs to be planned to ensure pedestrian safety and amenity; and to provide convenient access within a framework of integrated access and transport.
- Development within the town centre needs to be sympathetic to Woolgoolga’s existing character and scale, location and climate.
- There is a need to provide innovative and creative beautification and amenity initiatives that add value to the village and beach themes.
- There is a need to identify infrastructure projects that will add value and amenity to the beach and local environment.
- Identification of new community facilities and services that could add value and attraction to the Woolgoolga Town Centre.
- The need for innovative and creative thinking to envisage major changes of use to open up the town centre to the beach and to provide better community and cultural outcomes.

2.1 What makes Woolgoolga special to you?

TABLE 2.1



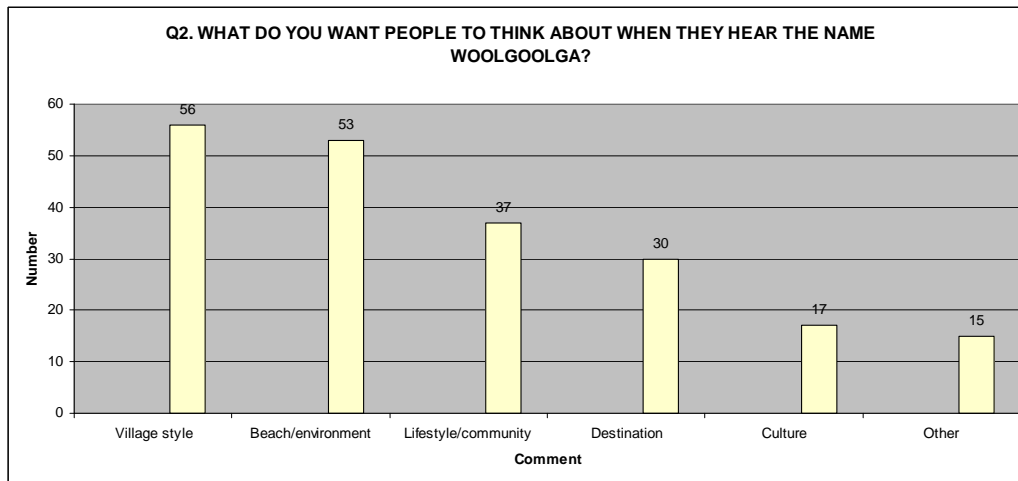
Q1 What makes Woolgoolga special to you?

	No.	%
BEACH / COAST		
Great beach/beaches	39	16.60
Headland / headland walk / whalewatching	14	5.96
Coastal / beach lifestyle	10	4.26
Beach reserve	5	2.13
Seaside charm	3	1.28
Watersports and fishing	3	1.28
Good surf	3	1.28
Surf club	1	0.43
Lakeside	1	0.43
TOTAL: BEACH/COAST	79	33.62
VILLAGE STYLE		
Village/ small town atmosphere	29	12.34
Laid back / relaxed atmosphere/lifestyle	10	4.26
Great coffee / cafes / restaurants / clubs	5	2.13
Great / unique businesses / shops	5	2.13
Low traffic	5	2.13
Understated/not too busy	5	2.13
Comfortable range of facilities and services	4	1.70
Lack of tall buildings	4	1.70
Small size (with good facilities)	4	1.70
Relative isolation	1	0.43
Wide streets	1	0.43
TOTAL: VILLAGE STYLE	73	31.06

COMMUNITY AND CULTURE		
Friendly	15	6.38
Great community spirit	12	5.11
Cultural diversity/heritage	6	2.55
The people	3	1.28
Sikh community	1	0.43
Library	1	0.43
Mix of age of residents	1	0.43
TOTAL: COMMUNITY	39	16.60
ENVIRONMENT AND AMENITY		
Climate	7	2.98
Quiet nature / peaceful	6	2.55
Natural beauty / environment	9	3.83
Open spaces	3	1.28
Beauty	3	1.28
TOTAL: ENVIRONMENT AND AMENITY	28	11.91
OTHER		
It's my home	4	1.70
Future potential	4	1.70
Proximity to a major centre (Coffs Harbour)	4	1.70
Highway is bypassed	2	0.85
Great place to work	1	0.43
Central between Brisbane and Sydney	1	0.43
TOTAL: OTHER	16	6.81
TOTAL ALL	235	100.00

2.2 What do you want people to think about when they hear the name Woolgoolga?

TABLE 2.2



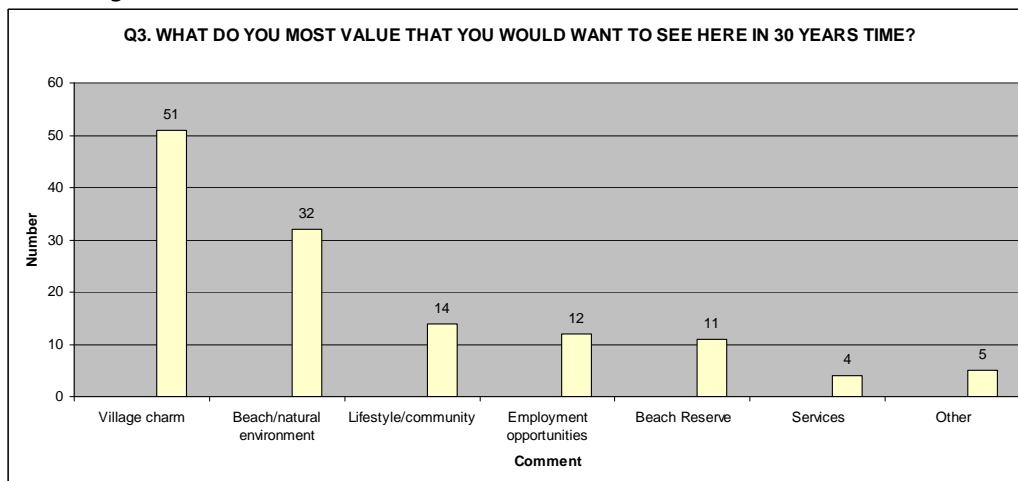
Q2 What do you want people to think about when they hear the name Woolgoolga? List 3 things.

	No.	%
VILLAGE STYLE		
Laid back / relaxed village atmosphere	18	8.65
Unique coastal village	8	3.85
Attractive, low key and beautiful	8	3.85
Good food / eateries / dining / restaurants	4	1.92
Well serviced / good facilities	4	1.92
Uncrowded /quiet/ peaceful/serene	5	2.40
Well-kept roads, clean and tree lined	3	1.44
Vibrant / progressive	2	0.96
Safe place / safe streets	2	0.96
Boutique shops / businesses	1	0.48
No high rise	1	0.48
TOTAL: VILLAGE STYLE	56	26.92
BEACH / ENVIRONMENT		
Clean / unspoilt beaches	25	12.02
Natural beauty / environment	13	6.25
Wildlife (whales, kangaroos)	3	1.44
Surfing	3	1.44
Special places (headland, beach reserve, lake)	3	1.44
Views and vistas	2	0.96
Safe beach	2	0.96
Climate	2	0.96
TOTAL: BEACH/ENVIRONMENT	53	25.48

LIFESTYLE/COMMUNITY		
Lifestyle (includes health, sports, fishing)	11	5.29
Sense of community	6	2.88
Friendly	6	2.88
Great place to live, work and enjoy	6	2.88
Welcoming	2	0.96
Happiness	3	1.44
Home	2	0.96
Easy	1	0.48
TOTAL: LIFESTYLE/COMMUNITY	37	17.79
DESTINATION		
Great place for family holidays	13	6.25
Fun	5	2.40
Seaside caravan park	3	1.44
Paradise	3	1.44
Great place to retire	3	1.44
Accessibility	1	0.48
Natural tourist attractions	1	0.48
A place to come back to	1	0.48
TOTAL: DESTINATION	30	14.42
CULTURE		
Sikh community / unique heritage	8	3.85
The Temple	4	1.92
Acceptance and respect	3	1.44
Curryfest	1	0.48
The Elephants	1	0.48
TOTAL: CULTURE	17	8.17
OTHER		
"Where Is That and How do you Spell It?"	4	1.92
"Why should I go there?"	3	1.44
Bananas and blueberries	3	1.44
Removal of highway	1	0.48
Available	1	0.48
A place in itself (not part of Coffs Harbour)	1	0.48
Residents who are not afraid of change	1	0.48
Not "Woopi"	1	0.48
TOTAL: OTHER	15	7.21
TOTAL: ALL	208	100.00

2.3 What do you most value that you would want to see here in 30 years' time?

TABLE 2.3



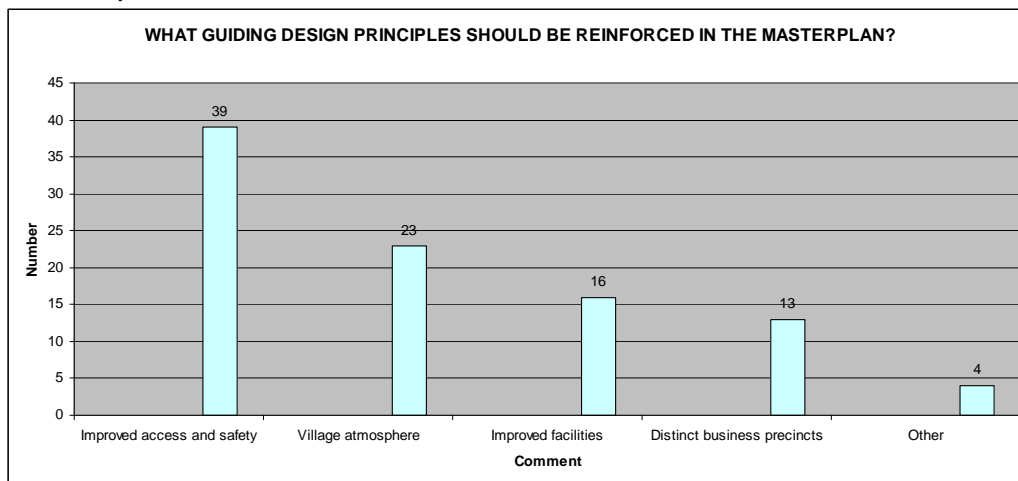
Q3. What do you most value that you would want to see here in 30 years time?

	No.	%
VILLAGE CHARM		
Village / small town community atmosphere	10	7.75
No highrise	8	6.20
Well presented (improved roads/drainage/footpaths/amenities)	7	5.43
Maintain current low key relaxed look and feel	7	5.43
Quality balanced development / progressive but not overdeveloped	6	4.65
Separate business precincts with Beach St focus on boutique retail and gourmet eateries	6	4.65
Variety of good businesses / eateries	4	3.10
Its own feel - not a suburb of Coffs	1	0.78
Heritage buildings	1	0.78
Seaside charm	1	0.78
TOTAL: VILLAGE CHARM	51	39.53
BEACH/NATURAL ENVIRONMENT		
Unspoilt pristine beaches and marine waterways	13	10.08
Retained natural beauty / protected environment	8	6.20
Space (green, seaside, leisure)	3	2.33
Clean creek, lake restored	2	1.55
Pines from beach to lake	1	0.78
Waterfall	1	0.78
Walks	1	0.78
Trees	1	0.78
Retained boat ramp access	1	0.78
Lakeside picnic area	1	0.78
TOTAL: BEACH/NATURAL ENVIRONMENT	32	24.81

LIFESTYLE/COMMUNITY		
Vibrant friendly community	4	3.10
Great retirement location	3	2.33
"Me"	2	1.55
Lifestyle	2	1.55
Ability to walk places	1	0.78
Unique culture (Punjabi and surf)	1	0.78
Great location family holidays	1	0.78
TOTAL: LIFESTYLE/COMMUNITY	14	10.85
EMPLOYMENT OPPORTUNITIES		
Growing businesses and jobs	7	5.43
Future for young people here	2	1.55
Expanded light industry	1	0.78
Retain commercial ribbon development	1	0.78
Continued development	1	0.78
TOTAL: EMPLOYMENT OPPORTUNITIES	12	9.30
BEACH RESERVE		
Beach Reserve as centrepiece / important	4	3.10
Uncluttered beach reserve / clear view of beach	2	1.55
Caravan park retained in current location	2	1.55
Caravan park moved from Beach Street	1	0.78
Beach green (extended in 2014)	1	0.78
Surf club retained	1	0.78
TOTAL: BEACH RESERVE	11	8.53
SERVICES		
Easy access to health services for aging population	1	0.78
Good public transport	1	0.78
No more motorway on the coastal strip	1	0.78
Library	1	0.78
TOTAL: SERVICES	4	3.10
OTHER		
Temple architecture	2	1.55
The next phase Woolgoolga building	1	0.78
Trafalgar Street opened to Faucett St	1	0.78
Stay as it is	1	0.78
TOTAL: OTHER	5	3.88
TOTAL: ALL	129	100.00

2.4 What guiding design principles should be reinforced in the Masterplan?

TABLE 2.4



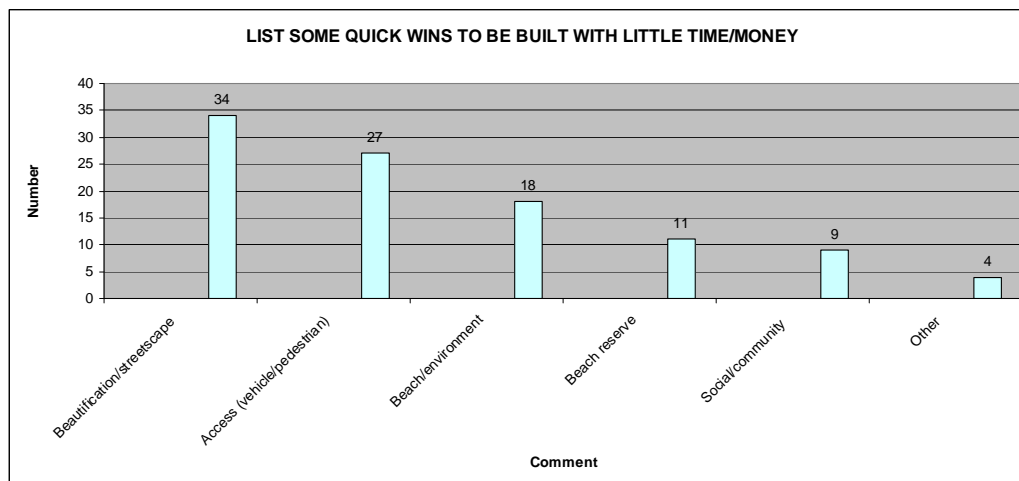
Group Exercise 1. Make a list of guiding design principles - what's important to reinforce the vision in the Masterplan

	No.	%
IMPROVED ACCESS AND SAFETY		
Pedestrian friendly, improved footpaths and linkages, with wheelchair access	10	10.53
Traffic plan for cycleways, buses, footpaths and off street parking	7	7.37
Improved road and access infrastructure	7	7.37
More parking / tidy parking	4	4.21
Improved lighting (LED street lighting)	4	4.21
Better police presence	2	2.11
Improved kerb and guttering and stormwater drainage	2	2.11
Larger bus shelters at bus stops	1	1.05
Coach stop with visitor information and caravan parking	1	1.05
Caravan parking in town for short stops	1	1.05
TOTAL: IMPROVED ACCESS AND SAFETY	39	41.05
VILLAGE ATMOSPHERE		
Retain village atmosphere in centre of town	6	6.32
Sympathetic development / buildings reflecting coastal location and climate	5	5.26
Only low rise development (limit highrise from beach front)	5	5.26
Better presented entrances to town (signage, landscaping) and town beautification	4	4.21
Retain and enhance green space	1	1.05
Low key coffee shops to attract visitors	1	1.05
Sustainable scale development	1	1.05
TOTAL: VILLAGE ATMOSPHERE	23	24.21
IMPROVED FACILITIES		
Open Surf Club to community (e.g. café)	4	4.21
Ocean pool	4	4.21
Better entertainment areas / improved youth centre / skate park	3	3.16
Better and safer access to community facilities	1	1.05
Beach showers	1	1.05
Exercise stations in open space areas	1	1.05
Bigger children's park with shade	1	1.05
Upgrade/relocate art gallery (air condition)	1	1.05
TOTAL: IMPROVED FACILITIES	16	16.84

DISTINCT BUSINESS PRECINCTS		
Boutique retail / village shopping in Beach St with bigger business on highway	6	6.32
All community services in one place	3	3.16
Activation of Beach St shops	1	1.05
Active street frontage for Beach St shops (they face inwards)	1	1.05
Move professional services to market st	1	1.05
Variable business outlets / zoning controls	1	1.05
TOTAL: DISTINCT BUSINESS PRECINCTS	13	13.68
OTHER		
Job opportunities for young people	1	1.05
Maintain and enhance the beach as the jewel	1	1.05
Cultural diversity (celebrate Indian culture, but not override)	1	1.05
Information to community about who owns what land (eg Crown)	1	1.05
TOTAL: OTHER	4	4.21
TOTAL: ALL	95	100.00

2.5 List some 'Quick Wins' which could be built with little time and money

TABLE 2.5



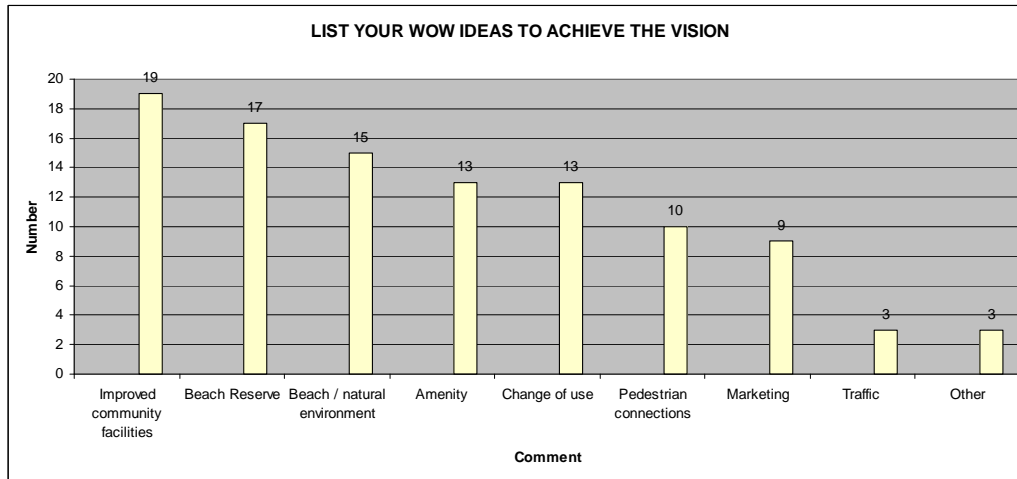
Group Exercise 2. List some 'quick wins' - things that can perhaps be easily built /created without a lot of time and money.

	No.	%
BEAUTIFICATION/STREETSCAPE		
Attractive landscaping (maybe themed), shade trees	7	6.80
Signage on highway, at gateway entry and in town	4	3.88
Tidy Lakeside picnic area (and playground)	4	3.88
Signage/directional/wayfinding	2	1.94
Information board (community info and town map)	2	1.94
More bins / more emptying	2	1.94
Bring back elephants (or theme)	2	1.94
Potted plants outside shops	1	0.97
Introduce theme to streets	1	0.97
Community street art (telegraph poles, street flags)	1	0.97
Mow more often	1	0.97
Clean up roundabout area on SI Way	1	0.97
Clean up / beautify access to Back Beach	1	0.97
Tidy appearance of industrial centre	1	0.97
Stunning entrance - avenue of trees	1	0.97
Better seating in town centre	1	0.97
Clean all rest areas daily	1	0.97
Beautify RSL building	1	0.97
TOTAL: BEAUTIFICATION/STREETSCAPE	34	33.01
ACCESS (VEHICLE/PEDESTRIAN)		
One way road circuit of headland	5	4.85
Reseal Beach St	4	3.88
Town Centre more pedestrian friendly	3	2.91
Kerb, guttering, drainage	2	1.94
Join missing links in key footpath connections	2	1.94
Improved lighting	2	1.94
Find an empty area and provide parking for RVs	1	0.97
Upgrade beachside carpark	1	0.97
Roundabout at River/Beach Street intersection	1	0.97
Connect Beach Street - River Street with footpath	1	0.97

Stop sign at Nightingale St to Beach street (trim tree that obscures give way sign)	1	0.97
Pathway from surf shed to lake	1	0.97
More linemarking for car parking	1	0.97
Headland walkway continued	1	0.97
Finish off Hastings thru to Fawcett St to relieve traffic in Gordon Street	1	0.97
TOTAL ACCESS (VEHICLE/PEDESTRIAN)	27	26.21
BEACH/ENVIRONMENT		
Fix beach erosion	6	5.83
Fix beach reserve - worn lawns, seating, bins, signage	6	5.83
Fix seaweed issues daily	2	1.94
Open Lake/clean tributaries	2	1.94
Fix beach access	1	0.97
Whale watching promotion	1	0.97
TOTAL: BEACH/ENVIRONMENT	18	17.48
BEACH RESERVE		
Beach Reserve with family campsites not cabins	4	3.88
Playground shade	2	1.94
Provide stage in beach reserve	2	1.94
Signage to stop free camping	1	0.97
Beach showers	1	0.97
Deck under the pine trees	1	0.97
TOTAL: BEACH RESERVE	11	10.68
SOCIAL/COMMUNITY		
Multi-function centre in West Woolgoolga	2	1.94
Extend alcohol free zone	2	1.94
Unlock and repair basketball court	1	0.97
Smoke free main street	1	0.97
Community gardens	1	0.97
Secure funding for existing youth centre	1	0.97
Regular community updates / get togethers	1	0.97
TOTAL: SOCIAL/COMMUNITY	9	8.74
OTHER		
Rename town to Woolgoolga Beach	1	0.97
Dog friendly	1	0.97
More internet exposure	1	0.97
dedicated Council website/officer for Woolgoolga	1	0.97
TOTAL: OTHER	4	3.88
TOTAL: ALL	103	100.00

2.6 List your WOW Ideas to achieve the Vision

TABLE 2.6



Group Exercise 3. Make a list of your WOW ideas: Projects? Themes? to achieve the Vision

	No.	%
COMMUNITY FACILITIES		
Outdoor exercise stations in appropriate locations	5	4.90
Town green / town square	4	3.92
Group Police / Fire / Ambulance on SI Way	3	2.94
Improved bus stops / interstate terminal	2	1.96
Youth Centre - add BMX section to skate park	1	0.98
Aquatic centre with wave machine	1	0.98
Make interstate bus terminal accessible, visible and displaying local info	1	0.98
Mountain bike track in hinterland	1	0.98
Rejuvenate Driver Reviver park	1	0.98
TOTAL: COMMUNITY FACILITIES	19	18.63
BEACH RESERVE		
Community stage and green space in reserve	4	3.92
Surf club with café and public use	2	1.96
Move the caravan park to open up foreshore space	2	1.96
Beach Reserve as jewel in Woolgoolga taking focus and pride of place	1	0.98
Beach Reserve has lost focus, its tired	1	0.98
Better use of beach reserve	1	0.98
Keep pine trees	1	0.98
Leave caravan park on current footprint but increase green space	1	0.98
Licence the Surf Club	1	0.98
Raise standards of Caravan Park to better standards	1	0.98
Surf club centre of town like Noosa	1	0.98
Lack of consultation for Beach Reserve	1	0.98
TOTAL: BEACH RESERVE	17	16.67

BEACH / NATURAL ENVIRONMENT		
Rock wall with boardwalk to fix erosion	4	3.92
Reinstate jetty	4	3.92
Foreshore beach access improved	4	3.92
Save beach from erosion	1	0.98
Weed control on headland	1	0.98
Dredge the Lake	1	0.98
TOTAL: BEACH / NATURAL ENVIRONMENT	15	14.71
AMENITY		
Good modern signage	4	3.92
No highrise	2	1.96
Improved landscaping / lighting through town	2	1.96
Big Blueberry opposite Woolworths	2	1.96
Provide face lift for bus stop near skate park	1	0.98
Street flags	1	0.98
Do up land in front of pool	1	0.98
TOTAL: AMENITY	13	12.75
CHANGE OF USE		
Move town pool, replace with cultural precinct	3	2.94
Put art gallery in cultural precinct	3	2.94
Town common (perhaps where caravan park is now)	2	1.96
Squash plans for the new pub	1	0.98
Combined site library, neighbourhood, seniors, community	1	0.98
Redevelop old tennis court opposite IGA	1	0.98
Business zone (with housing over) down full length Beach St	1	0.98
Water tower on headland converted to a café	1	0.98
TOTAL: CHANGE OF USE	13	12.75
PEDESTRIAN CONNECTIONS		
Boardwalk connecting lake to beach to headland walk	8	7.84
Walkway/cycleway connectedness throughout area	2	1.96
TOTAL: PEDESTRIAN CONNECTIONS	10	9.80
MARKETING		
Change name to Woolgoolga Beach	5	4.90
Make promotional DVD of Woolgoolga	1	0.98
Make Woolgoolga a beach theme (shells, seahorses, mermaids)	1	0.98
Woolgoolga Facebook page	1	0.98
Develop more major events - e.g. Curryfest	1	0.98
TOTAL: MARKETING	9	8.82
TRAFFIC		
More parking in front of IGA	1	0.98
Fix road surfaces	1	0.98
A one way circuit to headland - Pollack - Ocean St	1	0.98
TOTAL: TRAFFIC	3	2.94
OTHER		
Better catering at community meeting	1	0.98
Use reverse psychology for sign at SI Way roundabout ('don't turn here we don't want to share')	1	0.98
WOW Coffs Council finally recognises Woolgoolga's existence	1	0.98
TOTAL: OTHER	3	2.94
TOTAL: ALL	102	100.00

3. BUSINESS RETENTION AND EXPANSIONS SURVEY RESULTS

The early consultation phase included the completion of a confidential Business Retention and Expansion (BRE) Survey, to establish how confident businesses were with Woolgoolga now that the highway bypass has occurred; and also for the coming year. The survey was promoted by advertisement, on Council’s website and by presentation to a meeting of the Woolgoolga and Northern Beaches Chamber of Commerce of 6 March 2014. Flyers were also circulated to business owners in the three Woolgoolga business zones.

The survey consisted of 25 questions addressing a range of issues on business confidence, trade and patronage characteristics and perceptions of the township. Questions were prepared by Council’s Consultant Advisor.

A total of 46 businesses responded to the survey. Results of the survey are provided in a detailed report, which is provided as Attachment 2 to the Council Report. The survey has indicated that the business community has confidence in Woolgoolga as a place to do business and confidence for their business in the town. The constraints to business expansion identified by the survey generally reflect the high concentration of small and micro businesses with limits to growth from cash flow constraints, costs of training and meeting employment requirements. There was a strong positive feedback on potential initiatives that Council could undertake to assist improve business prospects. These include facilitating residential growth to increase population; street beautification works; new major retail development; improved walkways and cycleways; and new tourist development.

Some key findings of the survey are set out in the following four tables. There were positive sentiment for trading conditions over the next 12 months (Table 3.1) and the overall perception of respondents of Woolgoolga as “a place to conduct business” was overwhelmingly positive (Table 3.2).

TABLE 3.1

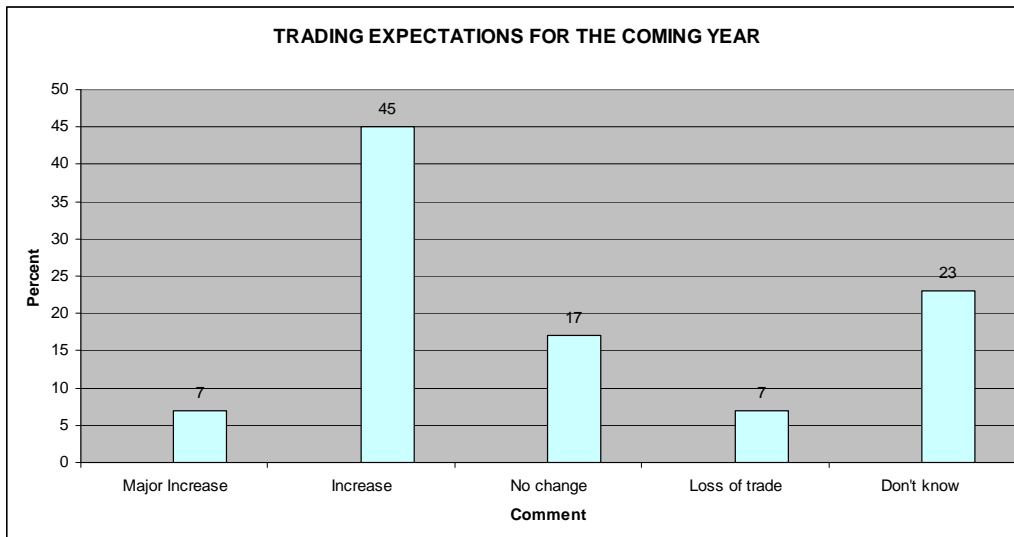


TABLE 3.2

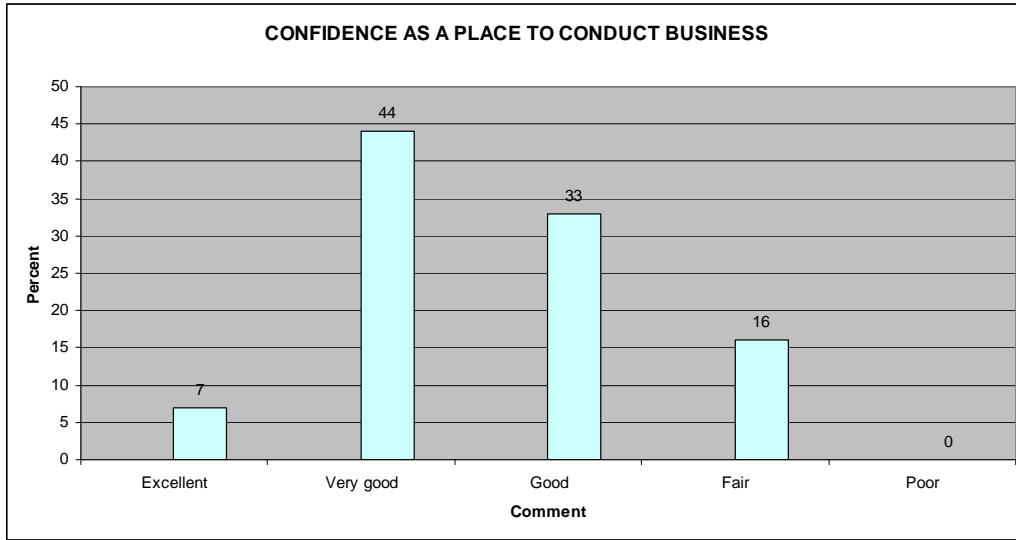


TABLE 3.3

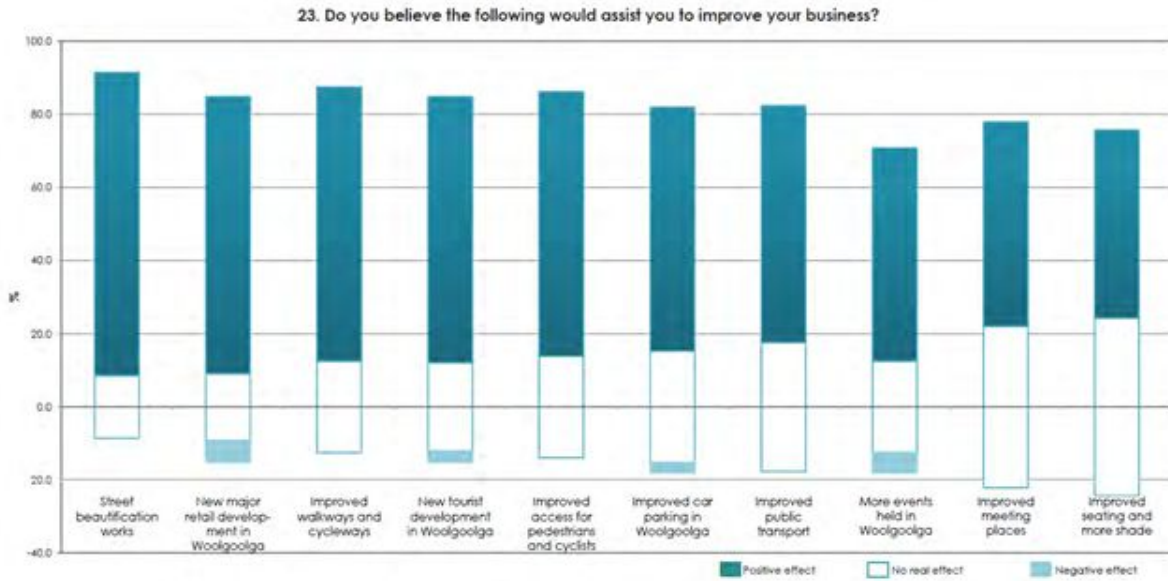
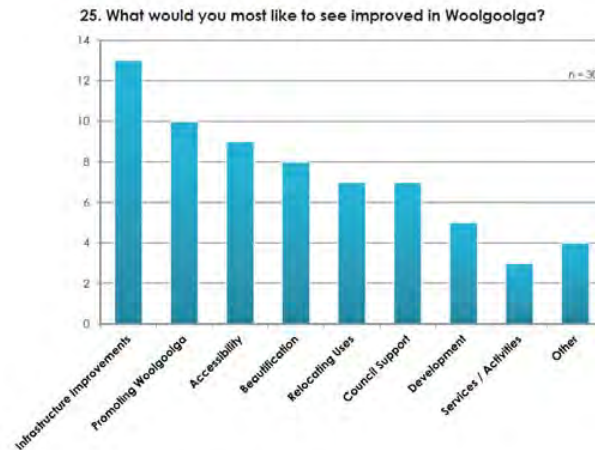


TABLE 3.4

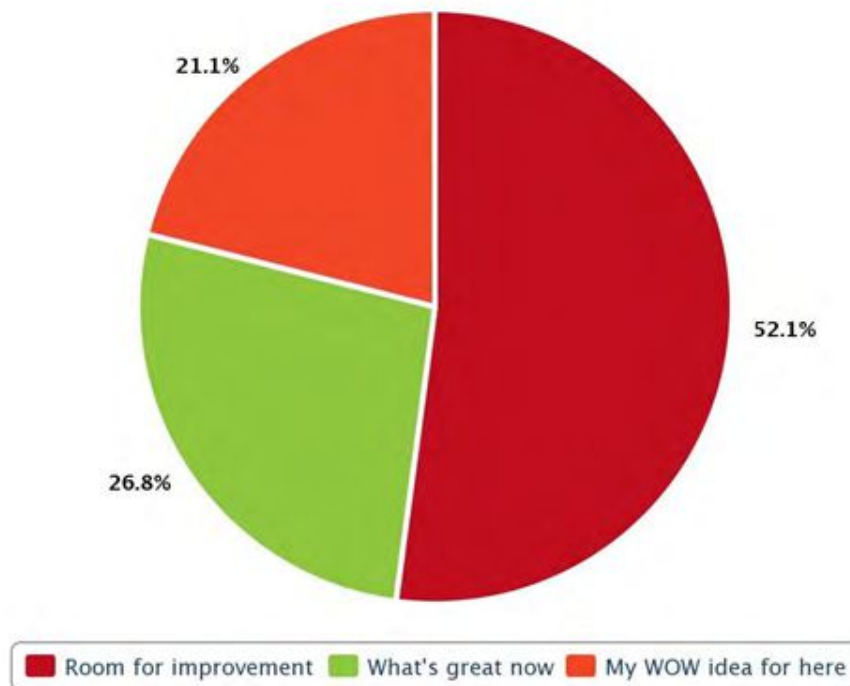


4. IDEAS MAP RESULTS

An Ideas Map was provided on the WoolgoolgaWOW website, which gave the community the opportunity to pin their comments and ideas on the map by dragging a pin to the location their comment related to. There was the opportunity for others to then rate that comment, by either voting ‘for’ or ‘against’ the comment.

The map was live on the website from mid February to 31 March 2014. A total of 2,150 hits were made on the Ideas Map, with a total of 1032 people visiting the map in the 6 weeks it was open for comment. A total of 451 comments were made on the map.

These comments were analysed thematically and are presented in Council Report Attachment 3. Over 50% of the comments related to things that the community would like to see improved, and just over 25% of the comments related to items that the community identified as ‘what’s great now’. The remaining 20% were identifying ideas for consideration for inclusion in the final Woolgoolga Town Centre Masterplan.



WOOLGOOLGA TOWN CENTRE STUDY REVIEW: Business Retention and Expansion Survey

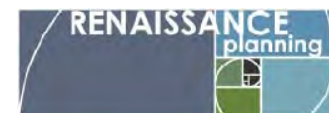


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Woolgoolga Business Retention and Expansion Survey

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1 BACKGROUND

In September 2013, Coffs Harbour City Council commissioned Bennell & Associates in association with Jackie Amos and Renaissance Planning to assist in the preparation of the Woolgoolga Town Centre Study Review. The Study provides a multifaceted approach for an assessment and framework for the revitalisation of the Woolgoolga Town Centre. The approach in the study has provided three main areas of advice encompassing:-

- economic issues;
- strategic planning; and
- built form assessments.

Within the context of the overall study, Renaissance Planning has undertaken a Business Retention and Expansion (BRE) Survey. The survey was informed by background research prepared by Bennell & Associates. This focused on an extensive literature review of studies and reports relevant to the Town Centre review. The Survey was required to highlight key strengths, weaknesses and opportunities for business development in the Town Centre. The Survey and supporting research has addressed a number of issues encompassing:-

- the role of the Woolgoolga Town Centre;
- business experiences and expectations;
- perceived differences between similar businesses in other regions;
- patronage characteristics;
- opportunities for business retention and expansion;
- attitude towards town centre opportunities;
- business trading measures;
- current and potential internet use.

This report outlines the research method, principal findings and implications for the wider Town Centre review.

Renaissance Planning Pty Ltd

2 CONTEXT

2.1 ROLE OF WOOLGOOLGA

Woolgoolga is a seaside township approximately 25 kilometres north of Coffs Harbour accessed by the Pacific Highway. It has a current population of 4,720 persons (2011 census population) and serves as a district centre for a broader catchment with a population of approximately 11,450 persons (Woolgoolga - Arrawarra SA2, at 2011 census).

In functional terms Woolgoolga fulfils two key roles, as a local centre for the town and surrounding rural district and as a holiday destination. As a local centre Woolgoolga has provided for a range of convenience and some regular food shopping requirements together with other basic retail goods and services. Its retail function will be substantially consolidated to a large neighbourhood activity centre role with the forthcoming opening of a full sized Woolworths supermarket. Research by the consultants indicates that the town has experienced significant escape expenditures to regional and sub-regional centres located to the south of Woolgoolga (Moonee Beach and Coffs Harbour).

Given the township's proximity to the beach, shops and services, Woolgoolga is a popular holiday destination for families and surfers in particular. The population over the summer months and during school holidays expands to accommodate holiday makers.

The township comprises three complementary commercial precincts (refer Figure 1):-

- **Beach Street**, is the primary retail centre in Woolgoolga. It hosts local shops, cafes, restaurants, fresh food stores, small supermarkets and banks.

The precinct is predominately at making it highly walkable with easy access to the beach and surrounding residential areas.

- the **River Street** precinct is bound by Clarence Street to the north, Solitary Island Way to the west and River Street to the east. The precinct includes the tavern and a number of takeaway food stores and supporting stores and services. The precinct has a supporting role to the Beach Street precinct.
- the **Solitary Island Way (Clarence Street)** precinct extends north to the Woolgoolga Creek and south to Pullen Street. The precinct currently accommodates a number of motels and other accommodation as well as a petrol station, emergency services and other highway uses. At present the precinct has a supporting role to both the Beach Street precinct and the River Street precinct. The site to the north of the intersection of Solitary Island Way and Pullen Street is currently being developed as a large supermarket.

FIGURE 1: WOOLGOOLGA TOWN CENTRE CONTEXT MAP



2.2 POPULATION AND DEMOGRAPHICS

The population for the Woolgoolga - Arrawarra Statistical Area 2 (SA2) has grown consistently from 10,507 persons in 2003 to 12,043 persons in 2013 (ABS ERP, Cat. No. 3218.0).

A socio-demographic analysis was undertaken for the Woolgoolga - Arrawarra Statistical Area (SA2) and the Coffs Harbour Local Government Area (LGA), with comparative assessments of regional New South Wales (defined as the State of New South Wales less the Sydney Greater Capital City Statistical Area (GCCSA)).

Key findings in relation to the age structure of the residential population were:-

- the age-sex structure for the Woolgoolga - Arrawarra SA2 is generally consistent with the Coffs Harbour LGA (refer Figure 2);
- the Woolgoolga - Arrawarra SA2 area has a marginally older population than regional NSW with proportionately more people aged over 50 years and relatively fewer people aged between 20 and 49 years (refer Figure 3).

In relation to household income (refer Figure 4):

- household incomes are marginally lower in the Woolgoolga - Arrawarra SA2 than in the Coffs Harbour LGA;
- a similar pattern of comparatively lower household incomes was observed when the income distribution of Woolgoolga - Arrawarra was compared to regional NSW. Note in this case however that there tends to be wider disparities in the household income distributions.

FIGURE 2: COMPARATIVE POPULATION DISTRIBUTION BY AGE GROUP: COFFS HARBOUR (LGA) AND WOOLGOOLGA - ARRAWARRA (SA2)

Source: ABS Census 2011 (Basic Community Profile)

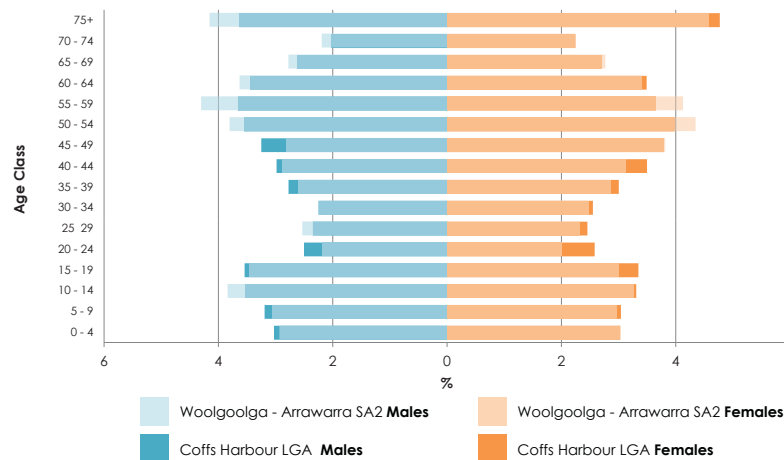


FIGURE 3: COMPARATIVE POPULATION DISTRIBUTION BY AGE GROUP: REGIONAL NSW AND WOOLGOOLGA - ARRAWARRA (SA2)

Source: ABS Census 2011 (Basic Community Profile)

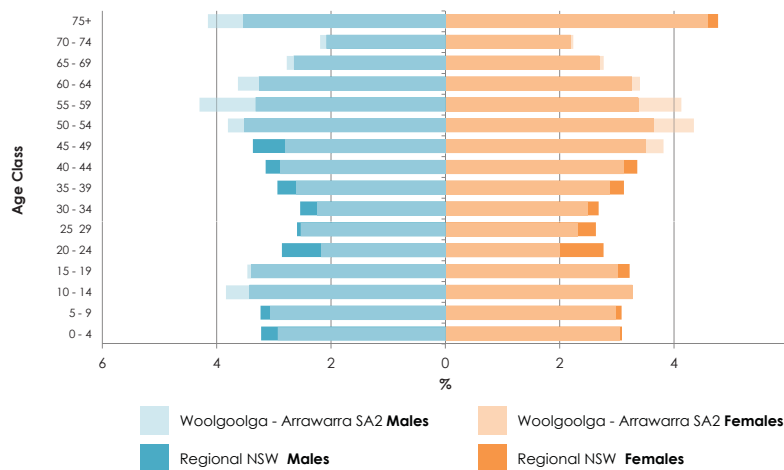


FIGURE 4: WOOLGOOLGA - ARRAWARRA (SA2): INCOME ANALYSIS

Source: ABS Census 2011 (Basic Community Profile)

Geographic Area	Woolgoolga - Arrawarra (SA2): LQ Analysis (base = Coffs Harbour City Council)							
	Individual Income (\$ / person / week)							
	1 - 199	200 - 299	300 - 399	400 - 599	600 - 799	800 - 999	1,000 - 1,249	> 1,250
Woolgoolga - Arrawarra	1.12	0.95	0.95	1.23	1.03	1.09	0.96	0.89

Geographic Area	Woolgoolga - Arrawarra (SA2): LQ Analysis (base = Regional New South Yarra)							
	Individual Income (\$ / person / week)							
	1 - 199	200 - 299	300 - 399	400 - 599	600 - 799	800 - 999	1,000 - 1,249	> 1,250
Woolgoolga - Arrawarra	0.99	1.05	0.93	1.36	1.13	1.20	1.06	0.78

LQ Measure	Description
> 1.35	Very highly over represented relative to base
1.20 - 1.35	Significantly over represented relative to base
1.11 - 1.19	Marginally over represented related to base
0.9 - 1.10	No significant variation relative to base
0.81 - 0.89	Marginally under represented relative to base
0.65 - 0.80	Significantly under represented relative to base
< 0.65	Very highly under represented relative to base

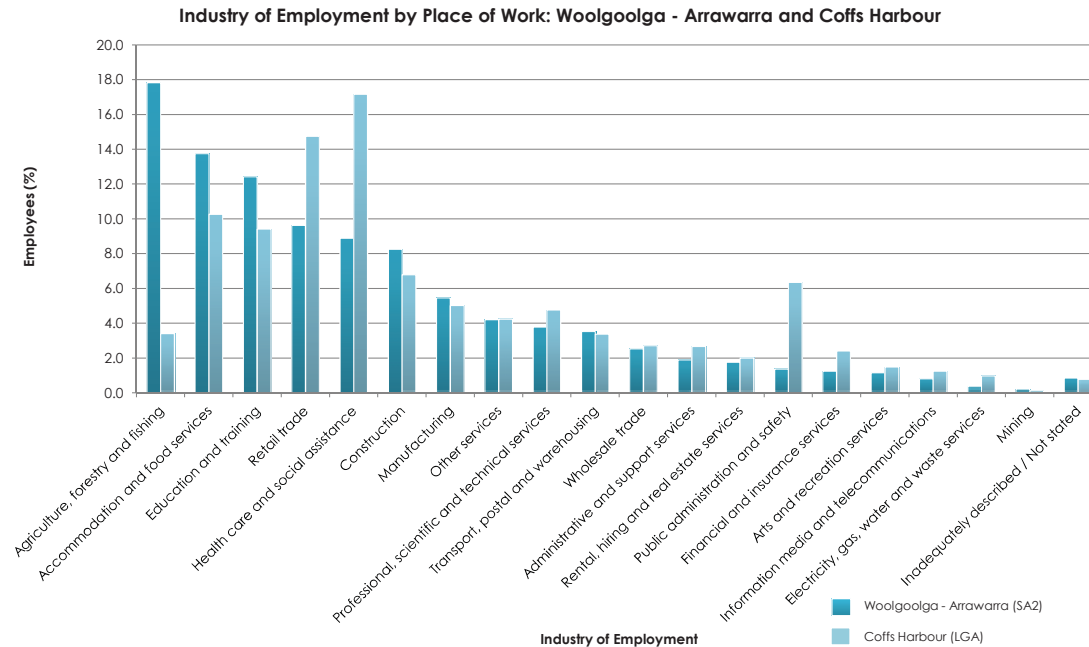
2.3 BUSINESS AND WORKFORCE CHARACTERISTICS

The relative proportion of employees by industry for those working within the Woolgoolga - Arrawarra SA2 compared to those working in Coffs Harbour LGA highlights the following characteristics (refer Figure 5):

- The largest industry within Woolgoolga - Arrawarra is *Agriculture, forestry and fishing* (17.8 per cent) followed by *Accommodation and food services* (13.8 per cent) and *Education and training* (12.4 per cent). The remaining industries have less than 10 per cent of employees each.
- In comparison Coffs Harbour's role as a regional centre shows a very different distribution of jobs. *Health care and social assistance* (17.2 per cent) accounts for the highest number of employees followed by *Retail trade* (14.8 per cent) and *Accommodation and food services* (10.3 per cent).

FIGURE 5: EMPLOYEES BY INDUSTRY OF EMPLOYMENT BY PLACE OF WORK: WOOLGOOLGA - ARRAWARRA (SA2) AND COFFS HARBOUR

Source: ABS Census 2011 (Working Population Profile)

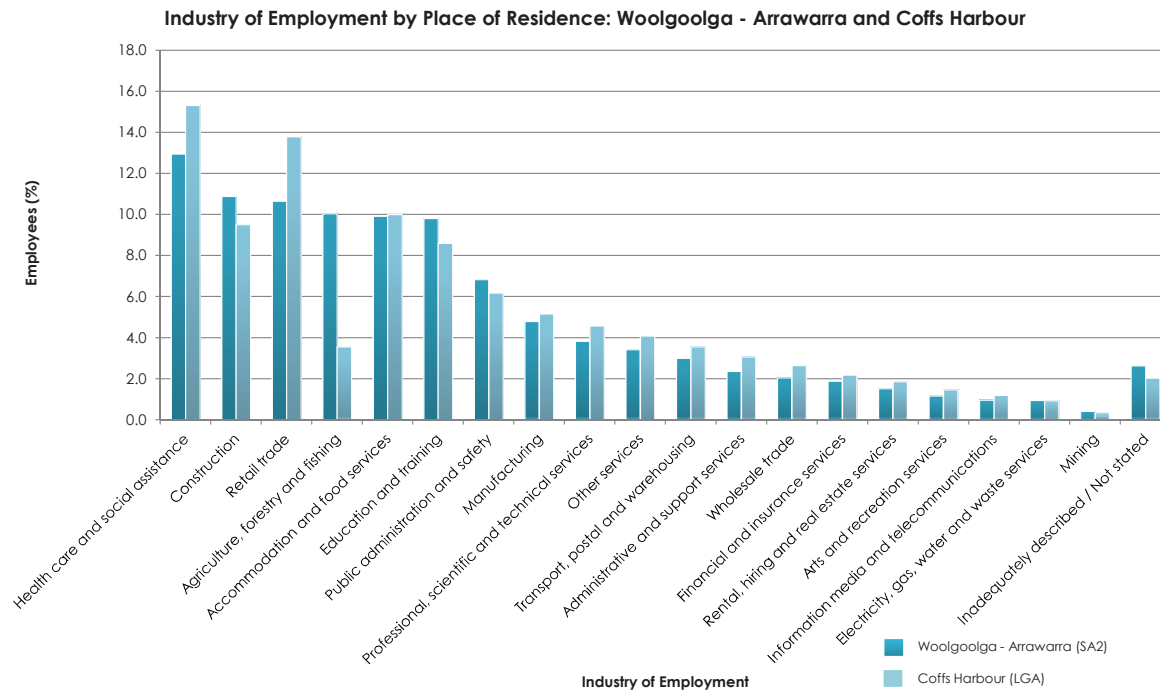


In contrast the distribution of employees by industry for people living in both Woolgoolga - Arrawarra and Coffs Harbour are remarkably similar (refer Figure 6). In both regions there is a high proportion of people working in both the *Health care and social assistance* and *Retail*

trade industries. The only significant difference in the distribution of employees is in *Agriculture, forestry and fishing* which accounts for 10 per cent of people living in Woolgoolga - Arrawarra and only 3.6 per cent of those living in the municipality of Coffs Harbour.

FIGURE 6: EMPLOYEES BY INDUSTRY OF EMPLOYMENT BY PLACE OF RESIDENCE: WOOLGOOLGA - ARRAWARRA (SA2) AND COFFS HARBOUR

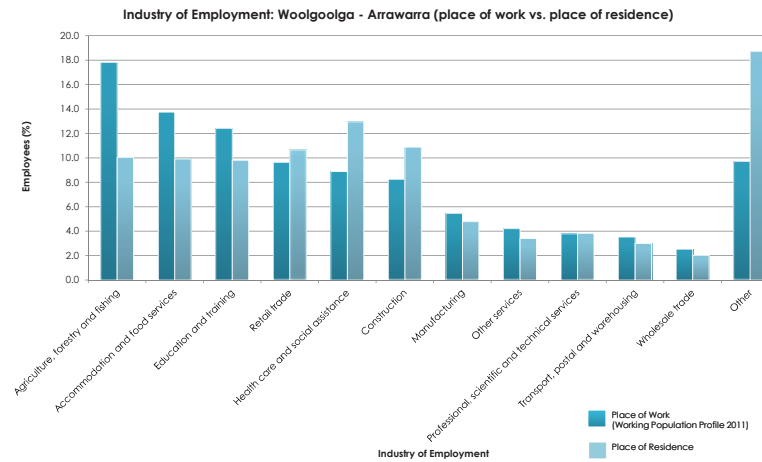
Source: ABS Census 2011 (Basic Community Profile)



When comparing industry of employment by where people work versus where they live for Woolgoolga - Arrawarra (refer Figure 7) it is clear that a number of people travel from beyond the SA2 to work in the *Agriculture, forestry and fishing; Accommodation and food services; and Education and training* industries. In contrast it is also evident that a significant proportion of the population live in Woolgoolga - Arrawarra and travel beyond the region for work, particularly those working in the *Retail trade, Health care and social assistance, and Construction* industries.

FIGURE 7: EMPLOYEES BY INDUSTRY OF EMPLOYMENT FOR WOOLGOOLGA - ARRAWARRA (SA2): PLACE OF WORK VS PLACE OF RESIDENCE

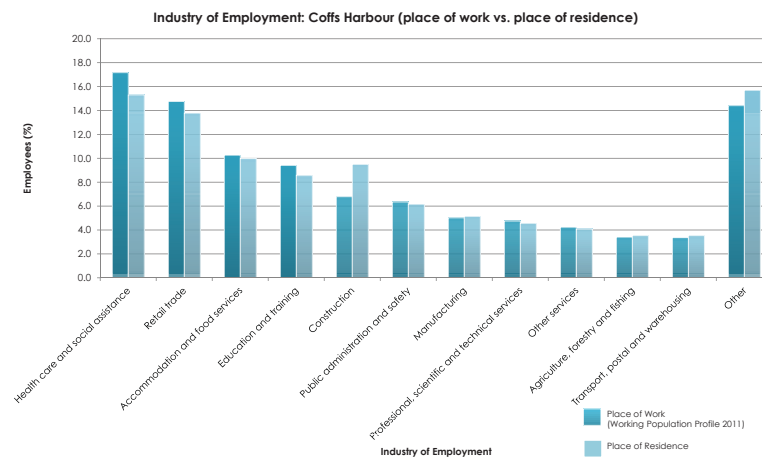
Source: ABS Census 2011 (Working Population Profile & Basic Community Profile)



Similarly when comparing those working and living in Coffs Harbour (LGA) there is a small proportion of people who travel from beyond the LGA for work (*Health care and social assistance; Retail trade; Education and training*) and some who travel from Coffs Harbour to surrounding regions to work in the *Construction* industry (refer Figure 8).

FIGURE 8: EMPLOYEES BY INDUSTRY OF EMPLOYMENT FOR COFFS HARBOUR: PLACE OF WORK VS PLACE OF RESIDENCE

Source: ABS Census 2011 (Working Population Profile & Basic Community Profile)



2.4 BUSINESSES BY INDUSTRY BY NUMBER OF EMPLOYEES

Table 1 shows the *Counts of Australian Businesses, including entries and exits, 2012* for the Woolgoolga - Arrawarra SA2 (ABS, Cat. No. 8165.0). These counts are sourced from the Australian Bureau of Statistics Business Register (ABSBR). The table indicates the following:-

- over 58 per cent of businesses in the region are non-employing;
- approximately 25 per cent of businesses have 1 - 4 employees (micro business);
- around 14.5 per cent of businesses have 5 - 19 employees (small business);
- approximately 2.2 per cent of businesses in the region have 20 - 199 employees (medium business).

Of the businesses that have employees the following can be concluded:

- approximately 60.2 per cent are micro businesses;
- a further 34.6 per cent are small businesses;
- the remaining 5.2 per cent are medium sized businesses.

TABLE 1: BUSINESSES BY INDUSTRY IN WOOLGOOLGA - ARRAWARRA (SA2) BY EMPLOYMENT SIZE RANGE

Source: ABS Counts of Australian Businesses at June 2012 (Cat. No. 8165.0)

Industry	Number of businesses by employment size range: Woolgoolga - Arrawarra (SA2)					
	Non employing	1-4	5-19	20-199	200+	Total
Agriculture, Forestry and Fishing	108	52	17	6	0	183
Mining	0	0	3	0	0	3
Manufacturing	15	3	13	0	0	31
Electricity, Gas, Water and Waste Services	3	0	3	0	0	6
Construction	103	45	10	0	0	158
Wholesale Trade	17	6	4	3	0	30
Retail Trade	21	17	6	3	0	47
Accommodation and Food Services	8	13	15	0	0	36
Transport, Postal and Warehousing	16	18	5	0	0	39
Information Media and Telecommunications	3	3	0	0	0	6
Financial and Insurance Services	38	3	0	0	0	41
Rental, Hiring and Real Estate Services	42	3	8	0	0	53
Professional, Scientific and Technical Services	35	11	4	0	0	50
Administrative and Support Services	12	6	3	0	0	21
Public Administration and Safety	0	0	0	0	0	0
Education and Training	3	0	4	0	0	7
Health Care and Social Assistance	21	13	9	6	0	49
Arts and Recreation Services	3	0	6	0	0	9
Other Services	19	13	10	0	0	42
Unknown	15	3	0	0	0	18
Total	482	209	120	18	0	829

3 BUSINESS RETENTION AND EXPANSION SURVEY: KEY FINDINGS

3.1 THE SURVEY

The BRE survey was drafted by Renaissance Planning and modified following a review by Council. The survey was undertaken by Council in February 2014. A copy of the survey is provided in Appendix A. The 25 questions addressed a range of issues on business confidence, trade and patronage characteristics and perceptions of the township. The key findings are set out below.

3.2 BUSINESS SIZE AND INDUSTRY STRUCTURE

A total of 46 businesses responded to the Survey. The Survey response does not meet requirements for statistical validity. However the clear patterns of responses provides an initial indication of business perceptions and will inform the broader Town Centre review.

A very high proportion of respondents (approximately 90 per cent) are in small businesses (5 - 19 employees) or in micro businesses (less than 5 employees). Almost two thirds of respondents are in micro businesses employing less than 5 people (refer Question 5).

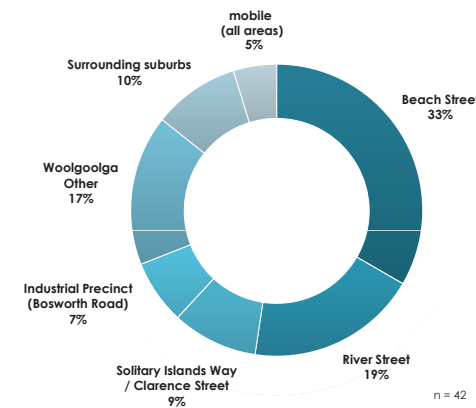
A comparative analysis of the business characteristics of the survey population with the broader distribution of businesses in the Woolgoolga - Arrawarra Statistical Area 2 (SA2) at 2012 (refer Table 1) indicates that the high concentration of micro businesses is a general reflection of business structure in the broader area. The survey business sample has a marginal under-representation of small businesses compared to the wider Woolgoolga - Arrawarra statistical area. In broad terms however the representation of small and micro businesses in the survey (that is businesses employing less than 20 persons) is consistent with the employment characteristics of the broader statistical area; some 89.6 per cent of businesses in the survey sample compared to 94.7 per cent in the wider business population at 2012.

The survey population is concentrated in accommodation, retail trade and other services (refer Question 3)

3.3 BUSINESS LOCATION

Some 62 per cent of the businesses surveyed are located in the three key commercial precincts of the township with the highest proportion being drawn from the Beach Street precinct (33.3 per cent of respondents). The balance were drawn from the industrial precinct and other Woolgoolga suburbs.

4. Where is your business located?



LQ Analysis	Woolgoolga BRES: LQ Analysis (base = ABS Count of Australian Businesses 8165.0)		
	Micro: Generally employ less than 5 people	Small: Employs between 5 - 19 people	Medium: Employs over 20 people
Woolgoolga Business Retention and Expansion Survey	1.09	0.70	1.98

LQ Measure	Description
> 1.35	Very highly over represented relative to base
1.20 - 1.35	Significantly over represented relative to base
1.11 - 1.19	Marginally over represented relative to base
0.9 - 1.10	No significant variation relative to base
0.81 - 0.89	Marginally under represented relative to base
0.65 - 0.80	Significantly under represented relative to base
< 0.65	Very highly under represented relative to base

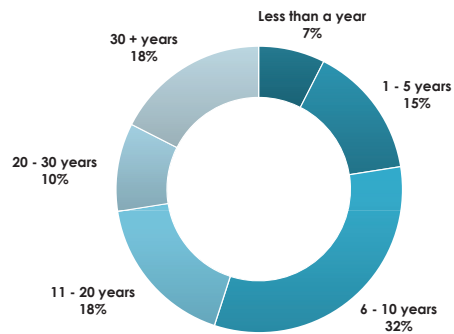
3.4 LENGTH OF TIME OPERATING IN WOOLGOOLGA

The survey population is characterised by a high preponderance of long established businesses in Woolgoolga:-

- some 78 per cent of respondents have been in Woolgoolga for more than 5 years;
- approximately 50 per cent of the survey sample have been in Woolgoolga for more than 9 years;
- some 27.5 per cent have been in Woolgoolga for more than 20 years.

These characteristics indicate a highly stable and committed local business community focused on continuity in Woolgoolga.

2. How long has your business been operating in Woolgoolga?



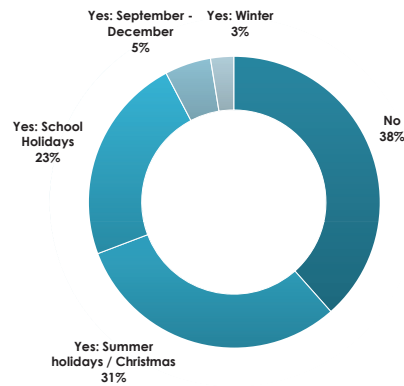
n = 40

3.5 TRADING PATTERNS AND BUSINESS CONFIDENCE

Seasonality in business trade

Approximately 62 per cent of businesses surveyed indicated seasonal fluctuations in business trade with peak seasons predominately experienced during the Christmas / summer period or school holidays (refer Question 9).

9. Does your business have a peak season? If so, when is it?

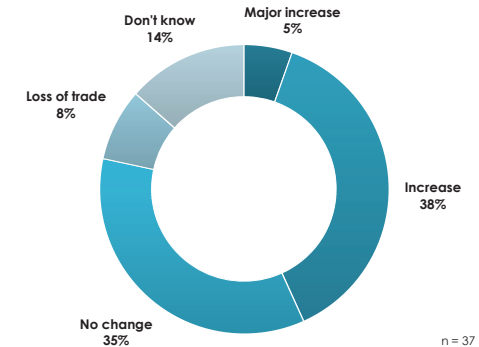


n = 39

Recent trading patterns

Over 43 per cent of businesses surveyed indicated an increase of trade over the past 12 months. Some 35 per cent indicated no significant change and only 8 per cent indicated a loss of trade (refer Question 10)

10. How is the level of trade at your business compared to 12 months ago?

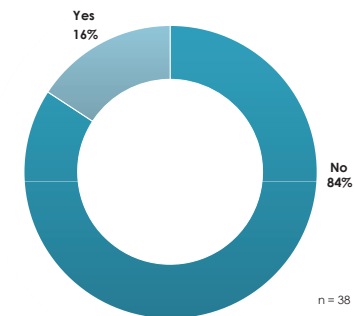


n = 37

Local trade and export services

Almost all of the businesses surveyed are focused on local trade with only 16 per cent indicating that they exported goods and services outside Woolgoolga (refer Question 13).

13. Does your business export goods / services? (sell any goods / services outside Woolgoolga)



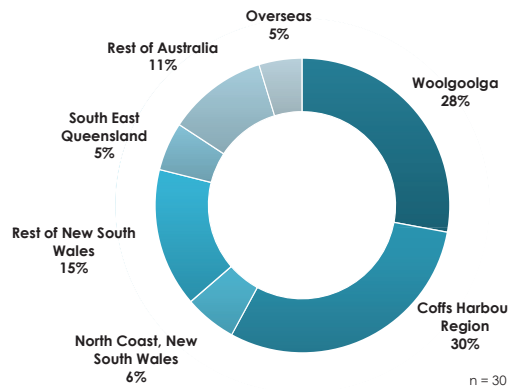
n = 38

Sources of supplies

Supplies are predominately sourced from the local region (refer Question 16):-

- approximately 62 per cent of supplies are sourced from Woolgoolga or the wider Coffs Harbour and North Coast region;
- some 23 per cent are sourced from other areas from New South Wales and South East Queensland;
- about 11 per cent are sourced from other areas in Australia;
- 4 - 5 per cent are sourced from overseas.

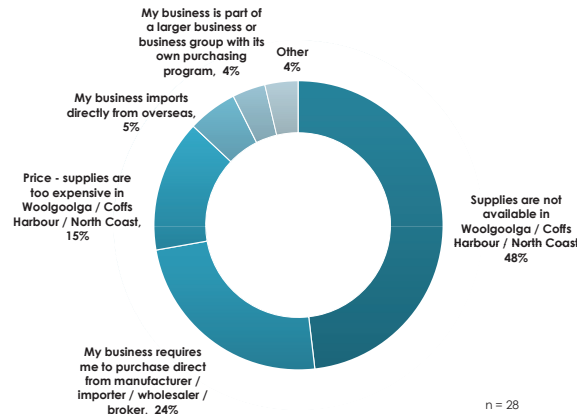
16. Where are your supplies purchased?



The survey indicated that the clear preference was to purchase from the local region. It found that the key reasons for business not purchasing locally were (refer Question 17):-

- supplies were unavailable from the local region (48 per cent of respondents);
- business arrangements required purchases to be made from suppliers in other areas (28 per cent of respondents);
- only approximately 15 per cent chose non-regional sources on the basis of price.

17. If supplies are purchased from regions other than Woolgoolga, Coffs Harbour and the North Coast of NSW, what are the main reason/s for sourcing your supplies from elsewhere?



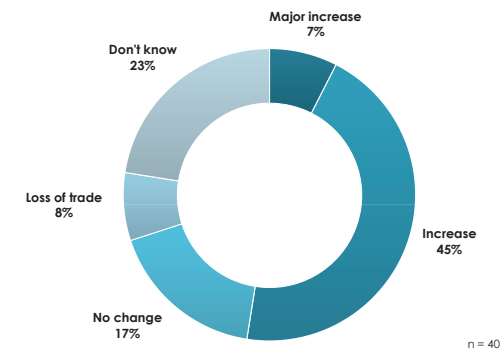
3.6 BUSINESS PROSPECTS

Trading expectations

The survey found positive sentiment for trading conditions over the next 12 months (refer Question 11):-

- a majority of businesses (52.5 per cent) anticipated an increase in business trade;
- some 17.5 per cent indicated likelihood of no change;
- a relatively small proportion (7.5 per cent of businesses) indicated an expectation of a loss of trade over the next 12 months;
- the balance (some 22.5 per cent) were uncertain as to future trading expectations.

11. Looking ahead to the forthcoming year, how do you expect the trade of your business to change?

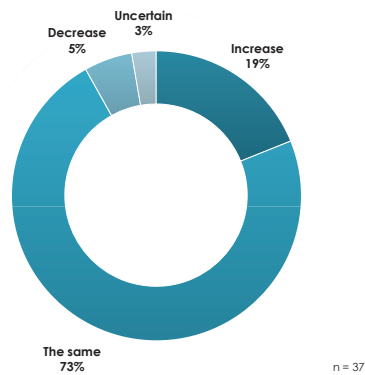


Employment expectations

The predominant sentiment in relation to employment prospects was one of maintaining the status quo (refer Question 12):-

- some 73 per cent of respondents indicated that they anticipated no change to employment at their businesses over the next 12 months;
- about 19 per cent expected their businesses to increase employment over the next 12 months;
- a small proportion of respondents (5 per cent) anticipated employment losses;
- only 3 per cent were uncertain in terms of employment prospects.

12. Over the next 12 months do you expect to increase or decrease the number of individuals employed at your business in Woolgoolga?



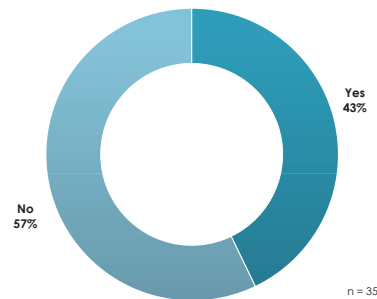
3.7 SIGNIFICANCE OF THE INTERNET

Profit generation and the internet

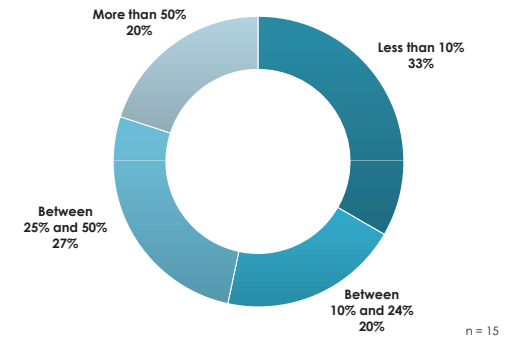
About 43 per cent of respondents indicated that their businesses generated profits through the internet (refer Question 19).

Of those generating profits through the internet almost half (approximately 47 per cent) generated in excess of 25 per cent of their business net income through the internet (refer Question 20).

19. Does your business generate profits through the internet?



20. If yes (business generates profits through the internet), what percentage of the profits of your business are generated through the internet?

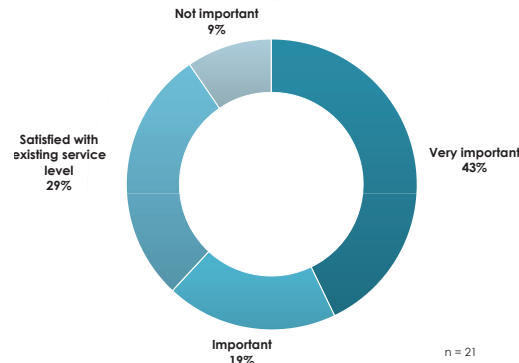


Issues for future internet usage

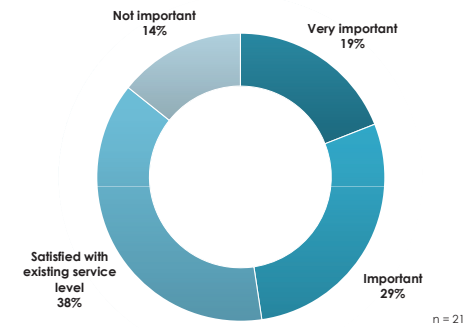
The most important issues for the businesses surveyed in relation to future internet usage were (refer Question 21):-

- the need to reduce the cost of internet services (65 per cent of respondents indicated that this issue was important / very important);
- the need for better / faster broadband services (61 per cent of respondents);
- connection to the National Broadband Network (NBN) (55 per cent);
- the need for technical assistance to better utilise / access the internet (50 per cent);
- the need for a better understanding of the capabilities of the internet (48 per cent).

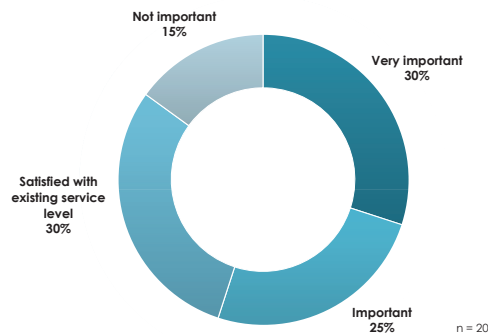
21b. How important is better and faster broadband to your business?



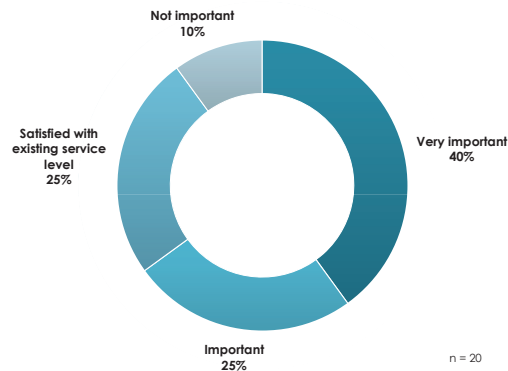
21d. How important is better understanding of the capability of the internet to your business?



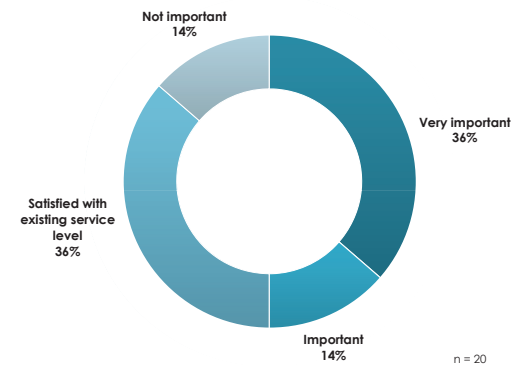
21a. How important is connection to the National Broadband Network to your business?



21c. How important is reducing the cost of internet access to your business?



21e. How important is technical assistance to better utilise / access the internet to your business?



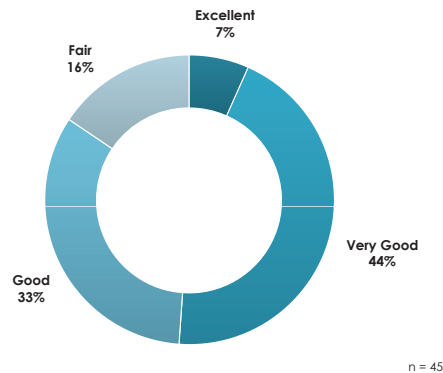
3.8 CONFIDENCE IN WOOLGOOLGA

Overall perception

The overall perception of respondents of Woolgoolga as "a place to conduct business" was overwhelmingly positive (refer Question 1):-

- some 51 per cent of respondents perceived Woolgoolga as either an "excellent" or "very good" place for business;
- some 33 per cent perceived Woolgoolga as a "good" place for business;
- only 16 per cent indicated their perception of Woolgoolga as a "fair" place for business;
- no respondents indicated Woolgoolga as a "poor" place for business.

1. What is your overall opinion of Woolgoolga as a place to conduct business?

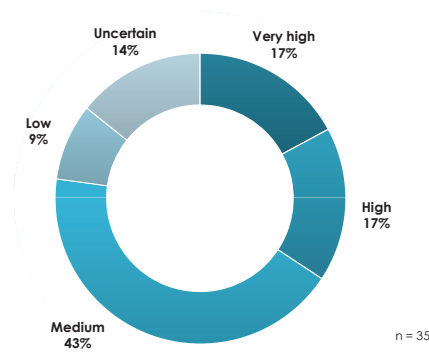


Future business prospects in Woolgoolga

The businesses surveyed expressed confidence in Woolgoolga's business prospects over the next 12 months (refer Question 22):-

- some 34 per cent indicated a "high" or "very high" level of confidence for business prospects and economic development in Woolgoolga over the next 12 months;
- approximately 43 per cent indicated a "medium" level of confidence;
- only 9 per cent had a "low" level of confidence in their perceptions of the future local business environment'
- some 14 per cent were uncertain as to the future.

22. What is your confidence in Woolgoolga's business environment over the next twelve months? (ie growth and business prospects and economic development)



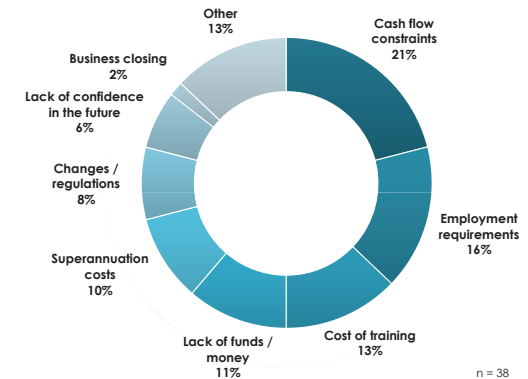
3.9 CONSTRAINTS TO BUSINESS EXPANSION

Barriers to additional employment

The key barriers to businesses taking on new employees were (refer Question 6):-

- costs of training or meeting employment requirements (29 per cent);
- related to cash flow constraints (21 per cent of responses);
- a general lack of funds and superannuation costs (21 per cent).

6. What are the key barriers to taking on new employees at your business? (please select top three only)

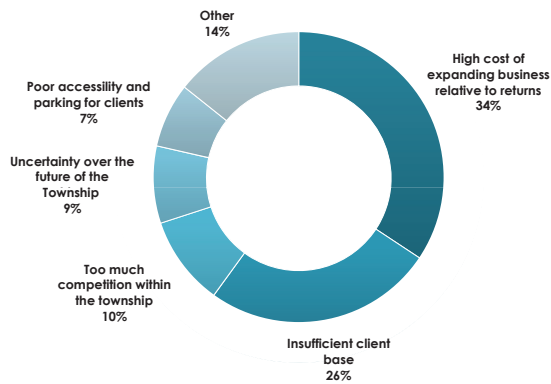


Impediments to business expansion

The key impediments to business expansion (refer Question 7) were:-

- the high cost of expanding business relative to returns (34 per cent of responses);
- an insufficient client base (26 per cent of responses).

7. What are the main impediments to you expanding your business? (please select top three only)



3.10 SUPPORT FOR INITIATIVES IN WOOLGOOLGA

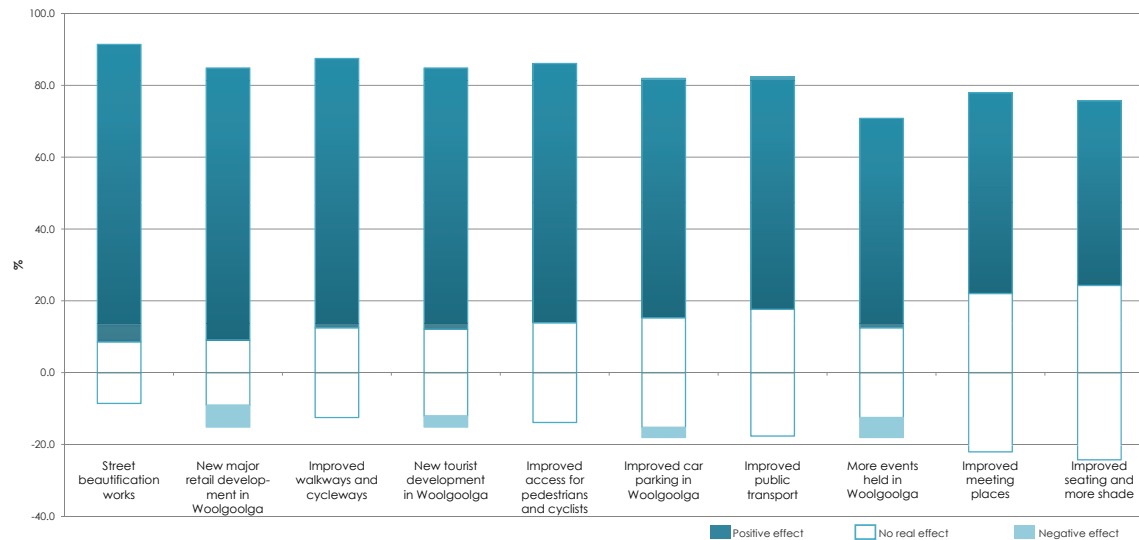
Two approaches were undertaken to assess the views of local businesses for potential initiatives to improve trading conditions and business potential in Woolgoolga:-

- feedback was sought on a range of potential initiatives drafted by Council and the consultants (refer Question 23);
- an open question was provided on improvements that businesses would like to see in Woolgoolga (refer Question 25).

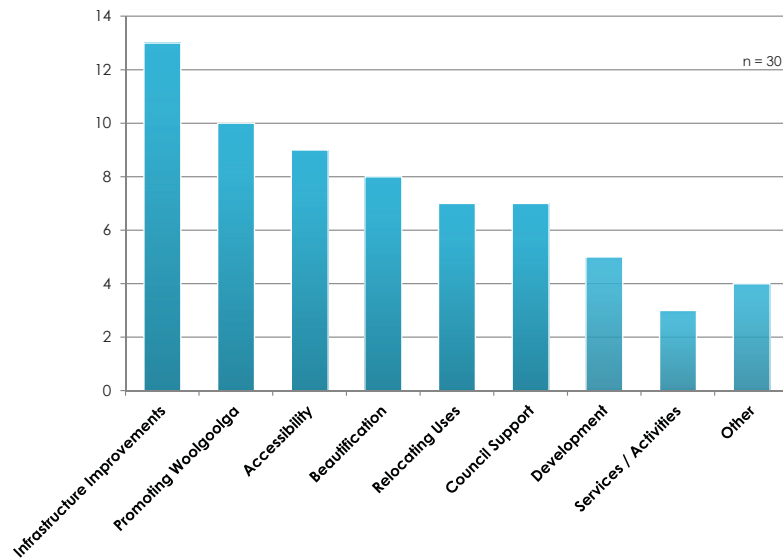
In relation to feedback on potential initiatives drafted by Council and the consultants there was a significant variation in the range of positive support (from 51 per cent to 85 per cent of businesses surveyed). The highest rated potential initiatives were (in descending order):-

- planned increases in residential population (85 per cent of respondents viewed that this initiative would have a "positive effect" to improve their businesses);
- street beautification works (82 per cent);
- new major retail development in Woolgoolga (76 per cent);
- improved walkways and cycleways (75 per cent);
- new tourist development in Woolgoolga (73 per cent).

23. Do you believe the following would assist you to improve your business?



25. What would you most like to see improved in Woolgoolga?

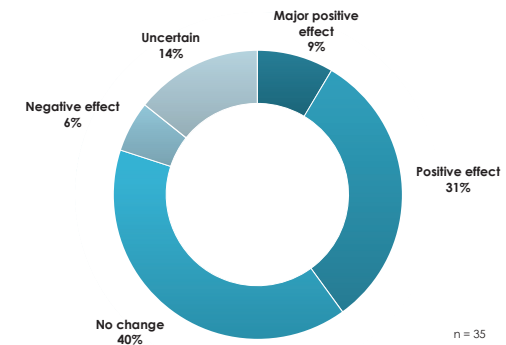


3.11 IMPACT OF THE BYPASS

In relation to the Woolgoolga bypass sentiment was evenly divided between a perception of an overall positive effect and no impact (refer Question 24):-

- some 40 per cent believe the Woolgoolga bypass would have a positive impact on their businesses;
- some 40 per cent believe the bypass would have no overall effect;
- about 6 per cent believed the bypass would have a negative effect;
- the balance (approximately 14 per cent) were uncertain as to the likely effect on their businesses.

24. How do you believe the Woolgoolga bypass will affect your business?



4 SUPPORTING FINDINGS

As part of the Town Centre Study Review Council conducted a Community Vision Night on Tuesday 25th February 2014. The workshop was well attended by the community with 67 participants including residents, stakeholders and business owners. The workshop addressed several issues directed to identify key values and aspirations held by the local community and stakeholders. The questions and workshop exercises comprised the following:-

4.1 WORKSHOP QUESTIONS AND EXERCISES

There were three open questions:-

- What makes Woolgoolga special to you? (Q.1)
- What do you want people to think about when they hear the name Woolgoolga? (Q.2)
- What do you most value that you would want to see here in 30 years time? (Q.3)

Three workshop exercises were undertaken. These were structured to provide guidance to Council and the planning consultants in their approach to planning and design for the Woolgoolga Town Centre. The exercises addressed the following:-

- Make a list of guiding design principles - what's important to reinforce the vision in the Masterplan? (Exercise 1)
- List some quick "wins" things that can perhaps be easily built / created without a lot of time and money (Exercise 2)
- Make a list of your WOW ideas: Projects? Themes? To achieve the vision (Exercise 3)

4.2 KEY WORKSHOP OUTCOMES

As indicated above the consultants have reassessed the workshop responses recorded by Council. A detailed report on the outcomes of the consultation and WOW projects will be provided in a separate report by Council.

It will be noted that the workshop has identified a clear consistent theme: **the notion of maintaining and enhancing a local village environment and ambience and the role of the beach linked to local environment and amenity are the key unifying values that run through the workshop.** These were consistently supported by significant proportions of workshop participants.

Within this context there were a number of important supporting values identified by the community and stakeholders. These encompassed:-

- Woolgoolga as an attractive place with a distinctive **lifestyle and community**;
- Woolgoolga as a great holiday and retirement **destination**;
- Woolgoolga as a place with a unique **culture and heritage**;
- the need to ensure that Woolgoolga is planned to ensure pedestrian safety and amenity, and convenient access within the framework of **integrated access and transport**;
- the need to ensure **sympathetic development** that is compatible with Woolgoolga's existing character and scale and best suited for its location and climate;
- the need to provide innovative and creative **beautification and amenity** initiatives that add value to the village and beach themes;

- the need to identify **infrastructure projects** that will add value and amenity to the beach and local environment;
- identification of new **community facilities and services** required that could add value and attraction to the Woolgoolga Town Centre;
- innovative and creative thinking to envisage major **changes of use** to open up the town centre to the beach and provide better community and cultural outcomes;

5 CONCLUSIONS AND IMPLICATIONS FOR THE STUDY

The BRE Survey and the consultation workshop provide a clear narrative of local business and community sentiment in relation to the business environment and opportunities and in relation to the future of Woolgoolga.

In general terms the majority of businesses surveyed are small and micro businesses with less than 20 employees. The distribution of small and micro businesses in the Woolgoolga survey is generally comparable to the wider Coffs Harbour LGA.

The business are largely long established and have a high level of commitment, confidence and optimism in the future of the town.

There is significant positive support for Woolgoolga as a place to do business and strong support for local and regional sourcing of supplies where these are available. There is also a strong positive sentiment for future trading prospects.

The constraints to business expansion identified by the survey generally reflect the high concentration of small and micro businesses with limits to growth being set by cash flow constraints, costs of training and meeting employment requirements and a lack of funds to meet superannuation requirements. A number of businesses have reached a point where the cost of expanding the business was not warranted relative to the returns. Importantly these are fundamental issues related to the structure of business in the area and are outside the scope of Council to influence.

There was a strong positive feedback on potential initiatives that Council could undertake that would be likely to improve business prospects in the Town. These included:-

- facilitating residential growth to increase the residential population;
- street beautification works;
- new major retail development;
- improved walkways and cycleways;
- new tourist development.

The Community Vision Night workshop identified a remarkable degree of consistent support for two key values central to the future direction of Woolgoolga:-

- the need for Woolgoolga to retain its village ambience and character;
- the need to enhance and reflect the town's beach and local environment.

Within this context there was strong and consistent support for a number of values to provide guidance on future directions and initiatives for the town. These encompassed:-

- lifestyle and community;
- Woolgoolga as a great holiday and retirement destination;
- cultural and heritage values;
- integrated access and transport;
- sympathetic development;
- beautification and amenity;
- infrastructure projects;
- community facilities and services;
- changes of use initiatives.

In summary, the business community has confidence in Woolgoolga as a place to do business and has confidence for their business in the town. It is strongly characterised by small and micro businesses and the identified trading constraints tend to reflect this characteristic.

Businesses tend to be long established with a strong commitment to the future of Woolgoolga.

The response to the Community Vision workshop provided a clear direction to Council of the need to retain the village ambience of Woolgoolga and to enhance the town's beach and local environment. Within this context the workshop provided clarity on a number of key supporting values to guide the future sustainable planning and development of the township.

APPENDIX A

Woolgoolga Business Retention and Expansion Survey:

Tables & Graphs

QUESTION 1:

What is your overall opinion of Woolgoolga as a place to conduct business?

Question 1: What is your overall opinion of Woolgoolga as a place to conduct business?	No.	%
Excellent	3	6.7
Very Good	20	44.4
Good	15	33.3
Fair	7	15.6
Total	45	100.0

n* = 45

*number of respondents

QUESTION 2:

How long has your business been operating in Woolgoolga?

Question 2: How long has your business been operating in Woolgoolga?	No.	%
Less than a year	3	7.5
1 - 5 years	6	15.0
6 - 10 years	13	32.5
11 - 20 years	7	17.5
20 - 30 years	4	10.0
30 + years	7	17.5
Total	40	100.0

n* = 40

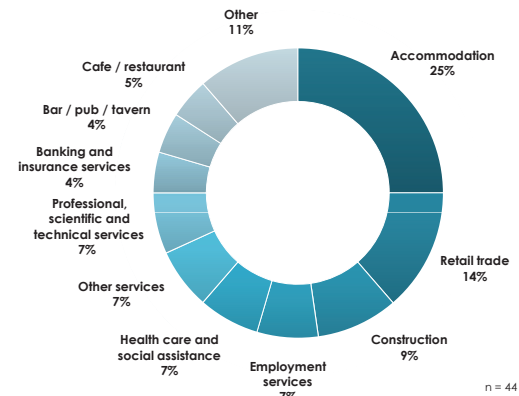
QUESTION 3:

Which of the following best describes your business?

Question 3: Which of the following best describes your business?	No.	%
Accommodation	11	25.0
Retail trade	6	13.6
Construction	4	9.1
Employment services	3	6.8
Health care and social assistance	3	6.8
Other services	3	6.8
Professional, scientific and technical services (incl. accounting, legal, advertising, etc)	3	6.8
Banking and insurance services	2	4.5
Bar / pub / tavern	2	4.5
Cafe / restaurant	2	4.5
Other		
<i>Arts and recreation services</i>	1	2.3
<i>Education and training</i>	1	2.3
<i>Hairdressing / beauty services</i>	1	2.3
<i>Information media and telecommunications</i>	1	2.3
<i>Rental, hiring and real estate services</i>	1	2.3
Total	44	100.0

n* = 44

3. Which of the following best describes your business?



QUESTION 4:

Where is your business located?

Question 4: Where is your business located?	No.	%
Beach Street	14	33.3
River Street	8	19.0
Solitary Islands Way / Clarence Street	4	9.5
Industrial Precinct (Bosworth Road)	3	7.1
Woolgoolga Other	7	16.7
Surrounding suburbs	4	9.5
mobile (all areas)	2	4.8
Total	42	100.0

n* = 42

QUESTION 5:

What is the size of your business in Woolgoolga?

Question 5: What is the size of your business in Woolgoolga?	Low Season		Peak Season	
	No.	%	No.	%
Generally employ less than 5 people	9	60.0	19	65.5
Employs between 5 - 9 people	3	20.0	4	13.8
Employs between 10 - 19 people	2	13.3	3	10.3
Employs between 20 - 49 people	1	6.7	2	6.9
Employs between 50-99 people	-	-	1	3.4
Total	15	100.0	29	100.0

note respondents were invited to give an answer for low and peak season

n* low season = 15

n* peak season = 29

QUESTION 6:

What are the key barriers to taking on new employees at your business?

Question 6: What are the key barriers to taking on new employees at your business	No.*	%
Cash flow constraints	13	21.0
Employment requirements	10	16.1
Cost of training	8	12.9
Lack of funds / money	7	11.3
Superannuation costs	6	9.7
Changes / regulations	5	8.1
Lack of confidence in the future	4	6.5
Business closing	1	1.6
Other		
<i>Small business / not required</i>	3	4.8
<i>Location constraints</i>	1	1.6
<i>Other n.e.c</i>	4	6.5
Total	62	100.0

n* = 38

note respondents were invited to give up to three responses each

QUESTION 7:

What are the main impediments to expanding your business?

Question 7: What are the main impediments to you expanding your business?	No.*	%
High cost of expanding business relative to returns	24	34.3
Insufficient client base	18	25.7
Too much competition within the township	7	10.0
Uncertainty over the future of the Township	6	8.6
Poor accessility and parking for clients	5	7.1
Other	10	14.3
<i>Zoning / regulations</i>	2	2.9
<i>Demographic changes</i>	1	1.4
<i>Lack of infrastructure</i>	1	1.4
<i>Lack of consumer confidence</i>	1	1.4
<i>Other n.e.c.</i>	5	7.1
Total	70	100.0

n* = 38

note respondents were invited to give up to three responses each

QUESTION 8:

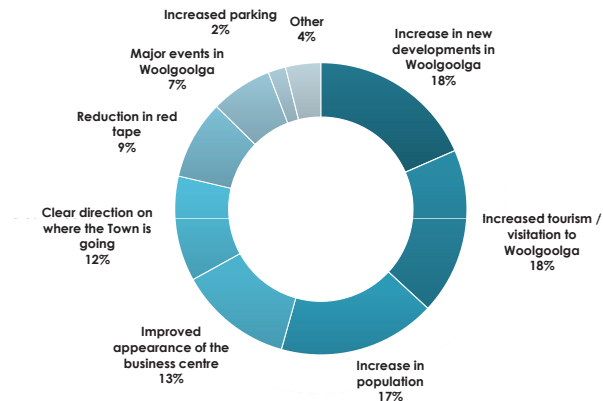
What are the main factors that would encourage you to expand your business?

Question 8: What are the main factors that would encourage you to expand your business?	No.*	%
Increase in new developments in Woolgoolga	19	18.4
Increased tourism / visitation to Woolgoolga	19	18.4
Increase in population	18	17.5
Improved appearance of the business centre	13	12.6
Clear direction on where the Town is going	12	11.7
Reduction in red tape	9	8.7
Major events in Woolgoolga	7	6.8
Increased parking	2	1.9
Other		
Clear signage	1	1.0
Improve pedestrian access	1	1.0
Other n.e.c.	2	1.9
Total	103	100.0

n* = 39

note respondents were invited to give up to three responses each

8. What are the main factors that would encourage you to expand your business? (please select top three only)



n = 39

QUESTION 9:

Does your business have a peak season? If so, when is it?

Question 9: Does your business have a peak season? If so, when is it?	No.	%
No	15	38.5
Yes		
Summer holidays / Christmas	12	30.8
School Holidays	9	23.1
September - December	2	5.1
Winter	1	2.6
Total	39	100.0

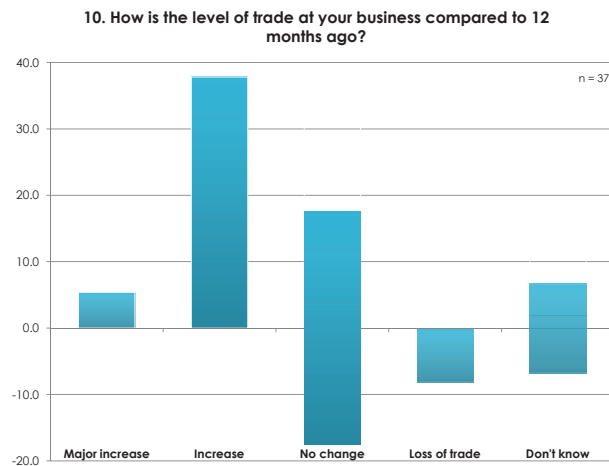
n* = 39

QUESTION 10:

How is the level of trade at your business compared to 12 months ago?

Question 10: How is the level of trade at your business compared to 12 months ago?	No.	%
Major increase	2	5.4
Increase	14	37.8
No change	13	35.1
Loss of trade	3	8.1
Don't know	5	13.5
Total	37	100.0

n* = 37

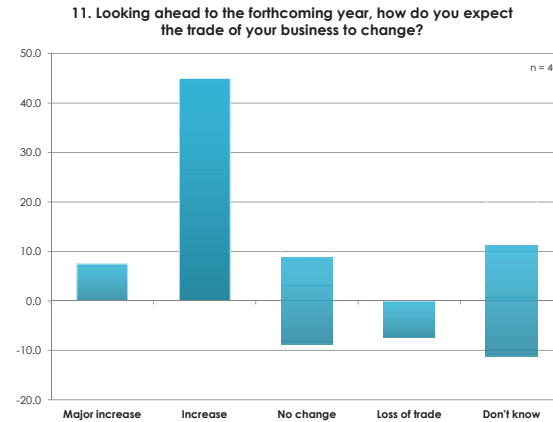


QUESTION 11:

Looking ahead to the forthcoming year, how do you expect the trade of your business to change?

Question 11: Looking ahead to the forthcoming year, how do you expect the trade of your business to change?	No.	%
Major increase	3	7.5
Increase	18	45.0
No change	7	17.5
Loss of trade	3	7.5
Don't know	9	22.5
Total	40	100.0

n* = 40



QUESTION 12:

Over the next 12 months do you expect to increase or decrease the number of individuals employed at your business in Woolgoolga?

Question 12: Over the next 12 months do you expect to increase or decrease the number of individuals employed at your business in Woolgoolga?	No.	%
Increase	7	18.9
The same	27	73.0
Decrease	2	5.4
Uncertain	1	2.7
Total	37	100.0

n* = 37

QUESTION 13:

Does your business export goods / services?

Question 13: Does your business export goods / services? (sell any goods / services outside Woolgoolga)	No.	%
No	32	84.2
Yes	6	15.8
Total	38	100.0

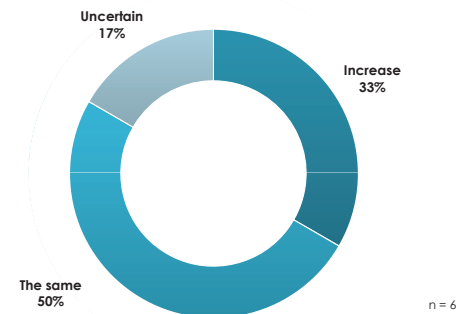
n* = 38

QUESTION 14:

Looking back over the previous year, have the total exports of your business increased, or decreased?

Question 14: Looking back over the previous year, have the total exports of your business increased, or decreased? (exports are any goods / services sold outside Woolgoolga)	No.	%
Increase	2	33.3
The same	3	50.0
Uncertain	1	16.7
Total	6	100.0

14. Looking back over the previous year, have the total exports of your business increased, or decreased?
(exports are any goods / services sold outside Woolgoolga)



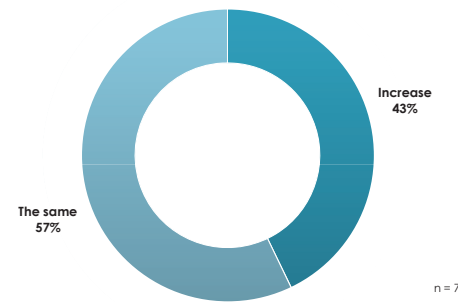
QUESTION 15:

Looking forward to the forthcoming year, do you expect the total exports of your business to increase, or decrease?

Question 15: Looking forward to the forthcoming year, do you expect the total exports of your business to increase, or decrease?	No.	%
Increase	3	42.9
The same	4	57.1
Total	7	100.0

n* = 7

15. Looking forward to the forthcoming year, do you expect the total exports of your business to increase, or decrease?



QUESTION 16:

Approximately what percentage of your supplies are purchased from the following location?

Question 16: Approximately what percentage of your supplies are purchased from the following locations?	Woolgoolga	Coffs Harbour Region	North Coast, New South Wales	Rest of New South Wales	South East Queensland	Rest of Australia	Overseas
Between 1% and 20%	12	16	6	4	4	9	7
Between 21% and 40%	3	4	2	3	1	1	-
Between 41% and 60%	3	5	1	2	-	1	-
Between 61% and 80%	3	4	-	2	-	1	1
Over 80%	3	1	-	1	1	1	-
Total (no.)	24	30	9	12	6	13	8
Total (%)	23.5	29.4	8.8	11.8	5.9	12.7	7.8

n* = 30

QUESTION 17:

If supplies are purchased from regions other than Woolgoolga, Coffs Harbour and the North Coast of NSW, what are the main reason/s for sourcing your supplies from elsewhere?

Question 17: If supplies are purchased from regions other than Woolgoolga, Coffs Harbour and the North Coast of NSW, what are the main reason/s for sourcing your supplies from elsewhere?	No.*	%
Supplies are not available in Woolgoolga / Coffs Harbour / North Coast	26	48.1
My business requires me to purchase direct from manufacturer / importer / wholesaler / broker	13	24.1
Price - supplies are too expensive in Woolgoolga / Coffs Harbour / North Coast	8	14.8
My business imports directly from overseas	3	5.6
My business is part of a larger business or business group with its own purchasing program	2	3.7
Other	2	3.7
Total	54	100.0

n* = 28

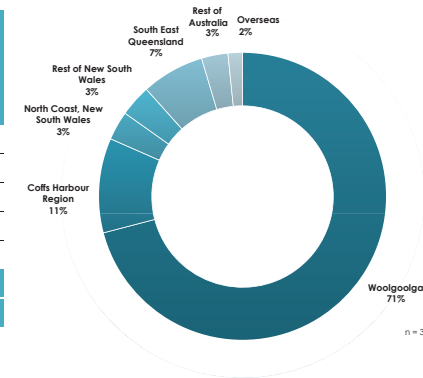
QUESTION 18:

Approximately what percentage of your profits are generated in the following regions?

Question 18: Approximately what percentage of your profits are generated in?	Woolgoolga	Coffs Harbour Region	North Coast, New South Wales	Rest of New South Wales	South East Queensland	Rest of Australia	Overseas
Between 1% and 20%	4	6	4	2	1	6	2
Between 21% and 40%	2	4	2	3	4	1	1
Between 41% and 60%	1	3	-	-	-	-	-
Between 61% and 80%	4	-	-	-	-	-	-
Over 80%	20	-	-	-	1	-	-
Total (no.)	31	13	6	5	6	7	3
Total (%)	43.7	18.3	8.5	7.0	8.5	9.9	4.2

n* = 31

18. Approximately what percentage of your profits are generated in?



QUESTION 19:

Does your business generate profits through the internet?

Question 19: Does your business generate profits through the internet?	No.	%
Yes	15	42.9
No	20	57.1
Total	35	100.0

n* = 35

QUESTION 20:

If yes (business generates profits through the internet), what percentage of the profits of your business are generated through the internet?

Question 20: If yes (business generates profits through the internet), what percentage of the profits of your business are generated through the internet?	No.	%
Less than 10%	5	33.3
Between 10% and 24%	3	20.0
Between 25% and 50%	4	26.7
More than 50%	3	20.0
Total	15	100.0

n* = 15

QUESTION 21:

What are the most important and / or pressing issues for your business regarding the internet?

Question 21: What are the most important and / or pressing issues for your business regarding the internet?	Connection to the National Broadband Network		Better and faster broadband		Reducing the cost of internet access		Better understanding of capability of the internet		Technical assistance to better utilise / access the internet	
	No.	%	No.	%	No.	%	No.	%	No.	%
Very important	6	30.0	9	42.9	8	40.0	4	19.0	8	36.4
Important	5	25.0	4	19.0	5	25.0	6	28.6	3	13.6
Satisfied with existing service level	6	30.0	6	28.6	5	25.0	8	38.1	8	36.4
Not important	3	15.0	2	9.5	2	10.0	3	14.3	3	13.6
Total	20	100.0	21	100.0	20	100.0	21	100.0	22	100.0

n* = 20

n* = 21

n* = 20

n* = 21

n* = 22

QUESTION 22:

What is your confidence in Woolgoolga's business environment over the next 12 months?

Question 22: What is your confidence in Woolgoolga's business environment over the next twelve months? (ie growth and business prospects and economic development)	No.	%
Very high	6	17.1
High	6	17.1
Medium	15	42.9
Low	3	8.6
Uncertain	5	14.3
Total	35	100.0

n* = 35

QUESTION 23:

Do you believe the following would assist you to improve your business?

Question 23: Do you believe the following would assist you to improve your business?	Street beautification works		New tourist development in Woolgoolga		Improved car parking in Woolgoolga		Improved access for pedestrians and cyclists		Improved walkways and cycleways		Improved seating and more shade		Improved meeting places	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Positive effect	29	82.9	24	72.7	24	66.7	26	72.2	27	75.0	18	51.4	19	55.9
No real effect	6	17.1	8	24.2	11	30.6	10	27.8	9	25.0	17	48.6	15	44.1
Negative effect	-	-	1	3.0	1	2.8	-	-	-	-	-	-	-	-
Total	35	100.0	33	100.0	36	100.0	36	100.0	36	100.0	35	100.0	34	100.0

n* = 35

n* = 33

n* = 36

n* = 36

n* = 36

n* = 35

n* = 34

QUESTION 24:

How do you believe the Woolgoolga bypass will affect your business?

Question 24: How do you believe the Woolgoolga bypass will affect your business?	No.	%
Major positive effect	3	8.6
Positive effect	11	31.4
No change	14	40.0
Negative effect	2	5.7
Uncertain	5	14.3
Total	35	100.0

n* = 35

Improved public transport		New major retail development in Woolgoolga		Planned major increases in residential population		More events held in Woolgoolga (e.g curry festival)	
No.	%	No.	%	No.	%	No.	%
22	64.7	25	75.8	29	85.3	21	65.6
12	35.3	6	18.2	4	11.8	9	28.1
-	-	2	6.1	1	2.9	2	6.3
34	100.0	33	100.0	34	100.0	32	100.0

n* = 34

n* = 33

n* = 34

n* = 32

QUESTION 25:

What would you most like to see improved in Woolgoolga?

Question 25: What would you most like to see improved in Woolgoolga?	No.
Infrastructure Improvements (include road maintenance, piping drains along Solitary Way, building more footpaths, one way streets, improved parking and improved lighting)	13
Promoting Woolgoolga (includes improved signage on the highway, advertising Woopi as a tourist destination and more events)	10
Accessibility (Includes improving walkways and wheelchair accessibility, creating links from Headland to the beach to Pollock Esplanade and to Emerald Beach and Sandy Beach)	9
Beautification (focusing on Beach Street, Market Street, River Street, town centre and gateways)	8
Relocating Uses (includes relocating the caravan park to make way for beachside shops, businesses and a promenade)	7
Council Support (includes greater support from Council, addressing erosion at front beach, connecting business precincts, support to upgrade facilities, develop town centre)	7
Development (includes having a positive attitude to change, encouraging development at River Street, not overdeveloping area and maintaining the village vibe)	5
Services / Activities (includes improving services and tourist activities, services for the elderly and provision of activities for youth)	3
Other (includes emphasis on green cities, improving tourist accommodation, improving houses at gateways and access to parks on Lake Road)	4

n = 30

WOOLGOOLGA TOWN CENTRE STUDY REVIEW: IDEAS MAP ANALYSIS



Prepared for

April 2014
13-118



Project Reference 13-118

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Figure 2: Ideas Map from WoolgoolgaWOW website



Source: Coffs Harbour City Council, April 2014

1 BACKGROUND

Coffs Harbour City Council is currently preparing a Masterplan for the Woolgoolga Town Centre. In conjunction with this in 2013 Coffs Harbour City Council set up the Woolgoolga - WOW website in order to provide the community with an opportunity to highlight any issues they currently had with using or moving around the Woolgoolga Town Centre and how they thought things could be improved.

An Ideas Map was placed on the website outlining the study area and the community was invited to place pins on different areas in the map which they felt needed attention (refer Figure 1). The pins indicated either:

- green = great now;
- red = room for improvement;
- orange = my WOW idea.

In April 2014 Coffs Harbour City Council commissioned Bennell and Associates in association with Renaissance Planning to undertake and analysis, graphic presentation and narrative arising from the 451 comments received by Council in relation to its Ideas Map.



Renaissance Planning Pty Ltd



2 METHODOLOGY

The ideas map generated a total of 451 comments which were categorised by Council into the following groups:

- car parking,
- connections,
- drainage/flooding,
- pedestrian environment,
- public amenities,
- amenity,
- headland,
- open space,
- beach reserve,
- beach,
- streetscape,
- commercial,
- tourism,
- cycleways,
- landscaping,
- building scale/appearance,
- safety,
- environmental issues,
- road connections / traffic,
- signage,
- other.

Some of the comments related to more than one group, so were allocated to more than one category. Therefore, the total number of related responses was significantly higher than the 451 responses received and totalled 745 comments.

In order to gain a broader understanding of the issues in the analysis, Renaissance Planning broke these groups down into a further nine groups as follows:

- beachfront
 - headland
 - beach reserve
 - beach
- vehicular access
 - car parking
 - roads/traffic
- environment
 - drainage/flooding
 - environmental issues
- pedestrian environment and open space
 - pedestrian environment
 - open space
 - cycleways

- urban design and landscape
 - streetscape
 - landscaping
 - building scale/appearance
 - signage
 - public amenities
- safety and amenity
 - amenity
 - safety
- development
 - commercial
- tourism/culture/heritage
- other

Key themes and overall patterns of commentary were then identified by Renaissance Planning and described both graphically and with text.

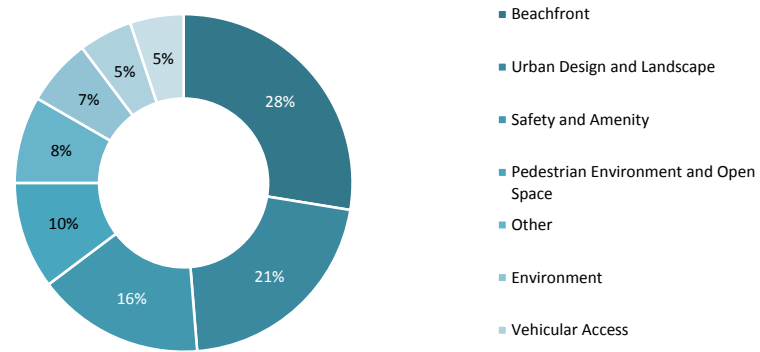
3 KEY THEMES

The majority of comments directly related to the beachfront (beach and beach reserve), urban design and landscape, safety and amenity and pedestrian environment and open space. The total percentages for each of these categories by group of comments are as follows:

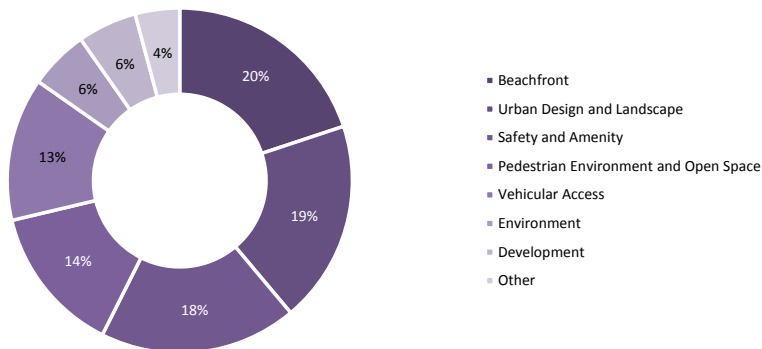
- My WOW idea 75 per cent
- Room for improvement 71 per cent
- What's great now 90 per cent

It is clear from these results that these broad areas are the most highly valued and important to the Woolgoolga community.

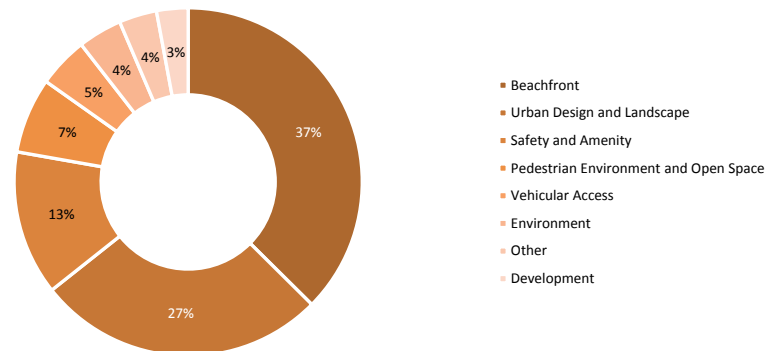
My Wow Idea (n = 156)



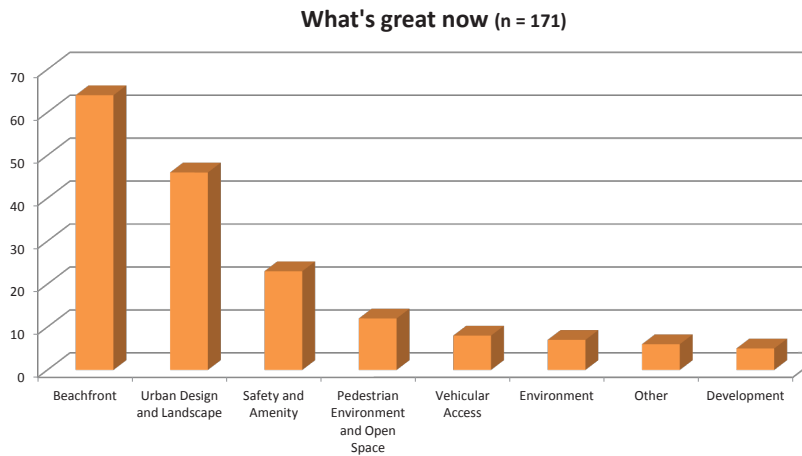
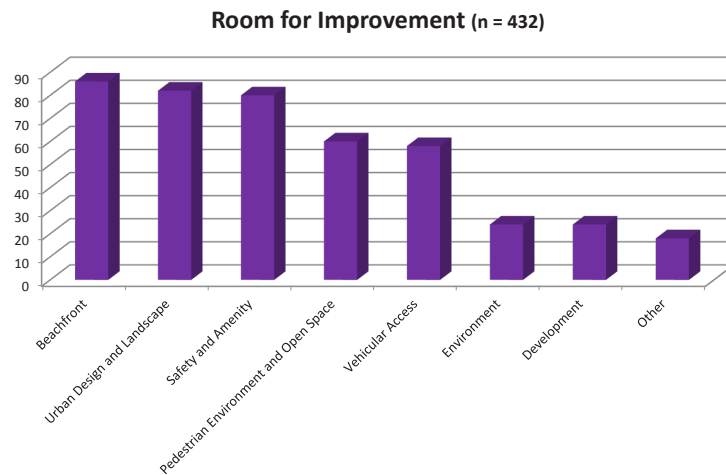
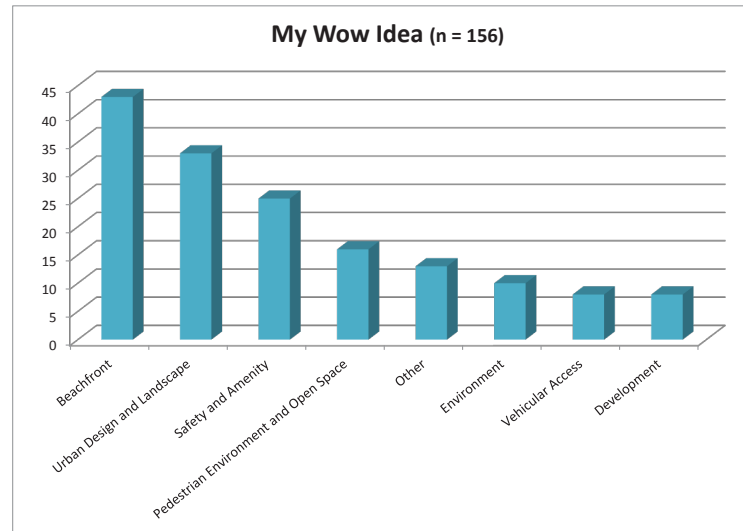
Room for Improvement (n = 432)



What's great now (n = 171)



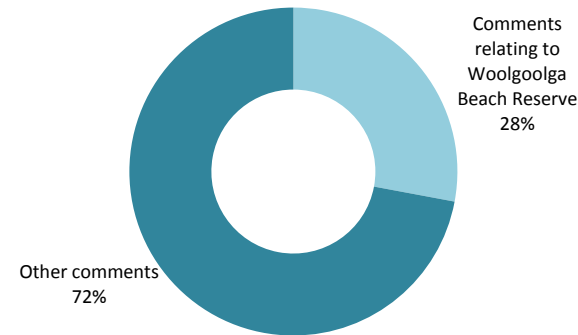
The beachfront environment was viewed by the majority of respondents as the most important asset of the Woolgoolga township. In terms of room for improvement it rated almost equally to urban design and landscape issues and safety and amenity. Clearly the community, while valuing the beach and beach reserve, believe there are areas for improvement, with a significant proportion of respondents suggesting a 'WOW' idea for this area.



Significance of Beach Reserve

Of the 451 comments received 126 (some 28 per cent) related directly to the Woolgoolga Beach Reserve. These comments predominantly related to the caravan park, surf club, facilities, amenities and landscaping.

Percentage of Comments related directly to Beach Reserve (n = 451)

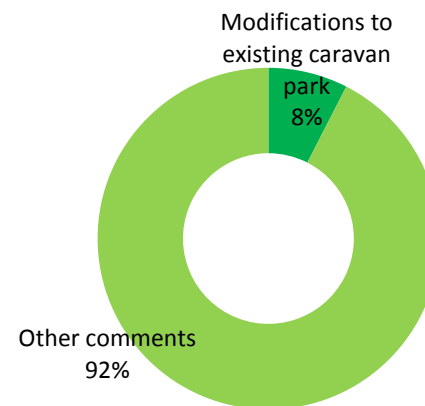


Significance of Caravan Park

Of the 451 comments received 34 (some 8 per cent) related directly to the caravan park. Some of the key suggestions included:

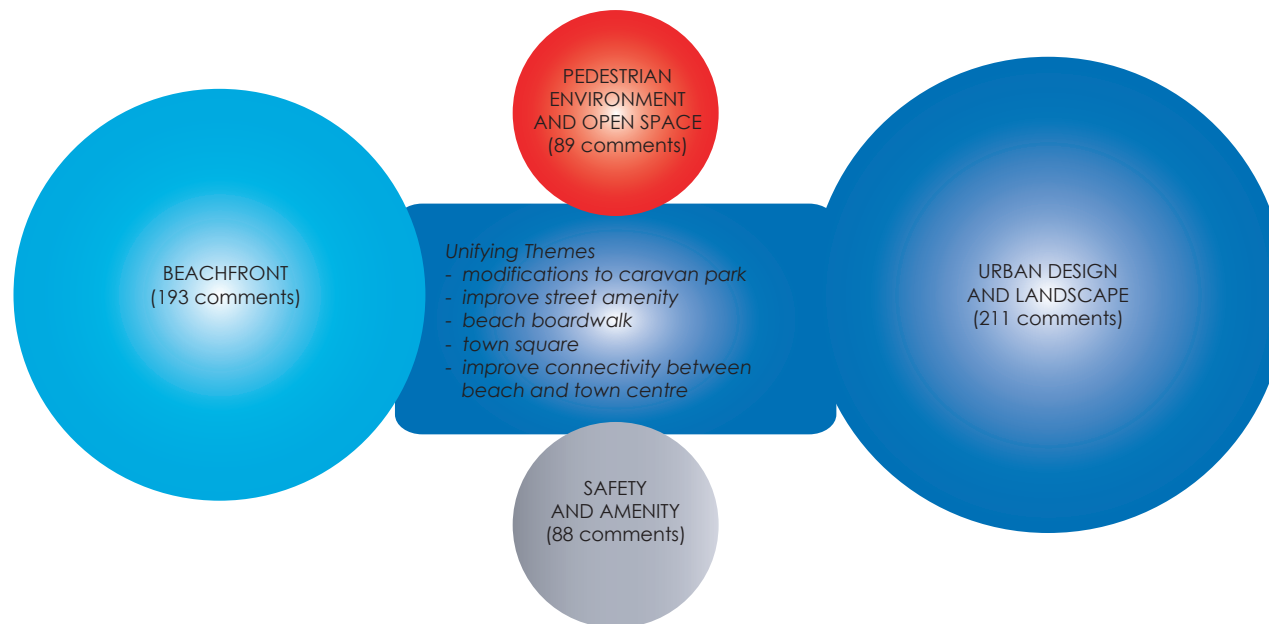
- a request for no new villas in the park;
- no fencing around the park (closing the park off to Beach Street);
- retaining pedestrian walkways through the park;
- either moving or reducing the size of the existing caravan park.

Percentage of Comments related directly to Caravan Park (n = 451)



Unifying Themes

Some 581 of the 759 total comments (76.5 per cent) related directly to the beachfront, pedestrian environment and open space, urban design and landscape and safety and amenity. Analysis of the actual comments revealed that there were several unifying themes which were consistently mentioned. These themes provide linkages between the areas which the community clearly regard as being the most important in the township of Woolgoolga.



BEACHFRONT

Headland

Key Themes:

My WOW idea

- provision of barbecue area and picnic facilities;
- commission artist to paint an attractive mural;
- pedestrian access only on movie nights.

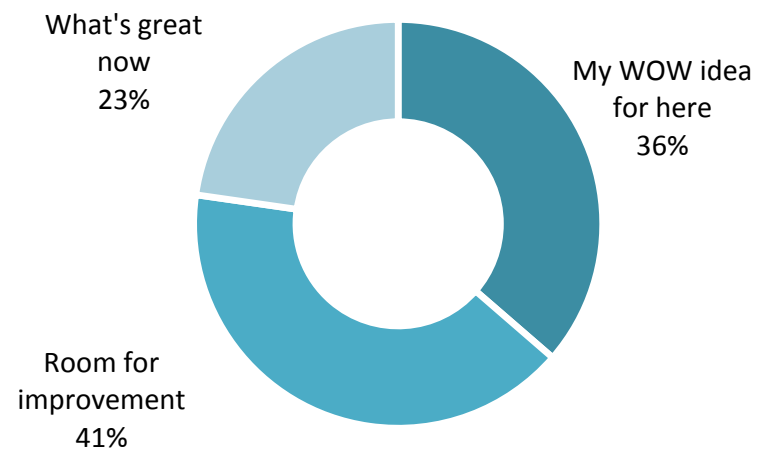
Room for Improvement

- improved pedestrian access;
- improved signage;
- repaint water tower white;
- new developments need to be appropriately designed.

What's great now

- wonderful amenity;
- great tourist attraction.

HEADLAND (n = 22)



BEACHFRONT

Beach Reserve

Key Themes:

My WOW idea

- development of a restaurant or cafe with ocean views (possibly using the existing jetty/pier);
- provision of beachfront children's playground;
- provision of outdoor ampitheatre;
- remodel caravan park to provide more public space and improve linkages between town and beach.

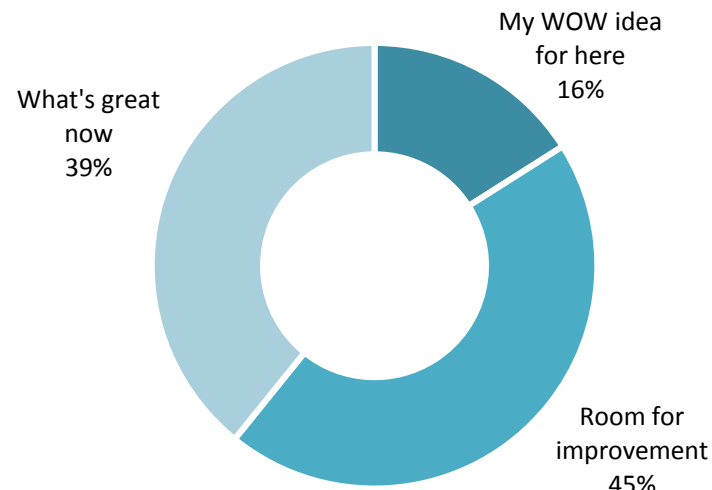
Room for Improvement

- move or reduce size of caravan park;
- need additional shade trees;
- improved gateway entry to town from highway with tree planting;
- improve pedestrian access to beach;
- Council needs to be mindful of overdeveloping the area.

What's great now

- iconic and appropriately located Surf Lifesaving Club;
- wonderful amenity for families;
- natural beauty of area.

BEACH RESERVE (n = 126)



BEACHFRONT

Beach

Key Themes:

My WOW idea

- construction of ocean pool/baths;
- sculpture exhibition and/or sand art created on weekends in off season;
- show beach movies in holiday season;
- winch from jetty - major historical element - could be displayed somewhere prominent.

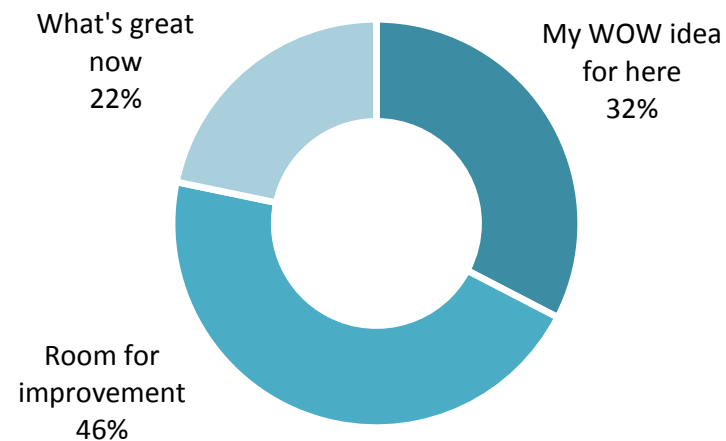
Room for Improvement

- improve amenity of pedestrian pathway to beach;
- turn existing caravan park into open space;
- boat ramp needs upgrading;
- extend headland walking path

What's great now

- iconic surf club;
- natural beauty;
- north facing beach.

BEACH (n = 46)



VEHICULAR ACCESS

Car Parking

Key Themes:

My WOW idea

- provide car parking at The Temple to attract tourists;
- need more parking at the pool area;
- improve public transport;
- move youth centre to allow more parking close to supermarket.

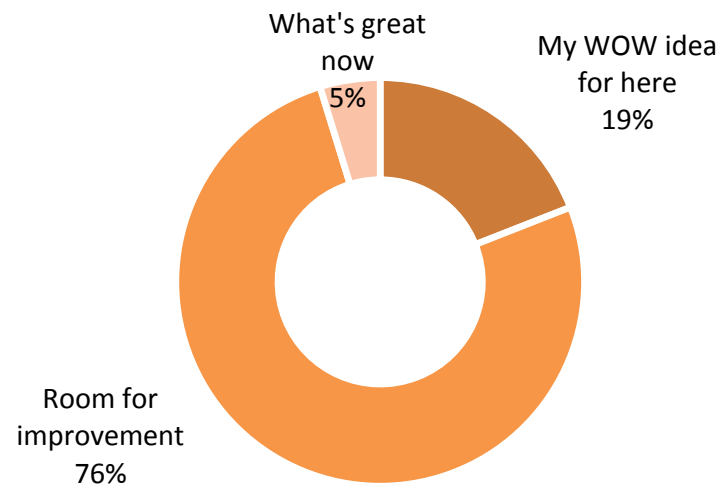
Room for Improvement

- improve amenity in existing car parks;
- don't agree with new car park in Plan for Reserve, this should be kept as recreation area;
- improve Back Beach car park.

What's great now

- current car parking works well.

CAR PARKING (n = 21)



VEHICULAR ACCESS

Roads/Traffic

Key Themes:

My WOW idea

- traffic calming measures in Beach Street business precinct and Scarborough Street;
- extend Hastings Street through to Fawcett Street to reduce traffic along Gordon Street;
- turn Beach Street into one way street from Nightingale Street north to Queen Street.

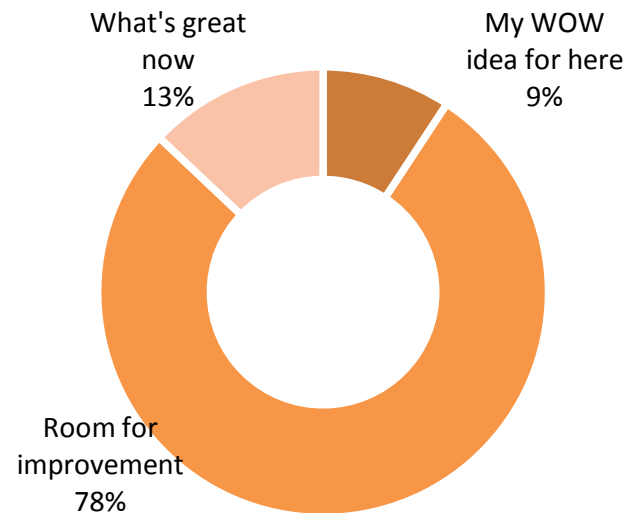
Room for Improvement

- road resurfacing required in Pullen Street and Beach Street;
- roundabouts needed at corner of Beach and Nightingale Streets and at corner of Beach and River Streets;
- traffic pacifying measures needed to Ocean Street.

What's great now

- Woolgoolga's rear lanes - part of original town subdivision, preserve and utilise as informal pedestrian through-links, no paving, guttering or hard edges to retain relaxed seaside feel.

ROADS/TRAFFIC (n = 54)



ENVIRONMENT

Drainage/Flooding

Key Themes:

My WOW idea

- improve amenity of open drains between River Street and Bosworth Road;
- initiatives for improvements in stormwater quality;
- creek near old pump station needs to be cleared of large blockage which currently disrupts water flow to mangroves.

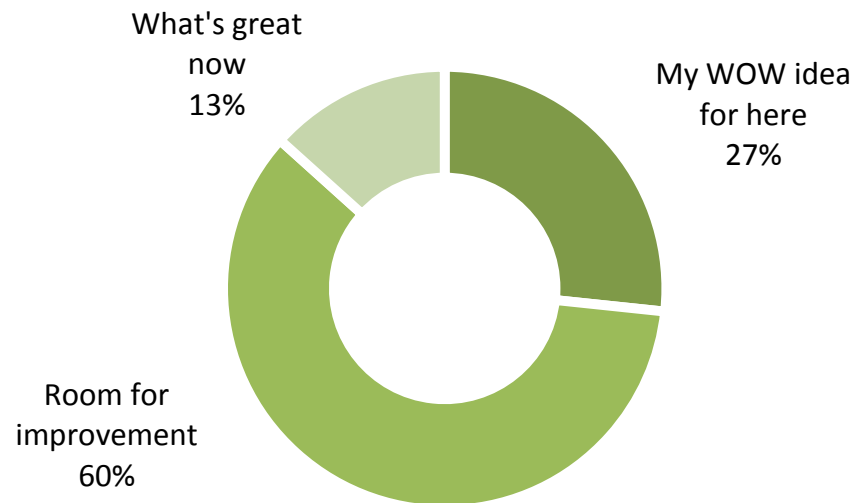
Room for Improvement

- kerb and gutter program in town needs to be completed;
- open stormwater channels in town need to be piped and grassed over.

What's great now

- informal pedestrian pathways with no paving, guttering or hard edges are a part of Woolgoolga's heritage.

DRAINAGE/FLOODING (n = 15)



ENVIRONMENT

Environmental Issues

Key Themes:

My WOW idea

- groups of pandanus palms planted at edge of dunes will help to prevent erosion;
- encourage use of sustainable energy practices in businesses and farms.

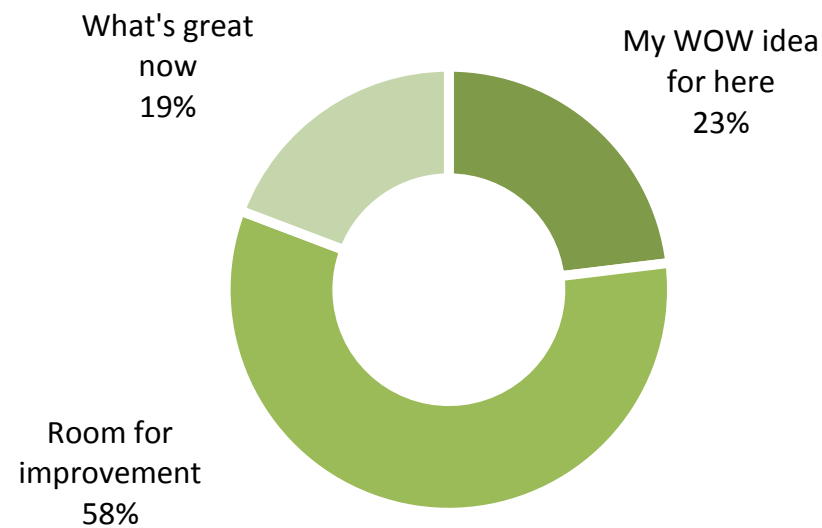
Room for Improvement

- need to capture rubbish before it enters the Woolgoolga Creek;
- turn existing caravan park into open space;
- need for measures to reduce erosion on main beach;
- need for effective weed eradication programs;
- need for program for protection of threatened species.

What's great now

- bike paths;
- local fauna;
- remnant trees on both public and private land - consider protection via the use of a Significant Tree Register.

ENVIRONMENTAL ISSUES (n = 26)



PEDESTRIAN ENVIRONMENT AND OPEN SPACE

Pedestrian Environment

Key Themes:

My WOW idea

- creation of town square area by creating a pedestrian island stretching from the post office to around the corner of Wharf Street and around to Market/Nightingale Street;
- continue headland walkway down Pollack Esplanade to the beach;
- improve pedestrian amenity in Beach Street business precinct.

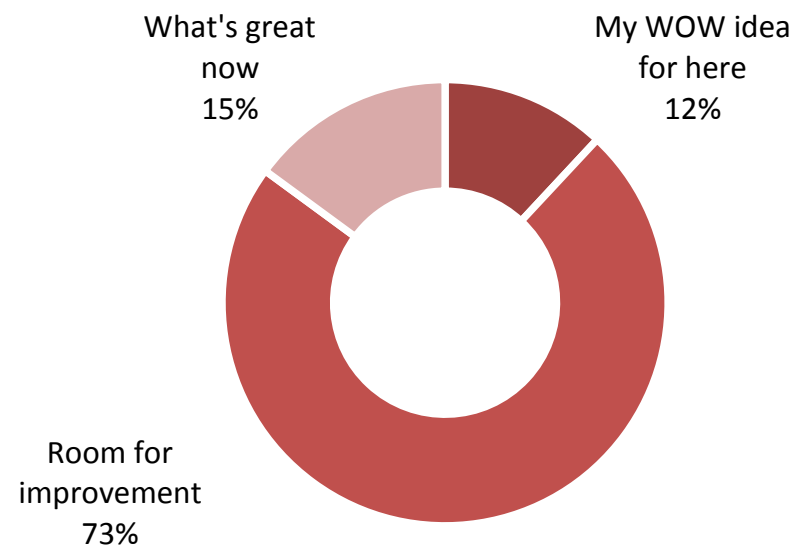
Room for Improvement

- improve pedestrian amenity at CBD end of Market Street;
- improve wheelchair access in main shopping area;
- installation of footpaths in areas around the town where they currently don't exist, so people do not need to walk on the road;
- improve pedestrian access to beach, including disabled access;
- addition of shared pathway along foreshore.

What's great now

- historic rear lanes;
- grassy road verges and no footpaths;
- walkway to the beach at Hofmeier Close.

PEDESTRIAN ENVIRONMENT (n = 67)



PEDESTRIAN ENVIRONMENT AND OPEN SPACE

Open Space

Key Themes:

My WOW idea

- permanent stage for outdoor concerts;
- maintain green spaces in residential areas on headland;
- develop a town green.

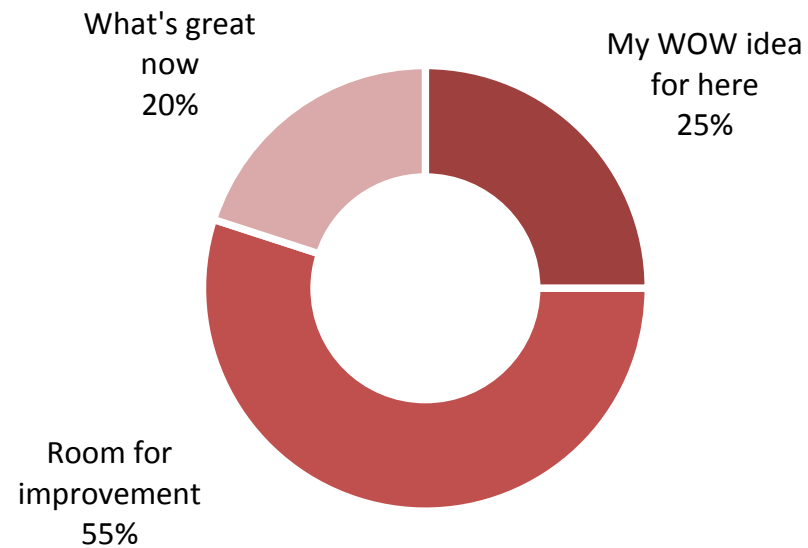
Room for Improvement

- move caravan park and convert to open space;
- move pool away from beach;
- establish more seating in shady areas;
- enlarge size of oval to accommodate proper cricket oval.

What's great now

- trees and open space adjacent to school;
- it is great that there is a place for skaters to use.

OPEN SPACE (n = 20)



PEDESTRIAN ENVIRONMENT AND OPEN SPACE

Cycleways

Key Themes:

My WOW idea

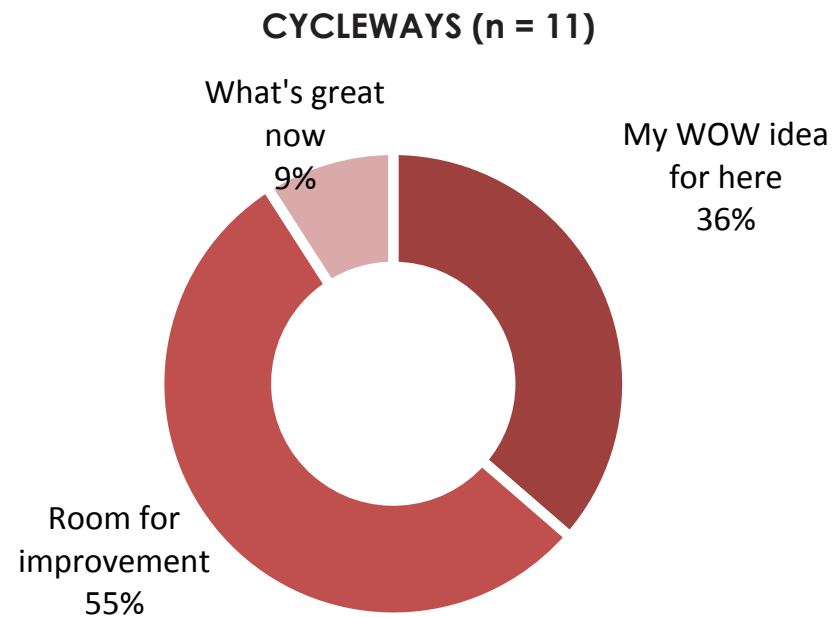
- Solitary Islands Cycleway is intended to run through Woolgoolga from Arrawarra to Sapphire as part of the S2W RMS project;
- continue the headland walkway down Pollack Esplanade to the beach;
- establish awnings of buildings in commercial areas for weather protection.

Room for Improvement

- prioritise pedestrian and bicycle access in planning for Woolgoolga;
- develop shared pathway along foreshore;
- create bike paths to link Woolgoolga to neighbouring villages.

What's great now

- bike path.



URBAN DESIGN AND LANDSCAPE

Landscaping

Key Themes:

My WOW idea

- plant pine tree in centre of roundabout that can be decorated at Christmas time;
- Pandanus palms at edge of dunes to provide shade and help prevent erosion;
- improve landscaping along Old Pacific Highway.

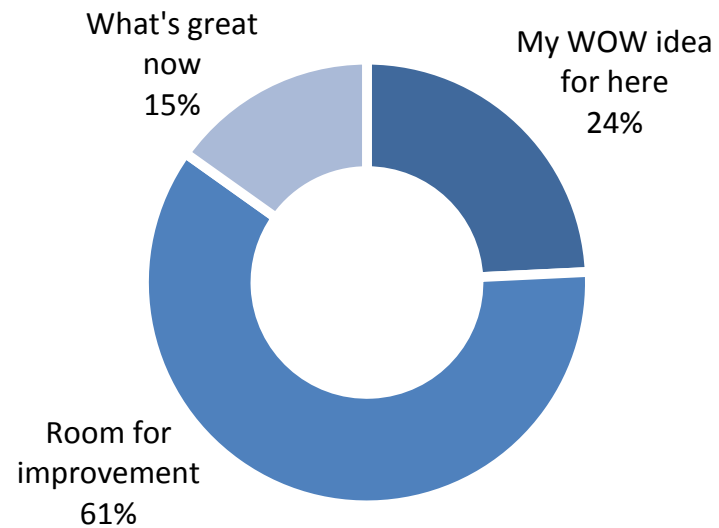
Room for Improvement

- increase tree planting around the town;
- improved landscaping on highway gateway areas to town;
- more effective weed control;
- plant palms along Solitary Islands Way.

What's great now

- Norfolk Island pines;
- Poinciana trees;
- landscaping in middle of road is well done.

LANDSCAPING (n = 33)



URBAN DESIGN AND LANDSCAPE

Streetscape

Key Themes:

My WOW idea

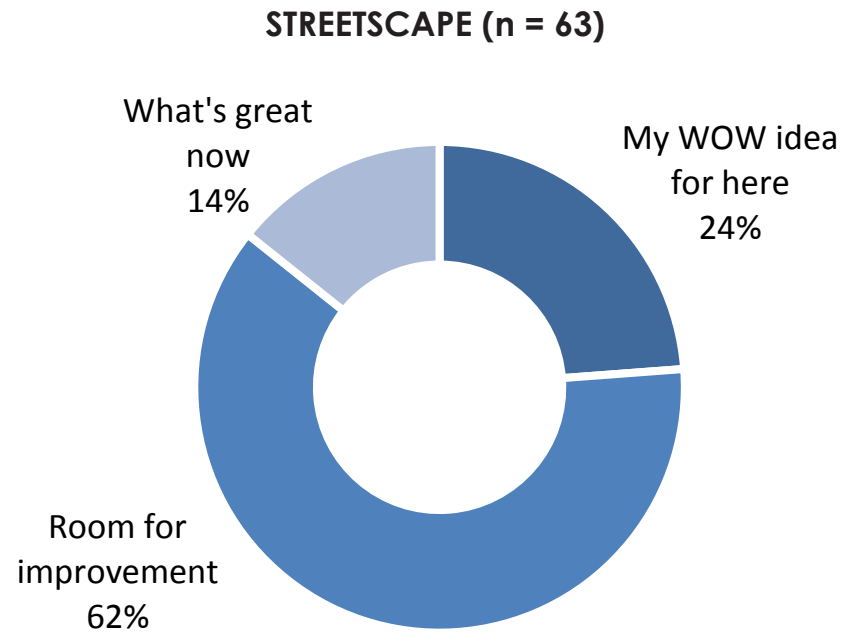
- fund the re-installation of the WW1 sandstone Woolgoolga war memorial which was removed years ago;
- plant more shade trees in town;
- use land in front of pools for cafes;
- reduce size of caravan park;
- improve landscaping along highway.

Room for Improvement

- activate street frontages;
- more designated parking spaces near headland;
- improve amenity of Market Street;
- provision of extra bus stop near Market and Queen Streets;
- improved street lighting;
- increase tree planting.

What's great now

- poinciana trees;
- traditional lack of fences;
- heritage listed buoys.



URBAN DESIGN AND LANDSCAPE

Building Scale/Appearance

Key Themes:

My WOW idea

- projection of coloured light on to the Temple;
- allow single residential development on headland sites;
- develop cafe/restaurant strip with ocean views;
- design buildings with awnings for weather protection.

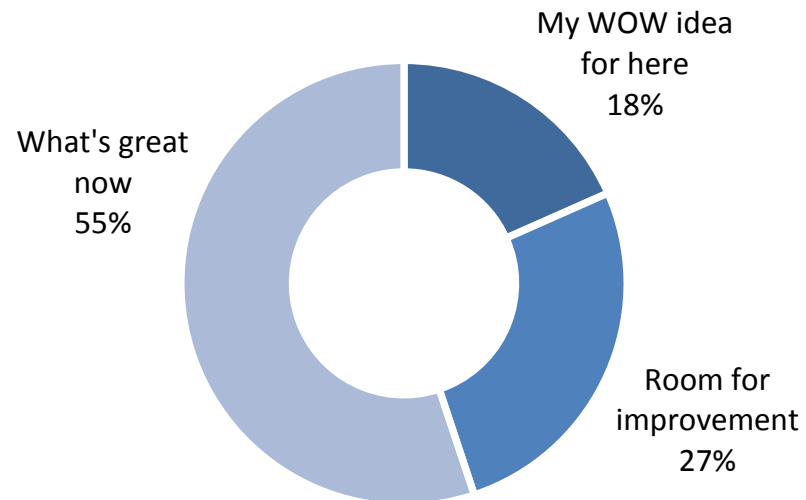
Room for Improvement

- activate shopfronts along Beach Street and move professional services to Market Street;
- soften starkness of road facing wall of RSL with trees, a mosaic or mural;
- develop design guidelines for new buildings in town.

What's great now

- village seaside feel created by small scale shops;
- heritage houses;
- lack of fences.

BUILDING SCALE/APPEARANCE (n = 49)



URBAN DESIGN AND LANDSCAPE

Signage

Key Themes:

My WOW idea

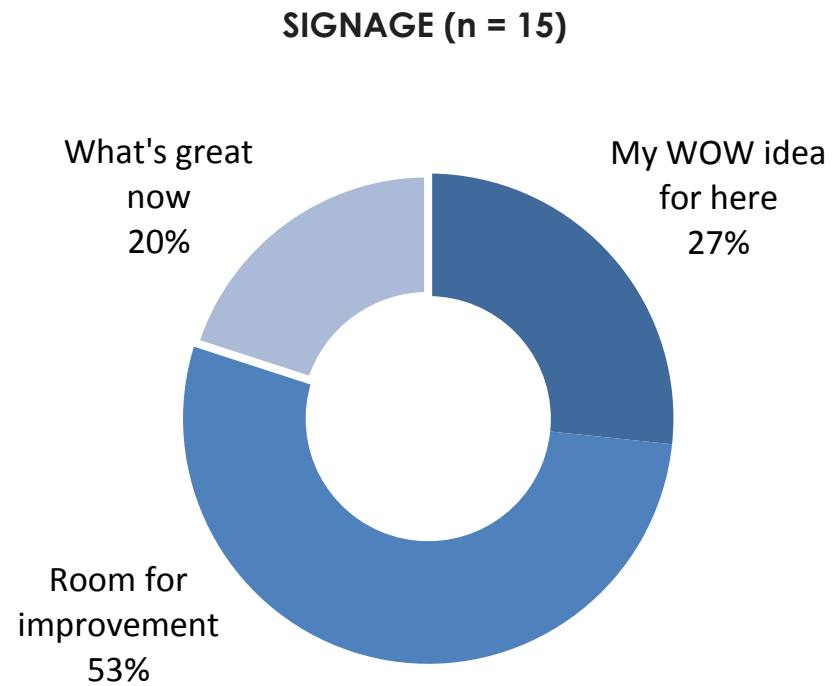
- 'Welcome' sign near off ramp at north and south exits in landscaped setting;
- decorate streets with starfish, shells, mermaids and dolphins;
- signage in recognition of Aboriginal cultural heritage and use of Gumbayngirr language

Room for Improvement

- better signage showing location of Woolgoolga Art Gallery;
- improved signage for library;
- improve signage to headland;
- street signs in both English and Punjabi.

What's great now

- signage saying Town Centre and Beach.



URBAN DESIGN AND LANDSCAPE

Public Amenities

Key Themes:

My WOW idea

- relocate ambulance, fire station and police station;
- rebuild youth centre;
- develop Apex Park as a co-ordinated bus stop for interstate buses and relocate information centre to here;
- build an outdoor bandstand.

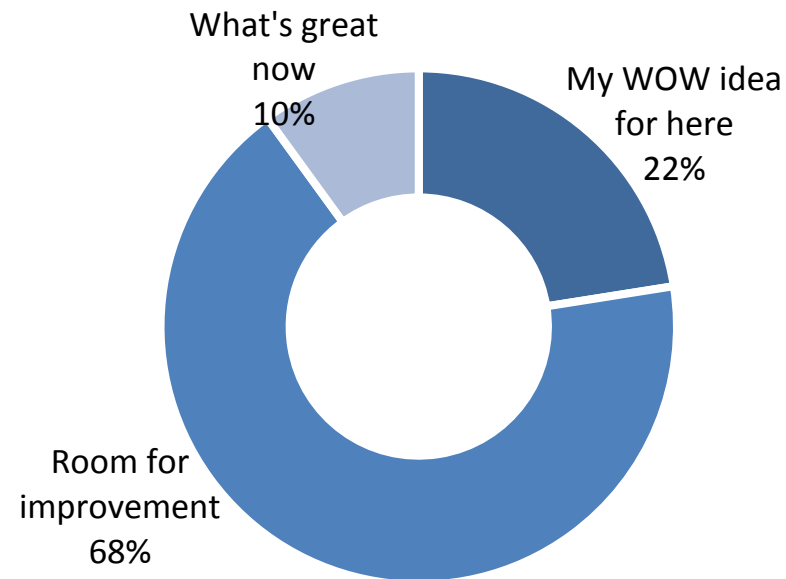
Room for Improvement

- major upgrade needed for beach showers;
- install drinking fountains on headland;
- update barbecue/picnic sheds;
- improve public toilets;
- upgrade swimming pool;
- separate rubbish bins from picnic tables;
- relocate caravan park.

What's great now

- outdoor showers.

PUBLIC AMENITIES (n = 40)



SAFETY AND AMENITY

Amenity

Key Themes:

My WOW idea

- develop heritage policy for rear laneways;
- reference the original jetty with a land based structure that provides pedestrian access and visual link to beach;
- develop Woolgoolga as a 'foodie' and eco-tourism destination and a halfway stop between Sydney and Brisbane.

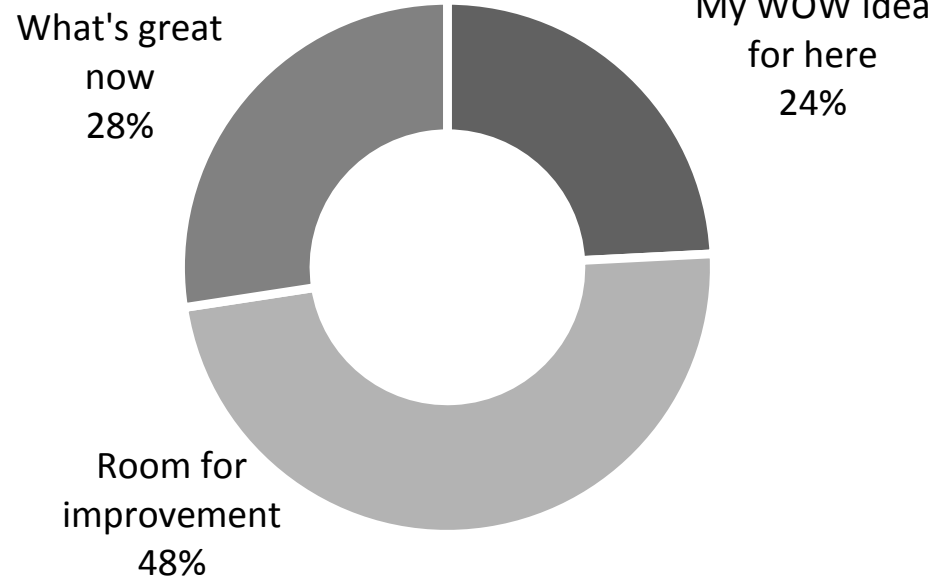
Room for Improvement

- install shade sails in childrens playground;
- incentives to relocate larger shops and businesses to old highway;
- try to avoid installation of fences;
- additional shade trees;
- continue centre island divider in River Street;
- move caravan park in part or in full to the Lake Road precinct.

What's great now

- heritage buildings;
- relaxed seaside village environment.

AMENITY (n = 62)



SAFETY AND AMENITY

Safety

Key Themes:

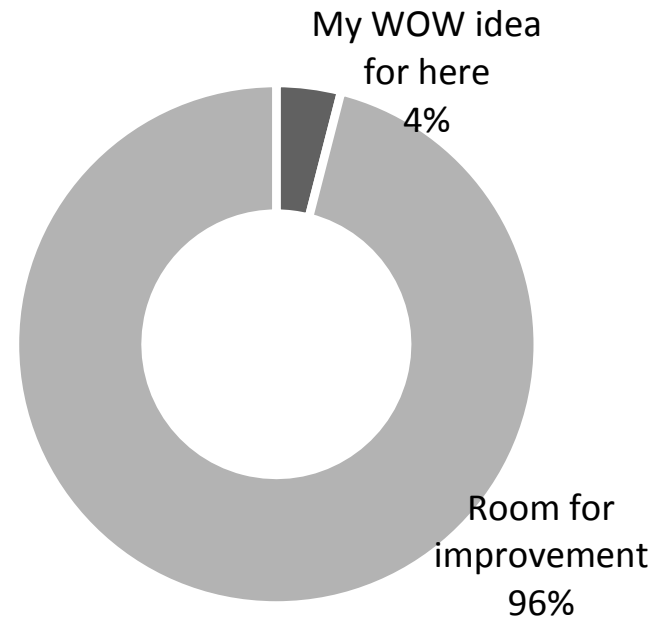
My WOW idea

- improve Beach Street landscaping, lighting and amenity.

Room for Improvement

- more prominent police presence;
- build new boat ramp;
- provide safe pedestrian and bicycle access;
- improve curbing on side of road;
- extend footpath on eastern side of Scarborough Street from Hastings Street to South Street;

SAFETY (n = 25)



DEVELOPMENT

Commercial

Key Themes:

My WOW idea

- retain village style character of central business district;
- develop a cafe/restaurant strip with ocean views;
- establishment of a quality Indian restaurant in town centre.

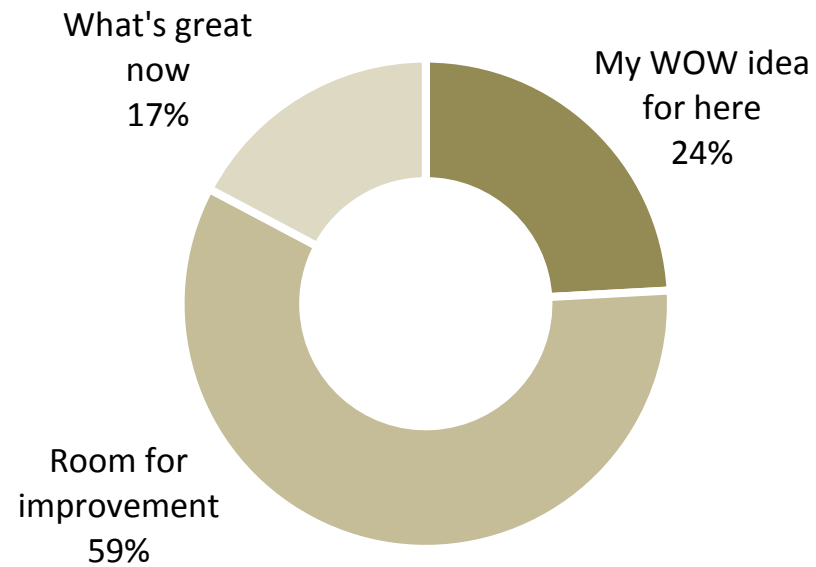
Room for Improvement

- activate shopfronts in Beach Street and move professional services to Market Street;
- establish a commercial precinct;
- need for improved facilities for health professionals in order to attract them to the area.

What's great now

- Woolgoolga Art Gallery.

COMMERCIAL (n = 30)



TOURISM/CULTURE/HERITAGE

Tourism/Culture/Heritage

Key Themes:

My WOW idea

- erect a new ocean pool;
- improve parking at The Temple;
- develop Apex Park into a co-ordinated bus stop for interstate buses.

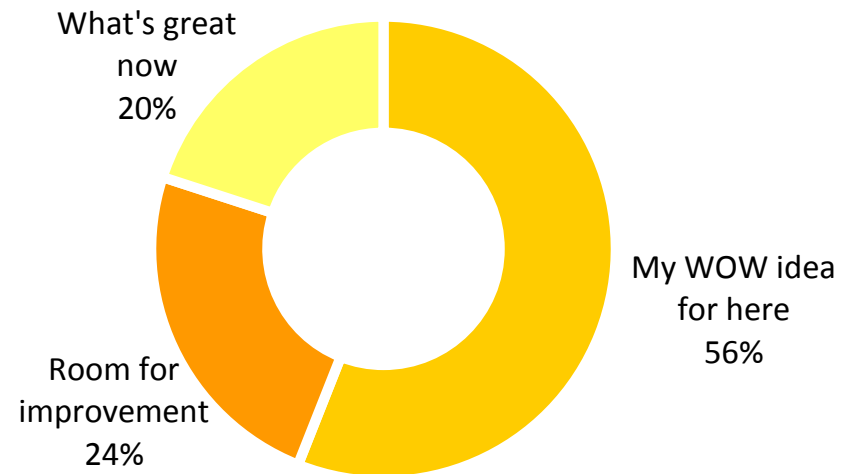
Room for Improvement

- Surf Club needs updating;
- need more cafes and restaurants in town.

What's great now

- Wreck of the Buster;
- Beach Street Caravan Park.

TOURISM (n = 25)



OTHER

Other

Key Themes:

My WOW idea

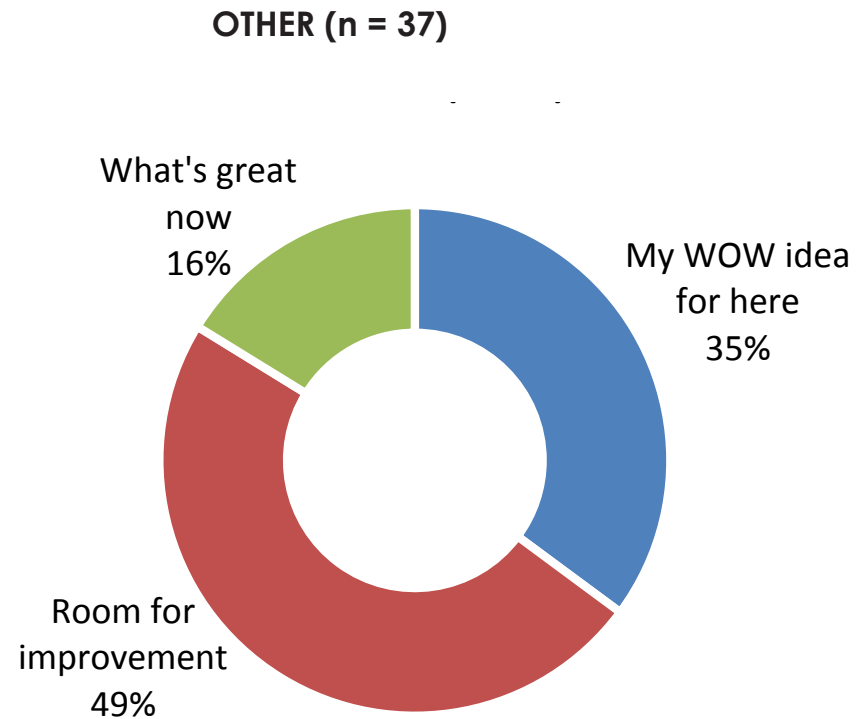
- provide free Wi-Fi for the Beach Street precinct and the beach reserve. If possible get support/promotion from the NBN. Use this to attract businesses and consumers;
- make Beach Street shopping precinct and adjoining areas non-smoking.

Room for Improvement

- along with the Indian culture, Woolgoolga's beach culture should be promoted as a unifying theme.

What's great now

- Congratulations CHCC - wonderful way to find out ideas. Put these ideas to the test and achieve some REAL results, not another paper trail.



4 CONCLUSIONS

In conclusion the Ideas Map generated a great deal of community interest (some 451 comments). Analysis of the commentary indicated that there are several critical areas of interest for the community including:

- beachfront (includes both beach and beach reserve);
- pedestrian environment and open space;
- urban design and landscape;
- safety and amenity.

A consistent theme throughout the comments was the importance of the beach reserve to the town centre, along with the location of the caravan park and the potential of this site to provide a public space improving both visual and pedestrian connectivity to the beach.

A large proportion of respondents highlighted the seaside amenity of Woolgoolga and the importance of enhancing and maintaining the quality of this element of the township. Whilst this is highly valued, there is also a general consensus that urban design and landscaping improvements were needed, however, these need to always be mindful of the valuable sense of place which Woolgoolga currently enjoys.

This report provides an overview of the general trend of comments generated by the Ideas Map. The actual Ideas Map contains a wealth of much more detailed feedback and community opinion which should be also taken into consideration when developing the masterplan.



The Hon. Duncan Gay MLC
Deputy Leader of Government in the Legislative Council
Minister for Roads and Ports

ML13/07003

Mr Steve McGrath
General Manager
Coffs Harbour City Council
Locked Bag 155
COFFS HARBOUR NSW 2450

Dear Mr McGrath

Thank you for your letter about funding assistance to undertake further socio-economic assessment of the Sapphire to Arrawarra Pacific Highway upgrade.

I understand Mr Bob Higgins, General Manager Pacific Highway, at Roads and Maritime Services (RMS) wrote to council on 25 July 2013.

I have enclosed a copy of that letter for your reference.

I hope this has been of assistance. If you have any further questions Mr Bob Higgins, on (02) 6640 1378 would be pleased to take your call.

Yours sincerely

- 9 AUG 2013

Duncan Gay MLC 9-8-13
Deputy Leader of Government in the Legislative Council
Minister for Roads and Ports

Encl



Transport
Roads & Maritime
Services

Mr Steve McGrath
General Manager
Coffs Harbour City Council
Locked Bag 155
COFFS HARBOUR NSW 2450

Dear Mr McGrath

Pacific Highway upgrade Sapphire to Woolgoolga

Thank you for your letter of 11 April 2013 (Ref: 3146857) regarding potential social and economic impacts from the Woolgoolga bypass as part of the Pacific Highway Sapphire to Woolgoolga upgrade project. I apologise for the delay in responding.

A socio-economic assessment was undertaken as part of the environmental assessment for the upgrade, prior to project approval.

A copy of the report is available on the Roads and Maritime Service (RMS) website (www.rms.nsw.gov.au/pacific) by clicking on the Sapphire to Woolgoolga link and then accessing the 'Project documents' page.

The Conditions of Approval for the project do not require RMS to prepare an additional economic impact study.

While RMS has no proposal to fund an additional economic impact study, it would be pleased to work with the Council, the Woolgoolga Chamber of Commerce and the community to help identify opportunities for the local economy following the opening of the project to traffic.

A letter responding to a similar request from the Woolgoolga Chamber of Commerce was sent in September 2012.

If you would like to discuss this matter further, please feel free to contact me on (02) 6640 1378.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'RPH'.

Robert (Bob) Higgins
General Manager Pacific Highway 25/7/13

Roads & Maritime Services

21 Prince Street, Grafton NSW 2460 | PO Box 576 Grafton NSW 2460
T 02 6640 1000 | F 02 6640 1001 | E pacific.highway@rms.nsw.gov.au

www.rms.nsw.gov.au | 1800 653 092



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Robert (Bob) Higgins
General Manager Pacific Highway 25/7/13

Roads & Maritime Services

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www.rms.nsw.gov.au | 1800 653 092

HIGH VALUE HABITATS OF COFFS HARBOUR LOCAL GOVERNMENT AREA - HIGH VALUE ARBOREAL HABITAT

Purpose:

To recommend that Council adopt the High Value Arboreal Habitat (HVAH) report and mapped layer for the Coffs Harbour Local Government Area (LGA).

Description of Item:

At its Ordinary meeting of 12 December 2013, Council endorsed the following digital layers and report for release for public exhibition:

- *Report: Draft High Value Arboreal Habitat of the Coffs Harbour Local Government Area*
- *Data Layer: Draft High Value Arboreal Habitat mapping (Version 1.1)*

The report, *High Value Arboreal Habitat of the Coffs Harbour Local Government Area* (**Attachment 1**) and associated mapped layer (**Attachment 2**) are an important stage in Council's science-based terrestrial biodiversity mapping program.

The project was a joint initiative between the Office of Environment and Heritage (OEH) and Coffs Harbour City Council under a Memorandum of Understanding.

The primary aim was to undertake a survey and mapping project to identify HVAH in forested areas of the Coffs Harbour LGA using high resolution digital imagery.

Old-growth forest is recognised as a high value habitat in conservation assessment programs but previous mapping, undertaken at regional scales, did not map patches of old forest less than five hectares in area. In seeking to map high value habitats for hollow-dependent species at finer scales for the purposes of land-use assessment and planning, Council requires growth stage mapping at finer scales to incorporate these smaller patches.

The term HVAH is introduced to convey the ecological importance of hollow-bearing trees as part of a wider identification and mapping of high value habitats across the LGA.

The report includes a summary of findings regarding the status of HVAH in the Coffs Harbour LGA and includes the following salient points.

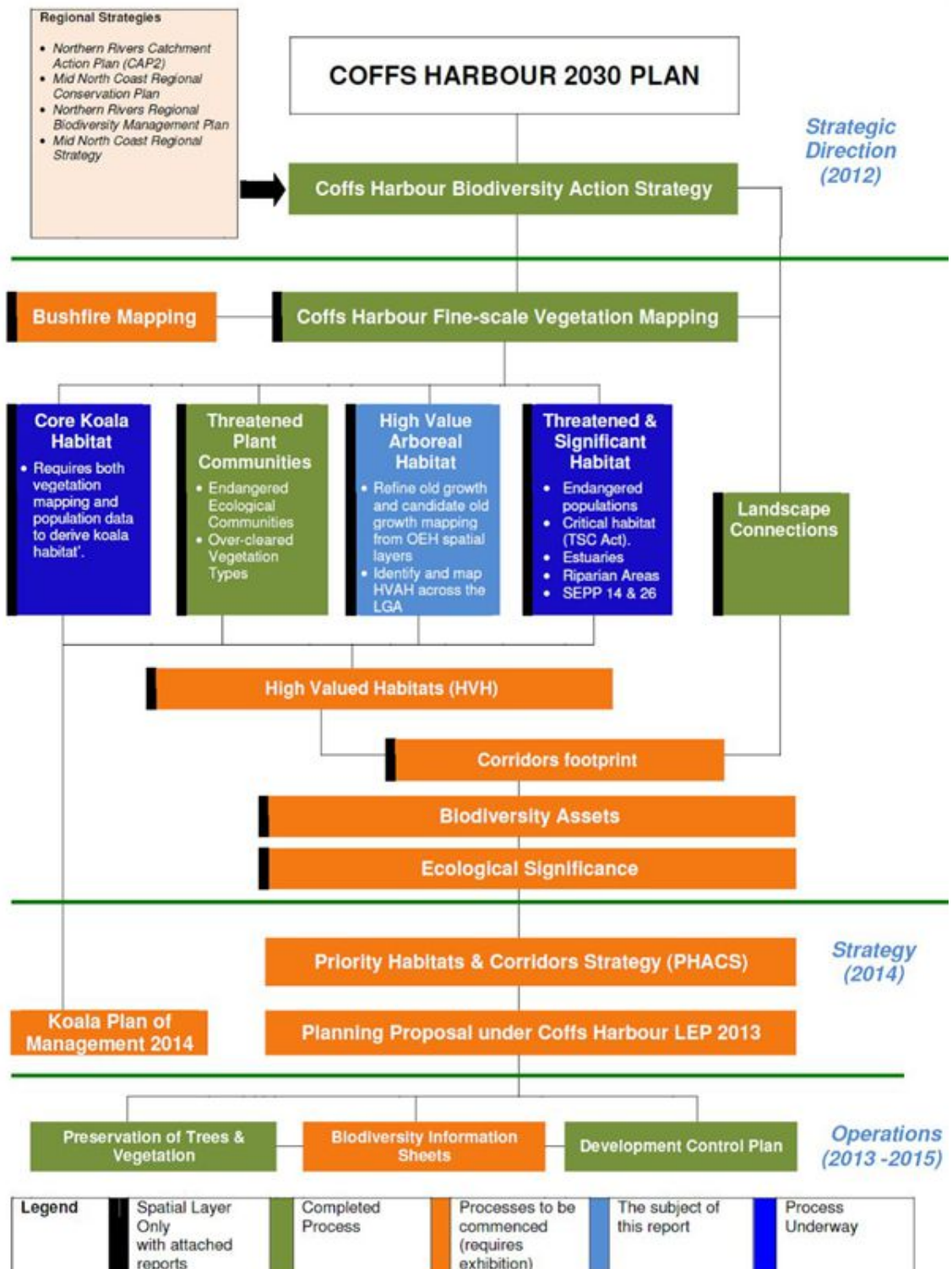
- HVAH have important conservation value wherever they occur in the Coffs Harbour LGA.
- There is very little high value arboreal habitat left in the Coffs Harbour LGA, especially on freehold lands.
- What remains requires the highest level of protection.
- What remains also requires supplementation by management regimes that promote the protection and recruitment of old trees including hollow-bearing trees throughout all tenures.
- There is a need to examine both the response of local forest fauna to variations in the abundance of trees with hollows and the scale and pattern of forest disturbance.
- In order to appreciate the enormous time scales involved in hollow development, dendrochronological (tree ring) studies, or similar, are required to determine the longevity of tree species in the Coffs Harbour LGA and length of time it takes for cavities suitable for use by wildlife to develop.

Development and exhibition of the draft report and mapping layer was in accordance with Council's adopted *Coffs Harbour Biodiversity Action Strategy 2012-2030* and endorsed *Biodiversity Assets Stakeholder Engagement Plan 2013-14*.

Figure 1 'Strategic Planning (modified from Council's Biodiversity Action Strategy 2012-2030)' details the adopted sequence of studies being undertaken to assist the development of Priority Habitats and Corridors Strategy (PHACS) and inform a future planning proposal.

The mapped HVAH layer acknowledges that selected land parcels have a unique set of environmental values. No land use or land management decisions will be made by Council in the development of the science-based Biodiversity Assets layers.

Figure 1 - Strategic Planning (modified from Council's Biodiversity Action Strategy 2012-2030)



Completion of the key science outputs will provide Council and the community with a sound basis of information to assist the development of PHACS and the determination of a future planning proposal under Coffs Harbour Local Environmental Plan (LEP) 2013. The timeframes associated with the remaining delivery of environmental strategic outputs is detailed in Table 1 below.

Table 1 - Biodiversity assets delivery schedule

Exhibition	Type	Planning framework
SCIENCE		
* May 2014	Science	(a) High Value Arboreal Habitat
by June 2014	Science	(b) Coffs Harbour Corridors
by Aug 2014	Composite science layer	(c) High Value Habitats
by Oct 2014	Science	(d) Biodiversity Assets
by Oct 2014	Science ranking	(e) Ecological Significance of environmental attributes
STRATEGY		
by Nov 2014	Strategy	(f) Priority Habitats and Corridors Strategy 2014 – 2030
PLANNING		
by March 2015	Planning proposal	(g) Planning proposal under Coffs Harbour LEP 2013

* the subject of this report

Sustainability Assessment:

• **Environment**

The adoption and integration of the HVAH spatial layer will assist in the sustainable management of older forests across the LGA. Old trees provide important structural elements for wildlife across the landscape; are recognised as High Value Habitats throughout NSW; their mapping and protection fits within LGA, regional, statewide and national frameworks and strategies for biodiversity conservation (e.g. Coffs Harbour Biodiversity Action Strategy 2012, Mid North Coast Regional Conservation Plan, Northern Rivers Regional Biodiversity Management Plan, NSW Biodiversity Strategy, and Australia’s Biodiversity Conservation Strategy).

The benefits of adopting the HVAH mapping at the LGA level are multi-faceted and include:

- Improved ability to undertake sustainable management of threatened species habitats listed under the Threatened Species Conservation Act (1995).
- Contribution to landscape level conservation, building resilience and the development of PHACS as the basis for a sustainable planning proposal under the Coffs Harbour LEP.
- Provision of greater certainty for landowners regarding land use and biodiversity conservation programs across the LGA.

• **Social**

The Council-endorsed process of science-based Biodiversity Assets delineation and mapping, of which HVAH is a component, reflects the Coffs Harbour community’s desire to see their natural environment protected and conserved for future generations. This broad vision has been championed, along with other more specific goals and strategies in the Coffs Harbour 2030 Plan which was adopted by Council in 2009 (CHCC 2009). The 2030 Plan is driven by the Community Vision 2030 (CHCC 2008). Key objectives within the 2030 Plan that relate to the mapping of High Value Habitats and Biodiversity Assets include:

- LE 1.1.1 Identify and promote the region's unique environmental values.
- LE 2.1.1 Ensure land use management policies and practices conserve the region's unique environmental and biodiversity values.
- LE 2.1.3 Maintain and conserve biodiversity through protected reserve systems and other land conservation mechanisms.
- LE 2.2.2 Manage our catchments effectively and adaptably.

- **Civic Leadership**

Council has a statutory and leadership role to encourage the preservation and sustainable management of its native vegetation. Its statutory role relates directly to habitats for threatened species and ecological communities. The mapped HVAH provides critical habitat for a range of threatened species. Its integration in to a landscape conservation program will promote their sustainable management.

The HVAH mapping meets the following Coffs Harbour 2030 objective in regard to civic leadership:

- LE 3.1.3 Ensure our use of natural resources, both marine and terrestrial, is sustainable.

There is a responsibility on Council to integrate the best available science into future strategic planning documents.

- **Economic**

Broader Economic Implications

The HVAH mapping will provide broad economic benefits to the community, primarily in relation to the ongoing sustainable management of Coffs Harbour's unique wildlife, vegetation and natural resources. This will ensure that future generations will be able to experience and enjoy our region's unique natural heritage.

The mapping and long term protection of HVAHs will aid in the preservation and restoration of ecosystem processes and are likely to promote tangible and invaluable ecosystem services. These will include the provision of clean air, drinking water, native fauna habitat, pollination services and natural pest control facilitated by native predatory insects, birds, bats and other species. These processes and services need to be managed and promoted to ensure the principles of ecological, economic and social sustainability are addressed in an ongoing manner.

In addition, the appeal of the region from an eco-tourism perspective will also be maintained and promoted by the integrated mapping and protection of important habitats, including HVAH, across the LGA.

This all relates to Coffs Harbour 2030 objective:

- LP 1.3.2 Develop and promote the Coffs Coast as a model for sustainable living.

Delivery Program/Operational Plan Implications

The HVAH mapping will be integrated into Council's land management GIS database following final adoption; this will be part of Council's standard procedures requiring no additional resources.

Following adoption, the HVAH mapping will be integrated in to the High Value Habitats and Biodiversity Assets mapping for the development of PHACS and a planning proposal under the Coffs Harbour LEP under a Council-endorsed approach.

The HVAH mapping layers have been funded through Council's Environmental Levy program.

Risk Analysis:

Overall, the risk analysis of consequences at both a strategic and operational level are considered minor with negligible impact on Council's function.

Consultation:

The High Value Arboreal Habitat report and mapping was placed on public exhibition for a period of 30 days from 5 February 2014 until 6 March 2014.

An advertisement appeared in the Public Notice section of the local paper and a display was erected in the main foyer of Council's Administration building showing the mapped layers and a copy of the accompanying report provided. The maps were made available on Council's website during the exhibition period as were the reports.

Council received a total of seven written submissions and a petition with 239 signatures advocating for the protection of High Value Arboreal Habitat in the Coffs Harbour LGA. A summary of submissions received is attached to this report (**Attachment 3**).

All of the submissions endorsed the report and maps as presented. There were no recommended changes or additions.

Since the report was last brought before Council, the only changes include the professional formatting of the document and addition of several images.

Related Policy and / or Precedents:

New mapping technology has given Council the opportunity to produce more comprehensive, accurate and up to date mapping of High Value Habitats and Biodiversity Assets than was previously possible.

The development of a HVAH spatial layer is highly desirable from a strategic planning perspective and will feed directly into the Council-endorsed development of PHACS and a planning proposal under the Coffs Harbour LEP.

Statutory Requirements:

The principles and actions associated with HVAH are broadly set out in the Mid North Coast Regional Conservation Plan and Mid North Coast Regional Strategy.

The HVAH mapping layers are integral to the development of PHACS and the body of information required to progress a planning proposal.

This will allow Council to meet its primary statutory obligations under the *Environmental Planning and Assessment Act 1979*, *Threatened Species Conservation Act 1995* and *Native Vegetation Act 2003*.

Issues:

Areas of HVAH have been mapped across private land which may be of concern to some landholders, although this was not reflected in any of the submissions received by Council.

Implementation Date / Priority:

The HVAH report and map will be adopted following resolution of Council.

Recommendation:

1. That Council adopt the attached Data Layer: High Value Arboreal Habitat map (Version 1.1) and Report: High Value Arboreal Habitat of the Coffs Harbour Local Government Area.
2. The submission authors be notified in writing of Council's decision.



High Value Arboreal Habitats in the Coffs Harbour Local Government Area

May 2014

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High Value Arboreal Habitats in the Coffs Harbour Local Government Area

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Abbreviations

3D	three-dimensional
ADS40	Airborne Digital Sensor (Leica Geosystems)
API	aerial photograph interpretation
CRAFTI	Comprehensive Regional Assessment Aerial Photographic Interpretation
DBH	diameter at breast height
HV	high value (as in HV Arboreal Habitats)
LGA	Local Government Area
LiDAR	light detecting and ranging
NPWS	NSW National Parks and Wildlife Service (which now falls within Office of Environment and Heritage)
NSW	New South Wales
PNF	private native forestry

Summary

- High Value Arboreal Habitats have important conservation value where ever they occur in the Coffs Harbour Local Government Area (LGA).
- There is very little High Value Arboreal Habitat left in the Coffs Harbour LGA, especially on freehold lands.
- What remains requires the highest level of protection.
- What remains also requires supplementation by management regimes that promote the protection and recruitment of old trees including hollow-bearing trees throughout all tenures.
- There is a need to examine both the response of local forest fauna to variations in the abundance of trees with hollows and the scale and pattern of forest disturbance.
- In order to appreciate the enormous time scales involved in hollow development, dendrochronological studies, or similar, are required to determine the longevity of tree species in the Coffs Harbour LGA and length of time it takes for cavities suitable for use by wildlife to develop.

Old-growth forest is recognised as a high value habitat in conservation assessment programs (RACD 1999a) but previous mapping, undertaken at regional scales, did not map patches of old forest less than 5 hectares in area. In seeking to map high value habitats for hollow-dependent species at finer scales for the purposes of land-use assessment and planning, the Coffs Harbour City Council (Council) requires growth stage mapping at finer scales to incorporate these smaller patches. The term 'High Value Arboreal Habitats' (HV Arboreal Habitats) is introduced to convey the ecological importance of hollow-bearing trees as part of a wider identification and mapping of high value habitats across the LGA.

A survey and mapping project was undertaken to identify HV Arboreal Habitats in forested areas of the Coffs Harbour LGA using high resolution digital imagery.

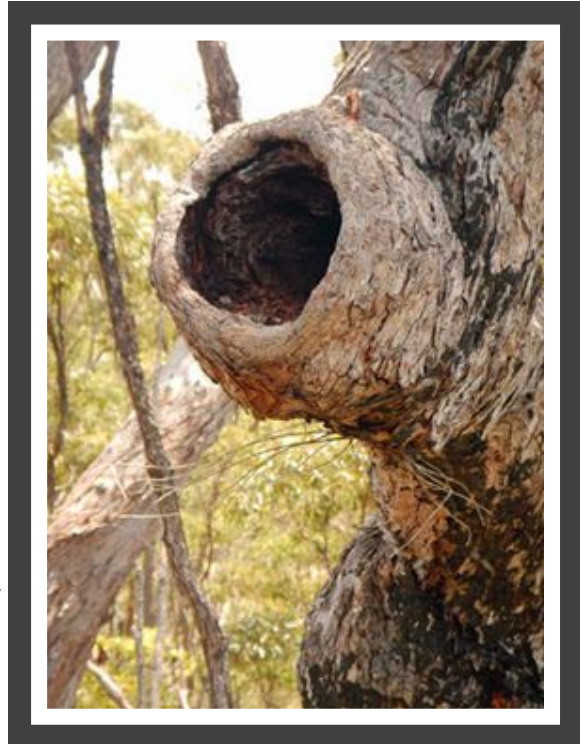
The purpose of the project was two-fold:

1. Use air photo interpretation (API) to produce a fine-scale map, using 3D API of HV Arboreal Habitats suitable for Council's planning and project requirements.
2. Produce a classification (definition) for HV Arboreal Habitats in the Coffs Harbour LGA, including:
 - HV Arboreal Habitat category 1 old-growth forest classification with mapping and field validation methods consistent with the *Private Native Forestry Code of Practice* (DECC 2008)

- to define and identify HV Arboreal Habitat categories 2–4 as highly significant components of forest structure and as important habitats for hollow-dependent species — an approach that could be more widely adopted by other local governments across coastal New South Wales to assist in the development of biodiversity management strategies.

The project was carried out in five stages:

1. Classify (or define) HV Arboreal Habitats in Coffs Harbour LGA.
3. Use API techniques to map areas of HV Arboreal Habitat.
4. Cross-check mapping against CRAFTI candidate old-growth forest mapping.
5. Undertake field surveys to guide API work and to validate areas mapped as HV Arboreal Habitat.
6. Refine mapped boundaries of HV Arboreal Habitats and finalise mapped determinations (coding).



The latest techniques, software and hardware were used for this mapping project. The most efficient and accurate method was used involving conventional API of high resolution digital imagery within the Stereo Analyst™ 3D viewing and mapping environment. Mapping was conducted at a scale of 1:3000.

HV Arboreal Habitats were divided into four categories

- HV Arboreal Habitat category 1 — old-growth forest
- HV Arboreal Habitat category 2 — forest areas >10 hectares with ≥ 5 senescent trees per hectare
- HV Arboreal Habitat category 3 — forest areas 5–10 hectares with ≥ 5 senescent trees per hectare
- HV Arboreal Habitat category 4 — forest areas 1–5 hectares with ≥ 5 senescent trees per hectare.

The delineation and identification of HV Arboreal Habitats reflected forest structure (i.e. the composition of late mature and over mature crowns) and disturbance regimes.

Field validation was undertaken at 149 survey sites to support the classification and mapping program. Information on structure and disturbance was collected through rapid site surveys or point-to-plant transects. Sites provided data for extrapolation and mapping purposes. To achieve maximum survey effort for all mapped areas, 85 private landowners were invited to voluntarily have surveys conducted on their land (14 landholders provided access).

API was conducted over 49,894 hectares of forested freehold lands in the Coffs Harbour LGA. A total 339 polygons were initially mapped as HV Arboreal Habitats.

The final mapping shows 1502 hectares (189 polygons) of HV Arboreal Habitats on freehold lands in the LGA. This represents less than 3% of freehold forested lands. The 1502 hectares includes 'verified' areas (i.e. those with an initial high mapping reliability and those areas that have been field validated) and 'potential' areas (i.e. those areas which still require field validation). Of the 339 polygons initially mapped as HV Arboreal Habitats within the LGA, 108 have been verified as meeting the classification for HV Arboreal Habitats. There are 81 polygons representing 835 hectares which still requiring further field validation, including 256 hectares (12 polygons) mapped as category 1 old-growth. For the first time, all old-growth forest and other HV Arboreal Habitats on freehold land have been consistently mapped across the LGA. This provides Council with a valuable conservation assessment and planning tool. The mapped information allows Council to identify old-growth forest and other HV Arboreal Habitats and to make comparisons of its distribution and extent to determine appropriate management actions.

The new HV Arboreal Habitats map will underpin a range of environmental planning and strategic management programs, for example the 'Biodiversity Action Strategy 2012–2030', *Coffs Harbour Local Environment Plan 2013* and *Coffs Harbour Development Control Plan 2013*. The development of the HV Arboreal Habitats map has been an initiative supported by Council and the Office of Environment and Heritage (OEH). It is anticipated that the HV Arboreal Habitats mapping products will be adopted by a range of end-users and natural resource managers.

1. Introduction

1.1 Aim of the study

The aim of this study is to produce a contiguous map of High Value Arboreal Habitats (HV Arboreal Habitats) on freehold forested lands in the Coffs Harbour Local Government Area (LGA) at a scale of 1:3000.

This study identifies senescent forest characteristics according to attributes which can be identified from the forest canopy, predominantly through remote sensing techniques. This is consistent with the Commonwealth and states' agreed JANIS¹ definition of old-growth forest which places an emphasis on the use of over-storey attributes to identify old-growth forest:

'Old-growth forest is ecologically mature forest where the effects of disturbances are now negligible' (JANIS 1997).

The study is also consistent with current *Private Native Forestry Code of Practice for Northern NSW* (DECC 2008) and supporting *Protocol for Re-evaluating Old-growth Forest on Private Property – Private Native Forestry Code of Practice Guideline No. 2* (DECC 2007) with respect to mapping and field validation procedures for old-growth forest.

1.2 Study area

The eucalypt forests of the North Coast of New South Wales have been recognised as some of the most diverse and species rich communities in the world (Cerese 2012). These forests include high levels of both endemic eucalypt diversity and overall eucalypt diversity (Cerese 2012).

In the Coffs Harbour LGA, wet sclerophyll and rainforest formations dominate the landscape, covering over 60% (54,750 hectares), and this is mainly due to the rich, fertile landscapes and high annual rainfall. Dry sclerophyll forests cover 20% (17,442 hectares), while the coastal forest covers only 6% (5214 hectares) of the LGA (OEH 2012).

¹ 'JANIS' refers to the Joint ANZECC/MCFFA National Forest Policy Statement Implementation Sub-committee report of 1997. ANZECC is the Australian New Zealand Environment and Conservation Council; and MCFFA is the Ministerial Council on Forestry, Fisheries and Aquaculture.

The Coffs Harbour LGA covers 117,300 hectares and is one of the few areas of coastal New South Wales where the high elevation landscapes of the Great Dividing Range are within close proximity to the coast. The diversity and extremes in landforms across the study area combined with past land-use practices have resulted in the majority of remaining forests supporting older trees being limited to the least accessible and least fertile areas in the LGA. These areas are typically escarpments and slopes greater than 30 degrees, and low fertility sites often on sandstone. In these areas past and present forest management activities have had less impact on the structural diversity of eucalypt forests.

The study area can be seen as consisting of three predominant topographical landscapes: coastal plains, midland hills and escarpment ranges (See Figure 1 and Table 1).

Table 1. Landscapes of the Coffs Harbour LGA

Landscape	Area (ha)	Area (%)
Coastal plains	32,150	27
Midland hills	47,500	41
Escarpment ranges	37,650	32
Total	117,300	100



Laughing Kookaburra (*Dacelo novaeguineae*) at hollow entrance, Corindi cemetery



Figure 1. The study area and landscapes of Coffs Harbour LGA

1.3 Context for the study

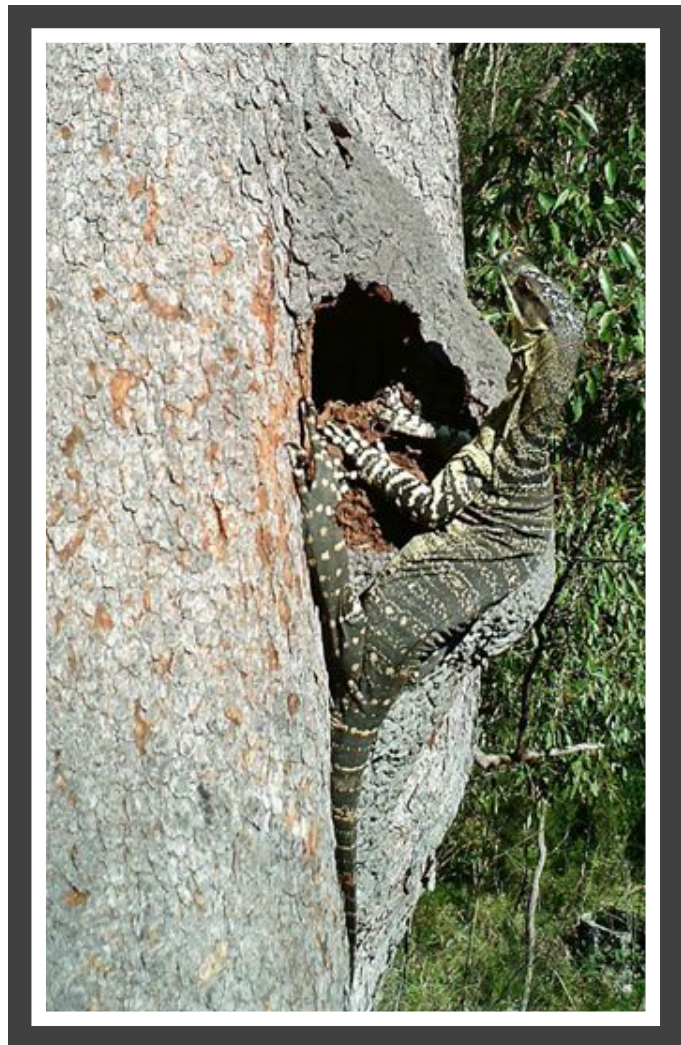
Forests supporting older trees are recognised high value arboreal habitats (see Section 1.6) and various regional conservation assessment programs have mapped growth stages and old-growth forest in north-east New South Wales (RACD 1999a).

Growth-stage mapping was previously undertaken for the Coffs Harbour LGA as part of the Comprehensive Regional Assessment Aerial Photographic Interpretation (CRAFTI) project undertaken for the upper north east and lower north east comprehensive regional assessments (see RACD 1999a). The CRAFTI methodology involved growth-stage mapping and disturbance mapping to determine 'candidate old-growth'.

The CRAFTI work was undertaken to meet the assessment requirements at a scale for the whole upper and lower north east regions which stretch from Tweed Heads in the north to the Hunter region in the south, and west as far as the Armidale region. Mapping at this regional scale (i.e. 1:25,000) is not suitable at the property scale or for local government planning purposes, and little ground-truthing was conducted over freehold lands during the CRAFTI work.

These regional scale programs (RACD 1999a) did not map patches of old forest less than 5 hectares. In seeking to map high value arboreal habitats for hollow-dependent species at finer scales for the purposes of land-use assessment and planning, the Coffs Harbour City Council (Council) requires mapping at finer scales to incorporate these smaller patches.

Over the last 20 years there have been significant improvements in growth-stage mapping resources



Lace Monitor (*Varanus varius*) feeding at termite nest, Barcoongere Way

and techniques. There have been major advances in the quality and availability of very high resolution (i.e. 50 centimetre) digital imagery and technologies for viewing and interpreting these images. The preparation/development of the Coffs Harbour HV Arboreal Habitats map provided an opportunity to take advantage of these new technologies.

The term 'High Value Arboreal Habitats' (HV Arboreal Habitats) is introduced to convey the ecological importance of hollow-bearing trees as part of a wider identification and mapping of high value habitats across the Coffs Harbour LGA (see Section 1.6 for more detail). Appendix 1 includes an extract from Council's Biodiversity Action Strategy showing the overarching framework within which this project sits.

The last 20 years has seen ongoing changes to land uses in the LGA, with shifts to residential lands, horticulture and private native forestry. These changes to land management have impacted the extent and presence of HV Arboreal Habitats in the LGA. Literature now points to the significance and rapid loss of hollow-bearing trees across the landscape. As such, a new, up-to-date HV Arboreal Habitats map is required to reflect their changed extent across the LGA.

Council requires updated detailed mapped information to support future planning strategies for the LGA. The new HV Arboreal Habitats mapping will underpin a range of environmental planning and strategic management programs. The map will be suitable for use at the 1:3000 scale and will support environmental planning at the whole-of-LGA level. The map may not necessarily be suitable for individual property or development plans where further surveys may be required to establish a forest's old-growth or HV Arboreal Habitat status. However, the mapping will have a direct influence on the following Council strategies, planning instruments and guidelines:

- Open Space Strategy
- Biodiversity Action Strategy 2012–2030
- State of the Environment reporting
- *Coffs Harbour Local Environmental Plan 2013*
- *Coffs Harbour Development Control Plan 2013*
- estuary management plans
- Draft Priority Habitats and Corridors Strategy
- Preservation of trees or vegetation clause (LEP 2013)
- Significant Tree Register
- biodiversity guidelines.



Blackbutt (*Eucalyptus pilularis*) hollow, Corindi cemetery

The development of the HV Arboreal Habitats map has been an initiative supported by Council and the Office of Environment and Heritage. It is anticipated that the HV Arboreal Habitat mapping process will be adopted by a range of stakeholders and natural resource managers.

Recently the Office of Environment and Heritage worked with Council to prepare a fine-scale vegetation map for the LGA (OEH 2012). The new HV Arboreal Habitats spatial layer will add value to and complement this product, and will also form an important component of Council's broader high value habitats projects.



Brush-tailed Phascogale (*Phascogale tapoatafa*), Barcoongere Way

1.4 Eucalypt forests and old trees in the Coffs Harbour LGA

There is very limited information on the geographical extent of old eucalypt trees and the age at which these eucalypts start to exhibit hollows. For example, of the 26 known species of eucalypt in the Coffs Harbour LGA (OEH 2012), Blackbutt (*Eucalyptus pilularis*) is the only species for which data has been collected on eucalypt longevity and hollow formation (Mackowski 1993). Fundamental ecological information is absent for the remaining 25 species.

Gibbons (2011) concluded that to manage our natural environments we must first interpret what forests and woodlands of Australia's looked like prior to European settlement. The literature suggests that 170 years of forestry, agriculture and urban development has left the majority of the Coffs Harbour area impoverished of old-growth forest and consequently lacking in hollow-bearing resources (Cerese 2012).

The first wave of timber getters to the North Coast targeted Australian Red Cedar (*Toona ciliata*) (Jervis 1940; Kass 1989; Vader 1987). They moved in to the Nambucca and Bellinger rivers in 1842 while the area around Dorrigo was not opened up by cedar getters until 1857 (Vader 1987). As this resource was depleted, and with the introduction and improvement of saw blades, the next big target became large, mature or early



Giant Tallowwood (*Eucalyptus microcorys*), Bruxner Park

mature eucalypts such as Blackbutt, various ironbarks and Tallowwood (*E. microcorys*) (Daly 1966). Large diameter eucalypt cohorts which are not yet hollow-bearing are usually more commercially viable and it is this group which were generally targeted by the timber industry. Many of the very large trees still remaining today in the Coffs Harbour LGA include Blackbutt and Flooded Gum (*E. grandis*).

The second wave of expansion was associated with pastoral squatters who sought to open grasslands to graze their ever-increasing flocks of cattle and sheep (Kitching et al. 2010). Expansion for agriculture saw further decline as large trees were ringbarked, cleared and burned to make way for agricultural pursuits (Griffiths 2002).

Large, old trees can still be found on some of the larger estuaries and some of the less fragmented forests of the Coffs Harbour LGA. Their persistence in the landscape is likely to be a result of a range of historical factors, but they remain largely isolated examples of what was once a continuous old-growth forest. Daley (1966) suggests that these trees were more than likely to have already been hollow-bearing when the first wave of timber getters came through in the 1860s.

Today, only fragmented and isolated patches of old-growth forest remain in Coffs Harbour, representing less than 26% of all forest cover on all tenure of which old-growth forests comprise less than 1% of freehold forested land. This is a result of 150 years of landscape modification that has included successive waves of forestry, farming and urbanisation leaving a sea of young trees which are many decades if not centuries away from developing hollows. Recent surveys in the region which measured eucalypt diameter at breast height (DBH) indicate the general DBH cohort for eucalypts is around 40 cm (pers. comm. D Lunney 1996–2011 Coffs Harbour Koala survey and J Turbill 2012 Bellingen Koala survey). Depending on the eucalypt species, the site condition, biotic and abiotic factors and fire frequency and intensity, hollow formation in the Coffs Harbour region is facing a formation time lag in the range of 50–300 years.

1.5 The process of hollow formation in eucalypts

Studies have shown that there are no clearly defined seasons on the NSW North Coast and therefore eucalypts are difficult to age (Pearson 2002). Apart from a few commercially valuable eucalypt species (e.g. Blackbutt), there is very little information in the literature regarding the longevity of eucalypts or the age at which trees start to form and retain hollows.

A number of studies have demonstrated the relationship between DBH and tree age (Ambrose 1982; Lindenmayer et al. 1993, 2000b; Brookhouse 2006; Koch et al. 2008). Models show that the size and number of hollows increases with the size and age of the tree. They also show that there are apparent differences between species. In dry sclerophyll forests in the Coffs Harbour area, it is likely that hollows begin to form in trees >50 cm DBH, and in wet sclerophyll forests hollows begin to form in trees >80 cm DBH (McLean 2012).

It is the older trees that provide hollows suitable for a range of fauna, and it is the older trees that provide the greatest number of hollows (Ambrose 1982; Mackowski 1993; Wormington et al. 2003; Goldingay 2009, 2012).

McLean (2012) found that fire frequency plays a significant role in the development of hollows within eucalypts, that hollows are scarce in trees under 80 years of age, and that it may take as long as 150 to 220 years for trees to develop a diversity of larger hollows.



Common Brushtail Possum (*Trichosurus vulpecula*), Moonee Caravan Park

1.6 Value of forests supporting hollow-bearing trees

Forests supporting old trees are recognised as having very high aesthetic, cultural and natural conservation values. Their protection and management is extremely important in maintaining biodiversity (Lunney 1991).

Old forests and forests with hollow-bearing trees are extremely important in the maintenance of biodiversity (fauna, flora and insect diversity) and ecological functions (e.g. nutrient and water cycles). Specific attributes of ecologically mature and old-growth forests used for foraging, nesting, basking or roosting by native animals include:

- diversity of hollows in limbs and trunks of live trees, dead trees (i.e. stags) and ground logs
- more dead wood present, including both standing timber and as ground logs
- deep litter layer or native grasses usually present as ground cover
- diversity in tree structure and age with older trees producing larger amounts of loose and shedding bark providing greater opportunities for nesting and roosting, and higher levels of food resources such as insects, nectar, pollen and sap
- mistletoe and epiphytes often present
- more availability of nest building materials and locations and perches for resting, basking and hunting forest birds and owls (DEC 2004).

The retention of a range of old trees supporting a diversity of hollows (i.e. hollows of different sizes, shapes, volumes, positions in tree and aspects) across a range of landscapes (e.g. riparian, mid-slope, hill and escarpments) has been shown to be a significant factor in maintaining overall species diversity. Many species require hollows within specific habitat or landscape types, such as riparian areas. Other species need hollows close to their foraging sites, whilst others species rely on the availability of different hollows across their home range. For example, maternity colonies of bats move between different hollows every few days and an individual Brush-tailed Phascogale (*Phascogale tapoatafa*) can use between 10–40 nest hollows within their home range each year (Soderquist et al. 1996). A range of hollows is required for these species to allow access to key foraging areas, avoid predators and cater for breeding. For example, a Stephens' Banded Snake (*Hoplocephalus stephensii*) may use 20 to 30 arboreal shelters or hollows within its home range (Fitzgerald et al. 2002). Yellow-bellied Gliders (*Petaurus australis*) live in social groups using exclusive home ranges which vary from 25 to 85 hectares (Goldingay & Possingham 1999). Family group members rely exclusively on the availability of numbers of larger tree hollows across their extensive

home range to cater for access to their variable food resource throughout different times of the year.

Squirrel Gliders (*Petaurus norfolcensis*) use tree hollows for shelter and nesting (Suckling 1995). They live in family groups of between 2 and 10 and often move between 300 and 500 metres in a night within a home range which may vary between 0.65 and 8.55 hectares according to habitat quality and availability of resources such as access to suitable hollows (Quin 1995).

Hollow diversity is also critical to maintaining predator–prey relationships for many species and is a critical limiting factor to the survival of many high order predators. For example, large forest owls depend on an abundant supply of smaller prey such as gliders and possums, all of which are hollow dependant. Where trees with hollows are scarce, habitat suitability and quality for species such as the Powerful Owl (*Ninox strenua*) is greatly reduced or removed.

Further, Smith et al. (1994) found that Greater Gliders (a common prey species for the Powerful Owl) are generally absent from forests where there are fewer than six hollow-bearing trees per hectare, whereas Mackowski (1993) states that three hollow trees per hectare becomes a limiting factor to the support of possum and glider populations in Blackbutt forests on the NSW North Coast.

In summary, any decrease in the availability and natural diversity of hollows across the forested landscape can lead to significant reduction in hollow-dependent animal species diversity and abundance, and in some cases, may result in local extinction of these species.



Hollow-bearing trees are a pivotal conservation resource and one which has been drastically reduced across Coffs Harbour's forested landscapes.

Regent Bowerbird (*Sericulus chrysocephalus*), Bruxner Park

2. Methods

This report outlines the process undertaken to map High Value Arboreal Habitats (HV Arboreal Habitats), including old-growth forest, across freehold forested areas in Coffs Harbour LGA.

The term **High Value Arboreal Habitats** (HV Arboreal Habitats) is introduced to convey the ecological importance of hollow-bearing trees as part of a wider identification and mapping of high value habitats across the LGA.

The project was carried out in five stages.

Classify (or define) HV Arboreal Habitats in Coffs Harbour LGA.

1. Use API techniques to map areas of HV Arboreal Habitat.
2. Cross-check mapping against CRAFTI candidate old-growth forest mapping.
3. Undertake field surveys to guide API work and to validate areas mapped as HV Arboreal Habitat.
4. Refine mapped boundaries of HV Arboreal Habitats and finalise mapped determinations (coding).



Regrowth surrounding a felled giant, Boambee (Photo: P Knock)

2.1 Classify HV Arboreal Habitats

A classification for HV Arboreal Habitats in Coffs Harbour LGA was developed. The four categories of HV Arboreal Habitat are shown in Table 2.

Table 2. Classification of High Value Arboreal Habitats in Coffs Harbour LGA

Category	Crown and patch/polygon size	Disturbance
Category 1, old-growth forest	>5 hectares relative crown cover is <10% regrowth >10% of trees are senescent	<50% of polygon shows signs of disturbance OR the effects of disturbance are now negligible 'negligible' disturbance is <50% of polygon with <10% regrowth / native pioneers or exotic species
Category 2	>10 hectares >5 senescent trees per hectare	Can show signs of 'significant' disturbance: >50% of polygon >10% regrowth / native pioneers or exotic species, landuse and/or point source disturbance
Category 3	5–10 hectares >5 senescent trees per hectare	
Category 4	1–5 hectares >5 senescent trees per hectare	As above or no disturbance or negligible disturbance

In this study, the definition (both forest structure and disturbance characteristics), API mapping methodology and field validation technique for category 1 old-growth forest is consistent with the *Protocol for Re-evaluating Old-growth Forest on Private Property: Private Native Forestry Code of Practice Guideline No. 2*, or 'the PNF old-growth protocol' (DECC 2007). The mapped layer which defines old-growth forest for matters relating to private native forestry (PNF) includes areas mapped with the following growth stages: <10% regrowth and either >30% or 10–30% senescence (tA and tB, respectively).

All other categories of HV Arboreal Habitats (i.e. categories 2–4) include more than five senescent trees per hectare. The literature defines the lack of hollow-bearing trees as a limiting factor in the sustainability of hollow-dependent fauna populations. Five trees per hectare was found to be a mappable unit at the scale required by Council, and was also a minimum number of hollows per hectare required to support a range of hollow-dependent fauna populations. It is argued that the number of hollow-bearing trees becomes generally limiting for forest on the north coast of NSW when there are less than about three hollow trees per hectare (Mackowski 1993, supported by extrapolations of the general habitats studied by Smith & Lindenmayer 1988). For the purposes of this study, these HV Arboreal



Stephens' Banded Snake (*Hoplocephalus stephensii*), Barcoongere Way

Habitat categories can also show signs of 'significant' disturbance. Categories 2–4 are distinguished by patch size (see Table 2).

2.2 Mapping HV Arboreal Habitats

API of forest growth stage involves recognising patterns in forest structure, understanding the structural composition of forest types and how this relates to environmental variables, and delineating growth stage boundaries and assigning a suitable code from a derived classification. For a full description of this process, refer to NSW NPWS (1996) and Resource and Conservation Division (1997). Appendix 2 includes the coding specifications used in this study and Section 2.6 discusses mapping disturbance.

Only 3D API is viable for the identification of HV Arboreal Habitats. Previous use of stereoscopes and low resolution aerial photographs has given way to the use of Stereo Analyst™ and high resolution digital imagery, and as such, this is the method used in this study.

Mapping of HV Arboreal Habitats was conducted by applying API techniques using Planar stereo/3D monitors and Stereo Analyst™ software on an ESRI ArcGIS 10.0 platform.

HV Arboreal Habitat categories 1, 2, 3 and 4 were mapped as either: verified or requiring field validation (i.e. coded as reliability 'Field Check'). Disturbance indicators were included for HV Arboreal Habitat category 1 old-growth, where appropriate, in the associated attribute table (Appendix 4). Disturbance indicators followed the 'CRAFTI API manual' (RACD 2007) and the PNF old-growth protocol (DECC 2007). See Appendix 2.

Mapping involved a three-step process:

- a) Map HV Arboreal Habitat category 1 old-growth forest as either:
 - i) verified old-growth, coded as reliability 'is old-growth' areas of steep topography determined through API and validated by DEM hill shade
OR
 - ii) old-growth requiring field validation, coded as reliability 'Field Check'.
- b) Map other HV Arboreal Habitats (i.e. categories 2, 3 and 4) as either:
 - i) verified HV Arboreal Habitats, coded as reliability = 'is HVAH'
OR
 - ii) HV Arboreal Habitats requiring field validation, coded as reliability 'Field Check'.
- c) Disturbance indicators were included for HV Arboreal Habitat category 1 old-growth mapping, where appropriate, in the associated attribute table (see Appendix 4).

The mapping was undertaken by one aerial photograph interpreter. The study area was divided into API progress grids to track progress across the landscape. Consistency was achieved by referring to reference senescent trees that were visible within the interpretation sphere and remaining within the interpretation scale range of 1:2000 to 1:4000. Under magnification would result in not visibly recognising senescent features of trees and over magnification would result in over estimating senescent composition and the inability to define polygons based on an homogenous structural and disturbance pattern.

As some forest types are difficult to interpret in addition to various factors masking senescent canopy characteristics, the study undertook an inclusive approach, where larger crowns within a forest context where tagged for field validation.

Additional information used to assist in the API work included:

- previous mapping and survey work in the study area (see Appendix 3)
- image enhancement products — Stereo Analyst™ enhancement of ADS40 stereo imagery and a saturation stretch of ADS40 ortho-rectified imagery based on Roff (2009)
- 'CRAFTI API manual' (RACD 1997)

- *Private Native Forestry Code of Practice* (DECC 2008) old-growth forest layer which includes only the growth stage codes tA (<10% regrowth and >30% senescence) and tB (<10% regrowth and 10–30% senescence)
- hillshade using LIDAR-derived digital terrain model to assist interpretation of topographic variables (aspect, slope, position on slope, ridges and gullies).

Interpretation used all available supporting data to attribute each polygon to one of the categories, and if uncertain, a 'Field Check' label was assigned.



Scaly-Breasted Lorikeet (*Trichoglossus chlorolepidotus*), Moonee Reserve

2.3 Cross-check mapping against CRAFTI candidate old-growth areas

'Candidate old-growth' forest (see NPWS 1999) is classified as forest with a relative crown cover of 10–30% regrowth and either >30% or 10–30% senescent trees ('sA' and 'sB' respectively). The classification of candidate old-growth differs from the PNF old-growth definition in that it includes areas exhibiting 'significant' disturbance, and as such includes areas classified as 'disturbed old-growth'. The aerial extent of candidate old-growth is, therefore, greater than old-growth as defined under the current PNF code of practice. Within the study area, CRAFTI originally mapped some 703 hectares of candidate old-growth on freehold tenure and 5800 hectares on public tenure (NPWS 2002).

The candidate old-growth senescent components of sA and sB (hollow-bearing trees in the canopy) and allowance of disturbance, meets the HV Arboreal Habitat categories being used in this project. As such, the candidate old-growth mapping provides a key reference layer to cross-check the mapping of HV Arboreal Habitats. Any areas not mapped by this project that were mapped as CRAFTI candidate old-growth were assessed via API and tagged for field check if appropriate, based on the mapping specifications.

The consideration of candidate old-growth forest in the HV Arboreal Habitats project is appropriate because the imagery used to map candidate old-growth in the Coffs Harbour area was captured in 1994, some 19 years ago. Since then, the regrowth proportions of the candidate old-growth may have become mature and some disturbance indicators may now be 'negligible'.

2.4 Field validation

Field validation surveys were carried out at various stages throughout the project. For example, some rapid site surveys (see below) were conducted during the mapping stage in order to guide the mapping work (by providing reference points for photo patterns). Data from these sites were also used to refine the mapped polygons. Surveys were also conducted after the mapping stage in order to validate polygons with a 'Field Check' reliability.

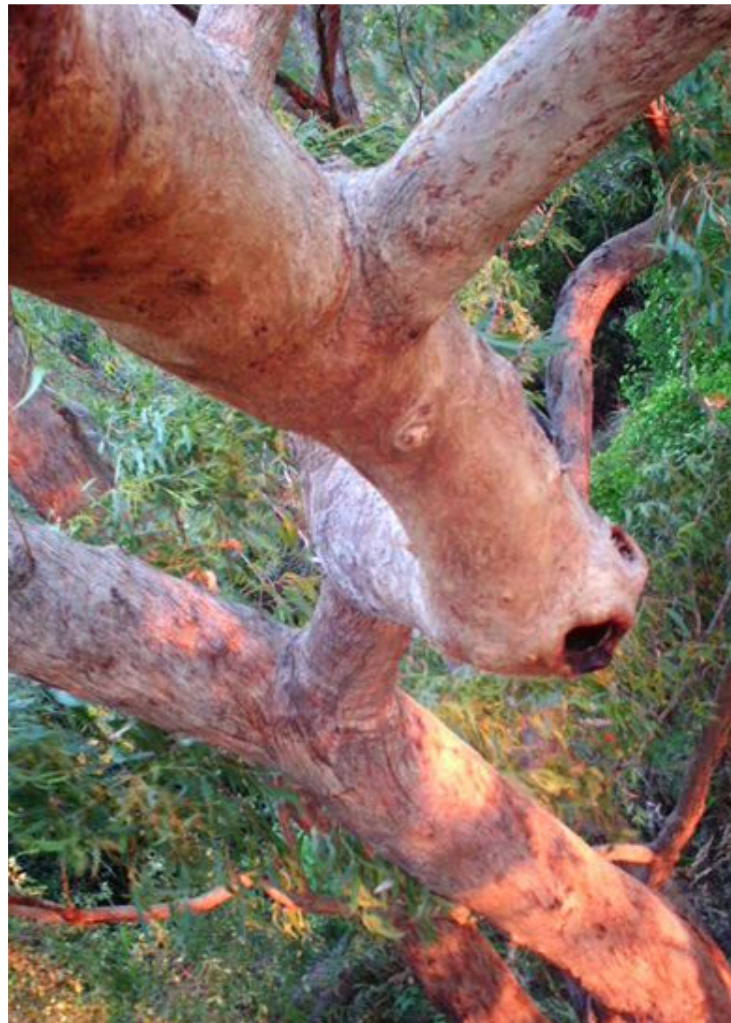
Surveys were conducted in areas where access was provided by private property owners as well as areas that were visible from public roads or tracks. Field information was collected using a geographic positioning system Garmin Oregon 550. Two assessors were involved in each survey to provide consistency.

Field validation surveys were undertaken in areas mapped for 'Field Check'. Access, project time and budget constraints impacted the level of field validation. Two types of field validation surveys were conducted to ground-truth API mapping and assign a polygon to the correct HV Arboreal Habitat category.

Rapid site surveys were undertaken to collect information on dominant structure and disturbance. The aim of rapid site surveys was to cover as much ground as possible in those areas that were easily accessible. Therefore, there is a spatial bias to that data, with no data collected in areas where access could not be gained or where locations were remote or steep (i.e. >30 degrees).

These surveys also recorded incidental records of threatened species, high conservation value areas, and areas where private native forestry operations were evident.

Point-to-plant surveys were undertaken to collect information on forest structure and disturbance within 30 metres of a maximum 10 points which are located 50 metres apart. These surveys were only conducted where field staff could not visually determine the dominant structure and or disturbance regime of an area. The point-to-plant methodology used in this study was the same as used in the PNF old-growth protocol.



Bastard Tallowwood (*Eucalyptus planchoniana*), Coffs Creek

Field validation surveys were carried out as follows:

- a) Determine where private property access will be provided by landholders for the purposes of ground-truthing the mapping. Access was sought via landholder response to a mail out carried out by Coffs Harbour City Council.
- b) Where access to freehold land mapped as reliability 'Field Check' is available, undertake rapid site surveys or point-to-plant surveys as appropriate.
- c) For categories 2–4, carry out surveys in category 2 first, then categories 3 and 4 as time allows.

2.5 Review, refine and make a final determination of mapped areas

Data from the field validation surveys were used in the 3D Stereo Analyst™ mapping environment to guide and confirm polygon line and attribution (i.e. coding).

- a) Review and refine mapped HV Arboreal Habitats based on field data, using Stereo Analyst™ and Planar monitor/viewer to make a final determination
 - Apply 3D analysis of survey data on forest maturity and disturbance to assess the original polygon determination. Boundaries and determinations were then validated or amended.
 - Use point-to-plant data to validate original determination of HV Arboreal Habitat as either category 1 old-growth, or category 2 or 3 or 4, or not HV Arboreal Habitat.
 - Review surrounding areas of mapped HV Arboreal Habitats with rapid site survey data to check for potential HV Arboreal Habitats missed during mapping.
 - Where access or time constraints did not resolve the original determination of mapped categories, the reliability remained coded as 'Field Check'.
- b) Provide final topology layer of HV Arboreal Habitats, metadata and report.

Final checking for global errors, gross errors, consistency in mapping and other logical checks were made. Data were collated in the table shown in Appendix 4. For details of the lineage of the data please refer to the metadata statement attached as Appendix 5.

2.6 Growth stage and disturbance mapping

The recognition of growth stage and disturbance categories from API is required to be consistent with the reality on the ground. Often environmental and anthropogenic factors confuse or mask interpretation and therefore field verification is required to validate API. This is usually the case in areas of high productive forests with a low intensity land-use management regime or rainforest understorey; or areas of low fertility which are subject to frequent fire.

Complex interpretation scenarios are many and the point-to-plant methodology can assist by determining the growth stage of a forest. However, determining whether 'the effects of unnatural disturbance are now negligible' is a significant consideration when conducting API and field validation of disturbance, to determine whether an area is old-growth forest. This part of the old-growth definition and assessment primarily applies to areas identified as 'older logging' where impacts are considered negligible with time. 'Now negligible' is where past evidence of logging or other anthropogenic disturbances are evident in the form of stumps (>40 cm diameter), unnatural stags, dieback, grazing infrastructure, gaps or clusters in the canopy structure and constructed tracks, however, are not associated with regrowth, native pioneers or weeds and does not affect >50% of a mappable area. Such disturbance evidence must be associated with gaps in the canopy with regrowth or native pioneers or weeds before potential old-growth areas are dismissed. This combination needs to be present for any mapped potential old-growth area to be excluded as old-growth and must affect greater than 50% of the mapped area. The singular presence of stumps, gaps, tracks, grazing infrastructure or native pioneers or weeds is not enough alone to exclude an old-growth determination. Some disturbance evidence can be responses to natural events or in the case of stumps, be an older logging regime of which the impacts are '*now negligible*' or a point source disturbance not affecting the homogeneity of the mapped polygon (affecting <50% of the polygon).



Yellow-Bellied Glider (*Petaurus australis*),
Corindi cemetery

3. Results

3.1 Mapping and refinement of HV Arboreal Habitats

An interactive approach was taken to finalise the HV Arboreal Habitats classification using the results of mapping and field validation surveys to inform the classification. During the mapping process, some grouping and splitting of the original classification occurred to better match forest identified during ground-truthing surveys. The four final classifications are shown above in Table 2.

API was conducted over 49,894 hectares of forested freehold lands in the Coffs Harbour LGA. A total 2125 hectares (339 polygons) were initially mapped as HV Arboreal Habitats.

CRAFTI candidate old-growth forests cover just 704 hectares on freehold land in the Coffs Harbour LGA, representing less than 1% of forested freehold lands. Cross-checking of the original mapped HV Arboreal Habitats against candidate old-growth mapping provided another validation option to identify areas for consideration and potential field survey.

One point-to-plant survey was carried out and 149 rapid site surveys were undertaken across the LGA. These surveys resulted in a number of amendments to the mapped HV Arboreal Habitats, including 150 polygons (623 hectares) that did not meet the HV Arboreal Habitats classification. This included three polygons where there was evidence of PNF (i.e. recent or current logging disturbances), and three polygons that were not HV Arboreal Habitats but were classified as 'high conservation value' vegetation owing to the noticeable absence of weeds and the intact representation of forest structure and floristic diversity.

Apart from the 150 polygons that were not HV Arboreal Habitats, other areas that were initially mapped as category 1 old-growth were downgraded to category 2 or 3 based on disturbance regimes and presence of >10% regrowth.

After reviewing and refining the map, it can be seen (Table 3) that there are 1502 hectares (189 polygons) of HV Arboreal Habitats in the LGA which represents only 3% of freehold forest. This includes 'verified' areas (i.e. those polygons with an initial high mapping reliability and those areas that have been field validated) and 'potential' areas (i.e. those areas which still require field validation).

Attachment

High Value Arboreal Habitats in the Coffs Harbour Local Government Area

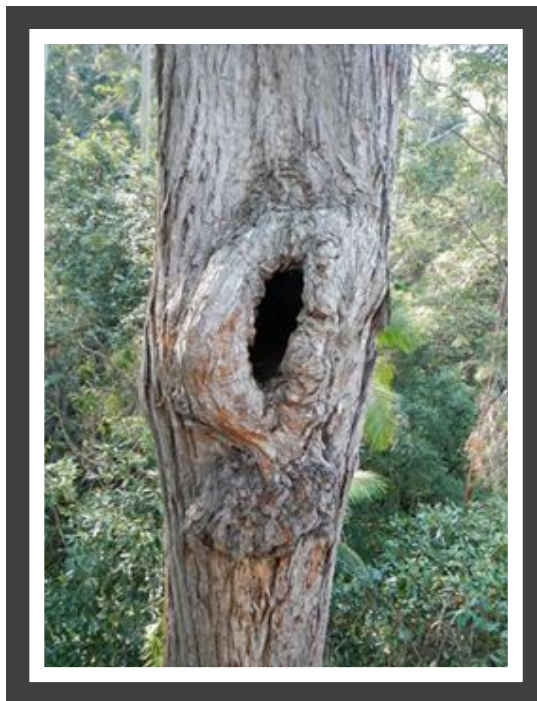
Table 3. High Value Arboreal Habitats in the Coffs Harbour LGA

Category	HV Arboreal Habitats		'Verified' HVAH		'Potential' HVAH to be verified	
	P'gons	Area (ha)	P'gons	Area (ha)	P'gons	Area (ha)
Category 1, old-growth	29	475.86	12	255.94	17	219.92
Category 2 (>10 ha)	25	559.14	12	151.54	13	407.60
Category 3 (5–10 ha)	29	189.52	13	80.93	16	108.59
Category 4 (1–5 ha)	106	277.37	71	179.03	35	98.34
Total	189	1501.89	108	667.44	81	834.45

Notes: HVAH = High Value Arboreal Habitats
 P'gons = polygons

Of the 339 polygons initially mapped as HV Arboreal Habitats within the LGA, 108 have been verified as meeting the classification for HV Arboreal Habitats. There are 81 polygons representing 835 hectares which still requiring further field validation, including 220 hectares (17 polygons) mapped as category 1 old-growth.

The difference between the number of polygons initially mapped as HV Arboreal Habitats and those that were verified is expected because the original mapping adopted an inclusive approach to forest structure and delineated areas that exhibited a larger canopy structure in contrast to surrounding areas. This step-wise method of reviewing the HV Arboreal Habitats classification highlighted areas where further field validation would be beneficial to adequately identify the HV Arboreal Habitat status of the LGA.



Turpentine (*Syncarpia glomulifera*), Bruxner Park

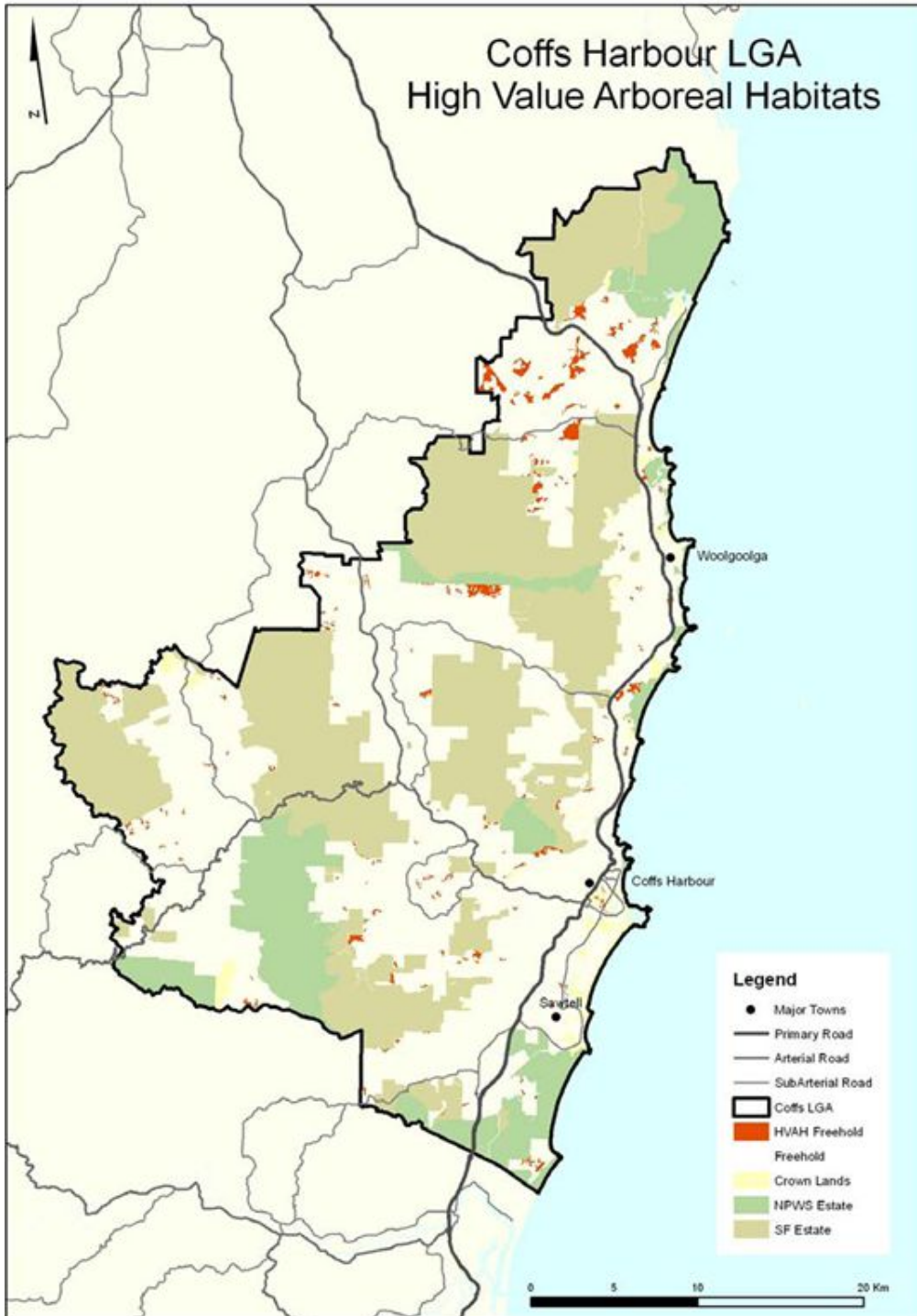


Figure 2. High Value Arboreal Habitats in Coffs Harbour LGA

3.2 Project management and costs

The use of the latest stereo API techniques and hardware, in combination with existing mapping products and field validation, allowed mapping of the study area to be accomplished within a four-month timeframe.

The mapping program consisted of three components:

1. API of 49,894 hectares to map HV Arboreal Habitats (conducted between January and April 2013 — approximately 24 days part time)
2. field validation and subsequent boundary refinement and polygon attribution (from July to August 2013 — approximately 24 days)
3. data analysis, metadata preparation and report compilation (from September to October 2013 — approximately 24 days).

Total costs of the project are summarised in Table 4.

Table 4. Summary of expenditure for this study

Description of activity	Council		OEH
	Cash	In-kind	In-kind
Private property access enquiries		500	
Preparation of specifications and classification	1,000	1,000	
API Mapping	10,000	1,000	
Field Survey	7,000	3,000	7,000
Refinement of API mapping	1,500		
Analysis and interpretation	1,500	1,000	1,000
Report preparation	6,000	2,500	
Total	27,000	9,000	8,000

3.3 Discussion

It is estimated that over half of the original forests of NSW have been cleared and that much of what remains is substantially disturbed or modified by grazing, logging, excessive fires, weeds and dieback (Lunney 1991). Areas of old-growth forest, in particular, have been severely reduced and now represent less than 10% of their original extent (Lunney 1991).



Australian King-parrot (*Alisterus scapularis*) on Blackbutt hollow

The current occurrence of HV Arboreal Habitats in the Coffs Harbour LGA (see Figure 2 above), reflects the land-use history of the region. Most HV Arboreal Habitats persist in the hinterland in steep and remote locations or on low site quality sites.

The final HV Arboreal Habitats map shows the major contributing influences on the contemporary distribution of these habitats to be slope and geology, followed by land-use history. The high fertility, easy accessible coastal areas experience the greatest land-use pressures and therefore the least remaining HV Arboreal Habitats. This is reflected in the low number and size of polygons in the coastal areas. The high fertile forests of the hinterland and Eastern Dorrigo have also had a history of high forestry extraction and therefore exhibit limited extent HV Arboreal Habitats. In areas of steep topographic or infertile geology where logging operations are difficult or uneconomical,

HV Arboreal Habitats persist. In the north of the study area on sandstone areas, low site quality forest types are present and therefore, have attracted lower land-use demands. The Corindi Plateau and surrounds are examples of this low intensity land use. The forest types here generally exhibit smaller, less dense tree crowns, lower heights and exist in conditions that accelerate senescence, such as higher fire regimes, lower soil nutrients, shallow soil profiles and experience a lower rainfall pattern. In this area, a larger portion of the LGA's HV Arboreal Habitats have persisted to date.

The loss or depletion across the landscape of old-growth forest, and in particular, hollow-bearing trees has been recognised as a key threat to fauna species diversity (NSW Scientific Committee 2006). In NSW, fauna that are reliant on tree hollows for shelter and nests include at least 46 mammals, 85 birds, 32 reptiles and 16 frogs (Gibbons & Lindenmayer 1997,

2002). Of these species, 45 are listed as threatened on Schedule 1 and Schedule 2 of the *Threatened Species Conservation Act 1995*.

A fine-scale map was produced for the Coffs Harbour LGA to support environmental planning purposes at the 1:3000 scale. 3D imagery analysis was found to be the current best practice for fine-scale HV Arboreal Habitats mapping for the LGA. This was largely due to the remote and inaccessible areas of HV Arboreal Habitats and the high resolution offered by this process. Significant changes in habitat quality occur within short distances requiring numerous small polygons to describe the HV Arboreal Habitat patterns. The ability to map HV Arboreal Habitats at such fine scales allowed this variation to be captured and assessed.

Intensive field sampling effort was required to achieve the desired mapping scale and accuracy for the LGA. This was largely due to the fragmented occurrence of HV Arboreal Habitats across varied landscapes within the study area and the rapid changes in site quality and land-use practices both past and present. Additional field data is required to inform the HV Arboreal Habitats layer, however, a large proportion of the remaining HV Arboreal Habitat areas are found on steep lands over 30 degrees or in low site quality areas, where threats are minimal.

Only 3% of freehold forest in the LGA is HV Arboreal Habitats. As discussed earlier, the land-use history of Coffs Harbour has been varied in both activity and intensity over time. There is a need to regulate present land-use activities to make sure further loss is prevented and recruitment of hollows is guaranteed. Areas of concern include the Corindi Plateau and coastal valleys north of Moonee Beach which are subject to intensive horticulture practices, particularly blueberry production. Significant losses of HV Arboreal Habitats are trending based on native vegetation loss in this area, depicted in aerial photo imagery from 1994 to present. Historically, these low site quality areas were overlooked because quality of the timber resource was inferior compared with the high fertility wet sclerophyll forests further south. More recently, land-use activities have intensified and diversified creating significant new threats to ecological values and in this case, HV Arboreal Habitats in particular, have arisen in these areas.

The planning process for residential release areas is another activity that requires sound reassessment as many of these release areas require the clearing of native vegetation. In some cases, development proposals in ecologically significant areas has resulted in the continued loss and fragmentation of HV Arboreal Habitats and associated ecological impacts such as the depletion of coastal habitats, severing ecological corridors, hampering climate change adaptation possibilities for species, contributing to over-cleared landscapes and elevating the number of threatened species and endangered ecological community nominations and occurrence in the landscape.

Forestry operations are a contemporary contributing factor in the decline of old-growth and other HV Arboreal Habitats. Wormington and Lamb (1999) found that old-growth wet and dry sclerophyll forest of south-east Queensland contained 35 and 37 hollow-bearing trees per hectare respectively. In woodland remnants of northern Victoria that had not been systematically logged, the density of hollow-bearing trees was found to range from 17 to 32 per hectare (Bennett et al. 1994; van der Ree et al 2001; Soderquist et al.1996). The Council's HV Arboreal Habitats study found that even at the low occupancy rate of 5 hollow-bearing trees per hectare, areas of HV Arboreal Habitat categories 2–4 were difficult to locate. Based on the figures from comparable forest types in south-east Queensland, the Coffs Harbour LGA has seen a 70–90% decline in hollow-bearing tree availability. By any measure, this is a drastic loss and one that can be presumed to have had major ecological impacts.

In north-east NSW, forestry operations are required to retain 10 habitat trees and 10 recruitment trees per 2 hectares (Anon 1999b). However, modelling by Ball et al. (1999) and Gibbons (1999) indicated that a long-term reduction in densities of hollow-bearing trees due to post harvest mortality is expected. Ball et al. (1999) and Gibbons (1999) state that over time, this has the potential to reduce the actual numbers of hollow-bearing trees across an actively managed forest landscape to far less than 5 trees per hectare. Gibbons et al. (1999) indicate that for wet sclerophyll forest of south-east Australia, twice this retention rate may be needed to avoid net loss of hollows in the longer term. The large variation in the recommended number of habitat trees conserved per hectare demonstrates a lack of understanding of the optimal level of hollows that are required for sustaining populations of hollow-dependent fauna (McLean 2012).

In north-east NSW, McLean (2012) found that logging significantly reduced a stand's average DBH, and the density of hollows and hollow-bearing trees in both wet and dry sclerophyll forests. Fire frequency was found to significantly increase the likelihood of basal injury. The abundance of hollow-bearing trees and hollows significantly decreased as a consequence of increasing fire frequency and logging intensity, however, on unlogged sites, the abundance of hollow-bearing trees and hollows increased as a consequence of increased fire frequency. The use of fire to create hollows is not recommended as a blanket management technique as appropriate fire regimes (e.g. intensity and frequency) are specific to forest types and the associated hollow-dependent species which inhabit these forests.

The time taken for small and large hollows to develop in 26 species of eucalypts known from the Coffs Harbour LGA is largely unknown. This lack of tree age data has, and continues to impede landscape management of this critical resource. Hollow formation is slow, with small hollows taking at least 80 years to form (Koch et al. 2008), while larger hollows suitable for

large hollow-dependant species such as forest owls and Greater Gliders may take as long as 220 years to develop (Gibbons & Lindenmayer 2003).

A review of the literature by McLean 2012, demonstrates that many authors believe recruitment of hollow-bearing trees has not kept pace with collapse rates and removal under existing forest management policy and there will be a future shortage of this resource in the years to come. Lindenmayer (2010) has continually reiterated that logging on short term rotations is perpetuated under existing state regional forest agreements despite the listing of loss of hollow-bearing trees as a key threatening process under the New South Wales *Threatened Species Conservation Act 1995* and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. Others, including Thompson (2008), believe that there is sufficient data to suggest that several threatened fauna species are at risk of whole-of-landscape collapse as a result of a lack of hollow resources upon which they depend. In NSW, terrestrial vertebrate species that are reliant on tree hollows for shelter and nests include at least 46 mammals, 81 birds, 31 reptiles and 16 frogs (Gibbons & Lindenmayer 1997, 2003). Of these species, 40 are listed as threatened on Schedule 1 and Schedule 2 of the Threatened Species Conservation Act.

Consequently, this study indicates that the hollow resource and remaining areas of HV Arboreal Habitats, needs to be carefully managed in Coffs Harbour. McLean's 2012 results are consistent with other studies that show that logging is likely to cause a net decline in hollow abundance (e.g. Gibbons et al. 2000b; Eyre et al. 2010). McLean also found that the effects of logging intensity on basal area and DBH are consistent with the assumption that logging removes large trees (i.e. likely to be hollow-bearing if DBH >80 cm in wet sclerophyll forest and DBH >50 cm in dry sclerophyll forest, depending on fire frequency). This has important implications for forestry and hollow-bearing paddock tree and recruitment tree management in Coffs Harbour and the rest of north-east New South Wales.

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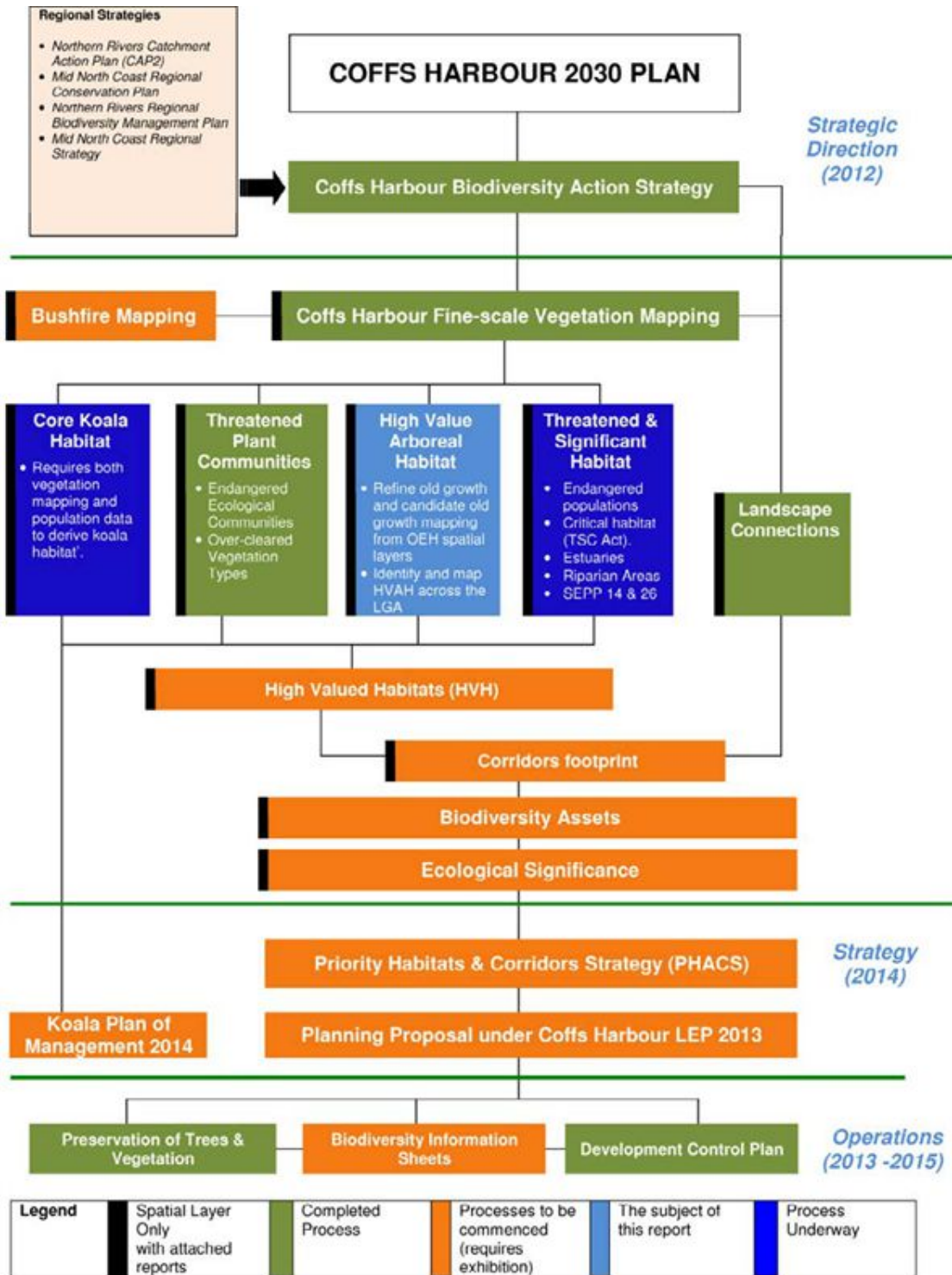
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Appendix 1

Figure A5.1 from Coffs Harbour Biodiversity Action Strategy (2012)



Appendix 2

Coding specifications for HV Arboreal Habitats mapping

Mapping area and scale

Reference scale for review of potential HV Arboreal Habitat areas	1:3000
Minimum area for category 1 old-growth category attribution	5 ha
Mapping scale for HV Arboreal Habitat areas	1:2000
Minimum area for HV Arboreal Habitats categories 2–4 attribution	1 ha

Structural composition of HV Arboreal Habitat category 1 old-growth

Presence of regrowth	<10%
Presence of senescent trees	>10%
Eucalypt crown cover percentage	>20%
Continuous forest cover	>5 ha

Acceptable disturbance characteristics of HV Arboreal Habitat category 1 old-growth: 'negligible' disturbance indicators

In the absence of associated regrowth clusters, native pioneers, weeds and <50% of the polygon affected by disturbance indicators as follows:

Collective 'older logging' indicators in the absence of regrowth (stumps >40cm diameter, snig tracks, dumps, canopy gaps, structure clusters and heights). Older logging where disturbance is 'now negligible'	Older logging
Clusters of different tree heights and crown size (dominantly mature and senescent NOT regrowth)	Clusters
Gaps in the canopy with no associated regrowth, native pioneers or weeds	Gaps
Tracks	Tracks
Grazing	Grazing

Structural composition of HV Arboreal Habitats categories 2–4

Presence of senescent trees	≥5trees/ha
-----------------------------	------------

Disturbance characteristics of HV Arboreal Habitats categories 2–4

(These areas are NOT included in category 1, old-growth forest due to disturbance or area. However, are delineated as HV Arboreal Habitat categories 2–4 based on presence of ≥5 senescent trees/ha and area

Native vegetation with significant disturbance (i.e. observed to be affecting >50% of the area of the polygon)

Category 2	>10 hectares
Category 3	5–10 hectares
Category 4	1–5 hectares

Appendix 3

Previous old-growth mapping and surveys in the study area

See the Reference section for full publication details.

Description/Method

Aerial photograph interpretation

Resource and Conservation Division 1998. UNE - LNE CRAFTI Accuracy Assessment Report. Prepared by Rennison, B. M., and Squire, R. H. for the Resource and Conservation Division of the Department of Urban Affairs and Planning

Resource and Conservation Division 1999a. Old Growth Forest Related Projects UNE/LNE CRA Regions. NSW Comprehensive Regional Assessments project number NA 28/EH. A report undertaken by the NSW National Parks and Wildlife Service for the NSW CRA/RFA Steering Committee. Forests Taskforce, Department of the Prime Minister and Cabinet, Canberra

New South Wales National Parks and Wildlife Service 2002. Re-derivation of Successional Stages For Upper and Lower North East NSW. Draft report, NPWS Northern Directorate, Coffs Harbour

Private Native Forestry derived Old Growth layer 2007, is a subset layer of CRAFTI 1999 Candidate Old Growth layer, using only the growth stage codes tA and tB. This layer removes areas of regrowth and disturbance that represented 55% of the COG mapped layer containing areas of sA and sB.



Brown Tree Snake (*Boiga irregularis*), Barcoongere Way

Appendix 4

Example of the HVAH Mapping Attribution:

OBJECT ID *	OG_Present	Older_Logging	Clusters	Grazing	Gaps	Tracks	HVAH	Relia-bility	Field Pr	HVAH_Pr	Area_ha
1	OG Present	<Null>	Distur-bance	<Null>	Distur-bance	<Null>	<Null>	Field Check	1	Old-growth	9.868855
2	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	Present	Is HVAH	4	1 - 5 Ha	2.641287
5	<Null>	<Null>	<Null>	<Null>	Distur-bance	<Null>	Present	Field Check	4	1 - 5 Ha	2.017416
6	OG Present	Distur-bance	<Null>	<Null>	Distur-bance	<Null>	<Null>	Field Check	1	Old Growth	9.661284
9	OG Present	<Null>	Distur-bance	<Null>	Distur-bance	<Null>	<Null>	Field Check	1	Old-growth	11.75143
16	OG Present	Distur-bance	Distur-bance	<Null>	Distur-bance	<Null>	<Null>	Field Check	1	Old-growth	5.500142
19	<Null>	<Null>	Distur-bance	<Null>	Distur-bance	<Null>	Present	Is HVAH	3	5 - 10 Ha	5.023482



Stag of Smooth-Barked Apple (*Angophora costata*), Old Bucca Road

Appendix 5

METADATA STATEMENT

High Value Arboreal Habitats Mapping of the Coffs Harbour Local Government Area (ver 1.1)

Abstract: This dataset represents fine-scale High Value Arboreal Habitats Mapping within the Coffs Harbour Local Government Area. Forest structure and disturbance has been categorized into HVAH priorities for conservation. Mapping was conducted by a vegetation mapping 'expert' (NSW Department of Environment and Heritage) between July and October 2013, and was based on 3-D PLANAR modelling, aerial photography interpretation, field growth stage and disturbance assessment. A nominal scale of use of 1:3000 is recommended for dataset display and interpretation, as linework digitising was based on ADS40 (50cm resolution) and minimum polygon size of 1.0 ha and was captured at screen scale range between 1:2000 and 1:4000. The map is not to be used at a property level scale or for development applications where a scale of 1:3000 or greater may be required to determine the level variation of vegetation within a property. Furthermore, DAs still need to undergo the rigour of planning laws in NSW including local assessment of impacts on flora and fauna. Overall thematic accuracy range of 58-76% (interpreter assessment). The dataset is to be considered a standalone layer.

1.1 ISO-19139 Metadata:

- [Metadata Information](#)
- [Resource Identification Information](#)
- Data Quality Information
 - [Data Quality 1](#)
 - [Data Quality 2](#)
 - [Data Quality 3](#)
 - [Data Quality 4](#)
 - [Data Quality 5](#)
- [Distribution Information](#)

1.2 Metadata Information:

Metadata language: eng

Metadata character set: utf8

Last update: 2013-10-02

Metadata constraints:

Security constraints:

Classification:

Classification system: Security classification not determined

Metadata contact - pointOfContact:

Individual's name: Mark Fisher

Organization's name: NSW Department of Environment and Heritage, Native Vegetation Information, Science Division

Contact's position: Land Assessment Officer

Contact information:

Phone:

Address:

Delivery point:

Country: Australia

Scope of the data described by the metadata: dataset

Scope name: dataset

Name of the metadata standard used: ANZLIC Metadata Profile: An Australian/New Zealand Profile of AS/NZS ISO 19115:2005, Geographic information - Metadata

Version of the metadata standard: 1.1

Metadata identifier: BFC9E3A2-791E-4F17-B08C-9D5E3D251A23

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1.3 Resource Identification Information:

Citation:

Title: High Value Arboreal Habitats Mapping of the Coffs Harbour Local Government Area (ver 1.1)

Alternate titles: 3-D Digital Interpretated High Value Arboreal Habitats Mapping of the Coffs Harbour Local Government Area, 3-D Digital Interpretated High Value Arboreal Habitat Mapping, Coffs Harbour, Coffs Harbour City Council High Value Arboreal Habitat Mapping Map - 2013,

Reference date - creation: 2013-10

Other citation details: NSW Office of Environment and Heritage (2013). Development of a Fine-Scale High Value Arboreal Habitat Map for the Coffs Harbour Local Government Area. Volume 1: Project Report. Office of Environment and Heritage, Coffs Harbour NSW Australia; High Value Arboreal Habitat Mapping Project for Coffs Harbour Local Government Area. Prepared for Coffs Harbour City Council.

Themes or categories of the resource: biota, environment, boundaries

Theme keywords:

Keywords: Biosphere | Vegetation | Canopy Characteristics, Biosphere | Vegetation | Forest Composition/structure

Citation:

Title: GCMD Science Keywords 5.3.8

Reference date - revision: 2006-01-01

Edition: 5.3.8

Edition date: 2012-05-17T21:34:56

Other citation details: Olsen, L.M., G. Major, K. Shein, J. Scialdone, R. Vogel, S. Leicester, H. Weir, S. Ritz, T. Stevens, M. Meaux, C.Solomon, R. Bilodeau, M. Holland, T. Northcutt, R. A. Restrepo, 2007 .NASA/Global Change Master Directory (GCMD) Earth Science Keywords.

Party responsible for the resource - custodian:

Organization's name: National Aeronautics and Space Administration (NASA)

Abstract:

This dataset represents fine-scale High Value Arboreal Habitat Mapping within the Coffs Harbour Local Government Area. Forest structure and disturbance has been categorized into HVAH priorities for conservation. Mapping was conducted by a vegetation mapping 'expert' (NSW Department of

Environment and Heritage) between July and October 2013, and was based on 3-D PLANAR modelling, aerial photography interpretation, field growth stage and disturbance assessment.

A nominal scale of use of 1:3000 is recommended for dataset display and interpretation, as linework digitising was based on ADS40 (50cm resolution) and minimum polygon size of 1.0 ha and was captured at screen scale range between 1:2000 and 1:4000.

The map is not to be used at a property level scale or for development applications where a scale of 1:3000 or greater may be required to determine the level variation of vegetation within a property. Furthermore, DAs still need to undergo the rigour of planning laws in NSW including local assessment of impacts on flora and fauna.

Overall thematic accuracy range of 58-76% (interpreter assessment)

The dataset is to be considered a standalone layer.

Purpose:

The dataset was primarily designed to identify HVAH, for display and interpretation at scales less than, or equal to, 1:3,000. Forest areas with regrowth greater than 10% and senescent trees less than 10%, have not been mapped. Disturbance has been recorded and category levels of HVAH have been attributed. Mapped areas that have not been field validated remain identified for Field Check. Users are reminded that the layer represents a model, and should only be regarded as an interpretation or prediction of real-world phenomena.

Dataset language: eng

Dataset character set: utf8

Status: completed

Maintenance:

Update frequency: unknown

Resource constraints:

Security constraints:

Classification:

Classification system: Security classification not determined

Resource constraints:

Legal constraints:

Access constraints: copyright

Resource constraints:

Legal constraints:

Access constraints: license

Resource constraints:

Legal constraints:

Access constraints: intellectual Property Rights

Resource constraints:

Legal constraints:

Use constraints:

Spatial representation type: vector

Format:

Format name: *.xml

Format version: Unknown

Spatial resolution:

Dataset's scale:

Scale denominator: 3000

Extent:

Geographic extent:

Bounding rectangle:

West longitude: 152.795444008

East longitude: 153.262029989

North latitude: -29.897385152

South latitude: -30.448434252

Extent:

Temporal extent:

Beginning date: 2013-07

Ending date: 2013-10

Credits:

Cotsell, Nigel
Black, Jeremy
Mark Cameron
Karen Caves
John Turbill
Anni Blaxland
Andrew Steed
Di Brown

Point of contact – Point Of Contact:

Individual's name: John Spry

Organization's name: Coffs Harbour City Council

Contact's position: Team Leader- GIS

Contact information:

Phone:

Voice:

Fax:

Address:

Delivery point:

City:

Administrative area:

Postal code:

Country:Australia

e-mail address:

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1.4 Data Quality - Description 1:

Scope of quality information:

Level of the data: dataset

dataset

Lineage:

Lineage statement:

****LINEAGE****

Source data for this layer has two components, the structure and disturbance field based site data and the other being high resolution aerial photography.

SITE DATA. 149 rapid data sites were funded by Coffs Council to inform the mapping. The rapid sites collected data on structure and disturbance at each site.

AERIAL PHOTOGRAPHY. The NSW Land and Property Management Authority (LPMA) captures airborne ADS40 4-band digital imagery at 50cm resolution for most of NSW. The Coffs Harbour (Sep 09), Dorrigo (Sep 09) and Bare Pt (June 10) 1:100k ADS40 tiles covered the Coffs LGA. Two levels of imagery were utilised for the project, the 4-band 2-dimensional orthorectified images and the Level 1 Rectified stereo image pair strips. The Level 1 data was used for 3-dimensional mapping in a GIS stereo environment. Significant spatial errors up to +/- 30 metres between Level 1 and the orthorectified data were discovered.

MAPPING PROCESS. Mapping was conducted by API expert in a stereo view workstation comprising of PLANAR monitors, ESRI ArcMap software and ERDAS Stereo Analyst software. The environment allows the direct delineation and attribution of polygons in 3-D stereo view (Level 1 imagery) whilst simultaneously having a 2D context view and any number of additional datasets to guide mapping decisions. Forest areas with regrowth greater than 10% and senescent trees less than 10%, have not been mapped. Disturbance has been recorded and category levels of HVAH (P1-4) have been attributed. Areas that have not been field validated remain identified for field check. Users are reminded that the layer represents a model, and should only be regarded as an interpretation or prediction of real-world phenomena. The interpreter routinely collected field check points with GPS to help extrapolate across areas of difficult interpretability. A total of 149 API points were collected for the project but points were constrained to private access approval, publicly accessible areas and areas that were visually accessible from public roads or tracks. This fieldwork resulted in 12 OG (HVAH P1) and 96 HVAH P2-4 areas validated, 150 polygons as neither and 81 areas remain attributed for field check. A total of 339 polygons were delineated. The mapping was conducted at

on screen at a range of scales but the final reference scale is deemed to be 1:3000. Linework was digitised using live streaming with a stream tolerance average of 5 metres ie a vertex every 5 metres.

The study area was divided into grid cells for stereo mapping to keep track of progress across the landscape. The first mapping layer was assessed against CRAFTI COG (2001) successional stage mapping of old-growth for the UNE, to verify and or capture missing data as a remote sensing validation process. The layer was then examined against field data and reviewed for line and attribute amendments. A final quality review of the map was conducted by examining each polygon in isolation and reviewing it for errors and attribution anomalies. Polygons that could not be field validated due to access, remote location, steep topography, time and budget constraints, were assessed to the best of the interpreter's ability. Where a final attribution could not be made, the final attribution remained as 'Field Check'. All data stored and edited within ESRI File Geo-database format.

****ACCURACY ASSESSMENT****

In this study, basic accuracy assessment was pursued in two ways:

- 1) The current mapping was compared to CRAFTI COG 2001, and
- 2) Field validation of as many mapped areas as access and time allowed.

The data set has a current accuracy range of 58-76% derived from a total of 339 polygons mapped and all but 81 polygons attributed (to be field checked). A total of 258 polygons have been assessed of which 149 field validated, labels were compared to field plots to determine if the polygon label should be amended and the remainder extrapolated from field sites close by.

To improve the map product, the remaining polygons to be attributed could be field validated on a category basis, starting with HVAH P1-OG and HVAH P2 areas greater than 10 Ha. It is acknowledged that extrapolated polygon attributes could be found incorrect under field validation, however, the interpreter did not attribute a polygon unless a degree of confidence was met, otherwise the polygon remained as 'Field Check'. It is also acknowledged that senescent trees are difficult to identify in some circumstances and therefore areas of HVAH may have been over looked.

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1.5 Data Quality - Description 1:

Scope of quality information:

Level of the data: dataset

dataset

Data quality report - Topological consistency:

Date of the test: 2013-09-24T00:00:00

Conformance test results:

Test passed: true

Meaning of the result: Geometry Topology: Topology validation was performed with a tolerance of 0.2 metres and all subsequent gaps and overlapping polygons fixed. Topology is correct. Geo-database XY tolerance set at 0.2 metres and the resolution set at 0.1 metres. Record Duplication: Not Assessed Topological Relationship to Other Layers: Not applicable

Citation:

Title: ESRI ArcMap Topology Validation

Reference date - publication: 2013-09-25

Edition:

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1.6 Data Quality - Description 1:

Scope of quality information:

Level of the data: dataset

dataset

Data quality report - Completeness omission:

Date of the test: 2013-09-23T00:00:00

Conformance test results:

Test passed: true

Meaning of the result: Coverage - Is complete for study area, no omissions known. Classification - Complete with regards to referred attribution system, no omissions known. Verification - Remote sensing interpretation covered all study area, no omissions. Field validation covered approx 50% of mapped areas.

Citation:

Title: Project Specifications

Reference date - publication: 2013-10-15

Edition:

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1.7 Data Quality - Description 1:

Scope of quality information:

Level of the data: dataset
dataset

Data quality report - Completeness commission:

Date of the test: 2013-09-23T00:00:00

Conformance test results:

Test passed: true

Meaning of the result: Coverage - Is complete for study area Classification
- Complete with regards to referred attribution system Verification - Remote sensing interpretation covered all study area. Field validation covered approx 50% of mapped areas.

Citation:

Title: Project Specifications

Reference date - publication: 2013-10-15

Edition:

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1.8 Data Quality - Description 1:

Scope of quality information:

Level of the data: dataset
dataset

Data quality report - Non quantitative attribute accuracy:

Date of the test: 2013-09-22T00:00:00

Conformance test results:

Test passed: true

Meaning of the result: Two main aspects of arboreal habitat value were captured as structure and disturbance into categories for conservation as HVAH P1-OG, HVAH P2 >10Ha, HVAH P3 5-10Ha, HVAH P4 1-5Ha. HVAH attribution is based on measurable forest structure and disturbance characteristics and considered to be an accurate reflection of potential arboreal habitat. HVAH P2-4 attribution is based upon number of hollow bearing trees per hectare and captured in 3 levels of intensity. Again, a measurable reflection of real forest characteristics but as a measure of habitat value, hollow trees are only one aspect of habitat value. It is an accurate attribute measure but not comprehensive in terms of total habitat attributes.

Citation:

Title: Field Validation & CRAFTI 1999 Old Growth Mapping Specifications

Reference date - publication: 2013-09-30

Edition:

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1.9 Distribution Information:

Distributor:

Distributor information - distributor:

Individual's name: Council GIS

Organization's name: Coffs Harbour City Council

Contact's position: Team Leader - GIS

Contact information:

Phone:

Voice: 66484000

Fax: 66484199

Address:

Delivery point:

City: Coffs harbour

Administrative area: NSW

Postal code: 2450

Country: Australia

e-mail address:

Ordering process:

Terms and fees: Where this dataset is provided, without charge, to non-employees of Council under service engagement, Spatial Data Licence Agreements apply. Spatial Data Licence Agreements are issued by Council, prior to data distribution, access and use, and define the terms of data usage, on-distribution and disposal. Distribution of this spatial dataset otherwise is to be determined by Council, and is subject to the current Coffs Harbour City Council Fees and Charges policy.

Date of availability: 2013-11-30T16:21:05

Turnaround time: Requests for spatial data and related quotations should be made, by phone or in writing (email or letter), to Coffs Harbour City Council's Geographic Information Systems section. E: gis@chcc.nsw.gov.au P: (02) 6648 4000 Coffs Harbour City Council Attn: Team Leader – GIS Locked Bag 155 COFFS HARBOUR NSW 2450

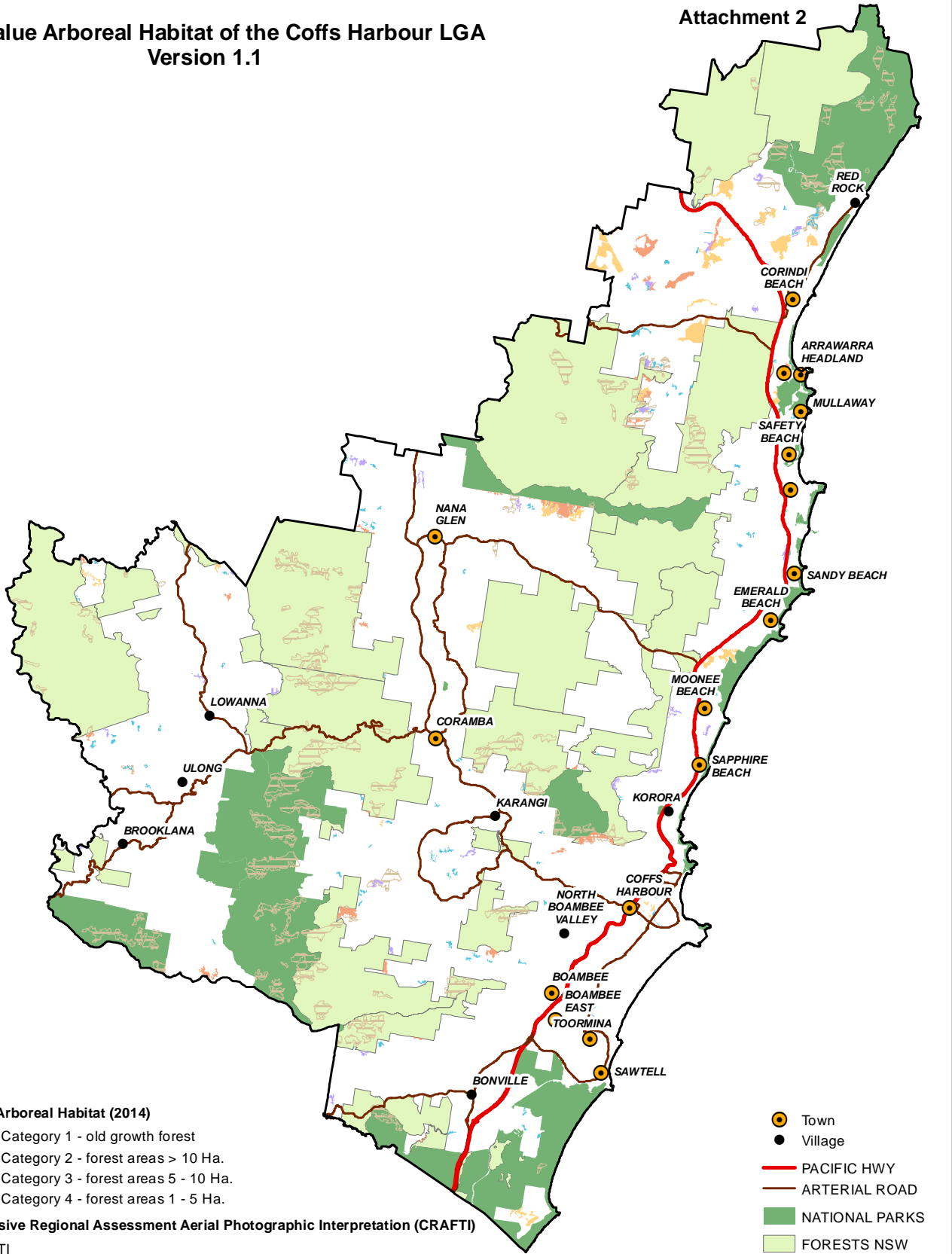
Instructions:

Coffs Harbour City Council endeavours to supply spatial data within 15 business days of confirmation of quotation. Where Spatial Data Licence Agreements, data extractions, manipulations or file conversions are required, additional turnaround timeframes may apply.

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High Value Arboreal Habitat of the Coffs Harbour LGA
Version 1.1

Attachment 2



High Value Arboreal Habitat (2014)

- HVAH Category 1 - old growth forest
- HVAH Category 2 - forest areas > 10 Ha.
- HVAH Category 3 - forest areas 5 - 10 Ha.
- HVAH Category 4 - forest areas 1 - 5 Ha.

Comprehensive Regional Assessment Aerial Photographic Interpretation (CRAFTI)

- CRAFTI

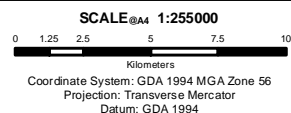
- Town
- Village
- PACIFIC HWY
- ARTERIAL ROAD
- NATIONAL PARKS
- FORESTS NSW



Cadastral, topographic and aerial ADS40 information supplied by the NSW Department of Finance and Services and maintained by Coffs Harbour City Council (Copyright © 2013, NSW Department of Finance and Services). Other data displayed may have been supplied by various other agencies under licence.
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Council accepts no liability or responsibility in respect to the map and any inaccuracies thereon. Any person relying on this plan shall do so at their own risk.

High Value Arboreal Habitat

This map produced by GIS Section
Coffs Harbour City Council
User: amdandama
Last Modified: 17/04/2014



GRID NTH



Submission	Comment	ECM reference
1	<p>This report highlights the drastic loss of old forests that has occurred across the Coffs Harbour Local Government Area and emphasises the critical importance of on-going protection and restoration of all identified remaining High Value Arboreal Habitat (HVAH) across the LGA and beyond. I hope that HVAH will receive the recognition and conservation protection that it deserves and that landowners with HVAH occurring on their lands are supported and encouraged sufficiently for that protection to occur.</p> <p>The mapping appears to have been undertaken in an explicit and scientifically valid manner and I applaud the foresight of Council and council officers in initiating and facilitating this project.</p> <p>One point of concern for me is that the mapping of CRAFT1 old growth forest within state forest on the HVAH map appears to be incorrect or at least incomplete. I am aware that there is old growth forest that is excluded from logging, under current zonings, within Lower Bucca State Forest but it does not appear on the HVAH map. I believe that this should be rectified for presentation within the final map to avoid any confusion regarding the presence of old growth forest on our public lands as well as private lands.</p>	3681925
2	<p>I would like to place a submission in support of the high value arboreal habitat mapping that council has on public exhibition.</p> <p>Coffs Harbour LGA has suffered extremely high levels of loss of old vegetation with high fauna habitat values. Only approximately 3% of the vegetation in the LGA retains these values. Where these values still exist, they need to be recognized and zoned appropriately.</p> <p>The mapping that has been done is an excellent resource to identify the high habitat values that still exist in Coffs vegetated areas, and I support council accepting this mapping in full.</p>	3707833
3	<p>Thank you for undertaking these surveys. I would like to write to support the mapping you have done and strongly believe that all such habitat is of such importance it must be protected and the land it is on must be zoned to ensure its protection.</p> <p>I can speak in particular of the rainforest on 9 Maccues Rd where there are many old and hollow trees. I have seen regent bowerbirds, sooty owls, lyre birds and a huge variety of other birdlife on or adjacent to this land. I am aware that a powerful owl has been sighted on a neighbouring property. It would be a tragedy if the forest here was lost and some of the forest on this property has already been illegally and legally cleared resulting in the loss of a significant amount of the threatened moonee quassia.</p>	3709472
4	<p>In regards to the Arboreal Habitat. I agree with councils mapping of the land and would like to see it appropriately zoned to ensure it is protected.</p>	3708294
5	<p>I give my support to the council's mapping of the land and would like to see it appropriately zoned to ensure the forest is protected.</p>	3708292
6	<p>I agree that the high value arboreal habitat is correctly zoned and that it needs to be protected.</p>	3711073
7	<p>I have studied the habitat survey at and agree with the mapping council has undertaken and endorse the view that all such land should be appropriately zoned to ensure its protection.</p>	3711539
8	<p>The petition totalled 239 separate individuals signed and dated: we the undersigned would like to state that we agree with the mapping that has taken place and strongly feel that all high value arboreal habitat must be appropriately zoned to ensure its protection.</p>	3715527

REGIONAL WASTE MANAGEMENT – COLLECTION CONTRACT

Purpose:

Seek Council approval to engage in discussions with Bellingen and Nambucca Shire Councils for the drafting of a new Regional Waste Collection Tender/Contract.

Description of Item:

The three Councils Bellingen Shire, Coffs Harbour City and Nambucca Shire commenced discussions on regional cooperation in waste management as early as 2002. Coffs Harbour City Council resolved in April 2002 to liaise with Bellingen and Nambucca Shire Councils to pursue regional waste management opportunities. This resulted in the current 'Collection Services for Coffs Coast Regional Waste Services', the 'Agreement for Processing of Waste at the Coffs Harbour Resource Recovery Facility and for Associated Purposes' and the 'Coffs Harbour Regional Resource Recovery Project'.

The Collection Services Contract is due to expire in June 2016.

This type of Tender process has a substantial lead in time including ordering new trucks and processing equipment and bin supplies. Due to the expected life of the Contract, the size of the geographic area, and the possibility of multiple options to be tendered on, requires a longer than average tender time period. It is therefore hoped to have the proposed Contract considered by the Councils for tendering at least fourteen (14) months prior to its commencement date on July 1, 2016.

It is known that there are a number of issues and elements of the existing Regional Contract that each of the Council's wish to consider as part of a future Collection Contract.

Sustainability Assessment:

- **Environment**

The regional approach to waste services will continue the ability of all three councils to maximise resource recovery and diversion of waste from landfill through the source separation of the domestic stream.

- **Social**

The regional approach will show continued leadership in regional cooperation and resource sharing and to provide a high level of local employment and a healthy living environment to the Coffs Coast Region.

- **Civic Leadership**

The regional approach will show continued leadership in regional cooperation and resource sharing to provide a highly cost effective waste collection service to the Coffs Coast Region.

Key objectives within the 2030 Plan that relate to waste management include:

- LP 4.1 Promote Sustainability programs and policies.
- LE 4.2 Implement programs which aim to make the Coffs Harbour Local Government Area pollution free.
- LE 4.4 Implement programs which aim to make the Coffs Harbour Local Government Area a zero waste community.

- **Economic**

Broader Economic Implications

All three Councils have the potential to achieve continued economies of scale from the larger regional collection system.

Delivery Program/Operational Plan Implications

The current Operational and Delivery Plans are unaffected by these discussions. The effect on both Plans from 2016/2017 will depend on the final contents of either a single or joint regional contract.

Risk Analysis:

There are no identified risks in discussing the continuation of the regional relationship with the other two Councils.

Consultation:

Initial contact with officers of the other two Councils, indicates support for this proposal. A letter has been received from Bellingen Shire requesting a meeting be arranged between Senior Management and staff representatives.

Related Policy and / or Precedents:

There are no policies of Council in relation to this matter.

Statutory Requirements:

The specific Tendering and Contracting requirements of Local Government Act will apply to the process and will form part of the reports when Council considers the draft Contract documents. None apply to these discussions.

Issues:

The purpose of this report is to ensure Council wishes to enter discussions on a new region collection contract. Issue of the Contract itself will be work shopped and drafted for separate consideration.

Implementation Date / Priority:

Immediate.

Recommendation:

That Council engages in discussions with Bellingen and Nambucca Shire Councils for the drafting of a new Regional Waste Collection Tender/Contract.

TENDER: ORARA RIVER REHABILITATION PROJECT BUSH REGENERATION TENDER 2014-15 RFT-637-TO

Purpose:

To report on tenders received for contract RFT-637-TO Orara River Rehabilitation Project Bush Regeneration Tender 2014-15 and recommend acceptance of tenders to form a panel of recognised contractors for bush regeneration.

Description of Item:

The Orara River Rehabilitation Project has received funding from Coffs Harbour City Council Environmental Levy and the North Coast Local Land Services to be expended by 30 June 2016. Approximately \$180,000 is available in the current budget for these works, although further funds may become available in 2014-15 through additional grants and Environmental Levy allocations.

Selective Tenders were invited electronically via Council's TenderLink portal and advertised in the Sydney Morning Herald on Tuesday 8 April 2014 for a Schedule of Rates contract. The proposed contract is non-exclusive, so more than one Contractor can be awarded parts of the work. It is proposed to establish a panel of recognised Contractors to undertake regeneration work to meet project requirements at various stages and within various timeframes.

Assessment Criteria used by the Assessment Panel, as listed in the Tender document were:

- Tender Price;
- Core Bush Regeneration Work Experience;
- Landholder & Project Manager Liaison Experience; and
- Work Plan & Reporting Experience.

Tenders were received from the following local entities:

1. Coffs Harbour District Local Aboriginal Land Council;
2. Coffs Harbour Bushland Regeneration Group Pty Ltd;
3. EnVITE Environment Inc;
4. Mt Coramba Nursery; and
5. Phil Santos.

Sustainability Assessment:

- **Environment**

The Orara River Rehabilitation Project aims to improve the condition of the river through the exclusion of stock from the riparian zone, erosion control, weed control, regeneration, and site maintenance. Project sites form vegetation corridors within the Orara Valley which link with forested hill slopes under National Park and State Forest tenures.

- **Social**

The Tender contains a Landholder liaison component which requires the successful Tenderer to encourage Landholder participation in project activities and an ongoing commitment by landholders to site maintenance. This is intended to build Landholder capacity to manage environmental impacts, actively participate in the project and be involved in long term site maintenance.

- **Civic Leadership**

The Tender Selection Panel was made up of representatives of the the Orara Valley RiverCare Groups Management Committee, contributing to Objective LC2.2 of the plan to welcome civic leadership. The Orara River Rehabilitation Project contributes to Objective LE2.2 of the plan to have active programs to restore and improve the environment.

- **Economic**

Broader Economic Implications

The recommended tenderers are local businesses who have significant local knowledge of the physical requirements of project sites and who understand the need for positive relationships with Landholders. This allows the work to be carried out to a satisfactory standard. The Tenderers continue to support local employment.

Delivery Program/Operational Plan Implications

Expenditure for the Contract has been allocated out of Environmental Levy funds, and from external grant funding from the Northern Rivers Catchment Management Authority and the NSW Environmental Trust. There are is currently around \$180,000 available in the current budget to conduct Orara River Rehabilitation Project Bush Regeneration.

The Tendered amount is inclusive of GST, which is not a net cost to Council.

Risk Analysis:

All successful Tenderers are registered with BNG Conserve, the contractor risk management system which Council uses. The Tender Selection panel was comprised of members of the Orara Valley RiverCare Groups Management Committee which oversees the project, as well as the Orara River Rehabilitation Project Officer as a Council representative. All panel members completed Conflict of Interest declarations and Confidentiality agreement forms before undertaking the selection process. Selection criteria and their weightings were fully discussed by the Orara Valley RiverCare Groups Management Committee and included in the Council Tender Selection Matrix which was registered in DataWorks prior to the Tender closing date. This means that the level of risk is low, due to diligent adherence to the Coffs Harbour City Council tender selection process and requirements for the engagement of contractors.

Consultation:

Tenders were reviewed in consultation with the Orara Valley RiverCare Groups Management Committee (OVRGMC), which has extensive experience of the Orara Valley and the requisite work. OVRGMC is the umbrella group for local Orara Valley LandCare groups which have been working on project sites since 1997.

Related Policy and / or Precedents:

Tendering procedures were carried out in accordance with Council policy. Council's Tender Value Selection System was applied to tenders capable of being considered under the Local Government (General) Regulations 2005. Council's policy is that the tender with the highest weighted score becomes the recommended tender.

Statutory Requirements:

The calling, receiving and reviewing of selective tenders was carried out in accordance with Part 7 Tendering of the Local Government (General) Regulations 2005 to establish a panel of recognised contractors.

Issues:

One Tenderer failed to meet the selection criteria relating to Landholder & Project Manager Liaison Experience and scored poorly on this assessment criterion.

The other Tenderers scored well on all selection criteria, with one Tenderer scoring particularly well on all the criteria and another scoring more favourably on price.

Implementation Date / Priority:

A contract can be awarded upon Council's resolution to accept a Tender. Failing any unforeseen events it is expected that the works will be completed by 8 May 2016 with a contract completion time of 104 weeks, subject to funding received.

Recommendation:

That Council considers tenders received for Orara River Rehabilitation Project Bush Regeneration Contract 2014-15 RFT-637-TO, and move the motion as detailed in the confidential attachment.

QUARTERLY BUDGET REVIEW STATEMENT FOR MARCH 2014

Purpose:

To provide the quarterly budget review statement and report on the estimated budget position as at 31 March 2014.

The following attachments are included with this report:

- Attachment 1 – General Budget Review Income and Expenses Statement by Program
- Attachment 2 – Sewer Budget Review Income and Expenses Statement by Program
- Attachment 3 – Water Budget Review Income and Expenses Statement by Program
- Attachment 4 – Budget Review Capital Budget
- Attachment 5 – Budget Review Cash and Investments position
- Attachment 6 – Budget Review Key Performance Indicators
- Attachment 7 – Part A Budget Review - Contracts
- Attachment 8 – Part B Budget Review - Consultancy and Legal Expenses.

Description of Item:

As part of the new Integrated Planning and Reporting (IP&R) framework for local government, the Office of Local Government has developed a minimum set of budget reports to assist Council in meeting their legislative requirements. These documents are collectively known as the Quarterly Budget Review Statement (QBRS) and form part of the framework of Clause 203 of the Regulation. This regulation requires a council's responsible accounting officer to submit quarterly budget review statements to the governing body of Council. These minimum statements are contained within attachments 1 through to 8 of this report. The table below summarises this month's budget variations.

Estimated Budget Position as at 31 March 2014:

	General Account \$	Water Account \$	Sewer Account \$
Original Budget adopted 13 June 2013	426,307 (D)	4,553,442 (D)	3,165,226 (D)
Approved Variations to December 2013	(408,707) (S)	Nil	Nil
Approved Variations for January 2014	Nil	(556,076) (S)	(300,000) (S)
Approved Variations for February 2014	15,000 (D)	Nil	Nil
Recommended variations for quarter ending 31 March 2014	Nil	Nil	Nil
Estimated result 2013/14 as at 31 March 2014	<u>32,600 (D)</u>	<u>3,997,366 (D)</u>	<u>2,865,226 (D)</u>

GENERAL ACCOUNT

Deficit/(Surplus)

Approved Variations for January 2014 – General

Sponsorship of BCU Coffs Tri 2014 approved by Executive Leadership Team meeting 22 January 2014, funded by Business Development reserve	13,000 (D)
Transfer of funding from Business Development reserve per above	(13,000) (S)

2013 Mayoral Ball expenses incurred	30,459 (D)
2013 Mayoral Ball income received	(26,489) (S)
Net cost of mayoral ball offset by savings in staff costs by reduction in work hours as requested by employee	(3,970) (S)
Revision of airport operational and capital works program budgets:	
- Terminal Enhancements	(189,000) (S)
- Runway Overlay	8,000 (D)
- Car Park Extension	(225,000) (S)
- Apron Overlay & Extension	189,000 (D)
- Terminal Area Masterplan	8,581 (D)
- General Car Parking Income	(22,000) (S)
- Security Car Park Income	(8,800) (S)
Surplus funds transferred back to airport reserve	239,219 (D)
Purchase of computer tablets to facilitate transition to electronic Development Assessments and Construction Certificate evaluation and inspections	
	12,000 (D)
Funding of tablet purchase through surplus City Planning staff costs	(12,000) (S)
Revision of bridge major repairs program:	
- Bobo Bridge	16,000 (D)
- James Small Drive footbridge replacement	62,000 (D)
- Harry Jensen Bridge	10,000 (D)
- Ferrets Bridge	10,000 (D)
- Seccombes Bridge	(25,000) (S)
- Puhos Bridge	10,000 (D)
- Hartleys Bridge	2,000 (D)
- Bridge investigations/appraisal	60,000 (D)
- Davies Bridge	(30,000) (S)
- Herds Bridge	25,000 (D)
Bridge major repairs unallocated funding	(140,000) (S)
West Woolgoolga Sportsground works including design and site monitoring funded from Section 94	
	17,792 (D)
Section 94 funds held	(17,792) (S)
January - General Subtotal	Nil
<u>Approved Variations for February 2014 – General</u>	
Revision of waste operational and capital works program budgets:	
- Pensioner Rebates Abandoned	2,000 (D)
- Woolgoolga Transfer Station Working Expenses	82,000 (D)
- Waste Education and Promotion	(100,000) (S)
- Greenwaste Processing Service	3,486 (D)
- Public Place Recycling Expenditure	(60,006) (S)
- Public Place Recycling Bins	60,000 (D)
- Waste Charges Income	(2,000) (S)
- Pensioner Rebates Subsidy	(1,978) (S)
- Scrap Metal Sales	(35,000) (S)
Net deficit of program adjustments funded from waste reserve	51,498 (D)
Revision of anticipated income from property rentals	
	(61,000) (S)
Revised subdivision construction certificate fees	(34,500) (S)
Surplus commercial property staff costs subsequent to restructure of	(60,000) (S)

organisation	
Shortfall in anticipated rental received for Rigby House building due to long term tenant vacating premises	155,500 (D)
Development Assessment and Building Services staff cost savings due to vacancies within the Division throughout the year	(62,000) (S)
Customer Services manager position yet to be advertised	(117,000) (S)
Increased audit fees for services provided outside scope of contract	20,000 (D)
Resourcing required to complete digitisation of cemetery records	10,000 (D)
Secondment of internal staff for further resourcing of asset accounting demands	41,400 (D)
GIS Team leader position vacancy	(93,800) (S)
Revised museum renovation costs in line with accepted tender	201,400 (D)
Woolgoolga netball courts resurfacing project, grant funds approved to supplement the \$141,000 set aside currently from Community Facilities Reserve	25,000 (D)
Department of Sport and Recreation grant funds approved	(25,000) (S)
Botanic Gardens Volunteer Coordinator 1 day per week, funded \$5,000 from Council with matching funding of \$5,000 from the Friends of the Botanic Gardens	10,000 (D)
Contribution from the Friends of the Botanic Gardens group towards coordinator	(5,000) (S)
Friends of the Parks Program Coordinator 1 day per week to coordinate volunteer groups park maintenance across the local government area - See Council report from Ordinary meeting 13 March 2014 – CIS 14/6	10,000 (D)
February - General Subtotal	15,000 (D)
<u>Recommended variations for March 2014 – General</u>	
Provision of floodlighting at Coffs Leisure Park 2 funded from Section 94 Developer Contributions plan	500,000 (D)
Section 94 funding for floodlighting works	(500,000) (S)
On Street parking at Mildura Street, Jetty funded from S94 Developer Contributions plan	122,000 (D)
Section 94 funding for on street parking works at the Jetty	(122,000) (S)
March - General Subtotal	Nil
WATER ACCOUNT	
<u>Approved variations for January 2014 – Water Fund</u>	
Reduction in water efficiency expenditure relating to meter exchange program	(100,000) (S)
To recognise income from sale of scrap metal relating to meter exchange program	(6,076) (S)
Water Strategy review to be undertaken in 2015/16	(450,000) (S)
January - Water Subtotal	(556,076) (S)

Approved variations for February 2014 – Water Fund

February - Water Subtotal **Nil**

Recommended variations for March 2014 – Water Fund

February - Water Subtotal **Nil**

SEWER ACCOUNT

Approved variations for January 2014 – Sewer Fund

Sewer Strategy review to be undertaken in 2015/16 (300,000) (S)

January - Sewer Subtotal **(300,000) (S)**

Approved variations for February 2014 – Sewer Fund

February - Sewer Subtotal **Nil**

Recommended variations for March 2014 – Sewer Fund

March - Sewer Subtotal **Nil**

Sustainability Assessment:

This report is one of procedure only.

- **Environment**

There are no perceived short or long term environmental impacts.

- **Social**

There are no perceived short or long term social impacts.

- **Civic Leadership**

Council strives to reach a balanced budget cash position by June 30 each year in conjunction with meeting its short term priorities.

- **Economic**

Delivery Program/Operational Plan Implications

The Original Budget for the General Account adopted on the 13 June 2013 provided for a deficit of \$426,307.

For substantial budget adjustments the associated council reports have addressed the triple bottom line factors independently in 2013/14.

Risk Analysis:

Not applicable.

Consultation:

Managers and their relevant staff have been provided with electronic budget reports for each program on a monthly basis. Requested variations and variations adopted by Council have been included in the report.

Statutory Requirements:

As discussed above, under local government regulations the responsible accounting officer is required to submit a quarterly budget review to Council. There is no obligation to provide monthly reviews but as part of prudent financial management we have opted to do so.

Responsible Accounting Officer's Statement

The responsible accounting officer believes the Quarterly Budget Review Statement indicates the financial position of the Council is satisfactory, having regard to the projected estimates of income and expenditure and the original budgeted income and expenditure.

Recommendation:

1. The Quarterly Budget Review Statements be noted.
2. That the budget adjustments be approved and the current budget position be noted.

Estimated budget position as at 31 March 2014:

	General Account \$	Water Account \$	Sewer Account \$
Original Budget adopted 13 June 2013	426,307 (D)	4,553,442 (D)	3,165,226 (D)
Approved Variations to December 2013	(408,707) (S)	Nil	Nil
Approved Variations for January 2014	Nil	(556,076) (S)	(300,000) (S)
Approved Variations for February 2014	15,000 (D)	Nil	Nil
Recommended variations for quarter ending 31 March 2014	Nil	Nil	Nil
Estimated result 2013/14 as at 31 March 2014	<u>32,600 (D)</u>	<u>3,997,366 (D)</u>	<u>2,865,226 (D)</u>

Agenda - Ordinary Meeting 8 May 2014 - CORPORATE BUSINESS DEPARTMENT REPORTS

**COFFS HARBOUR CITY COUNCIL
BUDGET REVIEW FOR THE QUARTER ENDED 31 MARCH 2014
INCOME & EXPENSES BY PROGRAM - GENERAL FUND**

Attachment 1

	ORIGINAL	Approved Changes			REVISED	Recommended Changes for March	PROJECTED Budget 2013/14	ACTUAL YTD
	Budget 2013/14	Other than by QBRs	Sept Rev	Dec Rev	Budget			
INCOME								
Community Facilities	2,067,069	1,743,635		-	3,810,704	(265,000)	3,545,704	3,335,874
Corporate Planning	4,815	94,193		90,000	189,008	13,000	202,008	139,356
CBD Masterplan Works	4,723,640			496,785	5,220,425	-	5,220,425	4,064,229
Jetty4Shores Project	-	-	-	2,316,286	2,316,286	(64,550)	2,251,736	31,302
Coffs Coast Tourism & Marketing	726,100	117,319		40,000	883,419	84,294	967,713	662,672
Sustainable & Precinct Planning	8,884	532,538		616,942	1,158,364	243,000	1,401,364	1,010,837
Development Assessment & Building Services	1,846,483	212,771		55,000	2,114,254	(214,708)	1,899,546	1,514,398
Environmental Services	324,470	1,054,191	112,875	(525,511)	966,025	(2,571)	963,454	660,990
Public Health & Safety	281,665	23,874		-	305,539	-	305,539	255,911
Ranger Services	463,586			-	463,586	-	463,586	372,219
Domestic Waste Management	16,597,501			-	16,597,501	7,962	16,605,463	16,269,216
Non-Domestic Waste Management	5,936,011	627,309		(458,151)	6,105,169	657,604	6,762,773	4,461,687
Commercial Property	56,432	-		(56,432)	-	-	-	-
Property Assets	1,677,784	337,729		9,480	2,024,993	(31,757)	1,993,236	1,609,629
Swimming Pools	90,952	40,000	27,500	-	158,452	-	158,452	118,768
Airport	10,026,741	5,586,991	367,972	5,697,023	21,678,727	(785,646)	20,893,081	17,022,231
Sports Unit	741,500	177,827		171,175	1,090,502	25,290	1,115,792	706,733
Admin & Corp Governance	5,754,835	496,785		(496,785)	5,754,835	-	5,754,835	4,324,105
Governance & Legal Services	96,500	664,203		-	760,703	-	760,703	596,643
Rural Fire Service	3,301,272	47,540		(1,030,074)	2,318,738	(45,000)	2,273,738	1,052,860
Information Services	755,720	1,108,257		-	1,863,977	-	1,863,977	1,359,595
Technology Group	1,629,230			-	1,629,230	-	1,629,230	795,857
Finance	992,401	24,422		67,445	1,084,268	-	1,084,268	830,247
Plant	13,924,366	841,085	32,776	-	14,798,227	-	14,798,227	9,939,018
Program Support	117,260	3,725		-	120,985	-	120,985	118,643
HR & Organisational Development	55,298	22,592		-	77,890	20,000	97,890	77,282
City Services Support	19,491			-	19,491	-	19,491	14,618
Assets Systems	-	8,313		51,040	59,353	-	59,353	44,515
Library Services	259,154	327,824		(445)	586,533	(10,800)	575,733	483,042
Community Services	595,209	387,496	71,225	71,420	1,125,350	82,187	1,207,537	805,967
Economic Development	210,325	187,412		(25,000)	372,737	26,489	399,226	367,021
Environmental Lab	922,791			-	922,791	(130,100)	792,691	534,764
Operational Administration	126,000	66,384		-	192,384	12,000	204,384	50,178
Recreational Services	6,253,515	3,517,175		(185,405)	9,585,285	284,708	9,869,993	4,530,187
Regional Roads	2,780,152	417,247	67,000	1,231,945	4,496,344	(5,563)	4,490,781	3,005,372
Local Roads	10,641,409	4,265,235	534,000	1,635,697	17,076,341	(38,465)	17,037,876	11,752,740
Bridges	1,507,335	247,477		76,938	1,831,750	-	1,831,750	1,489,759
Footpaths, Cycleways & Bus Shelters	612,623	392,033	39,726	254,488	1,298,870	64,856	1,363,726	920,380
Parking	1,047,334	542,081	1,250,000	-	2,839,415	21,000	2,860,415	2,129,561
Quarries	213,900			-	213,900	-	213,900	138,392
Street & Toilet Cleaning	-			-	-	-	-	-
Drainage	5,374,681	8,850,059		-	14,224,740	1,906,314	16,131,054	11,292,404
Harbour & Jetty	26,741			-	26,741	-	26,741	20,056
CityWorks - Private Works	411,300	75,376		-	486,676	-	486,676	2,086,323
Survey & Design	548,610	2,124,366	424,320	(276,269)	2,821,027	733,102	3,554,129	1,963,319
Street Lighting	151,000	27,650		-	178,650	-	178,650	20,738
Subdivisions & Contracts	107,250	16,100		-	123,350	40,900	164,250	174,664
Untied Funding	46,711,583	316,122	(162,122)	102,844	46,968,427	-	46,968,427	37,273,313
TOTAL INCOME	150,720,918	35,525,336	2,765,272	9,930,436	198,941,962	2,628,546	201,570,508	150,427,612

This document forms part of Coffs Harbour City Council's Quarterly Budget Review Statement for the quarter ended 31/03/14 and should be read in conjunction with other documents in the QBRs

Agenda - Ordinary Meeting 8 May 2014 - CORPORATE BUSINESS DEPARTMENT REPORTS

COFFS HARBOUR CITY COUNCIL

BUDGET REVIEW FOR THE QUARTER ENDED 31 MARCH 2014

Attachment 1

INCOME & EXPENSES BY PROGRAM - GENERAL FUND

	ORIGINAL	Approved Changes			REVISED	Recommended	PROJECTED	ACTUAL
	Budget 2013/14	Other than by QBRs	Sept Rev	Dec Rev	Budget	Changes for March	Budget 2013/14	YTD
EXPENSES								
Community Facilities	2,067,069	1,743,635		-	3,810,704	(265,000)	3,545,704	1,356,252
Corporate Planning	1,420,026	93,947		6,478	1,520,451	13,000	1,533,451	1,087,118
CBD Masterplan Works	4,723,640			496,785	5,220,425	-	5,220,425	1,309,233
Jetty4Shores Project	-			2,316,286	2,316,286	(64,550)	2,251,736	1,652,452
Coffs Coast Tourism & Marketing	2,061,318	117,319	(25,000)	40,000	2,193,637	84,294	2,277,931	1,222,839
Sustainable & Precinct Planning	1,195,301	532,538		1,092,203	2,820,042	243,000	3,063,042	1,513,152
Development Assessment & Building Services	2,869,110	212,771		-	3,081,881	(276,708)	2,805,173	1,949,230
Environmental Services	1,643,837	1,054,191	116,875	(990,772)	1,824,131	(2,571)	1,821,560	875,504
Public Health & Safety	1,317,696	23,874	246	-	1,341,816	-	1,341,816	1,018,122
Ranger Services	909,136			-	909,136	-	909,136	663,130
Domestic Waste Management	16,597,501			-	16,597,501	7,962	16,605,463	12,875,880
Non-Domestic Waste Management	5,936,011	627,309		(458,151)	6,105,169	657,604	6,762,773	2,244,036
Commercial Property	544,344	-	(7,174)	(75,840)	461,330	(256,048)	205,282	206,233
Property Assets	2,563,032	160,314	189,589	68,888	2,981,823	258,791	3,240,614	2,032,252
Swimming Pools	688,488	40,000	27,500	-	755,988	-	755,988	598,733
Airport	10,026,741	5,586,991	367,972	5,697,023	21,678,727	(785,646)	20,893,081	18,094,887
Sports Unit	2,343,291	74,002	128,825	171,175	2,717,293	25,290	2,742,583	1,822,193
Admin & Corp Governance	1,419,514	496,785		(527,595)	1,388,704	-	1,388,704	948,178
Governance & Legal Services	1,929,344	664,203		12,330	2,605,877	-	2,605,877	1,896,958
Rural Fire Service	3,634,502	27,540	20,000	(976,313)	2,705,729	(45,000)	2,660,729	1,353,633
Information Services	4,340,857	1,108,257	(50,000)	(29,000)	5,370,114	(93,800)	5,276,314	3,113,091
Technology Group	1,629,230			-	1,629,230	-	1,629,230	1,734,988
Finance	4,400,220	24,422		88,929	4,513,571	(45,600)	4,467,971	3,314,592
Plant	13,924,365	841,085	32,777	-	14,798,227	-	14,798,227	8,087,406
Program Support	419,584	3,725		-	423,309	-	423,309	304,534
HR & Organisational Development	1,446,780	22,592		-	1,469,372	20,000	1,489,372	1,135,498
City Services Support	716,144			(37,700)	678,444	(24,833)	653,611	532,007
Assets Systems	358,003	8,313		51,040	417,356	-	417,356	247,261
Library Services	1,994,975	327,824		(445)	2,322,354	(10,800)	2,311,554	1,484,641
Community Services	2,732,720	35,138	303,583	162,922	3,234,363	341,537	3,575,900	2,209,840
Economic Development	1,002,340	187,412		(25,500)	1,164,252	(6,618)	1,157,634	770,951
Environmental Lab	922,791			-	922,791	(130,100)	792,691	621,101
Operational Administration	1,075,177	66,384		(11,408)	1,130,153	(18,000)	1,112,153	710,309
Recreational Services	10,116,834	1,813,823	1,703,352	(185,405)	13,448,604	310,708	13,759,312	8,865,286
Regional Roads	2,885,007	417,247	67,000	1,231,945	4,601,199	(5,563)	4,595,636	3,103,097
Local Roads	16,231,709	4,265,235	554,000	1,693,697	22,744,641	(38,465)	22,706,176	12,662,348
Bridges	1,611,935	247,477		76,938	1,936,350	-	1,936,350	1,157,359
Footpaths, Cycleways & Bus Shelters	968,723	392,033	50,726	254,486	1,665,968	53,845	1,719,813	870,996
Parking	1,626,838	542,081	1,250,001	-	3,418,920	21,000	3,439,920	1,160,029
Quarries	213,900			-	213,900	-	213,900	175,169
Street & Toilet Cleaning	840,200			-	840,200	30,000	870,200	674,857
Drainage	5,664,481	8,850,059		-	14,514,540	1,906,315	16,420,855	4,309,747
Harbour & Jetty	196,641			-	196,641	-	196,641	140,351
CityWorks - Private Works	411,300	75,376		-	486,676	-	486,676	1,633,048
Survey & Design	2,492,806	2,124,366	378,320	(286,269)	4,709,223	733,102	5,442,325	2,455,563
Street Lighting	913,200	27,650		-	940,850	-	940,850	588,246
Subdivisions & Contracts	534,741	16,100		-	550,841	6,400	557,241	386,112
Untied Funding	7,580,823	316,122	(316,122)	-	7,580,823	-	7,580,823	5,685,617
TOTAL EXPENSES	151,142,225	33,168,140	4,792,470	9,856,727	198,959,562	2,643,546	201,603,108	122,854,056
NET OPERATING RESULT SURPLUS/(DEFICIT)	(421,307)	2,357,196	(2,027,198)	73,709	(17,600)	(15,000)	(32,600)	27,573,556

This document forms part of Coffs Harbour City Council's Quarterly Budget Review Statement for the quarter ended 31/03/14 and should be read in conjunction with other documents in the QBRs

Agenda - Ordinary Meeting 8 May 2014 - CORPORATE BUSINESS DEPARTMENT REPORTS

**COFFS HARBOUR CITY COUNCIL
BUDGET REVIEW FOR THE QUARTER ENDED 31 MARCH 2014
INCOME & EXPENSES BY PROGRAM - GENERAL FUND**

Attachment 1

	ORIGINAL Budget 2013/14	Approved Changes			REVISED Budget	Recommended Changes for March	PROJECTED Budget 2013/14	ACTUAL YTD
		Other than by QBRS	Sept Rev	Dec Rev				
Add Back:								
Capital Expenses	28,866,206	26,961,827	2,460,524	4,773,048	63,061,605	2,707,037	65,768,642	28,458,938
Less:								
Transfers to & from Reserves	29,198,992	24,326,339	9,513,398	(1,067,510)	61,971,219	(390,923)	61,580,296	46,185,223
Loan Drawdowns	-	2,500,000		4,800,000	7,300,000		7,300,000	4,800,000
Advance Repayments	54,609		(4,320)		50,289	7,765	58,054	39,583
Asset Sales	1,707,350	183,100			1,890,450		1,890,450	317,944
NET OPERATING RESULT FROM CONTINUING OPERATIONS	(2,516,052)	2,309,584	(9,075,752)	1,114,267	(8,167,953)	3,075,195	(5,092,758)	4,689,745
Less:								
Capital Grants	3,302,947		537,050	1,208,772	2,631,225	3,055,895	5,687,120	1,901,899
Capital Contributions	4,583,350		219,617	188,199	4,991,166	11,194	5,002,360	4,692,106
NET OPERATING RESULT BEFORE CAPITAL ITEMS	(10,402,349)	2,309,584	(9,832,419)	2,134,840	(15,790,344)	8,106	(15,782,238)	(1,904,260)

Note
ORIGINAL BUDGET +/- approved budget changes in previous quarters = REVISED Budget
REVISED BUDGET +/- recommended budget changes this quarter = PROJECTED Budget

Recommended Changes for March

The detail of what recommended changes are requested are included in the Description of Item section in the report

COFFS HARBOUR CITY COUNCIL
BUDGET REVIEW FOR THE QUARTER ENDED 31 MARCH 2014

INCOME & EXPENSES BY PROGRAM - SEWER FUND

	ORIGINAL	Approved Changes			REVISED	Recommended Changes for March	PROJECTED	ACTUAL
	Budget				Budget		Budget	YTD
	2013/14	Other than by QBRS	Sept Rev	Dec Rev	2013/14			
INCOME								
Management Expenses	1,093	94,610	-	-	95,703	-	95,703	72,298
Maintenance & Operating	7,998,492	-	-	-	7,998,492	-	7,998,492	5,875,331
Miscellaneous	-	-	-	-	-	-	-	-
Capital Expenses	20,985,443	11,316,825	-	-	32,302,268	(3,366,600)	28,935,668	19,503,080
Untied Funding	26,308,735	-	-	-	26,308,735	-	26,308,735	24,786,947
TOTAL INCOME	55,293,763	11,411,435	-	-	66,705,198	(3,366,600)	63,338,598	50,237,655

	ORIGINAL	Approved Changes			REVISED	Recommended Changes for March	PROJECTED	ACTUAL
	Budget				Budget		Budget	YTD
	2013/14	Other than by QBRS	Sept Rev	Dec Rev	2013/14			
EXPENSES								
Management Expenses	4,441,721	94,610	-	-	4,536,331	(300,000)	4,236,331	3,149,605
Maintenance & Operating	16,543,749	-	-	-	16,543,749	-	16,543,749	11,219,149
Miscellaneous	15,678,076	-	-	-	15,678,076	-	15,678,076	10,904,924
Capital Expenses	20,985,443	11,316,825	-	-	32,302,268	(3,366,600)	28,935,668	8,967,509
Untied Funding	810,000	-	-	-	810,000	-	810,000	607,500
TOTAL EXPENSES	58,458,989	11,411,435	-	-	69,870,424	(3,666,600)	66,203,824	34,848,687

NET OPERATING RESULT SURPLUS/(DEFICIT) (3,165,226) - - - (3,165,226) 300,000 (2,865,226) 15,388,968

Add Back:								
Capital Expenses	26,300,983	11,316,825	-	-	37,617,808	(3,716,600)	33,901,208	12,854,487
Less:								
Transfers to & from Reserves	19,457,744	10,073,877	-	-	29,531,621	(3,366,600)	26,165,021	19,623,766
Loan Drawdowns	-	-	-	-	-	-	-	-
Advance Repayments	-	-	-	-	-	-	-	-
Asset Sales	-	-	-	-	-	-	-	13,182

NET OPERATING RESULT FROM CONTINUING OPERATIONS 3,678,013 1,242,948 - - 4,920,961 (50,000) 4,870,961 8,606,507

Less:								
Capital Grants	1,134,948	1,337,558	-	-	2,472,506	-	2,472,506	(22,749)
Capital Contributions	3,812,900	-	-	-	3,812,900	-	3,812,900	2,859,675

NET OPERATING RESULT BEFORE CAPITAL ITEMS (1,269,835) (94,610) - - (1,364,445) (50,000) (1,414,445) 5,769,581

Note
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 REVISED BUDGET +/- recommended budget changes this quarter = PROJECTED Budget

Recommended Changes for March

The detail of what recommended changes are requested are included in the Description of Item section in the report

This document forms part of Coffs Harbour City Council's Quarterly Budget Review Statement for the quarter ended 31/03/14 and should be read in conjunction with other documents in the QBRS

**COFFS HARBOUR CITY COUNCIL
BUDGET REVIEW FOR THE QUARTER ENDED 31 MARCH 2014
INCOME & EXPENSES BY PROGRAM - WATER FUND**

	ORIGINAL	Approved Changes			REVISED	Recommended Changes for March	PROJECTED Budget 2013/14	ACTUAL YTD
	Budget				Budget			
	2013/14	Other than by QBRS	Sept Rev	Dec Rev				
INCOME								
Management Expenses	3,000	86,753			89,753		89,753	67,994
Maintenance & Operating	6,168,761	198,981			6,367,742	36,076	6,403,818	4,830,237
Miscellaneous	-				-		-	-
Capital Expenses	15,271,100	304,040			15,575,140	(5,971,383)	9,603,757	8,875,864
Regional Water Supply	-				-		-	-
Untied Funding	18,857,277				18,857,277		18,857,277	12,649,522
TOTAL INCOME	40,300,138	589,774	-	-	40,889,912	- 5,935,307	34,954,605	26,423,616

	ORIGINAL	Approved Changes			REVISED	Recommended Changes for March	PROJECTED Budget 2013/14	ACTUAL YTD
	Budget				Budget			
	2013/14	Other than by QBRS	Sept Rev	Dec Rev				
EXPENSES								
Management Expenses	4,040,852	86,753			4,127,605	(450,000)	3,677,605	2,546,113
Maintenance & Operating	12,052,561	198,981			12,251,542	(70,000)	12,181,542	8,467,209
Miscellaneous	13,179,067				13,179,067		13,179,067	9,113,971
Capital Expenses	15,271,100	304,040			15,575,140	(5,971,383)	9,603,757	3,317,319
Regional Water Supply	-				-		-	-
Untied Funding	310,000				310,000		310,000	155,000
TOTAL EXPENSES	44,853,580	589,774	-	-	45,443,354	- 6,491,383	38,951,971	23,599,612
NET OPERATING RESULT SURPLUS/(DEFICIT)	(4,553,442)	-	-	-	(4,553,442)	556,076	(3,997,366)	2,824,005
Add Back:								
Capital Expenses	19,371,168	304,040			19,675,208	(5,971,383)	13,703,825	6,338,711
Less:								
Transfers to & from Reserves	14,383,961	589,774			14,973,735	(5,971,383)	9,002,352	6,751,764
Loan Drawdowns	-	-			-	-	-	-
Advance Repayments	-	-			-	-	-	-
Asset Sales	-	-			-	-	-	10,909
NET OPERATING RESULT FROM CONTINUING OPERATIONS	433,765	(285,734)	-	-	148,031	556,076	704,107	2,400,043
Less:								
Capital Grants	-	-			-	-	-	-
Capital Contributions	3,428,000	-			3,428,000	-	3,428,000	2,571,000
NET OPERATING RESULT BEFORE CAPITAL ITEMS	(2,994,235)	(285,734)	-	-	(3,279,969)	556,076	(2,723,893)	(170,958)

Note

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REVISED BUDGET +/- recommended budget changes this quarter = PROJECTED Budget

Recommended Changes for March

The detail of what recommended changes are requested are included in the Description of Item section in the report

This document forms part of Coffs Harbour City Council's Quarterly Budget Review Statement for the quarter ended 31/03/14 and should be read in conjunction with other documents in the QBRS

COFFS HARBOUR CITY COUNCIL
BUDGET REVIEW FOR THE QUARTER ENDED 31 MARCH 2014
CAPITAL BUDGET - GENERAL FUND

Attachment 4

	ORIGINAL	APPROVED CHANGES			REVISED	RECOMMENDED	PROJECTED	ACTUAL
	Budget	Approved Changes			Budget	Changes	Budget	YTD
	2013/14	Other than by QBRs	Sept Rev	Dec Rev		for March	2013/14	
CAPITAL FUNDING								
Rates and other Untied Funding	8,230,298	2,390,865	41,000	119,945	10,782,108	234,788	11,016,896	5,992,554
Internal Restrictions								
- Airport	2,045,000	571,041	142,838	432,829	3,191,708	(208,419)	2,983,289	2,272,432
- Bldg Maint Resv	-	-	-	-	-	-	-	-
- Non-Domestic Waste Management	100,000	-	-	-	100,000	60,000	160,000	569
- Community Facilities Reserve	400,000	518,574	-	-	918,574	-	918,574	100,585
- Car Parking Upgrade	-	-	1,250,000	-	1,250,000	-	1,250,000	144,636
- Environmental Levy	50,000	73,081	-	-	123,081	-	123,081	25,873
- Future Fund	-	-	-	-	-	-	-	-
- Jetty Maint Reserve	-	-	-	-	-	-	-	-
- Pine Creek Reserve	-	-	-	-	-	-	-	-
- Environmental Laboratory	50,000	-	-	-	50,000	-	50,000	22,642
- Grant in Advance	-	583,272	-	9,520	592,792	6,101	598,893	52,029
- Plant	3,468,250	598,900	-	-	4,067,150	-	4,067,150	1,311,220
- Private Works	-	18,574	-	-	18,574	-	18,574	-
- Land Sale Reserve	-	134,147	-	-	134,147	-	134,147	-
- Open Space Resv	-	265,967	-	-	265,967	-	265,967	220,688
- RFS Reserve	-	-	-	-	-	-	-	-
- ELE Reserve	2,975,000	1,562,000	-	-	1,413,000	-	1,413,000	96,353
- EDP Reserve	-	309,790	-	-	309,790	-	309,790	165,848
External Restrictions								
- Domestic Waste Management	100,000	-	-	-	100,000	5,000	105,000	4,143
- S94	1,859,361	2,847,165	539,000	229,948	5,475,474	(332,197)	5,143,277	1,447,849
- S94 - Inkind	4,500,000	-	-	-	4,500,000	-	4,500,000	4,500,000
- Contribution	78,000	1,508,419	-	101,020	1,687,439	19,392	1,706,831	891,999
- Grant	3,302,947	593,465	460,186	(920,214)	3,436,384	2,922,372	6,358,756	1,141,445
- Sales Income	1,707,350	183,100	-	-	1,890,450	-	1,890,450	-
- Loan	-	17,927,467	27,500	4,800,000	22,754,967	-	22,754,967	10,068,073
New Loans	-	-	-	-	-	-	-	-
Income from Sale of Assets	-	-	-	-	-	-	-	-
TOTAL CAPITAL FUNDING	28,866,206	26,961,827	2,460,524	4,773,048	63,061,605	2,707,037	65,768,642	28,458,938

This document forms part of Coffs Harbour City Council's Quarterly Budget Review Statements for the quarter ended 31/03/14 and should be read in conjunction with other documents in the QBRs

COFFS HARBOUR CITY COUNCIL
BUDGET REVIEW FOR THE QUARTER ENDED 31 MARCH 2014
CAPITAL BUDGET - GENERAL FUND

	ORIGINAL	Approved Changes			REVISED	Recommended Changes for March	PROJECTED	ACTUAL
	Budget 2013/14	Other than by QBRS	Sept Rev	Dec Rev	Budget		Budget 2013/14	YTD
CAPITAL EXPENDITURE								
Loan Repayments (Principal)	3,699,068	-	-	81,151	3,780,219	-	3,780,219	2,594,287
New Assets								
Buildings	-	353,593	-	61,420	415,013	221,400	636,413	295,236
Furniture & Fittings	13,000	-	-	-	13,000	-	13,000	-
Land Improvements	100,000	27,255	-	5,062,745	5,190,000	7,045	5,197,045	4,917,329
Land - Operational	250,000	1,015,326	250,000	9,480	1,524,806	(250,000)	1,274,806	29,675
Community Land	-	-	-	-	-	-	-	-
Bulk Earthworks (non-depreciable)	-	-	-	-	-	-	-	-
Library Books	-	-	-	-	-	-	-	-
Office Equipment	7,400	400,887	-	(8,500)	399,787	-	399,787	125,283
Other Assets	1,189,594	1,118,896	126,663	(599,334)	1,835,819	134,773	1,970,592	593,088
Other Structures	2,056,000	1,340,855	32,500	-	3,429,355	-	3,429,355	448,190
Plant & Equipment	94,330	36,337	150,000	(84,000)	196,667	-	196,667	5,418
Water Supply Network	-	-	-	-	-	-	-	-
Roads, Bridges & Footpaths	5,947,000	2,900,944	1,584,726	364,488	10,797,158	(262,739)	10,534,419	5,801,353
Stormwater Drainage	771,605	9,800,319	-	(29,302)	10,542,622	1,904,432	12,447,054	677,631
Renewals (Replacement)								
Buildings	812,354	135,747	-	(378,000)	570,101	-	570,101	8,037
Furniture & Fittings	4,000	3,403	-	(2,000)	5,403	-	5,403	2,345
Land Improvements	100,000	843,765	-	1,855	945,620	13,947	959,567	735,299
Land - Operational	-	-	-	-	-	-	-	-
Community Land	-	-	-	-	-	-	-	-
Bulk Earthworks (non-depreciable)	-	-	-	-	-	-	-	-
Library Books	-	-	-	-	-	-	-	-
Office Equipment	550,691	625,469	-	(11,000)	1,165,160	-	1,165,160	216,319
Other Assets	650,000	777,565	-	421,589	1,849,154	976,241	2,825,395	433,813
Other Structures	155,000	376,890	-	-	531,890	-	531,890	241,059
Plant & Equipment	6,504,928	782,000	45,505	(621,552)	6,710,881	-	6,710,881	1,389,255
Water Supply Network	-	-	-	-	-	-	-	-
Roads, Bridges & Footpaths	5,961,236	6,422,576	271,130	504,008	13,158,950	(38,062)	13,120,888	9,945,321
Stormwater Drainage	-	-	-	-	-	-	-	-
TOTAL CAPITAL EXPENDITURE	28,866,206	26,961,827	2,460,524	4,773,048	63,061,605	2,707,037	65,768,642	28,458,938

Note

ORIGINAL BUDGET +/- approved budget changes in previous quarters = REVISED Budget

REVISED BUDGET +/- recommended budget changes this quarter = PROJECTED Budget

Recommended Changes for March

The detail of what recommended changes are requested are included in the Description of Item section in the report

This document forms part of Coffs Harbour City Council's Quarterly Budget Review Statements for the quarter ended 31/03/14 and should be read in conjunction with other documents in the QBRS

COFFS HARBOUR CITY COUNCIL
BUDGET REVIEW FOR THE QUARTER ENDED 31 MARCH 2014
CAPITAL BUDGET - WATER FUND

	ORIGINAL	Approved Changes			REVISED	Recommended Changes for March	PROJECTED Budget 2013/14	ACTUAL YTD
	Budget 2013/14	Other than by QBRs	Sept Rev	Dec Rev	Budget			
CAPITAL FUNDING								
Water Fund	7,338,068	-	-	-	7,338,068	-	7,338,068	5,456,288
External Restrictions								
Unexpended Loan	8,445,600	304,040	-	-	8,749,640	(5,400,000)	3,349,640	127,468
S64	3,587,500	-	-	-	3,587,500	(571,383)	3,016,117	754,955
TOTAL CAPITAL FUNDING	19,371,168	304,040	-	-	19,675,208	(5,971,383)	13,703,825	6,338,711

	ORIGINAL	Approved Changes			REVISED	Recommended Changes for March	PROJECTED Budget 2013/14	ACTUAL YTD
	Budget 2013/14	Other than by QBRs	Sept Rev	Dec Rev	Budget			
CAPITAL EXPENDITURE								
Loan Repayments (Principal)	7,030,201	-	-	-	7,030,201	-	7,030,201	5,222,773
New Assets								
Office Equipment	-	-	-	-	-	-	-	-
Water Supply Network	10,843,100	199,923	-	-	11,043,023	(5,972,500)	5,070,523	422,213
Plant & Equipment	70,000	-	-	-	70,000	-	70,000	74,707
Other Assets	-	-	-	-	-	-	-	-
Renewals (Replacement)								
Office Equipment	7,867	-	-	-	7,867	-	7,867	196
Water Supply Network	1,420,000	104,117	-	-	1,524,117	1,117	1,525,234	618,822
Plant & Equipment	-	-	-	-	-	-	-	-
Other Assets	-	-	-	-	-	-	-	-
TOTAL CAPITAL EXPENDITURE	19,371,168	304,040	-	-	19,675,208	(5,971,383)	13,703,825	6,338,711

Note

ORIGINAL BUDGET +/- approved budget changes in previous quarters = REVISED Budget

REVISED BUDGET +/- recommended budget changes this quarter = PROJECTED Budget

Recommended Changes for March

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COFFS HARBOUR CITY COUNCIL
BUDGET REVIEW FOR THE QUARTER ENDED 31 MARCH 2014
CAPITAL BUDGET - SEWER FUND

	ORIGINAL	Approved Changes			REVISED	Recommended Changes for March	PROJECTED Budget 2013/14	ACTUAL YTD
	Budget				Budget			
	2013/14	Other than by QBRS	Sept Rev	Dec Rev				
CAPITAL FUNDING								
Sewer Fund	8,078,440	-	-	-	8,078,440	-	8,078,440	5,994,422
External Restrictions								
Unexpended Loan	11,441,995	11,316,825	-	-	22,758,820	(305,000)	22,453,820	6,464,968
S64	5,645,600	-	-	-	5,645,600	(3,411,600)	2,234,000	395,097
Grant	1,134,948	-	-	-	1,134,948	-	1,134,948	-
TOTAL CAPITAL FUNDING	26,300,983	11,316,825	-	-	37,617,808	(3,716,600)	33,901,208	12,854,487

	ORIGINAL	Approved Changes			REVISED	Recommended Changes for March	PROJECTED Budget 2013/14	ACTUAL YTD
	Budget				Budget			
	2013/14	Other than by QBRS	Sept Rev	Dec Rev				
CAPITAL EXPENDITURE								
Loan Repayments (Principal)	8,068,440	-	-	-	8,068,440	-	8,068,440	5,994,253
New Assets								
Office Equipment	20,000	20,000	-	-	40,000	-	40,000	-
Sewer Network	14,738,543	11,096,825	-	-	25,835,368	(1,716,600)	24,118,768	5,525,459
Plant & Equipment	110,000	-	-	-	110,000	-	110,000	436,348
Renewals (Replacement)								
Office Equipment	10,000	-	-	-	10,000	-	10,000	169
Sewer Network	3,354,000	200,000	-	-	3,554,000	(2,000,000)	1,554,000	898,258
Plant & Equipment	-	-	-	-	-	-	-	-
TOTAL CAPITAL EXPENDITURE	26,300,983	11,316,825	-	-	37,617,808	(3,716,600)	33,901,208	12,854,487

Note
ORIGINAL BUDGET +/- approved budget changes in previous quarters = REVISED Budget
REVISED BUDGET +/- recommended budget changes this quarter = PROJECTED Budget

Recommended Changes for March

The detail of what recommended changes are requested are included in the Description of Item section in the report

COFFS HARBOUR CITY COUNCIL

Attachment 5

BUDGET REVIEW FOR THE QUARTER ENDED 31 MARCH 2014

CASH AND INVESTMENTS

Reserve Type	Opening	Add / (Subtract)	Approved Changes			Add	REVISED	Recommended	PROJECTED	YTD
	Balance	ORIGINAL				Interest	Balance	Budget Transfers	Closing	
	1/07/2013	Budget Transfers	Other than by QBRs	Sept Rev	Dec Rev	Apportioned	for March	Balance	Actual	
Total Cash and Investments	171,504,000	-	-	-	-	-	171,504,000	-	171,816,000	175,007,014
attributable to:										
External Restrictions (see below)	110,592,000	(8,669,493)	(30,341,531)	(587,000)	(183,963)	563,930	71,373,943	292,184	71,666,127	96,498,528
Internal Restrictions (see below)	51,401,977	(3,769,223)	(21,321,052)	(506,215)	(140,053)	774,343	26,505,811	(549,867)	25,955,944	39,450,582
Unrestricted	9,510,023	12,438,716	51,662,583	1,093,215	324,016	(1,338,273)	73,624,246	257,683	74,193,929	39,057,904
	171,504,000	-	-	-	-	-	171,504,000	-	171,816,000	175,007,014
External Restrictions										
General:										
Developer Contributions	13,757,000	(1,629,721)	(2,734,165)	(587,000)	(98,963)		8,707,151	306,765	9,013,916	1,678,585
Domestic Waste	527,000	371,303	-	-	(85,000)	2,591	815,894	(14,581)	801,313	332,505
Stormwater Management Levy	-	-	-	-	-	-	-	-	-	-
Other	32,000	-	-	-	-	-	32,000	-	32,000	-
Water:										
Unexpended Loans	23,990,000	(1,771,075)	(3,925,152)	-	-	-	18,293,773	-	18,293,773	23,989,797
Unexpended Grants	-	-	-	-	-	-	-	-	-	-
Developer Contributions	67,000	-	-	-	-	-	67,000	-	67,000	1,506,145
Water Supplies (Revenue)	12,164,000	-	(679,019)	-	-	189,823	11,674,804	-	11,674,804	10,149,306
Sewer:										
Unexpended Loans	37,588,000	(5,640,000)	(22,353,195)	-	-	-	9,594,805	-	9,594,805	37,517,995
Unexpended Grants	-	-	-	-	-	-	-	-	-	-
Developer Contributions	61,000	-	-	-	-	-	61,000	-	61,000	1,471,382
Sewer Services (Revenue)	22,406,000	-	(650,000)	-	-	371,516	22,127,516	-	22,127,516	19,852,813
Total External Restrictions	110,592,000	(8,669,493)	(30,341,531)	(587,000)	(183,963)	563,930	71,373,943	292,184	71,666,127	96,498,528
Internal Restrictions										
Airport	5,747,000	(266,632)	(652,820)	357,137	(369,194)	47,409	4,862,900	(4,799,981)	62,919	68,871
Asset Replacement & Maintenance	400,000	66,274	-	(129,017)	-	6,980	344,237	(295,132)	49,105	320,762
CBD Masterplan	-	1,433,640	-	-	-	-	1,433,640	-	1,433,640	-
Community Facilities	977,000	(204,301)	(518,574)	-	-	21,982	276,107	-	276,107	1,345,820
EDP Equipment	149,000	-	(309,790)	-	273,910	1,401	114,521	-	114,521	(15,710)
Technology Group	183,000	333,248	-	-	-	-3,331	512,917	-	512,917	73,360
Unexpended Contributions	2,811,000	-	-	-	-	-	2,811,000	-	2,811,000	586,794
Historical Jetty R & M	218,000	-	-	-	-	4,160	222,160	-	222,160	222,442
Future Fund	962,000	328,713	-	-	-	20,467	1,311,180	8,810	1,319,990	1,235,343
Business Development	1,212,000	36,000	(80,842)	-	(141,040)	21,565	1,047,683	13,429	1,061,112	1,089,569
Project Contingency	1,074,000	-	-	-	-	20,480	1,094,480	-	1,094,480	1,095,009
Private Works - General Fund Reserve	1,077,000	72,000	(18,574)	-	-	20,996	1,151,422	52,857	1,204,279	1,172,668
Non Domestic Waste	1,349,000	(124,560)	(58,151)	-	(400,000)	32,981	799,270	66,079	865,349	2,238,402
Employees Leave Entitlement	3,790,000	(4,260,124)	1,562,000	(300,000)	(31,555)	83,020	843,341	(400,000)	443,341	3,758,347
Revenue Revotes	4,489,000	-	(4,489,185)	-	(273,910)	-	(274,095)	-	(274,095)	-
Unexpended Grants	2,069,977	-	-	-	-	-	2,069,977	-	2,069,977	732,782
Open Space Land	460,000	-	(265,967)	-	-	8,422	202,455	-	202,455	80,572
Lab Equipment Replacement	643,000	264,526	-	-	-	13,175	920,701	(130,100)	790,601	747,248
Rural Fire Service	15,000	-	-	-	-	299	15,299	-	15,299	15,967
Plant Replacement	6,146,000	(1,172,929)	(657,985)	843,165	-	128,854	5,287,105	-	5,287,105	7,265,311
Environmental Levy	380,000	(181,537)	(269,550)	-	-	5,053	-	-	-	253,658
RTA Pine Creek Handover (Capital)	565,000	(33,000)	-	-	-	60,234	592,234	-	592,234	625,167
RTA - SH10 Garden Works	151,000	(60,541)	-	-	-	2,649	93,108	-	93,108	126,088
Moonee Beach Rd Upgrade	177,000	-	(134,147)	-	-	3,372	46,225	-	46,225	180,267
Unexpended Loan Funds	10,584,000	-	(15,427,467)	(27,500)	801,736	-	(4,069,231)	4,934,171	864,940	10,218,737
Car Parking Upgrade	2,328,000	-	-	(1,250,000)	-	42,812	1,120,812	-	1,120,812	2,245,976
Future Road Network	1,241,000	-	-	-	-	24,418	1,265,418	-	1,265,418	1,355,694
Flood Mitigation Works	2,204,000	-	-	-	-	206,945	2,410,945	-	2,410,945	2,411,438
	51,401,977	(3,769,223)	(21,321,052)	(506,215)	(140,053)	774,343	26,505,811	(549,867)	25,955,944	39,450,582

Investments

Per Council's monthly Bank Balances and Investments report the RAO provides a statement that Council's investments have been made in accordance with the Local Government Act 1993, Regulations and Council's investment policy

Reconciliation

Per Council's monthly Bank Balances and Investments report the total Cash and investments have been reconciled with funds invested and cash at bank

Cash

The last bank reconciliation was to the period ended 31/3/14 and was completed 30/4/14

Note

Opening Balances for Unexpended grants, Unexpended loans and unexpended contributions were extracted from Closing Balance at 30/6/13 per Note 6(c) of financial statements

COFFS HARBOUR CITY COUNCIL
BUDGET REVIEW FOR THE QUARTER ENDED 31 MARCH 2014
KEY PERFORMANCE INDICATORS STATEMENT

Attachment 6

RATIO	CALCULATION	WHAT IS BEING MEASURED	FIGURE	SUSTAINABLE TARGET
Sources of Revenue Ratio (Consolidated)	Own source revenue (all income excluding grants and contributions) divided by total income from continuing operations	Council's reliance on funding from sources other than grants and contributions. The greater the reliance on own source revenue the more control council has over its income stream	76.77%	> 65%
Rates and Annual Charges Coverage Ratio (Consolidated)	Rates and annual charges outstanding divided by income from continuing operations	The degree of dependence upon revenues from rates and annual charges and to assess the security of Council's income	50.19%	55% to 75%
Asset Sustainability Ratio (Consolidated)	Capital amounts spent on rehabilitation and replacement of existing assets divided by the level proposed in the infrastructure and asset management plan	The extent to which assets are being replaced at the rate they are wearing out	51.98%	90% to 110%
Debt Service Ratio (Consolidated)	Debt service cost divided by income from continuing operations excluding capital items and specific purpose grants and contributions	The impact of loan principal and interest repayments on the discretionary revenue of council	28.10%	< 10% Sustainable 10% to 15% Satisfactory > 15% Unsustainable
Rates and Annual Charges Outstanding (Consolidated)	Rates and annual charges outstanding divided by rates and annual charges collectable	The impact of uncollected rates and annual charges on liquidity and the adequacy of recovery efforts	7.16%	7%



This document forms part of Coffs Harbour City Council's Quarterly Budget Review Statement for the quarter ended 31/03/14 and should be read in conjunction with other documents in the QBRs

**COFFS HARBOUR CITY COUNCIL
BUDGET REVIEW FOR THE QUARTER ENDED 31 MARCH 2014
PART A - CONTRACTS LISTING**

Attachment 7

CONTRACTOR	CONTRACT DETAIL & PURPOSE	CONTRACT VALUE (Ex GST)	COMMENCEMENT DATE	COMPLETION DATE	BUDGETED (Y/N)
BMT WBM Pty Ltd	Woolgoolga Floodplain Risk Management Study & Plan	74,935	8/01/2014	7/07/2015	Y
NSW Boral Ashphalt	Mill & Replace Ashphalt at Harbour Drive, Coffs Harbour	112,000	26/02/2014	25/03/2014	Y
Commercial Projects Group Pty Ltd	Management of Construction Castle Street Car Park Lifts & Roof	95,000	6/01/2014	25/05/2014	Y
Coffs Coast Under Road Boring	Underbore of Diamond Head Drive, Sandy Beach	189,116	14/02/2014	17/04/2014	Y
Telstra Corporation	Cook Drive Intersection Upgrade - Telstra Infrastructure Relocations	258,081	10/03/2014	4/05/2014	Y

Notes

1. Minimum reporting level is 1% of estimated income from continuing operations or \$50,000 whichever is the lesser
2. Contracts to be listed are those entered into during the quarter and have yet to be fully performed, excluding contractors that are on Council's preferred supplier list
3. Contracts for employment are not required to be included

COFFS HARBOUR CITY COUNCIL
BUDGET REVIEW FOR THE QUARTER ENDED 31 MARCH 2014
PART B - CONSULTANCY AND LEGAL EXPENSES

Attachment 8

EXPENSE	EXPENDITURE YTD	BUDGETED (Y/N)
Consultancies	810,929	Y
Legal Fees	521,940	Y



Definition of Consultant

A consultant is a person or organisation engaged under contract on a temporary basis to provide recommendations or high level specialist or professional advice to assist decision making by management. Generally it is the advisory nature of the work that differentiates a consultant from other contractors.

This document forms part of Coffs Harbour City Council's Quarterly Budget Review Statement for the quarter ended 31/03/14 and should be read in conjunction with the other documents in the QBRS

BANK BALANCES AND INVESTMENT FOR MARCH 2014

Purpose:

To list Council's Bank Balances and Investments as at 31 March 2014.

Description of Item:

A copy of the state of Bank Balances and Investments as at 31 March 2014 is attached.

It should be noted that Council is required to account for investments in accordance with the Australian International Financial Reporting Standards. Term deposits are shown at face value and all other investment balances at the end of each month reflect market value movements which would be inclusive of accrued interest.

Interest when paid, say quarterly, would result in reductions in the market value of the investments.

The Investment Report reflects the above requirements and reflects the interest earned (or accrued) on each investment, based on the acquisition price.

Reports written by CPG Research & Advisory Pty Ltd (Council's investment portfolio advisors), which examine economic and financial markets data for March 2014 and review the performance of Councils investment portfolio for the month ended 31 March 2014, are available in the Councilors' Resource Centre.

Sustainability Assessment:

- **Environment**

There are no perceived current or future environmental impacts.

- **Social**

There are no perceived current or future social impacts.

- **Civic Leadership**

Council invests surplus funds to maximise investment income and preserve capital to assist with funding requirements for projects listed under the Coffs Harbour 2030 Community Strategic Plan.

- **Economic**

Broader Economic Implications

Council's investments are held according to the requirements stated within Council's investments policy and the returns are acceptable in relation thereto. In the long term earnings from investments can vary due to economic conditions and financial markets. Council constructs its investment portfolio with consideration of current conditions and to comply with the Office of Local Government (OLG) investment policy guidelines.

Delivery Program/Operational Plan Implications

For March 2014 it is noted that after deducting, from the total bank and investment balances of \$153,190,614 the estimated restricted General, Trust, Water and Sewerage cash and investments (\$153,085,734) the Unrestricted Cash is \$104,880.

Risk Analysis:

The likelihood of risks associated with New South Wales Local Government's investing funds is now remote due to the conservative nature of investments permitted under statutory requirements. The risks of capital not being returned in relation to each individual investment Council owns is indicated in the attachment.

The main risks for Council's investment portfolio are liquidity and credit risk, both of which are being managed under the advice of CPG Research & Advisory Pty Ltd. Liquidity risk is the risk that the investor is unable to redeem the investment at a fair price within a timely period and thereby incurs additional costs (or in the worst case is unable to execute its spending plans). Credit risk is the risk of loss of principal stemming from a financial institutions failure to repay that principal when that principal is due. Investors are compensated for assuming credit risk by way of interest payments from the financial institutions issuing the investment security.

Credit risk is rated by various rating agencies. Investment securities in Council's current portfolio are rated by either Standard and Poors or Fitch, with the majority of the portfolio rated by Standard and Poors. Standard and Poors credit ratings and an explanation of their ratings are as follows:

Rating	Ratings Explanation
AAA	Extremely strong capacity to meet financial commitments. Highest Rating.
AA	Very strong capacity to meet financial commitments.
A	Strong capacity to meet financial commitments, but somewhat susceptible to adverse economic conditions and changes in circumstances.
BBB	Adequate capacity to meet financial commitments, but more subject to adverse economic conditions.
BBB	Considered lowest investment grade by market participants.
BB+	Considered highest speculative grade by market participants.
BB	Less vulnerable in the near term but faces major ongoing uncertainties to adverse business, financial and economic conditions.
B	More vulnerable to adverse business, financial and economic conditions but currently has the capacity to meet financial commitments.
CCC	Currently vulnerable and dependent on favorable business, financial and economic conditions to meet financial commitments.
CC	Currently highly vulnerable.
C	Currently highly vulnerable obligations and other defined circumstances.
D	Payment default on financial commitments.

Ratings from 'AA' to 'CCC' may be modified by the addition of a plus (+) or minus (-) sign to show relative standing within the major rating categories.

Types of investment securities by credit risk ranking from highest to lowest are as follows:

- Deposits/Covered Bonds – these share first ranking
- Senior debt – Floating Rate Notes/Fixed Coupon Bonds.
- Subordinated debt
- Hybrids
- Preference shares
- Equity shares (common shares)

Subordinated debt, hybrids, preference and equity shares are not a permitted investment under the current Ministerial Order. Term deposits of \$250,000 or less per financial institution are covered under the Commonwealth Government Deposit Guarantee Scheme and therefore by default have the same credit rating as the Commonwealth Government i.e. AAA.

All credit unions, building societies and mutual banks are Authorised Deposit-taking Institutions (ADI's) and are regulated in the same way as all other Australian banks. ADI's are regulated by the Australian Securities and Investment Committee (ASIC) under the Corporations Act 2001, and by the Australian Prudential Regulatory Authority (APRA) under the Banking Act 1959.

Consultation:

Council's investment advisors, CPG Research & Advisory Pty Ltd have been consulted in the preparation of this report.

Related Policy and / or Precedents:

Council funds have been invested in accordance with Council's *Investment Policy* (POL-049), which was adopted on 22 August 2013.

Statutory Requirements:

Local Government Act 1993 – Section 625
Local Government Act 1993 – Investment Order (dated 12 January 2011).
Local Government General Regulation 2005
The Trustee Amendment (Discretionary Investments) Act 1997 – Sections 14A(2), 14C(1) and 14C(2).

Issues:

Nil.

Implementation Date / Priority:

Nil.

Further details are provided as a note on the attachment.


Recommendation:

1. That the bank balances and investments totaling (from loans, Section 94 and other avenues that form the restricted accounts and are committed for future works) one hundred and fifty three million, one hundred and ninety thousand, and six hundred and fourteen dollars (\$153,190,614) as at 31 March 2014 be noted.
2. That the general fund unrestricted cash and investments totaling one hundred and four thousand, eight hundred and eighty dollars (\$104,880) as at 31 March 2014 be noted.

BANK BALANCES AND INVESTMENTS AS AT 31 MARCH 2014

Attachment

	Credit Rating at 31/3/14	Legal Maturity	Acquisition Price \$	Market Value as at 1/3/14 \$	Market Value as at 31/3/14 \$	Income Earned (net of fees) Financial Yr to Date \$	Annualised Monthly Return (Managed Funds) / Current Coupon	Risk of capital not being returned
OVERNIGHT FUNDS:								
Cash - Fair Value movements through profit & loss								
NAB - Bank Accounts	AA-			3,295,747	2,820,225	66,986	2.31	Low
UBS Cash Management Trust	AAA			735,692	908,781	21,077	1.58	Low
Members Equity Bank - Business Investment Account	BBB+			72	72	2	3.25	Low
NAB Professional Funds Account	AA-			9,741,409	3,777,304	85,939	2.90	Low
Delphi Bank - Cash M'ment Acc't	A-			69,838	76,686	524	2.50	Low
Rabo Bank - Premium Cash Manage	AA			6,423	6,423	63	0.00	Low
Suncorp Business Saver	A+			192,223	192,671	3,350	3.25	Low
ANZ Negotiator Saver - Trust A/c	AA-			132,651	132,976	1,724	3.20	Low
Credit Union Australia Prime Access	BBB+			82	82	-	0.01	Low
Total				14,174,135	7,915,221	179,665		
BENCHMARK RATE - 11 AM INDICATIVE CASH RATE							2.50	
BENCHMARK RATE - UBS BANK BILL INDEX							2.60	
Term Deposits - Fair Value movements through profit & loss								
Investec 17/11/14	BBB-	17/11/2014	8,000,000	8,000,000	8,000,000	452,213	7.53	Low
Investec 29/6/16	BBB-	29/06/2016	1,000,000	1,000,000	1,000,000	56,076	7.47	Low
Investec 8/7/15	BBB-	8/07/2015	1,000,000	1,000,000	1,000,000	54,124	7.21	Low
Investec 8/8/16	BBB-	8/08/2016	2,500,000	2,500,000	2,500,000	125,552	6.69	Low
Investec 6/6/17	BBB-	6/06/2017	2,000,000	2,000,000	2,000,000	81,675	5.44	Low
Investec 14/8/15	BBB-	14/08/2015	1,800,000	1,800,000	1,800,000	86,884	6.43	Low
AMP 24/5/16	A+	24/05/2016	5,000,000	5,000,000	5,000,000	275,877	7.35	Low
Arab Bank 7/5/18	BBB-	7/05/2018	1,500,000	1,500,000	1,500,000	52,923	4.70	Low
Arab Bank 14/5/14	BBB-	14/05/2014	1,000,000	1,000,000	1,000,000	14,367	3.80	Low
Arab Bank 10/9/15	BBB-	10/09/2015	2,000,000	2,000,000	2,000,000	47,041	4.25	Low
Westpac 27/6/14	AA-	27/06/2014	1,000,000	1,000,000	1,000,000	48,795	6.50	Low
Westpac 6/5/14	AA-	6/05/2014	4,000,000	4,000,000	4,000,000	126,115	4.20	Low
NAB 9/3/15	AA-	9/03/2015	2,000,000	2,000,000	2,000,000	67,111	4.47	Low
NAB 12/3/15	AA-	12/03/2015	2,500,000	2,500,000	2,500,000	84,640	4.51	Low
NAB 4/3/16	AA-	4/03/2016	2,000,000	-	2,000,000	6,036	4.08	Low
Delphi Bank 29/1/15*	A-	29/01/2015	2,000,000	2,000,000	2,000,000	65,910	4.39	Low
Delphi Bank 5/8/15*	A-	5/08/2015	2,000,000	2,000,000	2,000,000	100,592	6.70	Low
Credit Union Australia 11/4/14	BBB+	11/04/2014	1,000,000	1,000,000	1,000,000	51,197	6.82	Low
Credit Union Australia 12/5/14	BBB+	12/05/2014	2,000,000	2,000,000	2,000,000	101,493	6.76	Low
Credit Union Australia 9/5/14	BBB+	9/05/2014	500,000	500,000	500,000	22,333	5.95	Low
Suncorp 11/8/14	A+	11/08/2014	3,000,000	3,000,000	3,000,000	141,879	6.30	Low
Bank of Queensland 4/9/17	A-	4/09/2017	2,000,000	2,000,000	2,000,000	84,827	5.65	Low
Bank of Queensland 5/2/18	A-	5/02/2018	3,000,000	3,000,000	3,000,000	115,981	5.15	Low
Bank of Queensland 5/3/18	A-	5/03/2018	2,000,000	2,000,000	2,000,000	76,570	5.10	Low
Bank of Queensland 17/5/17	A-	17/05/2017	1,000,000	1,000,000	1,000,000	34,907	4.65	Low
Bank of Queensland 20/2/18	A-	20/02/2018	1,000,000	1,000,000	1,000,000	4,893	4.70	Low
Rabo Direct 24/3/16	AA	24/03/2016	5,000,000	5,000,000	5,000,000	268,370	7.15	Low
Rabo Direct 10/8/15	AA	10/08/2015	1,000,000	1,000,000	1,000,000	50,296	6.70	Low
Rabo Direct 13/4/15	AA	13/04/2015	1,000,000	1,000,000	1,000,000	33,781	4.50	Low
ING 17/8/17	A-	17/08/2017	2,000,000	2,000,000	2,000,000	90,232	6.01	Low
ING 6/9/17	A-	6/09/2017	2,000,000	2,000,000	2,000,000	84,077	5.60	Low
ING 7/5/18	A-	7/05/2018	1,500,000	1,500,000	1,500,000	52,473	4.66	Low
ING 20/8/14	A-	20/08/2014	1,000,000	1,000,000	1,000,000	3,956	3.80	Low
ING 26/11/14	A-	26/11/2014	2,000,000	2,000,000	2,000,000	6,925	3.83	Low
ING 2/3/18	A-	2/03/2018	2,000,000	-	2,000,000	6,981	4.55	Low
Wide Bay 29/7/16	BBB	29/07/2016	1,000,000	1,000,000	1,000,000	53,299	7.10	Low
Wide Bay 8/8/16	BBB	8/08/2016	1,000,000	1,000,000	1,000,000	53,299	7.10	Low
ME Bank 15/5/14	BBB+	15/05/2014	2,000,000	2,000,000	2,000,000	63,808	4.25	Low
ME Bank 2/6/14	BBB+	2/06/2014	2,000,000	2,000,000	2,000,000	63,058	4.20	Low
ME Bank 18/2/19	BBB+	18/02/2019	3,000,000	3,000,000	3,000,000	17,018	5.05	Low
Police Credit Union 26/2/15	NR	26/02/2015	1,000,000	1,000,000	1,000,000	34,757	4.63	Low
Police Credit Union 17/5/16	NR	17/05/2016	500,000	500,000	500,000	16,928	4.51	Low
Police Credit Union 1/3/19	NR	1/03/2019	1,000,000	-	1,000,000	3,874	5.05	Low
Bendigo & Adelaide Bank	A-	16/04/2014	2,800,000	2,800,000	2,800,000	90,382	4.30	Low
Bank of Sydney 12/5/14	NR	12/05/2014	1,000,000	1,000,000	1,000,000	15,233	4.00	Low
Bank of Sydney 4/3/15	NR	4/03/2016	1,000,000	-	1,000,000	2,885	3.90	Low
Bank of Sydney 14/4/14 - RPT	NR	14/04/2014	1,220,000	1,220,000	1,220,000	10,037	3.90	Low
CBA 16/5/16	AA-	16/05/2016	1,000,000	1,000,000	1,000,000	33,781	4.50	Low
CBA 17/5/16	AA-	17/05/2016	1,000,000	1,000,000	1,000,000	33,781	4.50	Low
CBA 23/5/16	AA-	23/05/2016	1,000,000	1,000,000	1,000,000	34,156	4.55	Low
CBA 30/5/16	AA-	30/05/2016	1,000,000	1,000,000	1,000,000	34,156	4.55	Low
CBA 6/6/16	AA-	6/06/2016	1,000,000	1,000,000	1,000,000	34,156	4.55	Low
CBA 29/10/17	AA-	29/10/2017	2,511,423	2,779,070	2,511,423	61,969	3.03	Low
Total			99,331,423	93,599,070	99,331,423	3,633,678		

	Credit Rating at 31/3/14	Legal Maturity	Acquisition Price \$	Market Value as at 1/3/14 \$	Market Value as at 31/3/14 \$	Income Earned (net of fees) Financial Yr to Date \$	Annualised Monthly Return (Managed Funds) Current Coupon	Risk of capital not being returned
Floating Rate Notes:								
<i>Fair Value through Profit & Loss Accounting - movements through profits & loss.</i>								
Bank of Queensland 7/12/15	A-	7/12/2015	4,034,450	5,114,650	4,069,760	187,617	4.29	Low
Bank of Queensland 30/5/16	A-	30/05/2016	3,000,000	3,024,210	3,043,920	123,121	3.98	Low
CBA	AA-	24/12/2015	8,310,300	8,337,724	8,380,938	450,127	3.70	Low
Macquarie Bank 9/3/17	A	9/03/2017	5,000,000	5,269,415	5,262,335	213,566	5.56	Low
Arab	BBB-	12/12/2014	5,000,000	5,019,330	5,020,275	169,598	4.16	Low
Bendigo Bank	A-	14/11/2018	1,000,000	-	1,009,290	(6,180)	3.91	Low
ME Bank	BBB+	28/11/2016	500,000	500,025	501,630	6,499	3.88	Low
Credit Union Australia	BBB+	20/03/2017	500,000	-	500,610	610	3.96	Low
Total			27,344,750	27,265,354	27,788,758	1,144,957		
Capital Protected Notes								
<i>Fair Value through Profit & Loss Accounting - movements through profits & loss.</i>								
Lehman #	D	15/06/2009	300,000	-	-	-	0.00	High
Lehman #^	D	15/06/2009	500,000	-	-	-	0.00	High
Total			800,000	-	-	-		
Floating Rate Term Deposits:								
Bank of Queensland	A-	26/02/2016	1,500,000	1,500,000	1,500,000	46,561	4.14	Low
ING	A	27/02/2015	2,000,000	2,000,000	2,000,000	62,007	4.13	Low
Total			3,500,000	3,500,000	3,500,000	108,568		
Fixed Coupon Bonds								
Heritage Bank	BBB+	20/06/2017	9,395,544	9,693,275	9,603,105	539,012	7.25	Low
CBA	AA-	7/11/2018	1,000,490	1,018,710	1,017,880	36,053	4.50	Low
Total			10,396,034	10,711,985	10,620,985	575,065		
Covered Bonds								
ANZ	AAA	16/08/2023	995,350	1,001,900	1,005,550	20,789	5.00	Low
NAB	AA-	11/03/2024	994,560	-	998,816	4,256	5.00	Low
Total			1,989,910	1,001,900	2,004,366	25,045		
Floating Rate Transferrable Certificate of Deposit								
Greater Building Society	BBB	15/04/2016	2,000,000	2,021,340	2,029,860	93,240	4.15	Low
Total			2,000,000	2,021,340	2,029,860	93,240		
Other:								
Southern Phone Company Shares	N/A	N/A	2	2	2	-	N/A	Low
			2	2	2	-		
Securities No Longer Held (excluding Managed Funds).								
Accumulated at February 2014			-	-	-	476,720		
AMP	A+	10/03/2014	2,000,000	2,000,000	-	60,304	4.35	Low
Delphi Bank*	A-	7/03/2014	1,500,000	1,500,000	-	72,432	7.05	Low
Beyond Bank	BBB+	31/03/2014	1,000,000	1,000,000	-	2,871	3.38	Low
Total			4,500,000	4,500,000	-	612,327		
GRAND TOTAL (before fees)				156,773,786	153,190,614	6,372,545		
Less Portfolio Fees (Advice & Salary)						(124,584)		
GRAND TOTAL				156,773,786	153,190,614	6,247,961		
# Capital Guaranteed at maturity								
^ Ex Infrastructure IMP								
* Rated by Fitch								
The dates quoted alongside the name of the product for FRN's and Fixed Bonds are first call dates.								
First call dates for FRN's & fixed bonds are the likely date of maturity because the investment issuer is severely penalised if monies are not redeemed by that date, via damage in the market to their reputation, increased coupon rates and additional capital requirements by APRA.								
Term deposits of \$250,000 or less per financial institution are covered under the Commonwealth Government Deposit Guarantee Scheme & therefore by default have the same credit rating as the Commonwealth Government i.e. AAA.								
Less Unrealised Capital Gains/(Loss) for Available For Sale Investments						\$ 4,700		
Income to Profit & Loss						\$ 6,243,261		
TOTAL CASH & INVESTMENTS AS AT 31 MARCH 2014						\$ 153,190,614		
LESS ESTIMATED RESTRICTED EQUITY FOR WATER & SEWER FUNDS								
					\$ 32,936,038			
					\$ 54,775,963		\$ 87,712,001	
GENERAL FUND CASH & INVESTMENTS						\$ 65,478,613		
LESS TRUST FUND BALANCES AS AT 31 MARCH 2014						\$ 1,467,076		
LESS ESTIMATED RESTRICTED EQUITY FOR GENERAL FUND (\$94 contributions, grants, reserves).						\$ 63,906,658		
ESTIMATED GENERAL FUND UNRESTRICTED CASH & INVESTMENTS AS AT 30 JUNE 2014								
					\$ 137,480			
					\$ (32,600)			
ESTIMATED GENERAL FUND UNRESTRICTED CASH & INVESTMENTS AS AT 30 JUNE 2014						\$ 104,880		
I hereby certify that Council's investments have been made in accordance with the Local Government Act 1993, Regulations and Council's Investment Policy.								
								
Responsible Accounting Officer.								

EASTERN DORRIGO SHOWGROUND AND COMMUNITY HALL MANAGEMENT COMMITTEE MEMBERSHIP

Purpose:

To recommend to Council appointment of a community member to the Eastern Dorrigo Showground and Community Hall Management Committee.

Description of Item:

This report seeks approval from Council for appointment to the Eastern Dorrigo Showground and Community Hall Management Committee.

Sustainability Assessment:

- **Environment**

There are no environmental issues associated with this report.

- **Social**

The valuable contribution made by community members in the various roles of management and advisory committees adds to the significant social capital and sense of connectedness, while also providing a service Council would otherwise be unable to provide.

- **Civic Leadership**

This approach is addressed in Coffs Harbour 2030 through:

LC1 We are healthy and strong

LC1.3 We live in a safe, caring and inclusive community

LC1.3.2 Build community structures based on the values of care, inclusion and connectedness

LC1.3.3 Promote the importance of being part of a community

- **Economic**

Broader Economic Implications

There are no economic implications of the recommendations in this report.

Delivery Program/Operational Plan Implications

There are no delivery program or operational plan implications of the recommendations in this report.

Risk Analysis:

A risk analysis is not applicable in this instance

Consultation:

Consultation has been undertaken with the existing members of the relevant committee.

Related Policy and / or Precedents:

This process is in line with precedents set in the past.

Statutory Requirements:

This addresses requirements under the Local Government Act.

Issues:

The following community members have expressed interest in participating on the below committee. The nominations have been approved for recommendation to Council at the relevant committee meeting:

- Eastern Dorrigo Showground and Community Hall Management Committee.
Ms Cornelia Mundkowski
Ms Cherie Hay

Implementation Date / Priority:

The relevant committee and prospective members will be notified immediately following Council's decision.

Recommendation:

That Ms Cornelia Mundkowski and Ms Cherie Hay be appointed to the Eastern Dorrigo Showground and Community Hall Management Committee.

CONTRACT RFT-624-TO - SUPPLY AND DELIVERY OF SEALING AGGREGATES 2014-2016

Purpose:

To report to Council on tenders received for Contract RFT-624-TO Supply and Delivery of Sealing Aggregates 2014-2016 and seek approval to accept a tender.

Description of Item:

Open tenders where invited for suitably qualified and experienced organisations for the supply, or supply and delivery of sealing aggregates for a period of twenty four months. Tenders closed on 18 February 2014.

Tenders were evaluated on the following criteria:

- The Tenderer's financial capability and Tender conformity. These criteria were hurdles and are not scored. Only conforming Tenders and Tenderers with adequate financial resources can be considered further.
- Tender Price
 - Contract Supply rates
 - Contract Delivery rates
- Work, Health and Safety Management Systems.
- BNG Conserve™ registration.
- Contractors available resources and performance capabilities

Five tenders received as follows:

1. Coastal Homesites Pty Ltd, Woolgoolga.
2. Espedan Pty Ltd, Central Bucca.
3. Holcim Australia Pty Ltd, North Boambee.
4. McLennan Earthmoving Pty Limited, South Grafton.
5. Sheridans Hard Rock Quarry Pty Ltd, Hernani.

Of the five tenders received three did not include sufficient information in the returnable documents to determine the pricing of their offer and are considered to be nonconforming tenders.

Sustainability Assessment:

- **Environment**

All quarries are licensed and are required to operate in accordance with the NSW Department of Mineral Resources operational and environmental guidelines. Consequently quarries are inspected and environmental performance monitored for adherence to license conditions.

- **Social**

Sealing Aggregates supplied under this contract are used to complete Council's annual asset renewal and maintenance programs for sealed roads. These assets provide the community with infrastructure necessary to service the Coffs Harbour community.

- **Economic**

Council, being responsible for civil infrastructure, has an ongoing demand for materials to maintain civil assets. The best value for money materials are procured via the open tender process where offers are assessed against both price and non-price criteria. This tender is as an opportunity for suppliers to provide competitive rates to Council.

- **Civic Leadership**

Council in its civic leadership role must display probity and transparency in the decision making process. The tender process ensures a transparent procurement process and is a mechanism to control the quality and supply of product. The production of sealing aggregates demands the highest quality outputs from suppliers.

Broader Economic Implications:

Delivery Program / Operational Plan Implications

The funds for supply of sealing aggregates are available in the annual Works Program.

Risk Analysis:

The lack of supply of suitable sealing aggregates is a major risk to Council in regards to the quality of bitumen seals, reputation, financial and environmental risks. The selection of a single supplier for sealing aggregates diminishes the risk by reducing the likelihood of non-conforming materials.

Consultation:

Operational staff of Coffs CityWorks were consulted to ensure that the single supplier of aggregate was practical and efficient for staff to use.

Related Policy and / or Precedents:

Tendering procedures were carried out in accordance with Council's policy. Council's Tender Value Selection System has been applied during the tender review process to determine the most advantageous offer.

Council's policy is that the tender with the highest weighted score becomes the recommended tender.

Statutory Requirements:

The calling, receiving, opening and reviewing of tenders were carried out in accordance with Part 7 Tendering of the Local Government (General) Regulations 2005.

Tenderers are required to submit all returnable tender documents, fully complete, before the deadline for closing of tenders. Tenders may not be varied after the close of tenders except for the provision or additional information by way of clarification or to correct a minor mistake or anomaly.

Three of the five tenders failed to submit compulsory pricing and supporting tender information. It is not considered reasonable in the circumstances to allow tenderers to correct these errors as they are significant and could reduce probity of the tender process.

Issues:

Sealing aggregate production requires that the supplier isolate raw feed of a higher quality than typically required for the production of quarry products. Routinely, individual quarries suspend the production of road materials during the production of sealing aggregates due to the risk of non-conformance and contamination. Procurement of high quality sealing aggregates from a single source supply enables an efficient use of resources that is advantageous to Council.

Council is considered to be a major customer for sealing aggregates and therefore attracted some favorable offers from local quarries. Notwithstanding the non-conforming submission of three tenders and the lack of responses from other local quarries, there are sufficient conforming and competitive tenders to assure Council of a value-for-money outcome.

Implementation Date / Priority:

Accepting a tender for contract RFT-624-TO can proceed immediately upon Council resolution.

Recommendation:

That Council considers tenders received for Contract RFT-624-TO Supply and Delivery of Sealing Aggregates 2014-2016, and move the motion as detailed in the confidential attachment.

**CONTRACT NO. RFT-625-TO - SUPPLY & DELIVERY OF QUARRY PRODUCTS
2014-2016**

Purpose:

To report to Council on tenders received for Contract RFT-625-TO Supply & Delivery of Quarry Products 2014–2016 and seek approval to re-tender.

Description of Item:

Open tenders were invited for suitably qualified and experienced organisations to be included on a panel for the supply, or supply and delivery of quarry products for a period of twenty four months. Tenders closed on 18 February 2014.

Tenders were evaluated on the following criteria:

- The Tenderer's financial capability and Tender conformity. These criteria were hurdles and are not scored. Only conforming Tenders and Tenderers with adequate financial resources can be considered further
- Tender Price
 - Contract Supply rates
 - Contract Delivery rates
- Work, Health and Safety Management Systems.
- BNG Conserve™ registration.
- Haulage distance and time from Quarry to worksite or stockpile
- Tenderer's available resources and performance capabilities
- Tenderer's current commitments

Seven tenders were received as follows:

1. Boral Resources (Country) Pty Limited, Toormina.
2. Coastal Homesites Pty Ltd, Woolgoolga.
3. Espedan Pty Ltd, Central Bucca.
4. Holcim Australia Pty Ltd, North Boambee.
5. McLennans Earthmoving Pty Limited, South Grafton.
6. Quarry Solutions Pty Ltd, Valla.
7. Sheridans Hard Rock Quarry Pty Ltd, Hernani.

Of the seven tenders received, six did not include sufficient information in the returnable documents to determine the pricing of their offers and were considered to be nonconforming tenders. Furthermore, the tender process failed to elicit offers from three local suppliers who have provided a reliable and quality service across the LGA at reasonable cost in the past, namely:

- Jungs Quarry, Coffs Harbour
- Woolgoolga Quarry, Woolgoolga, and
- Cauchi Quarry, Corindi

The tender process has failed to identify sufficient suppliers to form a panel of recognised contractors for the supply and delivery of quarry products.

Sustainability Assessment:

- **Environment**

All quarries are licensed and are required to operate in accordance with the NSW Department of Mineral Resources operational and environmental guidelines. Consequently quarries are inspected and environmental performance monitored for adherence to license conditions.

- **Social**

Quarry products to be supplied under this contract are used to complete Council's annual asset renewal and maintenance programs for roads, bridges, drainage, water and sewer programs. These assets provide the community with infrastructure necessary to service the Coffs Harbour community.

- **Civic Leadership**

Council in its civic leadership role must display probity and transparency in the decision making process. A qualified panel of suppliers ensures a transparent procurement process and is a mechanism to control the quality and supply of product.

- **Economic**

Broader Economic Implications

Council, being responsible for civil infrastructure, has an ongoing demand for materials to maintain civil assets. The best value for money materials are procured via the open tender process where offers are assessed against both price and non-price criteria. This panel tender is seen as an opportunity for suppliers to provide competitive rates to Council.

Delivery Program/Operational Plan Implications

The funds for supply of quarry products are available in the annual Works Program.

Risk Analysis:

The non-supply of quarry products is a major risk to Council in regards to reputation, financial and environment. The establishment of a panel of pre-qualified suppliers mitigates the risk by reducing the likelihood of non-supply.

Due to the failure of this tender process to attract sufficient complying tenders it is considered necessary to re-advertise for further tenders.

Consultation:

Operational staff of Coffs CityWorks were consulted to ensure that a panel of suppliers was practical and efficient for staff to use.

Related Policy and / or Precedents:

Tendering procedures were carried out in accordance with Council's procurement policy. Tenders were assessed for conformity against the Conditions of Tendering in the Request

For Tender document and the requirements of the Local Government (General) Regulation 2005.

Statutory Requirements:

The calling, receiving, opening and reviewing of tenders were carried out in accordance with Part 7 Tendering of the Local Government (General) Regulation 2005.

Tenderers are required to submit all returnable tender documents, fully complete, before the deadline for closing of tenders. Tenders may not be varied after the close of tenders except for the provision or additional information by way of clarification or to correct a minor mistake or anomaly.

Six of the seven tenders failed to submit compulsory pricing and supporting tender information. One tenderer submitted a blank pricing document in error while others submitted only part offers. It is not considered reasonable in the circumstances to allow tenderers to correct these errors as they are significant and could reduce probity of the tender process.

Issues:

Of the five operating quarries within the Coffs Harbour LGA only three chose to submit a tender. The quality of submissions has been extremely poor, not allowing effective assessment in accordance with the Regulation. Also the number of local quarries that did not respond to the invitation is very disappointing.

The high demand for quarry products generated by the highway upgrade works to the north and south of Coffs Harbour has contributed to the poor industry response. Council is currently seen as a relatively small customer. Consequently suppliers have not responded to Council's panel tender with the same level of interest and care that has been shown previously.

Council regularly uses all the local quarries under its existing panel contract and does not wish to restrict its ability to purchase from the most advantageous suppliers across the region. It is noted that Council could still purchase quarry materials valued below the tender threshold from whomever it wishes, however that would negate the economies of scale achievable via a tender process.

Council officers have sought feedback from representatives of the local industry. All agree that the tendering opportunity could have been responded to in a better manner. Consequently it is proposed to recall tenders. It is expected that Council will receive an improved response as the quarries have indicated that they wish to maintain a mutually beneficial long term relationship with Council.

Implementation Date / Priority:

Invitation to call fresh tenders can proceed immediately upon Council resolution.

Recommendation:

That Council considers tenders received for Contract No. RFT-625-TO, Supply & Delivery of Quarry Products 2014-2016, and move the motion as detailed in the confidential attachment.

TENDER RFT-628-TO: SUPPLY OF ONE ASPHALT ROAD MAINTENANCE UNIT ON A CREW CAB 15,000 KG GVM TRUCK

Purpose:

Report to Council the results of going to tender for the replacement of an Asphalt Road Maintenance Unit on a 15,000kg GVM truck and to gain Council approval to accept a tender.

Description of Item:

The Asphalt Road Maintenance Unit is used in Council's operational area for maintenance of the local and regional sealed road network. This type of asphalt road patching is employed where a more substantial road repair is required. The asphalt patching unit will be administered through Council's Plant Fund, operated and maintained in accordance with general plant procedures.

Tenders for the Asphalt Road Maintenance unit were called following adoption of the 2013/2014 Plant Replacement Program and closed 4th February 2014 for the replacement of Councils Asphalt Road Maintenance Unit.

Tenders were required to provide the following options:

- (a) Supply with trade of Councils existing road maintenance unit.
- (b) Supply without trade.

Three conforming tenders were received from the following:

1. Paveline International Pty Ltd, Caringbah, NSW.
2. Ausroad Systems Pty Ltd, Archerfield, Qld.
3. Adtrans Hino, Mascot, NSW.

Paveline International Pty Ltd and Ausroad Systems Pty Ltd offered an alternative tender.

Sustainability Assessment:

Sustainability issues have been considered in the specification and tender assessment, as follows

- **Environment**

- Emission standards are in accordance with Australian standards. 'ADR 80 03'.
- Service frequency and the reduction of waste products on oil and filters.
- The percentage of bio fuel that the machines can operate on so as to reduce Council's reliance on fossil fuels.
- Noise Levels
- The use of recyclable parts in the truck.

- **Social**

A review was undertaken to determine the requirement for the road maintenance unit in the Council operational area. The outcome was that a Council owned machine would meet operational needs and provide a cost effective service to the community.

The review of tenders included field performance testing to assess

- The tendered unit's ability to carry out designated works.
- Ergonomics.
- Operator safety: including ABS brakes, cab strength.
- The operators' ability to operate the tendered machine to its full potential.

- **Civic Leadership**

The purchase and operation of a road maintenance unit is consistent in achieving the following strategies from the communities 2030 Strategic Plan.

- LC 1.3 Promote a safe community
- LE 3.5 Develop and improve infrastructure to provide appropriate access to environmental experiences
- MA 1.2 Improve the effectiveness of the existing transport system
- MA 2.1 Ensure adequate maintenance and renewal of roads, footpaths and cycleways
- MA 2.2 Facilitate safe traffic, bicycle and pedestrian movement

- **Economic**

Broader Economic Implications

The following points are considered when replacing or purchasing plant:

- The operational necessity of the plant item
- It must be cost effective to own and operate the plant rather than externally hire
- Projected resale value
- Forecast repair and maintenance costs

Delivery Program/Operational Plan Implications

Funds for the purchase have been allocated in the 2013/14 Plant Fund budget

Risk Analysis:

When considering the Enterprise Risk Rating Levels the following main considerations are applicable:

Financial: As the local road authority, Council is to maintain the road network so that the whole of life costs are as low as possible. To carry out timely repairs and minimize the overall costs specialized patching equipment is essential.

Reputational: If Council allowed the condition of the road network to deteriorate Council's reputation with the community and visitors will be impacted.

Environmental: The maintenance of council's roads system will extend the life of Council's asset and ultimately result in a decrease in the consumption of natural resources.

Consultation:

The Tender evaluation has included consultation with Council's Asset Maintenance section, plant operators, WHS officer, workshop and operational staff.

Related Policy and / or Precedents:

Tendering procedures were carried out in accordance with Council policy. Council's Tender Value Selection System was applied during the tender review process to determine the most advantageous offer.

Statutory Requirements:

The calling, receiving, opening and reviewing of tenders was carried out in accordance with the Local Government (General) Regulations 2005.

Issues:

The Tender Value Selection System was applied to all tenders and details of the assessment are contained in the attached confidential supplement.

The highest ranked units were subject to field evaluation by Council's operational and mechanical maintenance staff.

It is proposed that the disposal of Council's current road maintenance unit will be via public auction as soon as possible after the tendered unit is delivered.

Implementation Date / Priority:

The delivery of the asphalt road maintenance unit is quoted to be twenty weeks. If Council resolves to award the contract, it is expected the asphalt road maintenance unit will be delivered in late August 2014

Recommendation:

That Council consider tenders received for the supply of One Asphalt Road Maintenance Unit on a Crew Cab 15,000 Kg GVM Truck Contract No. RFT-628-TO and move the motion as detailed in the confidential attachment.

TENDER RFT-630-TO: SUPPLY OF ONE BLOWER TYPE ROAD MAINTENANCE UNIT ON A 22,500 KG GVM TRUCK

Purpose:

Report to Council the results of going to tender for the replacement of a Road Maintenance Unit on a 22,500kg GVM truck and to gain Council approval to accept a tender.

Description of Item:

The Road Maintenance Unit is used in Council's operational area for maintenance of the local and regional sealed road network. This type of road patching is operated by the driver eliminating the need for a crew and has become a standard plant item for Council's road maintenance operation. The patching unit will be administered through Council's Plant Fund, operated and maintained in accordance with general plant procedures.

Tenders for the Blower Type Road Maintenance Unit were called following adoption of the 2013/2014 Plant Replacement Program and closed on 4th February 2014.

Tenders were required to provide the following options:

- (a) Supply with trade of Council's existing road maintenance unit.
- (b) Supply without trade.

Two conforming tenders were received from the following:

1. Paveline International Pty Ltd, Sydney, NSW.
2. Ausroad Systems Pty Ltd, Archerfield, QLD.

Both Tenderers included alternative offers.

Sustainability Assessment:

Sustainability issues have been considered in the specification and tender assessment, as follows:

- **Environment**

- Emission standards are in accordance with Australian standards. 'ADR 80 03'.
- Service frequency and the reduction of waste products on oil and filters.
- The percentage of bio fuel that the machines can operate on so as to reduce Council's reliance on fossil fuels.
- Noise Levels
- The use of recyclable parts in the truck.

- **Social**

A review was undertaken to determine the requirement for the road maintenance unit in the Council fleet. The outcome was that a Council owned machine would meet Council's needs and provide a cost effective service to the community.

The review of tenders included field performance testing to assess,

- The tendered unit's ability to carry out designated works.
- Ergonomics.
- Operator safety: including ABS brakes, cab strength.
- The operators' ability to operate the tendered machine to its full potential.

- **Civic Leadership**

The purchase and operation of a road maintenance unit is consistent in achieving the following strategies from the communities 2030 Strategic Plan.

- LC 1.3 Promote a safe community
- LE 3.5 Develop and improve infrastructure to provide appropriate access to environmental experiences
- MA 1.2 Improve the effectiveness of the existing transport system
- MA 2.1 Ensure adequate maintenance and renewal of roads, footpaths and cycleways
- MA 2.2 Facilitate safe traffic, bicycle and pedestrian movement

- **Economic**

Broader Economic Implications

The following points are considered when replacing or purchasing plant.

- The operational necessity of the plant item
- It must be cost effective to own and operate the plant rather than externally hire
- Projected resale value
- Forecast repair and maintenance costs

Delivery Program/Operational Plan Implications

Funds for the purchase have been allocated in the 2013/14 Plant Fund budget.

Risk Analysis:

When considering the Enterprise Risk Rating Levels the following main considerations are applicable:

Financial: As the local road authority, Council is to maintain the road network so that the whole of life costs are as low as possible. To carry out timely repairs and minimise the overall costs specialised patching equipment is essential.

Reputational: If Council allows the condition of the road network to deteriorate Council's reputation with the community and visitors will be impacted.

Environmental: The maintenance of Council's roads system will extend the life of Council's asset and ultimately result in a decrease in the consumption of natural resources.

Consultation:

The tender evaluation has included consultation with Council's Asset Maintenance Section, plant operators, WHS officer, workshop and operational staff.

Related Policy and / or Precedents:

Tendering procedures were carried out in accordance with Council policy. Council's Tender Value Selection System was applied during the tender review process to determine the most advantageous offer.

Statutory Requirements:

The calling, receiving, opening and reviewing of tenders was carried out in accordance with the Local Government (General) Regulations 2005.

Issues:

The Tender Value Selection System was applied to all tenders and the assessment details are contained in the attached confidential supplement.

The highest ranked patching units were subject to field evaluation by Council's operational and mechanical maintenance staff.

It is proposed that the disposal of Council's current road maintenance unit will be via public auction as soon as possible after the tendered unit is delivered.

Implementation Date / Priority:

The time for the supply of the road maintenance unit is 20 weeks. If Council resolves to award the contract, it is expected the road maintenance unit will be delivered in late August 2014.

Recommendation:

That Council consider tenders received for the supply of One Blower Type Maintenance Unit on a 22,500 Kg GVM Truck Contract No. RFT-630-TO and move the motion as detailed in the confidential attachment.

COFFS HARBOUR CITY COUNCIL DRINKING WATER POLICY & DRINKING WATER QUALITY MANAGEMENT SYSTEM

Purpose:

To inform Council of the outcomes of the public exhibition of the Policy, including revisions made to the Drinking Water Quality Management System in response to submissions.

Description of Item:

The Drinking Water Quality Policy and Drinking Water Quality Management System for Coffs Harbour Water was first tabled for adoption at the November 14, 2013 Council Ordinary Meeting. At the meeting Council resolved to:

(Townley/Degens) that Council place the Coffs Harbour City Council Drinking Water Quality Policy and Drinking Water Quality Management System on public exhibition for a period of 28 days.

The Drinking Water Quality Policy and Drinking Water Quality Management System were placed on public exhibition for 32 days between 10 December 2013 to 10 January 2014. A public notice was placed in the local newspaper. The documents were made available within Council's libraries and from Council's website.

A total of four submissions were received. The submissions in their entirety are included in a confidential attachment to this report (Attachment 4) as the submissions may contain personal or private information or other considerations against disclosure as prescribed under the *Government Information (Public Access) Act 2009*. The nature of the feedback focused on areas considered to require greater emphasis in regard to the managing of the drinking water system and water quality, particularly impacts from mining and agriculture. Taking on board this feedback, two new sections have been added specifically to address these issues in section 4 – Risk Management and Controls – of the Drinking Water Quality Management System.

The table below outlines points raised in the submissions and how a response to these have been incorporated or are already addressed within the Drinking Water Management System Document.

Key Public Exhibition Submission Point	DWMS Document Reference
Request for mining to be incorporated as a high risk hazard within the Orara Catchment	Has been incorporated. Refer table 11 in section 4.1 of the DWMS document.
Queried the use of environmental assessment as a control for mining activity.	Refer section 4.5.1 of the DWMS document, which outlines steps for opposing mining activities within Council's Drinking Water Catchments in accordance with previous Council resolutions. Council actively lobby against any proposed mining activities within its catchments.

Queried as to whether alternative water source is a viable control.	Should one of Council's catchments become polluted, one of the alternative catchments will be used. (eg the Orara or Nymboida catchments or Shannon Creek Dam or Karangi Dam).
Request for testing of heavy metals, pesticides and agricultural chemicals.	Heavy metal testing, pesticide and agricultural chemical testing is incorporated within Council's monitoring program. Refer to table 15 (footnote Test B).
Sought a high priority for determining treatment processes for removal of toxicity from mining.	This has been reviewed and is not deemed to be a high priority. Council's chemical testing results relating to mining parameters have been consistently compliant with Australian Drinking Water Guidelines and no mines are currently active within the catchment. The current medium priority is considered appropriate.
Request for pesticides and agricultural chemicals to be listed as a likely or possible risk hazard.	Pesticides and agricultural chemicals have been incorporated as a high risk hazard. Refer table 11 in section 4.1 of the DWMS document.
Request for acknowledgement of catchment management as a key barrier to protecting water quality.	Refer section 4.2 and 4.4. Preventative Measures and Catchment management.
Concern that mining and agricultural water quality parameters are not incorporated as critical control point parameters in table 13.	Water quality parameters relating to agricultural/mining activities are tested periodically (refer table 15 of DWMS document). Critical control points must relate to parameters that are tested continuously.
Request for testing of sediment as part of the testing program.	The water treatment plant removes any sediment from the water supply. A comprehensive water monitoring program is in place. Refer table 15, within section 5 of the DWMS document.
Request for details on how water quality is linked to catchment action plans.	Section 4.4 has been added which acknowledges the benefits of the catchment action and rehabilitation plans.

Sustainability Assessment:

- **Environment**

The strong links between protection of the environment in our drinking water catchments and the quality of our water supply are acknowledged in the DWQMS.

- **Social**

Quality water services are essential for our community. The DWQMS will assist Council in providing safe drinking water to customers as per the Drinking Water Quality Policy.

- **Civic Leadership**

Best practice quality assurance ensures Council remains at the forefront in the provision water services.

- **Economic**

Broader Economic Implications

Safe, secure drinking water supply is a critical foundation for sustainable economic growth and development.

Delivery Program/Operational Plan Implications

Funding to enable the implementation of the DWQMS is already included in Council's long term financial plans and the Delivery Program.

Risk Analysis:

Development of the DWQMS has assisted in strengthening Council's risk management approach in regard to the harvesting, treatment and supply of drinking water.

Consultation:

Extensive consultation was undertaken with key staff within Coffs Harbour Water. NSW Health, NSW Office of Water, Clarence Valley Council, and Coffs Harbour Water participated in the risk assessment workshop held during the development process for the DWQMS. Both NSW Office of Water and NSW Health have reviewed the DWQMS, and are supportive of its adoption.

Feedback from the public exhibition process has been incorporated into the DWQMS.

Related Policy and / or Precedents:

Council does not currently have a drinking water policy or a documented Drinking Water Quality Management System to demonstrate Council's commitment to drinking water quality management throughout the organisation.

Statutory Requirements:


The Drinking Water Quality Management System (DWQMS) addresses Coffs Harbour City Council's (CHCC) compliance with the *Public Health Act (2010)* (NSW) and the NSW Public Health Regulation 2012.

Implementation Date / Priority:

The CHCC DWQMS document and policy can be introduced immediately following endorsement and adoption by Council.

Recommendation:

1. **That Council adopt the "Coffs Harbour City Council Drinking Water Quality Policy".**
2. **That Council note the "Coffs Harbour City Council Drinking Water Quality Management System April 2014", developed to support implementation of the Policy.**

Locked Bag 155. Coffs Harbour, NSW 2450 ABN 79 126 214 487	COFFS HARBOUR CITY COUNCIL	
<h2 style="margin: 0;">Drinking Water Quality Policy</h2>		
Policy Statement: The Drinking Water Quality Policy states Council's commitment to providing safe, high quality water utilising best practice water quality management.		
Director or Manager Responsible for Communication, Implementation and Review: Director of City Infrastructure Services		
Related Legislation, Division of Local Government Circulars or Guideline: Local Government Act 1993 Public Health Act 2010 NSW Public Health Regulation 2012 Fluoridation of Public Water Supplies Act 1957 & associated 2007 Regulations Water Management Act 2000 Water Act 1912 Catchment Management Authorities Act 2003 Competition and Consumer Act 2010 The Australian Drinking Water Guidelines (ADWG) 2011 NSW Best-Practice Management of Water Supply and Sewerage Guidelines NSW Health Drinking Water Monitoring Program (2005) NSW Health Response Protocol for management of microbial quality of drinking water		
Does this document replace an existing policy?		No
Other Related Council Policy or Procedure: Coffs Harbour City Council Drinking Water Quality Management System 2013		
Application: It is mandatory for all staff, councillors and delegates of council to comply with this policy.		
Distribution: This policy will be provided to all staff, councillors and delegates of council by: <input checked="" type="checkbox"/> Internet <input checked="" type="checkbox"/> Intranet <input type="checkbox"/> Email <input checked="" type="checkbox"/> Noticeboard <input checked="" type="checkbox"/> ECM		
Approved by: Executive Team [Meeting date] Council [Meeting date & Resolution No.]	Signature: _____ <i>General Manager</i>	
Council Branch Responsible:	Date of next Review:	

Key Responsibilities

Position	Directorate	Responsibility
Mayor	Council	To lead councillors in their understanding of, and compliance with, this policy and guidelines.
General Manager	Executive	To lead staff (either directly or through delegated authority) in their understanding of, and compliance with, this policy and guidelines.
Directors	All Directorates	To communicate, implement and comply with this policy and related guidelines and to ensure staff have frameworks and strategies necessary to implement and comply with this policy.
Executive and Managers	All Directorates	To ensure policy is integrated into planning and decision making and to implement and comply with this policy and related procedures.
All Council officials	Council	To have an understanding of and comply with this policy and related procedures.

1. Introduction

The Australian Drinking Water Guidelines (ADWG) 2011 was developed as a framework for good management of drinking water supplies that if implemented, will assure the safety of customers at the point of supply.

Whilst not mandatory standards, they provide an authoritative reference based on the best scientific evidence for determining that safe and good quality water, that is also aesthetically pleasing, is delivered to Council's customers.

The ADWG encourages the endorsement of a Drinking Water Quality Policy to ensure organisation support and long term commitment by senior management. This should ensure the effective management of drinking water quality within the organisation.

2. Definitions

Relevant Legislation: Refer previous policy page

3. Policy content

Coffs Harbour City Council is committed to managing its water supply catchments, treatment and supply assets to provide safe, high quality drinking water, which consistently meets the Australian Drinking Water Guidelines (2011), other regulatory requirements and consumer expectations.

To achieve Council's commitment, and in partnership with the community, other stakeholders and relevant agencies, Coffs Harbour City Council will:

- 3.1 **Manage water quality from catchment to tap** at all points along the delivery chain, from the source water to the consumer's tap
- 3.2 **Adopt a risk-based approach** in which potential threats to water quality are identified and managed, in accordance with the Australian Drinking Water Guidelines, to minimise any threat to drinking water quality
- 3.3 **Integrate the needs and expectations** of our consumers, stakeholders, regulators and employees into our planning
- 3.4 **Establish effective monitoring programs** to systematically monitor the quality of drinking water and ensure effective reporting mechanisms. Provide relevant and timely information that promotes confidence in the water supply and its management to consumers
- 3.5 **Develop / Review Contingency and Incident Response Plans** that will be regularly reviewed and updated
- 3.6 **Participate in research and development** by maintaining awareness of current research and development activities to ensure that Coffs Harbour City Council is up to date with current industry standards
- 3.7 **Contribute to setting industry regulations and guidelines** through active participation in the development of industry regulation and guidelines relevant to health and the broader water cycle

- 3.8 **Adopt best practice water quality management** by aligning our water quality systems and processes with the framework’s proactive and multi-barrier approach to best practice water quality management
- 3.9 **Continually improve our management practices** by assessing performance against industry standards, corporate commitments and stakeholder expectations
- 3.10 **Continually improve the capability of our staff** by encouraging and supporting participation in training and professional development and ensuring all employees are aware of and actively seek to achieve the aims of this policy
- 3.11 **Maintain a long term and sustainable water supply** which recognises global and regional priorities in the management of water.

4. Consultation

Key staff members across the organisation have been consulted in the development of this policy.

5. References

Coffs Harbour City Council Drinking Water Quality Management System October 2013.
 Australian Drinking Water Guidelines (2011)

6. Appendices

Coffs Harbour City Council Drinking Water Quality Management System October 2013.
 Australian Drinking Water Guidelines (2011)

7. Table of Amendments

Amendment	Authorised by	Approval reference	Date

Coffs Harbour City Council

Drinking Water Management System

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Coffs Harbour City Council

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Document Control					
Approved for Issue					
Issue	Author	Reviewer	Name	Signature	Date
4	Helen Salvestrin	Jessica Huxley	Jessica Huxley		November 2013
Amendments by CHCC					
5	Section 4.4 added: Catchment Management Section 4.5 added: Mining Section 8.3 added:Public Exhibition Section 4.1 New paragraph added “Subsequent...after the workshop” Table 11 amended (section 4.1) Tables 15 & 16 amended (section 5.1) Table 21 amended (section 10).		Paul Sparke		April 2013

Executive Summary

This Drinking Water Management System (DWMS) demonstrates Coffs Harbour City Council’s (CHCC) compliance with the *Public Health Act (2010)* (NSW) requirement to develop a Quality Assurance Plan in accordance with the Framework for Management of Drinking Water Quality in the Australian Drinking Water Guidelines (ADWG).

This document outlines the range of activities carried out by Council to ensure the provision of safe drinking water to its customers. A number of actions to improve the drinking water supply systems were identified through the risk assessment and system development. The Improvement Plan should be reviewed regularly as actions are completed and as part of the annual review process.

ADWG Framework for the Management of Drinking Water Quality

The ADWG 2011 sets out the “Framework for Management of Drinking Water Quality” which provides a structured risk-based approach to drinking water management. Coffs Harbour City Council’s activities relating to each of the 12 Elements of the ADWG, including references to sections of the DWMS are summarised in Table 1.

Table 1 ADWG Framework for the Management of Drinking Water Quality

ADWG Element	Status	DWMS Reference
Element 1: Commitment To Drinking Water Quality Management		
Drinking water quality policy	Draft Drinking Water Policy developed and documented. Council to consider endorsing the Policy. Council will ensure that the policy is visible, communicated, understood and implemented by employees.	Section 2.2, Appendix A
Regulatory and formal requirements	Regulatory and formal requirements identified and documented. Council has relevant approvals from Office of Water.	Section 2.3, Appendix A
Engaging stakeholders	DWMS identifies and documents relevant stakeholders. NSW Health, Office of Water and Clarence Valley Council participated in the development of the DWMS.	Section 2.4
Element 2: Assessment Of The Drinking Water Supply System		
Water supply system analysis	<p>Council supplies drinking water to Coffs Harbour, Nana Glen and Coramba.</p> <ol style="list-style-type: none"> 1. Karangi WTP provides full treatment for Coffs Harbour drinking water supply system including clarification, filtration, UV and chlorine disinfection. The supply is fluoridated. Sophisticated and dedicated infrastructure is used for each process. 2. Nana Glen WTP provides full treatment including clarification, filtration and disinfection. Infrastructure used provides for basic but adequate processing. 	Sections 3.2, 3.3 Appendix B

ADWG Element	Status	DWMS Reference
	<p>3. Coramba WTP provides disinfected (chlorinated) water. Council anticipate that within two years the Coramba drinking water supply system will be connected to the Coffs Harbour supply. An addendum will be issued to this plan at a later date to incorporate assessment of the Coramba system.</p> <p>The DWMS documents the key characteristics of the Karangi and Nana Glen water supply systems. Flow diagrams have been prepared for each supply system</p>	
Assessment of water quality data	<p>The following data was assessed:</p> <ul style="list-style-type: none"> ▪ Baseline studies of source waters ▪ Operational data since commissioning of Karangi WTP 2009 ▪ Ten years of verification data at point-of-supply 	Sections 3.2.2, 3.3.2, Appendix B
Hazard identification and risk assessment	<p>Risk assessment workshop completed with participation from NSW Health, NSW Office of Water, Clarence Valley Council and CHCC. Coffs Harbour risk assessment identified 62 risks. Nana Glen risk assessment identified 36 risks.</p>	Section 4.1, Appendix C
Element 3: Preventive Measures For Drinking Water Quality Management		
Preventive measures and multiple barriers	<p>Coffs Harbour system provides a multi-barrier approach including; catchment management, managed extraction, aeration of Shannon Creek and Karangi Dams, as well as Dissolved Air Flotation, Filtration, fluoridation and disinfection using UV and chlorination, at the WTP.</p> <p>The Nana Glen system barriers include catchment management, managed extraction, sand filtration and chlorination.</p>	Section 4.1, Appendix C
Critical control points (CCPs)	<p>CCPs for Coffs Harbour are documented and are as follows:</p> <ul style="list-style-type: none"> ▪ CCP1: Selective extraction ▪ CCP2: Aeration at Karangi Dam ▪ CCP3: Coagulation ▪ CCP4: Filtration ▪ CCP5: UV disinfection ▪ CCP6: Fluoridation ▪ CCP7: Chlorine disinfection ▪ CCP8: Point-of-supply disinfection <p>CCPs for Nana are documented and are as follows:</p> <ul style="list-style-type: none"> ▪ CCP1: Coagulation/Filtration ▪ CCP2: Disinfection ▪ CCP3: Point-of-supply disinfection 	Section 4.2, Appendix C

ADWG Element	Status	DWMS Reference
Element 4: Operational Procedures And Process Control		
Operational procedures	<p>Key Operational Procedures for each CCP have been documented.</p> <p>Operational Manuals have been developed for Karangi and Nana Glen WTPs and a Functional Specification for Karangi WTP.</p>	Sections 4.2, 6.1, Appendix C
Operational monitoring	CHCC have an 'Operational Water Quality Monitoring Plan' documenting monitoring points, parameters, trigger levels, frequency, and actions.	Section 5.1, Appendix D
Corrective action	Key corrective actions are documented for each CCP.	Section 4.2, Appendix D
Equipment capability and maintenance	Council's "Asset Systems" branch maintains an asset register. Major infrastructure renewals have been scheduled in Council's 20-year financial plan. O&M manuals assist in scheduling major asset renewals. Customer complaints and the mains breaks register assist in planning minor asset renewals.	Sections 4.2, 6.2, Appendix C
Materials and chemicals	Standardised procurement processes are documented in DWMS. Materials and chemicals conform to NSW Code of Practice Plumbing and Drainage, AUS-SPEC for Water Supply and WH&S Regulation for Dangerous Goods. Details of chemicals used at both WTPs are documented in the DWMS.	Section 6.3
Element 5: Verification Of Drinking Water Quality		
Drinking water quality monitoring	CHCC verifies drinking water quality by participating in the Drinking Water Monitoring Program. CHCC WTP operators collect samples for the Drinking Water Monitoring Program. Sampling frequency is based on population.	Section 5.2
Consumer satisfaction	<p>A two-yearly customer satisfaction survey is undertaken to rate importance and satisfaction with the water supply.</p> <p>Customer complaints are taken by Coffs Harbour Water (CHW) administration. Standard procedures for recording, response and customer feedback are detailed in the DWMS.</p>	Section 5.3
Short-term evaluation of results	<p>Council evaluates water quality data on receipt of monitoring results.</p> <p>Exceedances of criteria reported and responded as required by NSW Health protocols.</p>	Section 5.4
Corrective action	Corrective Actions have been identified and documented in DWMS. Council follows the NSW Health Response Protocols and Code of Practice for Fluoridation as required.	Section 5.4, Appendix C

ADWG Element	Status	DWMS Reference
Element 6: Management Of Incidents And Emergencies		
Communication	<p>Council’s “Media” officer distributes warnings and notifications to the community as required and in accordance with Council’s Media Protocol.</p> <p>A draft communication protocol has been developed in conjunction with CHW’s response protocol for a microbiological incident.</p>	Section 7.1
Incident and emergency response protocols	<p>CHCC responds according to NSW Health Response Protocols and the Code of Practice for Fluoridation. Emergency response plans have been developed for key infrastructure, including Karangi and Nana Glen WTPs, Red Hill Balance Tank and Dams. CHCC is a member of the Coffs Harbour City Local and North Coast District Emergency Management Committees.</p>	Section 7.2
Element 7: Employee Awareness And Training		
Employee awareness and involvement	<p>Toolbox safety meetings are held at the start of shift every morning.</p> <p>Council participation in the risk assessment workshop included participation from all water staff including senior management to operators. Council will continue to increase staff awareness and involvement in the DWMS.</p>	Section 8.1
Employee training	<p>All operators attend NSW Office of Water “Operator Training” CHW Administration and CHCC’s “Human Resources” branch maintain an up-to-date register of all inductions, trainings and refresher courses and ensures qualifications are kept up to date.</p>	Section 8.1
Element 8: Community Involvement And Awareness		
Community consultation	<p>CHCC has a Community Strategic Plan, “Coffs Harbour 2030 Plan”, updated every 4 years.</p> <p>Community participation is through monthly Council meetings.</p>	Section 8.2
Communication	<p>CHCC has an informative website for community understanding of the drinking water system. This includes monthly reporting of water quality results on the website.</p>	Section 8.2
Element 9: Research And Development		
Investigative studies and research	<p>Council undertakes investigative studies and research monitoring on a project basis as required. This DWMS has identified three research projects associated with catchment protection and potential hazards.</p>	Section 8.3.1

ADWG Element	Status	DWMS Reference
Validation of processes	DWMS details: Council processes to ensure safe and acceptable drinking water is supplied to the customer; and processes for validation of new or upgraded processes.	Section 8.3.2
Design of equipment	DWMS details the engineering expertise and processes used to validate the selection and design of new equipment required for upgrades and process improvements.	Section 6.2
Element 10: Documentation And Reporting		
Management of documentation and records	DWMS documents all aspects of drinking water quality management. "Records" branch of CHCC is committed to documents and records management. All water quality policies, laboratory data and documentation are submitted to the department and managed through the "TechnologyOne Enterprise Content Management" database.	Section 8.4.1
Reporting	Council prepares quarterly and annual reports. Water quality reports can be produced from the <i>NSW Health Drinking Water Monitoring Program</i> database on the NSW Health website. Fluoridation results are provided monthly to NSW Health. Performance results are also provided to NSW Office of Water for the Water Supply and Sewage NSW Performance Monitoring Report, annually.	Section 8.4.2
Element 11: Evaluation And Audit		
Long-term evaluation of results	<p>Council's Manager Water Treatment reviews and reports on performance data quarterly.</p> <p>NSW Health Drinking Water Monitoring Program data available online via NSW Drinking Water Database. Monitoring data is reviewed regularly by Council, NSW Health and Office of Water.</p> <p>Council undertakes periodic review of CCP exceedances.</p> <p>NSW Office of Water undertakes a regular assessment of the WTPs, using a risk-based approach.</p>	Section 5.2
Audit of drinking water quality management	<p>The DWMS will be internally audited by the Executive Manager Coffs Harbour Water Operations. The audit will include:</p> <ul style="list-style-type: none"> ▪ CCPs ▪ Improvement Plan ▪ Record keeping ▪ NSW Performance Monitoring ▪ Fluoridation monitoring 	Section 9.1

ADWG Element	Status	DWMS Reference
	External audits will be undertaken jointly by NSW Health, NSW Office of Water and Council: <ul style="list-style-type: none"> ▪ Improvement plan: annual audit ▪ Entire DWMS: four-yearly 	
Element 12: Review And Continual Improvement		
Review by senior executive	The Executive Manager, CHW Operations will review the effectiveness of the DWMS annually, NSW Health and NSW Office of Water. A complete review of the DWMS will be undertaken every four years, in line with the review of the Strategic Business Plan.	Section 9.2
Improvement plan	This DWMS documents an Improvement Plan for the CHCC drinking water supply systems.	Section 10

Critical Control Points

The Critical Control Points (CCP) for the Coffs Harbour City Council drinking water supply systems were identified as part of the development of the DWMS. The CCP's are essentially the heart of the Framework, with good management of the CCP's crucial to the DWMS.

Coffs Harbour CCP are summarised in Table 2 and Nana Glenn CCP in Table 3. Standard operating procedures and corrective actions have been documented for each CCP to guide daily activities and correct responses if the critical limits are reached.

Table 2 Coffs Harbour Critical Control Points

Parameter	Frequency	Target Limit	Alert Limit	Critical Limit
CCP1 Selective extraction				
Turbidity (NTU) COCHRANE'S POOL	Continuous	< 2	2 (> 10 min)	> 2 (> 10 min)
Turbidity (NTU) NYMBOIDA RIVER	Continuous	< 2	2 (> 1 hour)	> 2 (> 1 hour)
CCP 2 Aeration at Karangji Dam				
Aeration	Daily	Run-time = 6 hrs (DO > 7 mg/L @ 27m)	Run time < 6 hrs (DO < 7 mg/L @ 27m)	Run time (DO < 5 mg/L @ 27m)

Parameter	Frequency	Target Limit	Alert Limit	Critical Limit
CCP 3 Coagulation				
pH after prime CO ₂	Continuous	8	< 6.5 or > 9.5 (> 30 mins)	< 5.8 or > 9.6 (> 15 min)
pH after trim CO ₂	Continuous	6.8	< 5.8 or > 7.1 (> 30 mins)	< 5.5 or > 7.3 (> 5 min)
CCP 4 Filtration (post filter)				
Turbidity (NTU) (after start up following backwash)	Continuous	< 0.1 (on individual/ combined filters)	> 0.3 (> 30 min)	> 0.5 (> 15 min)
CCP 5 UV Disinfection (limits as per calibrated alarms for UV system)				
UV Transmissivity	Continuous	98 %	95 % < 1.1 x min (> 4 hrs)	85 % < 0.8 x min (> 1 hr)
UV Dose (at design flow rate)	Continuous	< 48 mJ/cm ²	< 22 mJ/cm (60 mins)	< 20 mJ/cm (60 mins)
CCP 6 Fluoridation				
Fluoride at treated water storage (mg/L)	Continuous	1	< 0.95 or > 1.05 (1 hour)	< 0.9 or > 1.5 (15 min)
CCP 7 Chlorine Disinfection				
Chlorine residual at treated water storage outlet (mg/L)	Continuous	1.2 – 2.0 (seasonal)	< 1.2 or > 2 (> 30 mins)	< 0.9 or > 2.5 (> 5 mins)
pH at outlet of treated water storage (pH units)	Continuous	7.7	< 7.2 or > 8.3 (> 30 mins)	< 7.0 or > 8.5 (> 30 min)
CCP 8 Point-of-Supply Disinfection				
Free chlorine at point-of-supply (mg/L)	Weekly	> 0.2	< 0.2	< 0.1

Table 3 Nana Glen Critical Control Points

Parameter	Frequency	Target Limit	Alert Limit	Critical Limit
CCP1 Coagulation/Filtration				
Turbidity after filtration (NTU)	Continuous	< 0.3	> 0.5	> 1.0
CCP 2 Disinfection				
Chlorine residual in reservoir (mg/L)	3-times/week	0.8 (summer) 0.5 (winter)	< 0.5	< 0.3
CCP 3 Disinfection at point-of-supply				
Free chlorine at point-of-supply (mg/L)	Fortnightly	> 0.3	< 0.2	< 0.1

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1 Introduction

1.1 Overview

Coffs Harbour City Council (CHCC), has developed a risk based Drinking Water Management System (DWMS) consistent with the Australian Drinking Water Guidelines 2011 (ADWG) (NHMRC, NRMCC). This fulfils their obligations under Section 25 of the *Public Health Act 2010* (NSW) and Part 5 Section 34 the Public Health Regulation 2012. The *Public Health Act 2010* sets out the requirement for drinking water suppliers to develop and adhere to a quality assurance program, or Drinking Water Management System.

The ADWG provides the framework for the good management of drinking water supplies that, if implemented, will insure safety at point of use. The framework was developed to guide a structured and systematic approach for the management of drinking water quality from catchment to consumer. It incorporates a quality assurance program developed specifically for the water industry, and includes elements of HACCP, ISO 9000 and AS/NZS ISO31000:2009.

1.2 Objective

This document aims to support both CHCC to provide, and the communities of CHCC to access a safe quality drinking water supply. Access to safe water is a basic need and is one of the most important contributors to public health.

The overall approach is to provide drinking water supply system operators and managers with a user friendly document that supports CHCC in its management of a safe drinking water supply. It provides an overview of the system and a summary of all relevant documentation and supporting requirements.

This DWMS and its supporting documentation are living documents. They should be reviewed and updated in line with CHCC's monitoring and reporting procedures and when new processes or changes are introduced.

1.3 Coffs Harbour City Council Drinking Water Supply Systems

CHCC delivers water supply services as a local water utility under the provisions of the *Local Government Act (1993)* (NSW). Coffs Harbour Water (CHW) is the business unit within CHCC responsible for the provision of drinking water.

CHCC operates three drinking water supply systems: Coffs Harbour, Nana Glen and Coramba. A summary of these system are detailed below.

Coffs Harbour Drinking Water Supply

The Coffs Harbour Drinking Water Supply System draws raw water from the Orara River, Nymboida River, and Shannon Creek Dam and stores it in Karangi Dam. Water is transferred between Nymboida Weir, Shannon Creek Dam and Karangi Dam through the Regional Water Supply System (RWSS). Water is treated at the Karangi Water Treatment Plant (WTP), which is a Dissolved Air Flotation and Filtration (DAFF) plant. The treated water is disinfected by UV and chlorination and is fluoridated.

Nana Glen Drinking Water Supply

The Nana Glen drinking water supply system draws raw water from the Orara River. The Nana Glen WTP is a conventional WTP with the raw water undergoing clarification, filtration and disinfection via chlorination.

Coramba Drinking Water Supply

The Coramba drinking water supply system draws raw water from the Regional Water Supply Pipeline, which is source from the Nymboida River, and on occasion back-fed from Karangi Dam. The Coramba drinking water supply undergoes disinfection via chlorination prior to reticulation.

2 Commitment to Drinking Water Quality

2.1 Commitment

CHCC is committed to managing its drinking water supply systems to provide a safe, high quality drinking water that consistently meets the ADWG, consumer expectations and regulatory requirements.

CHCC mission statement for water supply and sewerage services is:

“To provide long term sustainable and reliable water supply and sewerage services to the community which meets legislative, statutory and best-practice management requirements. These services will protect community, health and the environment.”

The development and implementation of this DWMS formalises and demonstrates Council commitment to drinking water quality management throughout the organisation by:

- Formally adopting drinking water quality as a Council priority
- Defining Council’s role and responsibility in regards to providing high quality drinking water
- Identifying and assessing risks associated with the drinking water system and introducing controls, preventative measures, appropriate training, procedures and emergency response plans to protect drinking water quality and public health
- Adopting a measurable Improvement Plan that will increase the integrity of the Drinking Water Management System
- Reinforces the ongoing and active involvement of all staff and supports senior management to ensure actions and policies support the management of drinking water quality

A draft Drinking Water Policy was provided as part of the development of this DWMS for CHCC to review and adopt (Appendix A: Regulatory and Formal Requirements). The policy will demonstrate Council’s commitment to supply high quality drinking water and to manage the risks to drinking water quality. Council will ensure that the policy is visible, communicated, understood and implemented by employees.

2.2 Regulatory and Formal Requirements

The regulatory and formal requirements relating to drinking water quality in Coffs Harbour City have been identified and detailed in Appendix A: Regulatory and Formal Requirements.

Table 4 provides a summary of the most relevant legislative and formal requirements for the supply of safe drinking water at CHCC.

Table 4 Summary of Regulatory and Formal Requirements

Regulatory or Formal Requirement	Relevance to Drinking Water Quality	Agency
Commonwealth Legislation		
<i>Competition and Consumer Act 2010</i>	<p>Replaces the Trade Practices Act 1974 and incorporates Schedule 2 – The Australian Consumer Law.</p> <p>As a “seller” of water, the local council is subject to provisions of Consumer transactions and Consumer guarantees, which guarantees that the goods supplied are reasonably fit for purpose.</p>	Australian Competition and Consumer Commission
<i>Environment Protection and Biodiversity Conservation Act 1999</i>	Provides for the protection of water resources, in relation to coal seam gas and large coal mining developments are considered as a matter of national environmental significance.	Department of Sustainability, Environment, Water, Population and Communities
NSW Legislation		
<i>Catchment Management Authorities Act 2003</i>	<p>Natural resource management, from planning to operations, is to be undertaken at the catchment level. State-wide standards are to be applied. A Catchment Action Plan (CAP) is used to define key themes for each catchment, with specific catchment and management targets.</p> <p>The Northern Rivers CAP identifies a need to improve the efficiency and effectiveness of water supply to urban communities.</p>	Northern Rivers Catchment Management Authority Natural Resources Commission Landholders
<i>Dams Safety Act 1978 No 96</i>	<p>Owners of prescribed dams are required to operate, maintain, extend and report on prescribed dams to the Dams Safety Committee (DSC) to ensure the safety of their dams.</p> <p>Shannon Creek and Karangi Dams are prescribed under the Act.</p>	NSW Government – Dams Safety Committee
<i>Environmental Planning & Assessment Act 1979</i>	<p>Requires that the environmental impacts of projects be studied at all stages on the basis of scale, location and performance.</p> <p>Under Part 3 of the Act, Local Environmental Plans (LEPs) are developed to establish what forms of development and land use are permissible and/or prohibited.</p> <p>LEPs ensure that drinking water quality is considered when assessing development applications. The Coffs Harbour LEP (2000, amended 2010) applies to all lands within Coffs Harbour City.</p>	NSW Department of Planning and Infrastructure

Regulatory or Formal Requirement	Relevance to Drinking Water Quality	Agency
<i>Fisheries Management Act 1994</i>	The “Eastern (Freshwater) Cod (<i>Maccullochella ikei</i>) Recovery Plan” (NSW Fisheries, 2004) was prepared in accordance with the Act, and sets recovery actions covering, in particular, the Orara River.	NSW Department of Primary Industries
<i>Fluoridation of Public Water Supplies Act 1957, Regulation and Code of Practice</i>	Requirements for testing and reporting where water supplies are fluoridated.	NSW Health
<i>Local Government Act 1993</i>	Local councils have the responsibility for the provision of water supply to consumers, in accordance to the NSW Best-Practice Management of Water Supply and Sewerage Guidelines.	NSW Government - Division of Local Government
<i>Protection of the Environment (Operations) Act 1997</i>	Requires licenses for activities with potentially significant environmental impacts. Prosecution may be carried out under this act for any chemical leakage, spill, and disposal of wastes or similar.	NSW EPA
<i>Public Health Act 2010</i>	Requires all water suppliers to develop Drinking Water Management Systems. Bestows certain powers on NSW Health with respect to provision of safe drinking water, including ability to enter treatment facilities, order mandatory testing or obtain information about the drinking water, power to close a water supply. Council is required to issue public advice regarding the water supply when directed by the Director General of NSW Health.	NSW Health
<i>Threatened Species Act 1995</i>	Identification of a range of threatened and significant species and vegetation communities under the act led to the development and implementation of the “Orara River Rehabilitation Strategy”.	Office of Environment and Heritage
<i>Water Act 1912</i>	Licences to extract water outside of areas covered by water-sharing plans. Affecting alterations to the quantity or quality of water in certain circumstances is an offence. Water Act 1912 is being progressively phased out and replaced by Water Management Act 2000.	NSW Office of Water

Regulatory or Formal Requirement	Relevance to Drinking Water Quality	Agency
Water Management Act 2000	Provides the basis for water planning, the allocation of water resources and water access entitlements. Environmental flows in the Nymboida River and Orara River are set by the “Water Sharing Plan for the Dorrigo Plateau Surface Water Source and Dorrigo Basalt Groundwater Source 2003”.	NSW Office of Water
Work, Health & Safety Act 2011	Specifies conditions for storage and handling of chemicals on-site at water treatment plants.	Work Cover Authority of NSW
National Guidelines and Programs		
Australian Drinking Water Guidelines 2011	Ensures the accountability of drinking water managers and operators and health authorities/auditors for the supply of safe, good quality drinking water to consumers.	NSW Health
Best-Practice Management of Water Supply and Sewerage Guidelines 2007	Provides for appropriate, affordable and cost-effective services to meet community needs while protecting public health and the environment and making best use of regional resources. Requires a Strategic Business Plan (SBP), including a Financial Plan and associated asset management plans, reviewed and updated every four years; a 30-year Integrated Water Cycle Management (IWCM) plan.	NSW Office of Water
NSW Health Drinking Water Monitoring Program	NSW Health provides for the analysis of drinking water samples for water utilities, providing an independent analysis of water at point of supply.	NSW Health
NSW Health Response Protocol for management of microbial quality of drinking water 2011	Guides Public Health Units and water utilities in their joint response to following rapidly changing source water quality, treatment failure or microbial contamination.	NSW Health
NSW Health Response Protocol for management of physical and chemical quality 2004	Guides Public Health Units and water utilities in their joint response following the detection of physical and chemical water characteristics that exceed the Guidelines. Aesthetic and health related guideline values are considered.	NSW Health
Plumbing Code of Australia 2011	Specifications for plumbing in drinking water systems, to be complied with by administrators, plumbing Licensees, developers and property owners/occupiers.	NSW Office of Water

2.3 Engaging Stakeholders

The stakeholders involved in the management of drinking water quality in Coffs Harbour are listed in Table 5. NSW Health Water Unit, Local Public Health Unit and NSW Office of Water participated in the development of this DWMS.

Table 5 Stakeholders in Drinking Water Quality Management

Stakeholder	Role in Drinking Water Management	Participation
NSW Health	Provides expert advice and supports Council in achieving their regulatory requirements	Provides for drinking water analysis for NSW Health Drinking Water Monitoring Program. NSW Health sets response protocol to microbial and physical and chemical exceedances. Representatives from the Local Public Health Unit and NSW Health Water Unit participated in the Risk Assessment Workshop as part of the DWMS.
NSW Office of Water	Provides expert advice and support Council in achieving their regulatory requirements	Inspector visits and assesses WTPs' compliance at regular intervals based on a risk management approach. Technical support on investigations, design, construction, operation, maintenance and management. Annual Reporting on Water Supply performance. Participated in Risk Assessment Workshop as part of the Coffs Harbour City DWMS. Northern Rivers Regional Algal Coordinating Committee (RACC) provides algal alerts.
Clarence Valley Council	Bulk water supply	Licence holder for bulk water supply from Nymboida Weir. Holds a service agreement with CHCC for bulk supply, covering monitoring of water quality and provisions to protect low flows. Participated in Risk Assessment Workshop as part of the Coffs Harbour City DWMS.
Essential Energy	Source water extractions	Licence holder for extractions from Nymboida Weir under the <i>Water Act 1912</i> . Holds a negotiated Service Agreement with CVC for bulk water supply.
Northern Rivers Catchment Management Authority	Catchment Management	Liaises with CHCC for the management of source water quality in the drinking water catchment. Coordinates action plans and funding in the drinking water catchment

3 Drinking Water Supply Systems

3.1 Overview

Coffs Harbour City Council manages three drinking water supply systems: Coffs Harbour, Nana Glen and Coramba. A summary of these drinking water systems are detailed below.

Table 6 Overview of CHCC Drinking Water Supply Systems

Category	Coffs Harbour	Nana Glen	Coramba
Catchment	Clarence River Catchment Subcatchments: Orara River Nymboida River Shannon Creek	Clarence River Catchment Subcatchment: Orara River	Clarence River Catchment
Source Water	Karangi Dam	Orara River Pool at Nana Glen	Regional Water Supply Pipeline
Treatment	Dissolved Air Flotation and Filtration (DAFF) Alkalinity and pH adjustment Coagulation and Flocculation Dissolved air floatation Filtration – coal, sand, gravel Ultraviolet radiation Fluoridation Chlorination	pH correction Coagulation and Flocculation Sand filtration Chlorination Alkalinity adjustment	Chlorination
Reservoirs	16 Reservoirs - Red Hill Balance Tanks (2) Red Hill Reservoir Roberts Hill Reservoir Macauleys Reservoir Boambee Reservoirs (2) Toormina Reservoirs (2) Sapphire Reservoir Moonee Reservoir Emerald Reservoir Haviland Reservoir Scarborough Reservoir Woolgoolga Headland Res Bark Hut Reservoir Mullaway Reservoir Corindi Reservoir	2 Reservoirs - Nana Glen 1 Reservoir Nana Glen 2 Reservoir	1 Reservoir - Coramba Reservoir
Reticulation	The coastal towns of Sawtell in the South to Corindi in the North, including Coffs Harbour. Population 69,783	Drinking water reticulated to consumers via gravity. Population 300	Drinking water reticulated to consumers via gravity. Population 297

3.2 Coffs Harbour Drinking Water Supply System Analysis

3.2.1 Description

Coffs Harbour, its suburbs, and coastal towns and villages are serviced by the Karangi WTP. The Karangi WTP is a dissolved air flotation and filtration (DAFF) plant commissioned on 9 June 2009. The Karangi WTP services the majority of Coffs Harbours Water consumers.

A complete description of the Coffs Harbour drinking water supply system is provided in Appendix B: Drinking Water Systems Analysis. Figure 1(a) and (b) provide a process flow diagram of the Coffs Harbour DWSS.

Raw water for the Coffs Harbour drinking water supply system is normally extracted from the Karangi Dam, where it is pumped directly to Karangi WTP for treatment and distribution. The Karangi Dam is topped up by three sources:

- ❑ Cochrane's pool, on the Orara River
- ❑ Nymboida weir, on the Nymboida River
- ❑ Shannon Creek Dam

The transfer of bulk water between Nymboida weir, Shannon Creek Dam and Karangi Dam is through the Regional Water Supply System (RWSS). The RWSS is managed and operated by Clarence Valley Council (CVC).

3.2.2 Regional Water Supply Scheme

The RWSS commenced in 2002 to provide the communities of Grafton, Lower Clarence and Coffs Harbour with a reliable bulk raw water supply. It consists of approximately 90 km of underground pipeline.

The RWSS extracts raw water from the Nymboida weir to fill Karangi Dam, Shannon Creek Dam and provides water to CVC for Grafton Drinking Water Supply at Rushforth Road Reservoirs. An environmental flow of 225 ML is maintained in the Nymboida River.

The RWSS prioritises water supply to the following:

1. Clarence Valley Council drinking water supplies
2. CHCC drinking water supplies
3. Nymboida Hydro Power Station

The RWSS extracts water from the Nymboida weir when quality is optimal and the river flow is above the abstraction licence conditions. Raw water flows under gravity to Karangi Dam at up to 16 ML/d, but if necessary, can be boosted by the pump station near Glenreagh to provide up to 25 ML/d to Karangi Dam.

Raw water is also extracted from the Nymboida weir in times of high flow to fill Shannon Creek Dam. Shannon Creek Dam has an off-stream storage capacity of 30,000 ML. The storage provides for a reliable raw water supply during droughts, periods of low flow and poor quality water in the Nymboida River. In addition to the topping up of the Karangi Dam, this storage also provides areas of Grafton, Coutts Crossing and other small villages with raw water during these periods.

3.2.3 Drinking Water Catchments

The CHCC drinking water is sourced from within the Clarence River Catchment. The Clarence River Catchment is the largest coastal river system in NSW covering approximately 22,716km².

The Orara River, Nymbodia River and Shannon Creek Dam are all subcatchments or within subcatchments of the Clarence River catchment.

3.2.4 Orara River Sub-catchment

The Orara sub-catchment is situated within the Coffs Harbour Local Government Area (LGA), west of Coffs Harbour City. The sub-catchment covers an area of 41,200 ha. The Orara River supplies raw water to the Karangi WTP, the Nana Glen WTP and Coramba System at times.

Headwater streams flow from well-vegetated state forests and national parks. Towards the floodplains of the Orara River, vegetation is impacted more progressively by land clearing, grazing and logging. Some regionally and locally important forest remnants are still dispersed within impacted areas.

The Orara River has been rated 'High' under the Stressed River Criteria, due to the habitat for the Eastern Fresh Water Cod. The abstraction licence from the river has environmental flow requirement conditions, to protect low flows (Strategic Business Plan 2012).

CHCC are strategically rehabilitating the Orara River as outlined in the "Orara River Rehabilitation Strategy 2012 – 2022" (Coffs Harbour City Council, 2012) under the Coffs Harbour Biodiversity Action Strategy.

3.2.5 Nymbodia Weir Sub-catchment

The Nymbodia sub-catchment covers an area approximately 1,700 km². The catchment is extensively vegetated and contains a number of National Parks. The Dorrigo Plateau is situated in the upper part of the catchment, with agricultural land use including beef grazing and potato growing.

The RWSS extracts from the Nymbodia Weir. The Hydro Power Station extracts from below the Nymbodia Weir.

An environmental flow of 225ML/day in the Nymbodia River is set by the "Water Sharing Plan for the Dorrigo Plateau Surface Water Source and Dorrigo Basalt Groundwater Source 2003".

3.2.6 Shannon Creek Catchment and Dam

The Shannon Creek sub-catchment is approximately 3,535 ha. The catchment is heavily vegetated with some areas of cleared land in the west. Steep forested valleys drain to the Shannon Creek Dam.

There are potential raw water quality issues in the sub-catchment, including increased turbidity due to dispersive soils in the catchment and at present, an inability to draw water off at various levels, from the multiple-level offtake tower. Furthermore, landholders in the Shannon Creek catchment plan to undertake logging activities in the future as a retirement income (Ministry of Energy and Utilities, 2003).

The Shannon Creek Dam is topped up with water from the Nymbodia weir.

3.2.7 Source Water: Karangi Dam

The Karangi WTP sources raw water directly from the Karangi Dam. Karangi Dam is topped up with flows from the Cochrane's Pool on the Orara River, the Nymbodia Weir or the Shannon Creek Dam via the RWSS. The Karangi WTP has a critical control point (CCP) for the turbidity at raw water

extraction from all source waters. The Karangi Dam ceases pumping from the Nymboida River at >2 NTU; and from the Cochrane's Pool at > 2 NTU.

Maximum flows to Karangi Dam are either:

- up to 16 ML/day from Nymboida Weir, under gravity,
- up to 25 ML/day from Nymboida Weir, with pump boosting near Glenreagh, or
- up to 63ML/day from Cochrane's Pool, off-peak pumping

Karangi Dam has a storage capacity of 5,600 ML and under average conditions the dam has a secure yield of 4,000 ML/year.

The Karangi WTP can bypass the Karangi Dam to be supplied with raw water directly from Cochrane's Pool or the RWSS pipeline if necessary.

3.2.8 Water Treatment

The Karangi WTP is a dissolved air flotation and filtration (DAFF) plant commissioned in June 2009. The plant operates automatically via SCADA control and programmable logic controller (PLC) alarms. The treatment process at the Karangi WTP comprises of the following process steps:

- Raw water is aerated at both Shannon Creek and Karangi Dams to maintain appropriate dissolved oxygen levels to maintain water quality
- Raw water is dosed with lime at Karangi Dam for alkalinity and pH adjustment
- Carbon dioxide dosing is undertaken at the contact tank at the WTP for further pH adjustment
- Dosing facilities for Powdered Activated Carbon (PAC) and permanganate are installed for removal of taste and odour and manganese, respectively, at the contact tank, but are not currently required
- Aluminium sulphate and a coagulant aid (Magnafloc or Hengfloc), if required, are dosed at the rapid mix tanks to effect coagulation of pollutants
- Sufficient contact time and mixing occurs in the flocculation tanks to assist pollutants to come together
- A filter aid (Magnafloc), if required, is dosed before the water flows to all three DAFF filters, where flocculated particles are removed by both flotation and filtration through a 3-layer media filter, consisting of coal, fine sand and gravel
- Filtered water from the DAFF is disinfected by ultra-violet (UV) radiation
- Caustic soda is dosed for final pH correction
- The treated water is dosed with fluorosilicic acid to maintain dental hygiene in consumers
- The treated water is disinfected with chlorine
- Chlorine contact time is provided in the onsite treated water storage tank
- Drinking water is pumped to Red Hill Balance Tanks (RHBT) and gravity fed into various reservoirs, then reticulated for use
- Washwater from the DAFF is treated on-site, supernatant returned to the inlet of the WTP or Karangi Dam, and thickened sludge disposed of in landfill
- A chlorine booster plant at the Emerald Reservoir is operated and monitored to maintain chlorine residuals at the end of the northern reticulation system.

3.2.9 Distribution Network

The Coffs Harbour Water Supply system distributes drinking water from Sawtell in the south to Corindi in the north, including the inland villages of Nana Glen and Coramba. Refer to Figure 1 (a) and (b) for the Coffs Harbour drinking water supply system diagram.

Treated water from the Karangi WTP is pumped to the two balance tanks at Red Hill. From the RHBTs, the drinking water is distributed to sixteen reservoirs, as summarised in Appendix B: Drinking Water Systems Analysis and displayed in the process flow diagram in Figure 1.

The distribution network consists of the following (including Nana Glen and Coramba):

- 3 balance tanks
- 19 storage reservoirs
- 641km trunk and reticulation mains
- 22,683 water service connections

All reservoirs have secure access with locked stairwells, access ladders and hatches. CHCC operates a chlorine booster plant at Emerald Reservoir to ensure appropriate chlorine residuals at the end of the northern reticulation system. CHCC monitors the chlorine residuals from this process. Additionally, CHCC is in the process of installing a chlorine booster plant at Boambee Headland Reservoirs in the south, to maintain chlorine residuals from the reservoirs (pers. com. Simon Thorn, CHCC Executive Manger of Operations 16/1/13).

All reservoirs are roofed, and incorporate bird proofing treatments. Bird proofing treatments generally consist of expandable foam or stainless steel mesh, for filling or covering gaps between the tank wall and its roof. Although the bird proofing at most reservoirs is good, some reservoirs require additional modifications to improve the effectiveness of the existing bird proofing.

Table 7 lists the reservoirs in the Coffs Harbour, Nana Glen and Coramba drinking water supply systems. Reservoirs are cleaned every 2 to 3 years by underwater divers and CHCC maintains a register of actions for maintenance and continual improvement.

Table 7 Coffs Harbour City Council Drinking Water Supply Reservoirs

No	Reservoir	Capacity (ML)	Reticulation Network
1	Red Hill Balance Tank 1	1	All drinking water is distributed from the Red Hill Balance Tanks
2	Red Hill Balance Tank 2	17	
3	Red Hill Reservoir	5.7	Coffs Harbour City (West and Central)
4	Toormina Reservoir 1	5	Toormina, Boambee
5	Toormina Reservoir 2	12.5	
6	Boambee Reservoir 1	1.36	Sawtell, Boambee
7	Boambee Reservoir 2	1.5	
8	Roberts Hill Reservoir	20	Coffs Harbour City (Central, South, supplies Boambee Reservoirs)

No	Reservoir	Capacity (ML)	Reticulation Network
9	Macauley's Reservoir	15	Coffs Harbour City (North, supplies Northern Reservoirs)
10	Sapphire Reservoir	2	Sapphire Beach
11	Moonee Reservoir	5	Moonee Beach
12	Emerald Reservoir	6	Emerald Beach, Sandy Beach
13	Haviland Street Reservoir	0.07	Woolgoolga
14	Scarborough Street Reservoir	4.54	Woolgoolga
15	Woolgoolga Headland Reservoir	0.5	Woolgoolga
16	Bark Hut Reservoir	1.5	Bark Hut area
17	Mullaway Reservoir	7	Safety Beach, Mullaway, Arrawarra, Corindi
18	Corindi Reservoir	3	Corindi (in emergencies)
19	Coramba Reservoir	0.45	Coramba
20	Nana Glen Reservoir 1	0.5	Nana Glen
21	Nana Glen Reservoir 2	0.5	

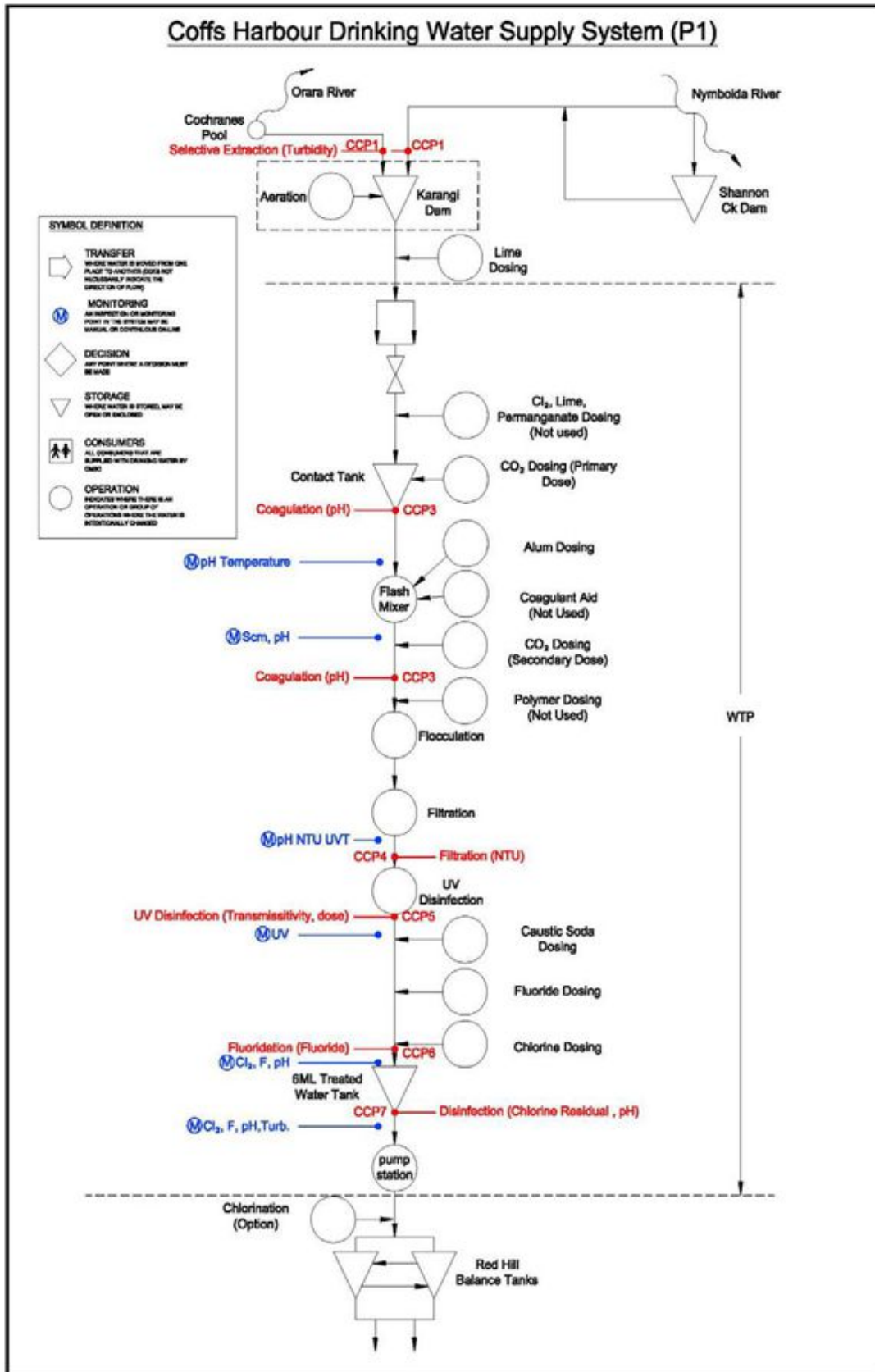


Figure 1: (a) Coffs Harbour Drinking Water Supply System Process Flow Diagram

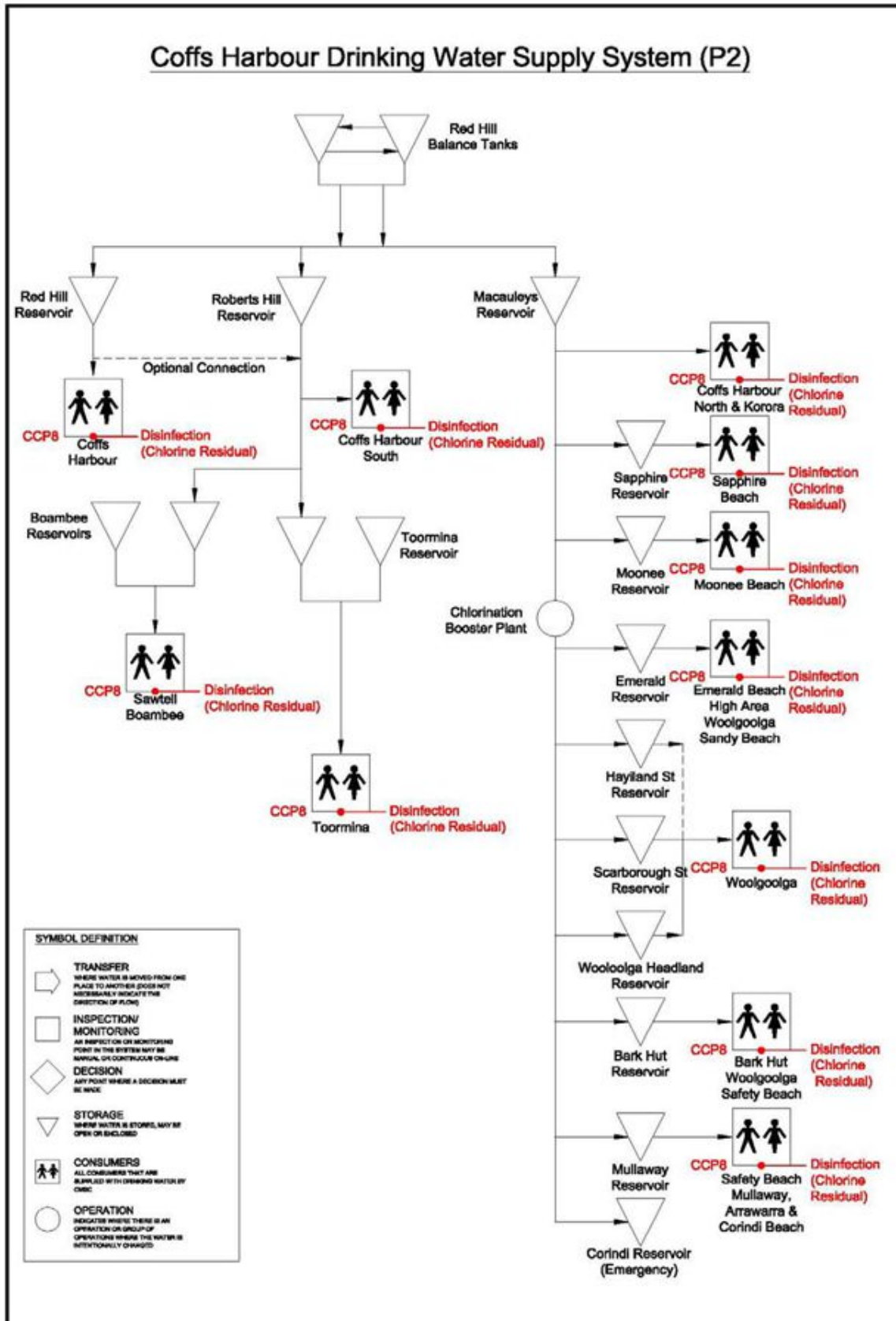


Figure 2: (b) Coffs Harbour Drinking Water Supply System Process Flow Diagram

3.2.10 Assessment of Water Quality

Water quality was assessed to inform the Risk Assessment Workshop process and identify issues within the supply. A detailed assessment of water quality is in Appendix B: Drinking Water System Analysis. A summary is provided below.

3.2.11 Source Water Quality

Baseline characterisation of raw water from Orara River at Cochrane’s pool, Nymboida River and Shannon Creek Dam is reported in the Coffs Harbour Water Treatment Plant HACCP Plan (Coffs Infrastructure Alliance, 2009) and summarised in Table 8.

All source waters were characterised as relatively soft with low alkalinity, low in manganese and phosphorous.

E.coli was detected in all raw water sources with the highest detections at Cochrane’s Pool.

Turbidity, Colour and Total Organic Carbon are the highest at the Shannon Creek Dam are above the ANZECC Fresh and Marine Guidelines (2000) for South-east flowing rivers indicating slightly disturbed ecosystems.

Table 8 Typical Water Quality of Karangi WTP Raw Water Sources

Parameter	Orara River at Cochrane’s Pool	Nymboida River	Shannon Creek Dam
<i>E.coli</i>	10 – 900 orgs/100 ml (median 118)	1 – 200 orgs/100 ml	5 – 300 orgs/100 ml
Total Organic Carbon	1 mg/L	2 mg/L	2 – 3 mg/L
Colour	5 – 15 PCU	5 – 50 PCU	20 – 200 PCU
Turbidity	0.5 – 5 NTU	2 – 140 NTU	4 – 200 NTU
Total Phosphorous	0.01 – 0.03 mg/L	<0.01 – 0.07 mg/L	<0.01 – 0.02 mg/L
Manganese	<0.01 – 0.05 mg/L	<0.02 mg/L	0.05 – 0.5 mg/L
Alkalinity	10 – 18 mg/L	10 – 15 mg/L	17 – 85 mg/L

Baseline pesticide sampling in the source water at Shannon Creek Dam conducted on 24 March 2010 included tests for a range of organochlorine and organophosphate pesticides. Pesticides were found to be non-detected. Further monitoring was undertaken at the Shannon Creek Dam in 2012 for a suite of physical, chemical, pesticide and radiological parameters. In relation to the chemical results, all parameters were within the guideline criteria for drinking water. Pesticides were found to be non-detected in all source water samples.

Two and a half years of baseline sampling data from Karangi Dam (July 1998 to December 2000) indicate that the raw water is of relatively good quality. pH (6.8 – 7.8) was in the optimal range with low turbidity (0.3 – 2.3 NTU) and conductivity (72 – 110 µS/cm) as typical of large lakes and reservoirs. The raw water is very soft (mean total hardness 8 mg/L and alkalinity 14 mg/L) and low in nutrients (mean/max nitrate and nitrite 0.1 mg/L and phosphorous 0.04 mg/L).

Radiological assessments in the form of alpha and beta radiation were undertaken in 2010 at Wongala and Corindi Beach Aboriginal Communities and Shannon Creek Dam. Corindi Aboriginal Community results were under the detection limit for both Alpha and Beta analysis. Wongala Aboriginal Community and Shannon Creek Dam results were under the detection limit for Alpha. However Beta results were above the detection limit at both Wongala Aboriginal Community and Shannon Creek Dam at 22 + 3 mBq/l and 20 mBq/l respectively. The ADWG recommended that if results are exceeded in the retest, it is recommended that specific radionuclides be identified and their activity concentrations determined. As this test is expensive, it is first suggested that Council retest to identify any ongoing issue.

3.2.12 Operational Water Quality

3.2.13 Karangi Water Treatment Plant

The Karangi WTP consistently meets operational water quality targets.

Filtered water turbidity is monitored inline continuously with alarms at each of the individual filters. CCP at each filter is alarm controlled by Alert level: 0.3 NTU and Critical alarm: 0.5 NTU. Operators record turbidity readings daily onsite. These recordings are hand written and were unavailable for statistical analysis. However, the mean turbidity of the treated water (< 0.1 NTU) indicates that filtration is effective and is achieving the desired results.

The water supply treated at the Karangi WTP undergoes disinfection via chlorination and UV. CHCC is achieving the operational target for effective chlorination with turbidity averaging 0.1 NTU in the treated water tank, and an average pH of 7.7 at the time of disinfection. It is considered that the Karangi WTP achieves sufficient contact time for disinfection given the volume of storage at the WTP and the transportation of treated water to the RHBT prior to reticulation. Treated water free chlorine is monitored inline continuously with alarms. CCP is alarm controlled by Alert level: < 0.6 or > 3.0 mg/L and Critical alarm: < 0.4 or > 3.5 mg/L

The water supply treated at the Karangi WTP is fluoridated. The treated water is sampled daily at the Karangi WTP for fluoride with an average concentration of 1 mg/L. Treated water fluoride is monitored inline continuously with Alarms. CCP is alarm controlled at Alert Level: < 0.8 or > 1.1 mg/L and Critical Alarm: > 1.5 mg/L. According to the operational data Coffs Harbour Water is achieving the stipulated fluoride concentration as required by the “*New South Wales Code of Practice for Fluoridation of Public Water Supplies*” (NSW Department of Health, 2011).

3.2.15 Reservoirs

From the operational data, free chlorine residual is maintained throughout the distribution system and reservoirs, although at times less than optimal (< 0.2 mg/L) at the Sawtell, Toormina and Bark Hut reservoirs. The Boambee Headland booster plant aims to address this issue for the Sawtell and Toormina areas. Bark Hut reservoir has a relatively low water usage and it is difficult to maintain the chlorine residual in storage. The chlorine dose is adjusted seasonally and hand dosing is carried out at Bark Hut and Sawtell.

Since the commissioning of the new Karangi DAFF plant, no *E.coli* has been detected in the drinking water supply system. Total coliforms were identified in low numbers at the Sawtell, Toormina and Bark Hut reservoirs. These reservoirs also displayed low chlorine residual at times. Fluoride is maintained at all reservoirs within the NSW Health criteria.

3.2.14 Supply Water Quality

Verification monitoring is undertaken within the distribution system. *E.coli* detections have occurred within the supply system. All follow-up tests for all but one occasion were within the guideline criteria and subsequently no boil water alerts were issued. *E.coli* detections may be attributed to poor sampling or low chlorine residuals. Total coliform exceedances have occurred. The presence of these coliforms may represent release from pipe or sediment biofilms, and may be part of the normal flora of the drinking-water distribution system or due to low chlorine residuals.

When the disinfectant in a drinking water supply is chlorine, disinfection by-products may be formed, including Trihalomethanes (THM). Sampling was undertaken monthly by CHCC in all reservoirs over 1999 and 2000 and at RHBT in 2005. Trichloromethane, Bromodichormethane, Dibromochloromethane, and Tribromomethane were monitored at 24 locations across the CHCC drinking water systems.

ADWG 2011 recommends that the concentration of THMs, either individually or in total, in drinking water should not exceed 0.25 mg/L. The results indicated that THMs concentration in the water supply system were below the guideline values on every occasion. Refer to Appendix B: Drinking Water System Analysis for data.

3.2.15 NSW Health Drinking Water Monitoring Program

Water quality results from the NSW Health Drinking Water Monitoring Program were assessed from the commissioning of the DAFF plant in June 2009. Results for July 2009 – November 2012 are summarised in Table 9.

The free chlorine non-compliances, with the exception of one event, were all low residuals. The greatest proportion of non-compliances was at Safety Beach, Toormina and Sawtell, all of which had more than 50% of samples below 0.2 mg/L. Council is currently constructing a chlorine booster for the Toormina and Sawtell supplies and is investigating options for maintaining chlorine residual at Safety Beach.

The fluoride non-compliances were all low values, with five of the eight low values resampled from the one event. From 6th to 10th April 2010 operators had difficulty maintaining the required concentration of fluoride within the drinking water supply. The remaining three events had values above 0.80 mg/L.

Table 9 Coffs Harbour NSW Health Drinking Water Monitoring Program Data

Parameters	ADWG	No. of Samples	Min	Mean	95%ile	Max	Non compliance
<i>E.coli</i> (cfu/100ml)	< 1	1,731	0	0	0	0	0
Total Coliform (cfu/100ml) ¹	< 1	1,726	0	0	0	> 200	7
Free Chlorine (mg/L)	0.2 - 5	1,731	0.05	0.48	1.08	28	500 (Low) 1(exceedance)
Total Chlorine (mg/L)	5	6	0.0	0.21	0.94	1.25	0
pH (pH units)	6.5 – 8.5	94	7.4	7.9	8.4	8.5	0
True Colour (HU)	15	66	< 1	1	1	1	0

Parameters	ADWG	No. of Samples	Min	Mean	95%ile	Max	Non compliance
Turbidity (NTU)	5	70	< 1	0.1	0.3	0.4	0
Iron (mg/L)	0.3	66	0.01	0.01	0.02	0.07	0
Fluoride (daily WU mg/L)	0.9 – 1.5	1200	0.04	0.98	1.02	1.10	8 (Low)
Hardness (as calcium carbonate) (mg/L)	200	66	46.6	57.6	63.90	65.7	0
Aluminium (mg/L)	0.2	66	0.01	0.01	0.02	0.04	0
Manganese (mg/L)	0.5	66	0.01	0.01	0.01	0.01	0

3.3 Nana Glen Drinking Water Supply System Analysis

3.3.1 Description

The Nana Glen Water Treatment Plant (WTP) is a conventional plant that provides filtered and disinfected water to the residents of Nana Glen and Nana Glen Rail. A complete description of the Nana Glen drinking water supply system is provided in Appendix B: Drinking Water Systems Analysis. Figure 3 provides a process flow diagram of the Nana Glen DWSS.

3.3.2 Source Water: Orara River

Water is extracted from a pool on the Orara River via a screened inlet, suction pipe and pump station adjacent to the eastern bank of the river. Water is pumped from the pool to the WTP for treatment.

Access to the extraction point is through a cattle grazing property.

3.3.3 Water Treatment

Raw water from the Orara River is treated at Nana Glen WTP, according to the following process steps (Reed Constructions Services, 1994):

- The raw water mains are injected with aluminium sulphate to effect coagulation
- Lime is also injected for alkalinity and pH adjustment
- Coagulation and flocculation occur in the clarifier, which is an up-flow sludge blanket type
- Clarified water flows to the gravity filter, comprised of sand and gravel
- Carbon dioxide and lime are dosed for pH correction before the service reservoirs
- Chlorine is dosed for disinfection before the service reservoirs, with contact time maintained in one of the two 0.5 ML service reservoirs

3.3.4 Distribution

Two 0.5 ML reservoirs at the WTP store treated water for distribution by gravity to consumers.

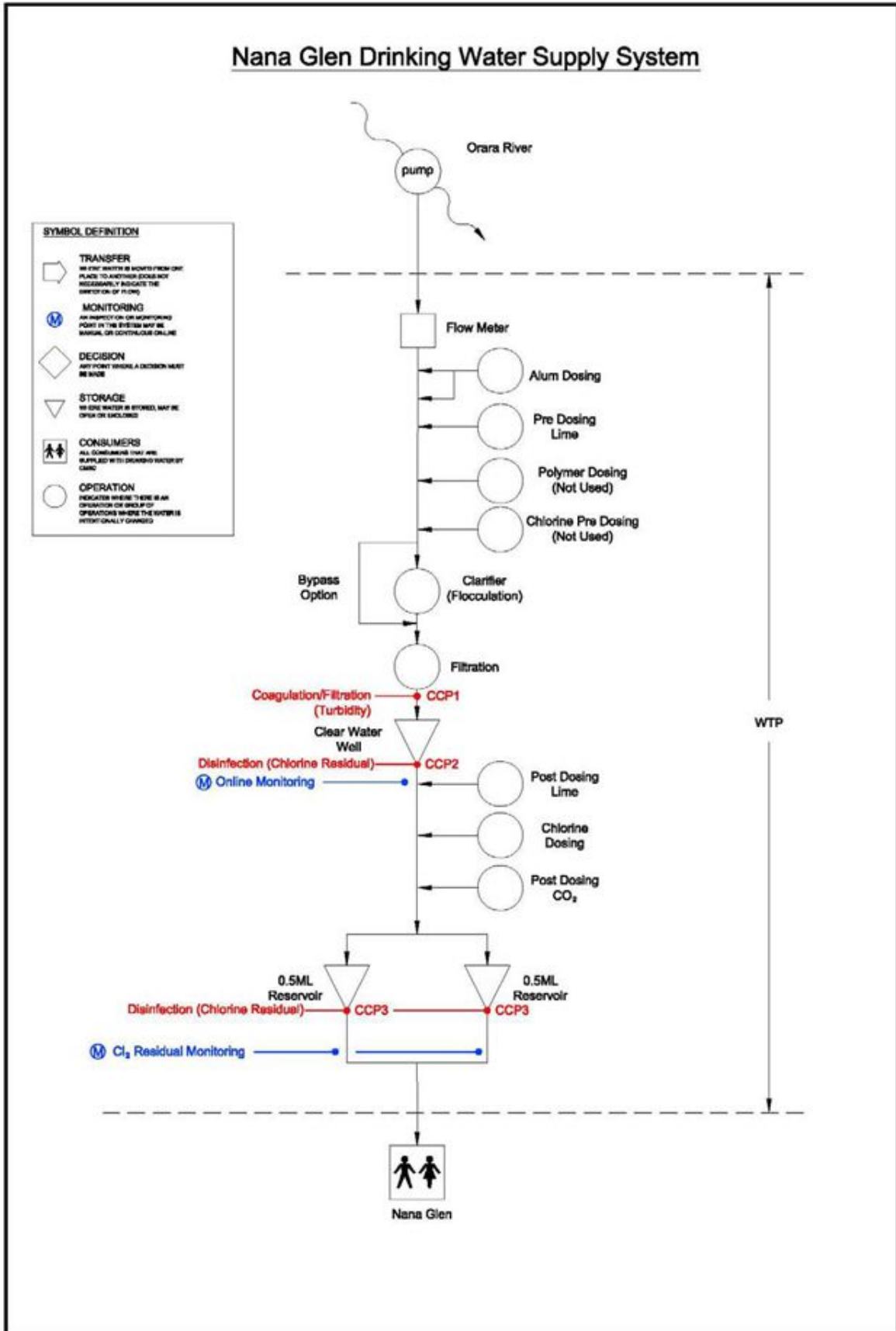


Figure 3: Nana Glen Drinking Water Supply System Process Flow Diagram

3.3.5 Assessment of Water Quality

Water quality was assessed to inform the Risk Assessment Workshop process and identify issues within the supply. A detailed assessment of water quality in the Nana Glen drinking water supply system is in Appendix B: Drinking Water System Analysis. A summary is provided below.

3.3.6 Source Water Quality

Raw water for the Nana Glen drinking water supply is sourced from the Orara River downstream of the Karangī WTP, and off Solomon Close, Nana Glen.

The waters of Orara River are soft, with a neutral pH (slightly acidic at times) and in periods of normal river flow, turbidity is low (averaging 3.7 NTU). Iron is above the ADWG 2011 recommended criteria for aesthetics with an average of 0.4.

Total and faecal coliforms are present in the Orara River with a median of 633 cfu/100ml and 106 cfu/100ml respectively. The intake point on the Orara River is surrounded by a cattle grazing property

3.3.7 WTP Operational Water Quality

Operational data is recorded manually by council staff and was unavailable for analysis. The absence of coliforms within the supply system indicates that treatment has effectively removed the coliforms from the raw water of the Orara River. It is recommended that Council record all water quality and or plant performance monitoring results in electronic format for future analysis.

3.3.8 Reservoir Water Quality

Council undertakes monthly operational water quality monitoring from the two service reservoirs at Nana Glen WTP. Data provided from 2007 to current was assessed with the following issues noted:

- ❑ At times, aluminium is elevated above the ADWG criteria of 0.2 mg/L. Although only an aesthetic consideration, the ADWG guideline value is 0.1 mg/L
- ❑ Alkalinity at times is less than desirable with mean results slightly below the recommended criteria of 60 mgCaCO₃/L
- ❑ pH ranges from 6.8 – 8.9, although mean results indicate pH is optimal at 7.7 or 7.8
- ❑ Turbidity in the last few years has been above the recommended criteria of < 1 NTU for effective disinfection. Reservoir 1 and Reservoir 2 have average turbidity readings of 1.9 NTU and 2.5 NTU respectively
- ❑ At times apparent colour is elevated with maximum readings of 90 and 72 in Reservoir 1 and Reservoir 2 respectively. This could be due to the higher Turbidity readings. 'Apparent Colour' is the colour resulting from the combined effect of true colour and any particulate matter, or turbidity. In turbid waters, the true colour is substantially less than the apparent colour. Guideline value for true colour is < 15HU.
- ❑ Manganese and Iron are well within the guidelines values of 0.5 mg/L and 0.3 mg/L respectively

3.3.9 Supply Water Quality

3.3.10 Operational Water Quality Monitoring

As part of the WTP operational monitoring procedures, water quality is sampled fortnightly at a point of supply in Nana Glen. From 2007 all mean parameters, including coliforms, were within the recommended limits with Aluminium (0.2 mg/L), Free Chlorine (0.4 mg/L), *E. coli* (no detections), Total coliforms (1 cfu/100ml detection) and temperature (21 degrees).

3.3.11 NSW Health Drinking Water Monitoring Program

Ten years (2002 – 2012) of NSW Health data was assessed from the NSW Drinking Water Database, as summarised in Table 10. A small number of exceedances for total coliforms, pH and aluminium were noted, most of which occurred up to 8 years previously.

Note: the low chlorine residuals were prior to June 2012, at which time a change in operations was undertaken. No further low residuals have been recording since this time.

Table 10 Nana Glen NSW Health Drinking Water Monitoring Program Data

Parameters	ADWG Value	No. of Samples	Min	Mean	95%ile	Max	Exceedances
<i>E. coli</i>	<1 cfu/100 ml	262	0	0	0	0	0
Total Coliform	<1 cfu/100 ml	263	0	0	0	1	1
Free Chlorine	0.2 - 5 mg/L	261	0.01	0.29	0.74	1.18	114
pH	6.5 – 8.5	20	7.3	8.2	8.7	8.8	3
True Colour	< 15 HU	18	0.05	0.10	0.19	1.00	0
Turbidity	< 5 NTU	20	0.05	0.35	0.74	1.50	0
Total Hardness	200 mg/L CaCO ₃	19	46.6	72.3	87.0	87.9	0
Aluminium	0.2 mg/L	19	0.02	0.13	0.33	0.46	2
Iron	0.3 mg/L	19	0.01	0.03	0.07	0.08	0
Manganese	0.5 mg/L	20	0	0	0.01	0.02	0

3.4 Coramba Drinking Water Supply

Coramba draws water from the Regional Water Supply System (RWSS) pipeline which is fed from the Nymboida River, or is back-fed from Karangí Dam, when water quality from Nymboida River or Shannon Creek Dam deteriorates after heavy rain or for other reasons (HSc, SBP 2012). Karangí Dam is generally only used when source water quality considerations at Shannon Creek and the Nymboida River deem it preferable, or when the regional water supply is transferring water north to Shannon Creek Dam.

Water is transferred to Coramba via the Regional water supply transfer mains that connect Nymboida Weir, Shannon Creek Dam and Karangí Dam. The Coramba drinking water system services 146 customer connections (as at 2013).

The raw water is disinfected by manually set chlorination dosing (Hypochloride) and pumped to a 0.45 ML reservoir for distribution by gravity within the village. Monitoring programs are in place for water quality, and include regular checking of chlorine levels within the reservoir.

The Coramba drinking water supply has not been assessed as part of the development of this DWMS. Council anticipate that within two years the Coramba drinking water supply system will be connected to the Coffs Harbour supply, and therefore Council decided not to assess the system.

In accordance with NSW Health requirements, Council intends that an addendum will be issued to this plan at a later date to incorporate assessment of the Coramba system. It is required that the addendum will be issued before 1 September 2014 to ensure Coffs Harbour City Council is compliant with Section 25 of the *Public Health Act 2010* (NSW) and the associated Public Health Regulation 2012.

4 Risk Management and Controls

4.1 Risk Assessment and Preventive Measures

The risk assessment and identification of preventive measures were undertaken in the risk assessment workshop on 19 – 20 February 2013, with participation from CHCC, Clarence Valley Council, NSW Health Water Unit and Local Public Health Unit and NSW Office of Water.

A preliminary set of hazardous events was provided for the workshop. Participants deleted or added hazards as required for each specific drinking water supply system. The participants were facilitated through the process to determine likelihood and consequence of each hazardous event in order to rate the risk.

Coffs Harbour City Council used the ADWG (NHMRC, NRMCC, 2011) Risk Assessment Matrix.

Hazardous events were also included that were identified as very high or high risks in the Nymboida catchment and Shannon Creek Dam by the following studies:

- ❑ Coffs Infrastructure Alliance (2009) “Coffs Harbour City Council. Coffs Harbour Water Treatment Plant HACCP Plan”
- ❑ Water Futures (2008) “Water Quality Risk Assessment Workshop. Workshop Outcomes Paper for Clarence Valley Council”
- ❑ Ministry of Energy and Utilities (2003) “Shannon Creek Raw Water Conceptual HACCP Plan”

Residual risks in the Coffs Harbour HACCP plan were based on the events before the commissioning of the Karangi WTP. Residual risks for the two other assessments, undertaken for CVC, were based on treatment at the CVC WTPs. Maximum risks from the assessments were used for the workshop and residual risks subsequently assessed by the workshop based on treatment at Karangi WTP.

Table 11 and Table 12 summarise the residual risks and preventive measures for the Coffs Harbour and Nana Glen systems, respectively. For the full details of the outcomes from the Risk Assessment Workshop refer to Appendix C.

62 risks were identified through the workshop for the Coffs Harbour drinking water supply system:

- ❑ Maximum risks: 26 very high, 28 high, 5 moderate and 3 low; and
- ❑ Residual risks: NIL very high, 5 high, 28 moderate and 29 low

36 risks were identified through the workshop for the Nana Glen drinking water supply system:

- ❑ Maximum risks: 15 very high, 15 high, 3 moderate and 3 low; and
- ❑ Residual risks: NIL very high, 4 high, 18 moderate and 14 low

From Table 10, the greatest risks in the Coffs Harbour drinking water supply are associated with pathogens in the reservoirs and distribution systems, highlighting the importance of maintaining effective chlorination and filtration.

Table 11 notes that one of the greatest risks to the Nana Glen drinking water supply system, as for Coffs Harbour, is pathogens in the distribution system, again highlighting the importance of maintaining effective chlorination and filtration. Damage to the WTP through bushfire, mine sites in the catchment, and, importantly, failure of alarms also show as high risks, supporting a recommendation to install automatic control and alarms at the WTP.

Additionally, there is the potential that antimony mines in the Nymboida catchment pose a high risk to drinking water, particularly if disused or new mining sites are opened for production without stringent control. Council’s treated water is periodically tested for antimony as part of its water quality monitoring program. There have been no exceedances of ADWG to date.

Subsequent to the risk assessment workshop in February 2013, and stemming from Public Exhibition concerns, gold mining has been listed as a high risk in the Orara Catchment, particularly if disused or new mining sites are opened for production without stringent control. Additionally Pesticides and Chemicals from agriculture has also been listed as a high risk. These risks are included in the table below, with an accompanying footnote to indicate their addition after the workshop.

Table 11 Coffs Harbour Risk Identification and Preventive Measures

Hazard	Hazardous Event	Preventive Measures
Orara River Catchment		
Pathogens	<p>MODERATE</p> <p>On-site sewage management (OSSM) failure/breach</p> <p>Unrestricted livestock/stockyards</p> <p>Primary contact by humans</p> <p>Wildlife access</p> <p>Milk (waste) spills/dumping</p>	<p>OSSM policy</p> <p>LEP/planning controls</p> <p>Orara River Rehabilitation Strategy (ORRS)</p> <p>Community education including signs</p> <p>Incident management and communication plans</p> <p>Selective extraction CCP</p> <p>Extract from alternate source/catchment (eg Nymboida, Shannon Creek Dam)</p> <p>Karangi WTP process control (clarification, DAFF, chlorination, UV disinfection)</p>
#Chemicals	<p>HIGH</p> <p>Mine Sites</p>	<p>Environmental assessment</p> <p>Selective extraction CCP</p> <p>Extract from alternate source/catchment (eg Nymboida, Shannon Creek Dam)</p> <p>WTP process control</p>
#Chemicals	<p>HIGH</p> <p>Pesticides & agricultural chemicals</p>	<p>Selective extraction CCP</p> <p>Extract from alternate source/catchment (eg Orara, Shannon Creek Dam, Karangi)</p> <p>WTP process control</p>

Hazard	Hazardous Event	Preventive Measures
Nymboida Catchment		
Pathogens	<p>MODERATE</p> <p>Septic systems</p> <p>Dorrigo STP</p> <p>Saleyards</p> <p>Dairies</p> <p>Cattle/sheep</p> <p>Native animals</p> <p>Primary contact</p>	<p>CVC septic tank program</p> <p>OSSM policy</p> <p>LEP/planning controls</p> <p>ORRS</p> <p>Variable wastewater treatment at farms</p> <p>Dilution and long detention time in river</p> <p>Training of key users (rafting operators)</p> <p>Selective extraction CCP</p> <p>Extract from alternate source/catchment (eg Orara, Karangi Dam)</p> <p>WTP process control</p>
Chemicals	<p>HIGH</p> <p>Mines sites</p>	<p>Environmental assessment</p> <p>Selective extraction CCP</p> <p>Extract from alternate source/catchment (eg Orara, Shannon Creek Dam, Karangi)</p> <p>WTP process control</p>
#Chemicals	<p>HIGH</p> <p>Pesticides & agricultural chemicals</p>	<p>Selective extraction CCP</p> <p>Extract from alternate source/catchment (eg Orara, Shannon Creek Dam, Karangi)</p> <p>WTP process control</p>
Shannon Creek Dam		
Pathogens	<p>MODERATE</p> <p>Native animals</p>	<p>Selective extraction CCP</p> <p>Dilution</p> <p>Detention time</p> <p>Extract from alternate source/catchment (eg Orara, Nymboida, Karangi Dam)</p> <p>WTP process control</p>
RWSS		
Pathogens	<p>MODERATE</p> <p>Breach of pipelines through breaks/maintenance/new installations</p> <p>Receipt of out-of-spec water (> 2 NTU) from RWSS</p>	<p>Superchlorination of new pipes</p> <p>Standard Operating Procedures (SOP)</p> <p>Visual inspections</p> <p>Programmed maintenance</p> <p>Water-system dedicated maintenance team</p> <p>Online turbidity meters at Nymboida weir</p> <p>Flow meter before Karangi Dam</p>

Hazard	Hazardous Event	Preventive Measures
		Telemetry WTP process control
Chemicals	MODERATE Stratification leading to algal toxins, or metal dissolution	Communication between CVC and CHCC Aeration Multiple level off-take (currently not functioning) Telemetry Selective extraction CCP Extract from alternate source/catchment (eg Orara, Karangi Dam) WTP process control
Karangi WTP		
Pathogens	MODERATE pH correction failure (dosing failure of lime, CO ₂ , caustic) DAFF failure Inadequate chlorination	Programmed maintenance Well trained staff Procurement procedures Asset renewal schedule On-site spare parts Secondary CO ₂ dose Online monitoring and SCADA Option for manual overrides Residual chlorine levels in downstream reservoirs to shandy flows if chlorine is under-dosed
	MODERATE Inadequate UV radiation	Multiple/redundancy of UV channels/bulbs Programmed maintenance/servicing Procurement procedures Asset renewal schedule Online monitoring and SCADA
	MODERATE Loss of trained operators due to sickness, leave etc.	Workforce planning, including succession planning
	MODERATE Cyber security	Firewall PLC locks Specific user accounts

Hazard	Hazardous Event	Preventive Measures
		Passwords Operational and verification monitoring Daily manual checks of plant “Loss-of-communications” alarm Back-up of PLC code RHBT storage capacity
	MODERATE Plant site security	Fences Security cameras Intruder alarms Entry card access
	MODERATE Failure of alarms (including through lightning strike)	“Loss-of-communications” alarm Earths Reservoir storage Daily manual checks of WTP
Chemicals	MODERATE Power failure	Daily manual checks of WTP Automatic WTP shut down Trained operators “Loss-of-communications” alarm Service Level Agreement (SLA) with IT department Blackberry back-up system Daily manual operations Manual chlorine dosing Options for manual overrides
	MODERATE Infrastructure (pipework, lining of valves, pump, oils) leach components of materials due to chemical reaction	Cathodic protection Visual inspection Programmed maintenance Asset renewal schedule On-site spare parts Procurement procedures Standard materials lists Redundancy WTP process control, including PAC
Reservoirs		
Pathogens	HIGH Breach of reservoir integrity e.g. recontamination by	Chlorine residuals Electronic alarms on hatches

Hazard	Hazardous Event	Preventive Measures
	vermin (birds, snakes etc.)	Visual inspections Bypass capacity on some reservoirs Chlorine residual Alternate supply capacity
	MODERATE Deliberate contamination	Security fences Chlorine residuals Razor wire Electronic alarms on hatches Bypass capacity on some reservoirs Alternate supply capacity
Distribution		
Pathogens	HIGH Low chlorine residual (due to long lengths of reticulation) Breach of pipelines through breaks, inappropriate maintenance, new or service works etc. Cross-connections and backflows	Online monitoring Superchlorination of new pipes SOPs Mains flushing Water-dedicated maintenance team Mains replacement programs Inspection and flushing of new works by outside contractors Well-trained staff Maintain high operating pressures Backflow prevention devices (RPZ) Backflow prevention policy and audit/inspections Registered users and customer agreement for recycled water Most houses have non-return valves on meters WTP process control

Footnote for Table 11:

#: Chemicals – Added subsequent to workshop and public exhibition

Table 12 Nana Glen Risks and Preventive Measures

Hazard	Hazardous Event	Preventive Measures
Orara River Catchment Nana Glen		
Pathogens	MODERATE On-site Sewage System failure	On-site Sewage System Management Policy LEP/planning controls

Hazard	Hazardous Event	Preventive Measures
	or breach Unrestricted livestock/ stockyards Primary contact by humans	ORRS Community education Nana Glen WTP process control (clarification, filtration, chlorination)
Chemicals	MODERATE Milk (waste) spills/dumping Point sources e.g. dip sites, service station (petrol - BTEX)	Vegetation buffers Incident management and communication plans Dilution River processes (aeration) EPA requirement of individual fuel balance at service station WTP process control
	HIGH Mines sites in Orara Catchment (e.g. mercury, gold)	WTP process control
Turbidity	MODERATE Stormwater flows Railway crash in catchment	CVC/Bellingen Shire Council LEP (special area) ORRS Visual inspection 5 days storage in reservoir State Emergency Services (SES), emergency services communications Incident management procedures Option to truck water to WTP WTP process control

Hazard	Hazardous Event	Preventive Measures
Nana Glen WTP		
Pathogens	MODERATE Incorrect lime pre-dose Flocculation failure Filter and clarifier failure Inadequate chlorination pH correction failure (post dose lime and CO2)	Programmed maintenance Hand mixing lime slurry Well trained staff Procurement procedures Asset renewal schedule WTP process control 3 days/week operator presence Downstream turbidity alarm Manual jar test Online turbidity monitor after filter Plant shut down if backwash failure Automatic backwash 5 day storage Limited uninstalled back-up supply "Daily" manual dose determination Residual in downstream reservoir pH probe at inlet to reservoir
	MODERATE Loss of trained operators due to sickness, leave etc.	Workforce planning, including succession planning
	MODERATE PLC failure	Code backup
	MODERATE Plant site security	Fences Intruder alarms
	HIGH Failure of alarms/communications	IT alarms 5-day reservoir storage Free chlorine residual in reservoir
	HIGH Damage to WTP (bushfire, tree damage)	Coordination with SES, Rural Fire Services (RFS)

Hazard	Hazardous Event	Preventive Measures
Reservoirs		
Pathogens	<p>MODERATE</p> <p>Breach of reservoir integrity e.g. recontamination by vermin (birds, snakes)</p> <p>Deliberate contamination</p>	<p>Security fences</p> <p>Chlorine residuals</p> <p>Electronic alarms on hatches</p> <p>Bypass capacity on some reservoirs</p> <p>Covered roofed reservoirs</p> <p>Visual inspection</p> <p>Yearly cleans and identification of gaps/holes</p>
Distribution		
Pathogens	<p>HIGH</p> <p>Low chlorine residual</p>	<p>WTP process control</p> <p>Well-trained operators</p>

4.2 Preventive Measures

CHCC provides and supports a multi-barrier approach for the protection of the drinking water supply, as promoted by the ADWG (2011). The strength of this approach is that a failure in one barrier may be compensation by effective operation of the remaining barriers, minimising the likelihood of contaminants passing through to consumers.

The key barriers for the Coffs Harbour drinking water supply system include:

- Catchment Management
- Controlled Abstraction
- Aeration of Karangi and Shannon Creek Dams
- pH and Alkalinity adjustment
- Dissolved Air Flotation and Filtration
- Fluoridation
- Disinfection by Chlorination and UV
- Water Quality Monitoring regime

The key barriers for the Nana Glen drinking water supply system include:

- Catchment Management
- pH and Alkalinity adjustment
- Filtration
- Disinfection by Chlorination
- Water Quality Monitoring regime

The Australian Drinking Water Guidelines notes that protection of water sources is of paramount importance in reducing risks. Catchments can be protected by limiting access by humans and animals, limiting land uses to non-polluting types that will not contribute to risk and the use of buffer zones.

Development controls can be used to ensure that development is appropriate. Planning Instruments such as Local Environmental Plans (LEPs) may be used to help protect catchment integrity, for example inclusion of local provisions which restrict land use within catchments to types that will not pose a risk to water quality. Water catchment areas can be declared under the Local Government Act 1993 section 128 which may provide a layer of protection against land uses that pose risks to water quality.

4.3 Critical Control Points

Critical Control Points (CCP) are activities, procedures or processes where the operator can apply control, and are essential processes in reducing risks to an acceptable level. In order to distinguish acceptable from unacceptable performance at each point, target levels, alert levels and critical limits have been identified for the CHCC DWSS.

Critical control points were identified in consultation with CHCC, Clarence Valley Council, NSW Health Water Unit and Local Public Health Unit and NSW Office of Water and documented in Appendix D: Operational and Verification Monitoring. Table 2 and Table 3 summarise the CCPs for Coffs Harbour and Nana Glen, respectively. For each CCP level or limit operational procedures and corrective actions have been documented.

It is recommended that the CCP Target Levels, Operational Procedures and Corrective Actions are easily assessable for WTP Operators. This allows WTP Operators to ensure corrective actions are undertaken immediately if there is any deviation from the target level. A sample of draft signs that may be erected at the location of each CCP within the WTP are available in Appendix E.

Three different limits have been set for the CHCC drinking water supply system:

1. **Target level:** Representing day-to-day operational limits and procedures. This is what the WTP aims to achieve
2. **Alert Limit:** Deviation from the Alert Limit indicates a trend towards loss of control and corrective actions should be immediately taken to resolve the problem and restore control to the Drinking Water Supply System
3. **Critical Limit:** Deviation from the Critical Limit indicates loss of control and the potential of unacceptable health risks. If the critical limit is exceeded, incident and emergency plans should be immediately activated

Table 13: Coffs Harbour CCPs and Limits

Parameter	Frequency	Target	Operational Procedures	Alert Limit	Corrective Action	Critical Limit	Corrective Action
CCP1 Selective extraction							
Turbidity (NTU)	COCHRANE'S POOL Continuous	< 2	<ul style="list-style-type: none"> Visually inspect source water daily Daily (M-F) manual turbidity reading at laboratory Inspect sample pump daily Monitor weather forecast Monitor rainfall gauges Calibrate instrumentation: <ul style="list-style-type: none"> - 3 Monthly by operators - Quarterly by electricians - As required after floods, abnormal readings etc 	2 (> 10 min)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator Ensure automatic shut-down of pump Visual check at intake, including river level Manual grab sample, test Increase monitoring until target is reached Operator reset of pumps when target is reached 	> 2 (> 10 min)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator Ensure automatic shut-down of pumps Visual check at intake, including river level Manual grab sample, test Increase monitoring until target is reached Operator reset of pumps when target is reached Consider alternate source (of those available)
	NYMBOIDA RIVER Continuous	< 2	<ul style="list-style-type: none"> Review daily email from CVC, including weather forecast, rainfall, NTU Monitor daily flows on NSW Office of Water website Daily manual flow test at RWSS Visual inspection of source water by CVC CVC control of manual valve for flows to and from CVC 	2 (> 1 hour)	<ul style="list-style-type: none"> CVC manually reads meters and notifies CHCC of increased turbidity CVC closes supply valve to CHCC Daily sampling until turbidity reaches target Manually close valve inside RWSS inlet pit Increase monitoring until target is reached Manually open inlet pit valve when target is reached 	> 2 (> 1 hour)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator CVC operator notifies CHCC of increased turbidity Daily sampling until target is reached Manually close valve inside RWSS inlet pit Increase monitoring until target is reached Operator opens inlet pit valve when target is reached Consider alternate source (of those available)

Parameter	Frequency	Target	Operational Procedures	Alert Limit	Corrective Action	Critical Limit	Corrective Action
CCP 2 Aeration at Karangi Dam							
Aeration	Daily	6 hrs Runtime (DO > 7 mg/L at 27m)	<ul style="list-style-type: none"> Monitor compressor run time (at 27 meters) daily Monitor DO weekly (TWL, 3,6,9m) Monitor DO monthly (0, 3, 6, 9 to 27 meters) Record pump hour readings daily Programmed maintenance and servicing of compressor Calibrate instrumentation: 3 monthly 	< 6 hrs Runtime (DO < 7 mg/L at 27m)	<ul style="list-style-type: none"> Increase aeration time until DO increases Increase DO monitoring Visual inspection of source water, compressor and bubbles on surface mechanic/ electrician to repair as required Check DO probe; maintain as appropriate Undertake diver inspection on high pressure alarm on compressor 	> 6 hrs Runtime (DO < 5 mg/L at 27m)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator Increase aeration time until DO increases as required Increase DO monitoring until target is reached Repeat corrective actions Consider alternate source (or those available)
CCP 3 Coagulation							
pH after prime CO ₂	Continuous	8	<ul style="list-style-type: none"> Daily visual inspection of floc and monitoring, dosing systems Daily clean algae from probe Weekly clean of pH monitor (lime) Calibrate online pH monitor (monthly) Calibrate instrumentation: 3 monthly 	< 6.5 or > 9.5 (> 30 mins)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator Visual inspection of source water source Inspect CO₂, lime plant; clean/maintain as required Inspect probes, flow meters; clean/maintain as required Grab sample, manual test Manually adjust CO₂, lime dose as required Increase monitoring until target is reached 	< 5.8 or > 9.6 (> 15 min)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator Inspect CO₂, lime plant; clean/maintain as required Inspect probes, flow meters; clean/maintain as required Grab sample, manual test Manually adjust CO₂, lime dose as required Ensure alert to filtration Consider alternate source Increase monitoring until target is reached

Parameter	Frequency	Target	Operational Procedures	Alert Limit	Corrective Action	Critical Limit	Corrective Action
pH after trim CO ₂	Continuous	6.8	<ul style="list-style-type: none"> Daily visual inspection of floc and monitoring, dosing systems Daily clean algae from probe Weekly clean of pH monitor (lime) Calibrate online pH monitor (monthly) Calibrate instrumentation: 3 monthly 	< 5.8 or > 7.1 (> 30 mins)	<ul style="list-style-type: none"> Inspect CO₂, lime plant; clean/maintain as required Inspect probes, flow meters; clean/maintain as required Take grab sample, test manually Manually override process to adjust CO₂, lime dose as required Increase monitoring until target is reached 	< 5.5 or > 7.3 (> 5 min)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator Inspect CO₂, lime plant; clean/maintain as required Inspect probes, flow meters; clean/maintain as required Grab sample, manual test Manually adjust CO₂, lime dose as required Ensure alert to filtration process Increase monitoring until target is reached
CCP 4 Filtration (post filter)							
Turbidity (NTU) (after start up following backwash)	Continuous	< 0.1 (on individual/combined filters)	<ul style="list-style-type: none"> Daily visual inspection of filters Programmed maintenance/servicing Manually record NTU daily (individual and combined three filters) Calibrate instrumentation: 3 monthly 	> 0.3 (> 30 min)	<ul style="list-style-type: none"> Visual inspection of water source Visual inspection of clarifier Take grab sample, test manually Operator-initiated backwash as required Check coagulation; increase alum dose as required Increase monitoring until target is reached 	> 0.5 (> 15 min)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator Ensure discharge of flow from clarifier (no flow to filter) Ensure automatic shut-down of filter Repeat operational and corrective actions Investigate process controls Operator re-start of flow to filter when target is reached
Turbidity (maturation spike at start of filter run – filter ripening)	Continuous	< 0.1 (> 5 mins)	<ul style="list-style-type: none"> Calibrate instrumentation: 3 monthly 	> 0.5 NTU (> 30 min)	<ul style="list-style-type: none"> Operator-initiated backwash as required Check coagulation; increase alum dose as required Increase monitoring until target is reached 	> 1 NTU (> 5 min)	<ul style="list-style-type: none"> Repeat operational and corrective actions Investigate process controls Operator re-start of flow to filter when target is reached

Parameter	Frequency	Target	Operational Procedures	Alert Limit	Corrective Action	Critical Limit	Corrective Action
CCP 5 UV Disinfection (limits as per calibrated alarms for UV system)							
UV Transmissivity	Continuous	98 %	<ul style="list-style-type: none"> Programmed maintenance/servicing Calibrate instrumentation: 3 monthly 	95 % < 1.1 x min (> 4 hours)	<ul style="list-style-type: none"> Check filtration process/ turbidity levels Repair reactors as required Increase monitoring until target is reached 	85 % < 0.8 x min (> 1 hour)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator Notify NSW Health Confirm automatic shut-down of reactors Repeat operational and corrective actions Repair reactors as required Operator re-start of reactors when transmissivity reaches target
UV Dose	Continuous	< 48 mJ/cm²		< 22 mJ/cm (60 minutes)		< 20 mJ/cm (60 minutes)	
CCP 6 Fluoridation							
Fluoride at treated water storage (mg/L)	Continuous	1.0	<ul style="list-style-type: none"> Daily drop test (10 mins – instant dose rate) Daily historical (24hr) balance Daily manual analysis Daily manual fill of fluoride day tank Weekly monitoring of natural fluoride level Weekly lab monitoring at three points in reticulation Programmed maintenance Ensure restricted access to dosing facility Undertake fluoride training Calibrate instrumentation 	< 0.95 or > 1.05 (1 hour)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator Respond as Fluoridation Code of Practice and CHCC Emergency Response Plan Ensure automatic plant shut-down Resample and test water Inspect dosing system Transfer water from treated water storage to emergency storage lagoon; shandy as appropriate Increase monitoring until target is reached Operator re-start of plant when target is reached 	< 0.9 or > 1.5 (15 min)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator Notify NSW Health Respond as Fluoridation Code of Practice and CHCC Emergency Response Plan Ensure automatic plant shut-down Resample and test water Inspect dosing system and Repair Transfer water from treated water storage to emergency storage lagoon; shandy as appropriate Increase monitoring until target is reached Operator re-start of plant when target is reached

Parameter	Frequency	Target	Operational Procedures	Alert Limit	Corrective Action	Critical Limit	Corrective Action
CCP 7 Chlorine Disinfection							
Chlorine residual at treated water storage outlet (mg/L)	Continuous	1.2 – 2.0 (seasonally dependent)	<ul style="list-style-type: none"> Daily manual free chlorine test on inlet and outlet of treated water storage and RHBT Daily free chlorine monitoring (Monday-Friday) at RHR Programmed maintenance/servicing Monthly calibration of instrumentation 	< 1.2 or > 2 (> 30 mins)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator; adjust chlorine dose as required Visual inspection of dosing point and repair as required Inspect filter and adjust as required Inspect flocculation and adjust as required Inspect pH correction points and adjust as required Increase monitoring at inlet and outlet until target is reached 	< 0.9 or > 2.5 (> 5 mins)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator Notify NSW Health Shut-down of pump to RHBT Check online monitor at RHBT Manual dose at treated water storage as required Repeat operational and corrective actions Transfer water from treated water storage to emergency storage lagoon; shandy as appropriate Operator re-start of RHBT pump when target is reached Consider boiled water alert
pH at outlet of treated water storage outlet (pH units)	Continuous	7.7	<ul style="list-style-type: none"> Confirm automatic adjustment of dose Weekly manual monitoring Monthly calibration of instrumentation 	< 7.2 > 8.3 (> 30 mins)	<ul style="list-style-type: none"> Notify Treatment Manager Visual inspection of dosing systems Adjust lime/acid dose as required Increase manual monitoring until target is reached 	< 7.0 > 8.5 (> 30 min)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator Shut-down of RHBT pump Adjust lime/acid dose at tank Transfer water to emergency storage lagoon; shandy as appropriate Increase manual monitoring until target is reached Operator re-start of RHBT pump when target is reached

Parameter	Frequency	Target	Operational Procedures	Alert Limit	Corrective Action	Critical Limit	Corrective Action
CCP 8 Point-of-Supply Disinfection							
Free chlorine at point-of-supply (mg/L)	Weekly	> 0.2	<ul style="list-style-type: none"> Weekly testing at point-of-supply (E.coli, total coliforms, free chlorine) Mains flushing Calibrate instrumentation: 3 monthly 	< 0.2	<ul style="list-style-type: none"> Contact Distribution Manager and Water Coordinator Check chlorine at appropriate reservoir Hand dose at appropriate reservoir if chlorine < 0.3 mg/L, according to SOP. Retest and re-dose as appropriate Consider increasing chlorine dose at RHBT, WTP, chlorine booster Increase monitoring until target is reached 	< 0.1	<ul style="list-style-type: none"> Notify Distribution Manager, Water Coordinator Notify NSW Health Respond as per NSW Health Drinking Water Quality Protocol (2005) Repeat corrective actions Flush mains Increase monitoring until target is reached Consider boiled water alerts

Table 14: Nana Glen CCPs and Limits

Parameter	Frequency	Target	Operational Procedures	Alert Limit	Corrective Actions	Critical Limit	Corrective Actions
CCP1 Coagulation/Filtration							
Turbidity after filtration (NTU)	Continuous	< 0.3	<ul style="list-style-type: none"> Weekly visual inspection of source water 3-times/week visual inspection of floc and filters Manual 3-times/week recording of NTU 3-times/week pH, alkalinity, colour, turbidity monitored at raw water and treated water reservoir Calibrate instrumentation: 3 monthly 	> 0.5	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator on repeat occurrences or additional problems Visual inspection of water source Visual inspection of floc, dosing systems; adjust dose/repair as appropriate Manual grab sample and jar test Initiate manual backwash Calibrate instrumentation Increase monitoring until target is reached 	> 1.0	<ul style="list-style-type: none"> Notify Water Treatment Manager, Water Coordinator Ensure automatic shut-down filter Repeat corrective actions Increase monitoring until target is reached Alert supervisor Water Treatment Manager on repeat occurrences Cart water if limit exceeded for long time Manual re-start of filter when target is achieved
CCP 2 Disinfection							
Chlorine residual in reservoir (mg/L)	3-times/ week	0.8 (summer) 0.5 (winter)	<ul style="list-style-type: none"> 3-times/week manual free chlorine test in reservoir 3-times/week operational monitoring Monthly calibration of equipment Programmed maintenance/ servicing 	< 0.5	<ul style="list-style-type: none"> Consult with Treatment Manager, Water Coordinator; adjust chlorine dose Visual inspection of dosing point/system; repair as required Visual inspection of filter; backwash as appropriate Visual inspection of floc, dosing systems; adjust dose/repair as appropriate Increase manual testing 	< 0.3	<ul style="list-style-type: none"> Notify Water Treatment Manager, Water Coordinator Notify NSW Health Manual plant shut-down Manual dose at reservoir as required Repeat corrective actions Increase monitoring until target is reached Manual re-start of plant when target is reached Consider boiled water alert

Parameter	Frequency	Target	Operational Procedures	Alert Limit	Corrective Actions	Critical Limit	Corrective Actions
					<ul style="list-style-type: none"> • Calibrate equipment • Take reservoir off-line, re-fill and add chlorine; balance and shandy the two reservoirs together. • Increase monitoring until target is reached 		
CCP 3 Disinfection at point-of-supply							
Free chlorine at point-of-supply (mg/L)	Fortnightly	> 0.3	<ul style="list-style-type: none"> • Fortnightly testing at point-of-supply (<i>E.coli</i>, total coliforms, free chlorine) • Mains flushing 	< 0.2	<ul style="list-style-type: none"> • Notify Water Treatment Manager, Water Coordinator • Check chlorine at appropriate reservoir • Hand dose at appropriate reservoir • Retest and re-dose as appropriate • Consider increasing chlorine dose WTP • Increase monitoring until target is reached 	< 0.1	<ul style="list-style-type: none"> • Notify Water Treatment Manager, Water Coordinator • Notify NSW Health • Respond as per NSW Health Drinking Water Quality Protocol (2005) • Repeat corrective actions • Increase monitoring until target is reached • Consider boiled water alert

4.4 Catchment Management

The structure for management of Council's water supply catchments stems from agreement between CHCC and Clarence Valley Council in 2008. It was agreed that both Council's would work with and assist the Catchment Management Authority towards water supply catchment improvements.

Clarence Valley Council would take responsibility to assist with the rehabilitation of the Nymboida catchment, and CHCC would take responsibility for continuing to assist with the rehabilitation of the Orara catchment. These catchments provide the source water for both Council's potable supply.

In recent years, annual funding in the order of \$50,000 has been allocated by Coffs Harbour water for riparian improvement works within the Orara Catchment. Rehabilitation works in the catchment are undertaken on Coffs Harbour Waters behalf predominantly by the Orara Valley Rivercare Groups Management Committee, through Council's Environmental Grant process. Coffs Harbour water have a strong commitment to continued funding of the OVRGMC for rehabilitation works. In addition to historical funding provided by Coffs Harbour Water, the OVRGMC have been successful in securing much larger funding grants provided by Coffs Harbour City Council (non CHW sourced) and other state and federal agencies. An integral aspect of the Coffs Harbour Water funding is that it can be used to leveraging dollar for dollar conditional grants from external agencies.

The OVRGMC aims for the catchment are aligned with those of CHW in that both organisations are looking to build healthy waterway ecosystems within the catchment. The OVRGMC are recognised as one of the leading Rivercare groups, having won a number of state and federal awards. Since 1998 they have successfully coordinated millions of dollars worth of rehabilitation works within the catchment. Their future works are guided by the The Orara River Rehabilitation Strategy 2013-2023. This strategy ties in with the Coffs Harbour Biodiversity Strategy 2009, and also overarching this is the NSW Catchment Management Authorities Northern Rivers Catchment Action Plan 2013.

4.5 Mining

4.5.1 Councils Opposition to Mining within Council's Drinking Water Catchments

Council actively lobby against any proposed mining activities within Council's drinking water catchments. Council has adopted the following resolutions in regard to mining within Council's LGA;

(Council Ordinary meeting 26 July 2012)

- To oppose coal seam gas exploration and mining
- To write to the Premier of NSW informing him of Council's position and seeking a ban on coal seam gas mining and exploration in the Clarence-Moreton Basin and across the North Coast.
- To write to our local members of parliament (both state and federal) seeking support for Council's position.
- Support other Councils in NSW in their opposition to coal seam gas mining

(Council Ordinary meeting 26 April 2012)

- Adopt as a matter of policy strong concerns with regard to any proposal to mine toxic materials within the regional water supply catchment area in light of the potential impacts on the health and wellbeing of the Coffs Harbour community; and

- Correspond with the relevant authorities to inform them of Council’s policy position outlined above such as Ministers responsible for minerals, resources and water also Minister for Planning and Minister for the Environment and Commonwealth Ministers, particularly the Commonwealth Minister for the Environment.

Should a mining development be proposed within Council’s Drinking Water Catchments a development application assessment process would be required to be followed by the relevant consent authority (ie CHCC or the State).

The Local Environment Plan 2013 is a primary mechanism by which Council controls development within the CHCC water catchments.

Special provisions are in place for the Cochranes Pool Drinking Water Catchment (as is outlined on page 17 of Appendix A, Technical Note 1, Regulatory and Formal requirements).

Clause 7.5 of The Coffs Local Environmental Plan 2013 specifically refers to drinking water catchments and development applications. It states that any consent authority (ie CHCC or the State), when dealing with a DA should comply with the provisions of Clause 7.5 (below).

Clause 7.5 Drinking water catchments

- (1) The objective of this clause is to protect drinking water catchments by minimising the adverse impacts of development on the quality and quantity of water entering drinking water storages.
- (2) This clause applies to land identified as “Drinking water catchment” on the Drinking Water Catchment Map.
- (3) Before determining a development application for development on land to which this clause applies, the consent authority must consider the following:
 - (a) whether or not the development is likely to have any adverse impact on the quality and quantity of water entering the drinking water storage, having regard to the following:
 - (i) the distance between the development and any waterway that feeds into the drinking water storage.
 - (ii) the on-site use, storage and disposal of any chemicals on the land,
 - (iii) the treatment, storage and disposal of waste water and solid waste generated or used by the development,
 - (b) any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.
- (4) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that:
 - (a) the development is designed, sited and will be managed to avoid any significant adverse impact on water quality and flows, or

(b) if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or

(c) if that impact cannot be minimised—the development will be managed to mitigate that impact.

A mining development proponent may seek consent from the NSW Minister for Planning & Infrastructure for their proposal to be assessed as a State Significant Development (SSD). State significant mining development can be designated if it involves extraction of more than 20,000 tonnes of ore or having a capital investment value greater than \$30 million.

If consent is granted by the Minister, development assessment decisions will not be made by Council. Developments will be assessed by the Minister, the Planning Assessment Commission (PAC) or by senior officers of the NSW Planning and Infrastructure Department depending on its particulars of the DA.

Prior to SSD development applications being lodged, Council and the NSW Planning and Infrastructure Department are given a short timeframe (14 days & 28 days respectively) to provide their recommended requirements that they want the proponent to meet at lodgement. (reference <http://www.planning.nsw.gov.au/Portals/0/DevelopmentAssessment>)

After lodgement of the SSD application, Council are given a minimum of 30 days to make submissions for consideration by the State during assessment. Development assessment decisions will then be made by either of the state government agencies previously mentioned.

As short timeframes are involved in this process, an action item is listed in the improvement plan to assist Council in providing adequate response during this process. The action item calls for the prior scoping of Mining DA requirements for calling on in the event that SSD mining activities are proposed within Council's Drinking Water Catchments.

Several mining companies are known to have/be investigating the viability of mining within Council's water supply catchments in recent years. These include aerial magnetic surveys to assess potential for gold and copper mining within the Orara Drinking Water Catchment near Coramba and Karangi. Other mining evaluation activities within the catchment have also occurred at Mt Browne. Evaluation activities have also been undertaken at Bielsdown in the Nymboida catchment.

If, in the event that, against Council's opposition, consent were granted for mining to be established within Council's drinking water catchments, then Coffs Harbour Water would expand its heavy metals monitoring program to include catchment areas within proximity of the mine. A review of Council's water treatment processes would also be expected to occur.

4.5.2 Past Mining within Council's Drinking Water Catchments

Historically the Orara and Nymboida catchment areas were part of gold fields that operated in the late 19th and early 20th century. It is understood that there are hundreds of old mine sites within the area, presumably of scale associated with the technology of the time. Presently, no mining extraction is known to be occurring within Council's drinking water catchments other than crushed rock extraction (for roadmaking uses, etc).

Hazardous chemicals most commonly known to be associated with gold mining activities include mercury and cyanide. Mercury is commonly associated with old mining extraction techniques, and cyanide with more modern techniques.

Council undertakes regular testing for heavy metals including antimony, arsenic, cadmium, chromium, copper, mercury and selenium. Operational testing is outlined in table 15, section 5.1 of the CHCC DWMS. Heavy metal testing is incorporated into test B (Refer notes on page 56). Previous testing has indicated that heavy metals have not been an issue for Council's drinking water, with all past tests results below Australian Drinking Water Guideline values.

There are several mining related items listed for investigation in Council's Improvement Plan (items 26, 28). The items listed do not stem from any adverse water quality testing results, but reflect a precautionary approach being taken, due to an awareness that past mining activities have been undertaken within the catchments.

5 Monitoring of Drinking Water System

5.1 Operational Monitoring

CHCC undertakes monitoring of water quality in the Coffs Harbour and Nana Glen DWSS. Monitoring is undertaken by CHCC in the source water (Orara River and Karangi Dam, treatment plants and distribution systems). Clarence Valley Council undertakes daily monitoring at Nymboida Weir and Shannon Creek Dam with results reported to CHCC.

In the Coffs Harbour drinking water supply system, monitoring is continuous online, with manual checks undertaken regularly for turbidity, chlorine residual, fluoride and pH at the Karangi WTP.

Process water quality monitoring at the Karangi WTP includes the following:

- Raw water at Inlet to the plant- turbidity, pH, and alkalinity;
- Clarified water- turbidity and pH;
- Filtered water- turbidity and pH;
- Treated water at the clearwater well – turbidity, colour, pH, temperature, free chlorine, total chlorine, aluminium, iron and manganese;
- Potable water at treated water reservoir- turbidity, colour, pH, temperature, free chlorine, total chlorine, fluoride, aluminium, iron, magnesium, hardness and salinity.

In the Nana Glen drinking water supply system, monitoring is undertaken manually, with the exception of turbidity after filtration, which is continuously monitored.

The monitoring schedule undertaken by Council is detailed in Appendix D: Operational and Verification Monitoring. Table 15 and Table 16 summarise the operational monitoring schedules for the two DWSS.

Table 15 Coffs Harbour Operational Monitoring Schedule

Site	Sample Point	Sampled By	Frequency	Tests Done
Source and Raw Water				
	Regional Intake	Water S, Lab T	Monthly	pH, Conductivity, Calcium Hardness, Alkalinity, Iron, Manganese, Turbidity, Apparent Colour
	Regional Intake - Coramba	Lab Staff	Monthly	pH, Turbidity, Colour (Apparent, Total), Total Organic Carbon, Coliforms (Faecal, Total)
	Regional Intake-Coramba	Water S, Lab T	Yearly	∅Pesticide & agricultural chemicals
	Regional Intake - Karangi	Lab Staff	Monthly	pH, Turbidity, Colour (Apparent, Total), Total Organic Carbon, Coliforms (Faecal, Total)

Site	Sample Point	Sampled By	Frequency	Tests Done
001	Orara River - Cochranes Pool	Lab Staff	Monthly	pH, Turbidity, Colour (Apparent, Total), Total Organic Carbon, Coliforms (Faecal, Total)
	Cochrane's Pool	Water S, Lab T	Monthly	Iron, Manganese
	Cochrane's Pool	Water S, Lab T	Yearly	∅Pesticide & agricultural chemicals
	Karangi Dam	Water S, Lab T	Yearly	∅Pesticide & agricultural chemicals
	Karangi Dam 1m	Water S, Lab T	Monthly	pH, Conductivity, Calcium Hardness, Alkalinity, Iron, Manganese, Total Nitrogen, Total Phosphorous
	Karangi Dam (3m, 6m, 9m)	Water S, Lab T	Monthly	Iron, Manganese
	Karangi Dam outlet (TWL, 1m, 3m, 6m, 9m)	Water S, Lab T	Weekly	Dissolved Oxygen, Temperature, Colour, Turbidity
	Karangi Dam (TWL, 1m, 3m, 6m, 9m, 12m, 15m, 18m, 21m, 24m)	Water S, Lab T	Monthly	Dissolved Oxygen, Temperature, Colour, Turbidity
	Karangi Dam (TWL, 1m, 3m, 6m)	Water S, Lab T	Weekly	Freshwater Algae Identification
	Karangi Dam (9m, 12m, 15m, 18m, 21m, 24m, 27m)	Water S, Lab T	Monthly	Freshwater Algae Identification
002	Karangi Dam	Lab Staff	Monthly	pH, Turbidity, Colour (Apparent, Total), Total Organic Carbon, Coliforms (Faecal, Total)
Treated Water				
007	Red Hill Reservoir - Coramba Rd. (East of Res.)	Lab S & T Water S, Lab T	Weekly Monthly	A pH, Conductivity, Calcium Hardness, Alkalinity, Iron, Manganese
Distribution System (Reservoirs)				
010	Macauley's - Mastracolas Rd (North of Res)	Lab S & T	Yearly	A
011	Roberts Hill - Kratz Dr. (North of Res.)	Lab S & T	Twice/Year	A
012	Mullaway - Tramway Dr. (East of Res)	Lab S & T	Yearly	A
013	Bark Hut - Bark Hut Rd.	Lab S & T	Yearly	A

Site	Sample Point	Sampled By	Frequency	Tests Done
	(East of Res.)			
014	Woolgoolga Headland - Ocean St. (West of Res.)	Lab S & T	Yearly	A
015	Scarborough St - Scarborough St. (East of Res.)	Lab S & T	Yearly	A
016	Emerald - Stefan Cls. (South of Res.)	Lab S & T	Yearly	A
017	Moonee - MacCues Rd. (North of Res.)	Lab S & T	Yearly	A
018	Sapphire - Old Coast Rd. (East of Res.)	Lab S & T	Yearly	A
019	Sawtell Headland - Boambee Headland (South of Eastern Res.)	Lab S & T	Twice/Year	A
020	Toormina - Belbowrie Rd. (South of Eastern Res.)	Lab S & T	Twice/Year	A
Supply to Consumer (Reticulated)				
021	Ulmarra offtake - Eggins Cl. (Next to meter pit)	Lab S & T	Every 4 Weeks 18 month rotation	A B
022	Arwarra - 2nd Ave.(Toilet Block, in service bay)	Lab S & T	Every 4 Weeks 18 month rotation	A B
023	Safety Beach - Ocean Drive. (SPS)	Lab S & T	Fortnightly 18 month rotation	A B
024	Woolgoolga - N. End Lake Rd.(Toilet Block, in service bay)	Lab S & T	Fortnightly 18 month rotation	A B
025	Sandy Beach - Sandy Beach Dr.(Toilet Block, in service bay)	Lab S & T	Every 4 Weeks 18 month rotation	A B
026	Emerald - Fiddamans	Lab S & T	Every 4	A

Site	Sample Point	Sampled By	Frequency	Tests Done
	Rd.(Reserve Toilet Block, East side)		Weeks 18 month rotation	B
027	Moonee -Woodhouse Rd (Bushfire Shed, North side)	Lab S & T	Fortnightly 18 month rotation	A B
028	Sapphire - Sapphire Cr.(SPS 69)	Lab S & T	Fortnightly 18 month rotation	A B
029	Korora - Sandy Beach Dr.(Toilet Block, South end)	Lab S & T	Fortnightly 18 month rotation	A B
030	Coffs Harbour Nth - York St (SPS 44)	Lab S & T	Fortnightly 18 month rotation	A B
031	Coffs Harbour Nth - Marcia St Depot (North end Stores Build)	Lab S & T	Fortnightly 18 month rotation	A B
032	Coffs Harbour Sth - Council Chambers (Riding Lane, carpark wall)	Lab S & T	Fortnightly 18 month rotation	A B
033	Coffs Harbour Sth - Jetty Oval (Toilet Block, South side)	Lab S & T	Fortnightly 18 month rotation	A B
034	Sawtell - Boronia Park (West side Lions Shed)	Lab S & T	Fortnightly 18 month rotation	A B
035	Toormina - Sea Breeze Pl. (SPS 21)	Lab S & T	Fortnightly 18 month rotation	A B
036	Toormina - Hamilton Dr. (SPS 17)	Lab S & T	Fortnightly 18 month rotation	A B
041	Corindi Beach Aboriginal Community	Lab S & T	Monthly # Twice Yearly	A B
042	Wongala Estate Aboriginal Community	Lab S & T	Monthly # Twice	A B

Site	Sample Point	Sampled By	Frequency	Tests Done
			Yearly	
043	Karangı Water Treatment Plant - Treated Water	Lab S & T	Weekly	A
Extra Sampling for Reticulated Supply				
	Reticulation Fluoride Testing	Lab Staff	Weekly	Fluoride (3 samples from 021 - 043: 1 from northern sites; 1 from Coff's sites; 1 from Sawtell sites)
007	Redhill Reservoir	Lab Staff	Weekly	pH, Turbidity, Apparent Colour, Alkalinity, Calcium Hardness, Fluoride, Iron, Manganese
043	Karangı Water Treatment Plant (Treated Water)	Lab Staff	Weekly	pH, Turbidity, Apparent Colour, Alkalinity, Calcium Hardness, Fluoride, Iron, Manganese
	Coff's Harbour Tap Water (either 030, 031, 032 or 033)	Lab Staff	Weekly	pH, Turbidity, Alkalinity, Apparent Colour
	Woolgoolga Tap Water (tap at Woolgoolga WRP)	Water S, Lab T	Weekly	pH, Turbidity, Alkalinity, Apparent Colour
034	Sawtell Tap Water (034)	Water S, Lab T	Weekly	pH, Turbidity, Alkalinity, Apparent Colour, Chloride (monthly)
041	Corindi Beach Aboriginal Community	Lab Staff	** Twice yearly	pH, Turbidity, Fluoride
042	Wongala Estate Aboriginal Community	Lab Staff	** Twice yearly	pH, Turbidity, Fluoride

Footnotes:

Lab S & T: Samples collected by lab with analysis (testing) undertaken/arranged by lab.

Water S Lab T: Samples collected and delivered to lab by CHCC Water staff with analysis (testing) undertaken or arranged by CHCC laboratory staff.

Twice Yearly: Testing has not been undertaken prior to 2013 but is proposed to be undertaken from 2013 onwards twice yearly, subject to review by Manager Distribution.

**** Twice Yearly:** Testing has been undertaken monthly prior to 2013 but is proposed to be undertaken from 2013 onwards twice yearly subject to review by Manager Distribution.

18 Month Rotation: Testing is undertaken at one different site each month. There are 18 sites in total.

Test A: Total coliforms; *E. coli*; free chlorine and temperature

Test B: Allocated Chemical: pH, turbidity, total dissolved solids, total hardness, true colour, iodide, aluminium, antimony, arsenic, barium, boron, cadmium, calcium, chromium, copper, (⊕ cyanide), iron, magnesium, manganese, mercury, molybdenum, nickel, selenium, silver, sodium, zinc, chloride, fluoride, sulphate, nitrate, and nitrite.

⊕: Test added subsequent to workshop and public exhibition

Table 16 Nana Glen Operational Monitoring Schedule

Site	Sample Point	Sampled By	Frequency	Tests Done
Source				
	Orara River (Grafton Street Bridge)	Lab S & T	Monthly	Faecal Coliforms, Total Coliforms
Raw Water				
	Intake	Water S & T	Fortnightly	Al
	Intake	Water S, Lab T	Yearly	Pesticide
005	Nana Glen Pump Intake	Water S, Lab T	Monthly	pH, Conductivity, Turbidity, Apparent Colour, Calcium Hardness, Alkalinity, Iron, Manganese
Treatment Plant (including Reservoirs)				
	Treated Water	Water S & T	Approx 3 times/week	Flow, Turbidity, pH
	Reservoirs 1 & 2	Water S & T	Approx 3 times/week	Free Cl; Reservoir 2: level
	Reservoirs 1 & 2	Water S, Lab T	Monthly	Turbidity, pH, Al, Alkalinity, Hardness, Colour Apparent, Conductivity, Fe, Mn
Extra Sampling				
	Reservoir 1 & 2 (at WTP)	Water S, Lab T	Monthly	For each reservoir: pH, Conductivity, Turbidity, Apparent Colour, Calcium Hardness, Alkalinity, Iron, Manganese, Aluminium
Supply to Consumer (Reticulated)				
008	Nana Glen - Grafton St (Park by River)	Lab S & T	Fortnightly 18 month rotation	A plus extra sampling of Al B
	Nana Glen - Grafton St (Park by River)		6-monthly	Chemical, Physical

5.2 Verification of Drinking Water Management

The verification of drinking water quality supplied to the consumer assesses the overall performance of the system. Verification provides an important link back to the operation of the water supply

system and additional assurance that the preventive measures and treatment barriers have worked and are supplying safe quality water.

Council monitors water quality at the point of supply as part of the NSW Health Drinking Water Monitoring Program. Analysis of these samples provides ongoing independent verification of the treatment process. Minimum frequency of sampling is based on population. The Program assesses 39 parameters for microbial, physical and chemical properties of the water as detailed in Table 17.

Table 18 lists the locations for the Program in both Coffs Harbour and Nana Glen DWSS. The results can be accessed by authorised CHCC staff from the Drinking Water Database.

<http://www.health.nsw.gov.au/environment/water/Pages/drinking-water-database.aspx>

CHCC’s water laboratory is responsible for the collection of samples for the NSW Health Drinking Water Monitoring Program. Samples are submitted in accordance with the “*Guide for Submitting Water Samples to FASS for Analysis*” (Sydney West Area Health Service, 2010) and Council procedures for samples. Exceedances are reported to the Manager, Water Treatment, Executive Manager, CHW Operations and the Local Public Health Unit. The CHCC laboratory analyses the microbiological samples and submits results to the NSW Drinking Water Database.

In addition to the NSW Health Drinking Water Monitoring Program, Council undertakes weekly operational monitoring at point of supply as part of the Council’s operating procedures.

Table 17 NSW Health Monitoring Program Parameters

Parameters		
Microbial		
E. coli	Total Coliforms	
Disinfection		
Free Chlorine	Total Chlorine	
Fluoridation		
Fluoride (daily WU) ¹	Fluoride (WU result) ¹	
Fluoride (weekly WU) ¹	Fluoride Ratio	
Physical		
pH	Total Dissolved Solids (TDS)	
True Colour	Total Hardness as CaCO ₃	
Turbidity		
Chemicals		
Aluminium	Copper	Nickel
Antimony	Fluoride	Nitrate
Arsenic	Iodide	Nitrite
Barium	Iron	Selenium
Boron	Lead	Silver
Cadmium	Magnesium	Sodium

Parameters		
Calcium	Manganese	Sulphate
Chloride	Mercury	Zinc
Chromium	Molybdenum	

¹ As fluoride dosing is not undertaken in Nana Glen drinking water supply system, sampling is only undertaken in Coffs Harbour DWSS. Other parameters can be analysed on request or as part of a special project.

Table 18 NSW Health Verification Monitoring Sites

Town	Sampling Site	Location
Ararwarra	21	Eggins Drive
	22	Second Avenue
Coffs Harbour	10	Mastracolas Road
	11	Kratz Drive
	30	York Street
	31	Marcia Street
	32	Coffs St
	33	Orlando St
	40	Ocean Parade
	7	Coramba Road
	Coramba	9
Corindi	1	Pacific Street
	2	Coral Street
	3	MacDougall Street
	4	Pacific Street
Corindi Beach aboriginal community	41	Red Rock Road
Emerald Beach	16	Stefan Close
	26	Fiddamans Road
Korora	29	Sandy Beach Road
Moonee Beach	17	MacCues Road
	27	Woodhouse Road
Mullaway	12	Tramway Drive
Safety Beach	23	Ocean Drive
Sandy Beach	25	Beach Drive
Sapphire	18	Old Coast Road
	28	Sapphire Crescent
Sawtell	19	Boambee Headland
	34	Boronia Park
Toormina	20	Belbowrie Rd
	35	Sea Breeze Place

Town	Sampling Site	Location
	36	Hamilton Drive
Wongala Aboriginal community	42	Wongala
Woolgoolga	13	Bark Hut Road
	14	Ocean Street
	15	Scarborough Street Reservoir
	24	Lake Road
Nana Glen	8	Grafton Street
	999	Not Defined, Nana Glen

5.3 Consumer Satisfaction

CHCC undertakes a Customer Satisfaction Survey on a 2-yearly basis. The most recent, “Coffs Harbour City Council Resident Satisfaction Survey” completed in 2012 (Jetty Research, 2012), rates urban and rural customer satisfaction and importance with water supply amongst 25 CHCC-supported facilities and services. The survey is available on the CHCC website and in hardcopy at the Council chambers.

CHCC’s *“Complaints and Other Feedback Policy”* (2008) outlines basic procedures and principles for the management of customer complaints. Complaints may be received by telephone, letter or in person. Water complaints are referred to CHW Administration or the Coordinator, Water Supply at the Works Depot, who arrange works crews to investigate and determine the appropriate course of action. Complaints are recorded in CHCC’s document management system (Technology One Enterprise Content Management (ECM)) and referred to the appropriate Manager (Water Treatment or Distribution) if required. Follow-up actions, customer response and close-out are detailed in ECM for each complaint.

In the near future, CHW intends to introduce ‘SharePoint’ software for recording water system customer complaints. This software will provide an additional tool for managing the customer complaints process.

Council reports on the time taken to resolve consumer complaints as a key performance indicator. The Water and Sewerage Strategic Business Plan (HydroScience Consulting, 2012) identifies an average of two hours response time to have staff on-site or answer inquiry.

Breakages and customer complaints are registered and can be mapped for future asset management.

Customer service staff is trained to deal appropriately with customers to ensure good relations are maintained between Council and the community.

5.4 Short Term Evaluation of Results and Corrective Action

Council evaluates water quality data on receipt of operational and point-of-supply monitoring results. Water quality results from NSW Health Monitoring Program are reported to Council’s Manager, Water Treatment and Executive Manager, CHW Operations. Compliance is assessed against the ADWG. Any exceedances are immediately reported to Manager, Water Treatment and the Local Public Health Unit.

Attachment 2

Drinking water quality exceedances from NSW Health monitoring triggers a notification by the laboratory to Executive Manager, CHW Operations and subsequently to the appropriate Water Treatment or Distribution Manager. Daily print-outs of laboratory results are distributed to CHW Management.

6 Operational Procedures and Process Control

6.1 Operational Procedures and Corrective Actions

As part of the development of the DWMS, key operating procedures and corrective actions were established for each critical control point:

- Coffs Harbour drinking water supply – selective extraction, aeration, coagulation, filtration, UV disinfection, fluoridation, chlorination disinfection, point of supply disinfection
- Nana Glen drinking water supply – coagulation/filtration, disinfection, point of supply disinfection

The CCPs have documented operational procedures that support Council to achieve the target criteria and corrective actions when alert levels or critical levels are reached. Refer to the CCP's under Risk Management and Controls. CCP signs have been developed and are attached in Appendix E.

The “*Coffs Harbour WTP: Operations and Maintenance Manual for Karangi WTP*” (Coffs Infrastructure Alliance, 2009) is available in both hard and soft copy from CHCC. The O&M Manual and the full WTP Functional Specification detail WTP operational control, including:

- Automatic Operating Mode, including the PLC control specification and plant start/stop controls triggered primarily by levels at the treated water storage tank
- Manual Operating Mode, including the generic drive operation specification
- Emergency Operating Modes, including ‘Filter Bypass’ and ‘Mains Power Failure’ modes
- WTP Flow Rate Adjustment, detailing the required balance between existing demand, historical daily consumption, seasonal conditions, weather, estimated plant losses and operating hours limitations
- Alarms Systems, including the priority of alarms and actions required for each alarm

Regular operational tasks, undertaken on a daily, weekly, monthly and more than monthly basis are documented in Appendix B of the O&M Manual, “*Routine Inspection, Testing, Monitoring and Maintenance*”.

The “*Nana Glen Water Treatment Plant and Raw Water Pumping Station Operating and Maintenance Instruction Manual*” (Reed Constructions Services Pty Ltd, 1994) is available in both hard and soft copy from CHCC. It covers a general description of treatment, plant data, laboratory testing and provides details on the following:

- Plant Operation Activities and Maintenance, including weekly log sheets
- Plant Control, including sequence of operation and levels, flows, pressure limits and timing for plant operation
- Plant Emergency Alarm Shut Downs, Alarm Annunciators and manual by-passes

6.2 Equipment Capability and Maintenance

Details of all water assets, including brand, model, age and type of material, are recorded on “*Asset Master*”, an asset database system, managed by the “*Asset Systems*” department of CHCC.

Council’s 20-year financial plan has developed a renewal schedule for major water assets. Periods for servicing and replacement of smaller-WTP assets, including pumps and filters, are detailed in the Operations and Maintenance Manual for each WTP. Specific scheduling of renewal/replacement is determined by the Superintendent Headworks.

The customer complaints/mains breaks register and GIS map are reviewed annually by the Manager, Distribution to develop an annual plan for asset replacement.

6.3 Materials and Chemicals

CHCC’s objective is to ensure all equipment purchased performs adequately and provides sufficient flexibility and process control. CHCC purchases materials for use in its operations via contracts managed by Council’s Purchasing and Supply Manager and Manager, Water Treatment. The supplier is expected to have a consistent level of fitness for the purpose; a high level of assured safety; and the ability to trace materials through the supply chain. The contracts provide guidelines as to the minimum expectations required in order to assure the quality and safety of raw materials and ultimately, the finished product delivered by CHCC (Paul Sparke, Engineer Strategic Infrastructure CHCC, pers. comm., 21/03/2013).

CHCC conforms to the *Plumbing Code of Australia* (ABCB, 2011) and *AUS-SPEC 0071 Water Supply – Reticulation and pump stations (Design)* (NATSPEC, year unknown) in the purchasing of materials.

Preferred suppliers identified through government contracts are used for the supply of some chemicals, including alum and lime. Public tender processes or sole sourced contracts in the case of a limited market are used for the remainder of chemicals, including chlorine.

The use, including transport and storage, of chemicals listed as “Dangerous Goods” under the *Occupational Health and Safety Regulation 2001 (NSW)* (OH&S Regulation), including chlorine and fluoride, is dictated by the provisions of the OH&S Regulation and Work Cover. Storages and trucks are licensed according to the OH&S Regulation. CHCC has five storages for chlorine: Karangi WTP, the old chlorine dosing plant at Red Hill Balance Tank, Nana Glen WTP, Emerald Booster Pump Station and Boambee Headland Reservoir.

The Coffs Harbour WTP Material Safety Data Sheet (MSDS) folder provides information on personal protective equipment (PPE) requirements, safety precautions, first aid treatment for chemical spills (Coffs Infrastructure Alliance, 2009).

Chemicals used by CHCC in the supply of drinking water are listed in Table 19 and Table 20.

Table 19 List of Chemicals Coffs Harbour drinking water supply system

Chemical	Purpose	Typical Dosing Concentration (mg/L)	Procurement/Storage
Chlorine Gas	Primary disinfectant	2.4	3 x 920 kg
Alum	Coagulation	23	50,000 L
Lime	pH adjustment	31	30 T
Carbon Dioxide	pH adjustment	42	30 T
Sodium Hydroxide	pH adjustment	8	25,000 L
Potassium Permanganate	Removal of manganese [not currently in use]	Note 1	Order in if required
Fluoride	Fluoridation for dental health	1	25,000 L
Powdered Activated Carbon	Removal of pesticides, algae, disinfection by-products, etc. [not currently in use]	Note 1	1 T
Coagulant Aid Polymer	Coagulation aid [not normally required]	Note 1	Order in, if required
Filter Aid Polymer	Filter aid [not normally required]	Note 1	Order in, if required
Centrifuge Polymer (poly LT20)	Centrifuge aid	200	1 T (pallet 25 kg bags)
Sludge Polymer (poly LT20)	Sludge aid	2	1 T (pallet 25 kg bags)

Note 1: If required, as guided by O&M manual and laboratory tests.

Table 20 List of Chemicals Nana Glen DWSS

Chemical	Purpose	Typical Dosing Concentration (mg/L)	Procurement/Storage
Alum	Coagulation	30	2 T
Lime	pH adjustment	Pre-dose: 9 Post-dose: 40	1,000 kg
Chlorine Gas	Primary disinfectant	1.9	2 x 70 kg
Carbon Dioxide	pH adjustment	47.1	1 x 70 kg

7 Management of Incidents and Emergencies

7.1 Communication

Council relies on the NSW Health Response Protocols for communication strategies to manage water quality incidents. Council has a dedicated full-time Media Officer who is available to assist and provide guidance for effective distribution of warnings and notifications.

A “*Media Protocol*”, which outlines a process for Council interaction with the media, has been distributed to appropriate staff by the Media Officer.

A draft “*Coffs Harbour Water response protocol for the management of microbiological quality of drinking water*” has been developed, providing information and guidance on communication methodologies and appropriate contacts.

7.2 Incident and Emergency Response Protocols

Council responds to water quality incidents utilising appropriately qualified and experienced operational staff and managers. Various documents are available to provide guidance and assist staff in responding to water utility incidents including the following NSW Health Drinking Water Monitoring Program protocols and Code of Practice for the Fluoridation of Public Water Supplies:

- ❑ NSW Health Response Protocol: for the management of microbiological quality of drinking water (2011)
<http://www.health.nsw.gov.au/environment/water/Pages/nswhrp-microbiological.aspx>
- ❑ NSW Health Response Protocol: following failure in water treatment or detection of *Giardia* or *Cryptosporidium* in drinking water (2008)
- ❑ NSW Health Response Protocol: for the management of physical and chemical quality (2004)
<http://www.health.nsw.gov.au/environment/water/Pages/nswhrp-chemical.aspx>
- ❑ New South Wales Code of Practice for Fluoridation of Public Water Supplies (2011)
<http://www.health.nsw.gov.au/environment/water/Documents/code-of-practice.pdf>
- ❑ CHCC Draft “*Coffs Harbour Water response protocol for the management of microbiological quality of drinking water*”

Council should immediately discuss any *E.coli* notification with NSW Health, to determine appropriate public health responses (including the need for a boiled water alert). *E. coli* detections require immediate re-testing as stipulated in both the draft “*Coffs Harbour Water response protocol for the management of microbiological quality of drinking water*” and NSW Health response protocol: for the management of microbiological quality of drinking water.

For physical and chemical exceedances, Council follows the NSW Health Response Protocol: for the management of physical and chemical quality. The NSW Code of Practice for Fluoridation of Public Water Supplies provides guidance on corrective actions relevant to fluoridation.

The draft Karangi HACCP (Coffs Infrastructure Alliance, 2009) provides emergency response details for the Karangi WTP including:

- ❑ Contact list of Council WTP and NSW Department of Health staff

- Steps for communication with the public
- Flow diagram for response to exceeding critical limit and water contamination events

Emergency Plans have also been developed for:

- Nana Glen WTP
- Red Hill Balance Tank
- Dam Safety Emergency Plan

Safe work Method Statements, Chemical Leak Emergency Response Plans and Coffs Harbour WTP Evacuation Plan provide safety information and response as appropriate.

The Coffs Harbour Incident Response and Emergency Management Plan include additional details on:

- Contact list of Customer Service, Public Relations and Executive Staff
- Emergency communications as specified in the Emergency Response Plan or Disaster Response Plan
- Incident Communication Strategy

CHCC has representation on the respective committees, and has participated in the development of both the Coffs Harbour City Local Emergency Disaster Plan (Coffs Harbour LEMC, 2012) and the North Coast Emergency Management District Disaster Plan (North Coast DEMC, 2012). These define the responsibility of CHCC in supporting disaster response and in particular, in mitigation/prevention strategies against contamination of water supply/waterways. The North Coast Plan notes arrangements for the special protection of Shannon Creek, Nymboida and Karangi Dams. These plans make provisions for ongoing testing and review.

An exercise is conducted periodically to test specific assets and procedures of the plans and to ensure all participants are familiar with the content and Standard Operational Procedures.

8 Supporting Requirements

8.1 Employee Awareness and Training

Staff are recruited through the CHCC Human Resources department, according to HR policies and the Equal Employment Opportunity Management Plan 2012-2014 (CHCC, 2012).

The HR department reviews training requirements of CHW staff, including inductions and refresher courses, on a periodic basis and arranges the training as appropriate.

Training includes those legislated by Work Cover and the OH&S Regulation, such as:

- Apply/Senior First Aid
- Manual Handling
- Work Cover General Induction
- Confined Spaces
- 5099 (Work Near Overhead Power lines)

Additional training undertaken by CHW staff includes:

- Asbestos Awareness
- Forklift operations
- RTA traffic control cards
- Mechanical plant licenses, including backhoes, excavators, chain saws etc
- WTP process control courses, including chemical dosing systems
- Dam safety

WTP operators currently undertake NSW Office of Water “*Water Treatment Operator Courses*” and will transfer to the “*National Certification for Operators of Drinking Water Treatment Facilities*” as appropriate.

CHW Administration maintains the “*Coffs Harbour Water Training Matrix*”, a live documentation of all CHW staff, their qualifications and schedule for refresher trainings. This also maintains health records of all staff, including vaccinations. CHW Administration liaises with HR periodically to ensure it is kept fully up-to-date.

Toolbox safety meetings are required to be held prior to the commencement of non-routine tasks on-site at both WTPs, conducted by the WTP Supervisor for all staff.

8.2 Community Involvement and Awareness

The CHCC website has a section for Drinking Water Supply, providing up-to-date monthly water quality statistics and corresponding compliance with ADWG. The website also provides detailed information on the following:

- The Water Cycle
- Water Distribution
- Water Quality
- Water Sources
- Water Treatment
- Water Metering and Bills
- Daily Water Data
- Water Restrictions
- Water and Sewerage Site Visits

CHCC's Community Strategic Plan (CSP) is reviewed every four years, developed in conjunction with a wide variety of public consultation activities. The most recent CSP, "*Coffs Harbour 2030 Plan*" (CHCC, 2009), is available electronically on the CHCC website and in hardcopy at the Council chambers. It has the following strategies for water supply and infrastructure:

- Provide infrastructure that that supports sustainable living and incorporates resilience to climatic events
- Manage our catchments effectively and adaptably
- Implement total water cycle management practices

Community consultation is currently underway for the 2013 update.

Ordinary meetings of Council are normally held on the second and fourth Thursday of the month at the Council Chambers. Agendas and minutes of all CHCC meetings are available in hardcopy at the Council chambers and on CHCC's website. Public submissions to Council meetings are accepted at a Public Forum on the second Thursday of the month. Participation by the community is as per the CHCC "*Public Address/Public Forum Information Sheet*" (2011).

8.3 Public Exhibition of Document

The Drinking Water Quality Policy and Drinking Water Quality Management System were placed on public exhibition for 32 days between 10 December 2013 to 10 January 2014. A public notice was placed in the local newspaper. The documents were made available within Council's libraries and from Council's website.

A total of three submissions were received. A key issue raised was the importance of Council's water supply catchments, and the possible threats to it from mining development. Some points involved water quality monitoring. Points raised included:

Water Catchments

- The importance of Council's water supply catchments and their need for a high level of protection and catchment management to ensure clean high quality water can be provided.
- The view that the main threat to drinking water quality is/will be from inappropriate land use within Council's water catchments, particularly mining.
- Concern regarding Council's ability to provide input to state government assessed developments, such as mines
- The view that pesticides and other agricultural chemicals within council's catchments pose a high risk to water quality.
- Support for further review of potential hazards within Council's water supply catchments
- Support for further review of potential hazards within Council's water supply catchments.

Water Quality Monitoring

- Request for expansion of the water quality monitoring program.

In developing the drinking water management system, analysis and risk management review was undertaken for all steps in the water production process. The catchment, the various treatment train steps and the water delivery steps were all reviewed. As interest from public exhibition has centred on the catchment process (and mining), additional information relevant to these topics has been incorporated into this document where relevant.

8.4 Research and Development

8.4.1 Investigative Studies and Research Monitoring

The following items have been identified as requiring additional investigative research projects:

- Investigate possible pathways for hazard transmission from mining within the source water catchments, particularly those associated with potential antimony mines. Investigate WTP processes for the removal of chemicals associated with antimony mining
- Investigate the presence of dip-sites in Orara River catchment and the possible pathways for hazard transmission
- Examine mixing effects in Karangi Dam, particularly associated with DO mixing zones and the potential for algal blooms

8.4.2 Validation of Processes and Equipment

Validation requires the evaluation of system processes and equipment to prove the performance under all conditions expected to be encountered during operations.

The Karangi WTP HACCP notes that validation is to be undertaken where there is a:

- "Change in raw water quality
- Modification to the water treatment processes
- Change to the delivery, storage and distribution systems of treated and untreated water
- Change in the use of treated water
- Change in water quality standards
- New research/understanding of water quality issues
- Receipt of information that indicates a health risk associated with the quality of the drinking water"

Validation of new or upgraded processes and equipment is undertaken by qualified, experienced engineers and operators at Coffs Harbour and Nana Glen DWSS:

- System design according to industry guidelines and standards
- Individual process/equipment specification against CCP target limits
- Procurement of equipment/chemicals from approved suppliers
- Market pre-validation by suppliers, particularly associated with water treatment chemicals
- Validation on start-up by monitoring at each process with reference to CCP limits

Ongoing validation processes to ensure safe and acceptable drinking water is supplied to the customer are:

- Review of water quality at the point-of-supply against ADWG
- Review and response to customer water quality complaints register

8.5 Documentation and Reporting

8.5.1 Management of Documentation and Records

The DWMS documents information pertinent to all aspects of drinking water quality management for the CHCC DWSS.

The DWMS is a living document and should be maintained in-line with actual operations and management. Any changes to the drinking water supply system should be updated and documented within this DWMS.

“*Corporate Information*” is a dedicated document and records management department of CHCC. All policies, laboratory data and documentation are submitted to Records. All information is stored on a database known as “*Technology One Enterprise Content Management (ECM)*”.

Daily operational water quality data is saved on CHW computers and backed-up regularly.

8.5.2 Reporting

Council undertakes reporting as required by NSW Office of Water. In line with Council's responsibilities the following reports are produced:

- ❑ CHCC Strategic Business Plan for Water Supply (HydroScience Consulting, 2012)
- ❑ Council Annual Report and Quarterly Performance Reports: available in hardcopy at the Council office and electronically on Council's website
- ❑ The drinking water quality is monitored as part of the NSW Drinking Water Monitoring Program and the results are recorded in a database accessible via the NSW Health website
- ❑ Water Supply and Sewage NSW Performance Reporting: Council's water supply service performance is detailed in the NSW Water Supply and Sewerage Performance Monitoring Report annually. This report is available for public access in NSW Office of Water
- ❑ Fluoridation reporting as required by the Code of Practice (NSW Department of Health, 2011)

Daily water quality monitoring results are logged and are reviewed by operators and exceedances reported to Council supervisors, NSW Health and NSW Office of Water as required.

9 Review and Audit

9.1 Evaluation and Audit

“*Performance Planning*” is CHCC’s performance data database. The Manager, Water Treatment reviews and reports on performance data quarterly. *NSW Health Drinking Water Monitoring Program* data is accessed through the NSW Drinking Water database.

An annual internal audit will be undertaken by Executive Manager, CHW Operations of the DWMS:

- CCPs and their exceedances
- Improvement Plan
- Record keeping
- NSW Performance Monitoring
- Levels of Service
- Fluoridation performance

NSW Office of Water Inspector carries out an external assessment of the WTPs on a regular basis. NSW Office of Water and the Public Health Water Unit may check key elements of the DWMS.

An external audit will be undertaken by an independent auditor approved by NSW Health. The audit frequency will be determined by Council in consultation with the local Public Health Unit. The *NSW Public Health Regulation 2012* allows NSW Health the power to commission a comprehensive audit of the DWMS at any time. In addition to this, NSW Office of Water and local Public Health Unit environmental health officers will undertake audits of areas within the DWMS.

A complete review of the DWMS will be undertaken every four years, in line with the review of the Strategic Business Plan.

9.2 Review by Senior Management

As part of the requirements of Council’s reporting procedures, as detailed above, CHW Operations’ Executive Manager will review the effectiveness of the DWMS and underlying policies.

10 Improvement Plan

Improvement actions for the CHCC water supplies are listed in Table 21. Priorities have been developed from the risks as identified through the workshop process.

The Executive Manager, CHW Operations is responsible for the Improvement Plan. The Improvement Plan is used by the Council to monitor the implementation of the drinking water management system. The Improvement Plan is subject to an annual review by the Executive Manager of CHW Operations.

Table 21 Improvement Plan

Priority	Objective	No.	Action	Timeframe
HIGH	Maximise efficiency of chlorination for removal of pathogens, Nana Glen drinking water supply system	1.	Install online chlorine analyser	
		2.	Install online turbidity, pH monitoring after post-dosing point	
		3.	Provide scales at Nana Glen WTP to determine quantity of chlorine gas available in supply	
HIGH	Maintenance of water quality in distribution system, Coffs Harbour drinking water supply system	4.	Repair/maintain security cameras at Karangi WTP	
		5.	Install security cameras at high risk service reservoirs	
HIGH	Maintenance of water quality in distribution system, Nana Glen drinking water supply system	6.	Include Nana Glen reservoirs in annual maintenance program	
HIGH	Inclusion of the Coramba drinking water supply system as an addendum to the DWMS	7.	Assessment and documentation of Coramba drinking water supply system: including documentation of system, historic water quality analysis, risk assessment and CCP, and recommendations for Improvement Plan. It is required that the addendum will be issued before 1 September 2014 to be compliant with Section 25 of the NSW <i>Public Health Act 2010</i>	
HIGH	Optimise management of employee training and safety	8.	Manager, Water Treatment, to update “ <i>Coffs Harbour Water Training Matrix</i> ” to identify staff with training for handling of fluoride and chlorine gas	

Priority	Objective	No.	Action	Timeframe
HIGH	Protection of source water quality, Nana Glen	9.	Restrict livestock access to riverbanks adjacent to the Nana Glen WTP river offtake	
HIGH	Optimise Karangī WTP control	10.	Establish internal firewalls; schedule for change of passwords; off-site disaster recovery of servers; develop policy on the use of thumb stick drives	
		11.	Install standby server at Karangī WTP	
		12.	Calculate Chlorine Contact Time at the Treated Water Tank to the Red Hill Balance Tank	
		13.	Review draft Critical Control Point signs with Karangī WTP operators and display when finalised and approved by Manager, Water Treatment.	
HIGH	Optimise Nana Glen WTP control and operations	14.	Install online monitoring of turbidity and automatic shut-down at extraction point in the Orara River	
		15.	Install electronic recording of all monitoring data	
		16.	Install SCADA control/alarms at Nana Glen WTP	
		17.	Install online pH, turbidity monitoring before flocculation and after filtration	
		18.	Calculate Chlorine Contact Time at the Nana Glen Reservoirs	
		19.	Review of Nana Glen WTP O&M manual and update if required	
		20.	Install and maintain fire breaks, clear trees close to WTP	
		21.	Review draft Critical Control Point signs with Nana Glen WTP operators and display when finalised and approved by Manager, Water Treatment.	

Priority	Objective	No.	Action	Timeframe
HIGH	Optimise management of source waters, Coffs Harbour DWSS	22.	Executive Manager, Operations to review extractions from the multiple-level offtake tower at Shannon Creek Dam and maintain/repair as required	
		23.	Integrate SCADA systems between CVC and CHCC, particularly associated with Nymboida Weir	
HIGH	Optimise management of source water, Nana Glen DWSS	24.	Install turbidity meter on the river	
		25.	Install alarms, automatic shut-down of river pumps based on turbidity	
MEDIUM	Protection of source water quality, Coffs Harbour DWSS	26.	Review City Planning's land contamination layer on Council's GIS database to check the absence or presence of potentially contaminating sites	
		27.	Install electronic recording of dissolved oxygen data at Karangi Dam	
		28.	Review hazards, pathways and treatment options associated with Antimony mining	
MEDIUM	Protection of source water quality, Nana Glen DWSS	29.	Confirm location/management of dip sites within Orara River catchment	
		30.	Liaise with EPA and "Biomass" company to regulate disposal of biosolids in the catchment	
MEDIUM	Considered and controlled responses to incidents and emergencies	31.	Adopt Draft " <i>Coffs Harbour Water response protocol for the management of microbiological quality of drinking water</i> "	
		32.	Liaise with CVC to develop water supply/water quality incident plans for Nymboida Weir and Shannon Creek	
		33.	Develop and implement incident and emergency communication protocol with key stakeholders in drinking water catchment	
		34.	Undertake periodic staff training and testing of Emergency Response Plans	
		35.	Update contact list of Council WTP, NSW Health staff and appropriate community	

Priority	Objective	No.	Action	Timeframe
			contacts	
		36.	Executive Manager, Operations to establish appropriate interval for Contacts list to be updated and resource accordingly	
MEDIUM	Endorse and communicate Drinking Water Quality policy	37.	Council to review and endorse the Draft Drinking Water Quality Policy. Policy to be communicated to staff and the community	
MEDIUM	Improve management of customer complaint process	38.	Executive Manager, Operations to progress the implementation of 'SharePoint' for the water distribution network	
		39.	Executive Manager, Operations to initiate review and audit the customer complaints process for water quality issues	
MEDIUM	Baseline monitoring of source water in accordance with ADWG	40.	Re-test Alpha and Beta analysis in source waters, and subsequent specific radionuclide testing as appropriate in accordance with ADWG	
MEDIUM	Continually review and audit DWMS	41.	Manager Water Distribution, Manager Water Treatment and Executive Manager Operations to establish internal review procedures for the DWMS	
		42.	Review/audit annually Council compliance with Drinking Water Quality Management System	

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Glossary

ADWG	Australian Drinking Water Guidelines, published by the National Health and Medical Research Council (NHMRC).
CAP	Catchment Action Plan
CHCC	Coffs Harbour City Council
CHW	Coffs Harbour Water, the business unit of CHCC responsible for supply of water
CMA	Catchment Management Authority
CO₂	Carbon dioxide
CSP	Community Strategic Plan
CVC	Clarence Valley Council
catchment	Area of land that collects rainfall and contributes to surface water (streams, rivers, wetlands) or to groundwater.
chlorination	Use of chlorine as a means of disinfection.
coagulation	Clumping together of very fine particles into larger particles using chemicals (coagulants) that neutralise the electrical charges of the fine particles and destabilise the particles.
consumer	An individual or organisation that uses drinking water.
corrective action	Procedures to be followed when monitoring results indicate a deviation occurs from acceptable criteria.
critical control point (CCP)	A point, step or procedure at which control can be applied and which is essential to prevent or eliminate a hazard or reduce it to an acceptable level.
critical limit	a prescribed tolerance that must be met to ensure that a critical control point effectively controls a potential health hazard; a criterion that separates acceptability from unacceptability
<i>Cryptosporidium</i>	Microorganism that may be present in the catchment and is highly resistant to disinfection.
C.t	The product of residual disinfectant concentration (C) in milligrams per litre determined before or at taps providing water for human consumption, and the corresponding disinfectant contact time (t) in minutes.
cyanobacteria	Bacteria containing chlorophyll and phycobilins, commonly known as 'blue-green algae'.
DAFF	Dissolved Air Flotation and Filtration

DBP	Disinfection By-Product
DISPLAN	Local Disaster Management Plans, often prepared by Councils in compliance with the State Emergency and Rescue Management Act, 1989.
DWMS	Drinking Water Management System
disinfection	An oxidising agent (eg chlorine, chlorine dioxide, chloramines and ozone) that is added to water in any part of the treatment or distribution process and is intended to kill or inactivate pathogenic (disease-causing) microorganisms.
distribution system	A network of pipes, pumps and reservoirs leading from a treatment plant to customers' plumbing system.
drinking water	Water intended primarily for human consumption.
drinking water quality management audit	The systematic and documented evaluation of activities and processes to confirm that objectives are being met, and which includes an assessment of management system implementation and capability.
drinking water quality monitoring	The wide-ranging assessment of the quality of water in the distribution system and as supplied to the consumer, which includes the regular sampling and testing performed for assessing conformance with guideline values and compliance with regulatory requirements and agreed levels of service.
drinking water supplier	An organisation, agency or company that has responsibility and authority for treating and/or supplying drinking water.
drinking water supply system (water supply system) (DWSS)	All aspects from the point of collection of water to the consumer (can include catchments, groundwater systems, source waters, storage reservoirs and intakes, treatment systems, service reservoirs and distribution systems, and consumers).
EPA	Environment Protection Authority
<i>Escherichia coli</i> (<i>E. coli</i>)	Bacterium found in the gut, used as an indicator of faecal contamination of water.
filtration	Process in which particulate matter in water is removed by passage through porous media.
flocculation	Process in which small particles are agglomerated into larger particles (which can settle more easily) through gentle stirring by hydraulic or mechanical means.
GL	Gigalitres
groundwater	Water contained in rocks or subsoil.
guideline value	The concentration or measure of a water quality characteristic that, based on present knowledge, either does not result in any significant risk to the health of the consumer (health-related guideline value), or is associated with good quality of water (aesthetic guideline value).

HU	Hazen Unit (colour)
hazard	A biological, chemical, physical or radiological agent that has the potential to cause harm.
Hazard Analysis Critical Control Point (HACCP) system	a systematic methodology to control safety hazards in a process by applying a two-part technique: first, an analysis that identifies hazards and their severity and likelihood of occurrence; and second, identification of critical control points and their monitoring criteria to establish controls that will reduce, prevent, or eliminate the identified hazards.
hazard control	The application or implementation of preventive measures that can be used to control identified hazards.
hazard identification	The process of recognising that a hazard exists and defining its characteristic (AS/NZS 3931:1998).
hazardous event	an incident or situation that can lead to the presence of a hazard (what can happen and how)
IWCM	Integrated Water Cycle Management
integrated catchment management	The coordinated planning, use and management of water, land, vegetation and other natural resources on a river or groundwater catchment, based on cooperation between community groups and government agencies to consider all aspects of catchment management.
ISO 9001:2000 (Quality Management)	An international accredited standard that provides a generic framework for quality management systems. Designed to assure conformance to specified requirements by a supplier at all stages during the design, development, production, installation and servicing of a product, it sets out the requirements needed to achieve an organisation's aims with respect to guaranteeing a consistent end product.
jar test	A laboratory procedure used to estimate the minimum or ideal coagulant dose required to achieve certain water quality goals. A jar test simulates a water treatment plant's coagulation and flocculation units with differing chemical doses, and mixing and settling times.
L/s	litres per second
LEP	Local Environmental Plan
mg/L	milligrams per litre
ML	megalitre
ML/d	megalitres per day
maximum risk	A risk in the absence of preventive measures.
microorganism	Organism too small to be visible to the naked eye. Bacteria, viruses, protozoa, and some fungi and algae are microorganisms

multiple barriers	Use of more than one preventive measure as a barrier against hazards.
NPWS	National Parks and Wildlife Service
NTU	Nephelometric Turbidity Units
O&M	Operation and maintenance
ORRS	Orara River Rehabilitation Strategy
OSSM	On-site sewage management
operational monitoring	The planned sequence of measurements and observations used to assess and confirm that individual barriers and preventive strategies for controlling hazards are functioning properly and effectively.
PAC	Powdered Activated Carbon
pathogen	An organism capable of eliciting disease symptoms in another organism.
pH	Value taken to represent acidity or alkalinity of an aqueous solution; expressed as a logarithm of the reciprocal of the hydrogen ion activity in moles per litre at a given temperature.
point of supply	The physical location of the outlet of the water supply scheme at the consumers' tap.
preventive measure	Any planned action, activity or process that is used to prevent hazards from occurring or reduce them to acceptable levels.
quality assurance	All the planned and systematic activities implemented within the quality system, and demonstrated as needed, to provide adequate confidence that an entity will fulfil requirements for quality (AS/NZS ISO 8402:1994).
quality control	Operational techniques and activities that are used to fulfil requirements for quality (AS/NZS ISO 8402:1994).
quality management	Includes quality control and quality assurance, as well as additional concepts of quality policy, quality planning and quality improvement. Quality management operates throughout the quality system (AS/NZS ISO 8402:1994).
quality system	Organisational structure, procedures, processes and resources needed to implement quality management (AS/NZS ISO 8402:1994).
R&D	Research and development
RACC	Regional Algal Coordinating Committee
RHBT	Red Hill Balance Tank
RWSS	Regional Water Supply Scheme
raw water	The water entering the first treatment process of a water treatment plant; water in its natural state, prior to any treatment.

reservoir	Any natural or artificial holding area used to store, regulate or control water.
residual risk	The risk remaining after consideration of existing preventive measures.
risk	The likelihood of a hazard causing harm in exposed populations in a specified time frame, including the magnitude of that harm.
risk assessment	The overall process of using available information to predict how often hazards or specified events may occur (likelihood) and the magnitude of their consequence.
risk management	The systematic evaluation of the water supply system, the identification of hazards and hazardous events, the assessment of risks, and the development and implementation of preventive strategies to manage the risks.
SBP	Strategic Business Plan
SCADA	Supervisory Control and Data Acquisition system used to monitor, control and alarm water treatment plants.
STP	Sewage Treatment Plant
SWL	Standing Water Level
service reservoir	Storage for drinking water, generally within the distribution system, used to meet fluctuating demands, accommodate emergency requirements and/or equalise operating pressures.
source water	Water in its natural state, before any treatment to make it suitable for drinking.
surface water	All water naturally opens to the atmosphere (eg rivers, streams, lakes and reservoirs).
TBL	Triple Bottom Line
THM	Trihalomethanes
target criteria	Quantitative or qualitative parameters established for preventive measures to indicate performance.
turbidity	The cloudiness of water caused by the presence of fine suspended matter.
validation of processes	The substantiation by scientific evidence (investigative or experimental studies) of existing or new processes and the operational criteria to ensure capability to effectively control hazards.
verification of drinking water quality	an assessment of the overall performance of the water supply system and the ultimate quality of drinking water being supplied to consumers; incorporates both drinking water quality monitoring and monitoring of consumer satisfaction.
UV	ultra-violet radiation
WTP	Water Treatment Plant
WU	Water Utility

Appendices

Appendix A

Technical Note 1 – Regulatory and Formal Requirements

Appendix B

Technical Note 2 – Drinking Water Systems Analysis

Appendix C

Technical Note 3 – Risk Assessment Workshop

Appendix D

Technical Note 4 – Operational and Verification Monitoring

Appendix E

Draft Critical Control Point Signs



Appendices



Appendix A



Technical Note 1 Regulatory and Formal Requirements



Technical Note 1

Commitment to Drinking Water Quality Management & Regulatory & Formal Requirements

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1 Introduction

Drinking water quality management is subject to a range of regulatory and other formal requirements. These are outlined in this Technical Note.

This Technical Note identifies the current regulatory and other formal requirements that relate to drinking water quality in Coffs Harbour City Council (CHCC).

2 Coffs Harbour City Council Drinking Water Supplies

Coffs Harbour Water (CHW) operates three drinking water supply systems. The biggest system, Coffs Harbour Water Supply, supplies water to coastal consumers from Sawtell in the South to Corindi Beach in the North. The system draws raw water from Orara River, Nymboida River, and Shannon Creek Dam and stores it in Karangie Dam before treatment.

The Karangie Water Treatment Plant (WTP) services almost all of Coffs Harbour City Council (CHCC) drinking water users. The system provides a multi-barrier approach including; catchment management, managed extraction from the rivers and aeration of Shannon Creek and Karangie Dams, as well as Dissolved Air Flotation, Filtration, fluoridation and disinfection using UV and chlorination, at the WTP.

The reticulation network services 21,838 domestic connections, 1766 commercial connections, 13 bulk water connections and 835 miscellaneous connections (as at May 2012) (CHCC Proclaim Business Database, 2012).

2.1 Nana Glen Drinking Water Supply

The Nana Glen drinking water supply system draws raw water from the Orara River near Solomon Close, on the south eastern edge of Nana Glen Rail. It supplies the residents of Nana Glen and Nana Glen Rail. Water is pumped from the Orara River to the Nana Glen WTP, where it is clarified, filtered, disinfected and conditioned. The treated water is stored in two 0.5 ML reservoirs on site. It is then reticulated to approximately 170 connections. As at May 2012 this included 131 domestic (household) connections, 8 commercial connections and 31 miscellaneous connections (CHCC Proclaim Business Database, 2012).

2.2 Coramba Drinking Water Supply

Coramba draws raw water directly from the Regional Water Supply pipeline, which passes through the main street of Coramba. The Coramba water supply is disinfected (chlorinated) before being supplied to about 127 households.

It is noted that Coramba Drinking Water Supply System will not be assessed in the development of the Coffs Harbour Risk Based Drinking Water Management Plan as it is soon to be connected to the main system.

3 Water Supply Agreements

CHW delivers water supply services as a local water utility (LWU) under the provisions of the Local Government Act 1993. The CHW is a business unit within CHCC.

In regards to the major extractions from the Nymboida River, water sharing is structured along the following arrangements;

Essential Energy holds a water licence under the Water Act 1912, used for extraction of water from the Nymboida Weir. Clarence Valley Council (CVC) obtains a bulk raw water supply from Essential Energy on the basis of a negotiated service agreement with Essential Energy.

In turn, CHCC has a service agreement with CVC for the provision of a bulk raw water supply. Each of the licences and agreements incorporates provisions to protect low flows (CHW IWCM Concept Study, Feb 2010).

CHW staff has advised that the Essential Energy agreement with CVC will be reviewed in 2013. CVC are expected to consult with CHW regarding this agreement as per the conditions in the service agreement (CHCC Draft SBP, Nov 2011).

4 Australian Drinking Water Guidelines

The *Australian Drinking Water Guidelines 2011* (ADWG) are intended to ensure the accountability of drinking water suppliers (managers) and health authorities (auditors) for the supply of safe, good quality drinking water to consumers.

The ADWG sets out a framework for the management of drinking water quality. Risk management and quality management are increasingly industry best practice, 'assuring drinking water quality by strengthening the focus on more preventative approaches'.

The ADWG framework has been developed to 'guide the design of a structured and systematic approach for management of drinking water quality from catchment to consumer'. It incorporates a preventative risk approach and includes elements of HACCP, ISO 9000 and AS/NZS ISO31000:2009 Risk Management.

The framework sets out four general areas as follows:

- Commitment to drinking water management – development of a commitment within the organisation;
- Systems analysis and management - understanding the entire water supply system, the hazards and events that compromise water quality, preventative measures and operational control to ensure safe and reliable drinking water;
- Supporting requirements – including employee training, research and development, validation of process efficacy, systems documentation and reporting; and
- Review – including evaluation and audit.



Figure 1 Framework for management of drinking water quality

The ADWG recommends that water utilities adopt this approach. The NSW Public Health Regulation 2012 requires water utilities in NSW to develop a Quality Assurance Program (Drinking Water Management System) that addresses the twelve elements of the Framework.

The values for individual characteristics listed in the ADWG are not mandatory, legally enforceable standards, but instead provide the basis for determining the quality of water to be supplied to consumers. Individual water utilities should develop monitoring programs based on local knowledge and experience of the key characteristics and their variability.

The Guideline values are to be used in two separate but complementary ways: for short-term verification of drinking water quality to allow for immediate corrective action when required; and to assess performance over the longer term. The Guideline values are used to assess overall performance and to determine appropriate management strategies. The assessment will be used to identify emerging problems and to determine priorities for improvement.

The Guiding Principles of the ADWG are:

- ❑ The greatest risks to consumers of drinking water are **pathogenic microorganisms**. The protection of water sources and treatment are of paramount importance and must never be compromised.
- ❑ The drinking water system must have, and continuously maintain, **robust multiple barriers (more than one)** appropriate to the level of potential contamination facing the raw water supply.
- ❑ Any **sudden or extreme change in water quality, flow or environmental conditions** (e.g. extreme rainfall or flooding) should arouse suspicion that drinking water might become contaminated.
- ❑ System operators must be able to **respond quickly and effectively** to adverse monitoring signals.
- ❑ System operators must maintain a personal sense of **responsibility and dedication** to providing consumers with safe water; and should never ignore a consumer complaint about water quality.
- ❑ Ensuring drinking water safety and quality requires the application of a considered **risk management approach**.

The ADWG provide the minimum requirements for two different guidelines values; a *health-related value* and an *aesthetic value*.

As the Guidelines relate to the quality of water at the point of use, (e.g. kitchen or bathroom tap) the drinking water suppliers must ensure that the quality of water in the reticulation system meets the stipulated values.

4.1 ADWG Monitoring Requirements

4.1.1 Microbial monitoring

The ADWG recommends *Escherichia coli* (*E.coli*) as the most suitable indicator organism for the presence of pathogens arising from faecal contamination. Total coliforms have been used in the past, but are no longer recommended for this purpose. Total coliforms however, can be used as an indicator organism for operational monitoring and maintenance requirements.

Representative samples should be collected and analysed for *E.coli*. Sampling frequency is governed by the size of the population being served, as summarised in Table 1.

Table 1 Australian Drinking Water Guidelines (2011, Table 9.4) for Microbial Quality – Recommended Frequency of E.coli monitoring

Population served	Minimum Number of Samples
5,000 – 100,000	One sample per week plus one additional sample per month for each 5,000 people above 5,000
1,000 – 5,000	One sample per week (52 samples per year)
Less than 1,000	One sample per week

Note: Sampling frequency should be increased at times of flooding or emergency operations and following repair work or interruptions of supply. In small water supply systems, periodic sanitary surveys are likely to yield more information than infrequent sampling.

4.1.2 Physical and Chemical Monitoring

In any monitoring program for physical and chemical characteristics, the minimum requirement is to routinely collect samples **from locations towards the end of a supply system**. This allows meaningful comparisons to be made over time.

The NSW Health Drinking Water Monitoring Program (2005) recommends that for water supplies with a population of less than 5000, two (2) samples per chemical characteristic per year be tested, ie 1 every 6 months.

For water supply systems with a population of greater than 5000, 1 sample per month per characteristic is recommended.

The characteristic to be tested will depend on the quality issues in each system. It is expected that a baseline screening assessment of the source water and drinking water quality has been undertaken and informs the monitoring.

It is noted that ADWG recommends that for small water supply systems, the following should be monitored as a minimum requirement:

- E.coli*
- Disinfectant residual
- pH
- Turbidity

4.1.3 Radiological Monitoring

The most practical cost effective approach is to use a screening procedure that determines the total radioactivity present in the form of alpha and beta radiation, without regard to specific radionuclides. The guideline value for radiological quality of

drinking water is for the total estimated dose per year from all radionuclides not to exceed 1.0 mSv. If the screening levels are exceeded then further investigation will be necessary.

4.2 Assessing long term performance

For all health related physical and chemical characteristics a confidence of 95% of the results over a 12 month period should be less than the guideline limit.

For aesthetic values, an average of results over a 12 month period should be less than the guideline value.

It is noted that the assessment of microbial quality requires a different approach. For the system performance to be regarded as satisfactory and representative of the quality of water supplied to the consumer, the following monitoring should occur over a 12 month period:

- At least the minimum number of routine samples has been tested for *E.coli*;
- ADWG recommends that sampling frequency should be increased at times of flooding or emergency operations and following repair work or interruptions to supply;
- E. coli* should not be detected in a minimum 100 mL sample of drinking water.

5 NSW Regulatory Requirements

The NSW Government endorses the ADWG with respect to drinking water quality standards. However, other NSW legislation also impact on the CHCC DWQM plan.

5.1 Local Government Act 1993

The NSW State Government has delegated to Local Councils the responsibility for provision of water supply, wastewater and drainage services to NSW Country Towns. The statutory framework is provided by the *Local Government Act 1993*.

Councils have specific functions imposed or conferred by laws including (s.22) fluoridation of water supply by council (according to the *Fluoridation Act 1957*).

Council is defined under the *Public Health Act 2010* as a supplier of Drinking Water and is required under s.10G to carry out testing on water supplied or similar.

Under Section 60 of the *Local Government Act 1993*, approval is required from the NSW Office of Water for the following:

- a. as to works of water supply – construct or extend a dam for the impounding or diversion of water for public use or any associated works;
- b. as to water treatment works – construct or extend any such works

Should Council make any changes to treatment processes, treatment chemicals and/or extend or upgrade the WTP a Section 60 approval is required for the works.

5.2 NSW Best-Practice Management of Water Supply and Sewerage Guidelines

The NSW Best-Practice Management of Water Supply Sewerage Guidelines was developed to provide appropriate, affordable and cost-effective services to meet community needs, while protecting public health and the environment and making best use of regional resources. The Guidelines were developed by NSW Department of Water and Energy (now NSW Office of Water) in 2007 and are pursuant to the requirement of *Local Government Act 1993* to prepare Guidelines for the management of the provision of water supply and sewerage services (s. 409(6)). (http://www.water.nsw.gov.au/ArticleDocuments/36/town_planning_water_utilities_best-practice_management_of_water_supply_and_sewerage_guidelines_2007.pdf.aspx. [accessed August 2012]).

Compliance with these Guidelines is a pre-requisite for payment of an efficiency dividend from the surplus of a utility's water supply or sewerage business to the council's general revenue. It also supports eligibility for additional financial assistance towards capital cost of backlog infrastructure through the NSW Office of Water's Country Towns Water Supply and Sewerage Program.

In order to qualify for financial support, the following six criteria must be met:

1. Integrated Water Cycle Management (IWCM)
2. Strategic business planning (SBP)
3. Regulation and pricing of water supply, sewerage and trade waste
4. Water conservation
5. Drought management
6. Performance monitoring

IWCM and SBP plans, in particular, are key planning tools for integrating water quality activities across local government areas, both of which CHCC is implementing.

5.3 Public Health Act 2010

Under the *Public Health Act 2010*, NSW Health has certain powers with respect to the provision of safe drinking water. Part 3 Division 1 of the *Public Health Act 2010* deals with the Safety of Drinking Water.

The term "drinking water" under the Act is broader than water for human consumption. It also includes water connected with human consumption, which can include water for such purposes as washing and preparing food and making ice.

Part 3 Division 1 of the Act bestows significant powers on NSW Health Officers, including to order mandatory testing and obtaining information in relation to the drinking water (s.18 & 19).

The Minister also has the power to order the closure of a water supply (s.16). In the event that the Chief Health Officer prepares advice on the safety of drinking water (s.22(1)), the Council is required to issue such advice to the public when directed to by the Director General of the Department (s.22(3)).

Penalties may be incurred for failure to comply with the Director-General's direction.

The *Public Health Act 2010* and associated Regulation has been proclaimed and are to be gradually phased in from September 1, 2012.

The Act requires drinking water suppliers to establish, and adhere to a quality assurance program that complies with the Public Health Regulation 2012. The Regulation 2012 requires water suppliers to implement a risk based drinking water management system consistent with the ADWG Framework (2011) by September 2014.

5.4 NSW Health Drinking Water Monitoring Program (2005)

NSW Health provides analysis of drinking water samples for water utilities. Drinking water quality monitoring samples should be taken in the distribution system and are representative of water supplied to the consumer. NSW Health has recommended a minimum number of samples for each water supply to monitor drinking water quality. NSW Health provides a free of charge service for the analysis of the recommended number of samples for indicator bacteria and health related inorganic chemicals.

The number of samples allocated to a water supply is determined by the population served.

Table 2: NSW Health (2005) schedule for Microbial Quality sampling

Population served	Minimum Number of Samples
5,000 – 100,000	One sample per week, plus one per month for each 5,000 people above 5,000
500 – 5,000	One sample per week

5.5 NSW Health Response Protocol for management of microbial quality of drinking water. Version 2: 25 November 2011

This protocol is to guide Public Health Units (PHU) and water utilities in their joint response to the following; rapidly changing source water quality, treatment failure or microbial contamination. A regional water utility may issue a boil water alert of its own accord. However, before issuing a boil water alert, the utility should liaise with their local PHU to discuss the situation.

5.6 Fluoridation of Public Water Supplies Act 1957 & associated 2007 Regulations

Water supplies to which fluoride is added must meet the requirements of the *Fluoridation of Public Water Supplies Act 1957*, the *Fluoridation of Public Water Supplies Regulation 2007* and the *Code of practice for the Fluoridation of Public Water Supplies 2011*. This includes:

- Daily and weekly tests at the treatment plant;
- A monthly test submitted to the Division of Analytical Laboratories;
- Appropriate reporting to local Public Health Units of dosing above 1.5 mg/L and below 0.9 mg/L and interruptions to dosing longer than 24 hours.

5.7 Water Management Act 2000

The *Water Management Act 2000* is the key piece of NSW water legislation that provides the basis for the sustainable management of water. The Act provides a legal basis for water planning, the allocation of water resources and water access entitlements.

The *Water Management Act 2000* is gradually replacing the planning and management frameworks in the *Water Act 1912*. However, many provisions of the *Water Act 1912* are still in force. For example, licences to extract water outside areas covered by a water-sharing plan are administered under the *Water Act*.

However, as part of the ongoing commitment of the NSW Government to the National Water Reform agenda, all water sources in NSW will be managed according to the *Water Management Act 2000*.

5.8 Water Act 1912

The *Water Act 1912* is being progressively phased out and replaced by the *Water Management Act 2000*, although some provisions are still in force. Licences to extract water outside areas covered by a water-sharing plan are administered under the *Water Act*.

Section 18 of the *Water Act 1912* makes altering the **quantity or quality** of water in certain circumstances an offence, in the following terms:

- ❑ 'alterations have been made in or in connection with the work, which materially and prejudicially affect the quantity or quality of water flowing in, to, or from, or being in any river or lake, the person who has made the alterations shall be liable to a penalty not exceeding 100 penalty units...'
- ❑ Any changes to pump sizes and sites and increase in capacity of the weir would trigger an application for a new licence. Any such changes would require the preparation of a REF. Any change in volume would mean a variation to the licence.
- ❑ CHCC must ensure compliance with any terms, conditions or limitations relating to water licences or permits issued pursuant to the *Water Act 1912*. The CHCC licence details and extraction volumes are summarised in Table 3. Table 3 CHCC Water Licenses

Table 3 CHCC Water Licenses

Water Supply	Licence No.	Type	Nominal Volume (Abstraction ML/year Storage ML)	Issue date
Orara River at Cochranes Pool	30SL039904	Abstraction	7,759	16 February 2009 for 10 years
Orara River at Coramba	30SL023858	Abstraction	48	24 September 2004 for 10 years
Orara River at Nana Glen	30SL051964	Abstraction	100	25 March 2011 for 5 years
Karangi Dam	30SL051671	Storage	5,600	12 September 2004 for 10 years
Woolgoolga Creek	30SL028313	Abstraction	10	15 November 2007 for 10 years
Fridays Creek	30SL034526	Abstraction	10	25 May 2012 for 10 years
Shannon Creek Dam	30SL066010	Storage	30,000	17 March 2006 for 10 years
Nymboida River at Nymboida Weir	30SL028758	Abstraction	29,500	27 February 1998

- Orara River water licences and other local licences are owned and operated by CHCC.
- Shannon Creek licence is owned and operated by CVC.
- Nymboida River water licence is owned and operated by Essential Energy (System Operation Plan CV&CHRW, Dec 2010).

5.9 Protection of the Environment (Operations) (POEO) Act 1997

The activities listed in Schedule 1 to the Act (broadly, activities with potentially significant environmental impacts) require a licence.

The POEO Act also has general penalties for air, land and water pollution. Licences can also be issued by the EPA to regulate water pollution from activities that are not in Schedule 1. If the conditions of the licence are complied with, the licence can provide protection against prosecution for water pollution.

No licence is required under Schedule 1 for water supply systems. Nevertheless should any chemical leakage, spill, disposal of wastes or similar impact on the environment occur, prosecution is possible. Council's due diligence in planning and carrying out activities would minimize such action.

5.10 Work, Health & Safety (WH&S) Act 2011

Potential hazards for employees, contractors and visitors should be identified and measures put in place to minimise these hazards. Safety issues should be dealt with in a manner complying with *WH&S Act 2011*.

Compliance with Work, Health & Safety Act is required for storage and handling of chemicals on-site. For instance, chlorine and fluoride storage and handling is subject to the *WH&S Act 2011*.

All Council operational activities are affected by this Act and the Regulations.

Specifically, most water supplies are disinfected with chlorine. Accordingly, the chlorine storages are required to be licensed. In addition, the requirements of the Act may also affect the storage of sodium hydrochlorite for super chlorination of water mains.

Equally, fluoride storages are required to be licensed.

5.11 Environmental Planning & Assessment (EP&A) Act 1979

The *EP&A Act 1979* requires that the environmental impact of projects be studied at all stages on the basis of scale, location and performance.

Environmental assessment is undertaken under one, or both of parts 4 and 5 of the *EP&A Act 1979*:

- Part 4 – where development consent is required from a consent authority; or
- Part 5 – where development consent is not required and a determination to approve the activity is made by a determining authority.

This Act is applicable to approvals for subdivision and major redevelopments, as well as water supply works amongst others.

The Coffs Harbour Local Environmental Plan 2000 (amended 2010) is the statutory planning instrument that applies within the Coffs Harbour City Council.

The LEP establishes what forms of development and land use are permissible and/or prohibited on lands within the City and is used to ensure that drinking water quality is considered when assessing development applications.

Of particular note is the LEP Controlled Catchments for the Orara River - Cochranes Pool Drinking Water Catchment. The catchment has special provisions that requires development consent for a number of forms of agriculture production, a dam with a surface area of greater than 5000 square meters and recreational areas other than a children's playground.

Consent may be granted where Council is satisfied that the impact of development will not increase any risk of pollution of the public water supply.

5.12 Catchment Management Authorities Act 2003

The *Catchment Management Authorities Act 2003* requires that natural resource management, from planning to operations, is undertaken at the catchment level, according to State-wide standards and collaborating with the Natural Resources Commission and landholders as appropriate.

The Draft Northern Rivers Catchment Action Plan (CAP) (2012), which covers the full extent of the CHCC, identified a need to improve the efficiency and effectiveness of water supply to urban communities.

5.13 Plumbing Code of Australia

The Plumbing Code of Australia (PCA) replaced the NSW Code of Practice Plumbing and Drainage 3rd Edition in 2012 (<http://www.abcb.gov.au/en/about-the-national-construction-code/the-plumbing-code-of-australia> [accessed August 2012]). It refers to AS/NZS 3500 and is the technical standard for the all plumbing and drainage work in NSW, covering "*design, construction, installation, replacement, repair, alteration and maintenance of plumbing and drainage installations.*"

5.14 AUS SPEC 0071 Water supply - Reticulation and pump stations (Design)

AUS SPEC 0071 details the specifications for the design of drinking water reticulation and pumping stations, for both upgrades and new systems (http://www.natspec.com.au/Products_Services/Public%20utilities.asp [accessed August 2012]).

6 Commonwealth Regulatory Requirements and Programs

6.1 Competition and Consumer Act 2010

The *Trade Practices Act 1974* was renamed as *Competition and Consumer Act 2010* on 1 January 2011.

Under Part 3-2, Division 1 (Consumer transactions and Consumer guarantees), consumers are granted protection through the provision that suppliers guarantee that the goods supplied are reasonably fit for purpose (s. 55).

CHCC is thus required to ensure that the water supplied is fit for purpose.

7 Stakeholders

Key stakeholders involved in the supply and delivery of drinking water in the Coffs Harbour City Council area are:

- Coffs Harbour City Council
- Clarence Valley Council
- Essential Energy
- NSW Health
- NSW Office of Water
- Northern Rivers Catchment Management Authority
- Consumers

8 Drinking Water Quality Policy (draft)

The Australian Drinking Water Guidelines (ADWG) 2011 were developed as a framework for good management of drinking water supplies, that if implemented, will assure the safety of consumers at the point of supply.

The ADWG are not mandatory standards, but provide an authoritative reference, based on the best scientific evidence, for determining that the supply of safe and good quality water, that is also aesthetically pleasing, is delivered to Council's customers.

The ADWG encourage the endorsement of a Drinking Water Quality Policy by senior management, to ensure organisation support and long term commitment. This should ensure the effective management of drinking water quality within the organisation, including staffing, funding and reporting.

Coffs Harbour City Council has not yet endorsed a Drinking Water Policy.

The following text is provided to Council for discussion as the basis for a draft Drinking Water Quality Policy.

8.1 Our Commitment

Coffs Harbour City Council is committed to managing its water supply catchments, treatment and supply assets to provide; safe, high quality drinking water, which consistently meets the Australian Drinking Water Guidelines (2011), other regulatory requirements and consumer expectations.

To achieve this commitment, and in partnership with the community, other stakeholders and relevant agencies, Coffs Harbour City Council will:

- ❑ **Manage water quality from catchment to tap:** at all points along the delivery chain, from the source water to the consumer's tap
- ❑ **Adopt a risk-based approach:** in which potential threats to water quality are identified and managed, in accordance with the Australian Drinking Water Guidelines, to minimise any threat to drinking water quality
- ❑ **Integrate the needs and expectations:** of our consumers, stakeholders, regulators and employees into our planning
- ❑ **Establish effective monitoring programs:** systematically monitor the quality of drinking water and ensure effective reporting mechanisms to provide relevant and timely information that promotes confidence in the water supply and its management to consumers

- ❑ **Develop / Review Contingency and Incident Response Plans:** that will be regularly reviewed and updated.
- ❑ **Participate in research and development:** maintain awareness of current research and development activities, to ensure that Coffs Harbour City Council is up to date with current industry standards.
- ❑ **Contribute to setting industry regulations and guidelines:** be an active participant in the development of industry regulation and guidelines, relevant to health and the broader water cycle.
- ❑ **Adopt best practice water quality management:** align our water quality systems and processes with the framework's proactive and *multi-barrier approach* to best practice water quality management
- ❑ **Continually improve our management practices:** by assessing performance against industry standards, corporate commitments and stakeholder expectations
- ❑ **Continually improve the capability of our staff:** by encouraging and supporting participation in training and professional development and ensure all employees are aware of and actively seek to achieve the aims of this policy
- ❑ **Maintain a long term and sustainable water supply:** which recognises global and regional priorities in the management of water

Coffs Harbour City Council will implement and maintain a drinking water quality management system consistent with the Australian Drinking Water Guidelines Framework for Management of Drinking Water Quality, to effectively manage risks to the drinking water quality.

All managers and employees involved in the supply of drinking water are responsible for understanding, implementing, maintaining and continuously improving the drinking water quality management system.

Coffs Harbour City Council will communicate to the public its drinking water quality policy and its implementation.

To be Signed (by senior authorised staff member e.g. General Manager)

Appendix B



Technical Note 2 Drinking Water Systems Analysis

Coffs Harbour City Council

Job Number B573



Technical Note 2

Drinking Water Systems Analysis

HydroScience Consulting Pty Ltd

A.B.N. 79 120 716 887

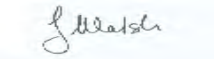


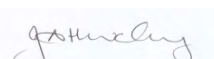
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1 Summary

Below is a summary of Coffs Harbour Drinking Water Supply Systems

Category	Supply System serviced by Karangi WTP	Supply System serviced by Nana Glen WTP
Catchment	<p>Orara River Sub catchment (Cochrane's Pool)</p> <p>Nymboida River Sub catchment (Nymboida Weir)</p> <p>Shannon Creek Sub catchment (Shannon Creek Dam)</p> <p>The above are subcatchments of the Clarence River Catchment</p>	<p>Orara River Sub catchment</p> <p>The above are subcatchments of the Clarence River Catchment</p>
Source Water	Karangi Dam	Orara River - Pool at Nana Glen
Treatment	<p>The Karangi WTP is a Dissolved Air Flotation and Filtration (DAFF) Plant.</p> <p>The treatment processes at Karangi WTP includes:</p> <ul style="list-style-type: none"> Alkalinity and pH adjustment Coagulation and Flocculation Dissolved air floatation Filtration- coal, fine sand and gravel Ultraviolet radiation Fluoridation Chlorination 	<p>The treatment processes at Nana Glen WTP include:</p> <ul style="list-style-type: none"> pH correction Coagulation and Flocculation Sand filtration Chlorination Alkalinity adjustment <p>It is recommended that operational data is maintained in electronic format for analysis.</p>
Reservoirs	<p>The Coffs Harbour DWSS has sixteen (16) reservoirs located throughout the coastal towns from Sawtell in the South to Corindi in the North.</p> <p>All reservoirs are covered with secure access.</p> <p>Chlorine residual is maintained in all reservoirs except for Sawtell, Toormina and Bark Hut, which are less than ideal at times (< 0.2mg/L). A new re-chlorination system is designed for the Sawtell Reservoir. Total coliforms have been identified in the above mentioned reservoirs.</p> <p><i>E.coli</i> exceedance occurred in the Sawtell reservoir (3 cfu/100ml - 6 April 2009). A zero re-test was achieved.</p>	<p>The Nana Glen DWSS includes two (2) reservoirs situated at the WTP.</p> <p>Both reservoirs are covered with secure access.</p> <p>At times turbidity and Aluminium have been above ADWG criteria.</p>
Reticulation	<p>Coffs Harbour WTP provides drinking water to a population of 69,783.</p> <p><i>E.coli</i> exceedance was recorded at Hamilton Drive Toormina (200 cfu/ 100ml -29 November 2010). No boiled water alerts have been issued.</p>	<p>Drinking water is reticulated to consumers via gravity.</p> <p>Nana Glen WTP provides drinking water to a population of 300.</p> <p>No <i>E.coli</i> exceedances have occurred.</p>

2 Introduction

CHCC are committed to providing a safe and secure drinking water supply. CHCC mission statement for water supply and sewerage services is:

“To provide long term sustainable and reliable water supply and sewerage services to the community which meets legislative, statutory and best-practice management requirements. These services will protect community, health and the environment.”

Coffs Harbour City Council (CHCC) commissioned HydroScience Consulting to develop a risk-based Drinking Water Quality Management System for their Drinking Water Supply Systems.

The CHCC Drinking Water Quality Management System (DWQMS) has been developed in accordance with Australian Drinking Water Guidelines (ADWG) 2011, with the aim to support council to 'establish and adhere to, a quality assurance program/risk based drinking water management system'.

The delivery of drinking water supply is the responsibility of the Coffs Harbour Water (CHW), which is the Water Branch of Coffs Harbour City Council. CHW operates three drinking water supply systems: Karangi WTP is the biggest DWSS, supplying water to the coastal areas from Sawtell in the South to Corindi in the North and including the Coffs Harbour City area; Nana Glen WTP supplies water to the village of Nana Glen; and the Coramba WTP supplies water to the village of Coramba.

The purpose of this technical note is to provide an overview of the water supply systems managed by CHCC and review the historic water quality data available for:

- Karangi Water Treatment Plant
- Nana Glen Water Treatment Plant

It is noted that Coramba system will be decommissioned in the near future with the township due to connect to the Karangi WTP.

Where the data is available, water quality will be assessed for the following points along the water supply process

- Catchment
- Source water
- Treatment processes
- Reservoirs
- Reticulation

The historical analysis of water quality will assist in understanding the drinking water systems characteristics and the identification of hazards.

3 Water Supply Catchment

Water for the Coffs Harbour drinking water supply is extracted from the upper regions of the Orara River and/or Nymboida River. Both rivers are situated in the Clarence River Catchment.

3.1 Clarence River Catchment

The Clarence River Catchment is within the Northern Rivers Catchment Management Area (CMA) and covers approximately 22,716km². The Clarence River Catchment is the largest coastal river system in NSW. Refer to Figure 1.

The Orara River, Nymbodia River and Shannon Creek are subcatchments of the Clarence River System.

3.1.1 Orara River Subcatchment

The Orara sub-catchment is situated within the Coffs Harbour Local Government Area (LGA), west of Coffs Harbour city. The sub-catchment covers an area of 41,200 ha. Figure 2 below shows the Orara River drinking water catchment. The Orara River supplies raw water to the Karangi WTP, the Nana Glen WTP and Coramba System at times.

Headwater streams flow from well vegetated state forests and national parks. Towards the floodplains of the Orara River, vegetation is impacted more progressively. Impacts include land clearing, grazing and logging. Some regionally and locally important remnants are still dispersed within impacted areas.

The Orara River has been rated high under the Stressed River Criteria, due to the habitat for the Eastern Fresh Water Cod. The abstraction licence from the river has environmental flow requirement conditions, to protect low flows.

CHCC are strategically rehabilitating the Orara River as outlined in the Orara River Rehabilitation Strategy 2002 – 2012 under the Coffs Harbour Biodiversity Action Strategy.

Raw water is pumped from the Orara River at Cochrane's Pool to fill the Karangi Dam. Raw water is also extracted from the Orara River at Nana Glen. At Nana Glen, raw water is pumped directly to the Nana Glen Water Treatment Plant. At Cochranes pool, raw water is pumped into Karangi Dam.

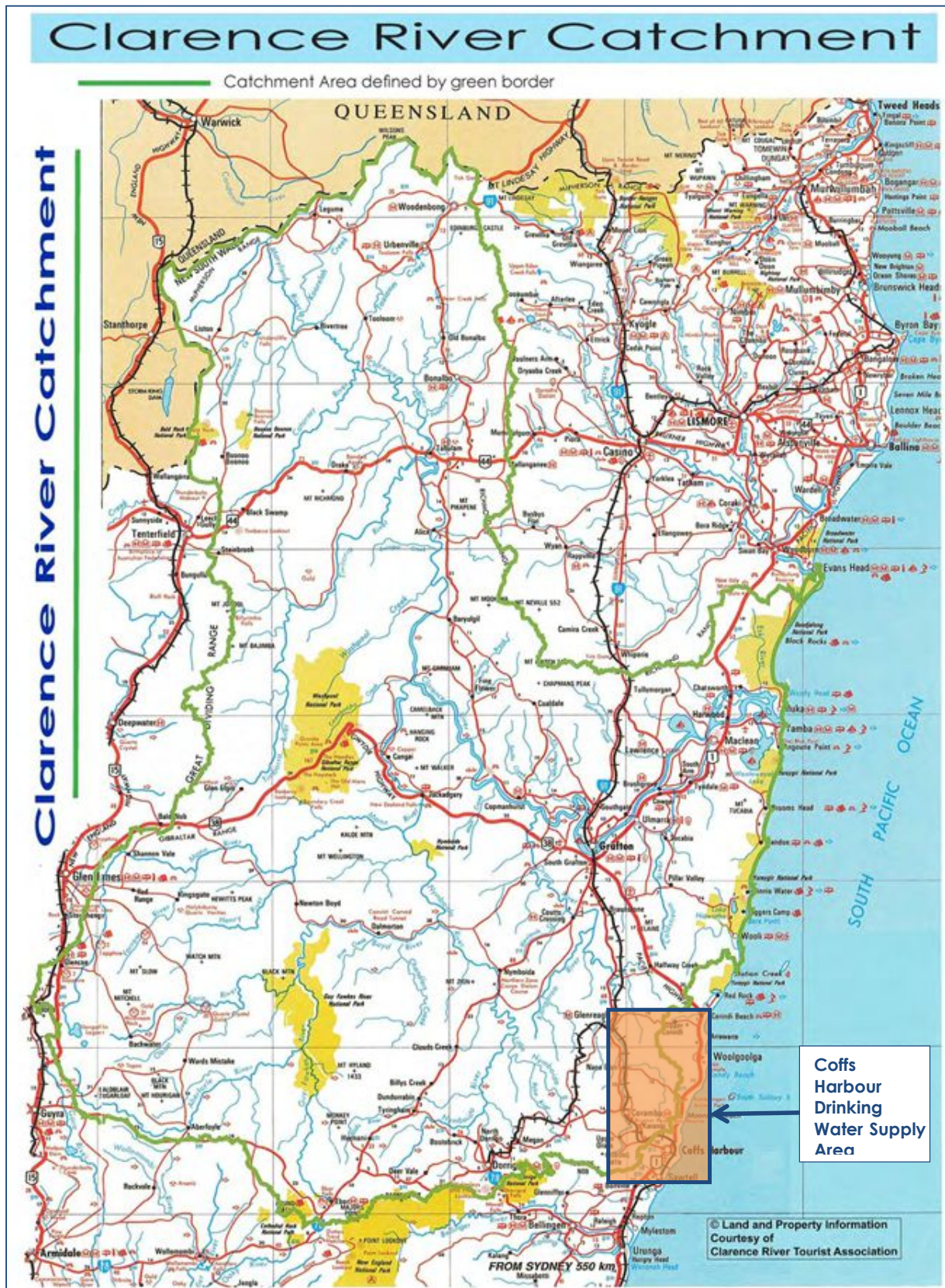


Figure 1 Clarence River Catchment



Figure 2 Orara River – Cochranes Pool Drinking Water Catchment

3.1.2 Nymbodia River Weir Subcatchment

The Nymbodia River Weir sub-catchment is situated within the Clarence River Catchment. The sub-catchment covers an area approximately 1,700 km². Figure 3 shows the Nymbodia River drinking water catchment. The Nymbodia River supplies raw water via various pipelines to Karangi Dam, Shannon Creek Dam and also to Clarence Valley Council (CVC) at Rushforth Road. This is all part of the Regional Water Supply System.

Raw water from the Nymbodia River flows via gravity from the Nymbodia River Weir to the Karangi Dam. This can also be boosted to supply additional water through a pump station near Glenreagh. The Regional Water Supply Scheme pipeline linking the Nymbodia River to Karangi Dam was constructed in 2002.

The Nymbodia sub-catchment is extensively vegetated and contains a number of National Parks. The Dorrigo Plateau is situated in the upper part of the catchment, with beef grazing and potato growing the main agricultural industries, which have impacts on the raw water quality.

3.1.3 Shannon Creek Catchment and Dam

The Shannon Creek sub-catchment is approximately 3,535 ha. The catchment is heavily vegetated with some areas of cleared land in the west. Steep forested valleys drain to the Shannon Creek Dam.

The Shannon Creek Dam was constructed as part of the regional water supply system. Raw water is extracted from the Nymbodia River in times of high flow to fill the Shannon Creek Dam. All water flowing from the catchment is released downstream and only water from the Nymbodia River is stored.

The Shannon Creek Dam has an off-stream storage capacity of 30,000 ML. The storage provides for a reliable raw water supply during droughts, periods of low flow and poor quality water in the Nymbodia River. In addition to the topping up of the Karangi Dam, this storage also provides areas of Grafton, Coutts Crossing and other small villages with raw water during these periods.

There are potential raw water quality issues, i.e.; increase turbidity, due to dispersive soils in the catchment and at present an inability to draw water off at various levels. Furthermore, landholders in the Shannon Creek catchment, plan to undertake logging activities in the future as a retirement income. (Shannon Creek Raw Water Conceptual HACCP Plan (2003).

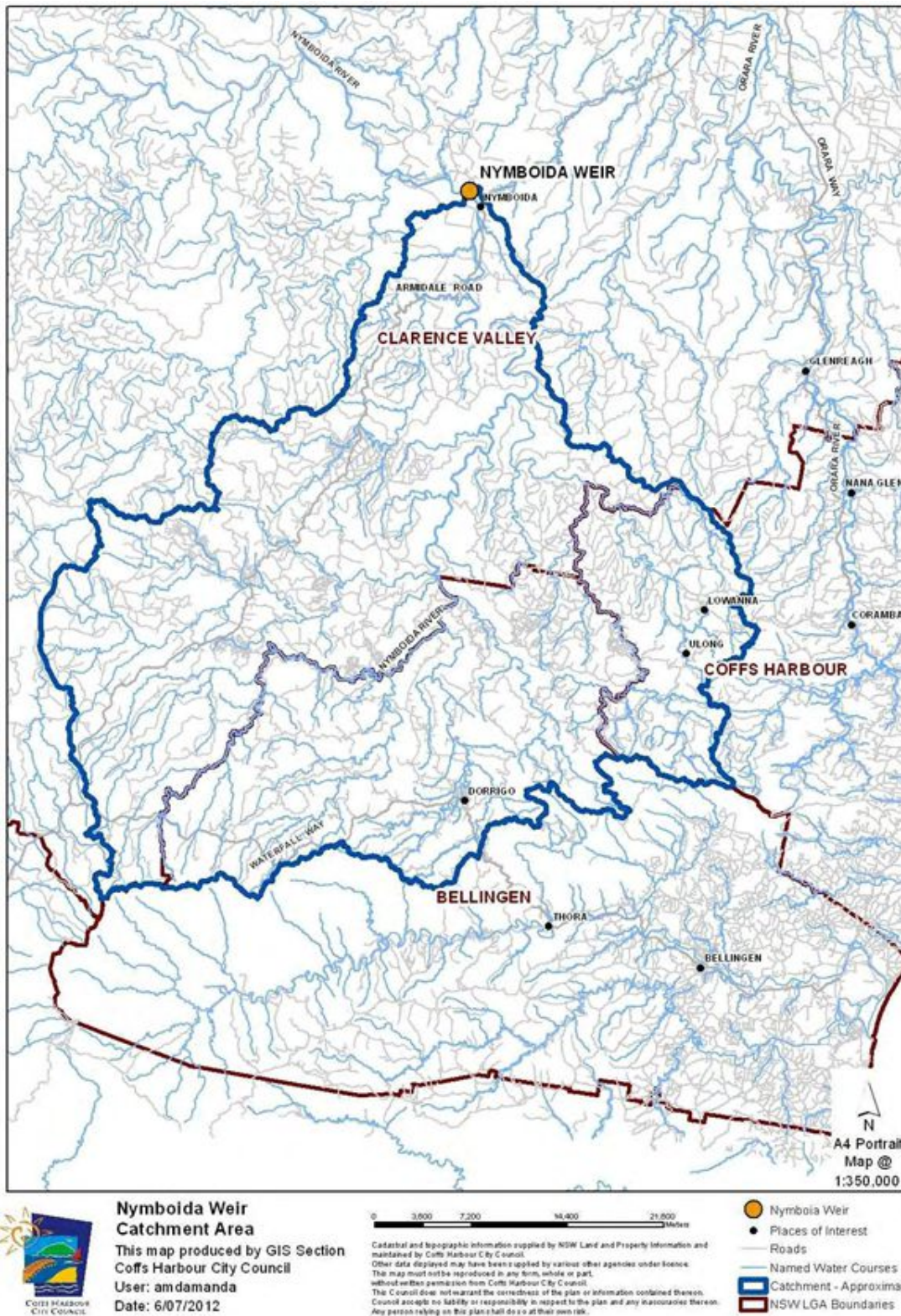


Figure 3 Nymboida Drinking Water Catchment

3.2 Bulk Regional Water Supply Scheme

The Bulk Regional Water Supply Scheme (RWSS) commenced in 2002 to provide the communities of Grafton, Lower Clarence and Coffs Harbour with a reliable bulk raw water supply.

The bulk water supply scheme extracts raw water from the Nymboida River to fill the Karangi Dam, Shannon Creek Dam and provide water to CVC at Rushforth Road Reservoirs. Raw water is diverted from the Nymboida River when water quality is optimal and the river flow is above the abstraction licence conditions. Raw water flows under gravity to Karangi Dam with a capacity of 16 ML/d and can be boosted by the pump station near Glenreagh to provide 25 ML/d to Karangi Dam.

Figure 4 and Figure 5 show the schematics for the Regional Water Supply Scheme.

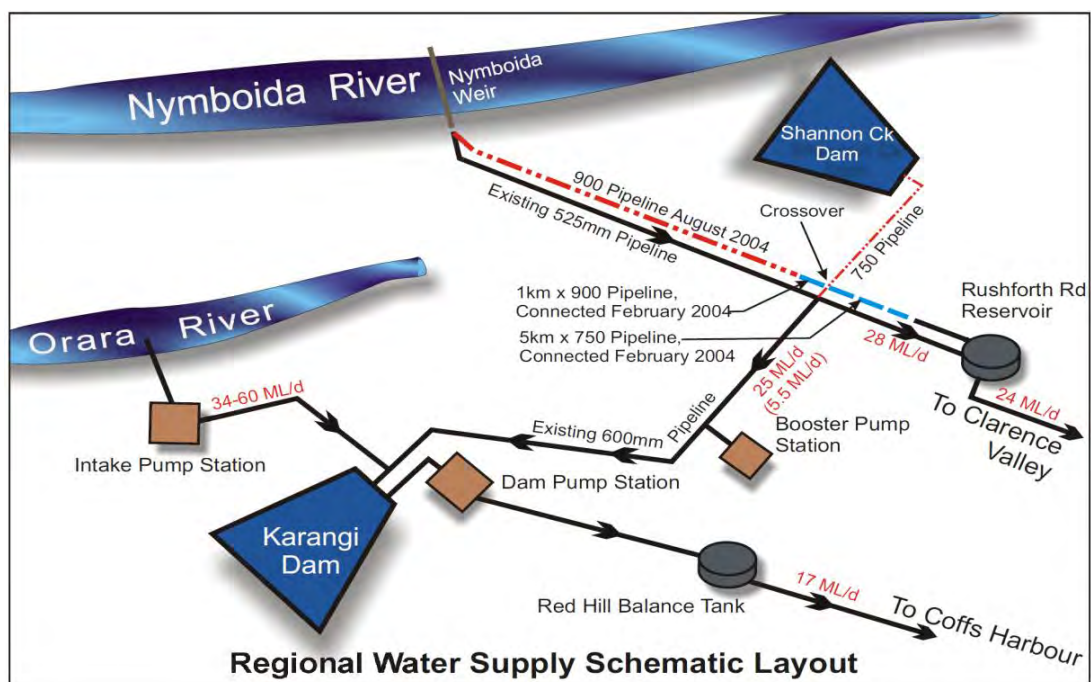


Figure 4 Regional Water Supply Scheme Layout

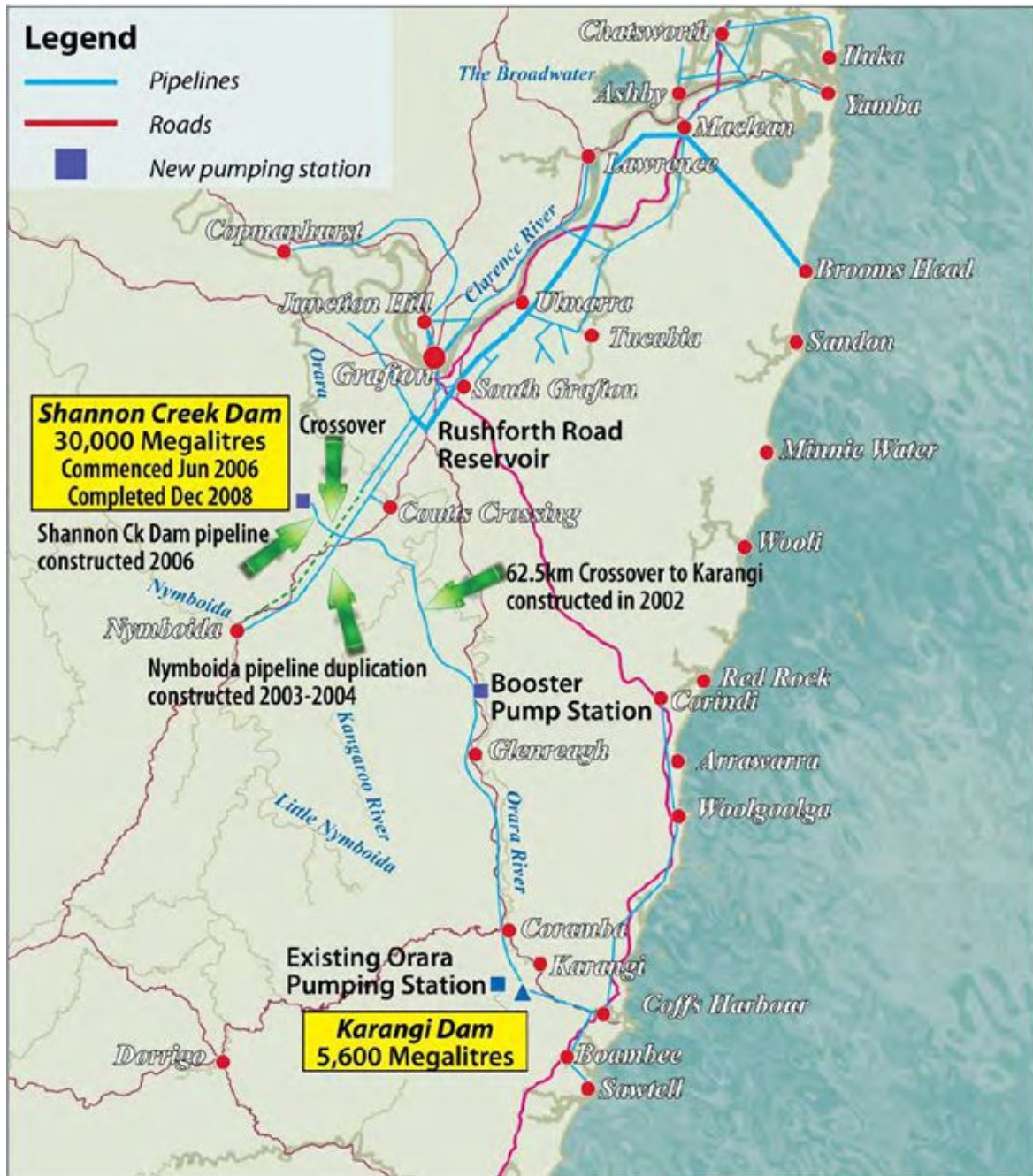


Figure 5 Regional Water Supply Scheme Schematic
(Source CCHCC)

4 Coffs Harbour Drinking Water Supply System

4.1 Overview of System

Coffs Harbour is provided with filtered and disinfected drinking water from the Karangi WTP. The Karangi WTP is located on Upper Orara Road; Karangi.

The system sources raw water from Orara River and Nymboida River and stores it in the Shannon Creek Dam and Karangi Dam. Raw water is abstracted from Karangi Dam and treated at the Karangi WTP then is distributed to the coastal populations from Sawtell in the South to Corindi Beach in the North.

The CHCC provides a multi - barrier approach in the provision of safe drinking water including:

- Catchment Management
- Controlled Abstraction
- Aeration of Karangi and Shannon Creek Dams
- pH and Alkalinity adjustment
- Dissolved Air Flotation and Filtration
- Fluoridation
- Chlorine and UV disinfection
- Water Quality Monitoring regime

4.1.1 Source Water: Karangi Dam

The Karangi WTP sources raw water directly from the Karangi Dam, but is able to be supplied with raw water directly from Cochrane's Pool or the RWS pipeline if necessary.

The Karangi Dam is topped up with flows from the Cochrane's Pool on the Orara River, the Nymboida River Weir or the Shannon Creek Dam via the RWS pipeline. Raw water is only abstracted if the turbidity is below 2 NTU, in order to maintain the quality in Karangi Dam.

Karangi Dam has a storage capacity of 5,600 ML and under average conditions; the dam has a secure yield of 4,000 ML/year.

4.1.2 Treatment Processes: Karangi WTP

The Karangi WTP is a dissolved air flotation and filtration (DAFF) plant. The Karangi WTP was officially opened on 9 June 2009. The Karangi WTP services the majority of Coffs Harbours Water consumers.

The treatment process at the Karangi WTP comprises of the following process steps:

- ❑ Alkalinity and pH adjustment - lime dosing at Karangi Dam
- ❑ pH correction - CO₂ dosing at WTP
- ❑ Powdered Activated Carbon (PAC) dosing (optional – taste & odour removal),
- ❑ Aluminium sulphate dosing (Coagulant aid – optional)
- ❑ Dissolved air flotation and filtration
 - Coagulation and flocculation
 - Skimmer removes scum
 - Scum sent to wash water tank
 - Dirty water sent to sludge thickener
 - Supernatant sent to inlet of WTP or Karangi Dam
 - Thickened sludge is dewatered in centrifuge
 - Sludge solids disposed of in landfill
 - The liquids (centrate) returned to wash water tank for reprocessing
 - Water is filtered through a 3 layer media filter–coal, fine sand and gravel
- ❑ Disinfection by ultra-violet (UV) radiation
- ❑ Fluoridation
- ❑ pH correction – caustic soda (sodium hydroxide)
- ❑ Disinfection by chlorination

Drinking water is sent to onsite treated water storage tank (reservoir)

Drinking water is pumped to Red Hill Balance Tanks and gravity fed into various reservoirs and reticulated for use.

A process diagram of the Karangi WTP is given in Figure 6 below. Figure 7 (a) and (b) show the process flow diagram of the Coffs Harbour Water Supply.

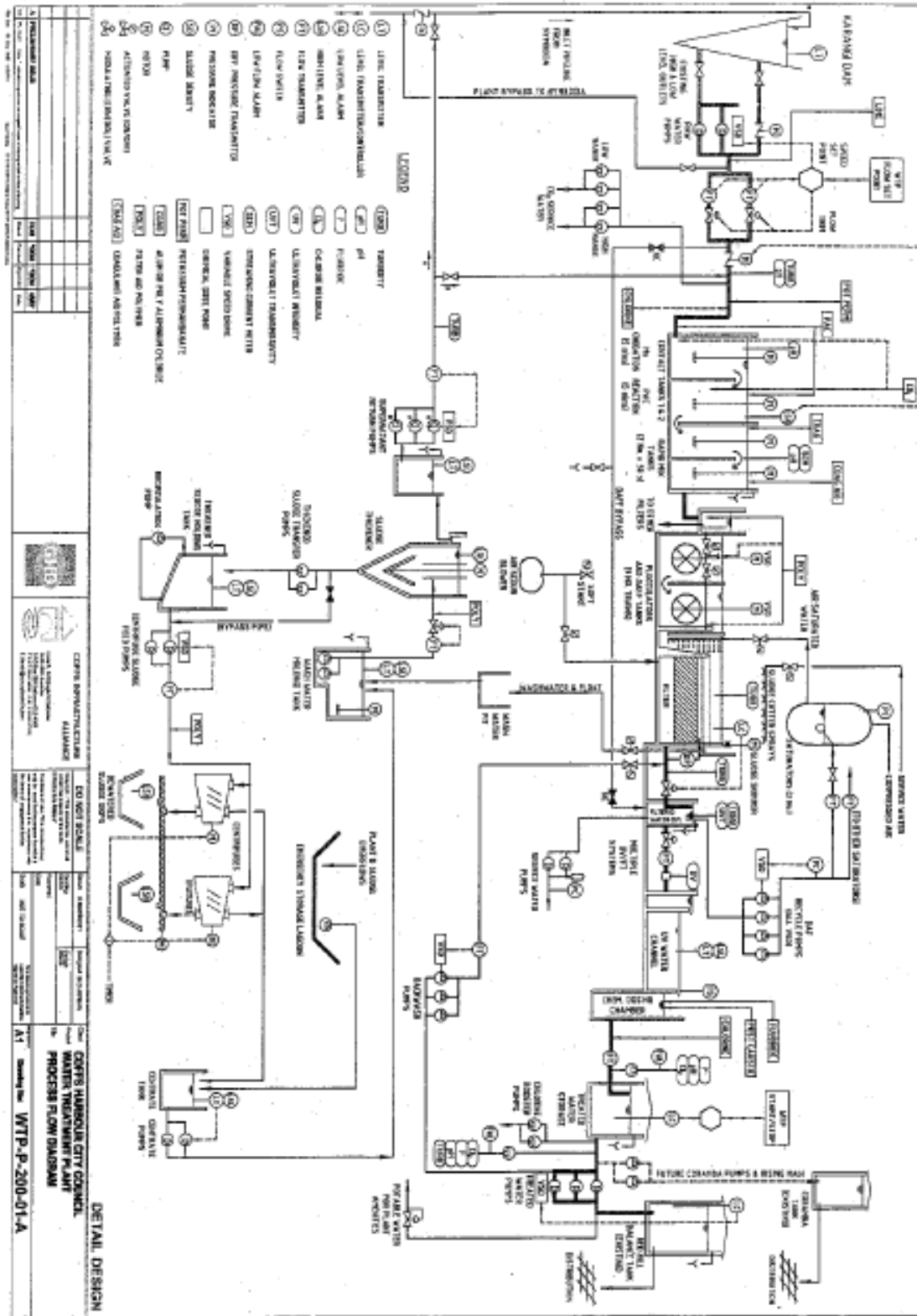


Figure 6 Karangi WTP Process Flow Diagram (Source: CHCC)

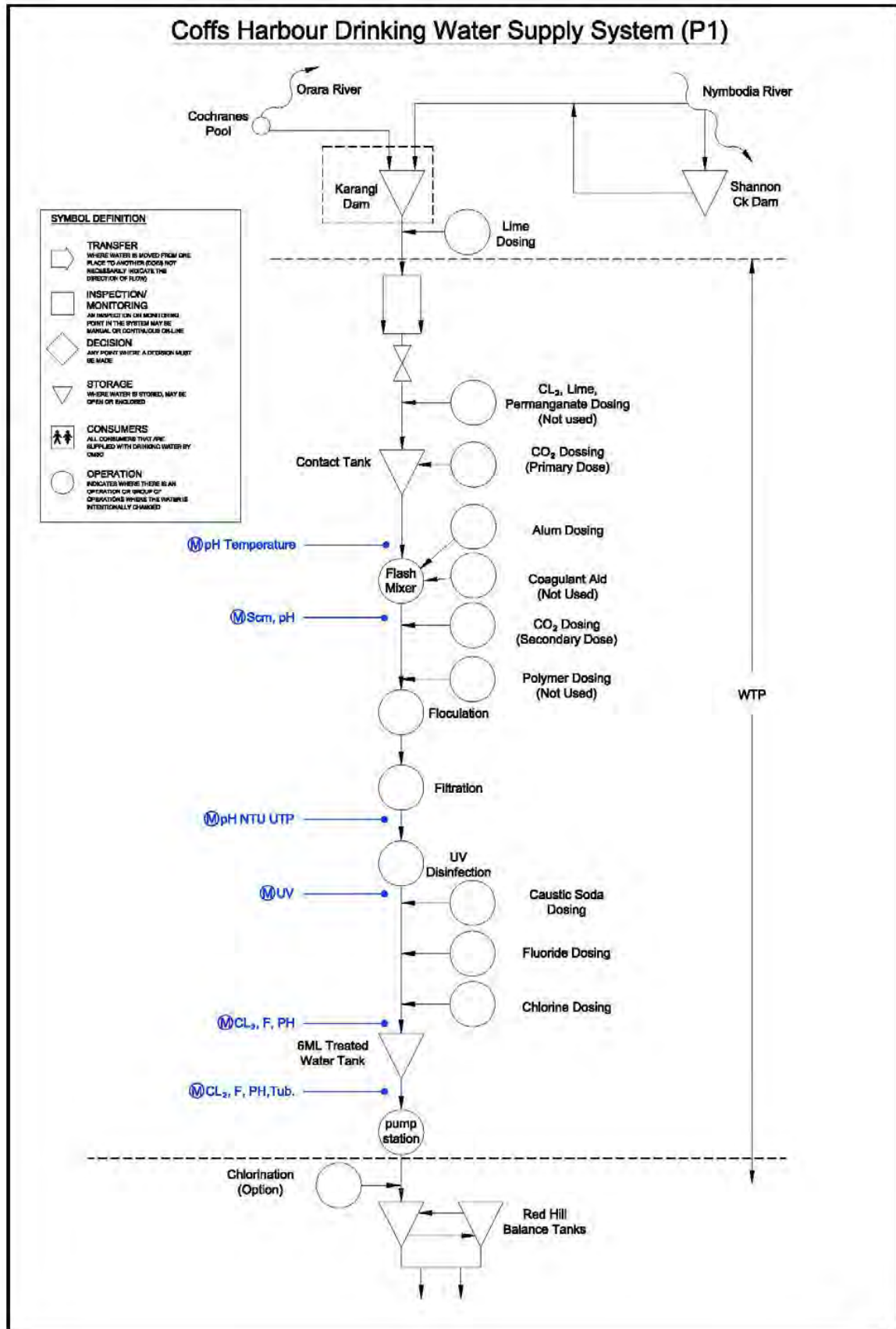


Figure 7 Process Flow Diagram of Coffs Harbour Water Supply

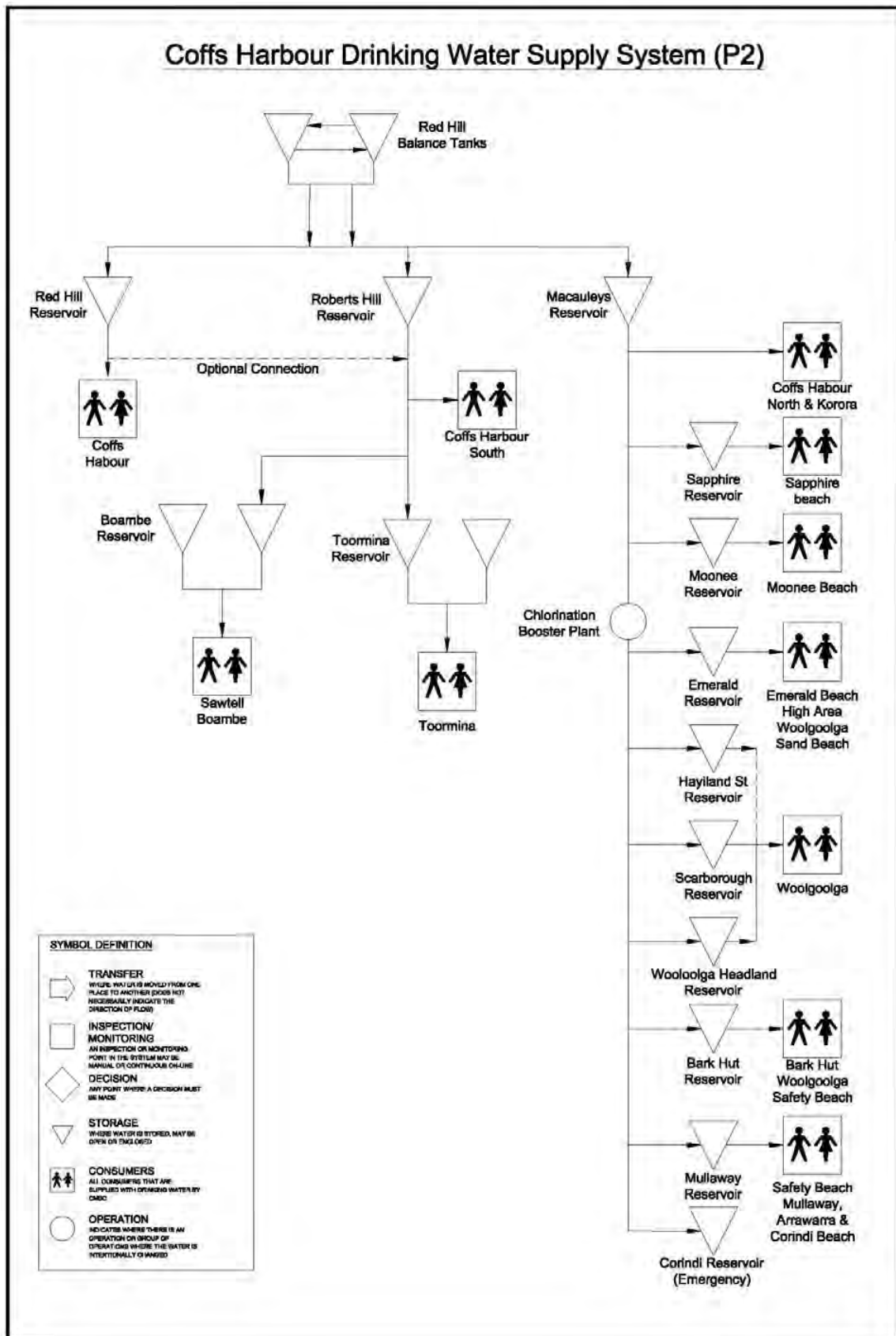


Figure 7 Process Flow Diagram of Coffs Harbour Water Supply (continued)

4.1.3 Distribution Network

The Coffs Harbour Water Supply system distributes drinking water from Sawtell in the South to Corindi in the North, including the inland villages of Nana Glen and Coramba. Refer to Figure 8 for the Coffs Harbour DWSS diagram.

The distribution network consists of the following (Note: Nana Glenn and Coramba distribution network included):

- ❑ 3 balance tanks
- ❑ 19 storage reservoirs
- ❑ 641km trunk & reticulation mains
- ❑ 22,683 water service connections

All reservoirs and balance tanks are roofed, and incorporate bird proofing treatments. Bird proofing treatments generally consist of expandable foam or stainless steel mesh, for filling or covering gaps between the tank wall and its roof.

Although the bird proofing at most reservoirs is good, some reservoirs require additional modifications to improve the effectiveness of the existing bird proofing.

The reservoirs have secure access with locked stairwells and hatches. Fences have been placed around most reservoirs. Reservoirs are cleaned every 2 – 3 years and CHCC maintain a register of actions for continual improvement.

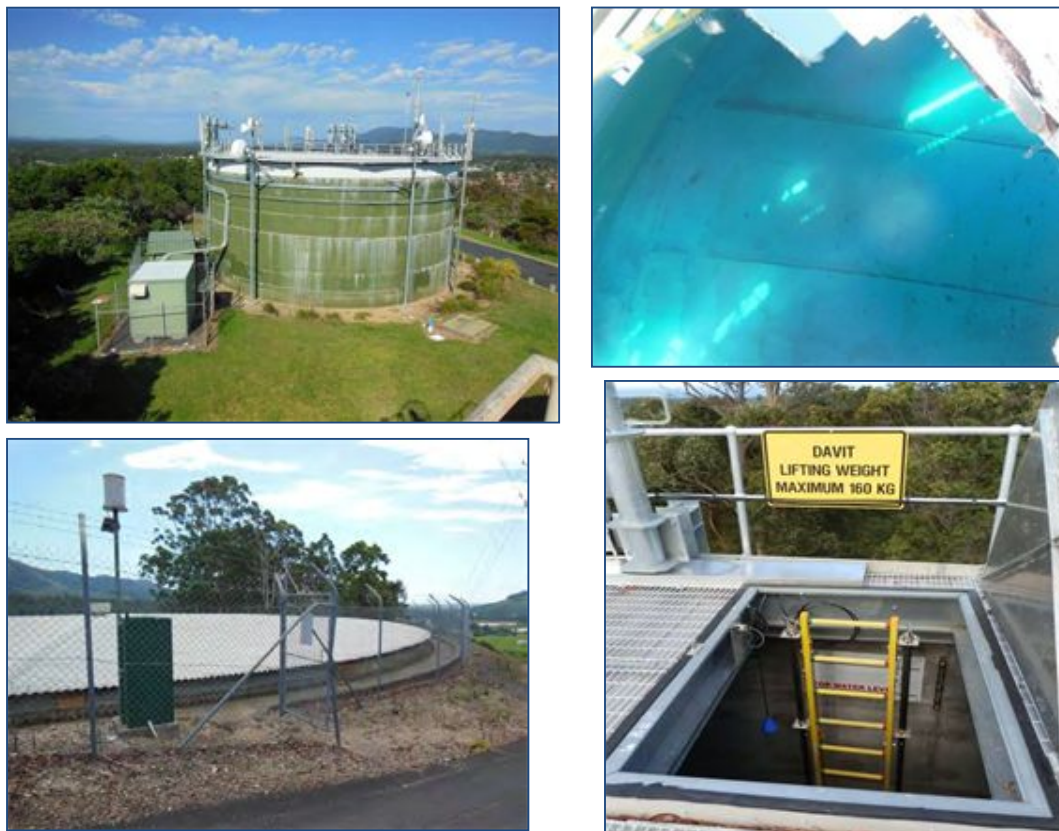


Table 1 CHCC Balance Tanks

No	Balance Tanks	Capacity (ML)	Reticulation Network
1	Karangie WTP	5.80	All drinking water from the WTP to Red Hill Balance Tank
2	Red Hill Balance Tank 1	1.00	All drinking water is distributed from the Red Hill Balance Tanks
3	Red Hill Balance Tank 2	17.00	

Table 2 CHCC Reservoirs

No	Reservoir	Capacity (ML)	Reticulation Network
1	Red Hill Reservoir	5.70	Coffs Harbour City (West and Central)
2	Toormina Reservoir 1	5.00	Toormina, Boambee
3	Toormina Reservoir 2	12.50	
4	Boambee Reservoir 1	1.36	Sawtell, Boambee
5	Boambee Reservoir 2	1.50	
6	Roberts Hill Reservoir	20.00	Coffs Harbour City (Central, South, Feeds Boambee Reservoirs)
7	Macauley's Reservoir	15.00	Coffs Harbour City (North, Feeds Northern Reservoirs)
8	Sapphire Reservoir	2.00	Sapphire Beach
9	Moonee Reservoir	5.00	Moonee Beach
10	Emerald Reservoir	6.00	Emerald Beach Sandy Beach
11	Haviland Street Reservoir	0.07	Woolgoolga
12	Scarborough Street Reservoir	4.54	Woolgoolga
13	Woolgoolga Headland Reservoir	0.50	Woolgoolga
14	Bark Hut Reservoir	1.50	Bark Hut area
15	Mullaway Reservoir	7.00	Safety Beach, Mullaway, Arawarra, Corindi
16	Corindi Reservoir	3.00	Corindi (in emergencies)
17	Coramba Reservoir	0.45	Coramba
18	Nana Glen Reservoir 1	0.50	Nana Glen
19	Nana Glen Reservoir 2	0.50	Nana Glen

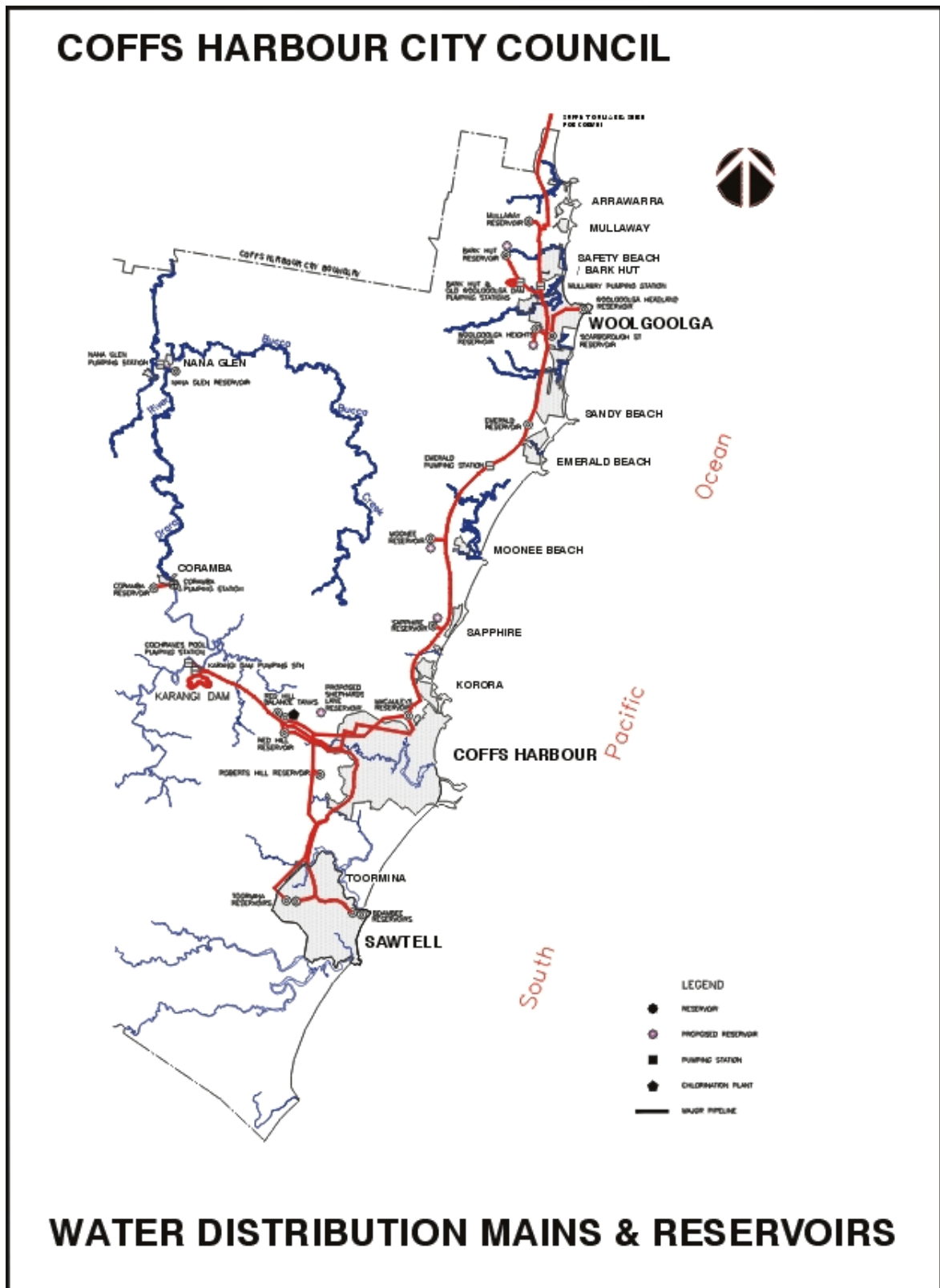


Figure 8 Coffs Harbour Distribution Network (Source: CHCC)

4.2 Drinking Water Quality Monitoring Regime

Table 3 summarises the water quality monitoring undertaken for the Coffs Harbour Drinking Water Supply. Sampling is either undertaken by CHCC Lab staff and / or Water Staff. Refer to Appendix 1 for further details.

Table 3 Coffs Harbour Quality Monitoring

Raw Water Source Monitoring			Operational Monitoring			Water Supply System Monitoring		
			Treated Water	Treated water	Red Hill Balance Tank	Red Hill Reservoir	All Reservoirs	Reticulation
Online and Daily	Weekly	Monthly	Online and Daily	Weekly	Weekly	Weekly	Yearly	Fortnightly/ Monthly
Turbidity	pH	pH	Turbidity at Filtration Plant	Total Coliforms	Total Coliforms	Total Coliforms	Total Coliforms	Total Coliforms
	Alkalinity	Conductivity	Fluoride	<i>E.coli</i>	<i>E.coli</i>	<i>E.coli</i>	<i>E.coli</i>	<i>E.coli</i>
	Algae	Calcium	Free Chlorine	Free Chlorine	Free Chlorine	Free Chlorine	Free Chlorine	Free Chlorine
		Hardness	Free Chlorine	Temp	Temp	Temp	Temp	Temp
		Alkalinity	pH	pH	pH	Temp	Temp	Fluoride
		Iron	UVT	UVT	Alkalinity	Conductivity	Fluoride	
		Manganese	UV	UV		Calcium		NSW Health Program:
		Total Nitrogen				Hardness		Microbial
		Total Phosphorous				Alkalinity		Physical
		Algae				Iron		Chemical
		Apparent colour				Manganese		
		Total colour						
		Total organic carbon						
		Faecal coliforms						
		Total coliforms						

Notes: Of these reservoir / reticulation water sampling points 12 are selected per year for comprehensive chemical analysis - with those missing out done the following year. Refer to Appendix 1 for a list of CHCC monitoring points and parameters, including the comprehensive chemical analysis.

WQ monitoring is undertaken by Coffs Water at various depths in the Karangi Dam including: surface level, 1m, 3m, 6m, 9m, 12m, 15m, 18m, 21m, 24m, 27m.

4.3 Water Quality Assessment

4.3.1 Source Water

According to ADWG, baseline assessment of the source water quality is recommended. ADWG recommends the following be assessed and, where detected

above the guideline limit, monitored at a relevant frequency depending on the parameter.

- Microbial
- Physical and chemical
- Radiological
- Pesticides

Microbial and Physical /Chemical

The table below provides a baseline characterisation of the raw water extracted from the HACCP workshop in 2010. Typical raw water quality is summarised for the three raw water sources.

Table 4 Typical Water Quality of Raw Water Sources

Parameter	Orara River at Cochrane’s Pool	Nymboida River	Shannon Creek Dam
<i>E.coli</i>	10 – 900 orgs/100 ml (median 118)	1 – 200 orgs/100 ml	5 – 300 orgs/100 ml
Total Organic Carbon	1 mg/L	2 mg/L	2 – 3 mg/L
Colour	5 – 15 PCU	5 – 50 PCU	20 – 200 PCU
Turbidity	0.5 – 5 NTU	2 – 140 NTU	4 – 200 NTU
Total Phosphorous	0.01 – 0.03 mg/L	<0.01 – 0.07 mg/L	<0.01 – 0.02 mg/L
Manganese	<0.01 – 0.05 mg/L	<0.02 mg/L	0.05 – 0.5 mg/L
Alkalinity	10 – 18 mg/L	10 – 15 mg/L	17 – 85 mg/L

Source: CHW HACCP 2010

The results above indicate relatively soft source waters, low in manganese and phosphorous. The water quality in the Orara River at Cochrane's Pool is within the ADWG criteria. *E.coli* was found to be highest at Crochane's Pool, indicating faecal contamination.

Turbidity, Colour and Total Organic Carbon are the highest at the Shannon Creek Dam are above the ANZECC Fresh and Marine Guidelines (2000) for South-east flowing rivers indicating slightly disturbed ecosystems.

Baseline sampling was undertaken at Karangi Dam over a two and a half year period from July 1998 to December 2000. Table 5 provides an analysis of the physical water quality parameters. The results indicate that the raw water is of relatively good quality. pH is in the optimal range with low turbidity and conductivity as typical of large lakes and reservoirs. The raw water is very soft and low in nutrients.

Table 5 Karangi Dam Raw Water Quality: Physical

	True Colour	Turbidity	Specific Conductance	pH	Alkalinity as CaCO ₃	Nitrite as N	Nitrate as N	Phosphorus	Ca Hardness as CaCO ₃	Total Hardness as CaCO ₃
	TCU	NTU	µS/cm		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Min	1	0.3	72	6.8	10	0.1	0.1	0.01	4	5
Mean	4	1.0	79	7.5	14	0.1	0.1	0.02	7	8
Max	18	2.3	110	7.8	19	0.1	0.1	0.04	11	11

Source: Water Sampling; Chemical THMs

Baseline sampling was undertaken at the Shannon Creek Dam on 24 March 2012 including physical, chemical, pesticide and radiological analysis. In relation to the physical and chemical results, all parameters were within the guideline criteria for drinking water. Pesticide and radiological results are discussed below. Refer to Appendix 2 for full results.

Pesticides

Baseline pesticide sampling in the source water at Shannon Creek Dam was conducted on 24 March 2010 for a range of:

- Organochlorine Pesticides
- Organophosphate Pesticides

Further to the above CHCC sampled pesticides in reservoirs over a 2 year period from September 1998 to October 2000. Refer to Appendix 3 for full results. Samples were analysed for the following pesticides.

- Organochlorine Insecticides
- Organophosphorus Insecticides
- Acidic Herbicides
- Synthetic Pyrethroids
- Glyphosate.

According to the information provided by CHCC, pesticides were found to be non-detectable in all source water samples.

Radiological analysis

Radiological baseline assessments in the form of alpha and beta radiation were undertaken on 20 September 2010 at Wongala Aboriginal Community and Corindi Beach Aboriginal Community and on 24 March 2010 at Shannon Creek Dam. Refer to Appendix 4 for Lab results. Results are summarised as follows:

- Corindi results were under the detection limit for both Alpha and Beta analysis.

- ❑ Wongala results were under the detection limit for Alpha. However Beta results were above the detection limit at 22 ± 3 mBq/l.
- ❑ Shannon Creek Dam results were under the detection limit for Alpha. However Beta results were above the detection limit at 20 mBq/l.

It is recommended that Council retest Alpha and Beta. If results are exceeded in the retest, it is recommended that specific radionuclides be identified and their activity concentrations determined.

Data Gap
Please provide Council response to the beta exceedance.

4.3.2 Operational Water Quality

Process water quality monitoring at the Karangi WTP includes the following:

- ❑ Raw water at Inlet to the plant- turbidity, pH, and alkalinity;
- ❑ Clarified water– turbidity and pH;
- ❑ Filtered water–turbidity and pH;
- ❑ Treated water at the clearwater well – turbidity, colour, pH, temperature, free chlorine, total chlorine, aluminium, iron and manganese;
- ❑ Potable water at treated water reservoir– turbidity, colour, pH, temperature, free chlorine, total chlorine, fluoride, aluminium, iron, magnesium, hardness and salinity.

For comparison purposes Table 6 sets out the mean monitoring results for pH, turbidity and alkalinity in the source waters and the treated /potable water. Points of note:

- ❑ pH adjustment achieves the desired results with an average pH of 7.7 in the treated water.
- ❑ Turbidity at 0.1NTU is reduced to the ADWG recommended criteria (<0.2 NTU) indicating effective filtration.
- ❑ Alkalinity is effectively increased to reduce problems associated with corrosion.

Table 6 Mean pH, Turbidity and Alkalinity: Operational

Parameter	Regional	Cochrane’s Pool	Karangi Dam	Raw Water at inlet	Treated Water	Red Hill Balance Tank
pH	7.2	-	7.2	7.2	-	7.7
Turbidity	1.5	3.0	1.1	-	0.1	-
Alkalinity	13.0	-	13.0	-	47.3	47.4

Source: Karangi Dam WTP data Spread sheet (2010 – 2012)

In relation to health considerations, turbidity can have a significant effect on microbial quality of drinking water. Elevated turbidity can interfere with the detection and treatment of bacteria and viruses.

The Karangi WTP has a critical control point (CCP) for the turbidity at raw water extraction from all source waters. The Karangi Dam ceases pumping from the Nymboida River at >2 NTU; and from the Cochrane's Pool at > 2 NTU.

The ADWG 2011 recommends that in order to remove waterborne pathogens where filtration is used as part of the water treatment process, the turbidity leaving individual filters should be less than 0.2 NTU and should not exceed 0.5 NTU at any time. It is essential that filtration is optimised.

Filtered water turbidity is monitored inline continuously with alarms at each of the individual filters. CCP at each filter is alarm controlled at:

- Alert level: 0.3 NTU
- Critical alarm: 0.5 NTU

Operators record turbidity readings daily onsite. These recordings are hand written and were unavailable for statistical analysis. However, the mean turbidity of the treated water (<0.1 NTU) indicates that filtration is effective and is achieving the desired results.

The water supply treated at the Karangi WTP undergoes disinfection via chlorination. The ADWG recommend the following limits in order to achieve effective disinfection:

- Turbidity <1 NTU
- pH 7 - 8

According to the data provided by Coffs Water, CHCC is achieving the operational target with turbidity averaging less than 1 mg/L in the reticulation, and pH 7 – 8 at the time of disinfection.

According to ADWG, in clean water, a combined residual chlorine level of 0.5 mg/L after contact time of 30 minutes should ensure microbial control given a clean distribution system and no significant recontamination.

It is considered that Karangi WTP has sufficient contact time for disinfection given the volume of storage at the WTP and the distribution of drinking water to the Red Hill Balance Tanks.

Treated water free chlorine is monitored inline continuously with alarms. CCP is alarm controlled at:

- Alert level: <0.6 or >3.0 mg/L

- ❑ Critical alarm: <0.4 or >3.5 mg/L

The water supply treated at the Karangi WTP is fluoridated. The ADWG 2011 stipulates that Fluoride in the Drinking Water Supply should be 1mg/L, but should not exceed 1.5 mg/L due to health concerns.

The treated water is sampled daily at the Karangi WTP for fluoride with an average concentration of 1 mg/L. Coffs Harbour Water is achieving the stipulated fluoride concentration as required by the NSW code of practice for fluoridation of public water supplies.

Treated water fluoride is monitored inline continuously with Alarms. CCP is alarm controlled at:

- ❑ Alert Level: <0.8 or >1.1 mg/L
- ❑ Critical Alarm: >1.5 mg/L

4.3.3 Reservoir Water Quality

Potable water from the Karangi WTP flows is pumped to the two Red Hill Balance Tanks. From the balance tanks the drinking water is distributed to fifteen reservoirs.

CHW operate a chlorine booster plant at Emerald Reservoir to ensure chlorine residuals at the end of the northern reticulation system. CHW are in the process of installing a chlorine booster plant at Sawtell Reservoirs in the south, to maintain chlorine residuals from the reservoirs. CHW monitor the chlorine residuals from this process.

CHW monitors and records weekly water quality from alternating reservoirs and reticulation points throughout the water supply system. Table 7 tabulates and compares mean results for free chlorine, E. coli, total coliforms and fluoride. Refer to the Coffs Harbour Water Sampling table in Appendix 1 for sample points and frequency.

Points of note from the operational data in Table 6:

- ❑ Free chlorine residual is maintained throughout the distribution system and reservoirs, although at times less than optimal at Sawtell, Toormina and Bark Hut with a low mean free chlorine. CHCC has difficulty maintaining a residual in the southern reservoirs and are considering a chlorine booster pump for the Sawtell reservoirs (pers. com. Simon Thorn, CHCC Executive Manger of Operations 16/1/13). Bark Hut reservoir has a relatively low water usage and it is difficult to maintain the chlorine residual in storage – hand dosing is carried out.
- ❑ All reservoirs conformed to ADWG 2011, with a mean *E.coli* of <1 cfu/100ml. On one occasion 3 *E.coli* were detected in the Sawtell Reservoir (6 April 2009). Resampling was undertaken on the 8 April 2009 in accordance with the NSW Health Microbial Response Protocol. No *E.coli* was identified in the resample.

Attachment 3

- ❑ Total coliforms were identified in low numbers at the Sawtell, Toormina and Bark Hut Reservoirs. These reservoirs also displayed low chlorine residual at times.
- ❑ Fluoride is maintained within the NSW Health criteria.

Table 7 Mean Free Chlorine, *E.coli* and Total coliforms in Reservoirs

Parameter	Red Hill	Sawtell	Toormina	Roberts Hill	McCauley s	Sapphire	Moonee	Emerald	Scarborough St	Woolgoolga	Bark Hut	Mullaway	Corindi PS
Free Chlorine mg/L		0.18	0.16	0.77	0.77	0.31	0.45	0.46	0.34	0.33	0.16	0.48	1) 0.24 2) 0.3
<i>E.coli</i> cfu/100ml		0 (max 3)	0	0	0	0	0	0	0	0	0	0	1) 0 2) 0
T. Coliforms cfu/100ml		4	0 (max 8)	0	0	0	0	0	0	0	1	0	1) 0 2) 0
Fluoride mg/L	0.97											-	1) 0.97 2) 0.97

Data obtained from CHW 'Coffs Water Lab Results 2007 to present'; Note the majority of reservoirs were tested annually - at times only 4 sample results

No results were provided for Hayiland Street Reservoir

4.3.4 Supply Water Quality Monitoring: WTP Operational

As part of the WTP Operational monitoring procedures, water quality is sampled weekly at a point of supply in Coffs Harbour. Table 8 below provides a snapshot of the operational data from the commencement of the upgrade of the Karangi WTP in 2007.

Table 8 Mean Water Quality at Points of Supply

Parameter	ADWG	Red Hill	Sawtell	Toormina	Coffs Harbour	Sapphire	Moonee	Emerald	Woolgoolga	Safety beach	Mullaway Arrawarra
Free Chlorine	0.2	-	0.19	0.19	0.4	-	0.21	0.36	0.36	0.22	0.31
<i>E.coli</i>	0	-	0	0 (max 200)	0	-	0	0	0	0	0
T.coliforms	-	-	5	1 (max 200)	7	-	1	0	0	0	4
Fluoride	0.9 – 1.1	0.97	0.98	0.97	0.99	1.1	0.95	-	0.96	-	0.97
Alkalinity	-	-	53.3	-	52.1	48.9	-	-	53.4	-	-
pH	7 - 8	-	8.3	-	7.6	7.6	-	-	8.0	-	-
Turbidity	<5	-	0.28	-	0.2	-	-	-	0.23	-	-
Colour	15	-	3.0	-	1.1	-	-	-	2.3	-	-

Data assessed from Coffs Water Lab Results 2007 to Present (December 2012) Spread sheet.

E.coli exceedances have occurred within the supply system. The maximum *E.coli* exceedance of 200 cfu/100ml occurred at Hamilton Drive Toormina on 29 November 2010. On this occasion it is unclear if retesting was undertaken.

For all other *E.coli* exceedances, CHW repeated tests in line with the NSW Health monitoring protocol. All follow-up tests were within the guideline criteria and subsequently no boiled water alerts were issued.

Total coliform exceedances have occurred. The highest total coliform reading of 200 cfu/100ml occurred at Hamilton Drive Toormina on 1 December 2008. The presence of these coliforms may represent release from pipe or sediment biofilms, and may be part of the normal flora of the drinking-water distribution system.

Data Gap

Please provide response to the *E.coli* exceedances on 29/11/10 at Hamilton Drive Toormina

Disinfection By – products

When the disinfectant in a drinking water supply is chlorine, the main by-product produced is normally Trihalomethanes (THMs). ADWG recommends that the concentration of THMs, either individually or in total, in drinking water should not exceed 0.25 mg/L. It is considered that THMs concentrations fluctuating occasionally up to 1 mg/L are unlikely to pose a significant health risk.

THM monitoring is carried out routinely and when required by CHCC (Pers Com Simon Thorn). THM monitoring results were provided for:

- CHCC Reservoirs – monthly sampling over 1999 and 2000
- Shannon Creek Dam – baseline assessment (the sampling results provided indicate that the THM assessment was done in the source water – not the supply water. Please explain).
- Redhill Balance Tank – 21 March 2005

The results indicated that THMs concentration in the water supply system is within the ADWG 2011 criteria. Refer to Appendix 5 for full results

4.3.5 Supply Water Quality Monitoring: NSW Health

Further to operational monitoring, the NSW Health Water Quality Monitoring Program requires Council to submit water quality sampling results at the point of supply. The samples are monitored for their physical, chemical and microbial parameters. Refer to Appendix 6 for the full list of parameters tested under the NSW Health monitoring protocols.

A total of 422 microbiological samples are tested per year for the Coffs Harbour drinking water supply - approximately 8 samples per week. Samples are collected and analysed by CHCC Laboratory Staff.

Table 9 lists the 36 sites that are monitored in Coffs Harbour, including 14 areas and two aboriginal communities. Table 10 summarises relevant statistics based on the water quality monitoring data submitted to NSW Health. The analysis of the data shows high compliance with the ADWG for all parameters, excluding chlorine residuals.

Table 9 NSW Health monitoring locations, Coffs Harbour

Town	Sampling Site	Location
Ararawarra	21	Eggins Drive
	22	Second Avenue
Coffs Harbour	10	Mastracolas Road
	11	Kratz Drive
	30	York Street
	31	Marcia Street
	32	Coffs St
	33	Orlando St
	40	Ocean Parade
	7	Coramba Road
Coramba	9	Martin Street
Corindi	1	Pacific Street
	2	Coral Street
	3	MacDougall Street
	4	Pacific Street
Corindi Beach Aboriginal community	41	Red Rock Road
Emerald Beach	16	Stefan Close
	26	Fiddamans Road
Korora	29	Sandy Beach Road
Moonee Beach	17	MacCues Road
	27	Woodhouse Road
Mullaway	12	Tramway Drive
Safety Beach	23	Ocean Drive
Sandy Beach	25	Beach Drive
Sapphire	18	Old Coast Road
	28	Sapphire Crescent
Sawtell	19	Boambee Headland
	34	Boronia Park

Town	Sampling Site	Location
Toormina	20	Belbowrie Rd
	35	Sea Breeze Place
	36	Hamilton Drive
Wongala Aboriginal community	42	Wongala
Woolgoolga	13	Bark Hut Road
	14	Ocean Street
	15	Scarborough Street Reservoir
	24	Lake Road

Table 10 Summary of NSW Drinking Water Monitoring Program Data Water Quality: Coffs Harbour

Parameters	ADWG Value	Number of Samples	Min	Mean	95%ile	Max	Exceedances
E.coli (cfu/100ml)	<1	1,726	0	0	0	0	0
Total Coliform (cfu/100ml)	<1	1,721	0	0.13	0	200	7
Free Chlorine (mg/L)	0.2 - 5	1,726	< 0.01	0.48	1.08	28	500 (Low residual)
Total Chlorine (mg/L)	5	6	0	0.21	0.94	1.25	0
pH (pH units)	6.5 – 8.5	94	7.4	7.94	8.4	8.5	0
True Colour (HU)	15	66	<1	1	1	1	0
Turbidity (NTU)	5	94	<1	0.1	0.3	0.4	0
Iron (mg/L)	0.3	66	0.01	0.01	0.02	0.07	0
Fluoride (mg/L)	0.9 – 1.5	985	0.04	0.98	1.02	1.10	8 (Low fluoride)
Hardness (as calcium carbonate) (mg/L)	200	66	46.6	57.6	63.90	65.7	0
Aluminium (mg/L)	0.2	66	0.01	0.01	0.02	0.04	0
Manganese (mg/L)	0.5	66	0.01	0.01	0.01	0.01	0

Note: Treated water data from 2009 to 2012

The free chlorine non-compliances, with the exception of one event, were all low residuals. The greatest proportion of non-compliances was at Safety Beach, Toormina and Sawtell, all of which had more than 50% of samples below 0.2 mg/L. Coffs Harbour, Wongala, Sapphire and Arrawarra had the lowest non-compliance, with less than 25%.

The fluoride non-compliances were all low values at the random site, with five of the eight values re-sampling around one event (6/04/2010). The remaining three events had values above 0.80 mg/L, and as such, were not re-tested.

Table 11 provides a summary of total coliform exceedances in at the point of supply, illustrating individual exceedances at a small number of different sites over the period of sampling. The presence of these coliforms may represent release from pipe or sediment biofilms, and may be part of the normal flora of the drinking-water distribution system.

Table 11 Summary of Total Coliform Exceedances at Point Of Supply: NSW Health database

Town	Unit	Total Samples	Exceedance			ADWG
			Site Number	Value	Date	
Arrawarra	cfu/100ml	44	21	10	16/04/2012	< 1
Coffs Harbour		86	32	5	21/12/2009	
		85	31	1	28/03/2011	
Corindi		82	2	2	19/03/2012	
Toormina		87	36	1	21/12/2009	
	200			8/03/2010		

Source NSW DOH Drinking Water Database. Data has been assessed: 2009 – 2012

5 Nana Glen Water Supply

5.1 Overview of System

The Nana Glen Water Treatment Plant (WTP) provides filtered, disinfected water to the residents of Nana Glen and Nana Glen Rail. CHCC draws raw water from the Orara River near the village.

5.1.1 Source Water: Orara River

Water is extracted from a pool on the Orara River via a screened inlet, suction pipe and pump station adjacent to the eastern bank of the river. Water is pumped from the pool to the WTP for treatment.

5.1.2 Treatment Processes: Nana Glen WTP

The treatment process for water extracted from the Orara River comprises of the following:

- Chemical dosing – alum and lime
- Uplift Clarifier - Coagulation and Flocculation
- Sand filtration
- pH correction
- Disinfection with chlorine

A flow diagram of the plant is given in Figure 9.

5.1.3 Distribution network

Refer to Section 4.1.3 for full details of the CHCC distribution network. Table 12 below provides a list of the storage reservoirs in the Nana Glen DWSS. The reservoirs in the Nana Glen distribution system are located at the WTP. Drinking water is reticulated via gravity to consumers.

Table 12 Nana Glen Reservoirs

No	Reservoir	Capacity (ML)	Reticulation Network
1	Nana Glen Reservoir 1	0.5	Nana Glen
2	Nana Glen Reservoir 2	0.5	Nana Glen

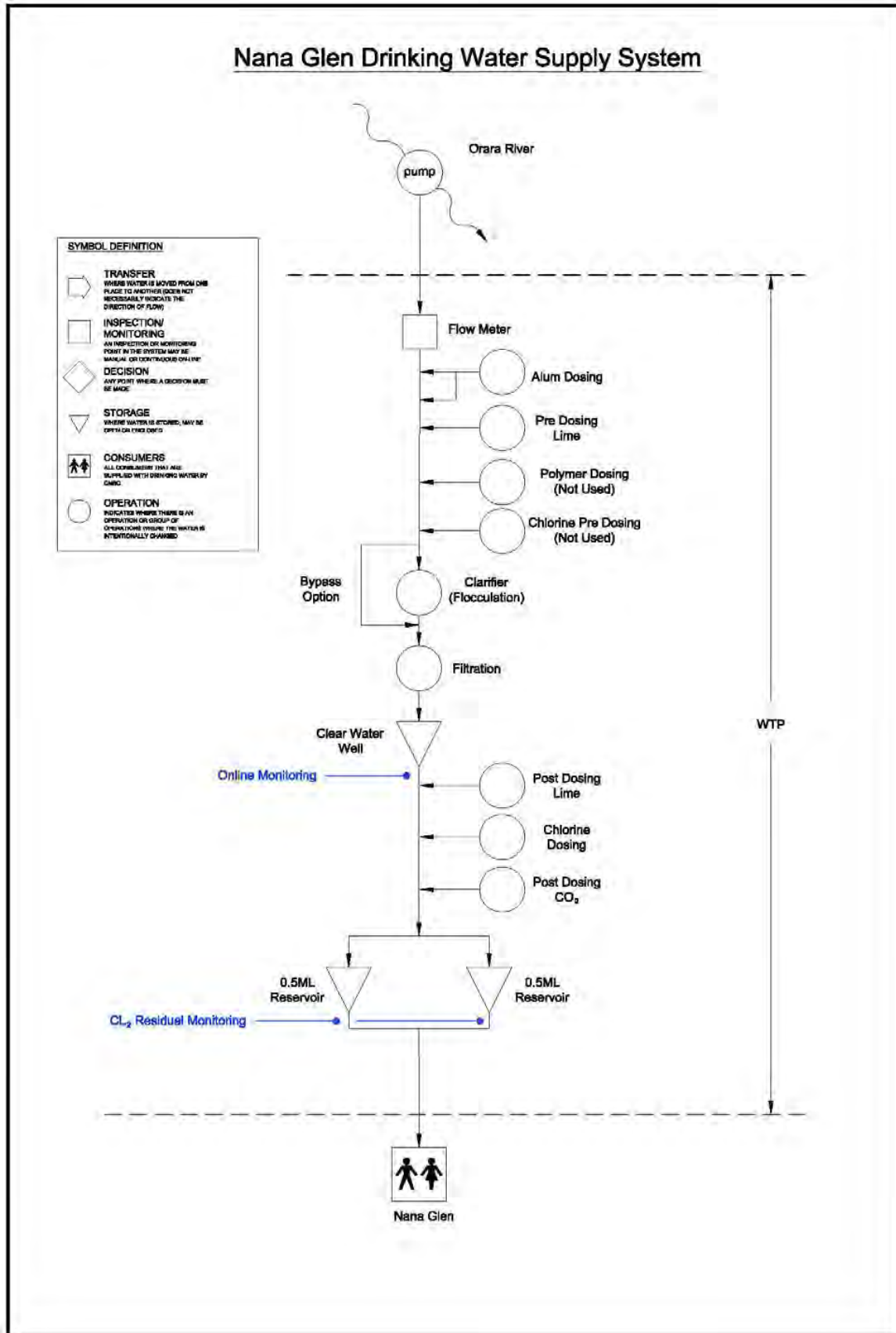


Figure 9 Process Flow Diagram of Nana Glen Drinking Water Supply

5.2 Drinking Water Quality Monitoring Regime

Set out below in Table 13 is the monitoring regime for the Nana Glen Water Supply.

Table 13 Nana Glen Water Quality Monitoring Regime

Source		Operational				Supply	
Orara River	Intake	Raw water	Treated Water	Reservoirs 1 & 2	Reservoirs 1 & 2	Grafton St (Park)	
Monthly	Monthly	Weekly	approx. 3 x per Week		Monthly	Fortnightly	6 monthly
Faecal coliforms	Turbidity	Inflow	Flow	Free Chlorine	Turbidity	Free Chlorine	Chemical
Total coliforms	pH	Turbidity	Turbidity	Reservoir 2 - level	pH	E.coli	Physical
	Aluminium		pH		Aluminium	Total coliforms	
	Alkalinity				Alkalinity	Temperature	
	Hardness				Hardness	Aluminium	
	Colour Apparent				Colour Apparent		
	Conductivity				Conductivity		
	Iron				Iron		
	Manganese				Manganese		

5.3 Water Quality Assessment

5.3.1 Source Water Quality

Water is sourced from the Orara River for the Nana Glen drinking water supply. Refer to Section 3.1.1 for information on the Orara River sub-catchment. CHCC water sampling sites for source water monitoring include:

- Orara River
- Nana Glen Pump Intake

Table 14 and Table 15; summarise the water quality data provided by CHCC. Data from 2008 – 2012 has been assessed.

Table 14 Microbial quality in Orara River at Nana Glen

Analyte	Min	Mean	Median	95%ile	Max
Faecal Coliforms	0	378	106	106	2,320
Total Coliforms	0	1907	633	633	25,400

Table 15 Water Quality Nana Glen Pump Intake

Analyte	Units	ADWG	Min	Mean	Max
Alkalinity CaCO3	mg/L		5	15	21
Hardness CaCO3	mgCaCO3/L	60 - 200	4	6	12
Colour Apparent	Pt Co		13	42	153
Conductivity	µS/cm		86	103	129
Iron	mg/L	0.3	0.12	0.42	0.87
Manganese	mg/L	0.5	0.004	0.028	0.099
pH	pH units	6.5 – 8.5	5.6	6.9	7.7
Turbidity	NTU		1.1	3.7	16

The waters of Orara River are soft, with a neutral pH (slightly acidic at times) and in periods of normal river flow, turbidity is low (averaging 3.7 NTU). Iron is above the recommended criteria for aesthetics with an average of 0.4.

5.3.2 Operational Water Quality

Process water quality monitoring includes the following:

- Turbidity in raw water
- Free chlorine in storage reservoirs

Operational data is recorded manually by council staff and was unavailable for analysis.

Nevertheless, the absence of coliforms within the supply system as noted in Table 17 and Table 18 indicates that treatment has effectively removed the coliforms as noted in Table 14 above.

Recommendation
Document all water quality data in electronic form in order to observe trends and issues over time

5.3.3 Reservoir Water Quality

Treated water from Nana Glen WTP flows to two storage reservoirs:

- Reservoir 1
- Reservoir 2

Both reservoirs are situated at the Nana Glen WTP. Nana Glen WTP operators monitor and record water quality from the reservoirs including:

- ❑ Free chlorine approximately three times per week (data not available in electronic format for analysis)
- ❑ Monthly: pH, conductivity, turbidity, apparent colour, calcium, hardness, iron, manganese, aluminium, free chlorine

Table 16 summarises the water quality results from the Nana Glen reservoirs.

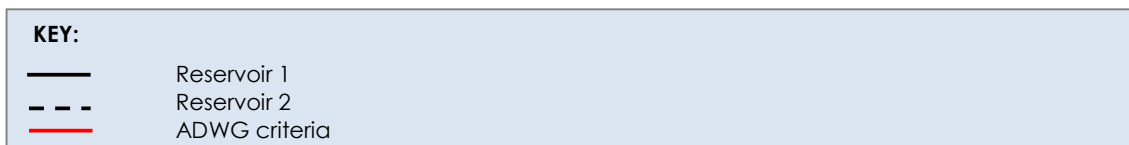
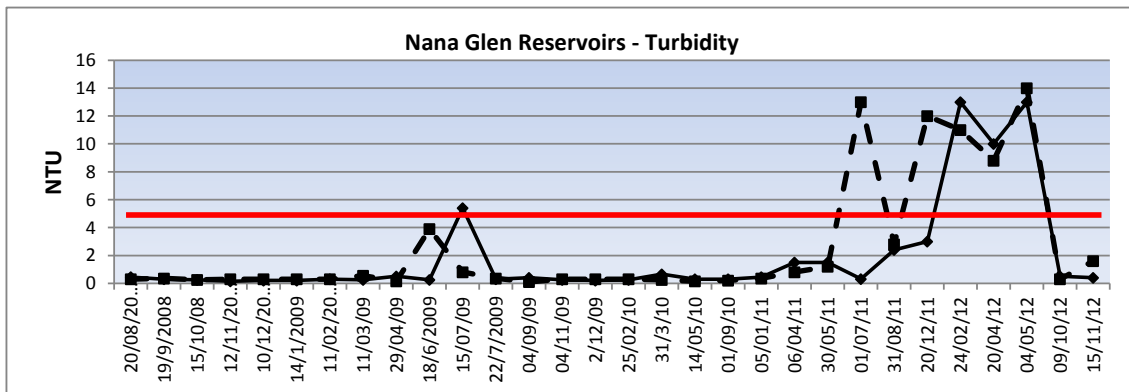
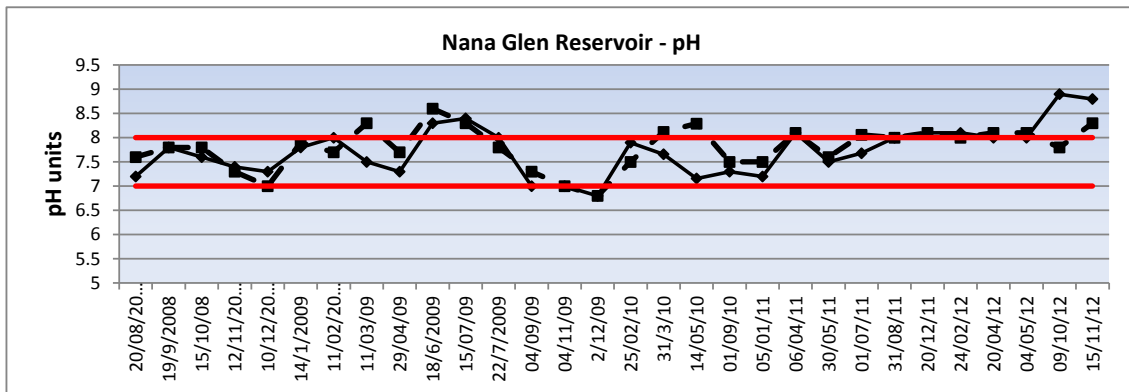
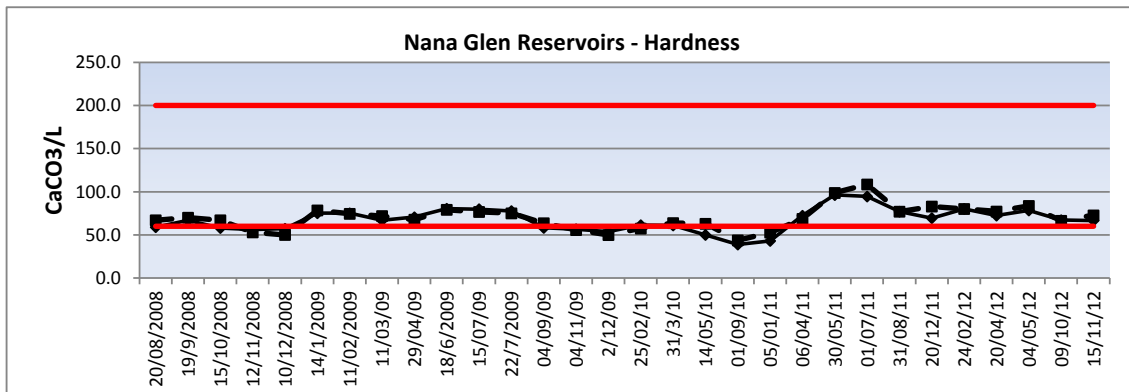
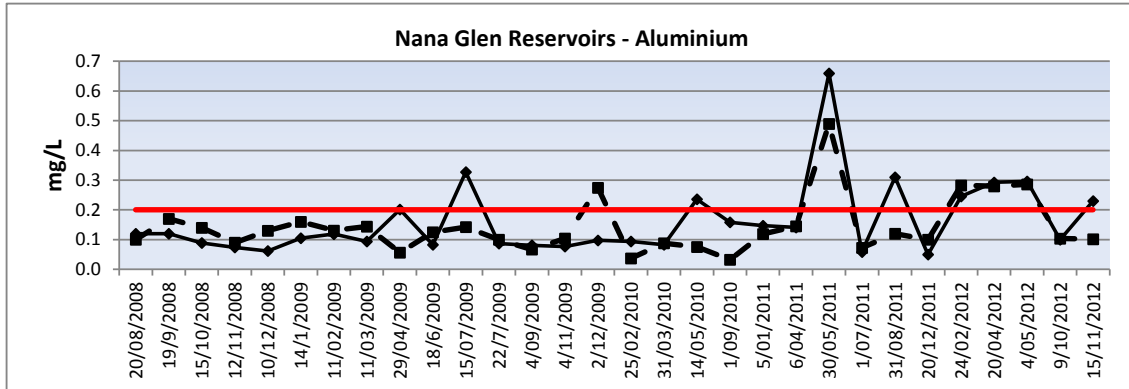
Table 16 Water Quality Nana Glen Reservoirs

Analyte	Units	ADWG	Reservoir 1			Reservoir 2		
			Min	Mean	Max	Min	Mean	Max
Alkalinity CaCO ₃	mg/L	60 - 200	30	54	78	37	56	76
Aluminium	mg/L	0.2	0.05	0.16	0.66	0.03	0.14	0.5
Hardness CaCO ₃	mgCaCO ₃ /L	200	38.8	67.3	96.2	43.7	69.9	108.5
Colour Apparent	Pt Co	-	0	11.4	90	0	15	72
Conductivity	µS/cm	-	169	222	283	184	224	292
Iron	mg/L	0.3	0	0.03	0.18	0	0.02	0.06
Manganese	mg/L	0.5	0	0.008	0.28	0	0.01	0.03
pH	pH units	7 – 8	6.8	7.7	8.9	6.8	7.8	8.6
Turbidity	NTU	< 5	0.2	1.9	13.0	0.1	2.5	14.0

Source: Coffs Water Lab results 2007 to present

The figures below display water quality over time for the Nana Glen reservoirs. Points to note include:

- ❑ At times Aluminium is elevated above the ADWG criteria. Although only an aesthetic consideration, the ADWG strongly encourage that aluminium is kept as low as possible – preferably below 0.1mg/L.
- ❑ Hardness is within or slightly under the recommended criteria.
- ❑ pH at times is slightly alkaline
- ❑ Turbidity in the last few years has been above the recommended criteria of 5 NTU and potentially indicates possible contamination. It is recommended CHCC review the cleaning schedule of these Reservoirs.
- ❑ At times Apparent Colour is elevated. This could be due to the higher Turbidity readings. ‘Apparent Colour’ is the colour resulting from the combined effect of true colour and any particulate matter, or turbidity. In turbid waters, the true colour is substantially less than the apparent colour. Guideline value for true colour is < 15HU.



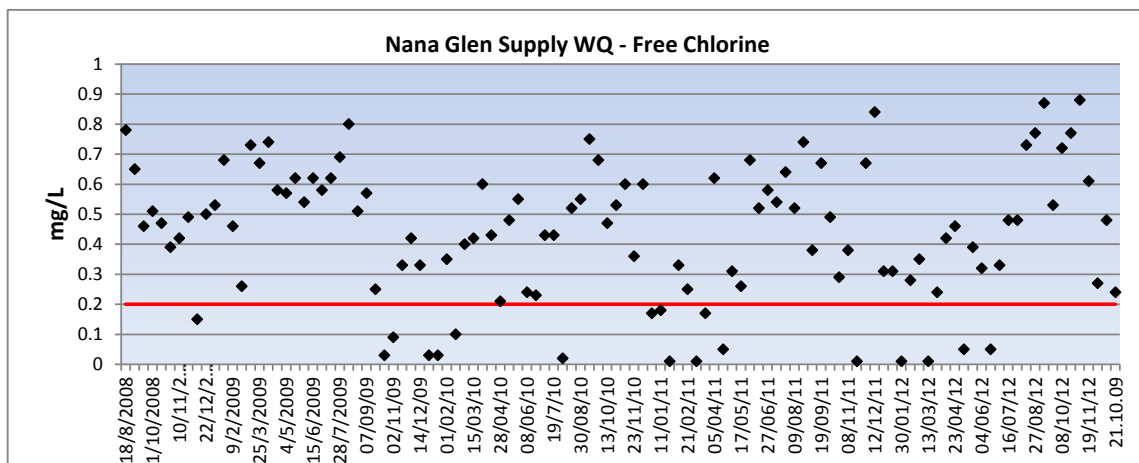
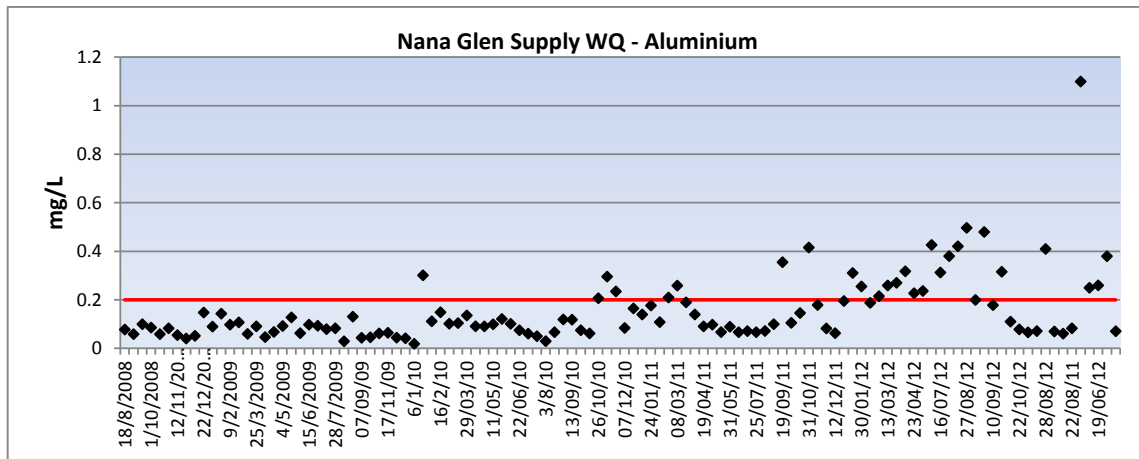
5.3.4 Supply Water Quality Monitoring: WTP Operational

As part of the WTP operational monitoring procedures, water quality is sampled fortnightly at a point of supply in Nana Glen. Table 17 provides the mean results. All mean parameters are within the recommended limits.

Table 17 Nana Glen Customer End Point Water Quality Sampling

Analyte	Units	ADWG	Min	Mean	Max
Aluminium	mg/L	0.2	0.02	0.2	1.1
Free Chlorine	mg/L	0.2 – 5	0.01	0.4	0.88
E. coli	cfu/100ml	< 1	0	0	0
Total coliforms	cfu/100ml	< 1	0	0	1
Temperature	Celcius	-	13	21	30

Source: Coffs Water Lab Results 2007 to Present



5.3.5 Supply Water Quality Monitoring: NSW Health

Further to the operational monitoring, NSW Department of Health (NSW Health) monitors water quality at the point of supply. The samples are monitored for their physical, chemical and microbial parameters.

A total of 26 microbiological samples are tested per year in the Nana Glen drinking water supply.

The following two sites are monitored in Nana Glen:

- ❑ 8. Grafton Street
- ❑ 999. Not Defined, Nana Glen

Table 18 summarises the water quality data for Nana Glen, illustrating nearly 100% compliance with all key indicators, with the exception of a small number of exceedances for total coliforms, pH and aluminium, most of which occurred up to eight years previously. Non-compliances for free chlorine were all low-residuals, with 11% non-compliance in 2009; and 21% non-compliance in each of 2009, 2010 and 2011. All exceedances were at Grafton Street monitoring site, except for a free chlorine reading on March, 2004.

Table 18 Summary of NSW Drinking Water Monitoring Program Data Water Quality: Nana Glen

Parameters	ADWG Value	Number of Samples	Min	Mean	95%ile	Max	Exceedances
E.coli	<1 cfu/100ml	262	0	0	0	0	0
Total Coliform	<1 cfu/100ml	263	0	0	0	1	5/09/2006: 2 cfu/100ml
Free Chlorine	0.2 - 5 mg/L	261	0.01	0.29	0.74	1.18	114 (Low residual)
pH	6.5 – 8.5	20	7.3	8.2	8.7	8.8	1/04/2004: 8.7 9/09/2004: 8.6 6/05/2010: 8.8
True Colour	<15HU	18	0.05	0.10	0.19	1.00	0
Turbidity	<5NTU	20	0.05	0.35	0.74	1.50	0
Total Hardness	200mg/L CaCo3	19	46.6	72.3	87.0	87.9	0
Aluminium mg/L	0.2mg/L	19	0.02	0.13	0.33	0.46	9/09/2004: 0.46 2/06/2005: 0.31
Iron	0.3mg/L	19	0.01	0.03	0.07	0.08	0
Manganese	0.5mg/L	20	0	0	0.01	0.02	0

Note: Treated water data from 2002 to 2012

Appendices

1.1. Frequency of Water Quality Monitoring

Site No	Sample Point	Sampled By	Frequency	Tests Done
TREATED WATER				
007	Red Hill Reservoir - Coramba Rd. (East of Res.)	Lab Staff	Weekly	A
008	Nana Glen - Grafton St (Park by River)	Lab Staff	Fortnightly	A, B
009	Coramba - Martin St. (Toilet Block)	Lab Staff	Fortnightly	A, B
DISTRIBUTION SYSTEM - (RESERVOIRS)				
010	Macauley's - Mastracolas Rd (North of Res)	Lab Staff	Yearly	A
011	Roberts Hill - Kratz Dr. (North of Res.)	Lab Staff	Twice / Year	A
012	Mullaway - Tramway Dr. (East of Res)	Lab Staff	Yearly	A
013	Bark Hut - Bark Hut Rd. (East of Res.)	Lab Staff	Yearly	A
014	Woolgoolga Headland - Ocean St. (West of Res.)	Lab Staff	Yearly	A
015	Scarborough St - Scarborough St. (East of Res.)	Lab Staff	Yearly	A
016	Emerald - Stefan Cls.(South of Res.)	Lab Staff	Yearly	A
017	Moonee - MacCues Rd. (North of Res.)	Lab Staff	Yearly	A
018	Sapphire - Old Coast Rd. (East of Res.)	Lab Staff	Yearly	A
019	Sawtell Headland - Boambee Headland (South of Eastern Res.)	Lab Staff	Twice / Year	A
020	Toomina - Belbowrie Rd. (South of Eastern Res.)	Lab Staff	Twice / Year	A
SUPPLY TO CONSUMER (RETICULATED)				
021	Ulmarra offtake - Eggins Cl. (Next to meter pit)	Lab Staff	Every 4 Weeks	A, B
022	Arararra - 2nd Ave.(Toilet Block, in service bay)	Lab Staff	Every 4 Weeks	A, B
023	Safety Beach - Ocean Drive. (SPS)	Lab Staff	Fortnightly	A, B
024	Woolgoolga - N. End Lake Rd.(Toilet Block, in service bay)	Lab Staff	Fortnightly	A, B
025	Sandy Beach - Sandy Beach Dr.(Toilet Block, in service bay)	Lab Staff	Every 4 Weeks	A, B
026	Emerald - Fiddamans Rd.(Reserve Toilet Block, East side)	Lab Staff	Every 4 Weeks	A, B
027	Moonee -Woodhouse Rd (Bushfire	Lab Staff	Fortnightly	A, B

Site No	Sample Point	Sampled By	Frequency	Tests Done
	Shed, North side)			
028	Sapphire - Sapphire Cr.(SPS 69)	Lab Staff	Fortnightly	A, B
029	Korora - Sandy Beach Dr.(Toilet Block, South end)	Lab Staff	Fortnightly	A, B
030	Coffs Harbour Nth - York St (SPS 44)	Lab Staff	Fortnightly	A, B
031	Coffs Harbour Nth - Marcia St Depot (North end Stores Build)	Lab Staff	Fortnightly	A, B
032	Coffs Harbour Sth - Council Chambers (Riding Lane, carpark wall)	Lab Staff	Fortnightly	A, B
033	Coffs Harbour Sth - Jetty Oval (Toilet Block, South side)	Lab Staff	Fortnightly	A, B
034	Sawtell - Boronia Park (West side Lions Shed)	Lab Staff	Fortnightly	A, B
035	Toomina - Sea Breeze Pl. (SPS 21)	Lab Staff	Fortnightly	A, B
036	Toomina - Hamilton Dr. (SPS 17)	Lab Staff	Fortnightly	A, B
041	Corindi Beach Aboriginal Community	Lab Staff	Monthly	A, B
042	Wongala Estate Aboriginal Community	Lab Staff	Monthly	A, B
043	Karangri Dam Water Treatment Plant - Treated Water	Lab Staff	Weekly	A, B
RAW WATER SAMPLES				
	Karangri Dam 1m	CHCC Water Staff	Monthly	pH, Conductivity, Calcium Hardness, Alkalinity, Iron, Manganese, Total Nitrogen, Total Phosphorous
	Karangri Dam 3m	CHCC Water Staff	Monthly	Iron, Manganese
	Karangri Dam 6m	CHCC Water Staff	Monthly	Iron, Manganese
	Karangri Dam 9m	CHCC Water Staff	Monthly	Iron, Manganese
	Cochranes Pool	CHCC Water Staff	Monthly	Iron, Manganese
007	Redhill Reservoir	CHCC Water Staff	Monthly	pH, Conductivity, Calcium Hardness, Alkalinity, Iron, Manganese
	Regional Intake	CHCC Water	Monthly	pH, Conductivity, Calcium Hardness, Alkalinity, Iron, Manganese

Site No	Sample Point	Sampled By	Frequency	Tests Done
	Karangī Dam 1m	CHCC Water	Weekly	Freshwater Algae Identification
	Karangī Dam 3m	CHCC Water	Weekly	Freshwater Algae Identification
	Karangī Dam 6m	CHCC Water	Weekly	Freshwater Algae Identification
	Karangī Dam 9m	CHCC Water	Monthly	Freshwater Algae Identification
	Karangī Dam 12m	CHCC Water	Monthly	Freshwater Algae Identification
	Karangī Dam 15m	CHCC Water	Monthly	Freshwater Algae Identification
	Karangī Dam 18m	CHCC Water	Monthly	Freshwater Algae Identification
	Karangī Dam 21m	CHCC Water	Monthly	Freshwater Algae Identification
	Karangī Dam 24m	CHCC Water	Monthly	Freshwater Algae Identification
	Karangī Dam 27m	CHCC Water	Monthly	Freshwater Algae Identification
	Karangī Dam Top Water Level	CHCC Water	Monthly	Freshwater Algae Identification
002	Karangī Dam	Lab Staff	Monthly	pH, Turbidity, Apparent Colour, Total Colour, Total Organic Carbon, Faecal Coliforms, Total Coliforms
001	Orara River - Cochranes Pool	Lab Staff	Monthly	pH, Turbidity, Apparent Colour, Total Colour, Total Organic Carbon, Faecal Coliforms, Total Coliforms
	Regional Intake - Karangī	Lab Staff	Monthly	pH, Turbidity, Apparent Colour, Total Colour, Total Organic Carbon, Faecal Coliforms, Total Coliforms
	Regional Intake - Coramba	Lab Staff	Monthly	pH, Turbidity, Apparent Colour, Total Colour, Total Organic Carbon, Faecal Coliforms, Total Coliforms
	Orara River - Nana Glen	Lab Staff	Monthly	Faecal Coliforms, Total Coliforms
005	Nana Glen Pump Intake	Lab Staff		pH, Conductivity, Turbidity, Apparent Colour, Calcium Hardness, Alkalinity, Iron, Manganese

Site No	Sample Point	Sampled By	Frequency	Tests Done
Extra Sampling for Reticulated Supply				
	Reticulation Fluoride Testing	Lab Staff	Weekly	Fluoride
				Note: Three samples chosen from sites 021 - 043 to do every week (1 from northern sites, 1 from Coffs sites, 1 from Sawtell sites)
007	Redhill Reservoir	Lab Staff	Weekly	pH, Turbidity, Apparent Colour, Alkalinity, Calcium Hardness, Fluoride, Iron, Manganese
043	Karangie Water Treatment Plant (Treated Water)	Lab Staff	Weekly	pH, Turbidity, Apparent Colour, Alkalinity, Calcium Hardness, Fluoride, Iron, Manganese
	Coffs Harbour Tap Water (either 030, 031,032 or 033)	Lab Staff	Weekly	pH, Turbidity, Alkalinity, Apparent Colour
	Woolgoolga Tap Water (tap at Woolgoolga WRP)	CHCC Water Staff	Weekly	pH, Turbidity, Alkalinity, Apparent Colour
034	Sawtell Tap Water (034)	CHCC Water Staff / Lab Staff	Weekly	pH, Turbidity, Alkalinity, Apparent Colour, Chloride(monthly)
	Nana Glen Reservoir 1	CHCC Water Staff	Monthly	pH, Conductivity, Turbidity, Apparent Colour, Calcium Hardness, Alkalinity, Iron, Manganese, Aluminium
	Nana Glen Reservoir 2	CHCC Water Staff	Monthly	pH, Conductivity, Turbidity, Apparent Colour, Calcium Hardness, Alkalinity, Iron, Manganese, Aluminium
008	Nana Glen Sampling Point	Lab Staff	Fortnightly	Aluminium
041	Corindi Beach Aboriginal Community	Lab Staff	Monthly	pH, Turbidity, Fluoride
042	Wongala Estate Aboriginal Community	Lab Staff	Monthly	pH, Turbidity, Fluoride

Test A–Total coliforms; E. coli; Free chlorine and Temperature

Test B–Chemical Comprehensive: pH, Turbidity, Total Dissolved Solids, Total Hardness, True Colour, Iodine, Aluminium, Antimony, Arsenic, Barium, Boron, Cadmium, Calcium, Chromium, Copper, Iron, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Selenium, Silver, Sodium, Zinc, Chloride, Fluoride, Sulphate, Nitrate, and Nitrite.

1.2. Pesticides Results

SITE	DATE	Organochlorine Insecticide	Organophosphorous Insecticide	Acidic Herbicides	Synthetic Pyrethroids	Glyphosate	TILT
Sandy Beach Dr	8/09/1998	nd	nd				
Cochranes Pool	20/10/1998	nd	nd				
Karangı Dam	20/10/1998	nd	nd				
Woolgoolga Lake - Retic	8/12/1998	nd	nd				
Cochranes Pool	19/01/1999	nd	nd				
Karangı Dam	9/02/1999	nd	nd				
Nana Glen Intake	16/02/1999	nd	nd				
Ocean Pde	9/03/1999	nd	nd				
Orara River, Coramba	17/03/1999	nd	nd				
Cochranes Pool	30/03/1999	nd	nd				
Karangı Dam	30/03/1999	nd	nd				
Orara River, Nana Glen	11/05/1999	nd	nd				
Orara River, Coramba	26/06/1999	nd	nd				
Moonee Reservoir	26/06/1999	nd	nd				
Cochranes Pool	6/07/1999	nd	nd				
Karangı Dam	6/07/1999	nd	nd				
Orara River, Nana Glen	16/08/1999	nd	nd	nd		nd	nd
Sapphire Cr	10/11/1999	nd	nd				
Orara River, Coramba	14/12/1999	nd	nd	nd	nd	nd	
Cochranes Pool	5/01/2000	nd	nd	nd	nd	nd	
Karangı Dam	5/01/2000	nd	nd	nd	nd	nd	
Orara River, Nana Glen	15/02/2000	nd	nd	nd	nd	nd	
York St Retic	29/02/2000	nd	nd	nd	nd	nd	
Orara River, Coramba	20/03/2000	nd	nd	nd	nd	nd	
Karangı Dam	5/04/2000	nd	nd	nd	nd	nd	
Cochranes Pool	5/04/2000	nd	nd	nd	nd	nd	
Urumbilum River U/S	9/05/2000	nd	nd	nd	nd	nd	
Urumbilum River D/S	9/05/2000	nd	nd	nd	nd	nd	
Orara River, ?	9/05/2000	nd	nd	nd	nd	nd	
Hamilton Dr Retic	10/05/2000	nd	nd	nd	nd	nd	
Orara River, Nana Glen	19/06/2000	nd	nd	nd	nd	nd	
Karangı Dam	4/07/2000	nd	nd	nd	nd	nd	
Cochranes Pool	19/07/2000	nd	nd	nd	nd	nd	
Orara River, Coramba	16/08/2000	nd	nd	nd	nd	nd	
Moonee Retic	23/08/2000	nd	nd	nd	nd	nd	
Orara River Nana Glen	11/10/2000	nd	nd	nd	nd	nd	

1.3. Disinfection By-products (all units in µg/L)

SITE	DATE	Trichloro methane	Bromodichloro methane	Dibromochloro methane	Tribromo methane	THM Total
Reservoirs						
Woolgoolga	22/03/1999	15	6	2.3	1	24.3
Scarborough	6/04/1999	12	7.2	4.4	1	24.6
Mullaway	8/02/1999	18	9.5	3.7	1	32.2
Emerald	10/05/1999	11	7.1	5.7	1	24.8
Moonee	26/06/1999	25	7	5	0	37
Sawtell	5/08/1999	100	9.9	6.1	1	117
Toomina	6/09/1999	18	13	1	1	33
Roberts Hill	13/10/1999	21	16	9.9	1	47.9
Mullaway	13/10/1999	14	8.2	5.2	1	28.4
Bark Hut	16/11/1999	12	19	7.8	1	39.8
Scarborough	12/01/2000	12	15	6.8	1	34.8
Mullaway	1/02/2000	14	8.4	4.5	1	27.9
Bark Hut	28/02/2000	12	6.9	4.6	1	24.5
Woolgoolga H'land	27/03/2000	12	8.7	7.1	1	28.8
Sawtell	5/05/2000	12	8.7	5.6	1	27.3
Toomina	6/06/2000	13	10	6.9	1	30.9
Mullaway	18/07/2000	9.1	7	5.7	1.2	23
Scarborough	19/09/2000	15	14	9.7	1	39.7
Woolgoolga H'land	10/10/2000	14	11	7.6	1	33.6
Emerald	29/11/2000	9.9	6.9	4.3	1	22.1
Red Hill (mean)	21/3/2005			10	9	19
Reticulation						
Sapphire Cr	5/04/2000	11	13	8.2	1	33.2
Nana Glen	29/11/2000	23	1	1	1	26
Shannon Creek Dam						
	25/03/2010	<1	<1	<1	<1	<4

NOTE: Guideline value 0.25mg/L for individual and total THM. Divide all above results by 1000 for comparison purposes.

1.4. NSW Health Water Quality Monitoring Parameters at Point of Supply

Parameter
Physical
pH
True Colour
Total Dissolved Solids (TDS)
Total Hardness as CaCO ₃
Turbidity
Microbial Monitoring
E. coli
Total Coliforms
Disinfectant residual
Free Chlorine
Total Chlorine
Nutrients
Nitrate
Nitrite
Metals
Aluminium
Antimony
Arsenic
Barium
Boron
Cadmium
Calcium
Chloride
Chromium
Copper
Cyanide
Fluoride
Iodine
Iron
Lead
Magnesium
Manganese
Mercury
Molybdenum
Nickel
Nitrate
Nitrite
Selenium
Silver
Sodium
Sulfate
Zinc

Appendix C



Technical Note 3 Risk Assessment Workshop

Coffs Harbour City Council

Hazard Identification and Risk Assessment

Technical Note 3

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Hazard Identification and Risk Assessment

Coffs Harbour City Council (CHCC) hosted a two day Risk Assessment workshop. It was undertaken on 19th and 20th February, 2013, with CHCC, Clarence Valley Council (CVC), NSW Health, NSW Office of Water and HydroScience Consulting (HSC) staff.

The purpose of the risk assessment was to identify all hazards inherent in the drinking water supply systems and identify where appropriate controls are required.

Workshop Participants

Participants in the workshop are noted below:

Coffs Harbour City Council

1. Simon Thorn – Executive Manager – CHW Operations
2. Paul Sparke – Engineer Strategic Infrastructure
3. **Glen O’Grady** – Manager Engineering Projects
4. Adam Wilson – Manager Water Treatment
5. Ty Cook – Manager Distribution
6. Les Potter – Acting Co-ordinator Water Supply
7. Graham Parkin – Acting **Headwork**’s Superintendent
8. Piers Everitt – Manager Mechanical/Electrical
9. Daron Brook – Electronics Coordinator
10. Steve Kermister – Supervisor Water Supply (Northern)
11. Ron Hansford – Testing Officer Water Supply
12. Peter Rice – Leading Hand Water Supply
13. Ross Clarke – Corporate Systems Coordinator
14. Neil Sutton – Coordinator – Senior Technical - Water
15. Sandy Eager – Catchment Management
16. Geraldine McMahon – Technical Officer Quality Control

Clarence Valley Council

17. Kieran McAndrew – Water Cycle Engineer

HydroScience Consulting

18. Jessica Huxley – Senior Environmental Planner
19. Helen Salvestrin – Senior Design Engineer
20. Joanne Walsh – Regional Manager Northern Rivers

NSW Health

21. Dr Katrina Wall – NSW Policy Adviser Water Unit
22. David Basso – North Coast Public Health

NSW Office of Water

23. Glenn George – Regional Manager Urban Water
24. Terry Call – Water Utilities Inspector

Approach and Methodology

A Hazard Identification and Risk Assessment workshop was facilitated by HydroScience to identify key hazardous events and rate the risks associated with Coffs Harbour and Nana Glen drinking water supply systems, **from catchment to consumer's tap**.

A preliminary set of hazardous events was provided for the workshop. Participants deleted or added hazards as required for each specific drinking water supply system. The participants were facilitated through the process to determine likelihood and consequence of each hazardous event in order to rate the risk.

CHCC used the Australian Drinking Water Guidelines (ADWG) (NHMRC, NRMCC, 2011) Risk Assessment Matrix. The risk rating of an incident was based on the combination of consequence and likelihood. Table 1 sets out the Risk Assessment Matrix and prioritisation of actions.

Hazardous events were also included that were identified as very high or high risks in the Nymboida catchment and Shannon Creek Dam by the following studies:

- Coffs Infrastructure Alliance (2009) Coffs Harbour City Council. Coffs Harbour Water Treatment Plant, HACCP Plan
- Water Futures (2008) Water Quality Risk Assessment Workshop. Workshop Outcomes Paper for Clarence Valley Council
- Ministry of Energy and Utilities (2003) Shannon Creek Raw Water Conceptual HACCP Plan

Residual risks in the Coffs Harbour HACCP plan were based on the events before the commissioning of the Karangi WTP. Residual risks for the two other assessments, undertaken for Clarence Valley Council (CVC), were based on treatment at the CVC WTPs. Maximum risks from the assessments were used for the workshop and residual risks subsequently assessed by the workshop based on treatment at Karangi Dam and WTP. [Note: these events are indicated by an asterisk (*) in the risk assessment.]

Table 2 and Table 3 document the Risk Assessment for the two CHCC drinking water supply systems.

The following list identifies the DWSS and their source waters:

1. Coffs Harbour DWSS

- Orara River
- Nymboida River
- Shannon Creek Dam

2. Nana Glen DWSS

- Orara River

The Karangi Water Treatment Plant (WTP), which treats water for the Coffs Harbour DWSS, is a dissolved air flotation and filtration (DAFF) plant and uses both UV disinfection and chlorination. It fluoridates water for distribution to consumers from Sawtell in the south to Corindi in the north.

The Nana Glen WTP filters and chlorinates water for consumers in Nana Glen.

Critical Control Points

Critical Control Points (CCP) are activities, procedures or processes where the operator can apply control, and are essential elements in preventing hazards and reducing risks to an acceptable level.

In order to distinguish acceptable from unacceptable performance at each point, target levels, alert levels and critical limits have been identified. Critical limits indicate that the operative process has lost control and may compromise health and/or environmental consequences. Corrective actions should be instituted immediately.

CCPs for the Karangi WTP were determined prior to the commissioning of the plant and are documented in the Coffs Harbour HACCP Plan (Coffs Infrastructure Alliance, 2009). The workshop reviewed the performance and relevance of the CCPs since the commissioning of the Karangi WTP. The CCPs were updated where appropriate to reflect the ADWG methodology and optimum WTP performance. Operational procedures and corrective actions were also documented for these CCPs.

For the Nana Glenn WTP the CCPs were developed as part of the risk assessment workshop.

CCPs, operational and corrective actions for Coffs Harbour and Nana Glen drinking water supply systems are summarised in Table 4 and Table 5.

Table 1: CHCC Risk Assessment Matrix

		CONSEQUENCE OR SEVERITY				
		1. Insignificant Insignificant impact, little disruption to normal operation, low increase in normal operation costs	2. Minor Minor impact or small population, some manageable operation disruption, some increase in operating costs	3. Moderate Minor impact for large population, significant modification to normal operation but manageable, operation costs increased, increased monitoring	4. Major Major impact for small population, systems significantly compromised and abnormal operation if at all, high level of monitoring required	5. Catastrophic Major impact for large population, complete failure of systems
LIKELIHOOD OR PROBABILITY	A. Almost Certain Expected to occur in most circumstances	Moderate	High	Very High	Very High	Very High
	B. Likely Will probably occur in most circumstances	Moderate	High	High	Very High	Very High
	C. Possible Might occur at some time	Low	Moderate	High	Very High	Very High
	D. Unlikely Could occur at some time	Low	Low	Moderate	High	Very High
	E. Rare May occur in exceptional circumstance	Low	Low	Moderate	High	High

Very High Risk: Senior Management to be advised - Immediate action taken

High Risk: Senior Management attention needed - To be actioned within 1 month

Medium Risk: Management responsibility must be specified - Permanent control required within one - three months

Low Risk: Responsibility to be recorded - To be actioned within 12 months

The risk rating of an incident is based on the combination of Consequence and Likelihood.

Consider the Consequence and Likelihood to determine a Risk Rating

Consequence + Likelihood = Risk Rating

Table 2: Coffs Harbour DWSS Risk Assessment

Hazardous Event	Preventive Measures	Max Risk with no Preventive Measures			Residual Risk with Preventive Measures			Monitoring and Control	Notes/Improvement Actions
		Likelihood	Consequence	Max Risk	Likelihood	Consequence	Residual Risk		
Orara River Catchment									
Pathogens									
OSSM failure/breach	OSSM policy; LEP/planning controls; selective extraction CCP; alternate sources; Karangi WTP process control (clarification, DAFF, chlorination, UV disinfection).	C	4	V High	E	3	Mod	<ul style="list-style-type: none"> OSSM inspections LEP and compliance Raw water (monthly: faecal coliform), WTP operational monitoring (weekly: <i>E.coli</i>) NSW Health 	Mixture of old and new style septics; Urumbilum River has houses closer to river.
Unrestricted livestock/stockyards	Orara River Rehabilitation Strategy (ORRS) activities including fencing, vegetation buffers; selective extraction CCP; alternate sources; WTP process control.	A	4	V High	E	3	Mod	<ul style="list-style-type: none"> ORRS monitoring Raw water (monthly: faecal coliform), WTP operational monitoring (<i>E.coli</i>) NSW Health 	Two dairies; cattle can walk through Cochrane's Pool.
Primary contact by humans	Community education including signs; selective extraction CCP; alternate sources; WTP process control.	C	4	V High	E	3	Mod	<ul style="list-style-type: none"> ORRS monitoring Raw water (monthly: faecal coliform), WTP operational monitoring (<i>E.coli</i>) NSW Health 	In particular, swimming at Cochrane's Pool.
Wildlife access	Selective extraction CCP; alternate sources; WTP process control.	A	4	V High	E	3	Mod	<ul style="list-style-type: none"> Raw water (monthly: faecal coliform), WTP operational monitoring (<i>E.coli</i>) NSW Health 	
Milk (waste) spills/dumping	Vegetation buffers; incident management and communication plans; selective extraction CCP; alternate sources; WTP process control.	E	4	High	E	3	Mod	<ul style="list-style-type: none"> Raw water (online: NTU; monthly: faecal coliform), WTP operational monitoring (turbidity, <i>E.coli</i>, free coliform) NSW Health 	
Chemicals									
Farming/forestry practices	ORRS; LEP/ planning controls; selective extraction CCP; alternate sources; WTP process control, including PAC.	C	2	Mod	E	1	Low	<ul style="list-style-type: none"> ORRS monitoring LEP and compliance Monthly (Fe, Mn, nutrients) monitoring in raw water; 5-yearly pesticides monitoring NSW Health 	Turf farm; fertilisers; pesticides; chronic health impact; aesthetic impacts.

Hazardous Event	Preventive Measures	Max Risk No Prevention			Resid Risk with Prevention			Monitoring and Control	Notes/Improvement Actions
Chemical spill e.g. fuel truck spillage/farm drums	Incident management and communication plans; selective extraction CCP; alternate sources; WTP process control, including PAC.	D	4	High	E	2	Low	<ul style="list-style-type: none"> ORRS monitoring LEP and compliance 5-yearly pesticides monitoring in raw, treated waters NSW Health 	Some bridge crossings of Orara River: fuel is highest hazard with taste and odour issue
Point sources e.g. mine sites	Selective extraction CCP; alternate sources; WTP process control, including PAC.	E	3	Mod	E	2	Low	<ul style="list-style-type: none"> ORRS monitoring LEP compliance 5-yearly pesticides monitoring in raw, treated waters NSW Health 	Old gold mine sites (possible arsenic, mercury contamination)
Contaminants naturally occurring in the source water	Selective extraction CCP; alternate sources; WTP process control.	E	1	Low	E	1	Low	<ul style="list-style-type: none"> Raw water (Fe, Mn), WTP operational monitoring NSW Health 	
Turbidity									
Stormwater flows	ORRS; visual inspection; selective extraction CCP; alternate sources (Shannon Creek, Nymboida); WTP process control.	B	4	V High	E	1	Low	<ul style="list-style-type: none"> Weather/rainfall monitoring ORRS monitoring Visual inspections for debris Online NTU monitoring in raw water, WTP NSW Health 	
Controlled and uncontrolled fires	Coordination with NSW Rural Fire Service and other emergency services; incident management procedures; visual inspection; selective extraction CCP; alternate sources; WTP process control.	D	4	High	E	2	Low	<ul style="list-style-type: none"> Weather/wind monitoring Coordination with NSW RFS Visual inspection Online NTU monitoring in raw water, WTP NSW Health 	
Poor logging practices	ORRS; LEP (special area); planning controls; CMA activities; vegetation buffers; selective extraction CCP; alternate sources (Shannon Creek, Nymboida); WTP process control.	D	4	High	E	1	Low	<ul style="list-style-type: none"> LEP compliance monitoring ORRS monitoring Visual inspection Raw water, WTP operational NTU monitoring NSW Health 	
Nymboida Catchment									
Pathogens									
Storm events*	Selective extraction CCP; detention time; ORRS; visual inspection; alternate sources (Shannon			V High	E	1	Low	<ul style="list-style-type: none"> Weather/rainfall monitoring ORRS monitoring 	(Coffs Harbour WTP HACCP, 2009)

Hazardous Event	Preventive Measures	Max Risk No Prevention	Resid Risk with Prevention	Monitoring and Control	Notes/Improvement Actions
	Creek, Orara); WTP process control.			<ul style="list-style-type: none"> Visual inspections for debris Online NTU monitoring in raw water, WTP NSW Health 	
Septic systems*	CVC septic tank program; dilution; long detention time in river for towns in the catchment; OSSM policy; LEP/planning controls; selective extraction CCP; alternate sources; WTP process control.	High	E 3 Mod	<ul style="list-style-type: none"> OSSM inspections LEP and compliance Raw water (monthly: faecal coliform), WTP operational monitoring (weekly: <i>E.coli</i>) NSW Health 	(Coffs Harbour WTP HACCP, 2009)
The Coaching Station*	CVC septic tank program; dilution; long detention time in river for towns in the catchment; OSSM policy; LEP/planning controls; selective extraction CCP; alternate sources; WTP process control.	V High	E 3 Mod	<ul style="list-style-type: none"> OSSM inspections LEP and compliance Raw water (monthly: faecal coliform), WTP operational monitoring (weekly: <i>E.coli</i>) NSW Health 	(Coffs Harbour WTP HACCP, 2009) Septic tank effluent spray irrigated next to river. Chlorinated effluent. Accommodation (60 people) and restaurant on-site. Effluent disposal being upgraded to subsurface irrigation.
Dorrigo STP*	Dilution; detention time in maturation pond selective extraction CCP; alternate sources; WTP process control.	High	E 3 Mod	<ul style="list-style-type: none"> OSSM inspections LEP and compliance Raw water (monthly: faecal coliform), WTP operational monitoring (weekly: <i>E.coli</i>) NSW Health 	(Coffs Harbour WTP HACCP, 2009)
Saleyards*	Fences and vegetation along creeks; cattle yards high in the catchment; dilution and detention in the river; ORRS; selective extraction CCP; alternate sources; WTP process control.	High	E 3 Mod	<ul style="list-style-type: none"> ORRS monitoring Raw water (monthly: faecal coliform), WTP operational monitoring (<i>E.coli</i>) NSW Health 	(Coffs Harbour WTP HACCP, 2009) Possible downstream treatment or collection ponds
Dairies*	Variable wastewater treatment, including settling ponds; funding for treatment ponds, laneways and crossings; farm dams; ORRS; selective extraction CCP; alternate sources; WTP process control.	High	E 3 Mod	<ul style="list-style-type: none"> ORRS monitoring Raw water (monthly: faecal coliform), WTP operational monitoring (<i>E.coli</i>) NSW Health 	(Coffs Harbour WTP HACCP, 2009) 10 - 20 dairies in the upper areas of the catchment near Dorrigo. 100 - 300 cows/dairy
Cattle/sheep*	Dilution in river and detention in weir pool; low stocking rates; farm dams; very few permanent creeks; ORRS; selective extraction CCP; alternate sources; WTP process control.	High	E 3 Mod	<ul style="list-style-type: none"> ORRS monitoring Raw water (monthly: faecal coliform), WTP operational monitoring (<i>E.coli</i>) NSW Health 	(Coffs Harbour WTP HACCP, 2009)
Native animals*	Selective extraction CCP; dilution; detention time.	High	E 3 Mod	<ul style="list-style-type: none"> Raw water (monthly: faecal coliform), WTP operational monitoring (<i>E.coli</i>) NSW Health 	(Coffs Harbour WTP HACCP, 2009)

Hazardous Event	Preventive Measures	Max Risk No Prevention		Resid Risk with Prevention			Monitoring and Control	Notes/Improvement Actions	
Primary contact*	Dilution; training of key users (rafting operators)			High	E	3	Mod	<ul style="list-style-type: none"> ORRS monitoring Raw water (monthly: faecal coliform), WTP operational monitoring (<i>E.coli</i>) NSW Health 	(Coffs Harbour WTP HACCP, 2009)
Chemicals									
Mines sites	Environmental assessment; selective extraction CCP, alternate water source; WTP process control, including PAC.	D	4	V High	E	4	High	<ul style="list-style-type: none"> Environmental assessment and compliance monitoring Raw water (Fe, Mn, chemicals), WTP operational monitoring NSW Health 	Investigations currently underway for Antimony mine. Potential for CSG in the future. Karangi WTP does not currently remove antimony. RECOMMENDATION: Review hazards and treatment options associated with Antimony.
Spills of chemicals, including milk*	Emergency services (but may not notify CVC); Dangerous Goods regulations; CVC emergency response plan; selective extraction CCP; dilution; incident management and communication plans; alternate sources; WTP process control, including PAC.			High	E	2	Low	<ul style="list-style-type: none"> ORRS monitoring LEP and compliance 5-yearly pesticides monitoring in raw, treated waters NSW Health 	(CVC Water Quality Risk Assessment Workshop, 2008) Review notification channels; development necessary water supply and/or CVC water quality incident plan
Turbidity/colour									
Major bushfire followed by major storm*	Bushfire management plan; fire fighting; selective extraction CCP; coordination with NSW Rural Fire Service and other emergency services; incident management procedures; visual inspection; alternate sources; WTP process control.			High	E	2	Low	<ul style="list-style-type: none"> Weather/wind monitoring Coordination with NSW RFS Visual inspection Online NTU monitoring in raw water, WTP NSW Health 	(CVC Water Quality Risk Assessment Workshop, 2008) Also colour, iron, manganese. Bushfire management plan has been developed?
Shannon Creek Dam									
Pathogens									
Storm events*	Selective extraction CCP; detention time; ORRS; visual inspection; alternate sources (Nymboida, Orara); WTP process control.			V High	E	1	Low	<ul style="list-style-type: none"> Weather/rainfall monitoring ORRS monitoring Visual inspections for debris Online NTU monitoring in raw water, WTP NSW Health 	(Coffs Harbour WTP HACCP, 2009)
Native animals*	Selective extraction CCP; dilution; detention time.			High	E	3	Mod	<ul style="list-style-type: none"> Raw water (monthly: faecal coliform), WTP operational monitoring (<i>E.coli</i>) NSW Health 	(Coffs Harbour WTP HACCP, 2009)

Hazardous Event	Preventive Measures	Max Risk No Prevention	Resid Risk with Prevention	Monitoring and Control	Notes/Improvement Actions		
Turbidity							
Bushfire*	Selective extraction CCP; coordination with NSW Rural Fire Service and other emergency services; incident management procedures; visual inspection; alternate sources; WTP process control.	High	E 2	Low	<ul style="list-style-type: none"> Weather/wind monitoring Coordination with NSW RFS Visual inspection Online NTU monitoring in raw water, WTP NSW Health 	(Coffs Harbour WTP HACCP, 2009) Also iron, manganese.	
Logging activities in the top part of the catchment*	ORRS; LEP; planning controls; selective extraction CCP; alternate sources; WTP process control, including PAC.	High	E 1	Low	<ul style="list-style-type: none"> LEP and compliance ORRS monitoring Visual inspection Raw water, WTP operational NTU monitoring NSW Health 	(CVC Water Quality Risk Assessment Workshop, 2008) Also herbicides.	
Toxins							
Algal blooms*	ORRS; CMA activities; vegetation buffers; alternate sources; selective extraction CCP; WTP process control, including PAC.	High	E 2	Low	<ul style="list-style-type: none"> Visual inspections Raw water, WTP operational monitoring NSW Health 	(CVC Water Quality Risk Assessment Workshop, 2008)	
RWSS							
Pathogens							
Breach of pipelines through breaks/maintenance/new installations	Superchlorination of new pipes; Standard Operating Procedures (SOP); visual inspections; programmed maintenance; water-system dedicated maintenance team; WTP process control.	D 4	High	E 3	Mod	<ul style="list-style-type: none"> Visual inspections; WTP operational monitoring NSW Health Inspection and flushing of new works by outside contractors 	
Cross-connections and backflows	Backflow prevention devices on meters (dual checks, air gaps); audit/inspection program; water-system dedicated maintenance team; WTP process control.	C 4	V High	E 2	Low	<ul style="list-style-type: none"> WTP operational monitoring NSW Health 	Rural stock, cattle troughs, water tanks (20mm off-take)
Receipt of out-of-spec water (> 2 NTU) from RWSS (Nymboida/SC).	Telemetry; selective extraction CCP; WTP process control.	A 4	V High	C 2	Mod	<ul style="list-style-type: none"> WTP operational monitoring NSW Health 	CVC to confirm alarms. RECOMMENDATION: Integration of SCADA systems between CVC and CHCC.
Chemicals							
Stratification	Multiple level off-take; telemetry; communication between CVC and CHCC; selective extraction CCP; alternate water supply; WTP process control.	B 4	V High	E 3	Mod	<ul style="list-style-type: none"> Visual inspections Raw water, WTP operational monitoring NSW Health 	
Deliberate contamination	Selective extraction CCP; alternate water supply; WTP process control, including PAC.	E 4	High	E 2	Low	<ul style="list-style-type: none"> Visual inspections Raw water, WTP operational monitoring NSW Health 	Impact on CHCC reputation.

Hazardous Event	Preventive Measures	Max Risk No Prevention		Resid Risk with Prevention		Monitoring and Control	Notes/Improvement Actions		
Accidental contamination (spraying)	Procurement procedures; MSDS; selective extraction CCP; alternate water supply; WTP process control, including PAC.	C	2	Mod	E	1	Low	<ul style="list-style-type: none"> Raw water, WTP operational monitoring NSW Health 	
Inlet screen failure/blockage (debris)	Multiple level off-take; alternate water supply.	D	2	Low	E	1	Low	<ul style="list-style-type: none"> Visual inspections Raw water, WTP operational monitoring 	Operational impact only.
Cyanobacteria									
Failure of aerator	Programmed maintenance; asset renewal schedule; on-site spare parts; WTP process control, including PAC.	D	4	High	E	2	Low	<ul style="list-style-type: none"> Visual inspections Raw water, WTP operational monitoring 	
Algal blooms (toxins, taste and odour)	ORRS; CMA activities; vegetation buffers; alternate sources; selective extraction CCP; WTP process control, including PAC.	C	4	V High	E	2	Low	<ul style="list-style-type: none"> Visual inspections Raw water, WTP operational monitoring NSW Health 	
Karangie WTP									
Pathogens									
pH correction failure (dosing failure of lime, CO ₂ , caustic)	Programmed maintenance; well trained staff; procurement procedures; asset renewal schedule; on-site spare parts; secondary CO ₂ dose; online monitoring and SCADA; option for manual overrides.	B	3	High	C	2	Mod	<ul style="list-style-type: none"> Raw water source monitoring Online pH, NTU monitoring at WTP WTP process control 	Major threat: poor corrosion control
Flocculation failure	Visual inspection of floc; programmed maintenance; well trained staff; procurement procedures; asset renewal schedule; on-site spare parts; online monitoring and SCADA; bypass mode – operate as direct filtration only; option for manual overrides.	C	4	V High	E	2	Low	<ul style="list-style-type: none"> Visual inspections Online pH, NTU monitoring at WTP WTP process control 	POSSIBLE CAUSES: dosing failure; lack of alum delivery; changes in source water; mechanical failure; power failure.
DAFF failure	Programmed maintenance; well trained staff; procurement procedures; asset renewal schedule; on-site spare parts; online monitoring and SCADA; option for manual overrides.	B	4	V High	D	3	Mod	<ul style="list-style-type: none"> Visual inspections Number of backwashes daily Online pH, NTU monitoring at WTP NSW Health WTP process control 	POSSIBLE CAUSES: Aeration failure; short circuiting; algal recycling; turbid water coming through; filter breakthrough; filter clogging; backwash pump failure; power outage; alarm failure; blower failure; diffuser failure; PLC failure; scum skimmer failure; no backup blower available. Impact: significant change in daily operations would be required.
Inadequate UV radiation	Multiple/redundancy of UV channels/bulbs; programmed maintenance/servicing; procurement procedures; asset renewal schedule; online	C	4	V High	E	3	Mod	<ul style="list-style-type: none"> Continuous UV transmissivity and dose monitoring Weekly operational monitoring 	POSSIBLE CAUSES: High turbidity water; "wrong" flow; inadequate exposure time; bulb breakage/ failure;

Hazardous Event	Preventive Measures	Max Risk No Prevention		Resid Risk with Prevention		Monitoring and Control	Notes/Improvement Actions	
	monitoring and SCADA.			V High		Mod	<ul style="list-style-type: none"> NSW Health WTP process control power failure; sensor failure; wiper failure; UV reactor failure.	
Inadequate chlorination	Programmed maintenance; well trained staff; procurement procedures; asset renewal schedule; on-site spare parts; online monitoring and SCADA; options for manual overrides and hand dosing at reservoirs; residual chlorine levels in downstream reservoirs help to shandy flows if chlorine is under-dosed.	B	5	V High	E	3	Mod	<ul style="list-style-type: none"> Continuous monitoring of free chlorine Weekly operational free chlorine monitoring at WTP, RHBT, RHR Fortnightly/monthly at reticulation; yearly at reservoirs NSW Health WTP process control POSSIBLE CAUSES: Dosing system failure, lack of chlorine supply, mechanical failure, alarms failure, lack of contact time. Significant impact of overdosing: taste issue.
Loss of trained operators due to sickness, leave etc	Workforce planning, including succession planning. One operator is required to operate the plant, but there are three operators have the skills/experience and three who can assist.	B	4	V High	E	3	Mod	WTP automated process control.
PLC failure	Trained operators; dual redundancy on PLCs; hot stand-by; daily manual checks of plant; programmed maintenance; spare parts; asset renewal schedule; SCADA system; "loss-of-communications" alarm; options for manual overrides.	D	5	V High	E	2	Low	WTP automated process control.
Cyber security	Firewall; PLC locks; specific user accounts; passwords; operational and verification monitoring; daily manual checks of plant; RHBT storage capacity; "loss-of-communications" alarm; back up of PLC code.	E	5	High	E	3	Mod	PLC and SCADA locks and alarms.
Plant site security	Fences; security cameras; intruder alarms; entry card access.	D	5	V High	E	3	Mod	Security cameras and intruder alarms.
Failure of alarms	"Loss-of-communications" alarm; earths; reservoir storage; daily manual checks of plant.	B	4	V High	C	2	Mod	PLC and SCADA alarms.
Power failure	Manual checks; automatic plant shut down; trained operators; "loss-of-communications" alarm; Service Level Agreement (SLA) with IT department; blackberry back-up system; daily manual operations; manual chlorine dosing; options for manual overrides.	B	5	V High	D	3	Mod	<ul style="list-style-type: none"> Automatic plant shut down PLC and SCADA alarms POSSIBLE CAUSES: Phase failure, brown-outs, power spike, surges
Lightning strike at WTP (worst case scenario: chlorine dosing system is hit)	Automatic plant shut down; trained operators; "loss-of-communications" alarm; Service Level Agreement (SLA) with IT department; blackberry back-up system; daily manual operations; manual chlorine dosing; options for manual overrides.	D	4	High	D	2	Low	<ul style="list-style-type: none"> Automatic plant shut down PLC and SCADA alarms

Hazardous Event	Preventive Measures	Max Risk No Prevention		Resid Risk with Prevention			Monitoring and Control	Notes/Improvement Actions	
Chemicals									
Overdosing due to equipment malfunction	Alarms; back-up systems; fluoride day tank: daily manual checks; well-trained operators; online monitoring and SCADA; redundancy on measuring devices; online monitoring of treated water for fluoride and chlorine; visual inspection of flocculation.	B	2	High	E	2	Low	<ul style="list-style-type: none"> Continuous monitoring free chlorine Weekly operational free chlorine monitoring at WTP, RHBT, RHR Fortnightly/monthly at reticulation; yearly at reservoirs WTP process control Online fluoride monitoring of treated water Fortnightly/monthly fluoride testing in reticulation NSW Health 	POSSIBLE IMPACTS: taste and odour from chlorine overdose; chronic health impact from fluoride overdose.
Infrastructure (pipework, lining of valves, pump, oils) leach components of materials due to chemical reaction	Cathodic protection; visual inspection; programmed maintenance; asset renewal schedule; on-site spare parts; procurement procedures; standard materials lists; redundancy; WTP process control, including PAC.	B	3	High	C	2	Mod	WTP operational monitoring.	POSSIBLE CAUSES: Inlet control valve failure, meter failure, gasket failure.
Lack of supply (Critically: alum, chlorine; less critically: fluoride, CO ₂)	Procurement procedures; back-up supply.	D	4	High	E	2	Low	PLC and SCADA monitoring.	
Supply of poor quality chemicals	Reputable suppliers; MSDS; certificates of analysis; receipt procedures; trained staff; daily manual checks.	C	3	High	E	2	Low	WTP operational monitoring.	
Reservoirs									
Pathogens									
Breach of reservoir integrity e.g. recontamination by vermin (birds, rats, snakes etc.)	Security fences; chlorine residuals; razor wire; electronic alarms on hatches; bypass capacity on some reservoirs; chlorine residual; alternate supply capacity.	A	4	V High	C	3	High	<ul style="list-style-type: none"> Visual inspection Weekly operational monitoring of RHBT, RHR Yearly monitoring of all reservoirs (<i>E.coli</i>) NSW Health 	Works underway for secondary chlorination at Sawtell. Residuals are low at Bark Hut due to low usage. Regular seasonal variation of chlorine dosing related to water and air temperatures.
Deliberate contamination		E	5	High	E	3	Mod	<ul style="list-style-type: none"> Visual inspection Weekly operational monitoring of RHBT, RHR NSW Health 	RECOMMENDATION: Installation of security cameras at high risk reservoirs
Build-up of slime, sediment	WTP process control; regular cleaning process (with divers); asset management; reservoir design (off-takes above bottom of reservoir).	D	3	Mod	E	2	Low	<ul style="list-style-type: none"> Weekly operational monitoring of RHBT, RHR Yearly monitoring of all reservoirs (<i>E.coli</i>, total 	Sediments coming through only as a result of mains break.

Hazardous Event	Preventive Measures	Max Risk No Prevention		Resid Risk with Prevention		Monitoring and Control	Notes/Improvement Actions		
						coliforms, free chlorine, temp) • NSW Health			
Distribution									
Pathogens									
Low chlorine residual (due to long lengths of reticulation)	WTP process control; option for hand-dosing at reservoirs; online monitoring.	A	4	V High	B	3	High	<ul style="list-style-type: none"> • Hand dosing of reservoirs • Boiled water alerts • Fortnightly/monthly monitoring at supply (<i>E.coli</i>, free chlorine) • NSW Health 	Online monitoring is being installed at Sawtell; issue mostly in summer (seasonal changes in dose); opportunity to increase dosing at Bark Hut and Sawtell.
Breach of pipelines through breaks, inappropriate maintenance, new or service works etc.	Superchlorination of new pipes; SOPs; flushing, water-dedicated maintenance team; mains replacement programs; inspection and flushing of new works by outside contractors; trained staff.	A	4	V High	C	2	Mod	<ul style="list-style-type: none"> • Boiled water alerts • Inspections of new works • Fortnightly/monthly monitoring at supply (<i>E.coli</i>, free chlorine, total coliforms) • NSW Health • Hand dosing of reservoirs 	
Cross-connections and backflows	Maintain high operating pressures; backflow prevention devices (RPZ); backflow prevention policy and audit/inspection programs; registered users; customer agreement for recycled water users; most houses have non-return valves on meters.	B	5	V High	E	4	High	<ul style="list-style-type: none"> • Backflow inspection/audit programs • Fortnightly/monthly monitoring at supply (<i>E.coli</i>, free chlorine, total coliforms) • NSW Health • Hand dosing of reservoirs 	POSSIBLE CAUSES: Rainwater tanks; recycled water doesn't go to individual houses; backflow is possible at golf course, stadium, industrial connections, etc. RECOMMENDATION: Continue backflow prevention program
Dead end in reticulation system leading to stagnation (aesthetic impacts due to overdosing of lime)	Mains extension program; yearly flushing; weekly water sampling; complaints response program; two lime dosing points to reduce overall content.	D	2	Low	E	2	Low	<ul style="list-style-type: none"> • Fortnightly/monthly monitoring at supply (<i>E.coli</i>, free chlorine, total coliforms, temperature) • NSW Health • Hand dosing of reservoirs 	
Chemicals									
Overdosing at chlorine booster/hand dosing (chlorine)	Chlorine monitoring; online monitoring and SCADA; alarms; trained operators; SOP.	E	3	Mod	E	2	Low	<ul style="list-style-type: none"> • Fortnightly/monthly monitoring of free chlorine at reticulation; yearly at reservoirs • NSW Health 	

Table 3 Nana Glen Risk Assessment

Hazardous Event	Preventive Measures	Max Risk no Preventive Measures			Residual Risk with Preventive Measures			Monitoring and Control	Notes/Improvement Actions
		Likelihood	Conseq'ce	Max Risk	Likelihood	Conseq'ce	Reside Risk		
Orara River Catchment Nana Glen									
Pathogens									
OSSM failure/breach	OSSM policy; LEP/planning controls; Nana Glen WTP process control (filtration, chlorination).	C	4	V High	D	3	Mod	<ul style="list-style-type: none"> OSSM inspections LEP and compliance ORRS monitoring Raw water (monthly: faecal coliforms) and WTP operational monitoring (weekly: turbidity) NSW Health 	Village sewage trucked to CHCC STP.
Unrestricted livestock/ stockyards	ORRS; WTP process control.	A	4	V High	D	3	Mod	<ul style="list-style-type: none"> ORRS monitoring Raw water (monthly: faecal coliforms) and WTP operational monitoring (weekly: turbidity) NSW Health 	RECOMMENDATION: Fencing, riparian vegetation, CMA activities
Primary contact by humans	Community education; WTP process control.	C	4	V High	E	3	Mod	<ul style="list-style-type: none"> ORRS monitoring Raw water (monthly: faecal coliforms) and WTP operational monitoring (weekly: turbidity) NSW Health 	
Biosolid spreading	EPA license; STP SOPs; WTP process control.	D	4	High	E	2	Low	<ul style="list-style-type: none"> EPA monitoring Raw water (monthly: faecal coliforms) and WTP operational monitoring (weekly: turbidity) NSW Health 	STP process: extended aeration, air-dried. "Biomass" is an independent contractor. RECOMMENDATION: CHCC liaises with Biomass for disposal of biosolids.
Wildlife access	WTP process control.	A	4	V High	E	3	Mod	<ul style="list-style-type: none"> Raw water (monthly: faecal coliforms) and WTP operational monitoring (weekly: turbidity) NSW Health 	

Hazardous Event	Preventive Measures		Max Risk No Prevention		Resid Risk with Prevention		Monitoring and Control	Notes/Improvement Actions
Chemicals								
Poor farming/forestry practices	ORRS; LEP/planning controls; dilution; WTP process control.	C	2	Mod	E	1	Low	<ul style="list-style-type: none"> ORRS monitoring LEP and compliance 5-yearly pesticide monitoring in raw and treated waters NSW Health
Milk (waste) spills/dumping	Vegetation buffers; incident management and communication plans; WTP process control.	E	4	High	E	3	Mod	<ul style="list-style-type: none"> Raw water (monthly: NTU, faecal coliforms) and WTP operational monitoring (weekly: turbidity) NSW Health
Chemical spill e.g. fuel truck spillage/farm drums/septic truck	Incident management and communication plans; WTP process control.	D	4	High	E	2	Low	<ul style="list-style-type: none"> ORRS monitoring 5-yearly pesticides monitoring in raw and treated waters Raw water (monthly: NTU, faecal coliforms) and WTP operational monitoring (weekly: turbidity) NSW Health
Point sources e.g. dip sites, service station (petrol - BTEX)	Dilution; river processes (aeration); EPA requirement of individual fuel balance at service station; WTP process control.	D	4	High	D	3	Mod	<ul style="list-style-type: none"> EPA monitoring ORRS monitoring 5-yearly pesticides/hydrocarbon monitoring in raw and treated waters NSW Health <p>No detection to date. Tanks are rusty and known to leak. It takes a week to install aeration if required. RECOMMENDATIONS: Consider in-stream monitoring; liaise with remediation program; SCADA control of WTP. Sandy to confirm dip sites. Biodiversity Unit to confirm the presence of dip sites.</p>
Contaminants naturally occurring in the source water	WTP process control.	E	1	Low	E	1	Low	<ul style="list-style-type: none"> Raw water (monthly: Fe, Mn) and WTP operational monitoring (weekly: turbidity) NSW Health
Mines sites in Orara Catchment (e.g. mercury, gold)	WTP process control.	B	4	V High	D	4	High	<ul style="list-style-type: none"> ORRS monitoring NSW Health
Turbidity								
Stormwater flows	CVC/BSC LEP (special area); planning controls; ORRS; visual inspection; WTP process control.	B	4	V High	C	2	Mod	<ul style="list-style-type: none"> Weather/rainfall monitoring ORRS monitoring LEP and compliance Raw water (monthly: NTU) and WTP operational monitoring (weekly: turbidity) NSW Health monitoring (turbidity) <p>RECOMMENDATION: Installation of alarms, automatic shut-down of river pumps, turbidity meter on the river, SCADA control of WTP</p>

Hazardous Event	Preventive Measures	Max Risk No Prevention			Resid Risk with Prevention			Monitoring and Control	Notes/Improvement Actions
Controlled and uncontrolled fires	5 days effective storage in reservoir; option to truck water to WTP; WTP process control.	D	4	High	D	2	Low	<ul style="list-style-type: none"> Weather/wind monitoring Raw water (monthly: NTU) and WTP operational monitoring (weekly: turbidity) NSW Health 	RECOMMENDATION: Installation of alarms, automatic shut-down of river pumps, turbidity meter on the river, SCADA control of WTP
Poor logging Practices	CVC/BSC LEP (special area); planning controls; ORRS; visual inspection; WTP process control.	D	4	High	D	1	Low	<ul style="list-style-type: none"> LEP compliance monitoring Raw water (monthly: NTU) and WTP operational monitoring (weekly: turbidity) NSW Health 	
Railway crash in catchment	5 days storage in reservoir; SES, emergency services communications; incident management procedures; option to truck water to WTP; WTP process control.	E	4	High	E	3	Mod	<ul style="list-style-type: none"> 5-yearly pesticides monitoring in raw and treated waters NSW Health 	
Extraction Point Nana Glen									
Chemicals									
Deliberate contamination	WTP process control.	E	4	High	E	2	Low	<ul style="list-style-type: none"> Visual inspections Raw and operational monitoring NSW Health 	Impact on CHCC reputation.
Accidental contamination (spraying)	Procurement procedures; MSDS; WTP process control.	C	2	Mod	E	1	Low	<ul style="list-style-type: none"> Raw and operational monitoring NSW Health 	
Inlet screen failure/blockage (debris)		E	2	Low	E	1	Low	<ul style="list-style-type: none"> Visual inspections Raw and operational monitoring NSW Health 	Operational impact only.
Nana Glen WTP									
Pathogens									
Incorrect lime pre-dose	Programmed maintenance; hand mixing lime slurry; well trained staff; procurement procedures; asset renewal schedule; WTP process control.	B	3	High	C	2	Mod	<ul style="list-style-type: none"> Raw water source monitoring (turbidity, pH etc: monthly) Manual operational monitoring 	POSSIBLE CAUSES: mechanical or dosing failure; operator mistake.
Flocculation failure	3 days/week operator presence; downstream turbidity alarm; manual jar test; WTP process control.	B	3	High	C	2	Mod	<ul style="list-style-type: none"> Visual inspection Manual operational monitoring 	No online monitoring, dosing. RECOMMENDATION: Install online monitoring and SCADA

Hazardous Event	Preventive Measures	Max Risk No Prevention			Resid Risk with Prevention			Monitoring and Control	Notes/Improvement Actions
		A	4	V High	D	3	Mod		
Filter and clarifier failure	Online turbidity monitor after filter; plant shut down if backwash failure: automatic backwash; 5 day storage; WTP process control.	A	4	V High	D	3	Mod	<ul style="list-style-type: none"> Visual inspection Number of backwashes daily Headloss across filter Manual operational monitoring 	POSSIBLE CAUSES: headloss loss; backwash failure. RECOMMENDATION: Install online monitoring and SCADA
Inadequate chlorination	Limited uninstalled back-up supply; "daily" manual dose determination; residual in downstream reservoir; WTP process control.	B	4	V High	D	3	Mod	<ul style="list-style-type: none"> Manual operational monitoring Weekly free chlorine monitoring in reservoirs NSW Health 	POSSIBLE CAUSES: loss of chlorine supply; dosing failure; service water pump failure. RECOMMENDATIONS: Install online chlorine, pH, turbidity monitoring before dosing; provide scales to determine quantity of chlorine remaining.
pH correction failure (post dose lime and CO ₂)	Programmed maintenance; hand mixing lime slurry; well trained staff; procurement procedures; asset renewal schedule; pH probe at inlet to reservoir.	B	3	High	C	2	Mod	<ul style="list-style-type: none"> Manual operational monitoring Weekly free chlorine monitoring in reservoirs NSW Health 	POSSIBLE CAUSES: mechanical dosing failure RECOMMENDATION: Install online turbidity, pH monitoring downstream of dosing; clean reservoir yearly.
Loss of trained operators due to sickness, leave etc	Workforce planning, including succession planning.	B	4	V High	E	3	Mod		
PLC failure	Code backup.	E	4	High	E	3	Mod	<ul style="list-style-type: none"> Manual operational monitoring NSW Health 	No hot standby; the system may be out of action for a few days. RECOMMENDATION: Install SCADA
Plant site security	Fences; intruder alarms	D	4	High	E	3	Mod	Intruder alarms.	
Failure of alarms/communications	IT alarms; 5-day reservoir storage; free chlorine residual in reservoir.	C	4	V High	C	3	High	"Loss-of-communications" alarm.	May take 2 days before communications alarm come through. RECOMMENDATIONS: Install SCADA; provide training to on-site security staff in significance of alarms and provide CHCC staff contact details.
Power failure	Manual checks; trained operators; loss of communications alarm; 3-daily manual operations; notification by SNP security; manual re-set.	B	4	V High	D	2	Low	<ul style="list-style-type: none"> Automatic plant shut down "Loss-of-communications" alarm 	No backup generator available. RECOMMENDATION: Install SCADA.
Damage to WTP (bushfire, tree damage)	Coordination with SES, RFS.	C	4	V High	D	4	High	<ul style="list-style-type: none"> PLC alarms; automatic plant shut down "Loss-of-communications" alarm 	RECOMMENDATION: Install and maintain fire breaks, clear trees close to WTP.

Hazardous Event	Preventive Measures	Max Risk No Prevention		Resid Risk with Prevention		Monitoring and Control	Notes/Improvement Actions
Reservoirs							
Pathogens							
Breach of reservoir integrity e.g. recontamination by vermin (birds, snakes)	Security fences; chlorine residuals; electronic alarms on hatches; bypass capacity on some reservoirs; covered roofed reservoirs; visual inspection; yearly cleans and identification of gaps.	A	4	V High	D	3	Mod <ul style="list-style-type: none"> Visual inspection Number of backwashes daily Headloss across filter Manual operational monitoring
Deliberate contamination	Security fences; chlorine residuals; electronic alarms on hatches; bypass capacity on some reservoirs; capacity; covered roofed reservoirs; visual inspection.	E	5	High	D	3	Mod <ul style="list-style-type: none"> 3-times weekly and monthly operational monitoring of reservoirs NSW Health
Build-up of slime, sediment	WTP process control; yearly cleaning process with divers; asset management.	D	3	Mod	E	2	Low <ul style="list-style-type: none"> 3-times weekly and monthly operational monitoring of reservoirs NSW Health
Distribution							
Pathogens							
Low chlorine residual	WTP process control; well-trained operators; option for hand-dosing at reservoirs.	B	4	V High	C	3	High <ul style="list-style-type: none"> Hand-dosing at reservoirs Boiled water alerts Fortnightly monitoring at supply (<i>E.coli</i>, free chlorine) NSW Health RECOMMENDATION: Install online chlorine analyser, SCADA.
Breach of pipelines through breaks, inappropriate maintenance, new or service works etc	Superchlorination of new pipes: SOPs; flushing; water-dedicated team; mains replacement programs; inspection and flushing of new works by outside contractors; trained staff.	D	4	High	D	2	Low <ul style="list-style-type: none"> Inspections of new works Fortnightly monitoring at supply (<i>E.coli</i>, free chlorine) NSW Health Hand-dosing at reservoirs
Cross-connections and backflows	Backflow prevention devices (RPZ); backflow prevention policy and audit/inspection programs; all houses have non-return valves on meters; pool has backflow prevention; chlorine residual.	B	4	V High	E	2	Low <ul style="list-style-type: none"> Backflow inspection/audit programs Fortnightly monitoring at supply (<i>E.coli</i>, free chlorine) NSW Health Hand-dosing at reservoirs
Dead end in reticulation system leading to stagnation (aesthetic)	Mains extension program, quarterly flushing, weekly water sampling. Complaints response. (Lime has been found)	D	2	Low	E	2	Low <ul style="list-style-type: none"> Fortnightly monitoring at supply (<i>E.coli</i>, free chlorine) NSW Health Hand-dosing at reservoirs

Table 4: Coffs Harbour CCPs and Limits

PARAMETER	FREQUENCY	TARGET	OPERATIONAL PROCEDURES	ALERT LIMIT	CORRECTIVE ACTION	CRITICAL LIMIT	CORRECTIVE ACTION
CCP1 Selective extraction							
Turbidity (NTU)	COCHRANE'S POOL Continuous	< 2	<ul style="list-style-type: none"> Visually inspect source water daily Daily (M-F) manual turbidity reading at laboratory Inspect sample pump daily Monitor weather forecast Monitor rainfall gauges Calibrate instrumentation: <ul style="list-style-type: none"> Monthly by operators Quarterly by electricians As required after floods, abnormal readings etc 	2 (> 10 min) (CHCC to confirm)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator Ensure automatic shut-down of pump Visual check at intake, including river level Manual grab sample, test Increase monitoring until target is reached Operator reset of pumps when target is reached 	> 2 (> 10 min) (CHCC to confirm)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator Ensure automatic shut-down of pumps Visual check at intake, including river level Manual grab sample, test Increase monitoring until target is reached Operator reset of pumps when target is reached Consider alternate source
	NYMBOIDA RIVER Continuous	< 2	<ul style="list-style-type: none"> Review daily email from CVC, including weather forecast, rainfall, NTU Monitor daily flows on NSW Office of Water website Daily manual flow test at RWSS Visual inspection of source water by CVC CVC control of manual valve for flows to and from CVC 	2 (> 1 hour) (CHCC to confirm)	<ul style="list-style-type: none"> CVC notifies CHCC of increased turbidity CVC closes supply valve to CHCC Daily sampling until turbidity reaches target Manually close valve inside RWSS inlet pit Increase monitoring until target is reached Manually open inlet pit valve when target is reached 	> 2 (> 1 hour) (CHCC to confirm)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator CVC operator notifies CHCC of increased turbidity Daily sampling until target is reached Manually close valve inside RWSS inlet pit Increase monitoring until target is reached Operator opens inlet pit valve when target is reached Consider alternate source
CCP 2 Aeration at Karangi Dam							
Aeration	Daily	Run-time = 6 hrs (DO > 7 mg/L at 27m)	<ul style="list-style-type: none"> Monitor compressor run time (at 27 meters) daily Monitor DO weekly (TWL, 3,6,9m) 	Run time < 6 hrs (DO < 7 mg/L at 27m)	<ul style="list-style-type: none"> Increase aeration time until DO increases as required Increase DO monitoring Visual inspection of source 	Run time DO < 5 mg/L at 27m	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator Increase aeration time until DO increases as required

PARAMETER	FREQUENCY	TARGET	OPERATIONAL PROCEDURES	ALERT LIMIT	CORRECTIVE ACTION	CRITICAL LIMIT	CORRECTIVE ACTION
			<ul style="list-style-type: none"> Monitor DO monthly (0, 3, 6, 9 to 27 meters) Record pump hour readings daily Programmed maintenance and servicing of compressor Calibrate instrumentation [CHCC: confirm schedule] 		water, compressor and bubbles on surface; mechanic/ electrician to repair as required <ul style="list-style-type: none"> Check DO probe; maintain as appropriate Undertake diver inspection on high pressure alarm on compressor 		<ul style="list-style-type: none"> Increase DO monitoring until target is reached Repeat corrective actions Consider alternate source
CCP 3 Coagulation							
pH after prime CO ₂	Continuous	8	<ul style="list-style-type: none"> Daily visual inspection of floc and monitoring, dosing systems Daily clean algae from probe Weekly clean of pH monitor (lime) Calibrate online pH monitor (monthly) Calibrate instrumentation [CHCC: confirm schedule] 	< 6.5 or > 9.5 (> 30 mins)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator Visual inspection of source water source Inspect CO₂, lime plant; clean/maintain as required Inspect probes, flow meters; clean/maintain as required Grab sample, manual test Manually adjust CO₂, lime dose as required Increase monitoring until target is reached 	< 5.8 or > 9.6 (> 15 min)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator Inspect CO₂, lime plant; clean/maintain as required Inspect probes, flow meters; clean/maintain as required Grab sample, manual test Manually adjust CO₂, lime dose as required Ensure alert to filtration process Consider alternate source Increase monitoring until target is reached
pH after trim CO ₂	Continuous	6.8	<ul style="list-style-type: none"> Daily visual inspection of floc and monitoring, dosing systems Daily clean algae from probe Weekly clean of pH monitor (lime) Calibrate online pH monitor (monthly) Calibrate instrumentation 	< 5.8 or > 7.1 (> 30 mins)	<ul style="list-style-type: none"> Inspect CO₂, lime plant; clean/maintain as required Inspect probes, flow meters; clean/maintain as required Take grab sample, test manually Manually override process to adjust CO₂, lime dose as required 	< 5.5 or > 7.3 (> 5 min)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator Inspect CO₂, lime plant; clean/maintain as required Inspect probes, flow meters; clean/maintain as required Grab sample, manual test Manually adjust CO₂, lime dose as required

PARAMETER	FREQUENCY	TARGET	OPERATIONAL PROCEDURES	ALERT LIMIT	CORRECTIVE ACTION	CRITICAL LIMIT	CORRECTIVE ACTION
			[CHCC: confirm schedule]		<ul style="list-style-type: none"> Increase monitoring until target is reached 		<ul style="list-style-type: none"> Ensure alert to filtration process Increase monitoring until target is reached
CCP 4 Filtration (post filter)							
Turbidity (NTU) (after start up following backwash)	Continuous	< 0.1 (on individual/combined filters)	<ul style="list-style-type: none"> Daily visual inspection of filters Programmed maintenance/servicing Manually record NTU daily (individual and combined three filters) Calibrate instrumentation [CHCC: confirm schedule] 	> 0.3 (> 30 min)	<ul style="list-style-type: none"> Visual inspection of water source Visual inspection of clarifier Take grab sample, test manually Operator-initiated backwash as required Check coagulation; increase alum dose as required Increase monitoring until target is reached 	> 0.5 (> 15 min)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator Ensure discharge of flow from clarifier (no flow to filter) Ensure automatic shut-down of filter Repeat operational and corrective actions Investigate process controls Operator re-start of flow to filter when target is reached
Turbidity (maturation spike at start of filter run – filter ripening)	Continuous	< 0.1 (> 5 mins)	<ul style="list-style-type: none"> Daily visual inspection of filters Programmed maintenance/servicing Manually record NTU daily (individual and combined three filters) Calibrate instrumentation [CHCC: confirm schedule] 	> 0.5 NTU (> 30 min)	<ul style="list-style-type: none"> Visual inspection of water source Visual inspection of clarifier Take grab sample, test manually Operator-initiated backwash as required Check coagulation; increase alum dose as required Increase monitoring until target is reached 	> 1 NTU (> 5 min)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator Ensure discharge of flow from clarifier (no flow to filter) Ensure automatic shut-down of filter Repeat operational and corrective actions Investigate process controls Operator re-start of flow to filter when target is reached
CCP 5 UV Disinfection (limits as per calibrated alarms for UV system)							
UV Transmissivity	Continuous	98%	<ul style="list-style-type: none"> Programmed maintenance/servicing Calibrate instrumentation [CHCC: confirm schedule] 	95% < 1.1 x min (> 4 hours)	<ul style="list-style-type: none"> Check filtration process/ turbidity levels Repair reactors as required Increase monitoring until target is reached 	85% < 0.8 x min (> 1 hour)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator Notify NSW Health Confirm automatic shut-down of reactors

PARAMETER	FREQUENCY	TARGET	OPERATIONAL PROCEDURES	ALERT LIMIT	CORRECTIVE ACTION	CRITICAL LIMIT	CORRECTIVE ACTION
							<ul style="list-style-type: none"> Repeat operational and corrective actions Repair reactors as required Operator re-start of reactors when transmissivity reaches target
UV Dose	Continuous	< 48 mJ/cm ²	<ul style="list-style-type: none"> Undertake programmed maintenance/servicing Calibrate instrumentation [CHCC: confirm schedule] 	< 22 mJ/cm (60 minutes)	<ul style="list-style-type: none"> Check filtration process/ turbidity levels Repair reactors as required Increase monitoring until target is reached 	< 20 mJ/cm (60 minutes)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator Notify NSW Health Confirm automatic shut-down of reactors Repeat operational and corrective actions Repair reactors as required Operator re-start of reactors when transmissivity reaches target
CCP 6 Fluoridation							
Fluoride at treated water storage (mg/L)	Continuous	1.0	<ul style="list-style-type: none"> Daily drop test (10 mins – instant dose rate) Daily historical (24hr) balance Daily manual analysis of water Daily manual fill of day tank with fluoride Weekly monitoring of natural fluoride level Weekly laboratory monitoring at three points in reticulation Programmed maintenance/servicing Ensure restricted access to 	< 0.95 or > 1.05 (1 hour)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator Respond as Fluoridation Code of Practice and CHCC Emergency response plan Ensure automatic plant shut-down Resample and test water Inspect dosing system Repair as required Transfer water from treated water storage to emergency storage lagoon; shandy as appropriate Increase monitoring until target is reached 	< 0.9 or > 1.5 (15 min)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator Notify NSW Health Respond as Fluoridation Code of Practice and CHCC Emergency response plan Ensure automatic plant shut-down Resample and test water Inspect dosing system Repair as required Transfer water from treated water storage to emergency storage lagoon; shandy as appropriate Increase monitoring until

PARAMETER	FREQUENCY	TARGET	OPERATIONAL PROCEDURES	ALERT LIMIT	CORRECTIVE ACTION	CRITICAL LIMIT	CORRECTIVE ACTION
			dosing facility <ul style="list-style-type: none"> Undertake fluoride training for operational, maintenance and management staff Calibrate instrumentation [CHCC: confirm schedule] 		<ul style="list-style-type: none"> Operator re-start of plant when target is reached 		target is reached <ul style="list-style-type: none"> Operator re-start of plant when target is reached
CCP 7 Chlorine Disinfection							
Chlorine residual at treated water storage outlet (mg/L)	Continuous	1.2 – 2.0 (seasonally dependent)	<ul style="list-style-type: none"> Daily manual free chlorine test on inlet and outlet of treated water storage and RHBT Daily free chlorine monitoring (Monday-Friday) at RHR Programmed maintenance/servicing Monthly calibration of instrumentation 	< 1.2 or > 2 (> 30 mins)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator; adjust chlorine dose as required Visual inspection of dosing point and repair as required Inspect filter and adjust as required Inspect flocculation and adjust as required Inspect pH correction points and adjust as required Increase monitoring at inlet and outlet until target is reached 	< 0.9 or > 2.5 (> 5 mins)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator Notify NSW Health Shut-down of pump to RHBT Check online monitor at RHBT Manual dose at treated water storage as required Repeat operational and corrective actions Transfer water from treated water storage to emergency storage lagoon; shandy as appropriate Operator re-start of RHBT pump when target is reached Consider boiled water alert
pH at outlet of treated water storage outlet (pH units)	Continuous	7.7	<ul style="list-style-type: none"> Confirm automatic adjustment of dose Weekly manual monitoring Monthly calibration of instrumentation 	< 7.2 > 8.3 (> 30 mins)	<ul style="list-style-type: none"> Notify Treatment Manager Visual inspection of dosing systems Adjust lime/acid dose as required Increase manual monitoring until target is reached 	< 7.0 > 8.5 (> 30 min)	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator Shut-down of RHBT pump Adjust lime/acid dose at tank Transfer water to emergency storage lagoon; shandy as appropriate Increase manual monitoring until target is reached Operator re-start of RHBT

PARAMETER	FREQUENCY	TARGET	OPERATIONAL PROCEDURES	ALERT LIMIT	CORRECTIVE ACTION	CRITICAL LIMIT	CORRECTIVE ACTION
							pump when target is reached
CCP 8 Point-of-Supply Disinfection							
Free chlorine at point-of-supply (mg/L)	Weekly	> 0.2	<ul style="list-style-type: none"> Weekly testing at point-of-supply (E.coli, total coliforms, free chlorine) Mains flushing Calibrate instrumentation [CHCC: confirm schedule] 	< 0.2	<ul style="list-style-type: none"> Contact Distribution Manager and Water Coordinator Check chlorine at appropriate reservoir Hand dose at appropriate reservoir if chlorine < 0.3 mg/L, according to SOP. Retest and re-dose as appropriate Consider increasing chlorine dose at RHBT, WTP, chlorine booster Increase monitoring until target is reached 	< 0.1	<ul style="list-style-type: none"> Notify Distribution Manager, Water Coordinator Notify NSW Health Respond as per NSW Health Drinking Water Quality Protocol (2005) Repeat corrective actions Flush mains Increase monitoring until target is reached Consider boiled water alerts

Table 5: Nana Glen CCPs and Limits

PARAMETER	FREQUENCY	TARGET	OPERATIONAL PROCEDURES	ALERT LIMIT	CORRECTIVE ACTIONS	CRITICAL LIMIT	CORRECTIVE ACTIONS
CCP1 Coagulation/Filtration							
Turbidity after filtration (NTU)	Continuous	< 0.3	<ul style="list-style-type: none"> Weekly visual inspection of source water 3-times/week visual inspection of floc and filters Manual 3-times/week recording of NTU 3-times/week pH, alkalinity, colour, turbidity monitored at raw water and treated water reservoir Calibrate instrumentation [CHCC: confirm schedule] 	> 0.5	<ul style="list-style-type: none"> Notify Treatment Manager, Water Coordinator on repeat occurrences or additional problems Visual inspection of water source Visual inspection of floc, dosing systems; adjust dose/repair as appropriate Manual grab sample and jar test Initiate manual backwash Calibrate instrumentation Increase monitoring until target is reached 	> 1.0	<ul style="list-style-type: none"> Notify Water Treatment Manager, Water Coordinator Ensure automatic shut-down filter Repeat corrective actions Increase monitoring until target is reached Alert supervisor Water Treatment Manager on repeat occurrences Cart water if limit exceeded for long time Manual re-start of filter when target is achieved
CCP 2 Disinfection							
Chlorine residual in reservoir (mg/L)	3-times/ week	0.8 (summer) 0.5 (winter)	<ul style="list-style-type: none"> 3-times/week manual free chlorine test in reservoir 3-times/week operational monitoring Monthly calibration of equipment Programmed maintenance/ servicing 	< 0.5	<ul style="list-style-type: none"> Consult with Treatment Manager, Water Coordinator; adjust chlorine dose Visual inspection of dosing point/system; repair as required Visual inspection of filter; backwash as appropriate Visual inspection of floc, dosing systems; adjust dose/repair as appropriate Increase manual testing Calibrate equipment Take reservoir off-line, re-fill and add chlorine; balance and shandy the two reservoirs 	< 0.3	<ul style="list-style-type: none"> Notify Water Treatment Manager, Water Coordinator Notify NSW Health Manual plant shut-down Manual dose at reservoir as required Repeat corrective actions Increase monitoring until target is reached Manual re-start of plant when target is reached Consider boiled water alert

PARAMETER	FREQUENCY	TARGET	OPERATIONAL PROCEDURES	ALERT LIMIT	CORRECTIVE ACTIONS	CRITICAL LIMIT	CORRECTIVE ACTIONS
					together. <ul style="list-style-type: none"> Increase monitoring until target is reached 		
CCP 3 Disinfection at point-of-supply							
Free chlorine at point-of-supply (mg/L)	Fortnightly	> 0.3	<ul style="list-style-type: none"> Fortnightly testing at point-of-supply (<i>E.coli</i>, total coliforms, free chlorine) Mains flushing 	< 0.2	<ul style="list-style-type: none"> Notify Water Treatment Manager, Water Coordinator Check chlorine at appropriate reservoir Hand dose at appropriate reservoir Retest and re-dose as appropriate Consider increasing chlorine dose WTP Increase monitoring until target is reached 	< 0.1	<ul style="list-style-type: none"> Notify Water Treatment Manager, Water Coordinator Notify NSW Health Respond as per NSW Health Drinking Water Quality Protocol (2005) Repeat corrective actions Increase monitoring until target is reached Consider boiled water alert

Appendix D



Technical Note 4 Operational and Verification Monitoring

Coffs Harbour City Council



Technical Note 4 Operational and Verification Monitoring

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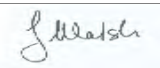
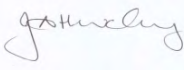
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1 Introduction

This Technical Note outlines the operational and verification monitoring activities in Coffs Harbour City Council's Drinking Water Supply Systems (DWSS).

Operational monitoring provides for the testing and observations to determine whether the process is achieving the limits that are defined in the control point.

Testing of the final water is verification monitoring.

1.1 Operational monitoring

Operational monitoring is a planned sequence of measurements and observations throughout the water supply system to ensure and confirm performance of preventive measures and barriers to contamination. The importance of operational monitoring to the effective maintenance of preventive barriers to contamination cannot be overstated.

The single most significant concern for WTP operators is to ensure effective barriers are in place to protect the drinking water supply from waterborne microbial pathogens. Therefore, the most important monitoring activity is to ensure that microbial contamination does not cross the barriers and enter the drinking water supply.

The operational requirements and frequency of monitoring varies for each water supply system depending on the key characteristics identified through the analysis of the water supply system and risk assessment.

WTP operators and distribution staff must ensure that the drinking water supply remains free from microbial contamination as it moves through the distribution system. In relation to health considerations, the following parameters can have a significant effect on the microbial quality of drinking water:

TURBIDITY - Elevated turbidity can interfere with the detection and treatment of bacteria and viruses, and is known to protect microorganisms from the action of disinfectants.

Turbidity at extraction can provide a useful indicator of changes in the catchment and can alert the operator to the potential contamination of the source water. In turn, this enables WTP operators to trigger appropriate management responses.

The ADWG (NHMRC, NRMMC, 2011) recommends that in order to remove waterborne pathogens in unprotected catchments, where filtration is used as part of the water treatment process, the turbidity leaving the filters, under normal operating conditions should be less than 0.2 NTU and should not exceed 0.5 NTU at any time.

pH - pH is monitored to ensure effective disinfection. Chlorine disinfection is impaired above pH 8.0.

CHLORINE RESIDUAL – The ADWG (2011) states that typically, chlorine residuals at a point of supply in Australia are generally in the range of 0.1 to 4 mg/L with typical concentration at about 0.2 to 0.4 mg/L.

1.2 Verification Monitoring

The verification of the drinking water quality supplied to consumers is an essential element in assessing the overall performance of the system. Verification provides an important link back to the operation of the water supply system and additional assurance that the preventive measures and treatment barriers in the water supply system have worked, and are supplying safe drinking water.

The ADWG 2011 recommends that sampling points within a distribution system are divided into zones that are typically:

- Supplied from a single source, and / or
- Hydraulically separated from other zones

As the priority for drinking water quality is to ensure the absence of pathogenic organisms, locations for verification monitoring should be strategically placed so that representative sites are monitored within each zone.

2 Operational Monitoring

CHCC undertakes monitoring of water quality in the Coffs Harbour and Nana Glen DWSS. Monitoring is undertaken by CHCC in the source water (Orara River and Karangi Dam), treatment plants and distribution systems. Clarence Valley Council (CVC) undertakes daily monitoring at Nymboida Weir and weekly at Shannon Creek Dam. Results are also reported to CHCC.

In the Coffs Harbour DWSS, monitoring at the Karangi WTP is continuous online, with manual checks undertaken regularly for turbidity, chlorine residual, fluoride and pH at the Karangi WTP, with manual checks undertaken daily.

In the Nana Glen DWSS, monitoring is undertaken manually, with the exception of turbidity after filtration, which is continuously monitored.

The frequency and number of microbiological and chemical samples is based on population size, as summarised in Table 1.

Table 1: Populations for CHCC drinking water supply systems

Analysis	Population
Coffs Harbour	69,800
Nana Glen	300

Table 2 and Table 3 summarise the operational monitoring activities for each of the two CHCC water supply systems, excluding online monitoring within the WTPs.

Table 2: Operational Monitoring Regime for Coffs Harbour Drinking Water Supply System (excluding WTP)

Site	Sample Point	Sampled By	Frequency	Tests Done
Source and Raw Water				
	Regional Intake	Water S, Lab T	Monthly	pH, Conductivity, Calcium Hardness, Alkalinity, Iron, Manganese, Turbidity, Apparent Colour
	Regional Intake - Coramba	Lab Staff	Monthly	pH, Turbidity, Colour (Apparent, Total), Total Organic Carbon, Coliforms (Faecal, Total)
	Regional Intake - Karangi	Lab Staff	Monthly	pH, Turbidity, Colour (Apparent, Total), Total Organic Carbon, Coliforms (Faecal, Total)
001	Orara River - Cochranes Pool	Lab Staff	Monthly	pH, Turbidity, Colour (Apparent, Total), Total Organic Carbon, Coliforms (Faecal, Total)
	Cochrane's Pool	Water S, Lab T	Monthly	Iron, Manganese
	Karangi Dam 1m	Water S, Lab T	Monthly	pH, Conductivity, Calcium Hardness, Alkalinity, Iron, Manganese, Total Nitrogen, Total Phosphorous
	Karangi Dam (3m, 6m, 9m)	Water S, Lab T	Monthly	Iron, Manganese
	Karangi Dam outlet (TWL, 1m, 3m, 6m, 9m)	Water S, Lab T	Weekly	Dissolved Oxygen, Temperature, Colour, Turbidity
	Karangi Dam (TWL, 1m, 3m, 6m, 9m, 12m, 15m, 18m, 21m, 24m)	Water S, Lab T	Monthly	Dissolved Oxygen, Temperature, Colour, Turbidity
	Karangi Dam (TWL, 1m, 3m, 6m)	Water S, Lab T	Weekly	Freshwater Algae Identification
	Karangi Dam (9m, 12m, 15m, 18m, 21m, 24m, 27m)	Water S, Lab T	Monthly	Freshwater Algae Identification
002	Karangi Dam	Lab Staff	Monthly	pH, Turbidity, Colour (Apparent, Total), Total Organic Carbon, Coliforms (Faecal, Total)
Treated Water				
007	Red Hill Reservoir - Coramba Rd. (East of Res.)	Lab S & T Water S, Lab T	Weekly Monthly	A pH, Conductivity, Calcium Hardness, Alkalinity, Iron, Manganese
Distribution System (Reservoirs)				
010	Macauley's - Mastracolas Rd (North of Res)	Lab S & T	Yearly	A
011	Roberts Hill - Kratz Dr. (North of Res.)	Lab S & T	Twice/Year	A
012	Mullaway - Tramway Dr. (East of Res)	Lab S & T	Yearly	A
013	Bark Hut - Bark Hut Rd. (East of Res.)	Lab S & T	Yearly	A
014	Woolgoolga Headland - Ocean St. (West of Res.)	Lab S & T	Yearly	A
015	Scarborough St - Scarborough St. (East of Res.)	Lab S & T	Yearly	A
016	Emerald - Stefan CIs. (South of Res.)	Lab S & T	Yearly	A
017	Moonee - MacCues Rd. (North of	Lab S & T	Yearly	A

Site	Sample Point	Sampled By	Frequency	Tests Done
	Res.)			
018	Sapphire - Old Coast Rd. (East of Res.)	Lab S & T	Yearly	A
019	Sawtell Headland - Boambee Headland (South of Eastern Res.)	Lab S & T	Twice/Year	A
020	Toormina - Belbowrie Rd. (South of Eastern Res.)	Lab S & T	Twice/Year	A
Supply to Consumer (Reticulated)				
021	Ulmarra offtake - Eiggins Cl. (Next to meter pit)	Lab S & T	Every 4 Weeks 18 month rotation	A B
022	Arararra - 2nd Ave.(Toilet Block, in service bay)	Lab S & T	Every 4 Weeks 18 month rotation	A B
023	Safety Beach - Ocean Drive. (SPS)	Lab S & T	Fortnightly 18 month rotation	A B
024	Woolgoolga - N. End Lake Rd.(Toilet Block, in service bay)	Lab S & T	Fortnightly 18 month rotation	A B
025	Sandy Beach - Sandy Beach Dr.(Toilet Block, in service bay)	Lab S & T	Every 4 Weeks 18 month rotation	A B
026	Emerald - Fiddamans Rd.(Reserve Toilet Block, East side)	Lab S & T	Every 4 Weeks 18 month rotation	A B
027	Moonee -Woodhouse Rd (Bushfire Shed, North side)	Lab S & T	Fortnightly 18 month rotation	A B
028	Sapphire - Sapphire Cr.(SPS 69)	Lab S & T	Fortnightly 18 month rotation	A B
029	Korora - Sandy Beach Dr.(Toilet Block, South end)	Lab S & T	Fortnightly 18 month rotation	A B
030	Coffs Harbour Nth - York St (SPS 44)	Lab S & T	Fortnightly 18 month rotation	A B
031	Coffs Harbour Nth - Marcia St Depot (North end Stores Build)	Lab S & T	Fortnightly 18 month rotation	A B
032	Coffs Harbour Sth - Council Chambers (Riding Lane, carpark wall)	Lab S & T	Fortnightly 18 month rotation	A B
033	Coffs Harbour Sth - Jetty Oval (Toilet Block, South side)	Lab S & T	Fortnightly 18 month rotation	A B
034	Sawtell - Boronia Park (West side Lions Shed)	Lab S & T	Fortnightly 18 month rotation	A B
035	Toormina - Sea Breeze Pl. (SPS 21)	Lab S & T	Fortnightly 18 month rotation	A B
036	Toormina - Hamilton Dr. (SPS 17)	Lab S & T	Fortnightly 18 month rotation	A B
041	Corindi Beach Aboriginal Community	Lab S & T	Monthly # Twice Yearly	A B
042	Wongala Estate Aboriginal Community	Lab S & T	Monthly # Twice Yearly	A B

Site	Sample Point	Sampled By	Frequency	Tests Done
043	Karangie Water Treatment Plant - Treated Water	Lab S & T	Weekly	A
Extra Sampling for Reticulated Supply				
	Reticulation Fluoride Testing	Lab Staff	Weekly	Fluoride (3 samples from 021 - 043: 1 from northern sites; 1 from Coffs sites; 1 from Sawtell sites)
007	Redhill Reservoir	Lab Staff	Weekly	pH, Turbidity, Apparent Colour, Alkalinity, Calcium Hardness, Fluoride, Iron, Manganese
043	Karangie Water Treatment Plant (Treated Water)	Lab Staff	Weekly	pH, Turbidity, Apparent Colour, Alkalinity, Calcium Hardness, Fluoride, Iron, Manganese
	Coffs Harbour Tap Water (either 030, 031, 032 or 033)	Lab Staff	Weekly	pH, Turbidity, Alkalinity, Apparent Colour
	Woolgoolga Tap Water (tap at Woolgoolga WRP)	Water S, Lab T	Weekly	pH, Turbidity, Alkalinity, Apparent Colour
034	Sawtell Tap Water (034)	Water S, Lab T	Weekly	pH, Turbidity, Alkalinity, Apparent Colour, Chloride(monthly)
041	Corindi Beach Aboriginal Community	Lab Staff	** Twice yearly	pH, Turbidity, Fluoride
042	Wongala Estate Aboriginal Community	Lab Staff	** Twice yearly	pH, Turbidity, Fluoride

Notes:

Lab S & T: Samples collected by lab with analysis (testing) undertaken/arranged by lab.

Water S Lab T: Samples collected and delivered to lab by CHCC Water staff with analysis (testing) undertaken or arranged by CHCC laboratory staff.

Twice Yearly: Testing has not been undertaken prior to 2013 but is proposed to be undertaken from 2013 onwards twice yearly, subject to review by Manager Distribution.

**** Twice yearly:** Testing has been undertaken monthly prior to 2013 but is proposed to be undertaken from 2013 onwards twice yearly subject to review by Manager Distribution.

18 month rotation: Testing is undertaken at one different site each month. There are 18 sites in total.

Test A: Total coliforms; *E. coli*; free chlorine and temperature

Test B: Routine Chemical: pH, turbidity, total dissolved solids, total hardness, true colour, iodide, aluminium, antimony, arsenic, barium, boron, cadmium, calcium, chromium, copper, iron, magnesium, manganese, mercury, molybdenum, nickel, selenium, silver, sodium, zinc, chloride, fluoride, sulfate, nitrate, and nitrite.

RECOMMENDATION:
Cyanide to be included in NSW Health Monitoring Program Test B

Table 3: Operational Monitoring Regime for Nana Glen Drinking Water Supply System

Site	Sample Point	Sampled By	Frequency	Tests Done
Source				
	Orara River (Grafton Street Bridge)	Lab S & T	Monthly	Faecal Coliforms, Total Coliforms
Raw Water				
	Intake	Water S & T	Fortnightly	Al
005	Nana Glen Pump Intake	Water S, Lab T	Monthly	pH, Conductivity, Turbidity, Apparent Colour, Calcium Hardness, Alkalinity, Iron, Manganese
Treatment Plant (including Reservoirs)				
	Treated Water	Water S & T	Approx 3 times/week	Flow, Turbidity,pH
	Reservoirs 1 & 2	Water S & T	Approx 3 times/week	Free Cl; Reservoir 2: level
	Reservoirs 1 & 2	Water S, Lab T	Monthly	Turbidity, pH, Al, Alkalinity, Hardness, Colour Apparent, Conductivity, Fe, Mn
Extra Sampling				
	Reservoir 1 & 2 (at WTP)	Water S, Lab T	Monthly	For each reservoir: pH, Conductivity, Turbidity, Apparent Colour, Calcium Hardness, Alkalinity, Iron, Manganese, Aluminium
Supply to Consumer (Reticulated)				
008	Nana Glen - Grafton St (Park by River)	Lab S & T	Fortnightly 18 month rotation	A plus extra sampling of Al B
	Nana Glen – Grafton St (Park by River)		6-monthly	Chemical, Physical

3 Verification Monitoring

CHCC water operators monitor water quality at the point-of-supply as part of the NSW Health Monitoring Program. NSW Health analysis of the distribution system provides on-going independent verification of the treatment process. Frequency of sampling is based on population. The Program assesses 39 parameters for microbial, physical and chemical properties of the water as detailed in Table 4. Table 5 lists the locations for the Program in both Coffs Harbour and Nana Glen DWSS. The results can be accessed at: http://www.health.nsw.gov.au/publichealth/environment/water/drinkwater_nsw.asp

Council's Manager, Water Treatment is responsible for the collection of the NSW Health monitoring program. Samples are submitted in accordance with the "Guide for submitting water samples to DAL for analysis" and the Council water procedures for samples.

In addition to the NSW Health Monitoring Program, Council undertakes weekly operational monitoring at point of supply as part of the Council's operating procedures.

Table 4: NSW Health Monitoring Program Parameters

Microbial		
<i>E. coli</i>	Total Coliforms	
Disinfection		
Free Chlorine	Total Chlorine	
Fluoridation		
Fluoride (daily WU) ¹	Fluoride (WU result) ¹	
Fluoride (weekly WU) ¹	Fluoride Ratio	
Physical		
pH	Total Dissolved Solids (TDS)	
True Colour	Total Hardness as CaCO ₃	
Turbidity		
Chemicals		
Aluminium	Copper	Nickel
Antimony	Fluoride	Nitrate
Arsenic	Iodine	Nitrite
Barium	Iron	Selenium
Chemicals		

Boron	Lead	Silver
Cadmium	Magnesium	Sodium
Calcium	Manganese	Sulphate
Chloride	Mercury	Zinc
Chromium	Molybdenum	

¹ As fluoride dosing is not undertaken in Nana Glen DWSS, sampling is only undertaken in Coffs Harbour DWSS.

Table 5: NSW Health Verification Monitoring Sites

Town	Sampling Site	Location
Coffs Harbour		
Arrawarra	21	Eggins Drive
	22	Second Avenue
Coffs Harbour	10	Mastracolas Road
	11	Kratz Drive
	30	York Street
	31	Marcia Street
	32	Coffs St
	33	Orlando St
	40	Ocean Parade
	7	Coramba Road
Coramba	9	Martin Street
Corindi	1	Pacific Street
	2	Coral Street
	3	MacDougall Street
	4	Pacific Street
Corindi Beach aboriginal community	41	Red Rock Road
Emerald Beach	16	Stefan Close
	26	Fiddamans Road
Korora	29	Sandy Beach Road
Moonee Beach	17	MacCues Road
	27	Woodhouse Road
Mullaway	12	Tramway Drive
Safety Beach	23	Ocean Drive

Town	Sampling Site	Location
Sandy Beach	25	Beach Drive
Sapphire	18	Old Coast Road
	28	Sapphire Crescent
Sawtell	19	Boambee Headland
	34	Boronia Park
Toormina	20	Belbowrie Rd
	35	Sea Breeze Place
	36	Hamilton Drive
Wongala Aboriginal community	42	Wongala
Woolgoolga	13	Bark Hut Road
	14	Ocean Street
	15	Scarborough Street Reservoir
	24	Lake Road
Nana Glen		
	8	Grafton Street
	999	Not Defined, Nana Glen

4 Recommendations

A number of improvements in the operational and verification monitoring programs in the Coffs Harbour and Nana Glen DWSS have been identified. The following recommendations will be incorporated into the improvement plan for the CHCC DWQMS:

Coffs Harbour

- Integration of SCADA systems between CVC and CHCC for coordinated monitoring
- Consideration of cyanide testing in NSW Health Monitoring Program at point-of-supply, dependant on past and existing mine sites within catchment
- Electronic recording of dissolved oxygen data at Karangie Dam

Nana Glen

- Electronic recording of all data in order to observe trends and issues over time
- Online monitoring of turbidity in the Orara River
- Installation of alarms, automatic shut-down of river pumps based on turbidity
- Installation of SCADA control/alarms at Nana Glen WTP
- Install online pH, turbidity monitoring before flocculation
- Provide scales at Nana Glen WTP to determine quantity of chlorine gas available in supply
- Install online turbidity, pH monitoring after post-dosing point

Appendix E



Draft Critical Control Point Signs

Coffs Harbour Drinking Water System



CONTINUOUS

CCP 1 Turbidity Cochrane's Pool

TARGET	ALERT	CRITICAL
<p>< 2 NTU</p>	<p>> 2 NTU for > 10 mins</p>	<p>> 2 NTU for > 10 mins</p>
<ul style="list-style-type: none"> ➤ Inspect: raw water and sample pump daily ➤ Daily (Mon-Fri) manual turbidity reading in lab ➤ Monitor: weather forecast and rainfall gauges ➤ Unless manufacturer instrumentation manuals indicate otherwise, calibrate instrumentation: <ul style="list-style-type: none"> • 3-monthly by operators • Quarterly by electricians • As required after floods, abnormal readings etc 	<ul style="list-style-type: none"> ➤ Notify Treatment Manager, Water Coordinator ➤ Ensure automatic shutdown of pump ➤ Visual check at intake, including river level ➤ Take a manual grab sample and test ➤ Increase monitoring until system reaches target ➤ Operator reset of pumps when target is reached 	<ul style="list-style-type: none"> ➤ Notify Treatment Manager, Water Coordinator ➤ Ensure automatic shutdown of pumps ➤ Visually check intake, including river level ➤ Take manual grab sample and test ➤ Increase monitoring until system reaches target ➤ Operator reset of pumps when target is reached ➤ Consider alternate source

Coffs Harbour Drinking Water System



CONTINUOUS

CCP 1 Turbidity Nymboida River

TARGET	ALERT	CRITICAL
<p>< 2 NTU</p>	<p>2 NTU for > 1 day</p>	<p>> 2 NTU for > 1 day</p>
<ul style="list-style-type: none"> ➤ Review daily email from CVC, including weather forecasts, rainfall, NTU ➤ Monitor daily flows on NSW Office of Water website ➤ Daily manual flow test at RWSS ➤ Visual inspection of source water by CVC ➤ CVC control of manual valve for flows to and from CVC 	<ul style="list-style-type: none"> ➤ CVC notifies CHCC of increased turbidity ➤ CVC closes supply valve to CHCC ➤ Daily sampling until turbidity reaches target ➤ Manually close valve inside RWSS inlet pit ➤ Increase monitoring until system target is reached ➤ Manually open inlet pit valve when target is reached 	<ul style="list-style-type: none"> ➤ Notify Treatment Manager, Water Coordinator ➤ CVC operator notifies CHCC of increased turbidity ➤ Daily sampling until target is reached ➤ Manually close valve inside RWSS inlet pit ➤ Increase monitoring until system reaches target ➤ Operator opens inlet pit valve when target is reached ➤ Consider alternate source

Coffs Harbour Drinking Water System



DAILY

CCP 2 Aeration at Karangi Dam

TARGET	ALERT	CRITICAL
<p>Run time = 6 hr OR DO > 7 mg/L at 27 m</p>	<p>Run time < 6 hr OR DO < 7 mg/L at 27 m</p>	<p>> 6 hrs run time OR DO < 5 mg/L at 27 m</p>
<ul style="list-style-type: none"> ➤ Monitor compressor run time (at 27 m) daily ➤ Monitor DO weekly: TWL, 3 m, 6 m, 9 m) ➤ Monitor DO monthly: 0 m, 3 m, 6 m, 9 – 27 m ➤ Record pump hour readings daily ➤ Programmed maintenance and servicing of compressor ➤ Unless manufacturer instrumentation manuals indicate otherwise, calibrate instrumentation: 3-monthly 	<ul style="list-style-type: none"> ➤ Increase aeration time until DO increases as required ➤ Increase DO monitoring ➤ Visual inspection of source water, compressor and bubbles on surface, mechanic/electrician to repair as required ➤ Check DO probe, maintain as appropriate ➤ Undertake diver inspection on high pressure alarm on compressor 	<ul style="list-style-type: none"> ➤ Notify Treatment Manager, Water Coordinator ➤ Increase aeration time until DO increase as required ➤ Increase DO monitoring until system reaches target ➤ Repeat corrective actions ➤ Consider alternate source

Coffs Harbour Drinking Water System



CONTINUOUS

CCP 3 Coagulation pH after prime CO₂

TARGET	ALERT	CRITICAL
8	< 6.5 OR > 9.5 for > 30 min	< 5.8 OR > 9.6 for > 15 min
<ul style="list-style-type: none"> ➤ Daily visual inspection of floc and monitoring, dosing systems ➤ Daily clean algae from probe ➤ Weekly clean of pH monitor (lime) ➤ Monthly calibrate online pH monitor ➤ Unless manufacturer instrumentation manuals indicate otherwise, calibrate instrumentation: 3-monthly 	<ul style="list-style-type: none"> ➤ Notify Treatment Manager, Water Coordinator ➤ Visual inspection of source water ➤ Inspect CO₂, lime plant: clean and maintain as required ➤ Inspect probes, flow meters: clean and maintain as required ➤ Manually test grab sample ➤ Manually adjust CO₂, lime dose, as required ➤ Increase monitoring until system target is reached 	<ul style="list-style-type: none"> ➤ Notify Treatment Manager, Water Coordinator ➤ Inspect CO₂, lime plant: clean and maintain as required ➤ Inspect probes, flow meters: clean and maintain as required ➤ Manually test grab sample ➤ Manually adjust CO₂, lime dose as required ➤ Ensure alert to filtration process ➤ Consider alternate source ➤ Increase monitoring until system target is reached

Coffs Harbour Drinking Water System



CONTINUOUS

CCP 3 Coagulation pH after trim CO₂

TARGET	ALERT	CRITICAL
6.8	< 5.8 OR > 7.1 for > 30 min	< 5.5 OR > 7.3 for > 5 min
<ul style="list-style-type: none"> ➤ Daily visual inspection of floc and monitoring dosing systems ➤ Daily clean algae from probe ➤ Weekly clean of pH monitor (lime) ➤ Monthly calibrate online pH monitor ➤ Unless manufacturer instrumentation manuals indicate otherwise, calibrate instrumentation: 3-monthly 	<ul style="list-style-type: none"> ➤ Inspect CO₂, lime plant: clean and maintain as required ➤ Inspect probes, flow meters: clean and maintain as required ➤ Manually test grab sample ➤ Manually override process to adjust CO₂, lime dose as required ➤ Increase monitoring until system target is reached 	<ul style="list-style-type: none"> ➤ Notify Treatment Manager, Water Coordinator ➤ Inspect CO₂, lime plant: clean and maintain as required ➤ Inspect probes, flow meters: clean and maintain as required ➤ Manually test grab sample ➤ Manually adjust CO₂, lime dose as required ➤ Ensure alert to filtration process ➤ Increase monitoring until system target is reached

Coffs Harbour Drinking Water System



CONTINUOUS

CCP 4 Post-Filtration Turbidity after start up following backwash

TARGET	ALERT	CRITICAL
<p style="text-align: center;">< 0.1 NTU on individual and combined filters</p>	<p style="text-align: center;">> 0.3 NTU for > 30 min</p>	<p style="text-align: center;">> 0.5 NTU for > 15 min</p>
<ul style="list-style-type: none"> ➤ Daily visual inspection of filters ➤ Programmed maintenance and servicing ➤ Manually record NTU daily (individual and combined three filters) ➤ Unless manufacturer instrumentation manuals indicate otherwise, calibrate instrumentation: 3-monthly 	<ul style="list-style-type: none"> ➤ Inspect: water source and clarifier ➤ Manually test grab sample ➤ Operator-initiated backwash as required ➤ Check coagulation: increase alum dose as required ➤ Increase monitoring until system reaches target 	<ul style="list-style-type: none"> ➤ Notify Treatment Manager, Water Coordinator ➤ Ensure discharge of flow from clarifier (no flow to filter) ➤ Ensure automatic shutdown of filter ➤ Repeat operational and corrective actions ➤ Investigate process controls ➤ Operator restart of flow to filter when target is reached

Coffs Harbour Drinking Water System



CONTINUOUS

CCP 4 Post-Filtration Turbidity

maturation spike at start of filter run – filter ripening

TARGET	ALERT	CRITICAL
<p style="text-align: center;">< 0.1 NTU > 5 min</p>	<p style="text-align: center;">> 0.5 NTU > 30 min</p>	<p style="text-align: center;">> 1 NTU > 5 min</p>
<ul style="list-style-type: none"> ➤ Daily visual inspection of filters ➤ Programmed maintenance and servicing ➤ Manually record NTU daily (individual and combined three filters) ➤ Unless manufacturer instrumentation manuals indicate otherwise, calibrate instrumentation: 3-monthly 	<ul style="list-style-type: none"> ➤ Inspect: water source and clarifier ➤ Manually test grab sample ➤ Operator initiated backwash as required ➤ Check coagulation: increase alum dose as required ➤ Increase monitoring until system reaches target 	<ul style="list-style-type: none"> ➤ Notify Treatment Manager, Water Coordinator ➤ Ensure discharge of flow from clarifier (no flow to filters) ➤ Ensure automatic shutdown of filter ➤ Repeat operational and corrective actions ➤ Investigate process controls ➤ Operator restart of flow when target is reached

Coffs Harbour Drinking Water System



CONTINUOUS

CCP 5 Disinfection UV Transmissivity

CRITICAL	ALERT	TARGET
> 90% < 0.8 x min for > 1 hr	95% < 1.1 x min for > 4 hr	> 90%
<ul style="list-style-type: none"> ➤ Notify Treatment Manager, Water Coordinator ➤ Notify NSW Health ➤ Confirm automatic shutdown of reactors ➤ Repeat operational and corrective actions ➤ Repair reactors as required ➤ Operator restart of reactors when transmissivity reaches target 	<ul style="list-style-type: none"> ➤ Check filtration process and turbidity levels ➤ Repair reactors as required ➤ Increase monitoring until system reaches target 	<ul style="list-style-type: none"> ➤ Programmed maintenance and servicing ➤ Unless manufacturer instrumentation manuals indicate otherwise, calibrate instrumentation: 3-monthly

Coffs Harbour Drinking Water System



CONTINUOUS

CCP 5 Disinfection UV Dose

CRITICAL	ALERT	TARGET
<p>< 18 mJ/cm² For > 1 hr</p>	<p>18 mJ/cm² For > 1 hr</p>	<p>> 18 mJ/cm²</p>
<ul style="list-style-type: none"> ➤ Notify Treatment Manager, Water Coordinator ➤ Notify NSW Health ➤ Confirm automatic shutdown of reactors ➤ Repeat operational and corrective actions ➤ Repair reactors as required ➤ Operator restart of reactors when dose reaches target 	<ul style="list-style-type: none"> ➤ Check filtration process and turbidity levels ➤ Repair reactors as required ➤ Increase monitoring until system reaches target 	<ul style="list-style-type: none"> ➤ Undertake programmed maintenance and servicing ➤ Unless manufacturer instrumentation manuals indicate otherwise, calibrate instrumentation: 3-monthly

Coffs Harbour Drinking Water System



CONTINUOUS

CCP 6 Fluoridation at Treated Water Storage

TARGET	ALERT	CRITICAL
<p style="text-align: center;">0.95 – 1.05 mg/L</p>	<p style="text-align: center;">< 0.95 OR > 1.05 mg/L For > 1 hr</p>	<p style="text-align: center;">< 0.9 OR > 1.5 mg/L For > 15 min</p>
<ul style="list-style-type: none"> ➤ Daily drop test (10 mins – instant dose rate) ➤ Daily historical (24 hr) balance ➤ Daily manual fill of day tank with fluoride ➤ Weekly monitoring of natural fluoride level ➤ Weekly lab monitoring at three points in reticulation ➤ Programmed maintenance and servicing ➤ Ensure restricted access to dosing facility ➤ Complete Form 4 of <i>NSW Code of Practice for the Fluoridation of Public Water Supplies</i> ➤ Undertake fluoride training for operational, maintenance and management staff ➤ Unless manufacturer instrumentation manuals indicate otherwise, calibrate instrumentation: 3-monthly 	<ul style="list-style-type: none"> ➤ Notify Treatment Manager, Water Coordinator ➤ Respond as per <i>NSW Code of Practice for the Fluoridation of Public Drinking Supplies</i> and CHCC Emergency Response Plan ➤ Ensure automatic plant shutdown ➤ Resample and test water ➤ Inspect dosing system ➤ Repair as required ➤ Transfer water from treated water storage to emergency storage lagoon; shandy as appropriate ➤ Increase monitoring until system reaches target ➤ Operator restart of plant when target is reached 	<ul style="list-style-type: none"> ➤ Notify Treatment Manager, Water Coordinator ➤ Notify NSW Health ➤ Respond as per <i>NSW Code of Practice for the Fluoridation of Public Drinking Supplies</i> and CHCC Emergency Response Plan ➤ Ensure automatic plant shutdown ➤ Resample and test water ➤ Inspect dosing system and repair as required ➤ Transfer water from treated water storage to emergency storage lagoon; shandy as appropriate ➤ Complete Form 5 of <i>NSW Code of Practice for the Fluoridation of Public Water Supplies</i> ➤ Increase monitoring until system reaches target ➤ Operator restart of plant when target is reached

Coffs Harbour Drinking Water System



CONTINUOUS

CCP 7 Chlorine Residual at Treated Water Storage

TARGET	ALERT	CRITICAL
<p style="text-align: center;">1.2 – 2.0 mg/L seasonally dependent</p>	<p style="text-align: center;">< 1.2 OR > 2.0 mg/L for > 30 min</p>	<p style="text-align: center;">< 0.9 OR > 2.5 mg/L for > 5 min</p>
<ul style="list-style-type: none"> ➤ Daily manual free chlorine test on inlet and outlet of treated water storage and RHBT ➤ Daily free chlorine monitoring (Mon – Fri) at RHR ➤ Programmed maintenance and servicing ➤ Unless manufacturer instrumentation manuals indicate otherwise, calibrate monthly instrumentation 	<ul style="list-style-type: none"> ➤ Notify Treatment Manager, Water Coordinator ➤ Adjust chlorine dose as required ➤ Visual inspection of dosing point and repair as required ➤ Inspect filter and adjust as required ➤ Inspect flocculation and adjust as required ➤ Inspect pH correction and adjust as required ➤ Increase monitoring at inlet and outlet until system target is reached 	<ul style="list-style-type: none"> ➤ Notify Treatment Manager, Water Coordinator ➤ Notify NSW Health ➤ Shutdown of pump to RHBT ➤ Check online monitor at RHBT ➤ Manual dose at treated water storage as required ➤ Repeat operational and corrective actions ➤ Transfer water from water storage to emergency storage lagoon; shandy as appropriate ➤ Operator restart of RHBT pump when target is reached ➤ Consider boiled water alert

Coffs Harbour Drinking Water System



CONTINUOUS

CCP 7 pH at Treated Water Storage Outlet

TARGET	ALERT	CRITICAL
7.7	< 7.2 OR > 8.3 for > 30 min	< 7.0 OR > 8.5 for > 30 min
<ul style="list-style-type: none"> ➤ Confirm automatic adjustment of dose ➤ Weekly manual monitoring ➤ Unless manufacturer instrumentation manuals indicate otherwise, calibrate monthly instrumentation 	<ul style="list-style-type: none"> ➤ Notify Treatment Manager, Water Coordinator ➤ Inspect dosing systems ➤ Adjust lime/ acid dose as required ➤ Increase manual monitoring until target is reached 	<ul style="list-style-type: none"> ➤ Notify Treatment manager, Water Coordinator ➤ Shutdown of RHBT pump ➤ Adjust lime/acid dose at tank ➤ Transfer water to emergency storage lagoon; shandy as appropriate ➤ Increase manual monitoring until target is reached ➤ Operator restart of RHBT pump when target is reached

Coffs Harbour Drinking Water System



WEEKLY

CCP 8 Free Chlorine at Point of Supply

CRITICAL	ALERT	TARGET
< 0.1 mg/L	< 0.2 mg/L	> 0.2 mg/L
<ul style="list-style-type: none"> ➤ Notify Distributon Manager, Water Coordinator ➤ Notify NSW Health ➤ Respond as per <i>NSW Health Drinking Water Quality Protocol (2005)</i> ➤ Repeat corrective actions ➤ Flush mains ➤ Increase monitoring until system target is reached ➤ Consider boiled water alerts 	<ul style="list-style-type: none"> ➤ Contact Distribution Manager, Water Coordinator ➤ Check chlorine at appropriate reservoir ➤ Hand dose at appropriate reservoir if chlorine < 0.2 mg/L according to SOP ➤ Retest and redoes as appropriate ➤ Consider increasing chlorine dose at RHBT, WTP, chlorine booster ➤ Increase monitoring until target is reached 	<ul style="list-style-type: none"> ➤ Weekly testing at point-of-supply (E. coli, total coliforms, free chlorine) ➤ Mains flushing ➤ Unless manufacturer instrumentation manuals indicate otherwise, calibrate instrumentation: 3-monthly

Nana Glen Drinking Water System



CONTINUOUS

CCP 1 Turbidity after Filtration

TARGET	ALERT	CRITICAL
< 0.3 NTU	> 0.5 NTU	> 1.0 NTU
<ul style="list-style-type: none"> ➤ Weekly visual inspection of source water ➤ 3-times/week visual inspection of flocs and filters ➤ Manual 3-times/week recording of NTU ➤ 3-times/week pH, alkalinity, colour, turbidity monitored at raw water and treated water reservoir ➤ Unless manufacturer instrumentation manuals indicate otherwise, calibrate instrumentation: 3-monthly 	<ul style="list-style-type: none"> ➤ Notify Treatment Manager, Water Coordinator on repeat occurrences or additional problems ➤ Visual inspection of water source ➤ Visual inspection of floc, dosing systems; adjust dose/repair as appropriate ➤ Manual grab sample and jar test ➤ Initiate manual backwash ➤ Calibrate instrumentation ➤ Increase monitoring until target is reached 	<ul style="list-style-type: none"> ➤ Notify Water Treatment Manager, Water Coordinator ➤ Ensure automatic shutdown of filter ➤ Repeat corrective actions ➤ Increase monitoring until target is reached ➤ Alert supervisor Water Treatment Manager on repeat occurrences ➤ Cart water if limit exceeded for long time ➤ Manual re-start of filter when target is achieved

Nana Glen Drinking Water System



3 TIMES PER WEEK

CCP 2 Disinfection at Reservoir

CRITICAL	ALERT	TARGET
<p>< 0.3 mg/L</p>	<p>< 0.5 mg/L</p>	<p>0.8 mg/L (summer) 0.5 mg/L (winter)</p>
<ul style="list-style-type: none"> ➤ Notify Water Treatment Manager, Water Coordinator ➤ Notify NSW Health ➤ Manual plant shut-down ➤ Manual dose at reservoir as required ➤ Repeat corrective actions ➤ Increase monitoring until system target is reached ➤ Manual re-start of plant when target is reached ➤ Consider boiled water alert 	<ul style="list-style-type: none"> ➤ Consult with Treatment Manager, Water Coordinator; adjust chlorine dose ➤ Inspect dosing point, dosing system and repair as required ➤ Inspect filter and filter backwash as appropriate ➤ Inspect floc and adjust dose or repair as appropriate ➤ Increase manual testing until system reached target ➤ Calibrate equipment ➤ Take reservoir off-line, re-fill and add chlorine; balance and shandy the two reservoirs together ➤ Increase monitoring until target is reached 	<ul style="list-style-type: none"> ➤ Manual free chlorine test in reservoir ➤ Operational monitoring ➤ Unless manufacturer instrumentation manuals indicate otherwise, calibrate equipment monthly ➤ Programmed maintenance and servicing

Nana Glen Drinking Water System



FORTNIGHTLY

CCP 3 Free Chlorine at Point of Supply

CRITICAL	ALERT	TARGET
< 0.1 mg/L	< 0.2 mg/L	> 0.3 mg/L
<ul style="list-style-type: none"> ➤ Notify Water Treatment Manager, Water Coordinator ➤ Notify NSW Health ➤ Respond as per <i>NSW Health Drinking Water Quality Protocol (2005)</i> ➤ Repeat corrective actions ➤ Increase monitoring until system target is reached ➤ Consider boiled water alert 	<ul style="list-style-type: none"> ➤ Notify Water Treatment Manager, Water Coordinator ➤ Check chlorine at appropriate reservoir ➤ Hand dose at appropriate reservoir ➤ Retest and re-dose as appropriate ➤ Consider increasing chlorine dose WTP ➤ Increase monitoring until target is reached 	<ul style="list-style-type: none"> ➤ Testing at point-of-supply: <i>E.coli</i>, total coliforms, free chlorine ➤ Mains flushing

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Based in Sydney and Byron Bay, HydroScience Consulting (HSc) is an Australian consultancy dedicated to serving the water industry in Australia.

HydroScience provides planning and design services to public and private sector clients throughout Australia. We are committed to developing strong client relationships that become the foundation for understanding our clients' needs and exceeding their expectations.



NSW WATER SUPPLY & SEWERAGE PERFORMANCE REPORT 2012/2013

Purpose:

To inform Council regarding the comparative performance of Council's systems, as reported in the '2012-2013 NSW Water Supply and Sewerage Performance Monitoring Report'.

Description of Item:

The NSW Water Supply and Sewerage Performance Monitoring Report outlines the performance of the State's 105 regional local water utilities, and was prepared by the NSW Office of Water. A copy of the full report is attached as Attachment 6.

Performance monitoring and benchmarking are an increasingly important management tool that is required under the water initiative and has been strongly endorsed by the Independent Pricing and Regulatory Tribunal (IPART). To provide a balanced view of the long-term sustainability of NSW water utilities, the report adopts a triple bottom line (TBL) accounting focus, with performance reported on the basis of social, environmental and economic performance indicators.

Key facts of the Report include:

- Average NSW residential water use has fallen from 330kL (in 1991) to 166kL per connected property, which is a reduction of 50% over the past 22 years. Coffs Harbour's annual residential water use for 2012/13 was 161kL, just below the state median, despite Council not having any severe water restrictions since 2003.
- CHCC complied 100% with the physical, chemical and microbiological quality parameters for both water supply and sewerage. Over 99.7% of the 19,000 samples tested for E.coli for urban population in country NSW complied with the Australian Water Guidelines.
- CHCC achieved 100% compliance with the Best Practice Management requirements.
- CHCC has a sound Strategic Business Plan and a Long Term Financial Plan in place. whereas 8% of utilities in NSW do not.
- Council has sound Integrated Water Cycle Management (IWCM) practices in place that cover sewer and water. These include a water conservation plan and drought management plan, as well as a water efficiency plan developed in conjunction with Clarence Valley Council through the Regional Water Supply Scheme.
- Coffs Harbour's water main break results are in line with the state average. This is a very good result considering that the City's water supply operates at quite a high pressure. A water leakage report undertaken by the Australian Government's 'Water Smart' has stated that *“the low night flows [ie low levels of leakage] have been attributed to an active mains renewal program.”*
- 84 per cent of local water utilities carry out recycling. Coffs Harbour Council has undertaken water recycling for over 20 years

Attached are the following documents which include how to understand and use the reports:

1. CHCC TBL Sewerage Performance 2012/13.
2. CHCC TBL Water Supply Performance 2012/13.
3. CHCC Sewerage Action Plan.
4. CHCC Water Supply Action Plan.
5. TBL Performance Report and Action Plans - Understanding and Using Your Report.
6. 2012-13 NSW Water Supply & Sewerage Performance Monitoring Report.

Sustainability Assessment:

- **Environment**

See indicators on TBL Performance Results sheets.

- **Social**

See indicators on TBL Performance Results sheets.

- **Economic**

See indicators on TBL Performance Results sheets.

- **Civic Leadership**

Council provides water and sewerage services in accordance with the Local Government Act and Regulations, and Council's 2030 Strategic Plan

Issues

Coffs Harbour City Council performs very well in the NSW Water Supply and Sewerage Performance Monitoring Report, and for the most part scores very well in the performance criteria when benchmarked against other water authorities. The areas that Council's score is low are caused by the following:

- Due to the topography of the area (many hills and valleys), there are a large number of Sewage Pump Stations (117) to the proportion of services provided, necessitating higher power usage and higher operational costs.
- High quality treatment levels for both water and sewage contribute to operational costs.
- Due to the recent upgrades in sewage infrastructure to provide higher levels of service, residential charges are higher than the State median.
- The number of sewer main breaks and overflows stated has more to do with the Council's transparency of reporting than comparative performance.

Statutory Requirements:

Performance monitoring and benchmarking are required under National Competition Policy and the National Water Initiative, are important for public accountability and have been strongly endorsed by the NSW Independent Pricing and Regulatory Tribunal. Performance monitoring is also a key requirement of the NSW Best Practice Management of Water Supply and Sewerage Guidelines, which drive the NSW Best Practice Management Framework.

Recommendation:

That Council note the Performance Monitoring Report and the 2012-2013 NSW Water Supply and Sewerage document in relation to Coffs Harbour's systems.

Coffs Harbour City Council TBL Sewerage Performance 2012-13

SEWERAGE SYSTEM - Coffs Harbour has 5 sewage treatment works providing secondary, advanced secondary, tertiary and advanced tertiary treatment. The system comprises 114,500 EP treatment capacity (Intermittent and Continuous Extended Aeration (Activated Sludge) with Biological Nutrient Removal), 117 pumping stations, 188 km of rising mains and 501 km of gravity trunk mains and reticulation. 11% of effluent was recycled and treated effluent is discharged to ocean via a deep sea release.

PERFORMANCE - Residential growth for 2012-13 was 0.9% which is similar to the statewide median. Coffs Harbour City Council achieved 100% implementation of Best-Practice requirements. The 2013-14 typical residential bill was \$783 which was above the statewide median of \$625 (Indicator 12). The economic real rate of return was 0.1% which was less than the statewide median (Indicator 46). The operating cost per property (OMA) was \$584 which was well above the statewide median of \$430 (Indicator 50). Sewage odour complaints were less than the statewide median of 0.7 (Indicator 21). Coffs Harbour Council reported 5 Category 3 (major) environmental incidents. Council complied with the requirements of the environmental regulator for effluent discharge. The current replacement cost of system assets was \$620M (\$24,700 per assessment), cash and investments were \$60M, debt was \$110M and revenue was \$26M (excluding capital works grants).

IMPLEMENTATION OF REQUIREMENTS OF BEST-PRACTICE MANAGEMENT FRAMEWORK

(1) Complete current strategic business plan & financial plan	YES	(2e) Pricing - DSP with commercial developer charges	Yes
(2) (2a) Pricing - Full Cost Recovery without significant cross subsidies	Yes	(2f) Pricing - Liquid trade waste approvals & policy	Yes
(2b) Pricing - Appropriate Residential Charges	Yes	(3) Complete performance reporting (by 15 September)	YES
(2c) Pricing - Appropriate Non-Residential Charges	Yes	(4) Integrated water cycle management strategy	YESC
(2d) Pricing - Appropriate Trade Waste Fees and Charges	Yes	IMPLEMENTATION OF ALL REQUIREMENTS	100%

TRIPLE BOTTOM LINE (TBL) PERFORMANCE INDICATORS

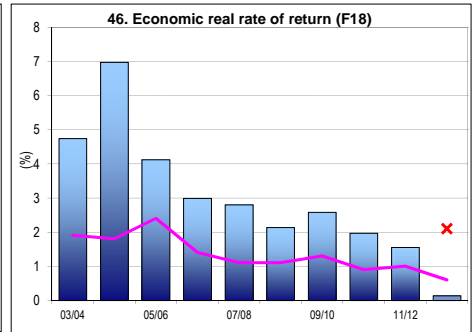
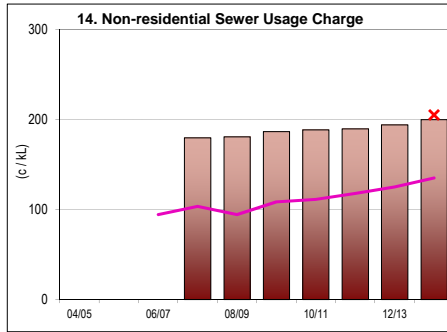
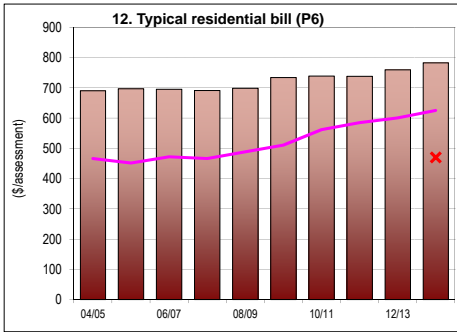
NWI	No.	Description	Unit	LWU RESULT	RANKING		MEDIANS			
					Col 1	Col 2	Col 3	Col 4	Col 5	
UTILITY	CHARACTERISTICS	C5	1 Population served: 68,100							
		C8	2 Number of connected properties: 23,400	Number of assessments: 25,160						
		C6	3 Number of residential connected properties: 21,930							
			4 New residences connected to sewerage (%)	%	0.9	3	2	0.9		
		A6	5 Properties served per kilometre of main	Prop/km	34			39	42	
		W18	6 Volume of sewage collected (ML)	ML	6,878			4,700	6,705	
			7 Renewals expenditure (% of current replacement cost of system assets)	%	0.4	3	3	0.4		
			8 Employees per 1000 properties	per 1,000 prop	1.7	3	3	1.5		
SOCIAL	CHARGES & BILLS	P4	Description of residential tariff structure:	access charge/prop; independent of land value						
		P4.1	11a Residential access charge for 2012-13 (\$/assessment)	\$ 2012-13	760	4	5	600	555	
			11 Residential access charge for 2013-14 (\$/assessment)	\$ 2013-14	783	4	5	625		
		P6	12a Typical residential bill for 2012-13 (\$/assessment)	\$ 2012-13	760	4	5	600	650	
			12 Typical residential bill for 2013-14 (\$/assessment)	\$ 2013-14	783	4	5	625		
			13 Typical developer charge for 2013-14 (\$/equivalent tenement)	\$ 2013-14	9,260	1	1	4,700		
	HEALTH	F6	14 Non-residential sewer usage charge (c/kL)	c/kL	200	2	2	135		
			15 Revenue per property - Sge (\$)	\$	1110	1	1	815	868	
			16 Sewerage Coverage (% of Urban Population with Reticulated Sge Service)	%	99.1	2	1	96.2		
	SERVICE LEVELS	E3	17 Percent of sewage treated to a tertiary level (%)	%	100	1	1	99	93	
		E4	18 Percent of sewage volume treated that was compliant (%)	%	100	1	1	98	99	
			19 Number of sewage treatment works compliant at all times		5 of 5					
		C11	21 Odour complaints per 1000 properties	per 1,000 prop	0.0	1	1	0.7		
	ENVIRONMENTAL	NATURAL RESOURCE MANAGEMENT	C16	22 Service complaints - sewerage per 1000 properties	per 1,000 prop	0	1	1	6	1
				23a Average sewerage interruption (minutes)	min	91	2	3	100	99
			25 Total days lost (%)	%	1.1	3	3	1.3		
W19			26 Volume of sewage collected per property (kL)	kL	294	4	5	230	220	
W26			26a Total recycled water supplied (ML)	ML	800	3	1	600	1,666	
ENVIRONMENTAL	ENVIRONMENTAL PERFORMANCE	W27	27 Recycled water (% of effluent recycled)	%	11	3	3	9	17	
		E8	28 Biosolids reuse (%)	%	100	1	1	100	100	
			30 Energy consumption - sewerage (kWh/ML)	kWh	1,086	4	5	780		
			31 Renewable energy consumption (% of total energy consumption)	%	1	2	1	0		
		E12	32 Net greenhouse gas emissions - WS & Sge (net tonnes CO2 equivalents per 1000 properties)		510	5	5	400	398	
			33 90 th Percentile licence limits for effluent discharge: BOD 10 mg/L; SS 15 mg/L; Total N 10 mg/L; Total P 2 mg/L							
			34 Compliance with BOD in licence (%)	%	100	1	1	100		
			35 Compliance with SS in licence (%)	%	100	1	1	100		
ECONOMIC	FINANCE	A14	36 Sewer main breaks and chokes (per 100 km of main)	per 100km main	65	5	4	38	19	
			37a Sewer overflows (per 100 km of main)	per 100km main	18	3	4	15		
		E13	37b Sewer overflows reported to environmental regulator (per 100km of main)		12.6	5	5	0.8	0.4	
			39 Non res & trade waste % of total sge volume	%				19		
			43 Revenue from non-residential plus trade waste charges (% of total revenue)	%	21	2	3	16		
			44 Revenue from trade waste charges (% of total revenue)	%	1.9	3	2	2.5		
		F18	46 Economic real rate of return - Sge (%)	%	0.1	4	3	0.6	1.9	
ECONOMIC	EFFICIENCY		46a Return on assets - Sge (%)	%	-0.4	5	5	0.7		
			48a Loan payment per property - Sge (\$)	\$	654	1	1	90		
		F24	48b Net profit after tax - WS & Sge (\$'000)	\$'000	-2,156	3	5	-500	5,091	
			49 Operating cost (OMA) per 100 km of main (\$'000)	\$'000	1,990	4	5	1,710		
		F12	50 Operating cost (OMA) per property (\$) (Note 9)	\$	584	5	5	430	404	
			51 Operating cost (OMA) per kL (cents)	c/kL	199	3	3	189		
			52 Management cost per property (\$)	\$	183	4	5	155		
			53 Treatment cost per property (\$)	\$	215	5	5	138		
			54 Pumping cost per property (\$)	\$	117	5	5	80		
			55 Energy cost per property (\$)	\$	81	5	5	39		
	56 Sewer main cost per property (\$)	\$	55	4	4	50				
F29	57 Capital Expenditure per property - Sewerage (\$)	\$	220	3	2	224	240			

NOTES :

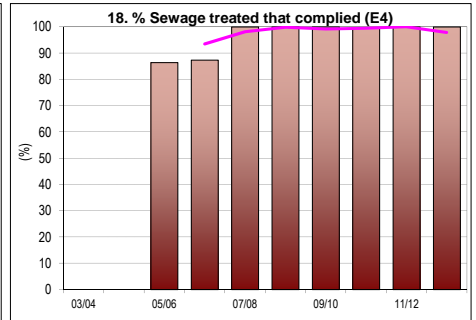
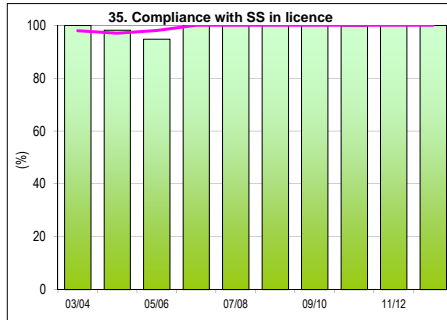
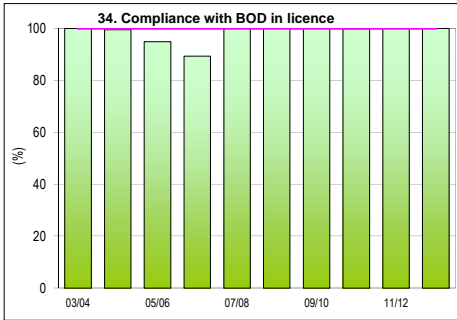
- Col 2 rankings are on a % of LWUs basis - best reveals performance compared to similar sized LWUs (ie. Col 1 is compared with LWUs with >10,000 properties).
- Col 3 rankings are on a % of LWUs basis - best reveals performance compared to all LWUs (ie. Col 1 is compared with all LWUs). - see attachment.
- Col 4 (Statewide Median) is on a % of connected properties basis- best reveals statewide performance (gives due weight to larger LWUs & reduces effect of smaller LWUs).
- Col 5 (National Median) is the median value for the 66 utilities reporting sewerage performance in the National Performance Report 2012-13 (www.nwc.gov.au).
- LWUs are required to annually review key projections & actions in their Strategic Business Plan and annually update their financial plan. The SBP should be updated after 4 years.
- Non-residential access charge - \$766 x MF x SDF (MF - meter factor = [water meter size (mm)/20]^2 SDF - sewerage discharge factor). Sewer usage charge - 200 c/kL.
- Non-residential revenue was 21% of revenue from access, usage & trade waste charges. The sewage collected (residential, non-residential & trade waste) was not reported.
- Compliance with Total N in Licence was 100%. Compliance with Total P in Licence was 100%.
- Operating cost (OMA)/property was \$584. Components were: management (\$183), operation (\$126), maintenance (\$133), energy (\$81), chemical (\$10) & effluent/biosolids (\$51).
- Coffs Harbour City Council rehabilitations included 0.3% of its sewerage mains and 0.2% of its service connections. Renewals expenditure was \$326,000/100km of main.

(Results shown for 10 years together with 2012/13 Statewide Median and Top 20%)

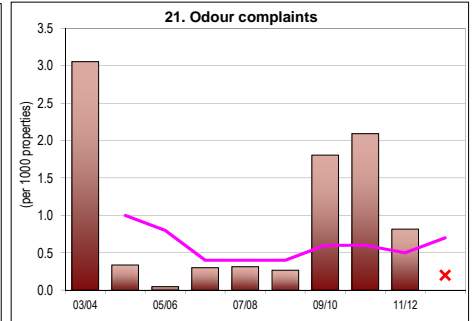
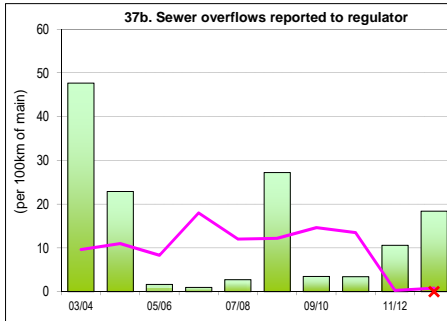
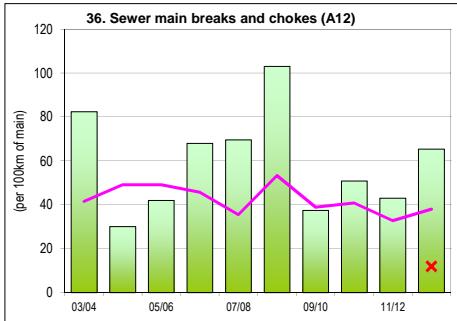
COST RECOVERY



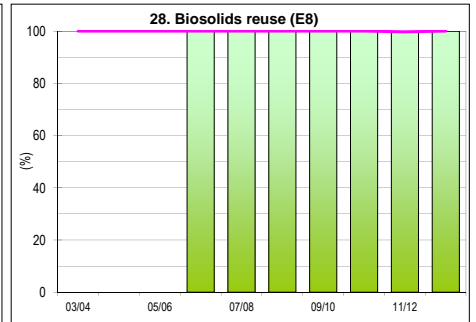
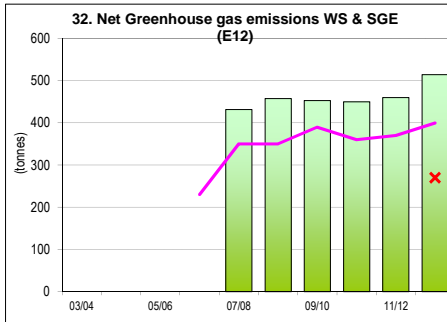
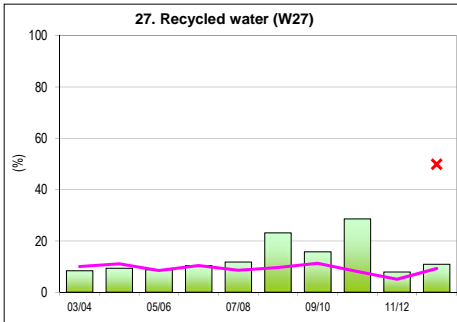
COMPLIANCE



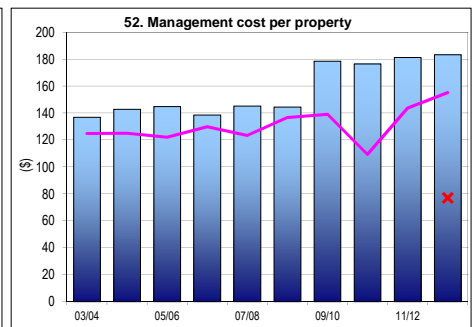
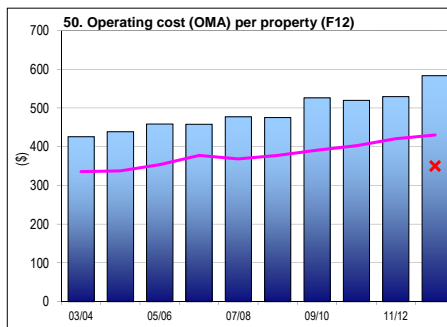
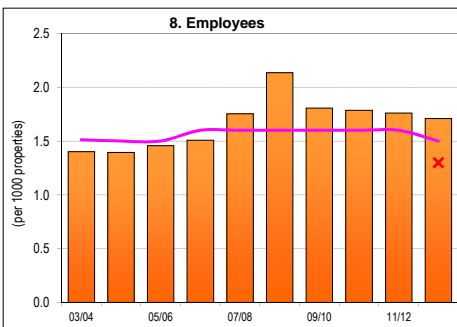
CUSTOMER SERVICE/RELIABILITY



ENVIRONMENT



EFFICIENCY



NOTES:

1. Costs are in Jan 2013\$ except for graph 12, which is in Jan 2014\$.

LEGEND
 State Median for all years (pink line)
 Top 20% for 2012-13 (red X)

Coffs Harbour City Council TBL Water Supply Performance 2012-13

WATER SUPPLY SYSTEM - Coffs Harbour City Council serves a population of 69,200 (24,750 connected properties). Water is sourced from the Nymboida River (part of the Regional Water Supply which includes Shannon Creek Dam) and also from the Orara River. Water is transferred to Karangi Dam where it is treated and supplied to the Coffs Harbour area which stretches from Sawtell to Corindi. Council has 2 storage dams at Karangi and Woolgoolga (total storage capacity 5870ML), not including Shannon Creek Dam. Council has 2 smaller systems providing treated water to Coramba and Nana Glen villages. The water supply network comprises a dissolved air flotation treatment works, a conventional water treatment works and a chlorinator, 18 service reservoirs (88 ML), 7 pumping stations, 42.6 ML/d delivery capacity into the distribution system, 177 km of transfer and trunk mains and 489 km of reticulation.

PERFORMANCE - Coffs Harbour City Council achieved 100% compliance with Best Practice requirements. The 2012-13 typical residential bill was \$549 which was close to the statewide median of \$540 (Indicator 14). The economic real rate of return was 1.8% which was greater than the statewide median (Indicator 43). The operating cost (OMA) per property was \$388 which was close to the statewide median of \$410 (Indicator 49). Water quality complaints were negligible compared to the statewide median of 3 (Indicator 25). Compliance was achieved for microbiological water quality (100% of the population, 3 of 3 zones compliant), chemical water quality and physical water quality. There were no failures of the chlorination system or the treatment system. Coffs Harbour City Council reported no water supply public health incidents. Current replacement cost of system assets was \$400M (\$15,200 per assessment). Cash and investments were \$36M, debt was \$90M and revenue was \$21.4M (excluding capital works grants).

IMPLEMENTATION OF REQUIREMENTS OF BEST-PRACTICE MANAGEMENT FRAMEWORK

(1) Complete Current Strategic Business Plan & Financial Plan	YES	(3) Sound water conservation implemented	YES
(2) (2a) Pricing - Full Cost Recovery, without significant cross subsidies	Yes	(4) Sound drought management implemented	YES
(2b,2c) Pricing - Appropriate Residential Charges	Yes	(5) Complete performance reporting (by 15 September)	YES
(2d) Pricing - Appropriate Non-residential Charges	Yes	(6) Integrated water cycle management strategy	YESC
(2e) Pricing - DSP with Commercial Developer Charges	Yes		100%
IMPLEMENTATION OF ALL REQUIREMENTS			

TRIPLE BOTTOM LINE (TBL) PERFORMANCE INDICATORS

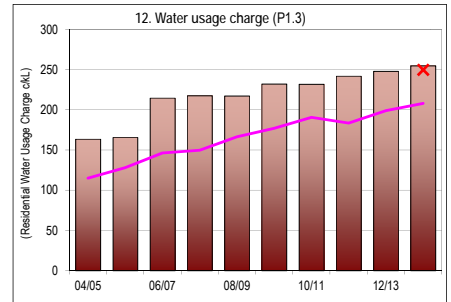
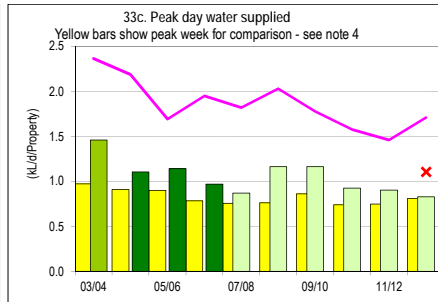
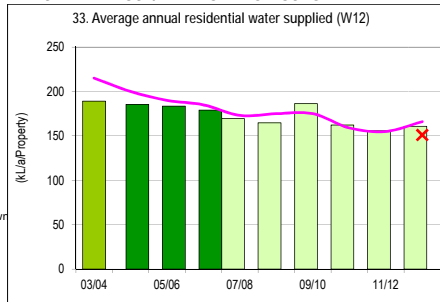
		NWI No.		LWU RESULT	RANKING		MEDIANS		
					>10,000 properties	All LWUs	Statewide	National	
				Col 1	Note 1	Note 2	Note 3	Note 4	
					Col 2	Col 3	Col 4	Col 5	
UTILITY	CHARACTERISTICS	C1	1 Population served:	69200					
		C4	2 Number of connected properties:	24750	Number of assessments: 26330				
			3 Residential connected properties (% of total)	%	94				91
			4 New residences connected to water supply (%)	%	1.1	2	2		0.8
		A3	5 Properties served per kilometre of water main	Prop/km	38				32 35
			6 Rainfall (% of median annual rainfall)	%	123	1	1		108
		W11	7 Total urban water supplied at master meters (ML)	ML	6,150				6,500 8,610
			8 Peak week to average consumption (%)	%	124	1	1		160
			9 Renewals expenditure (% of current replacement cost of system assets)	%	0.5	2	2		0.5
			10 Employees per 1000 properties	per 1,000 prop	1.6	4	2		1.4
SOCIAL	CHARGES & BILLS	P1	Residential tariff structure for 2013-14:	inclining block; independent of land value; access charge \$139					
		P13	12a Residential water usage charge for 2012-13 for usage <365 kL (c/kL)	c/kL (2012-13)	248	1	1	199 167	
			12 Residential water usage charge for 2013-14 for usage <365 kL (c/kL)	c/kL (2013-14)	255	1	1	208	
		P3	14a Typical residential bill for 2012-13 (\$/assessment)	\$ (2012-13)	534	4	2	510 474	
			14 Typical residential bill for 2013-14 (\$/assessment)	\$ (2013-14)	549	4	2	540	
			15 Typical developer charge for 2013-14 (\$/equivalent tenement)	\$ (2013-14)	9,700	1	1	5,500	
		F4	16 Residential revenue from usage charges (% of residential bills)	%	75	2	2	74 65	
		F5	17 Revenue per property - water (\$/property)	\$/prop	860	4	4	750 691	
		H6	18 Water Supply Coverage (% of Urban Population with reticulated WS)	% of population	99.1	3	2	99.2	
		H4	19a Number of zones with chemical compliance		No				
			19 Physical compliance achieved? Note 10		Yes	1	1		
			19a Chemical compliance achieved? Note 10		Yes	1	1		
		H3	20a % population with microbiological compliance	% of population	3 of 3	1	1	100 100	
			H3	20a % population with microbiological compliance	% of population	100	1	1	100 100
			C9	25 Water quality complaints per 1000 properties	per 1,000 prop	0	1	2	3 3
			C10	26 Water service complaints per 1000 properties	per 1,000 prop	0	1	1	4 1
			C17	27 Average incidence of unplanned interruptions per 1000 properties	per 1,000 prop	35	3	4	47 69
			C15	28 Average duration of interruption (min)	min	120	1	2	160 119
		A8	30 Number of water main breaks per 100 km of water main	per 100km	10	3	3	10 13	
			31 Drought water restrictions (% of time)	% of time	0	1	1	0	
			32 Total days lost (%)	%	4.6	5	5	2.0	
ENVIRONMENTAL	NATURAL RESOURCE MANAGEMENT	W12	33 Average annual residential water supplied - STATEWIDE (kL/property)	kL/prop	161	2	2	166 167	
			33a Average annual residential water supplied - COASTAL LWUs (kL/property)	kL/prop	161	3	3	160	
			33b Average annual residential water supplied - INLAND LWUs (kL/property)	kL/prop				257	
		A10	34 Real losses (leakage) (L/service connection/day)	L/connection/day	70	3	2	60 73	
			35 Energy consumption per Megalitre (kiloWatt hours)	kWh	435	2	3	650	
			36 Renewable energy consumption (% of total energy consumption)	%	0	1	1	0	
		E12	36a Net greenhouse gas emissions - WS & Sge (net tonnes CO2 - equivalents per 1000 properties)	t CO2	510	5	5	400 390	
ECONOMIC	FINANCE	F17	43 Economic real rate of return - Water (%)	%	1.8	1	2	0.7 0.6	
			44 Return on assets - Water (%)	%	0.6	2	3	0.3	
		F22	45 Net Debt to equity - WS&Sge (%)	%	15	1	1	1 11	
		F23	46 Interest cover - WS&Sge		2	3	3	1 2	
			47 Loan payment per property - Water (\$)	\$	526	1	1	66	
		F24	47b Net profit after tax - WS & Sge (\$'000)	\$'000	-2,160	3	5	-497 2591	
				48 Operating cost (OMA) per 100km of main (\$'000)	\$'000	1,470	3	4	1,375
				49 Operating cost (OMA) per property (\$/prop) Note 8	\$/prop	388	2	1	410 393
				50 Operating cost (OMA) per kilolitre (cents)	c/kL	146	3	4	133
				51 Management cost (\$/prop)	\$/prop	139	3	3	137
				52 Treatment cost (\$/prop)	\$/prop	70	4	2	56
				53 Pumping cost (\$/prop)	\$/prop	14	2	1	36
				54 Energy cost (\$/prop)	\$/prop	11	2	1	27
				55 Water main cost (\$/prop)	\$/prop	92	4	4	71
		F28	56 Capital Expenditure (\$/prop)	\$/prop	137	4	3	180 213	

NOTES:

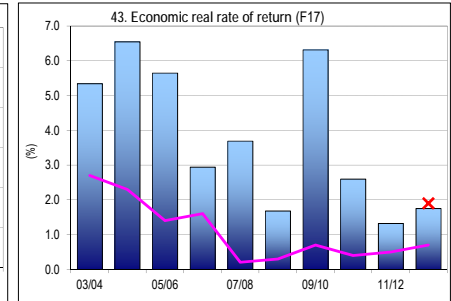
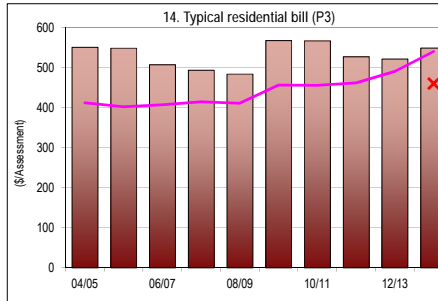
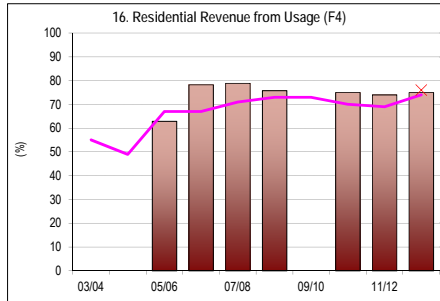
- Col 2 rankings are on a % of LWUs basis - best reveals performance compared to similar sized LWUs (ie. Col 1 is compared with LWUs with >10,000 properties).
- Col 3 rankings are on a % of LWUs basis - best reveals performance compared to all LWUs (ie. Col 1 is compared with all LWUs).
- Col 4 (Statewide Median) is on a % of connected properties basis- best reveals statewide performance (gives due weight to larger LWUs & reduces effect of smaller LWUs).
- Col 5 (National Median) is the median value for the 72 utilities reporting water supply performance in the National Performance Report 2012-13 (www.nwc.gov.au).
- LWUs are required to annually review key projections & actions in their Strategic Business Plan and annually update their financial plan. The SBP should be updated after 4 years.
- 2012-13 Non-residential Tariff: Access Charge based on Meter Size: 40mm \$556, Two Part Tariff: Usage Charge 255c/kL.
- Non-residential water supplied was 27% of potable water supplied excluding non-revenue water.
- Non-residential revenue was 23% of annual rates and charges, indicating fair pricing of services between the residential and non-residential sectors.
- The operating cost (OMA) per property was \$388. Components were: management (\$139), operation (\$111), maintenance (\$108), energy (\$11) & chemical (\$16).
- Rehabilitations included 0.2% of water mains, 0.04% of service connections and 1.4% of water meters. Renewals expenditure was \$333,000/100km of main.
- Compliance with ADWG 2011 for drinking water quality is shown as "Yes" if compliance has been achieved (indicators 19, 19a & 20), otherwise the % of samples complying is shown.
- Coffs Harbour City Council has 2 fully qualified water treatment operators.

(Results shown for 10 years together with 2012-13 Statewide Median and Top 20%)

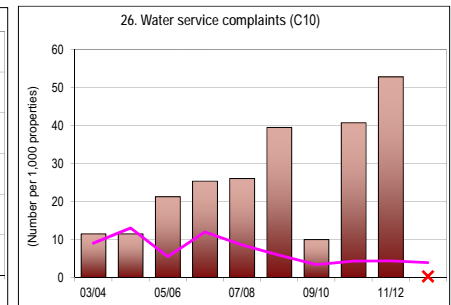
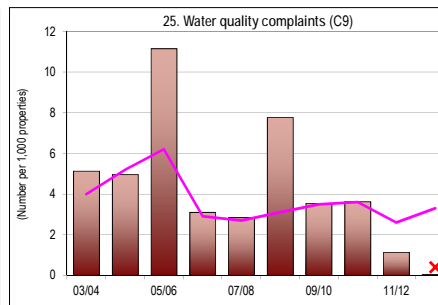
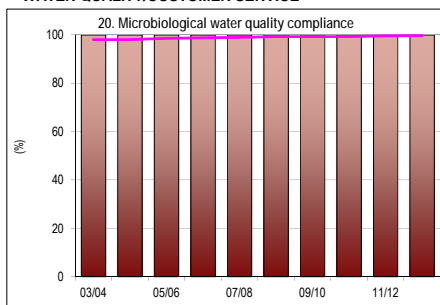
RESIDENTIAL USE/REVENUE FROM USAGE



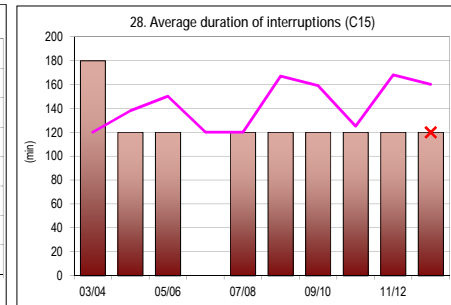
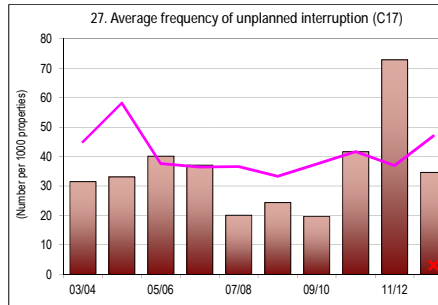
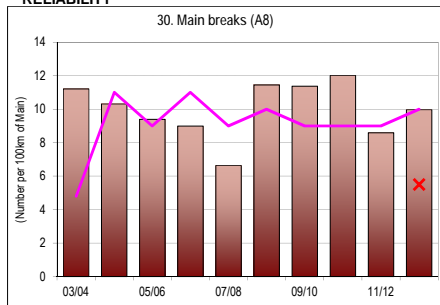
COST RECOVERY



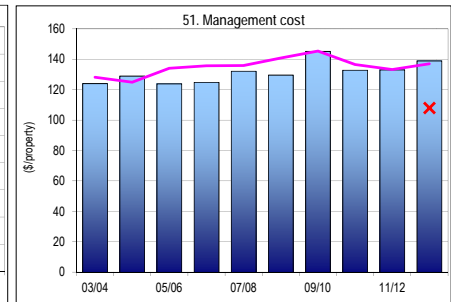
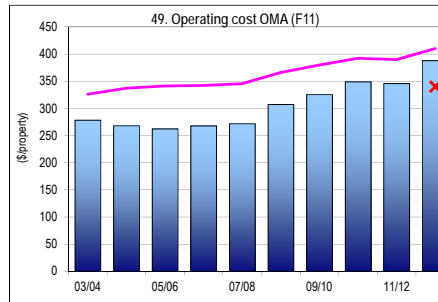
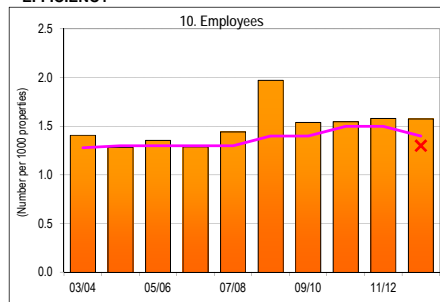
WATER QUALITY/CUSTOMER SERVICE



RELIABILITY



EFFICIENCY



NOTES:

- Costs are in Jan 2013\$ except for graphs 12 and 14, which are in Jan 2014\$.
- Microbiological water quality compliance 1999-00 to 2003-04 was on the basis of 1996 NHMRC/ARMCANZ Australian Drinking Water Guidelines for E. coli; from 2004-05 to 2010-11 compliance was on the basis of the 2004 NHMRC/NRMMC Australian Drinking Water Guidelines (ADWG) and for 2011-12 and 2012-13 compliance was on the basis of the 2011 ADWG.
- Indicators 33 and 33c - Green shading of bars shows % of time Drought Water Restrictions applied in each year.
- Indicator 33c - Yellow bars show Peak Week Water Supplied for comparison with Peak Day Water Supplied shown in green.

LEGEND
 State Median for all years ———
 Top 20% for 2012-13 X

0 - 30% 30-50% >50% of time

Coffs Harbour City Council Sewerage – Action Plan Page 1

Summary

In 2012-13, Coffs Harbour City Council has implemented all 19 planning, pricing and management requirements (10 water, 9 sewerage) of the NSW *Best-Practice Management Framework* and its performance has continued to be very good. The key actions required are shown below for Indicators 20 and 32. Key action from Council's Strategic Business Plan:

- *Strategic business plan and financial plan completed in May 2012 (<http://www.coffsharbour.nsw.gov.au/places-for-living/Documents/Strategic-Business-Plans-Water-Supply-Sewerage.pdf>).*

INDICATOR		RESULT ²		COMMENT/DRIVERS	ACTION
	Best-Practice Management Framework	Implemented all the Best Practice Requirements ¹	Very good	Implementation demonstrates effectiveness and sustainability of water supply and sewerage business. 100% implementation is required for eligibility to pay an 'efficiency dividend'.	Continue the periodic review and update of Integrated Water Cycle Management (IWCM) Strategy, Drought Management Plan and Development Servicing Plan (DSP)
CHARACTERISTICS					
5	Connected property density	34 per km of main	Lower than the statewide median of 40	A connected property density below about 30 can significantly increase the cost per property of providing services.	
7	Renewals expenditure	0.4% Median ranking (3, 3)	Satisfactory	Adequate funds must be programmed for works outlined in the Asset Management Plan – page 3 of the 2012-13 NSW Performance Monitoring Report.	Satisfactory. Appropriate renewals included in capital works program reported in Council's Strategic Business Plan 2012.
8	Employees	1.7 per 1,000 props Median ranking (3, 3)	Satisfactory		
SOCIAL – CHARGES					
12	Typical residential bill ³ (TRB)	\$783 per assessment Low ranking (4, 5)		TRB should be consistent with projection in the financial plan. Drivers – OMA Management Cost and Capital Expenditure.	
13	Typical Developer Charges	\$9260 per ET Highest ranking (1, 1)	Good		
14	Non-residential sewer usage charge	200c/kL High ranking (2, 2)	Good	Similar to OMA cost of 199c/kL.	
SOCIAL - HEALTH					
16	Sewerage coverage	99.1% High ranking (2, 1)	Good		
17	Percent sewage treated to tertiary level	100% Highest ranking (1, 1)	Very good		
18	Percent of sewage volume that complied	100% Highest ranking (1, 1)	Very good	Key indicator of compliance with regulator.	
19	Sewage treatment works compliant at all times	5 of 5		Key indicator of compliance with regulator.	
SOCIAL – LEVELS OF SERVICE					
21	Odour Complaints	0 per 1,000 props Highest ranking (1, 1)	Very good	Critical indicator of customer service and operation of treatment works.	
22	Service complaints	0 per 1,000 props Highest ranking (1, 1)	Very good	Key indicator of customer service.	Council's reporting system has been revised to record complaints only, [ie. expressions of dissatisfaction], in accordance with the definition of this indicator.
23 a	Average Duration of Interruption	91 minutes High ranking (2, 3)	Good	Key indicator of customer service, condition of network and effectiveness of operation.	
25	Total Days Lost	1.1% Median ranking (3, 3)	Satisfactory		

1. Review of Council's TBL Performance Report and Preparation of an **Action Plan** to Council required annually.

Strategic Business Plan review and update required after 4 years. **Financial Plan** update required annually.

IWCM Strategy review and update required after 8 years. **Liquid Trade Waste Regulation Policy** in accordance with the 'NSW Liquid Trade Waste Regulation Guidelines, 2009' required. **Development Servicing Plan** review and updating is required after 5 years.

2. The ranking relative to similar size LWUs is shown first (Col. 2 of TBL Report) followed by the ranking relative to all LWUs (Col. 3 of TBL Report).

3. Review and comparison of the 2013-14 Typical Residential Bill (Indicator 12) with the projection in your Strategic Business Plan is mandatory.

In addition, if both indicators 46 and 46a are negative, you must report your proposed 2014-15 typical residential bill to achieve full cost recovery.

Coffs Harbour City Council Sewerage – Action Plan Page 2

INDICATOR		RESULT		COMMENT/DRIVERS	ACTION
ENVIRONMENTAL					
26	Volume of sewage collected per property	294 kL Low ranking (4, 5)		Compare sewage collected to water supplied.	
27	Percentage effluent recycled	11% Median ranking (3, 3)	Satisfactory	Key environmental indicator. Drivers – availability of potable water, demand, proximity to customers, environment.	
28	Biosolids reuse	100% Highest ranking (1, 1)	Very good	Key environmental indicator.	
32	Net Greenhouse gas emissions (WS & Sge)	510 t CO2/1000 props Lowest ranking (5, 5)	May require review	Drivers – gravity vs pumped networks, topography, extent of treatment.	Topography requires many pump stations. Also high quality treatment levels contribute to high power usage and therefore high greenhouse gas emissions.
34	Compliance with BOD in licence	100% Highest ranking (1, 1)	Very good	Key indicator of compliance with regulator requirements.	
35	Compliance with SS in licence	100% Highest ranking (1, 1)	Very good	Drivers – algae in maturation ponds, impact of drought.	
36	Sewer main breaks and chokes	65 per 100km of main Lowest ranking (5, 4)	May require review	Drivers – condition and age of assets, ground conditions.	Council's data collection is more rigorous than most councils and may affect our comparative performance.
37 a	Sewer overflows to the environment	18 per 100km of main Median ranking (3, 4)	Satisfactory	Drivers – condition of assets, wet weather and flooding.	
39	Non-residential percentage of sewage collected			For non-residential, compare % of sewage collected to indicator 43 (% of revenue).	
ECONOMIC					
43	Non-residential revenue	21% High ranking (2, 3)	Good	See 39 above.	
46	Economic Real Rate of Return (ERRR)	0.1% Low ranking (4, 3)	Satisfactory	Reflects the rate of return generated from operating activities (excluding interest income and grants). An ERRR or ROA of ≥ 0% is required for full cost recovery.	
46 a	Return on assets	-0.4% Lowest ranking (5, 5)		See 46.	
47	Net debt to equity	15% Highest ranking (1, 1)	Very good	LWUs facing significant capital investment are encouraged to make greater use of borrowings – page 13 of the 2012-13 NSW Performance Monitoring Report.	
48	Interest cover	0.3 Median ranking (3, 3)	Satisfactory	Drivers – in general, an interest cover of > 2 is satisfactory.	
48 a	Loan payment	\$654 per prop Highest ranking (1, 1)	Good	The component of TRB required to meet debt payments. Drivers – expenditure on capital works, short term loans.	
50	Operating cost (OMA)	\$584 per prop Lowest ranking (5, 5)	May require review	Prime indicator of the financial performance of an LWU. Drivers – development density, level of treatment, management cost, topography, number of discrete schemes and economies of scale.	See 32
52	Management cost	\$183 per prop Low ranking (4, 5)	May require review	Drivers – number of discrete schemes, number of employees. Typically about 40% of OMA.	See 32
53	Treatment cost	\$215 per prop Lowest ranking (5, 5)	May require review	Drivers – type and level of treatment, economies of scale.	See 32
54	Pumping cost	\$117 per prop Lowest ranking (5, 5)	May require review	Drivers – topography, development density, effluent recycling.	See 32
56	Sewer main cost	\$55 per prop Low ranking (4, 4)	May require review	Drivers – topography, development density, effluent recycling.	See 32
57	Capital expenditure	\$220 per prop Median ranking (3, 2)	Satisfactory	An indicator of the level of investment in the business. Drivers – age and condition of assets, asset life cycle.	

Coffs Harbour City Council Water Supply – Action Plan Page 1

Summary

In 2012-13, Coffs Harbour City Council has implemented all 19 planning, pricing and management requirements (10 water, 9 sewerage) of the NSW *Best-Practice Management Framework* and its performance has continued to be very good. The key actions required are shown below for Indicators 20 and 32. Key action from Council's Strategic Business Plan:

- *Strategic business plan and financial plan completed in May 2012* (<http://www.coffsharbour.nsw.gov.au/places-for-living/Documents/Strategic-Business-Plans-Water-Supply-Sewerage.pdf>).

INDICATOR		RESULT ²		COMMENT/DRIVERS	ACTION
	Best-Practice Management Framework	Implemented all the Best-Practice Requirements ¹	Very good	Implementation demonstrates effectiveness and sustainability of water supply business. 100% implementation is required for eligibility to pay an 'efficiency dividend'.). Continue the periodic review and update of Integrated Water Cycle Management (IWCM) Strategy, Drought Management Plan and Development Servicing Plan (DSP)
CHARACTERISTICS					
5	Connected property density	38 per km of main Highest ranking (1, 1)		A connected property density below 30 can significantly increase the cost per property of providing services, as will also a high number of small discrete water supply schemes.	
9	Renewals expenditure	0.5% High ranking (2, 2)	Good	Adequate funds must be programmed for works outlined in the Asset Management Plan – page 3 of the 2012-13 NSW Performance Monitoring Report.	Satisfactory. Appropriate renewals included in capital works program reported in Council's Strategic Business Plan 2012.
10	Employees	1.6 per 1,000 props Low ranking (4, 2)	May require review		Satisfactory in view of Council's storage dam and water treatment works.
SOCIAL - CHARGES					
12	Residential water usage charge	255 c/kL Highest ranking (1, 1)	Good	Benefits of strong pricing signals are shown on page 5 of the 2012-13 NSW Performance Monitoring Report.	Good. Consider replacing the existing inclining block tariff with a two-part tariff [refer to Circular LWU11] with a uniform usage charge for all water use, as recommended by the NSW Government and the Productivity Commission.
13	Residential access charges	\$139 per assessment High ranking (2, 1)	Good		See 12.
14	Typical residential bill ³ (TRB)	\$549 per assessment Low ranking (4, 2)	Good	TRB should be consistent with projection in the financial plan. Drivers – OMA Management Cost and Capital Expenditure.	The TRB of \$549 is satisfactory as it is within 1% of the projection of \$552 (2013/14\$) in Council's Strategic Business Plan. The 2014-15 tariff will be determined in accordance with Circular LWU11 of March 2011.
15	Typical developer charges	\$9680 per ET Highest ranking (1, 1)	Good		
16	Residential revenue from usage charges	75% of residential bills High ranking (2, 2)	Good	≥ 75% of residential revenue should be generated through usage charges.	See 12.
SOCIAL – HEALTH					
19	Physical quality compliance	Yes Highest ranking (1, 1)	Very good		
19 a	Chemical quality compliance	Yes Highest ranking (1, 1)	Very good		
20	Microbiological compliance ⁴	Yes Highest ranking (1, 1)	Very good	Critical indicator. LWUs should develop a risk based water quality management system.	

- Review of Council's TBL Performance Report and Preparation of an **Action Plan** to Council required annually. **Strategic Business Plan** review and update required after 4 years. **Financial Plan** update and report to Council required annually. New **IWCM Strategy** required after 8 years. **Development Servicing Plan** review and updating is required after 5 years. **Liquid Trade Waste Regulation Policy** in accordance with the 'NSW Liquid Trade Waste Regulation Guidelines, 2009' required by June 2011.
- The ranking relative to similar size LWUs is shown first (Col. 2 of TBL Report) followed by the ranking relative to all LWUs (Col. 3 of TBL Report).
- Review and comparison of the 2013-14 **Typical Residential Bill (Indicator 14)** with the projection in your Strategic Business Plan is **mandatory**. In addition, if both indicators 43 and 44 are negative, you must report your proposed 2014-15 typical residential bill to achieve full cost recovery.
- Microbiological compliance (Indicator 20)** is a **high priority** for each NSW LWU. Corrective action for non-compliance (≤97%), or any 'boil water alerts' must be reported in your Action Plan. Refer to pages 7, 8 and 26 of the 2012-13 NSW Water Supply and Sewerage Performance Monitoring Report (www.water.nsw.gov.au).

Coffs Harbour City Council Water Supply – Action Plan Page 2

INDICATOR		RESULT		COMMENT/DRIVERS	ACTION
SOCIAL – LEVELS OF SERVICE					
25	Water quality complaints	0 per 1,000 props Highest ranking (1, 2)	Very good	Critical indicator of customer service. Can be influenced by the type of business - e.g. unfiltered supply.	
26	Service complaints	0 per 1,000 props Highest ranking (1, 1)	Very good	Key indicator of customer service.	Council's reporting system has been revised to record complaints only, [ie. expressions of dissatisfaction], in accordance with the definition of this indicator.
27	Average frequency of unplanned interruptions	35 per 1,000 props Median ranking (3, 4)	Satisfactory	Key indicator of customer service, condition of network and effectiveness of operation.	
30	Number of main breaks	10 per 100km of main Median ranking (3, 3)	Satisfactory	Drivers – condition and age of water mains, ground conditions.	Satisfactory, as result is equal to the Statewide Median of 10 breaks per 100 km of main.
32	Total Days Lost	4.6% Lowest ranking (5, 5)	May require review		Will be reviewed.
ENVIRONMENTAL					
33	Average annual residential water supplied	161 kL per prop High ranking (2, 2)		Drivers – available water supply, climate, location (Inland or coastal), pricing signals (Indicator 3), restrictions.	
34	Real losses (leakage)	70 L/c/d Median ranking (3, 2)	Satisfactory	Loss reduction is important where an LWU is facing drought water restrictions or the need to augment its water supply system.	
ECONOMIC					
43	Economic Real Rate of Return (ERRR)	1.8% Highest ranking (1, 2)	Good	Reflects the rate of return generated from operating activities (excluding interest income and grants). An ERRR or ROA of ≥ 0% is required for full cost recovery.	Satisfactory. See 14.
44	Return on assets (ROA)	0.6% High ranking (2, 3)		See 43.	
45	Net debt to equity	15% Highest ranking (1, 1)	Very good	LWUs facing significant capital investment are encouraged to make greater use of borrowings – page 13 of the 2012-13 NSW Performance Monitoring Report.	
46	Interest cover	2 Highest ranking (1, 1)	Very good	Drivers – in general, an interest cover > 2 is satisfactory.	
47	Loan payment	\$526 per prop Highest ranking (1, 1)	Very good	The component of TRB required to meet debt payments. Drivers – expenditure on capital works, short term loans.	
49	Operating cost (OMA)	\$388 per prop High ranking (2, 1)	Good	Prime indicator of the financial performance of an LWU. Drivers – development density, level of treatment, management cost, topography, number of discrete schemes and economies of scale.	The components below have been carefully reviewed as part of developing Council's strategic business plan.
51	Management cost	\$139 per prop Median ranking (3, 3)	Satisfactory	Typically about 40% of the OMA. Drivers – No. of employees. No. of small discrete water schemes.	
52	Treatment cost	\$70 per prop Low ranking (4, 2)	May require review	Drivers – type and quality of water source. Size of treatment works	Satisfactory, as Council has a dissolved air flotation water treatment works.
53	Pumping cost	\$14 per prop High ranking (2, 1)	Good	Drivers – topography, development density and location of water source.	
55	Water main cost	\$92 per prop Low ranking (4, 4)	May require review	Drivers – age and condition of mains. Ground conditions. Development density.	
56	Capital expenditure	\$137 per prop Low ranking (4, 3)		An indicator of the level of investment in the business. Drivers – age and condition of assets, asset life cycle and water source.	

ATTACHMENT¹**TBL Performance Reports and Action Plans –
Understanding and Using Your Report****1. Introduction**

This appendix has been prepared to assist Councillors with their Council's *2012-13 Triple Bottom Line (TBL) Performance Reports* for water supply and sewerage. It will also help the Water and Sewerage Manager prepare a sound Action Plan to Council. Action plans should include a strategy for addressing any areas of under-performance. A sample Action Plan is shown on page 73 of the *2012-13 NSW Water Supply and Sewerage Performance Monitoring Report²*. The NSW Office of Water prepares the annual TBL report for each Local Water Utility's water supply business and for its sewerage business together with an Action Plan template for completion by the Water and Sewerage Manager. A copy of the TBL report is also provided to IPART.

The TBL reports show your LWU's key performance indicators (column 1), your ranking compared to other LWUs in your size range (column 2) and your ranking relative to all NSW LWUs (column 3). **Column 4** shows the **Statewide medians** which are calculated from the 50 percentile result for all connected properties (statewide). This best reveals Statewide performance by giving due weight to larger LWUs and reducing the effect of smaller LWUs. Column 5 shows the National Medians for the 74 utilities which reported in the *2012-13 National Performance Report for Urban Water Utilities* (www.nwc.gov.au).

There are four size ranges: > 10,000, 3,000 to 10,000, 1,500 to 3,000 and 200 to 1,500 connected properties. Rankings shown in Columns 2 and 3 of the TBL Report are based on the top 20% of LWUs for each indicator being ranked 1 and the bottom 20% being ranked 5 (LWUs in the range 40% to 60% are ranked 3).

2. Factors Impacting on Performance

When comparing reported performance with other utilities, LWUs should take account of the wide range of factors which can impact on effectiveness and efficiency of a business. An indicator with a low ranking may not necessarily imply **poor** performance, for example, business efficiencies and effectiveness are functions of:

- **Number of connected properties** - there are significant economies of scale for large LWUs,
- **Type of services provided** - eg. whether the LWU provides a full water supply system or whether is a reticulator or bulk supplier,
- **Provision of bulk storage and/or long transfer systems** - these costs are not incurred by LWUs relying on groundwater or those receiving a regulated supply from a State Water dam.
- **Regional topography and soil types** affects pumping costs, frequency of main breaks and useful life,
- **Regional rainfall and evaporation,**

¹ This attachment is an update of Appendix G of the *NSW Water and Sewerage Strategic Business Planning Guidelines*, July 2011 (available at http://www.water.nsw.gov.au/ArticleDocuments/36/utilities_nsw_water_sewerage_strategic_planning_guidelines.pdf.aspx).

² The *2012-13 NSW Water Supply and Sewerage Performance Monitoring Report* is available at <http://www.water.nsw.gov.au/Urban-water/Country-towns-program/Best-practice-management/Performance-monitoring/default.aspx>.

- **Water quality at the source** – for example, a good quality groundwater will require minimal water treatment,
- **Standard of nutrient removal facilities** at the sewage treatment works,

An understanding of such factors is essential for valid interpretation of performance data. Utilities are encouraged to compare and contrast their performance with other LWUs having similar characteristics. Further factors to assist your LWU in its assessment of performance are listed below.

2.1 UTILITY CHARACTERISTICS

- **Properties served per km** – lower density of urban development significantly increases the infrastructure cost, particularly for those LWUs with very low densities (ie. < 20 properties per km).
- **Renewals** – each LWU should ensure that its Typical Residential Bill (see below) is adequate and consistent with the projection in its 30 year strategic business plan to ensure it is raising sufficient revenue for developing, maintaining and renewing the required infrastructure. It should also examine its total asset management policy and ensure that the necessary funds are directed to maintenance and renewals.
- **Employees per 1000 properties** – this is a good indicator of operating and management costs. As noted on page 21 of the *2011-12 NSW Water Supply and Sewerage Benchmarking Report* (www.water.nsw.gov.au), the number of employees per 1,000 properties is a good indicator of operating and management costs. However, it is important to note that a higher number of employees per 1,000 properties is needed for small non-contiguous water supply systems and for small water or sewage treatment works.

2.2 SOCIAL FACTORS – Bills and Charges

- **Typical Residential Bill (TRB)** – is the **principal indicator of the overall cost** of a water supply or sewerage system (it is the annual bill paid by a residential customer using the utility's average annual residential water supplied). The main element of the TRB is the operating cost (OMA – operation, maintenance and administration). The TRB should be consistent with the projection in your LWU's 30 year strategic business plan.

Review and comparison of the 2013-14 Typical Residential Bill (Indicator 14) with the projection in your Strategic Business Plan is **mandatory**. In addition, if both the economic real rate of return and the return on assets (indicators 43 and 44 for water supply and indicators 46 and 46a for sewerage) are negative, you must report your proposed 2014-15 typical residential bill to achieve full cost recovery.

- **Residential Water Usage Charge (c/kL)** – Highest charges are automatically ranked "1" and lowest charges as "5". These rankings however, should be compared with your TRB and whether your LWU is achieving full cost recovery, and the required residential revenue from water usage charges, in which case a low water usage charge may be a good result.

Please note that Circular LWU 11 of March 2011 has removed the need for LWUs to use inclining block tariffs. In addition, the **NSW Government encourages LWUs to use a two-part tariff with a uniform water usage charge** per kL for all water use (see page 6 of the *2012-13 NSW Performance Monitoring Report*).

- **Residential revenue from usage charges (%)** – The *Best Practice Management Guidelines 2007* require LWUs with 4,000 or more properties to raise at least 75% of residential revenue from water usage charges, while LWUs with under 4,000 properties, including LWUs with a dual supply must raise at least 50% of residential revenue from usage charges. The strategic

benefits of providing such **strong pricing signals** are highlighted on page 5 of the *2012-13 NSW Performance Monitoring Report*.

2.3 SOCIAL FACTORS - Health

- **Risk based drinking water management system** – each LWU should develop and implement such a drinking water management system on a priority basis (tools and assistance are available from the NSW Office of Water - see pages 7 and 8 of the *2012-13 NSW Performance Monitoring Report*).
- **Microbiological water quality compliance** is a **high priority** for each NSW LWU – This is the most important water supply **health indicator** and all LWUs should aim for a value of 100%. LWUs with less than 98% do not comply with the *Australian Drinking Water Guidelines, 2011* and must develop and implement a corrective strategy (see page 7 of the *2012-13 NSW Performance Monitoring Report*). If your LWU failed to achieve microbiological compliance in either of the last 2 financial years, the corrective action implemented and whether it was successful must be reported in your LWU's annual Action Plan to Council.
- **'Boil water alerts'** – if your LWU has issued any 'boil water alerts' in the last 18 months, the corrective action implemented and whether it was successful must be reported in your LWU's annual Action Plan to Council.

Assistance is available to your LWU from your NSW Office of Water Regional Water and Sewerage Treatment Officer (page 35 of the *2012-13 NSW Benchmarking Report*).

2.4 SOCIAL FACTORS - Customer Service

- **Water quality complaints** – water quality may depend for example, on whether the supply is unfiltered, good quality groundwater or whether a fully treated supply is provided.
- **Odour complaints** – This is an important indicator of the effectiveness of sewage treatment and transfer. LWUs with a high number of complaints (ranking of 5) should investigate the reasons for the complaints, including past performance, as indicated in page two of their TBL Report.
- **Number of water main breaks** – water mains with a high incidence of breaks (say over 30 per 100km of main) may indicate that renewals are warranted. Assistance is available for such utilities from the NSW Office of Water (Roshan Iyadurai 02 8281 7317).

2.5 ENVIRONMENTAL FACTORS

- **Average annual residential water supplied** – is influenced by the number of connected properties, geographic location, climate, strength of the utility's pricing signals (NWI Indicator F4 – percent of residential revenue from usage charges – see 2.6 below) and the presence of drought water restrictions. Inland LWUs have significantly higher residential water supplied due to their hotter and drier climate and the use of evaporative air coolers. The weighted median value for inland LWUs was 257kL/connected property (percentage of connected properties basis). The weighted median for coastal LWUs was 160kL/property.
- **Sewer main chokes and collapses** – sections of sewer main with a high incidence of chokes and collapses (say treble the statewide median) require close attention.
- **Sewer overflows to the environment** – are untreated sewage spills and may increase during wet weather due to infiltration of sewage mains and flooding. They do not include discharges or overflows contained within emergency storages.

2.6 ECONOMIC FACTORS - Financial

- **Economic real rate of return (ERRR)** – reflects the rate of return from operating activities (ie. excluding interest income, grants for acquisition of assets and gain/loss on disposal of assets). Water and sewerage charges should be sufficiently high to achieve full cost recovery. All LWUs should aim to achieve a positive ERRR. LWUs which have met all the Best-Practice Management requirements are strongly encouraged to pay an ‘efficiency dividend’ from the surplus of their water and sewerage businesses to the Council’s general revenue (see page 12 of the *2012-13 NSW Performance Monitoring Report*). Refer also to Circular LWU 11 of March 2011.
- **Net Debt to equity** – LWUs facing significant capital investment are encouraged to make greater use of borrowings to reduce their TRB. This avoids unfairly burdening existing customers and facilitates inter-generational equity (see page 12 of the *2012-13 NSW Performance Monitoring Report*).
- **Loan payment (\$/property)** – A high loan payment per property indicates a relatively high capital cost per property, recent construction of significant capital works or use of short-term loans. 20-year loans are generally optimal (see page 13 of the *2012-13 NSW Performance Monitoring Report*).
- **Interest cover** – this ratio provides an indicator of the LWU’s ability to meet interest commitments. The interest cover is nil for a business incurring a loss. As a general guide, an interest cover >2 is a good interest cover position. This should be considered in conjunction with the comment on making greater use of borrowings for capital investment.
- **Net profit after tax (NPAT) ratio** – this is NPAT divided by the revenue. LWUs should have a positive NPAT ratio. LWUs facing major capital expenditure for expanding system capacity may need a relatively high value for this indicator in order to help fund this investment.

2.7 ECONOMIC FACTORS - Efficiency

Operating cost (OMA – operation, maintenance and administration) per property is a prime indicator of the performance of an LWU. The **components of operating cost** are:

- **Management cost** – includes administration, engineering and supervision and is typically almost 40% of the total operating cost. The number of employees per 1,000 properties can be a useful indicator of the operating and management costs and hence the efficiency of an LWU. LWUs with a number of separate water supply schemes and those with smaller water or sewage treatment works will need a higher level of employees per 1000 properties in order to effectively manage their systems.
- **Treatment cost (water)** – is dependent on the type and quality of the water source and the types of treatment used. In addition, there are great economies of scale for the operation of larger water treatment works (ie. facilities involving at least filtration and disinfection).
- **Treatment cost (sewage)** – is dependent on type of treatment and discharge requirements. Where the discharge licence conditions are stringent involving for example, a low level of phosphorus, treatment costs will be high. There are significant economies of scale for operation of larger treatment works.
- **Pumping cost (water)** – is influenced by topography and distance to the water source. For example, Essential Energy and Goldenfields Water have a high pumping cost due to the distance required to pump from the water source, while Fish River Water Supply is almost a fully gravitational supply, with negligible pumping costs. For water supply, there are significant economies of scale in pumping cost per connected property.

2012-13

NSW WATER SUPPLY AND SEWERAGE

PERFORMANCE MONITORING REPORT



Attachment 6

2012-13
NSW WATER SUPPLY AND SEWERAGE
PERFORMANCE MONITORING REPORT

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BEST PRACTICE MANAGEMENT

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Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (March 2014). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of the Department of Primary Industries or the user's independent adviser.

Minister's foreword



The *Performance Monitoring Report* for NSW water utilities for 2012-13 provides an overview of the current status and future water supply and sewerage needs of NSW.

This annual Report has been prepared by the NSW Office of Water and its predecessors since 1986, and presents the key performance indicators for all NSW urban water utilities. This enables each utility to monitor and improve its performance through benchmarking against similar utilities. The Report also highlights the overall statewide performance of the NSW regional local water utilities and compares that performance with interstate utilities. The Report is important for public accountability and has been strongly endorsed by both the Independent Pricing and Regulatory Tribunal and the Productivity Commission.

Through the NSW Government's Country Towns Water Supply and Sewerage Program, which includes the *NSW Best-Practice Management of Water Supply and Sewerage Framework* (see page viii), the State Government will continue to work with water utilities to ensure the community benefits from effective, sustainable and safe piped water supply and sewerage services.

To provide a balanced view of the long-term sustainability of NSW water utilities, the report adopts a triple bottom line accounting focus, with performance reported on the basis of social, environmental and economic performance indicators. These indicators include the utility's pricing signals and typical residential bill, compliance with the *Australian Drinking Water Guidelines 2011*, compliance with sewage treatment works licences, the volume of water used and recycled, greenhouse gas emissions, the fair value of assets and asset condition, including water main breaks and real water loss (leakage), the operating cost, whether each utility has achieved full cost recovery and its level of implementation of the 19 planning, pricing and management requirements of the Best-Practice Management Framework.

I am pleased to note that the NSW utilities are continuing to perform well and I again encourage all utilities to implement the NSW Best-Practice Management Framework, including preparing a current strategic business plan¹, financial plan and asset management plan, monitoring their performance and implementing their annual Action Plan. By doing so, utilities will continue to operate efficiently, provide value for money to their community and improve the effectiveness of their water and sewerage services.



The Hon. Katrina Hodgkinson MP
Minister for Primary Industries
Minister for Small Business

¹ The strategic business plan is a water utility's peak planning document for water supply and sewerage: *NSW Water and Sewerage Strategic Business Planning Guidelines, NSW Office of Water, July 2011 (www.water.nsw.gov.au)*.

Acknowledgements

Local Government NSW (LGNSW) is acknowledged for its strong and continuing support for the NSW annual water supply and sewerage performance monitoring system since its commencement in 1986.

The contribution of NSW Health is acknowledged for providing additional water quality data (from the NSW water quality database) and water quality monitoring compliance data. This data has been incorporated into Appendix D and Figures 4 and 5 of this Report and Tables 5 and 12 and Appendices D1 and D3 of the *2012-13 NSW Water Supply and Sewerage Benchmarking Report*.

The NSW Local Government Water Directorate is also acknowledged for its support and contributions and for permitting use of its *Technical Guidelines for Drought Management*.

The success of the NSW performance monitoring system is contingent on full participation by all NSW local water utilities (LWUs). The continuing participation of each LWU in the performance monitoring system and each LWU's significant efforts in providing current, accurate and timely data on its performance are therefore particularly acknowledged.

List of NSW water utilities

This report discloses performance indicators for all NSW water utilities, comprising the 105 regional local water utilities (LWUs) together with the four metropolitan utilities (Sydney Water Corporation, Hunter Water Corporation, Sydney Catchment Authority and Hawkesbury Council). All the NSW utilities are listed in the table below in alphabetical order. To facilitate comparisons with similar sized LWUs, Appendices C to F of this report are sorted in order of the number of connected properties served. The number shown in the table below with each utility is its rank in terms of connected properties for water supply. For example, the table shows '11 Albury City', indicating that Albury City is the 11th LWU in the water supply tables. LWUs are grouped in four size ranges, namely over 10,000; 3,001 to 10,000; 1,501 to 3,000, and 200 to 1,500 connected properties.

NSW water utilities (regional and metropolitan) in alphabetical order

11	Albury City	54	Deniliquin	59	Lachlan	3	Shoalhaven
29	Armidale Dumaresq	18	Dubbo	48	Leeton	35	Singleton
24	Ballina (R)	26	Essential Energy	22	Lismore (R)	52	Snowy River
100	Balranald (DS)	15	Eurobodalla	31	Lithgow		Sydney Catchment Authority
21	Bathurst Regional			61	Liverpool Plains		Sydney Water
23	Bega Valley	12	Fish River WS (BS)	102	Lockhart (NO WS)		
47	Bellingen	51	Forbes	5	MidCoast	13	Tamworth Regional
53	Berrigan (DS)			32	Mid-Western Regional	69	Temora (NO WS)
72	Bland (NO WS)	84	Gilgandra	38	Moree Plains	68	Tenterfield
78	Blayney (NO WS)	60	Glen Innes Severn	65	Murray (DS)	93	Tumbarumba
89	Bogan	28	Goldenfields (NO SGE)	101	Murrumbidgee	43	Tumut
97	Bombala	1	Gosford	41	Muswellbrook	6	Tweed
104	Boorowa	20	Goulburn Mulwaree				
87	Bourke (DS)	80	Greater Hume	34	Nambucca	45	Upper Hunter
105	Brewarrina	30	Griffith	46	Narrabri	73	Upper Lachlan
27	Byron (R)	94	Gundagai	63	Narrandera	85	Uralla
		44	Gunnedah	62	Narromine	107	Urana (NO WS)
91	Cabonne	90	Guyra				
92	Carrathool	81	Gwydir	83	Oberon (R)	9	Wagga Wagga (NO WS)
103	Central Darling (DS)			19	Orange	88	Wakool (DS)
40	Central Tablelands (NO SGE)	76	Harden (R)			98	Walcha
14	Clarence Valley	30A	Hawkesbury (NO WS)	71	Palerang	79	Walgett (DS)
67	Cobar (R)	86	Hay (DS)	36	Parkes	96	Warren (DS)
66	Cobar WB (BS)		Hunter Water	7	Port Macquarie-Hastings	55	Warrumbungle
10	Coffs Harbour					95	Weddin (NO WS)
99	Coolamon (NO WS)	37	Inverell	17	Queanbeyan (R)	57	Wellington
50	Cooma-Monaro	106	Jerilderie (DS)	33	Richmond Valley	74	Wentworth (DS)
75	Coonamble	77	Junee (NO WS)	8	Riverina (NO SGE)	16	Wingecarribee
58	Cootamundra (R)			4	Rous (BS) (NO SGE)	2	Wyong
42	Corowa	25	Kempsey				
39	Cowra	70	Kyogle			56	Yass Valley
						49	Young (R)

R – Reticulator; DS – Dual Supply; BS – Bulk Supplier; NO WS – No water supply; NO SGE – No sewerage

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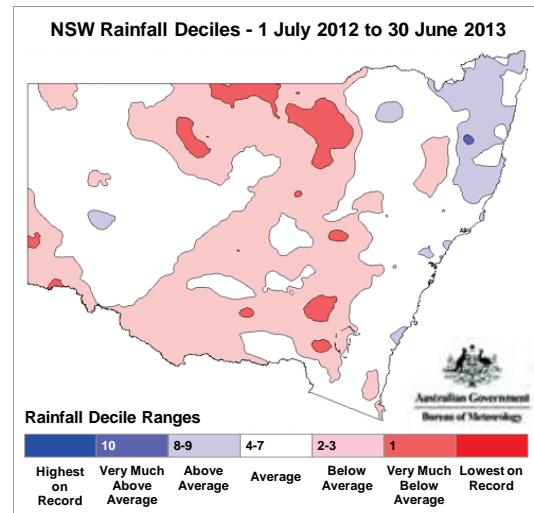
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Executive summary

In regional NSW, the reticulated public water supply and sewerage services are the single most important factor in protecting public health. However, in recent years NSW has been severely affected by drought and then by exceptionally wet years and major flooding in 2010-11 and 2011-12 followed by a moderately dry period in 2012-13. In addition, the local water utilities continue to face significant challenges from issues such as climate variability, the effect of water sharing plans on water availability, population changes (growth along coastal NSW and a decline in some inland areas), together with a projected shortage of skills and resources in water engineering.

In such challenging operating conditions, sound strategic business planning and financial planning is essential. It is strongly recommended that utilities undertake such planning in accordance with the NSW Government's *Best-Practice Management of Water Supply and Sewerage Framework* (page viii).

Currently, 92 per cent of utilities have sound strategic business and financial plans and implementation of these plans should ensure long term sustainability of these services. In addition, all of the utilities are now achieving full cost recovery for water supply and 96 per cent for sewerage. The overall level of implementation of the 19 planning, pricing and management requirements of the Framework is 90 per cent (91 per cent for water supply and 88 per cent for sewerage).



NSW local water utilities have continued to achieve consistently high standards notwithstanding the challenges outlined above. There has been a real increase of only 12% in the water supply median Typical Residential Bill (TRB) of \$540 over the past 18 years. The water supply TRB is now similar to country Victoria and the National Median and lower than all the other Australian states and the capital city utilities except for Melbourne. The median TRB for water supply and sewerage combined is \$1165, which involves a real increase of 13% over this period. At the same time, 99.7 per cent of all 19,000 samples tested for E. coli comply with the 2011 Australian Drinking Water Guidelines, with 98 per cent of the regional utilities complying with these Guidelines. Average annual residential water supplied is a low 166 kilolitres (kL) per property, which is 50 percent lower than that in 1991. The trend in reductions is due mainly to the strong pay-for-use water pricing signals with a median water usage charge of 208 cents per kilolitre (c/kL) together with implementation of water conservation and demand management measures by the utilities and some drought water restrictions.

Utility characteristics

Unlike 2010-11 and 2011-12, 2012-13 was a moderately dry year, with around 30% of the state receiving a below average annual rainfall. The 2012-13 statewide median rainfall was 108% of the long term median and around 75% of the water supply utilities received a rainfall in 2012-13 below their long term median annual rainfall.

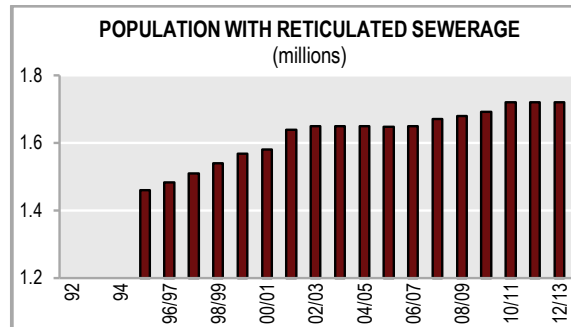
Since July 2012, 105 local water utilities (LWUs) have provided water supply and sewerage services to regional NSW (i.e. excluding Sydney and Hunter Water Corporations). Of these LWUs, 96 provided water supply services (including three bulk suppliers - Cobar Water Board, Fish River Water Supply and Rous County Council) while 99 LWUs provided sewerage services.

The LWUs provided a piped water supply to a population of 1.81 million (98.0 per cent coverage) and to 834,000 connected properties. The total water supplied was 297,000 megalitres (ML) which has fallen by

over 95,000 ML over the past 22 years. This is mainly due to the application of best-practice management measures (e.g. strong pay-for-use water pricing signals [box on page 5], water conservation and demand management including leakage reduction (page 10)), as well as some drought water restrictions.

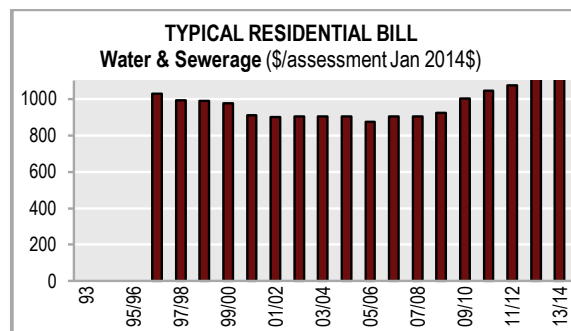
The LWUs also provided a piped sewerage service to 1.69 million people (95.6 per cent coverage).

Since implementation of the new Country Towns Water Supply and Sewerage (CTWSS) Program in 1996, the small town backlog sewerage services provided have increased the piped sewerage coverage in regional NSW from 92.3 per cent to 95.6 per cent of the urban population (page 7).



Social

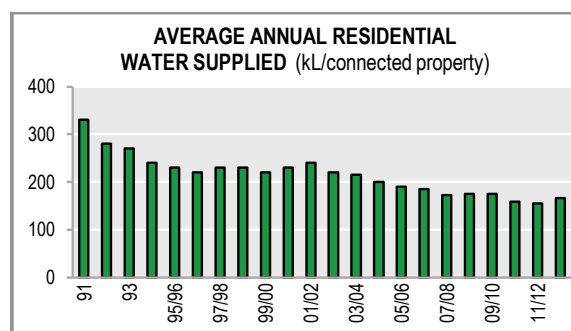
- The median typical residential bill for water supply is \$540 per assessment (Jan 2014\$), which has increased by 12% in real terms over the past 18 years [box on page 5]. The median typical residential bill for sewerage is \$625 and the median typical residential bill for water supply and sewerage is \$1165, which has increased by 13% over this period in real terms.



- Median water usage charge for the first step has risen to 208 c/kL. This is relatively high & provides a strong pricing signal to encourage efficient water use. Water usage charges now provide 74 per cent of residential revenue, a major reform to the 20 per cent of revenue obtained 18 years ago [page 5].
- The median typical developer charge for water supply and sewerage is \$10,200 per equivalent tenement. This is 32 per cent of the \$32,000 median current replacement cost of system assets per assessment.
- Water quality compliance has remained high [pages 7 and 8] and water quality complaints have remained low (page 9). As noted on page 15, 312 LWU water treatment operators meet the requirements of the National Certification Framework for Water Treatment Operators.
- Water main breaks are 10 per 100km of main. These have remained much lower than all the other Australian states and the capital city utilities, indicating good asset condition (pages 17 and 9).

Environmental

Average annual residential water supplied was 166 kL/connected property which was lower than country Victoria, the National Median and all the other Australian states and capital city utilities, except for Melbourne and Brisbane (pages 17 and 9). Average annual residential water supplied has fallen by 50 per cent over the past 22 years (from 330 to 166 kL/property).



- Ninety four per cent of utilities have implemented sound water conservation measures (page 77).
- Reuse of recycled water comprised 40,000 ML, which is 23 per cent of the total volume of sewage collected and was carried out by 84 per cent of the utilities, mostly for agriculture (pages 18 and 10).

- Compliance with the Environment Protection Authority (EPA) sewerage licences was 98 per cent of the 3,984 samples analysed for Biochemical Oxygen Demand (BOD) and 94 per cent of the 3,984 samples analysed for suspended solids (SS) (page 10). Eighty-nine per cent of the utilities complied with their licence for BOD and 78 per cent complied for suspended solids.

Economic

The total revenue for the 105 regional utilities was \$1,220M and the current replacement cost of their water supply and sewerage assets was \$25,700M.

- The median economic real rate of return was 0.8 per cent for water supply and sewerage which was lower than country Victoria, the National Median and the capital city utilities (page 19). All LWUs are now achieving full cost recovery [box on page 12] for water supply and 96 per cent for sewerage.
- The median operation, maintenance and administration cost (OMA) for water supply and sewerage has increased from \$514 to \$840 (Jan 2013\$) over the past 21 years, largely due to more stringent standards for sewage treatment and increasing management costs. The water supply OMA cost was lower than the National Median and country utilities in all the other states but higher than most of the capital city utilities (pages 19 and 13).

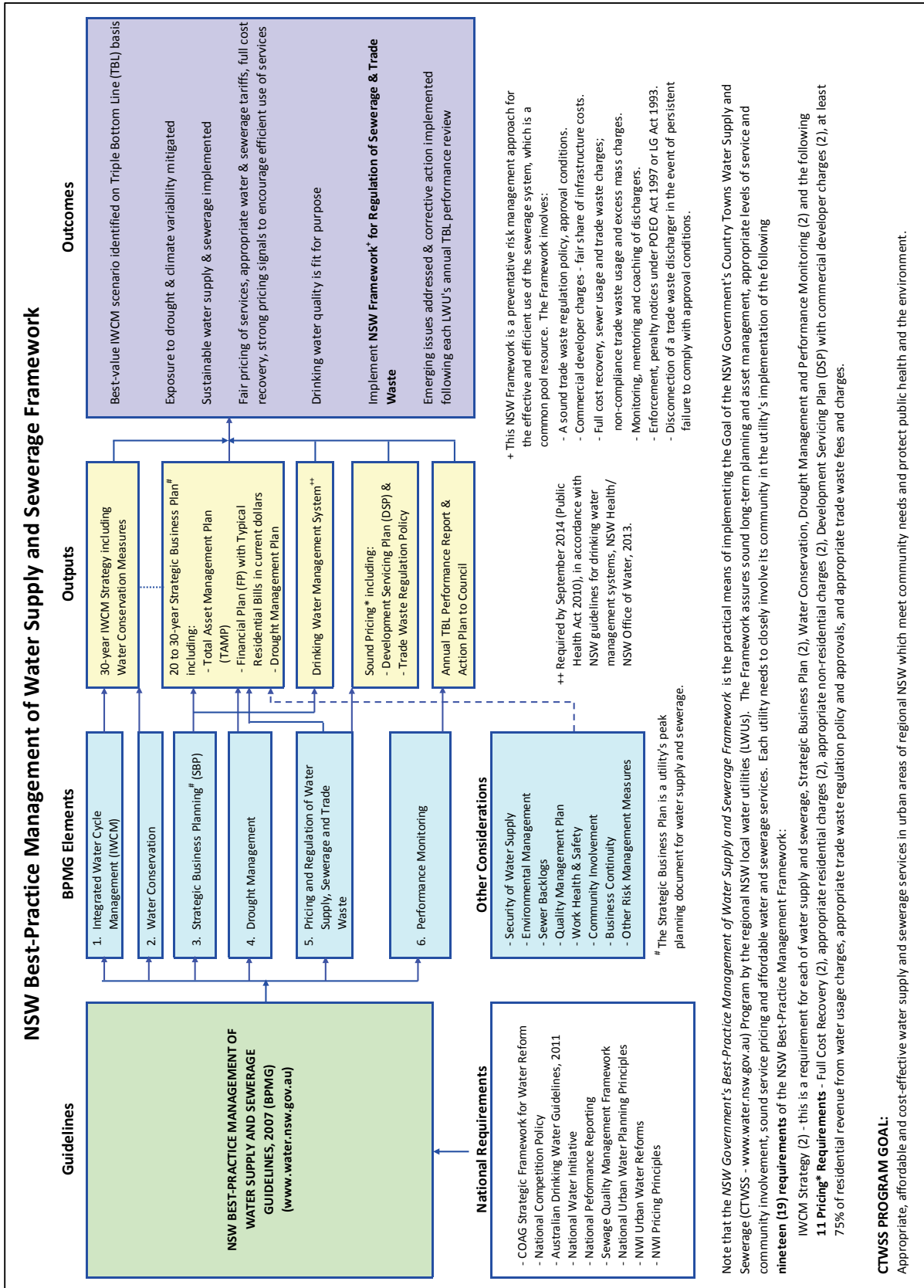
All NSW urban water utilities have abolished water allowances and have pay-for-use water pricing, thus enabling NSW to meet this key requirement of the National Water Initiative (NWI). Ninety-two per cent of utilities have a sound 20 to 30-year strategic business plan and financial plan, compared to 31% 15 years ago. Implementation of these plans should ensure the long term sustainability of these services.

Best-practice management

The NSW Government continues to actively encourage the regional NSW local water utilities to achieve appropriate, affordable, cost-effective and sustainable water supply and sewerage services through implementation of the *NSW Best-Practice Management of Water Supply and Sewerage Framework* (page viii). All utilities are expected to implement the requirements of the *Best-Practice Management Framework*.

- The overall level of implementation of the 105 NSW local water utilities (LWUs) of the 19 planning, pricing and management requirements of the *Best-Practice Management Framework* is 90 per cent, compared to 46 per cent eight years ago. In addition, 45 per cent of the utilities have implemented all of the requirements for water and 52 per cent of the utilities have implemented all of the requirements for sewerage. [Figures 25 to 27, pages 23 and 77].
- Implementation of all of the requirements of the *Best-Practice Management Framework* is a pre-requisite for payment of a dividend from the surplus of a utility's water supply or sewerage businesses. Each utility which meets these requirements is encouraged to pay such an 'efficiency dividend' to the council's general revenue, which is required under the National Water Initiative where practicable [box on page 12].
- Such implementation is also required for financial assistance towards the capital cost of backlog infrastructure (as at 1996) under the NSW Government's Country Towns Water Supply and Sewerage (CTWSS) Program (www.water.nsw.gov.au) which is a major reform program.

Data reliability - the performance indicators for the 29 LWUs serving over 10,000 connected properties have been independently audited in accordance with the rigorous national auditing requirements (page 32) and have been reported in the *National Performance Report 2012-13* (www.nwc.gov.au). These LWUs serve 74% of the connected properties in regional NSW. In addition all 30 NWI financial performance indicators for all the NSW LWUs have been independently audited annually since 2006-07. Furthermore the NSW Office of Water undertakes comprehensive data validation processes (page 90) to assure the ongoing data reliability of the NSW Performance Monitoring System (page 1).



1. NSW performance monitoring system

Performance monitoring and benchmarking are required under the *National Competition Policy* and the *National Water Initiative*, are important for public accountability and have been strongly endorsed by both the NSW Independent Pricing and Regulatory Tribunal and the Productivity Commission. Performance monitoring is also a key requirement of the *NSW Best-Practice Management of Water Supply and Sewerage Guidelines*² which drive the *NSW Best-Practice Management Framework* (page viii).

This *Performance Monitoring Report* presents the key NSW performance indicators (Figures 1 to 31 and Appendix D), discloses the overall Statewide performance of the regional NSW local water utilities (page 2) and compares that performance with interstate utilities (page 16 and Appendix A). The full suite of performance indicators is provided in the *2012-13 NSW Water Supply and Sewerage Benchmarking Report* which contains benchmarking data to enable each local water utility (LWU) to monitor trends in its performance indicators over the past six years and to benchmark its performance against that of similar LWUs. The benchmarking report is available on the NSW Office of Water website (www.water.nsw.gov.au). Independent auditing and data validation assure data reliability (page 90).

To facilitate comparisons, performance indicators have been prepared for each LWU's aggregated water businesses and aggregated sewerage businesses, rather than for individual water & sewerage systems.

1.1 Triple bottom line focus

To provide a balanced view of the long-term sustainability of the NSW utilities, this report continues to use a triple bottom line (TBL) accounting focus. This involves consideration of a utility's strategic business plan together with its social and environmental management practices, with performance reported on the basis of social, environmental and economic performance indicators.

1.2 Statewide performance

The Statewide performance of the NSW LWUs is provided in section 2 overleaf, where the performance indicators are calculated on a 'percentage of connected properties basis'. This is a weighted median on the basis of connected properties, which best reveals Statewide performance by giving due weight to larger LWUs and reducing the effect of smaller LWUs (page 30).

1.3 Utility performance comparison

When comparing reported performance, utilities should take account of the wide range of factors which can impact on their performance and typical residential bill, which is the principal indicator of the overall cost of a water or sewerage system. Such factors can produce a fundamental difference in performance.

For example, in the case of water supply, a utility which provides full water treatment and has its own bulk storage dam and raw water transfer mains and channels will have a much higher capital and operating cost structure than a utility which has a nearby good quality groundwater supply. Each utility can improve its performance by taking account of such factors and comparing its performance with utilities having similar characteristics.

For further detail on factors that impact on a utility's performance, refer to section 5.3 on page 28.

1.4 TBL reports and action plans

The NSW Office of Water provides each LWU with an annual TBL Performance Report and a template for its Action Plan to Council for its water supply business and for its sewerage business. The TBL reports provide a summary of the LWU's implementation of the requirements of the Best-Practice Framework & its performance for over 50 key performance indicators together with the Statewide & National medians & the LWU's relative performance against similar sized LWUs. TBL reports and action plans are discussed on page 25. An example TBL report [page 75] and action plan [page 73] are provided in Appendix B.

² *Best-Practice Management of Water Supply and Sewerage Guidelines*, NSW Government 2007 (www.water.nsw.gov.au).

2. Statewide performance summary

The Statewide performance of the regional NSW local water utilities (LWUs) is provided below for the key performance indicators. The full suite of performance indicators over the past six years is shown in the *2012-13 NSW Water Supply and Sewerage Benchmarking Report* which is available on the NSW Office of Water website (www.water.nsw.gov.au).

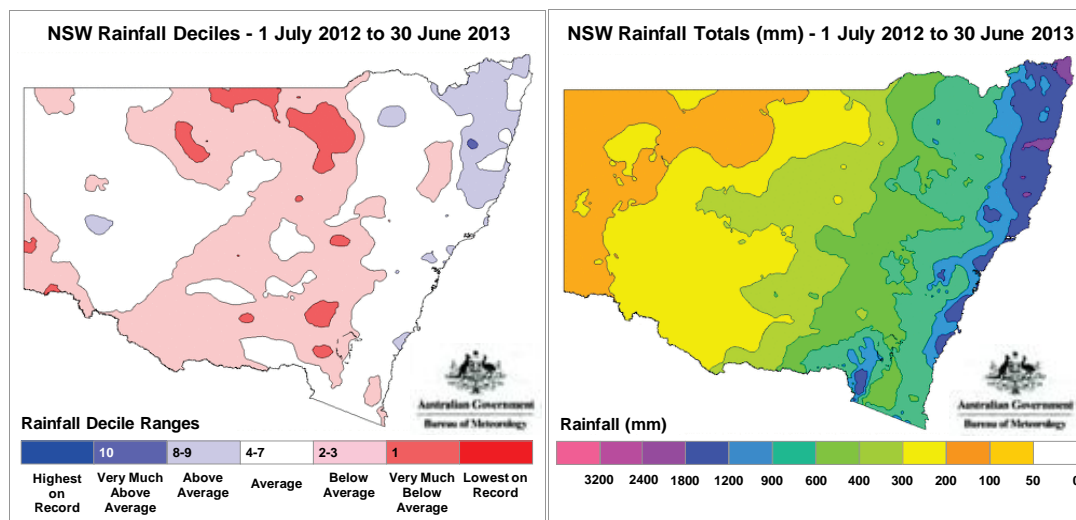
To provide a balanced view of the long-term sustainability of NSW water utilities, this report provides a triple bottom line (TBL) focus with performance reported on the basis of social, environmental and economic indicators.

Performance monitoring and benchmarking are required under National Competition Policy and the National Water Initiative³, are important for public accountability and have been strongly endorsed by the Independent Pricing and Regulatory Tribunal⁴ and the Productivity Commission⁵.

Utility characteristics

Rainfall

Unlike 2010-11 and 2011-12, 2012-13 was a moderately dry year, with around 30% of the state receiving a below average annual rainfall (left figure below). The statewide median rainfall was 108% of the long term median (Figure 6 of the *2012-13 NSW Water Supply and Sewerage Benchmarking Report*). Seventy five percent of water supply utilities received less than their long term median annual rainfall. Bogan (61%), Coonamble (52%), Harden (47%), Narrandera (48%) and Walgett (51%) received the lowest percentage of their median annual rainfall. Byron (135%), Gosford (130%), Kempsey (126%), Nambucca (126%) and Tenterfield (136%) received the highest percentage of their median annual rainfall.



The figures⁶ above show the rainfall decile ranges for NSW (left) and the total annual rainfall (mm) for NSW (right), indicating the moderate rainfall received statewide in 2012-13.

New residential dwellings - median as a percent of the existing residential properties was:

- 0.8% connected to water supply;
- 0.9% connected to sewerage.

³ *National Performance Framework – 2012-13 Urban Performance Report Indicators and Definitions*, National Water Commission/Water Services Association of Australia, June 2013 (www.nwc.gov.au).

⁴ *Pricing Principles for Local Water Authorities*, Independent Pricing and Regulatory Tribunal NSW, 1996.

⁵ *Australia's Urban Water Sector*, Productivity Commission Inquiry Report No. 55, August 2011 (www.pc.gov.au).

⁶ Source: Australian Bureau of Meteorology, 2013 (www.bom.gov.au).

Renewals expenditure - median as a percent of current replacement cost of system assets was:

- 0.5% for water supply
- 0.4% for sewerage.

These may appear to be low, however they are considered to be appropriate as discussed in the box below and Item 9 on page 73.

Infrastructure renewals

As noted in section 4.1 on page 21, assessment of infrastructure renewals requirements is a critical element of a utility’s asset management plan, which must be documented in the utility’s 20 to 30-year strategic business plan and financial plan (page 21). Details of each LWU’s asset rehabilitation activities and renewals expenditure are provided in Tables 10 and 15 of the *2012-13 NSW Water Supply and Sewerage Benchmarking Report*.

For water supply and sewerage, it is misleading to measure annual renewals expenditure on the basis of a nominal percentage (say one or two per cent) of the current replacement cost of assets. Rather, the bulk of renewals expenditure will be required towards the end of the economic life of an asset (e.g. a new water main with an economic life of 80 years would be expected to have minimal renewal expenditure before year 80). Therefore, LWUs should ensure that their financial plan addresses all future capital expenditure, including renewals, identified in a soundly based asset management plan. They should ensure their Typical Residential Bill is in accordance with the projection in their adopted Strategic Business Plan (Item 14 on page 73). They should also annually monitor income and expenditure and update their 30-year financial plan (page 26). Funding in the financial plan involves an appropriate mix of the utility’s annual income, accumulated cash and investments and borrowings. Further guidance on renewals and asset management is available on page 13 of the *2012-13 NSW Water Supply and Sewerage Benchmarking Report* and in the *NSW Water and Sewerage Strategic Business Planning Guidelines, July 2011*.

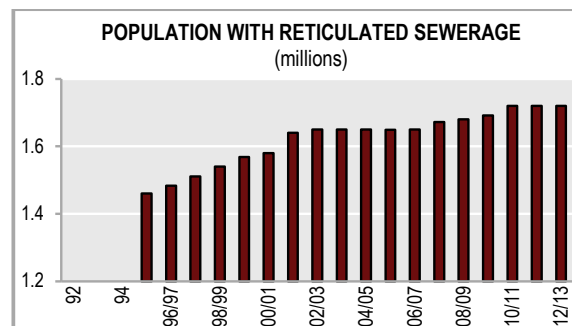
As shown on pages 9, 17, 67 and 80, water main breaks for NSW LWUs have remained much lower than all the other states and the capital city utilities, indicating good water main asset condition.

Properties served per km of main – median was:

- 32 for water supply
- 39 for sewerage.

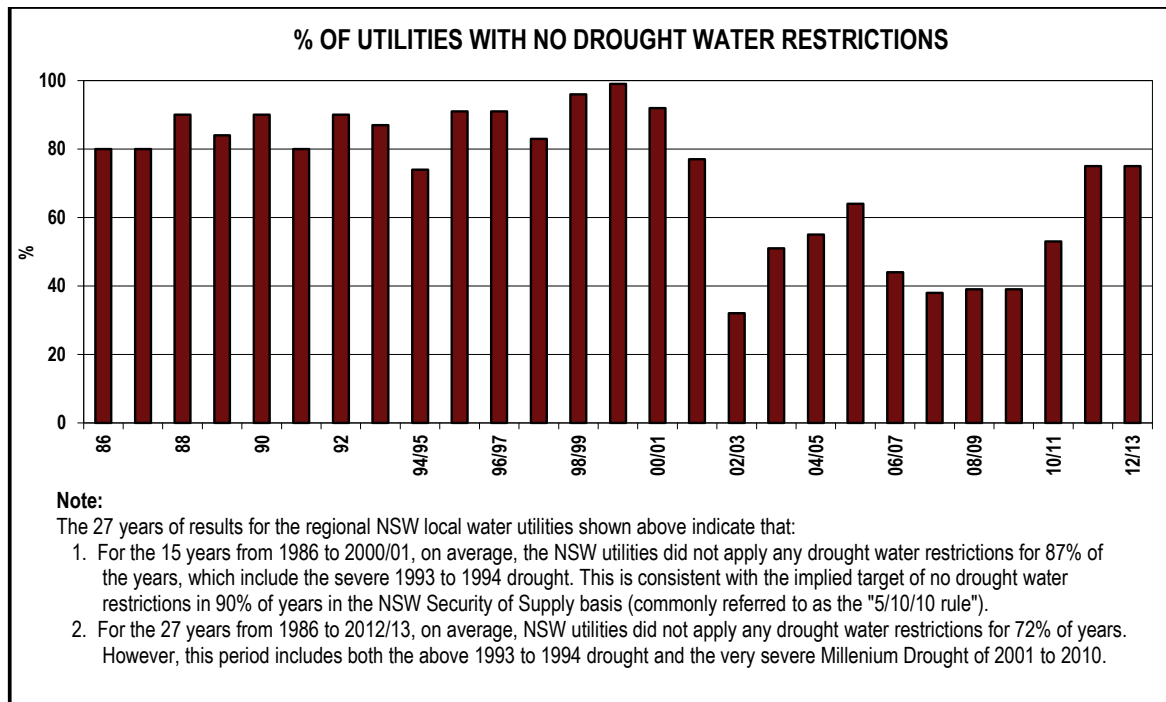
Refer also to the 2nd paragraph of page 16.

Provision of reticulated sewerage – The 2012-13 population provided with a piped sewerage service was 1.69 million (95.6% coverage). For water supply, the population served was 1.81 million (98.0% coverage). Refer also to footnote 8 on page 7, footnote 15 on page 16 and Figure 42 of the Benchmarking Report.



Water restrictions

During at least part of 2012-13, 25% of LWUs applied drought water restrictions [Figure 22 of the *2012-13 NSW Water Supply and Sewerage Benchmarking Report*]. 94% of LWUs have implemented a sound drought management plan [column 4 on page 77].



Business plans

The strategic business plan is a LWU's peak planning document for water supply and sewerage: *NSW Water and Sewerage Strategic Business Planning Guidelines, July 2011* (http://www.water.nsw.gov.au/ArticleDocuments/36/utilities_nsw_water_sewerage_strategic_planning_guidelines.pdf.aspx).

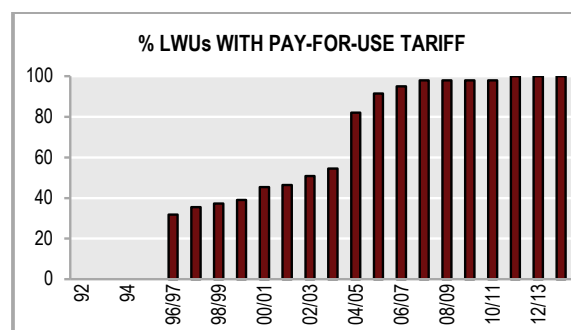
The NSW Office of Water reviews LWU strategic business plans and financial plans to ensure they are soundly based (pages 21 and 96). The percentage of utilities with a sound 20 to 30-year strategic business plan and financial plan has increased from 31% to 92% over the past 15 years. This now includes all LWUs serving over 3,000 properties. These utilities comply with National Competition Policy [column 21 on page 80] and cover 99% of the connected properties in regional NSW. 21 of these LWUs now need to update their plans [column 21 on page 80]. Refer also to section 4.1 on page 21.



Social – charges/bills

Tariffs

All of the LWUs had both pay-for-use water pricing and full cost recovery for water supply. 96% of LWUs had sound pricing with full cost recovery for sewerage [column 2a on page 77 for both water supply and sewerage]. These are required under the National Water Initiative. From July 2012, all NSW utilities have had a metered potable water supply and pay-for-use water pricing with the completion of domestic metering and pricing by Walgett and Brewarrina.



Pay-for-use water supply tariff – since July 2012, 100% of LWUs had a two-part tariff (i.e. an access charge and a usage charge for all potable water usage) or an inclining block tariff (column 5b on page 84). These tariffs comply with National Competition Policy and the National Water Initiative.

Annual water allowance

Since July 2007, all NSW utilities have abolished the annual water allowances for their potable water supply.

Case study
The strategic benefits of the strong NSW pricing signals

RESIDENTIAL WATER USAGE CHARGE (c/kL) (Jan 2014\$)

Year	Charge (c/kL)
91	0
93	0
95/96	0
97/98	0
99/00	0
01/02	75
03/04	90
05/06	110
07/08	140
09/10	170
11/12	200
13/14	208

% OF RESIDENTIAL REVENUE FROM WATER USAGE CHARGES

Year	Percentage (%)
91	20
93	20
95/96	20
97/98	20
99/00	20
01/02	35
03/04	55
05/06	65
07/08	70
09/10	74
11/12	74
13/14	74

AVERAGE ANNUAL RESIDENTIAL WATER SUPPLIED (kL/connected property)

Year	Water Supplied (kL)
91	350
93	280
95/96	240
97/98	230
99/00	220
01/02	230
03/04	220
05/06	200
07/08	190
09/10	180
11/12	170
13/14	160

TYPICAL RESIDENTIAL BILL - WATER (\$/property Jan 2014\$)

Year	Bill (\$/property)
91	450
93	450
95/96	450
97/98	450
99/00	450
01/02	450
03/04	450
05/06	450
07/08	450
09/10	450
11/12	450
13/14	450

- The Statewide median **residential water usage charge** has increased from effectively nil (i.e. a 'free water allowance') to 208 cents per kilolitre over the past 18 years [pages 62 and 84]. Although 68% of the NSW local water utilities had a 'free water allowance' in 1996-97, these were fully abolished by July 2007.
- The NSW LWUs have reformed their pricing through **strong pricing signals**, with **residential revenue from usage charges** increasing from 20% to **74%** over the past 18 years. These pricing signals are higher than country Victoria, the National Median and all the reported results for the other Australian states and the capital city utilities except for Sydney and Canberra [pages 16, 66, 56 and 84].
- Increased water usage charges have sent strong pricing signals which have assisted the NSW utilities to achieve a **50% reduction** in the **residential water supplied** per property since 1991, which equates to a saving of over 95 billion litres per annum. It has also enabled the NSW utilities to **avoid over \$1 billion in capital expenditure** over the last decade for augmenting headworks and treatment capacity.
- The strong pricing signals and efficient water use have enabled the NSW utilities to **limit the real increase in the water supply typical residential bill (TRB) to 12%** over the past 18 years. The water supply TRB is now similar to country Victoria and the National Median and lower than all the reported results for the other Australian states and the capital city utilities except for Melbourne (pages 16, 66 & 84).

Water usage charge

As noted in *Item 2* above, the Statewide median residential revenue from water usage charges is 74%, which enables residents to influence most of their water supply bills. Figure 24 and Appendix E show that 65% of LWUs obtained at least 65% of their residential revenue from usage charges.

- As noted in *Item 1* above, the median water usage charge for the first step is 208 c/kL, which is relatively high [page 66] and provides a strong pricing signal [refer to *Item 2* above] to encourage

efficient water use [Figure 30 on page 62, column 5 on page 84]. As shown in *Item 4* on page 5, the real increase in the water supply typical residential bill (TRB) over the past 18 years has been limited to 12%. The real TRB for water supply and sewerage has increased by 13% over this period (page 7).

LWUs are reminded that Circular LWU 11 of March 2011 (refer also to the box on page 12) has removed the need for use of inclining block tariffs by LWUs. **The NSW Government encourages LWUs to use a 2-part tariff with a uniform water usage charge⁷ per kL for all water use.** IPART has implemented such tariffs for Sydney, Hunter, Gosford and Wyong.

Residential water billing in accordance with national guidelines – 42% of LWUs now have residential water billing in accordance with the *National Guidelines for Residential Customers' Water Accounts, 2006*. In addition, a further 20% of LWUs have made significant progress towards such billing [column 5e of Appendix E on page 84].

Sewer usage charge – 72% of water utilities had a non-residential sewer usage charge per kL to provide a strong pricing signal to commercial and industrial dischargers [Figure 31 on page 63, column 3a on page 87]. The median sewer usage charge was 135 c/kL.

Access charge - median residential access charge per assessment was:

- \$175 for water supply [column 2 on page 84]
- \$625 for sewerage [column 1 on page 87].

Developer charges - median typical developer charge was:

- \$5,500 per equivalent tenement (ET) for water supply [Figure 28 on page 60, column 7 on page 84]
- \$4,700 per ET for sewerage [Figure 29 on page 61, column 7 on page 87].

The median current replacement cost of system assets for water supply and sewerage was \$14,900 and \$17,100 per assessment respectively. The typical developer charge for water supply and sewerage was \$10,200, which is 32% of the current replacement cost of system assets per assessment.

The number of LWUs with appropriate liquid trade waste fees and charges is 79%, compared with 20% of LWUs eight years ago [column 4 on page 87]. The non-residential sewerage charges and the trade waste fees and charges levied by each LWU are shown respectively in Tables 7B and 7C of the *2012-13 NSW Water Supply and Sewerage Benchmarking Report*. The non-residential water supply charges are shown in Table 6B of the Benchmarking Report.

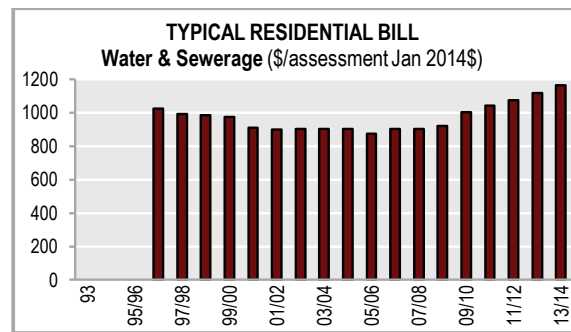
All LWUs should levy appropriate non-residential sewerage access and sewer usage charges, together with trade waste charges for **all** commercial and industrial dischargers to the sewerage system [item 3 on page 22 and page 98]. Each utility's TBL Performance Report compares the percentage of sewage discharged or the percentage of water supplied for non-residential customers with the percentage of the revenue from access and usage charges paid by such customers. Where a significant cross-subsidy is identified, the utility should move to phase it out. For example, note 7 on page 75 shows that 27% of the water supplied was non-residential, and that these customers paid 23% of the revenue, indicating fair pricing of services across the residential and non-residential sectors.

Typical residential bill - median 2013-14 typical residential bill per assessment was:

- \$540 for water supply [Figure 2 on page 34, column 8 on page 84]
- \$625 for sewerage [Figure 3 on page 35, column 8 on page 87], i.e. a total of \$1,165 for water and sewerage.

⁷ Refer to page 15 of the NSW Government's submission of May 2011 on the Productivity Commission's Draft Report 'Australia's Urban Water Sector, April 2011' (available at www.pc.gov.au and <http://www.water.nsw.gov.au/Urban-Water/default.aspx#draft>). Such a tariff is also recommended by the Productivity Commission's Report No. 55 on Australia's Urban Water Sector.

The typical residential bill (TRB) is the principal indicator of the overall cost for a water or sewerage system. It is the bill paid by a residential customer using the LWU's average annual residential water supplied (refer also to pages 27 and 30). As noted on page 5, the real increase in the Statewide water supply TRB has been limited to 12% over the past 18 years and is now similar to country Victoria and the National Median and lower than all the reported results for the other Australian states and the capital city utilities except for Melbourne. As noted on page 6, the real TRB for water and sewerage was \$1,165 and has increased by 13% over this period [pages 33, 17, 66, column 13 on page 80].



Social – health

Population served - the NSW Government's Country Towns Water Supply and Sewerage (CTWSS) Program (www.water.nsw.gov.au) has assisted the NSW local water utilities in achieving the present high levels of water supply and sewerage coverage⁸ and the resulting public health and environmental protection for the urban population in regional NSW:

- water supply 98.0% coverage (1.81 million population served)
- sewerage 95.6% coverage (1.69 million population served).

Australian Drinking Water Guidelines (ADWG) 2011

A **priority** issue for all water supply utilities is preparing and implementing a risk-based drinking water management system in accordance with *NSW guidelines for drinking water management systems*, NSW Health and Office of Water, 2013. This is required from 1 September 2014 under the *Public Health Act 2010*.

A further **high priority** for each NSW local water utility is to provide a drinking water supply which:

1. Complies with ADWG for microbiological quality (health related).
2. Complies with ADWG for chemical quality (health related).
3. Maintains the microbiological⁹ and chemical drinking water quality through providing appropriate water supply and treatment infrastructure and carrying out the necessary operation and maintenance activities. These include adjusting treatment processes in response to changes in raw water characteristics and regular inspections of service reservoirs⁹ in order to detect and repair any defects in the reservoir roof, wall or vermin proofing which may allow contamination of the stored water by birds, vermin or windblown material.
4. Maintains effective disinfection of the utility's water supply distribution system (including a minimum free chlorine residual of about 0.2 mg/L throughout the distribution system).

Guidance on items 3 and 4 above is available on pages 10 and 277 of the *2012-13 NSW Water Supply and Sewerage Benchmarking Report*.

In view of their importance for ensuring public health protection, any failures to achieve microbiological compliance in the last 2 financial years or any 'boil water alerts' in the last 18 months, the corrective action implemented and whether it was successful must be reported in your LWU's annual Action Plan to Council [note 4 on page 74]. Refer also to Item 2 on page 26.

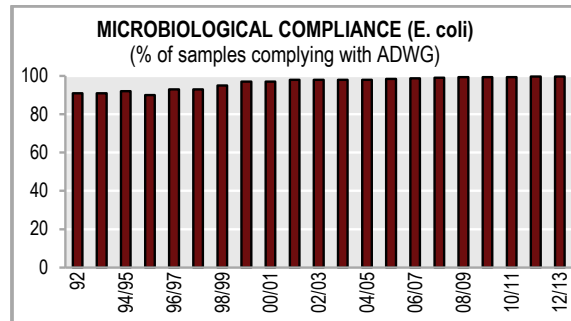
Assistance available: urbanwater@water.nsw.gov.au or (02) 8281 7321 or your Regional Water and Sewerage Treatment Officer (refer to page 35 of the *NSW Benchmarking Report*).

⁸ The systematic provision of backlog sewerage services for unsewered small towns under the NSW Government's CTWSS Program has increased the sewerage coverage to 95.6% of the urban population, compared to 92.3% in 1996.

⁹ While a boil water alert will be necessary to protect the community, for example if a LWU's raw water sources become highly turbid due to major flooding, over 80% of recent boil water alerts in regional NSW were found to be avoidable through appropriate maintenance and chlorine residuals (page 10 of *2012-13 NSW Benchmarking Report*). LWUs need to follow the NSW Health response protocol if E. coli bacteria is found, or if there is failure of the disinfection system, or disinfection is otherwise ineffective e.g. due to poor treated water quality. [<http://www.health.nsw.gov.au/environment/water/Pages/nswhrp-microbiological.aspx>].

The basis for assessing drinking water quality compliance is set out in section G4.6 on page 94.

Microbiological compliance for *E. coli* (health related) - of the 19,000 samples tested for *E. coli* in 2012-13, 99.7% complied with 2011 NHMRC/ NRMCC Australian Drinking Water Guidelines (2011 ADWG), which was similar to the other Australian utilities [page 67]. However, only 98% of LWUs complied for microbiological quality, which is the primary health related indicator and is a **high priority** for each LWU.



There were 2 non-complying LWUs, Clarence Valley (73% of population received a complying supply) and Brewarrina (79% of population received a complying supply). The result for Clarence Valley was affected by three major floods, as well as defects in bird-proofing of the 21 ML MacLean reservoir, allowing birds and windblown material to enter the stored water [refer to page 10 of the Benchmarking Report]. In view of the very long Clarence Valley distribution system, a permanent rechlorination system has been installed at MacLean and pumping will no longer be undertaken during such major floods. The box on page 7 provides information to assist LWUs to achieve microbiological compliance [Figure 5 on page 37, column 8 on page 80].

Chemical compliance (health related) - of the 4,200 samples tested, 98.5% complied with the 2011 ADWG for chemical water quality [Figure 4 on page 36, column 7 on page 80] while 100% of LWUs complied with ADWG for chemical quality. Chemical compliance is also a **high priority** for each LWU.

Physical compliance - of the 4,200 samples tested, 99.2% complied with the 2011 ADWG for physical water quality (aesthetic) and 100% of LWUs complied with ADWG for physical water quality [Figure 12 of the 2012-13 NSW Water Supply and Sewerage Benchmarking Report].

In 2012-13, the water supply for 99.9% of the urban population in regional NSW complied with 2011 ADWG for both microbiological and chemical water quality [Figures 4 and 5 on pages 36 and 37, columns 7, 8 and 8b on page 80].

Over the past twelve years microbiological compliance has ranged from 97% to 99.7%, and chemical compliance has ranged from 95% to 99.6%.

For LWUs with a number of separate water treatment works or sewage treatment works, the 2012-13 compliance with drinking water quality guidelines and EPA licence conditions have been pro-rated based on the number of samples tested for each treatment works. The full 2012-13 results for each of the 241 LWU water treatment works/chlorinators are disclosed in Appendix D1 of the *Benchmarking Report* available on the Office of Water website. Appendix D2 of the *Benchmarking Report* discloses the full 2012-13 results for each of the 290 LWU sewage treatment works.

Table 12 of the *Benchmarking Report* shows the LWUs with a risk-based drinking water quality management system and those that had their system externally assessed. Commencing in reporting for the 2014-15 financial year, such plans will need to comply with the *NSW guidelines for drinking water quality management systems, 2013* and to be independently audited in order to comply with the *Public Health Act 2010* and to report 'Yes' for 'Externally Assessed – NWI Indicator H5'.

A summary of sampling requirements under 2011 ADWG is provided on page 225 of the *Benchmarking Report*. Each LWU should ensure that it adheres to the sampling frequencies specified in Part 3 of ADWG and to the NSW Health advice of the required sampling frequency for each of the utility's water sources.

Social – levels of service

Sewage odour complaints - median 0.7 per 1000 properties [pages 67 and 39]. Odour complaints, which are a key sewerage system performance indicator, have remained low over the past 19 years.

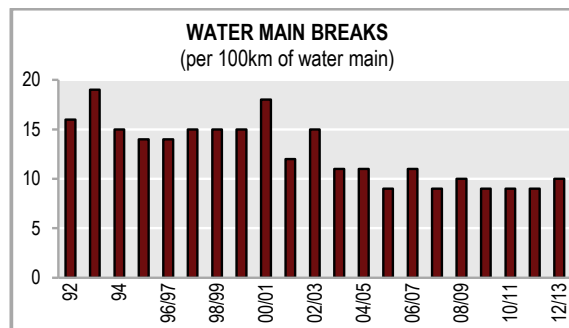
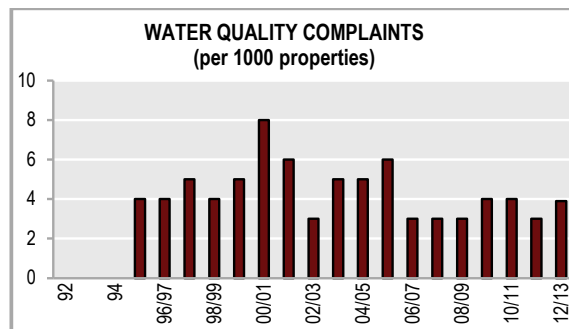
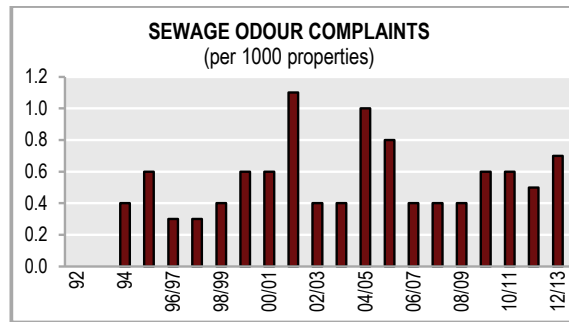
Sewerage service complaints – median was 6 per 1000 properties [Figure 44 of the *Benchmarking Report*]. Service complaints have fallen from 20 to 6 over the past 18 years.

Water quality complaints – median was 4 per 1000 properties, similar to the other Australian utilities [pages 67 and 80, Figure 6 on page 38].

Water service complaints – median was 4 per 1000 properties [Figure 19 of the *Benchmarking Report*].

Water quality complaints have fallen from a maximum of eight to four over the past 18 years while service complaints have decreased from seven to four. As indicated above, drinking water quality has improved over this period due to the commissioning of new water treatment facilities and improved operation and maintenance by LWUs.

Water main breaks – median was 10 per 100km of main. This has remained much lower than all other Australian states and capital city utilities, indicating good water main asset condition [pages 17, 67 and 80 and Figure 20 of the *Benchmarking Report*].

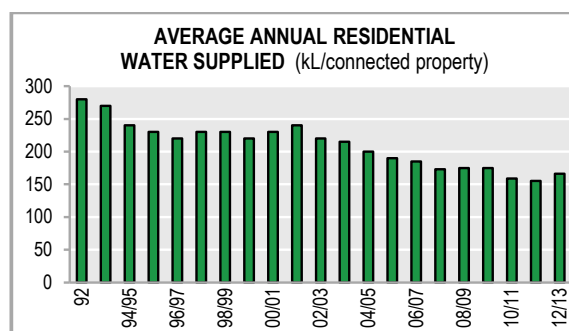


Environmental – water usage and reuse

Average annual residential water supplied

The Statewide median ‘average annual residential water supplied’ was 166 kL/connected property, which has fallen by 50% over the past 22 years [pages 5, 17 and 68, Figure 8 on page 40, column 3 on page 80, column 14b on page 84].

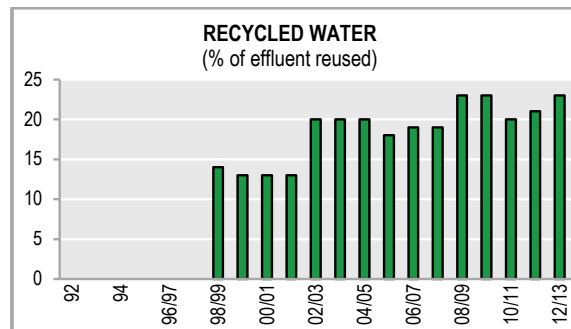
Note that for inland water utilities the hotter and drier climate, together with the use of evaporative cooling, results in significantly higher residential water usage than coastal utilities. Water restrictions also affect this value. The weighted median ‘average annual residential water supplied’ for the inland utilities was 257 kL/connected property while the weighted median for coastal utilities was 160 kL/property [Figure 9 on page 41].



Water conservation – 94% of LWUs have implemented a sound water conservation plan [column 3 on page 77], which is important for minimising wastage and reducing our environmental footprint. The water conservation measures implemented by each LWU are disclosed in Table 8C of the *2012-13 NSW Water Supply and Sewerage Benchmarking Report*.

Recycled water - 84% of LWUs carried out re-use of effluent, mostly for agriculture [Figure 13 on page 45, column 12 on page 80]. The total volume of water recycled in the 2012-13 financial year was 40,000 ML. This was 23% of the total volume of sewage collected, compared to 14% in 1998-99.

24% of LWUs recycled over 50% of their effluent. The highest volume recycled by one utility was 5,500 ML (Wagga Wagga) and a further seven utilities (Albury, Bathurst, Dubbo, Goulburn Mulwaree, Orange, Shoalhaven and Tamworth) each recycled over 1,000 ML. The demand for recycled water in 2012-13 remained stable as a result of the return to moderate rainfall conditions (108% of the long term median - page 2). Refer also to pages 18 and 69.

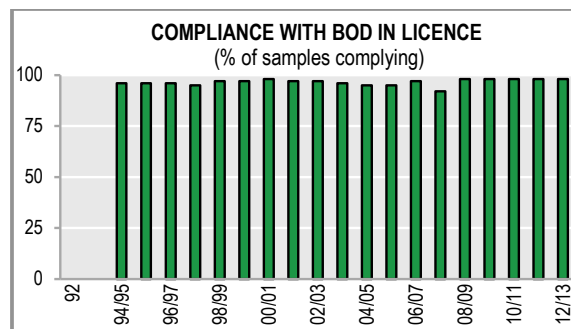


Real losses (leakage) – the Statewide median real water loss is 60 L/connection/d, which is lower than the National Median of 79 L/connection/d [pages 18, 68 and 80]. (Refer also to Figure 26 of the 2012-13 NSW Water Supply and Sewerage Benchmarking Report). As indicated in note 8 on page 31, 77 LWUs have recently carried out water loss management, including leakage testing, analysis and leakage reduction. The Regional NSW Water Loss Management Program [footnote 24 on page 31] has resulted in reductions in the average water losses for the 68 participating LWUs from 154 to 92 L/connection/d, or from 16% to 10% of the potable water supplied, a total saving of 5,500 ML/a.

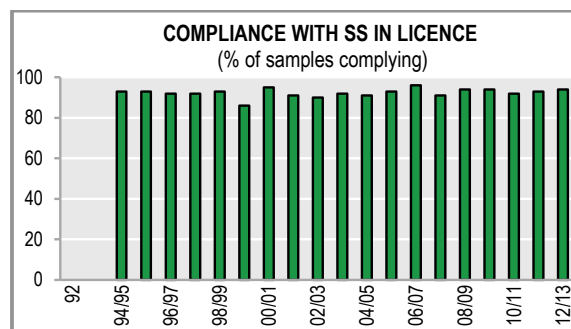
Environmental – effluent management

Sound sewerage and trade waste pricing and regulation is an essential pre-requisite to the effective and efficient management of a sewerage system. Refer to the NSW Framework for Regulation of Sewerage and Trade Waste on page viii and pages 22, 15 and 98.

Sewage effluent quality (BOD) – 98% of the 3,984 sampling days complied with the 90-percentile limits of the Environment Protection Authority (EPA) licences for Biochemical Oxygen Demand (BOD) and 89% of utilities complied with the 90-percentile limit of their BOD licence [page 69, Figure 10 on page 42]. Over the past 19 years Statewide compliance for BOD has ranged from 92% to 98%. Over this period, licence limits for both BOD and Suspended Solids (SS) have become more stringent for many LWUs.



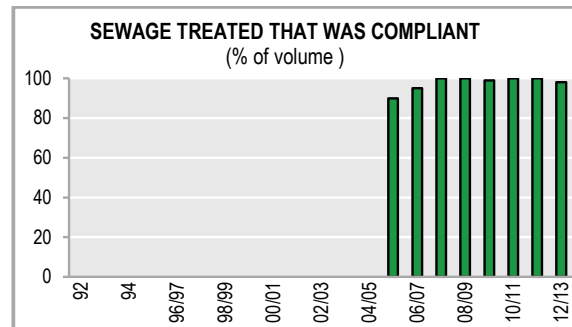
Sewage effluent quality (SS) – 94% of the 3,984 sampling days complied with the 90-percentile limits of the EPA licences for SS and 78% of utilities complied with 90-percentile limits of their SS licence [page 69, Figure 11 on page 43]. Over the past 19 years Statewide compliance for SS has ranged from 90% to 96%. The major cause of non-compliance is the growth of algae in maturation ponds being measured as SS.



Greenhouse gas emissions – total greenhouse gas emissions was 400 tonnes per 1000 properties, which is similar to the National Median [page 18, Figure 15 on page 47 and page 70].

Biosolids reuse – median LWU reuse of biosolids was 100% in 2012-13. This has increased from 43% in 1998-99 [page 69 and Table 15 of the *2012-13 NSW Water Supply and Sewerage Benchmarking Report*]. As noted on page 10, 23% of the total sewage volume collected was recycled.

Sewage volume treated that was compliant – median LWU sewage volume treated that was compliant was 98%, up from 90% 7 years ago [Figure 14 on page 46 and pages 70 and 80].



Sewer main breaks and chokes – median was 38 per 100 km of main [page 70 and Figure 12 on page 44]. This has fallen from 75 to 38 over the past 21 years, partly as a result of revision of the national definition for this indicator in 2009-10. However, the NSW result is significantly higher than the National Median of 19 [page 70].

Sewer overflows reported to the environmental regulator – the Statewide median is 0.8 per 100km of main, which is higher than the National Median of 0.4 [pages 70 and 80]. However, as results are dependent on the requirements of each state’s regulator, it is not directly comparable across jurisdictions.

Economic – financial

Economic real rate of return – median was:

- 0.7% for water supply
- 0.6% for sewerage

The economic real rate of return (ERRR) for water supply and sewerage was 0.8% [page 19, Figure 16 on page 48, pages 71 and 80]. This has declined over the past 18 years and was lower than country Victoria, the National Median and the capital city utilities. The 2001-2010 Millenium Drought and the high rainfalls in 2010-11 and 2011-12 (pages 4 and 2) had adversely impacted water supply and sewerage ERRRs. [Figures 17 and 18 on pages 49 and 50, column 19 on page 80, column 12 on page 84, column 11 on page 87].

Full cost recovery - as indicated in Figures 17 and 18 on pages 49 and 50, full cost recovery was achieved by:

- 100% of utilities for water supply; and
- 96% of utilities for sewerage.

There remain four sewerage utilities which are not achieving full cost recovery [Figure 18 on page 50]. The basis for achieving long-term financial sustainability of water supply and sewerage services in regional NSW is discussed in Appendix G on page 84 of the *2010-11 NSW Performance Monitoring Report* (www.water.nsw.gov.au).

Each LWU should continue to review its annual water, sewerage and trade waste tariffs, its developer charges, its operation, maintenance and administration costs, and its projected volume of water to be supplied to customers and the resulting revenue in order to ensure it achieves full cost recovery. This will ensure the utility meets this key requirement of the *Best-Practice Management Guidelines* (http://www.water.nsw.gov.au/ArticleDocuments/36/town_planning_water_utilities_best-practice_management_of_water_supply_and_sewerage_guidelines_2007.pdf.aspx) and the *National Water Initiative*. Further guidance on achieving full cost recovery and on assessing infrastructure renewal needs are provided in the boxes on pages 12 and 3 respectively.

ACHIEVING FULL COST RECOVERY FOR WATER SUPPLY

Some NSW utilities have been using a long-term financial model requiring input of water supply access and usage charges and projected volumes of water supplied to determine the required future revenue. A number of these utilities have experienced significant revenue shortfalls in recent years as a result of reduced water sales due to more efficient water use by residents, above average rainfall and/or drought water restrictions.

Accordingly, it is recommended that utilities do not use models involving access and usage charges in order to avoid such revenue shortfalls as well as potentially misleading customers on the required future access and usage charges. Rather, utilities should use a model such as the NSW Financial Planning Model (FINMOD – refer to pages 131 and 132 of the NSW Strategic Business Planning Guidelines – link below) which determines the required future typical residential bill and annual revenue in current dollars.

Your utility can then set each year's water supply tariff in accordance with Circular LWU 11 of March 2011 using an evidence based estimate of the residential water to be supplied in the next financial year, together with the access and usage charges required to yield the Typical Residential Bill and annual revenue in accordance with your 20 to 30-year financial plan.

Such an approach is transparent as the financial modelling discloses the required Typical Residential Bill (and annual revenue) in current dollars as required by Items 1 and 16 of the Check List in Appendix F of the *NSW Water and Sewerage Strategic Business Planning Guidelines, July 2011* (http://www.water.nsw.gov.au/ArticleDocuments/36/utilities_nsw_water_sewerage_strategic_planning_guidelines.pdf.aspx).

In addition, annually setting your water supply tariff in accordance with Circular LWU 11 will minimise the risk of revenue shortfalls while maintaining Typical Residential Bills in accordance with your LWU's financial plan. Assistance is available from the Office of Water (urbanwater@water.nsw.gov.au or (02) 8281 7321).

Each LWU which meets all the requirements of the *Best-Practice Management Framework* is encouraged to pay a dividend from the surplus of its water and sewerage businesses to the council's general revenue. A LWU which pays such an 'efficiency dividend' will be moving towards **upper bound pricing**, which is required under the National Water Initiative, where practicable.

Refer also to:

- page 6, which notes that the NSW Government and the Productivity Commission encourage all LWUs to use a 2-part tariff with a uniform water usage charge per kL for all water use;
- the box on page 5, which highlights the strategic benefits of the strong NSW pricing signals, and the resulting efficient water use and affordable typical residential bills; and
- note 3 on page 73, which indicates that comparing your Typical Residential Bill (TRB) with the projection in your Strategic Business Plan is **mandatory in preparing your annual Action Plan to Council**. If you are not achieving full cost recovery, you will need to review and increase your TRB in order to do so.

Revenue (revenue less grants for capital works) [columns 4 and 9 on page 80 and page 77]

Total revenue was \$1220M comprising:

- \$640M for water supply and \$580M for sewerage.

Net debt to equity - the median net debt to equity was:

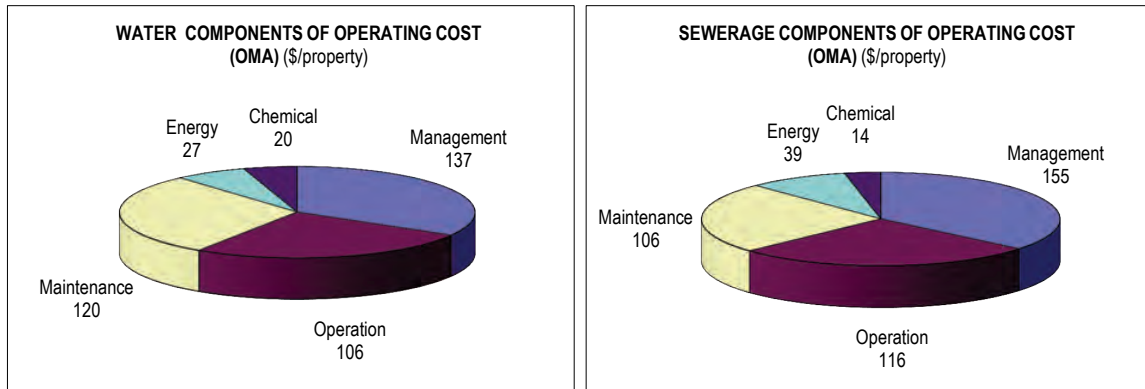
- 0% for water supply and 4% for sewerage.
- Net debt to equity for water supply and sewerage was 1% [column 19a on page 80, page 71]. Refer also to the box above and to footnote 10 on page 13.

Economic – efficiency

Operating cost per property – the median operating cost (OMA)* per connected property was:

- Water Supply - \$410 per property [Figure 19 on page 51]
- Sewerage - \$430 per property [Figure 20 on page 52]

* OMA – Operation, maintenance and administration



The median operating cost for water supply of \$410/property was lower than Brisbane, Melbourne, the country utilities in all the other Australian states and the National Median, but higher than the other capital city utilities. The median operating cost for sewerage of \$430/property was similar to the National Median but higher than country Victoria and the capital city utilities. Refer also to pages 19, 71 and 51.

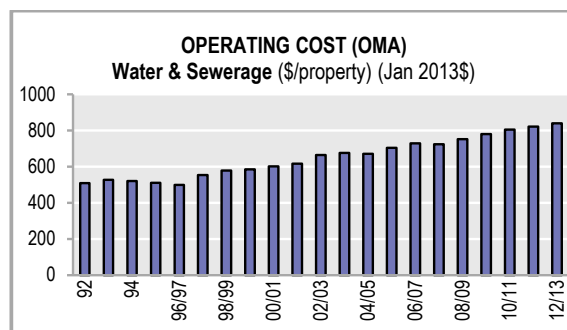
Increased borrowing

Utilities facing significant capital investment are encouraged to make greater use of borrowings¹⁰ to reduce their required Typical Residential Bill (TRB). As most water and sewerage assets are long-lived (eg. water mains have an economic life of 80 years [page 3]), **20-year loan terms are recommended** in order to avoid placing an unfair financial burden on existing customers and to facilitate inter-generational equity (urbanwater@water.nsw.gov.au or (02) 8281 7321).

Refer also to section 12 of the *NSW Water and Sewerage Strategic Business Planning Guidelines, July 2011* (http://www.water.nsw.gov.au/ArticleDocuments/36/utilities_nsw_water_sewerage_strategic_planning_guidelines.pdf.aspx).

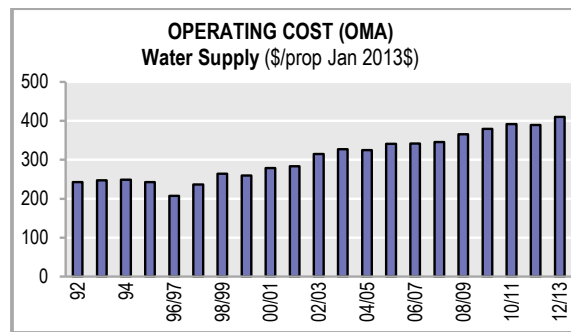
Operating cost (OMA) – \$840/property for water supply and sewerage [column 17 on page 80]. This has increased from \$514 to \$840 (Jan 2013\$) over the past 21 years, largely due to more stringent standards for sewage treatment and to increasing management costs.

LWUs with higher operating costs than the above medians should carefully examine their operations to determine whether they can improve their cost-effectiveness [page 27].



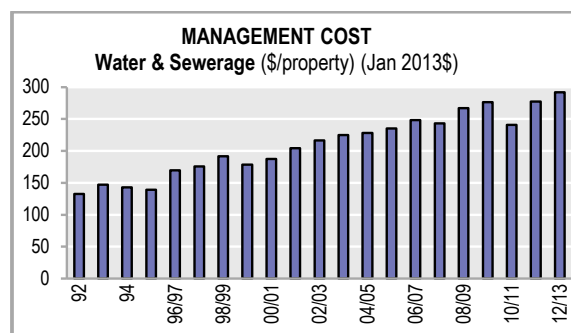
¹⁰ It is important to note that most NSW LWUs have relatively little borrowings at present. In **2012-13** the Statewide median net debt to equity for LWU water and sewerage was 1% (range -32% to 25%). The **2012-13** net debt to equity for major Australian utilities include 100% for Sydney Water, 141% for ACT Electricity and Water, 188% for Melbourne Water, 130% for Yarra Valley Water, 69% for Queensland Urban Utilities, 54% for Water Corporation (WA) and 75% for Hunter Water (*National Performance Report 2012-13 for Urban Water Utilities*). Refer also to page 71. Providing your utility has a soundly based asset management plan and financial plan (including sensitivity analysis), net debt to equity of up to 50% when financing a major capital works program for growth and/or improved levels of service, would be satisfactory for NSW LWUs.

Water supply operating cost – the median water supply operating cost was 133 c/kL (Jan 2013\$). This has risen from 93 c/kL over the past 18 years largely due to the reduced volume of water supplied per property and higher management costs [Figure 21 on page 53, column 6 on page 84].



Sewerage operating cost – the median sewerage operating cost was 189 c/kL (Jan 2013\$). This has risen from 98 c/kL over the past 18 years due to more stringent standards for sewage treatment, reduced sewage volumes and increasing management costs [column 2 on page 87 and Figure 62 of the 2012-13 NSW Water Supply and Sewerage Benchmarking Report].

Management cost – the median management cost was \$292/property for water supply and sewerage [column 18 on page 80]. The management cost per property has increased from \$166 to \$292 (Jan 2013\$) over the past 21 years. The median management cost per property for water supply was \$137 [Figure 22 on page 54]. The median management cost for sewerage was \$155 [Figure 23 on page 55].



Treatment cost – the median treatment cost per property was:

- \$56 for water treatment*
- \$138 for sewerage treatment (including chemical and energy costs).

* Only the 70 utilities with water treatment works involving at least filtration and disinfection for over 50% of their supply have been considered.

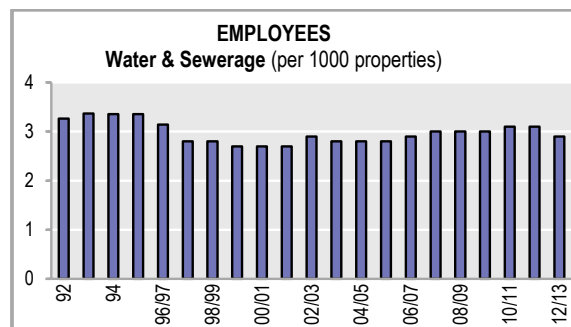
Pumping cost – the median pumping cost per connected property (including energy) was:

- \$36 for water supply
- \$80 for sewerage.

Water main and sewer main cost – the median water and sewer main cost per connected property was:

- \$71 for water mains
- \$50 for sewer mains.

Number of employees – the median number of employees was 2.9 per 1000 properties for water supply and sewerage, which was lower than the last reported values for country Victoria, Sydney and Hunter. This indicator has fallen from a maximum of 3.3 over the past 21 years. Each LWU's results are shown on Figures 8 and 39 of the 2012-13 NSW Water Supply and Sewerage Benchmarking Report. Refer also to the final two paragraphs of section 5.3 on page 29.



Water supply employees per 1000 properties has fallen by over 15% from a maximum of 1.7 to 1.4.
Sewerage employees per 1000 properties has fallen by over 15% from a maximum of 1.8 to 1.5.

Software, guidelines and training

Comprehensive software and guidelines to assist LWUs in developing appropriate water supply and sewerage strategic business plans, financial plans, community involvement¹¹, water supply tariffs, sewerage tariffs, liquid trade waste fees and charges, developer charges, asset management plans (capital works plan, operation plan and maintenance plan), asset valuation¹², integrated water cycle management (IWCM), water conservation and demand management, drought management, assessing future urban water security, greenhouse gas calculation and trade waste regulation policies continue to be available from the NSW Office of Water.

In addition, the NSW Government provides accredited training for water utility operators in water treatment, wastewater treatment, fluoridation, dam safety inspection and trade waste regulation.

(urbanwater@water.nsw.gov.au or (02) 8281 7321).

National Certification Framework for Water Treatment Operators

Appendix I of the *2012-13 NSW Benchmarking Report* discloses that the 91 NSW LWUs responsible for providing water treatment[#] have a total of 281 fully qualified water treatment operators* to operate the 154 LWU water treatment works and 87 chlorinators/aerators. In addition, a further 31 operators are qualified to operate the chlorinators and aerators[†].

Continuing professional development of operators is required, such as attending a NOW Water Treatment Update Seminar at least every 3 years. The above 312 operators meet the requirements of the National Certification Framework for Water Treatment Operators.

[#] Excludes the 9 LWUs responsible for sewerage only (page ii), reticulators Cootamundra, Harden, Queanbeyan and Young, and Cobar Water Board which provides a bulk raw water supply.

* Such operators have a Certificate III in Water Operations (Water Treatment) or equivalent and are employed in operating a LWU treatment works or a chlorinator/aerator (refer to page 23 of *NSW Guidelines for drinking water management systems*, NSW Health and NSW Office of Water, 2013 (<http://www.health.nsw.gov.au/environment/water/Documents/NSW-Guidelines%20for-Drinking-Water-Management-Systems.pdf>)).

[†] Such operators have a NSW Office of Water Part 1 Certificate (Chemical Dosing Systems) or equivalent, have also completed chlorine safety training and are employed in operating a LWU chlorinator/aerator (refer to page 23 of *NSW Guidelines for drinking water management systems*).

¹¹ NSW Water and Sewerage Community Involvement Guidelines – Consultation draft, October 2012, NSW Office of Water (available on request from urbanwater@water.nsw.gov.au).

¹² NSW Reference Rates Manual for Valuation of Water Supply, Sewerage and Stormwater Assets, 2014, NSW Office of Water (www.water.nsw.gov.au).

3. Interstate comparisons

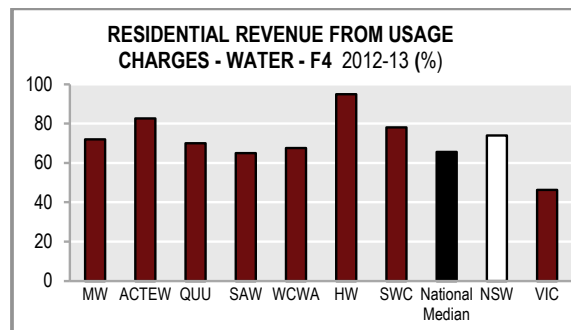
To provide an overall assessment of NSW Local Water Utilities (LWUs), the key performance indicators are compared below with those reported by interstate utilities¹³. For detailed graphs on interstate performance comparisons over the past 21 years and an explanation of the utility abbreviations, refer to Appendix A¹⁴ on page 64.

It is noted that many performance indicators are significantly affected by the density of development (i.e. the number of properties served per km of water main or sewer main), which for country utilities such as the NSW LWUs and country Victoria is significantly lower than the capital city utilities [page 65]. Also, the performance of smaller utilities such as the NSW LWUs and the other country utilities is adversely affected by a lack of economy of scale¹⁵.

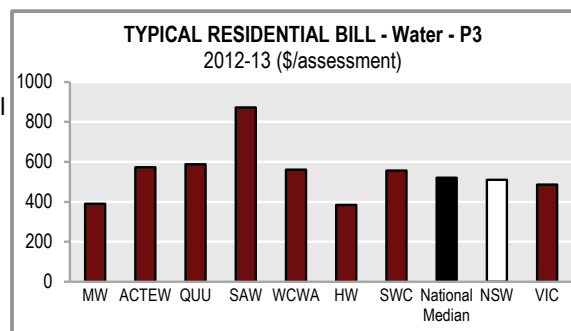
Social

Compliance with microbiological water quality guidelines for NSW LWUs was high (99.7% of the 19,000 samples tested) and similar to most other Australian utilities [pages 67, 37 and 80]. Also, **water quality complaints** of 4 per 1000 properties were low and similar to most other Australian utilities [pages 67, 38 and 80].

The NSW LWUs are continuing to provide strong pricing signals through their **residential revenue from usage charges** of 74% (NWI Indicator F4), which was higher than country Victoria, the National Median [note 9 on page 65] and all the reported results for the other Australian states and the capital city utilities except for Sydney and Canberra [pages 66, 5, 56 and 84].



Typical residential bill (TRB) is the principal indicator of the overall cost of a water supply or sewerage system. It is the bill paid by a residential customer using the utility’s average annual residential water supplied. The median **water supply TRB** for the NSW LWUs (NWI Indicator P3) is now similar to country Victoria and the National Median and lower than all the reported results for the other Australian states and the capital city utilities except for Melbourne [pages 66, 5, 37 and 84].

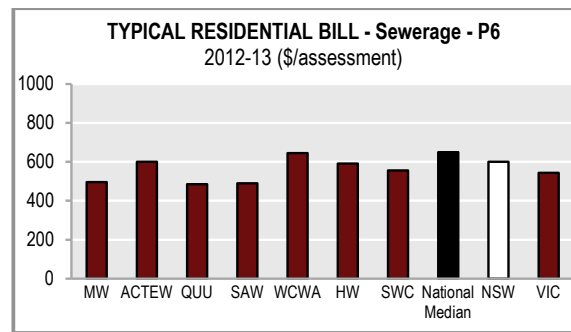


¹³ Queensland Urban Utilities (QUU) commenced operation in July 2010 to provide water supply & sewerage services to the former customers of Brisbane Water and 4 neighbouring councils (note 3 on page 65). Refer also to the legend and notes 9 and 10 on page 65.

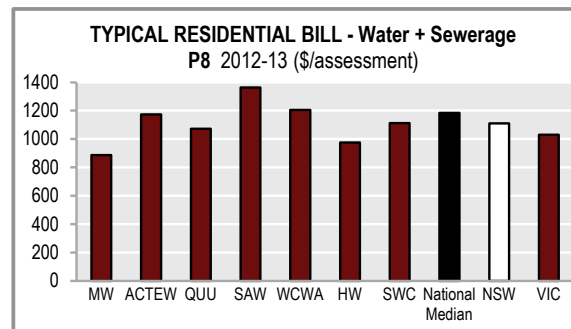
¹⁴ Note 10 on page 65 explains why Hobart and Darwin have not been included in the comparisons. Although Notes 4 to 7 on page 65 indicate that Statewide results for the country utilities are only available for Victoria and NSW, it is possible to also compare the results for country NSW and country Victoria with the reported results for country utilities for a few key NWI Indicators such as F4, P3, P8, A8 and W12 above. This has been done using the reported results for 9 country utilities in Queensland, 2 country utilities in South Australia and 7 country utilities in Western Australia in the *National Performance Report 2012-13 for Urban Water Utilities* (www.nwc.gov.au).

¹⁵ The lack of economy of scale and the lower development density in small towns result in a **capital cost per property** for providing water supply trunk mains to a town of 300 properties being typically over **3 times** that required for servicing a contiguous city of 15,000 properties. The capital cost per property for other structures such as water treatment works, service reservoirs, pumping stations and dams is similarly affected. This highlights the importance of Government financial assistance towards the capital cost of servicing backlog areas (e.g. footnote 8 on page 7) and why appropriate standards should be used, such as those in the *National Handbook on Affordable Water Supply and Sewerage for Small Communities, ARMCANZ/WSAA, 1999* (available on request from urbanwater@water.nsw.gov.au).

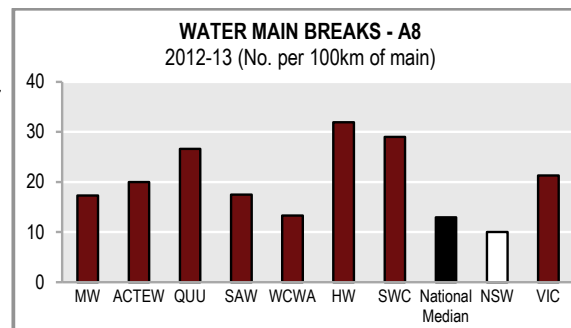
The median **sewerage TRB** for the NSW LWUs (NWI Indicator P6) was lower than the National Median, Canberra and Perth, but higher than country Victoria and the other capital city utilities [pages 66, 35 and 87].



The median **water and sewerage TRB** for the NSW LWUs (NWI Indicator P8) was lower than the National Median and all the other Australian states and capital city utilities, except for country Victoria, Melbourne and Brisbane [pages 66, 7, 33 and 80]. However, the first step **water usage charge** for NSW LWUs of 208 c/kL and the **residential revenue from usage charges** (Indicator F4 on page 16) are relatively high and provide strong pricing signals to encourage efficient water use [pages 66 and 5].

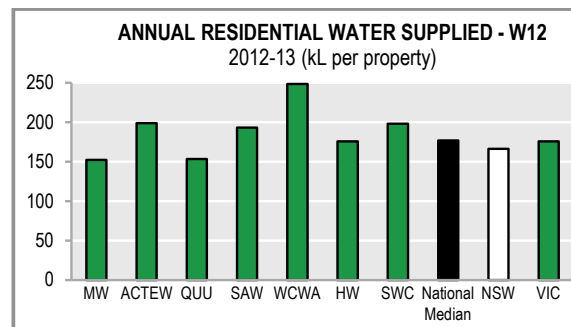


Water main breaks of 10 per 100 km for the NSW LWUs (NWI Indicator A8) have remained much lower than all the reported results for the other Australian states and the capital city utilities, indicating good water main asset condition [pages 67, 9 and 80 and Figure 20 of the *Benchmarking Report*].

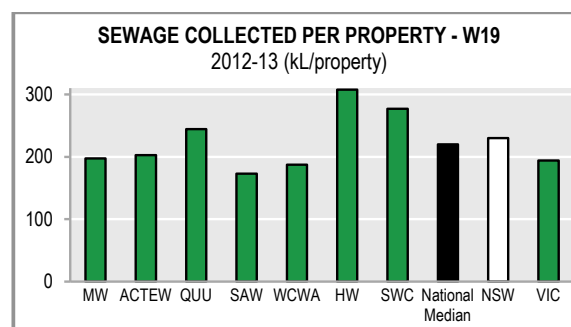


Environmental

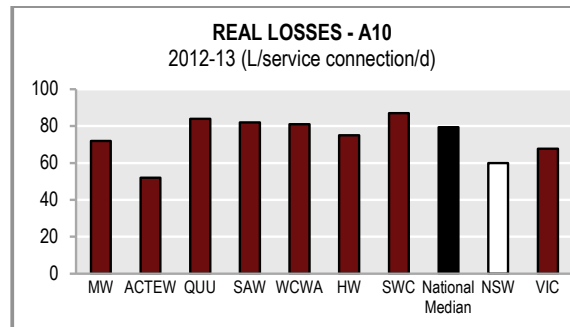
Annual residential water supplied (NWI Indicator W12) was 166 kL per connected property, which was lower than country Victoria, the National Median and all the reported results for the other Australian states and capital city utilities except for Melbourne and Brisbane [pages 68, 9, 40 and 80].



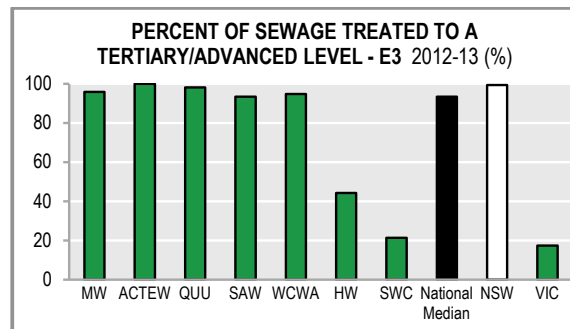
The **sewage collected per property** of 230 kL (NWI Indicator W19) was lower than Sydney and Brisbane, but higher than country Victoria and the other capital city utilities [page 68 and Table 15 of the *Benchmarking Report*].



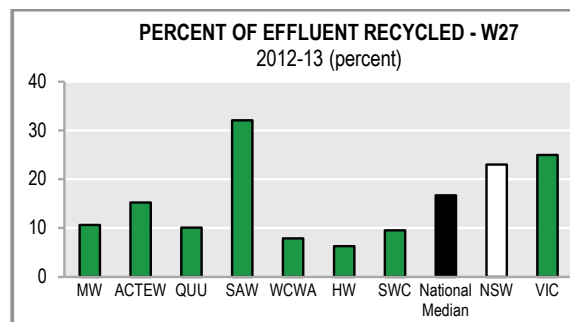
Real losses (leakage) of 60 L/connection/d (NWI Indicator A10) were lower than country Victoria, the National Median and all of the capital city utilities except Canberra [pages 68, 10 and 80 and Figure 26 and Tables 8A, 10 and 10A of the *Benchmarking Report*].



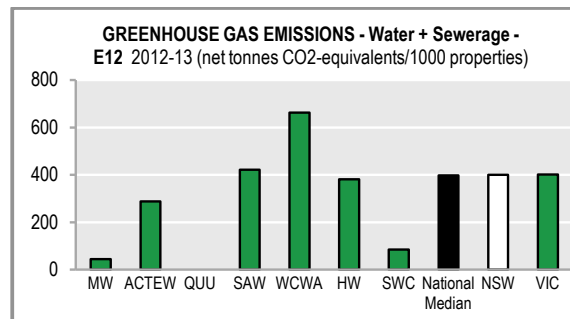
The **percentage of sewage treated to a tertiary level** of 100% (NWI Indicator E3) was the same as Canberra and Brisbane but higher than country Victoria, the National Median and the other capital city utilities [page 68 and Table 15 of the *Benchmarking Report*].



In total, 40,000 ML of **effluent** was **recycled** in regional NSW in 2012-13, which was 23% of the volume of sewage collected. This percentage (NWI Indicator W27) was lower than country Victoria and Adelaide, but higher than the National Median and the other capital city utilities [pages 69, 10, 45 and 80].



Total **greenhouse gas emissions** (NWI Indicator E12) was 400 tonnes per 1000 properties [pages 70 and 47], which was similar to the National Median, country Victoria and Adelaide, lower than Perth, but higher than the other capital city utilities.

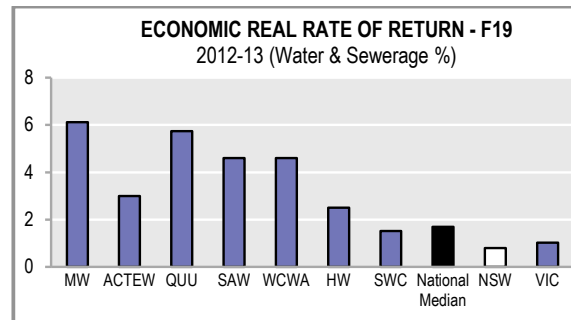


The **percent sewage treated that was compliant** (NWI Indicator E4) of 98% was similar to the National Median and most of the capital city utilities [pages 70, 11, 46 and 80 and Table 15 of the *Benchmarking Report*].

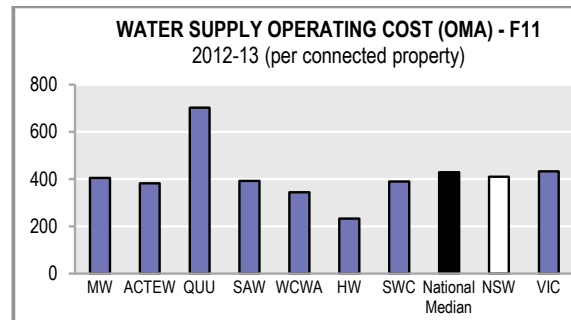
Sewer overflows reported to the environmental regulator (NWI Indicator E13) of 0.8 per 100 km of main were higher than the National Median [pages 70, 11 and 80 and Table 15 of the *Benchmarking Report*], as were the **sewer main breaks and chokes** (NWI Indicator A14) of 38 per 100 km of sewer main [pages 70, 11 and 44].

Economic

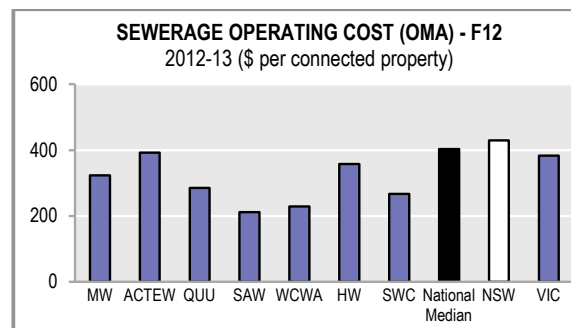
Economic real rate of return for water supply and sewerage (NWI Indicator F19) of 0.8% [pages 71, 11, 48 and 80] was lower than country Victoria, the National Median and the capital city utilities.



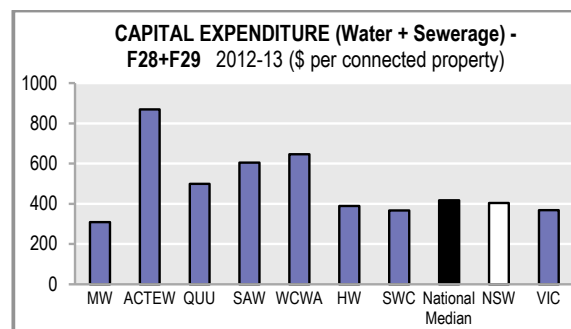
Annual median operating cost (OMA) for water supply (NWI Indicator F11) was \$410 per connected property [pages 71, 13 and 51], which was lower than Brisbane, Melbourne, the National Median and the country utilities in all the other states but higher than the other capital city utilities. Water and sewerage OMA costs are shown on page 80.



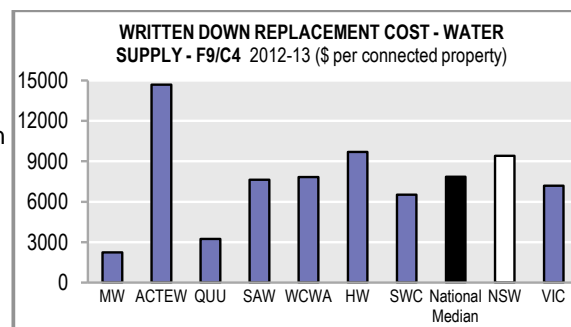
The median operating cost for sewerage (NWI Indicator F12) was \$430 per connected property [pages 71, 13 and 52], which was higher than country Victoria, the National Median and the capital city utilities.



Water and sewerage capital expenditure per property (NWI Indicators F28 + F29) of \$404 [page 72 and column 19b on page 80] was higher than country Victoria, Sydney and Melbourne but lower than the National Median and the other capital city utilities.



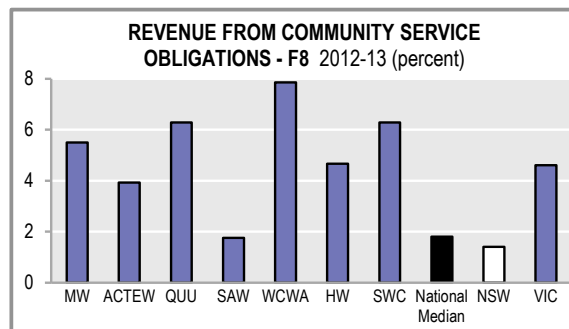
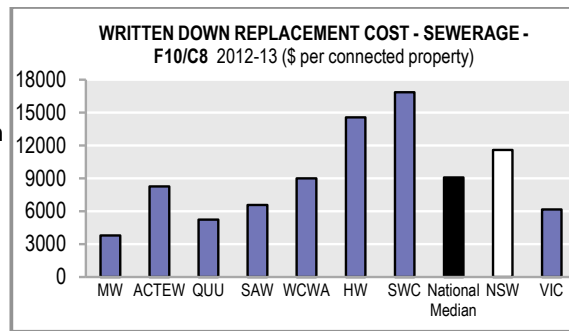
Written down replacement cost per property for water supply (NWI Indicator F9/C4) of \$9,400 [page 72 and Table 11 of the *Benchmarking Report*] was higher than country Victoria, the National Median and all the capital city utilities except Canberra.



Written down replacement cost per property for sewerage (NWI Indicator F10/C8) of \$11,600 [page 72 and Table 16 of the *Benchmarking Report*] was higher than country Victoria, the National Median and all the capital city utilities except Sydney.

Net Debt to equity (NWI Indicator F22) of 1% [pages 71, 12 and 80] was lower than country Victoria, the National Median and all the capital city utilities. Refer also to footnote 10 on page 13 and Table 5A of the *Benchmarking Report*.

Revenue from community service obligations (NWI Indicator F8) of 1.4% [page 72 and Table 5A of the *Benchmarking Report*] was lower than country Victoria, the National Median and all the capital city utilities.



4. Best-practice management

4.1 Best-Practice Management Framework

The NSW Government’s Best-Practice Management of Water Supply and Sewerage Framework (page viii (www.water.nsw.gov.au)) actively encourages continuing improvement in performance of all NSW urban water utilities through sound planning, pricing and management of services. It is based on the Best-Practice Management of Water Supply and Sewerage Guidelines (www.water.nsw.gov.au), which were updated in August 2007. The Framework addresses the 9 key national requirements (page viii) and is the key driver for reform of planning and management and for continuing performance improvement by each utility.

Implementing the 19 planning, pricing and management requirements of the Framework will enable each utility to achieve appropriate, affordable, cost-effective and sustainable piped water supply and sewerage services. In addition, in order to pay a dividend from the surplus of its water supply and sewerage businesses or to seek financial assistance towards the capital cost of backlog infrastructure under the Country Towns Water Supply and Sewerage program, a utility must demonstrate such implementation.

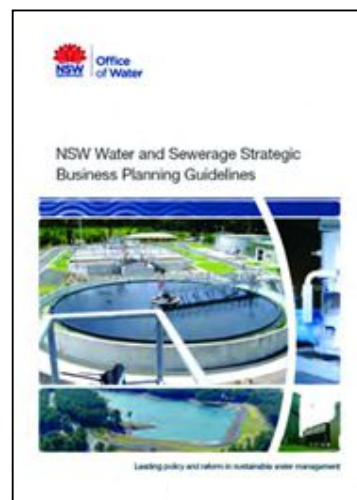
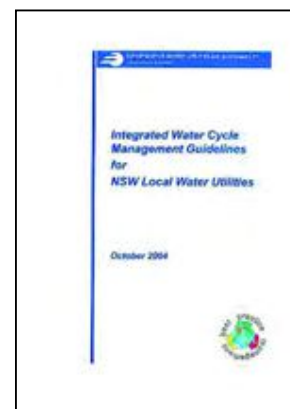
All utilities are expected to implement the above requirements (Appendix C on page 77), which involve the following six interrelated elements:

1. Integrated Water Cycle Management
2. Strategic business planning
3. Pricing and regulation of water supply, sewerage and trade waste
4. Water conservation and demand management
5. Drought management
6. Annual performance monitoring

1. **Integrated Water Cycle Management (IWCM)** is a comprehensive framework for identifying a utility’s 30-year Strategy for water supply, sewerage and stormwater which provides the best value for money on the triple bottom line (TBL) basis of social, environmental and economic considerations. The IWCM Strategy needs to identify the best mix of capital works, non-build solutions, policies and operation and maintenance activities. Note that the 19 Best-Practice Management requirements aid the development of such a strategy through the required sound planning, pricing and management of services.

Seven IWCM information sheets are available on the Office of Water website to provide guidance for LWUs on developing a sound IWCM evaluation and IWCM strategy. Refer also to pages 98 and 15.

2. **Strategic business planning.** The community and governments are demanding increased accountability, increased levels of services and increased efficiency from water utilities. In addition, regulatory authorities are imposing more stringent environmental and health regulations. The LWU’s strategic business plan, which should be made available on the utility’s website (e.g. page 73), facilitates sound asset management by addressing these issues and providing a framework within which the utility needs to negotiate appropriate levels of service with the community and develop its 30-year asset management plan. This involves a

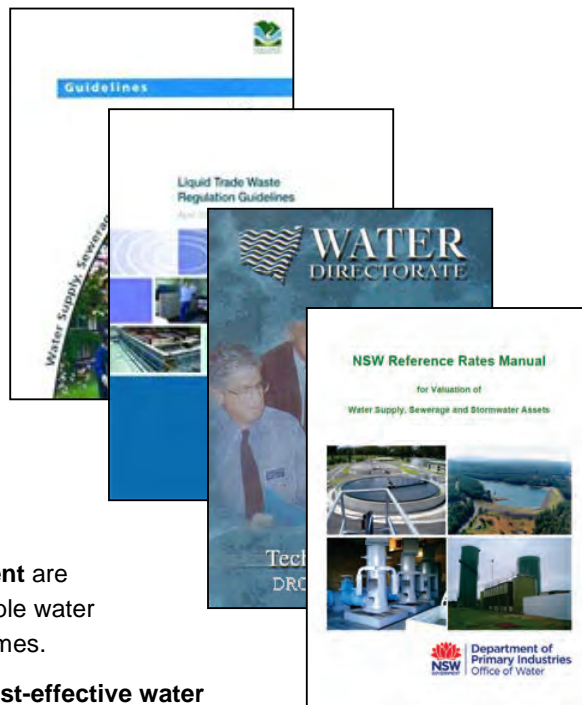


cost-effective capital works program¹⁶ which discloses each of the growth, improved standards and renewals [box on page 3] components, together with a sound operation plan and maintenance plan. The **strategic business plan is a utility's peak planning document for water and sewerage** and must include the utility's proposed levels of service, asset management plan and a sound 20 to 30-year financial plan which identifies the resulting Typical Residential Bill (in current dollars) over this period. Refer also to pages 3 to 5.

The *Local Government Integrated Planning and Reporting Framework, 2010* has been designed to complement and avoid duplication with the *Best-Practice Management of Water Supply and Sewerage Guidelines*. The inter-relationship of this Framework with the Best-Practice Management Guidelines is shown on pages 4, 95 and 99 of the *NSW Water and Sewerage Strategic Business Planning Guidelines, July 2011* (http://www.water.nsw.gov.au/ArticleDocuments/36/utilities_nsw_water_sewerage_strategic_planning_guidelines.pdf.aspx).

3. **Pricing and regulation of water supply, sewerage and trade waste.** Best-practice pricing and regulation are fundamental to the effective delivery of water supply, sewerage and trade waste services, resulting in fair pricing of services, removal of significant cross-subsidies and protection of our valuable water resources and the environment. The strong pricing signals thus provided encourage both efficient water use by all users and compliance with discharge limits and waste minimisation by commercial and industrial dischargers. Refer also to the boxes on pages 5 and 12.

The NSW Office of Water has published comprehensive *Water Supply, Sewerage and Trade Waste Pricing Guidelines 2002* and *Liquid Trade Waste Regulation Guidelines 2009* (http://www.water.nsw.gov.au/ArticleDocuments/36/town_planning_water_utilities_liquid_trade_waste_guidelines.pdf.aspx). In addition to providing guidance for best-practice pricing and regulation by LWUs, these documents emphasise the need for appropriate pricing. Such pricing meets the key national requirements (page viii). The comprehensive software and guidance provided for LWUs are noted on page 15. Refer also to pages 23 and 97.

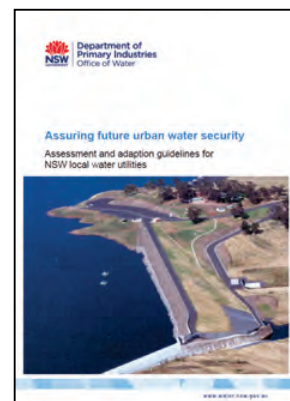


4. **Water conservation and demand management** are essential for ensuring efficient use of our valuable water resources and to improve environmental outcomes.

Each LWU should develop and implement a **cost-effective water conservation plan**, which includes consideration of:

- active intervention – e.g. retrofit programs, rebates for water efficient appliances or rainwater tanks and building code programs (including BASIX);
- water pricing reform (Element 3 above), community education and water loss (i.e. leakage) reduction programs (page 10).

5. **Drought management** is a fundamental responsibility of the LWU for ensuring continuity of supply. This needs to be documented in a drought management plan with an adopted schedule of trigger points for timely



¹⁶ I.e. fit for purpose and without wasteful 'gold plating'. Refer also to the 5th paragraph of page 95.

implementation of appropriate drought water restrictions and supplementary water sources.

6. **Annual performance monitoring** is required under National Competition Policy and the National Water Initiative and is essential for monitoring and improving performance and for public accountability.

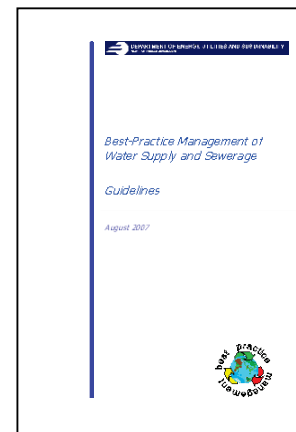
Each LWU should continue to lodge its data on the NSW Performance Monitoring Database by 15 September each year [column 5 (water) and 3 (sewerage) on page 77]. Each LWU should also review its annual TBL Performance reports prepared by the Office of Water and provide a sound Action Plan to Council, addressing any emerging issues or areas of under-performance [page 26].

Guidance for councillors on quickly understanding and using your TBL Performance Report and Action Plan is provided in Appendix G of the *NSW Water and Sewerage Strategic Business Planning Guidelines, July 2011* (www.water.nsw.gov.au). This appendix will also assist the water and sewerage manager in preparing a sound Action Plan to Council.

4.2 Implementation of framework

Water utilities are required to report whether they have implemented each of the 19 planning, pricing and management requirements of the *Best-Practice Management Framework* (ten for water supply and nine for sewerage – page viii) in Notes 2 and 3 of the Special Purpose Financial Statements of their 2012-13 Annual Financial Statements. The current implementation of the requirements is shown in Appendix C on page 77.

As noted on page vii, the overall level of implementation of the above requirements was 90%, comprising 91% for water supply and 88% for sewerage. 45% of the utilities have implemented all the requirements for water supply and 52% have implemented all the requirements for sewerage [page 77 and Figures 25, 26, 27 on pages 57, 58, 59].



- **Strategic business plan & financial plan** – As shown on page 4, 92% of LWUs have a sound 20 to 30-year strategic business plan, financial plan and asset management plan [column 21 on page 80].
- **Pricing and cost recovery** - All LWUs now have both pay-for-use water supply pricing and full cost recovery for water supply, while 96% have both appropriate pricing and full cost recovery for sewerage [column 2a on page 77]. As noted on page eleven, all LWUs have full cost recovery for water supply and 96% have full cost recovery for sewerage.
- **Residential revenue from usage charges** - 73% of utilities have achieved the requirements [column 2c on page 77]. This includes 27 utilities (59%) with 4,000 or more connected properties [75%/25% split] and 41 utilities (87%) with fewer than 4,000 connected properties [50%/50% split].
- **Non-residential charges** - 97% of LWUs have appropriate non-residential water supply charges [column 2d on page 77] while 78% have appropriate non-residential sewerage charges [column 2c on page 77].
- **DSP and developer charges** - 84% of LWUs have an appropriate water supply Development Servicing Plan (DSP) with commercial developer charges and 82% of LWUs have a sewerage DSP [column 2e on page 77].
- **Liquid trade waste policy, fees and charges** - 84% of LWUs have an appropriate liquid trade waste regulation policy and have issued a liquid trade waste approval to all their trade waste dischargers [column 2f on page 77]. As noted on page 6, 79% of LWUs have appropriate liquid trade waste fees and charges [column 2d on page 77].
- **Water conservation plan** - As noted on page 9, 94% of LWUs have implemented a sound water conservation plan [column 3 on page 77].

- **Drought management plan** - As noted on page three, 94% of LWUs have implemented sound drought management [column 4 on page 77].
- **IWCM strategy** - 77% of LWUs reported that they have commenced their IWCM evaluation or strategy [columns 6 and 4 on page 77]. As noted on page 79, 67 LWUs have completed an IWCM Evaluation, 35 of which have also completed an IWCM Strategy.

4.3 Eligibility for payment of a dividend

Appendix C on page 77 indicates that only 2% of the utilities are proposing to pay a dividend from the surplus of their water supply or sewerage businesses.

Following an update of the *Best-Practice Management Guidelines* in 2007, the utilities' continuing efforts have resulted in a steady increase in the level of implementation of the 19 planning, pricing and management requirements of the *Guidelines* and the *Best-Practice Management Framework* (page viii). As noted on page 23, 45% and 52% of the NSW utilities are now eligible to pay a dividend for water supply and sewerage, respectively. These utilities have appropriate, affordable, cost-effective and sustainable piped water supply and sewerage services.

As noted in the final paragraph in the box on page 12, each utility which has implemented all the requirements of the Framework is encouraged to pay an 'efficiency dividend' from the surplus of its water supply and sewerage businesses to the council's general revenue.

4.4 Climate variability

The NSW Government is tackling the challenge of the impact of climate variability on regional local water utilities by developing climate variability guidelines¹⁷ which build on the existing robust¹⁸ **NSW Security of Supply basis** for sizing of urban water supply headworks. The new guidelines will be informed by the results of a pilot study¹⁹ on 11 existing water supplies in regional NSW. A Climate Change Steering Group involving the National Water Commission, CSIRO, Local Government NSW, the NSW Water Industry Directorate, NSW Public Works and the NSW Office of Water is responsible for overseeing the pilot study and the development of the guidelines. The guidelines and a comprehensive report on the pilot study are proposed for release in 2014.

The NSW Security of Supply basis for sizing water supply headworks was developed in response to the experiences and lessons learnt from the severe 1979-1983 drought. This basis for sizing headworks is commonly referred to as the "**5/10/10 rule**" and is designed to maintain water supply to customers with only moderate water restrictions during a more severe drought than had been experienced over the previous 100 or more years. Refer also to the box on page 4.

The pilot study has developed a sound basis for NSW LWUs to assess the impact of future climate variability on the secure yield of their urban water supply. The impact is influenced by the location of the LWU and the utility's headworks system.

Future 30-year IWCM strategies will need to include assessment of the secure yield of the utility's water supply in accordance with the new climate variability guidelines.

¹⁷ Assuring future urban water security: Assessment and adaptation guidelines for NSW local water utilities, NSW Office of Water, 2014 (www.water.nsw.gov.au).

¹⁸ *Impacts of the 2001-2007 Drought and Climate Change on Security of Water Supplies in Country NSW* – Peter Cloke, NSW Public Works and Sam Samra, NSW Office of Water, Institution of Engineers Australia, *32nd Hydrology and Water Resources Symposium*, Newcastle, December 2009 (available on request from urbanwater@water.nsw.gov.au).

¹⁹ *NSW Response for Addressing the Impact of Climate Change on the Water Supply Security of Country Towns* – Sam Samra, NSW Office of Water and Peter Cloke, NSW Public Works, Institution of Engineers Australia, *Practical Responses to Climate Change National Conference*, Melbourne, October 2010 (available on request from urbanwater@water.nsw.gov.au).

5. TBL reports and action plans

5.1 Triple bottom line (TBL) performance reports

The NSW Office of Water provides each utility and IPART with an annual triple bottom line (TBL) performance report for the utility's water supply business and for its sewerage business (a sample report is shown on pages 75 and 76).

Each LWU's annual TBL performance report provides a brief description of the LWU's water supply or sewerage system together with a summary of the LWU's performance for over 50 key performance indicators. The TBL reports also disclose whether the LWU has implemented each of the ten water supply and nine sewerage requirements of the *Best-Practice Management Framework*.

Each TBL report groups the above performance indicators under Characteristics, Social, Environmental and Economic factors. For each indicator, the LWU's result is shown together with the Statewide & National medians, the ranking of the LWU's result against all LWUs and also the ranking against similar sized LWUs. These rankings aim to assist each LWU to gain a quick appreciation of its relative performance. The rankings are based on quintile groupings, with the top 20% of LWUs for each indicator being ranked 1 and the bottom 20% being ranked 5 (LWUs in the range 40% to 60% are ranked 3).

LWUs will appreciate that each of the performance indicators is a 'partial' indicator only and therefore cannot be interpreted in isolation. It is also emphasised that the rankings are indicative only and do not take account of the wide range of factors which can impact on a LWU's performance, as discussed in section 5.3 on page 28. The aim of providing a ranking for each LWU's performance is to assist the LWU in quickly identifying any areas of apparent under-performance in comparison with similar sized LWUs.

The second page of the TBL reports provides graphs with the LWU's performance and Statewide medians over the past 10 years for 15 key indicators. These graphs enable the LWU to review trends over time for each indicator, which provide the most meaningful assessment of performance.

Each LWU needs to review its performance using its annual TBL performance reports for water supply and sewerage and to provide an Action Plan to Council which addresses any emerging issues or areas of under-performance, as outlined in section 5.2 below.

In addition, following the review of its TBL Performance Report, each LWU should review and update its total asset management plan and 20 to 30-year financial plan. A brief report²⁰ to Council should be provided on the updated financial plan. Any necessary corrective action must be noted in the Action Plan to Council (Item 4 of page 26).

5.2 Review performance and preparation of an action plan

Each utility should aim to provide the levels of service negotiated with its community at the lowest sustainable typical residential bill. This is done by setting cost-reflective developer charges, non-residential charges and liquid trade waste fees and charges, and then minimising the Typical Residential Bill (TRB) on a sustainable basis. Utilities which have implemented the *Best-Practice Management Framework* and wish to pay an 'efficiency dividend' [box on page 12] to the Council's general revenue should also include the dividend amount.

Each LWU is required to prepare an annual Action Plan to Council (page 26), based on its review of the TBL performance report and its updated financial plan. The Action Plan should address any areas of under-performance and should also document any target dates for remedial actions. It should also report results for the financial year for the key actions set out in the utility's Strategic Business Plan.

²⁰ An example report to Council on the updated financial plan is provided in Appendix H of the *NSW Water and Sewerage Strategic Business Planning Guidelines, July 2011* (http://www.water.nsw.gov.au/ArticleDocuments/36/utilities_nsw_water_sewerage_strategic_planning_guidelines.pdf.aspx).

PREPARATION OF AN ACTION PLAN

The steps that each LWU should follow to review performance and prepare an annual action plan are:

1. **Check level of implementation of BPFM** and highlight requirements which have not been implemented. Any such requirements must be addressed as a priority in order to achieve sound planning, pricing and regulation of services by each LWU.
2. **Review performance** using the indicators shown on the first page of the TBL performance report for each of water supply and sewerage (example TBL report on pages 75 and 76). Particular note should be taken of indicators that appear to be less than satisfactory i.e. with a ranking of 4 or 5.
3. **Identify any trends** over the past ten years in the selected performance indicators shown on the second page of the TBL performance report, and compare the latest values with the Statewide median values and the top 20%. In undertaking a review of indicators and trends in performance, LWUs should take note of the many factors that may contribute to the apparent under-performance (section 5.3 on page 28).
4. **Update Financial Plan** Annually update your total asset management plan (page 25) and input the results, together with your latest annual financial statements to prepare an update of your 20 to 30-year financial plan (page 25). Include any warranted corrective action in your Action Plan.
5. **Prepare Action Plan** Use the Action Plan template provided to your LWU together with your TBL reports. Example review and Action Plan is provided on pages 73 and 74 as the basis for your Action Plan. Consider any emerging issues and address areas of under-performance and document remedial actions (with target dates). Review targets set out in your Strategic Business Plan (SBP) (particularly whether this year's **TRB** is consistent with the projection in your SBP and any corrective action required from the above update of your 20 to 30-year financial plan (section 5.1 on page 25) and document appropriate actions. In particular, your Action Plan must report any failures in achieving **microbiological compliance**²¹ with ADWG in the last 2 financial years, as well as the corrective action implemented and whether this has been successful. Similarly, if any 'boil water alerts' were issued in the last 18 months, these should be reported, as well as the corrective action implemented and whether this has been successful. Refer also to the box on page 7.

Examples of 'emerging issues' which should be addressed in your utility's IWCM Strategy include:

- What is your secure yield based on the "5/10/10 rule" (NSW Security of Supply Basis)?
- What is the impact of climate variability on water supply secure yield (section 4.4 on page 24)?
- Has your IWCM Strategy addressed 'liveability'²²? A circular to assist LWUs is proposed for issue in mid 2014.

If further analysis is warranted (e.g. if the ranking of the performance indicator is low and remains unexplained or other factors suggest apparent under-performance), then steps 6 and 7 below may also be required.

6. Compare selected performance indicators with those of similar utilities in a similar size range using the Figures showing performance trends for four utility size ranges over the past six years in the Benchmarking Report (provided on the Office of Water website www.water.nsw.gov.au). Where in-depth investigation is warranted for selected indicators, the LWU can also undertake process benchmarking.
7. Process benchmarking for selected indicators for areas of apparent under-performance, e.g. where the LWU has a low ranking (ie. 4 or 5) relative to LWUs with similar characteristics.

²¹ Refer to section G4.6 of Appendix G on page 94.

²² Water supply, sewerage and stormwater systems can contribute to the 'liveability' of towns and cities, including watering of parks, gardens and playing fields and the use of water sensitive urban design to encourage the greening of urban areas and healthy urban creeks and waterways. Appropriate financial contributions from the beneficiaries of such 'broader solutions' (eg. a large water user or Council's Planning, Parks & Gardens, Stormwater &/or Roads functions) should be included in the IWCM Strategy.

A key role for the annual Action Plan is to ‘**close the planning loop**’ with the utility’s strategic business plan. The utility’s **TRB** must therefore be compared with the projection in its strategic business plan and any necessary corrective action documented in the Action Plan (box on page 12 and note 3 on page 73).

An example Action Plan is shown on pages 73 and 74. In order to assist LWUs, the NSW Office of Water will continue to provide a template for each LWU’s Action Plan together with the annual TBL reports for each LWU. The template will show your LWU’s results, the drivers for each indicator and the ranking relative to similar sized LWUs followed by the ranking relative to all LWUs. Space is provided for the LWU to indicate its proposed actions and its findings (the right hand column on pages 73 and 74).

In order to prepare an Action Plan, it will be necessary for each LWU to review its performance. In practice this means reviewing whether the performance indicators under ‘Health’, ‘Levels of Service’, ‘Environmental’ and ‘Economic’ are satisfactory, taking into account factors that may affect performance outlined in section 5.3. If the indicators are unsatisfactory, the LWU will need to develop options to improve performance.

It is important to note that the **typical residential bill** is the **principal indicator of the overall cost** of a water supply or sewerage system and is the annual bill paid by a residential customer using the utility’s average annual residential water supplied [section 1.3 on page 1 and note 4 on page 30]. A critical element in minimising the typical residential bill and providing value for money for the community is to ensure that the operating cost (OMA) is efficient. Each LWU therefore needs to carry out an ongoing review of the components of its operating cost. Particular attention is required for components with a low ranking (ie. 4 or 5).

The components²³ of operating cost highlight the significant differences that can arise depending on the type of infrastructure (eg. whether a bulk storage dam is provided or whether the utility has a groundwater supply) and the type of service (eg. pumped vs gravity, full treatment vs chlorination). Components are:

Management cost – includes administration, engineering and supervision and is typically almost 40% of the total operating cost [Figures 22 and 23 on pages 54 and 55].

Treatment cost (water) – dependent on the type and quality of the water source and the extent of treatment provided. There are great economies of scale for the operation of water treatment works.

Treatment cost (sewage) – dependent on the type of treatment and the discharge requirements. Where discharge licence conditions are stringent (eg. low levels of phosphorus), treatment costs will be high. There are significant economies of scale for operation of treatment works.

Pumping cost (water) – dependent on topography and the location of the water source. For example, Essential Energy has a high pumping cost due to the long distance required to pump from the water source, while Fish River is almost a fully gravitational supply, with negligible pumping costs. There are significant economies of scale in pumping cost per property.

Pumping cost (sewage) – dependent on topography. There are significant economies of scale in pumping cost per property.

Energy cost – for water supply, this is mainly a consequence of pumping requirements. Energy cost may be reduced by maximising pumping in off-peak periods or by obtaining a competitive energy rate from the energy supplier (e.g. maximising off-peak pumping has provided annual savings in energy costs of over \$200,000 for a number of large water supplies).

For sewerage, energy cost is a component of pumping and treatment costs. Significant cost savings may be available by optimising energy use in the treatment process (e.g. such

Refer also to Recommendation 10 of the National Water Commission’s report on *Urban Water in Australia Future Directions 2011* (www.nwc.gov.au).

²³ Figures 31 to 37, Figures 60 to 66 and Tables 11, 13, 16 and 18 of the *2012-13 NSW Water Supply and Sewerage Benchmarking Report* report these components for each LWU.

optimising of energy use has provided annual savings of over \$100,000 for a number of large sewage treatment works).

Water and Sewerage mains cost – this is dependent on the age and condition of the mains, the ground conditions and the number of connected properties per kilometre of mains.

5.3 Factors affecting performance

Many factors impact on a water utility's performance and make comparison of utilities a complex analysis. These factors include the extent of the services provided by each utility, geography, climate etc. An understanding of these factors is vital for valid interpretation of performance data.

The most meaningful indicators are the trends over time for each utility. However, even with these, care needs to be exercised due to changes in the factors over time. For comparison between utilities, each utility should benchmark its performance with utilities having similar characteristics. An example of some of the factors affecting performance of a utility's water supply system are outlined below.

Location

1. **Climate** – the variability of rainfall is a key driver of water supply costs in relation to water demand and water supply security during droughts. This will affect both capital and operating costs. For example, the average annual residential water supplied in inland NSW is approximately 60% higher than coastal NSW [page 9 and Figure 9 on page 41].
2. **Geography** – The geology, geography and topography can have a significant effect on water and sewage transportation costs, particularly with pumped systems compared to gravity systems.
3. **Water Resources Availability and Proximity** - Bulk storage and/or long water transfer mains and channels can incur significant capital and operating costs [note 10 on page 32]. Such costs would not apply for utilities relying on a nearby groundwater source or those receiving a regulated supply from a State Water dam.

Utility characteristics

4. **Asset Life Cycle** – Recently constructed systems have much lower maintenance and renewals costs compared to older systems. Refer also to the box on page 3.
5. **Development density** – Distribution networks are a major investment component of a water supply system. The density of urban development has a large effect on the infrastructure cost (e.g. the number of properties served per km of main varies in regional NSW from 2 to over 70). A further key factor is the number of small discrete urban water supply systems operated by the utility which tend to greatly increase the operating cost per property. Refer also to footnote 15 on page 16.
6. **Size of LWU** – there are significant economies of scale for large utilities, particularly the capital cost of infrastructure and the operating cost of water treatment works.

Social – levels of service

7. **Service standards** – increasingly stringent standards for water quality and environmental health may result in additional capital and operating costs to the utility. Similarly, requirements for minimum pressures or rates of flow can also affect costs.
8. **Filtered supply** – will incur both a high capital cost per property and a high treatment cost per property for small discrete urban water supply systems (utilities without 'unfiltered' or 'groundwater' after their name in Appendices C to E have water treatment involving at least filtration and disinfection for over 50% of their water supply) [note 11 on page 32].

Environmental

9. **High residential water supplied per property** – such utilities should examine opportunities for achieving efficient water use through water demand management and providing appropriate water

pricing signals to customers including the residential water usage charge/kL (Figure 30 on page 62) and the residential revenue from water usage charges (Figure 24 on page 56). As noted on Figure 24, many utilities with 3,000 to 10,000 connected properties are providing relatively weak pricing signals to their residential customers through their water usage charges. These utilities should review their tariff structure to provide appropriate pricing signals. Assistance is available from the NSW Office of Water in this regard (page 15). Refer also to the box on page 5.

Economic

10. **High loan payment per property** – indicates a relatively high capital cost per property, recent construction of significant capital works or use of short-term loans. **Twenty-year loan terms are recommended** in order to avoid unfairly burdening existing customers and to facilitate inter-generational equity. Refer also to the boxes on pages 12 and 13.
11. **High pumping cost** – is influenced mainly by topography and geography. As noted on page 27, the LWU may be able to achieve significant savings in energy cost.

There is a strong correlation between the operating cost per property and the number of employees per 1000 properties. Refer also to pages 14 and 15.

Similar considerations to those listed in this section apply to sewerage. In addition, a significant cost impactor is whether the LWU is operating nutrient removal facilities at its treatment works or providing filtration and disinfection of its treated sewage effluent.

5.4 Benchmarking

Each LWU can improve its performance in areas of apparent under-performance by benchmarking its key work processes with those of one or two high-performing similar LWUs and implementing the best-practices thus identified. This will provide better customer service, reduced environmental impact and better value for the community.

In addition, each LWU should undertake 'Syndicate Benchmarking' with a group of LWUs with similar characteristics in order to determine current best-practice and to identify existing practices which each LWU can improve. Such process benchmarking should be highly cost-effective for all NSW LWUs.

6. General notes

1. **Triple bottom line (TBL) focus** – To provide a balanced view of the long-term sustainability of the regional local water utilities (LWUs), a triple bottom line accounting focus has been adopted, with performance reported on the basis of social, environmental and economic indicators.
2. **Data validation** – the comprehensive data validation procedures for the NSW Performance Monitoring System are shown in Appendix G on page 90. These procedures include matters such as aggregated businesses, assessments, connected properties, charges and bills, urban water supplied, operating cost and management cost, drinking water quality compliance, sewage treatment works compliance and implementation of the NSW Best-Practice Management Framework.
3. **Statewide medians** – This report refers to Statewide medians for the regional local water utilities, which are calculated on a 'percentage of connected properties' basis. These are a weighted median on the basis of connected properties and best reveal Statewide performance by giving due weight to larger LWUs and reducing the effect of smaller LWUs. LWU rankings on a 'percentage of LWUs' basis are also provided where appropriate (e.g. for comparison of LWUs in the 'Ranking' columns of the two-page TBL Performance Report (example in Appendix B on page 75)).
4. **Typical residential bill (TRB)** – The typical residential bill per assessment is the annual bill paid by a residential customer using the LWU's average annual residential water supplied and is the **principal indicator of the overall cost of a water supply or sewerage system**. Pensioners pay a lower amount due to the \$87.50 pensioner rebate as do owners of vacant lots as they pay no water usage charges. Refer also to pages 27 and 7.

Calculation of TRB – The 2013-14 typical residential bill is based on a customer of the LWU's principal water supply or sewerage system using the LWU's 2012-13 average annual residential water supplied per connected property. Refer also to section G4.3 on page 93. These bills and tariff details are shown in Appendices E and F on pages 84 and 87. The typical residential bill for 2012-13 and previous years is based on the reported average annual residential water supplied for that year (2012-13 residential water supplied is shown in column 3 of Appendix D on page 80 and column 14b of Appendix E on page 84). As noted on pages 86 and 89, the charges, bills and costs shown in Appendices E and F are those applicable for the relevant financial year and involve no CPI adjustment.

5. **Average annual residential water supplied** – The average annual residential water supplied per connected property is shown in Appendix D [column 3] and includes both potable and non-potable water supplied. Where a LWU has not separately reported its residential water supplied, such volume has been estimated using the Statewide average of 57% of the LWU's total potable water supplied. As indicated in note 6 below, the potable water supplied and the total water supplied (potable + non-potable) have been separately reported for the 11 LWUs with a dual water supply. Refer also to pages 9 and 17.
6. **Dual supplies** – Eleven LWUs had a dual water supply to over 50% of their residential customers in July 2012 (i.e. with a potable supply for indoor use and a non-potable supply for outdoor use).

The total annual residential water supplied (i.e. potable + non-potable) in kilolitres per property for those LWUs with a dual water supply is shown below, together with their potable residential water supplied in brackets. These volumes were: Balranald 1,396 (351), Berrigan 441 (142), Bourke 1,056 (258), Central Darling 632 (179), Hay 966 (166), Jerilderie 1,242 (229), Murray 506 (262), Wakool 517 (146), Walgett 1,337 (721), Warren 804 (330) and Wentworth 350 (60).

The typical residential bill (TRB) has been calculated for those LWUs with a dual supply using the above volumes. The TRB for Deniliquin and Moree Plains has also taken into account the significant volumes of non-potable supply provided by these LWUs.

7. **Water losses** – For consistency with national and international performance reporting, water losses comprise *Real Losses* (mostly leakage) plus *Apparent Losses* (under-registration of customer meters and illegal use). *Unbilled Water* supplied (fire fighting and mains flushing) is not a water loss but is a component of non revenue water (NRW) (below and note 8). Real losses and NRW apply to the potable water supply only.

As noted on page 15 of the *2012-13 NSW Water Supply and Sewerage Benchmarking Report*, NWI Indicator A10 (real losses in L/connection/d) is the relevant measure for **tracking a LWU's leakage performance over time**. Each LWU's real losses (L/connection/d) are shown in column 41 of Table 10 of the *Benchmarking Report*.

Due to perverse impacts shown on page 14 of the above Benchmarking Report, it is inappropriate to track a utility's leakage as a percentage of the total water supplied. Similarly, use of Unaccounted for Water (**UFW**) is not appropriate. Rather '**Non Revenue Water (NRW)**' (L/connection/d) should be used, as recommended by the International Water Association – Reference: Kenneth J Brothers, *Assessing UFW and Variable Water Rate Impacts, Use and Loss Metrics in a Declining Water Consumption Environment*, IWA Water Loss Conference, 2012, February 2012, Manila, Philippines.

NRW (L/connection/d) is shown in column 41f of Table 10 of the *Benchmarking Report*. In addition, the 2012-13 adopted volume of NRW (NWI Indicator W10.1) and NRW as a percentage of the total potable water supplied are shown in columns 15 and 16 of Table 8A of the *Benchmarking Report*.

8. **Minimum real loss and NRW** – Further to note 7 above, the NSW Performance Monitoring System determines minimum values for each LWU's real loss and NRW as shown below.

Leakage studies for 77 NSW LWUs indicate an average leakage from potable water supply distribution systems of 3% to 15% of total potable water supplied, as shown in column 41e of Table 10 of the *Benchmarking Report*. These utilities have recently carried out a reservoir drop test, waste metering or night flow analysis to determine their real losses and opportunities for leakage reduction. Only 13 of these utilities had a real loss of under 6%. In addition, Table 10A of the *Benchmarking Report* discloses the real losses for 68 LWUs 'before' and 'after' leakage reduction under the Regional NSW Water Loss Management Program²⁴. For these LWUs, Table 10A indicates average real losses of 10% of the potable water supplied after leakage reduction.

Accordingly, a **minimum real loss** (mostly leakage) of 6% of the total potable urban water supplied (NWI Indicator W11.1) has been adopted. Reported real losses of less than 6% have only been accepted where the utility has provided evidence to support the adoption of a lower value. Where such evidence has not been provided, real losses have been increased to 6% of W11.1 and are shown in italics bold in column 8 of Table 8 of the *2012-13 Benchmarking Report*. Refer also to the final paragraph below on NRW and to the 2nd paragraph of page 10.

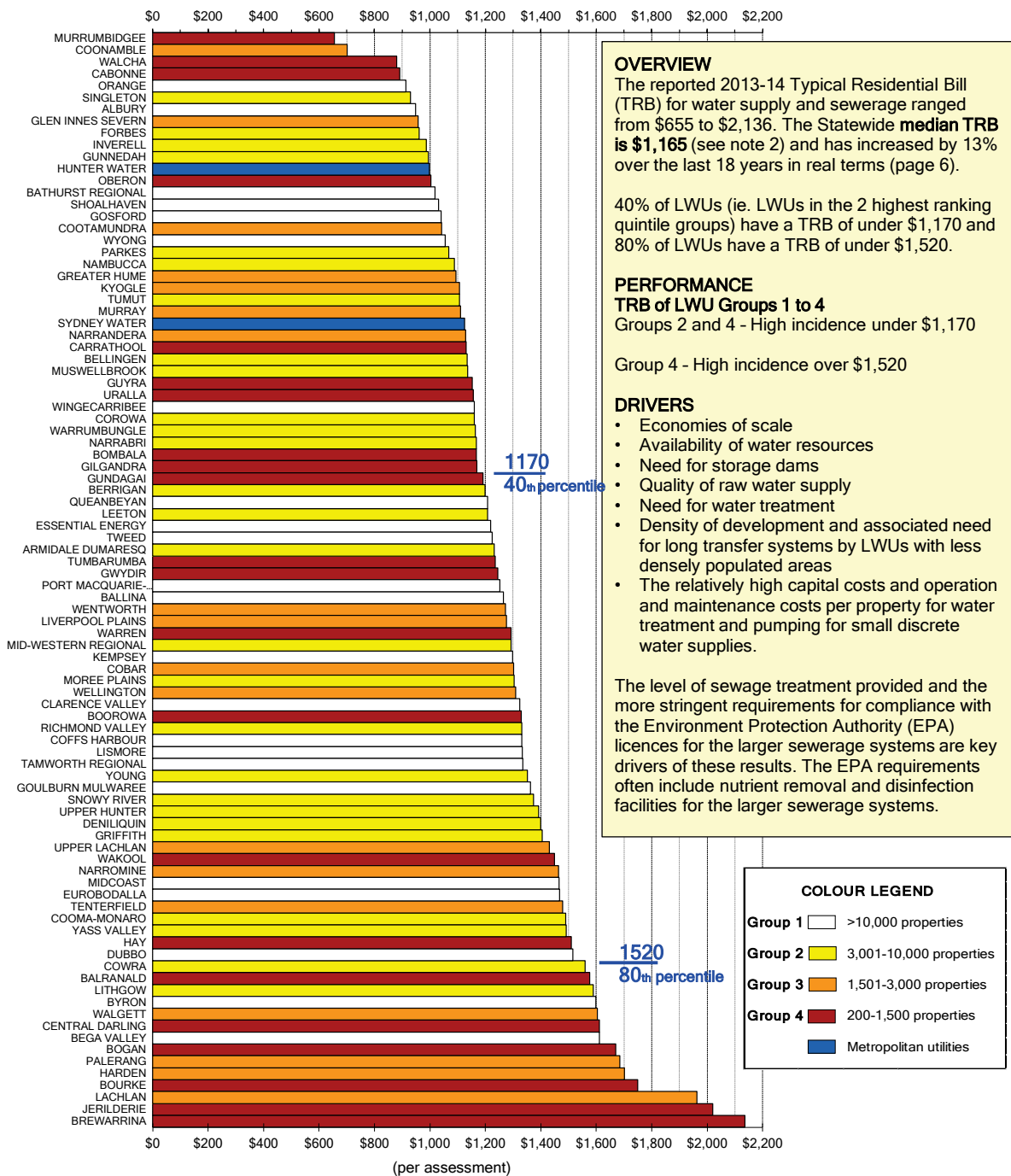
Similarly, Statewide analysis of **NRW** (*Real Losses*, *Apparent Losses* and *Unbilled Water* supplied (refer to note 7 above)) for NSW water utilities other than bulk water suppliers, indicates a minimum of 10% of the potable water supplied.

Accordingly, a **minimum NRW** of 10% of the total potable urban water supplied (W11.1) has been adopted. Where a LWU has reported NRW of less than 10% of the potable water supplied, the reported NRW has been increased to 10%, unless the LWU has provided evidence of a Real Loss of less than 6%. In such cases, the adopted value for NRW has been determined as the Real Loss plus 4%. Any increases to the real loss (above) or to the NRW (W10.1) have also been applied to W11.1. The adjusted values of the real loss, NRW (W10.1) and the total potable urban water supplied (W11.1) are shown in italics bold in columns 8, 9 and 10 of Table 8 of the *Benchmarking Report*.

²⁴ Refer to Table 10A of the *2012-13 NSW Water Supply and Sewerage Benchmarking Report*. In addition, results from the Regional NSW Water Loss Management Program (WLMP) are available at <http://www.lgsa.org.au/policy/water/water-loss-management-program>.

- 9. Sydney Water Corporation, Hunter Water Corporation and Sydney Catchment Authority** – The performance indicators for Sydney Water, Hunter Water and Sydney Catchment Authority were obtained from the *National Performance Report 2012-13 for Urban Water Utilities* (www.nwc.gov.au).
- 10. Bulk storage** – utilities that provide bulk storage dams for their water supply incur significant capital and operating costs for these facilities, resulting in a higher typical residential bill and operating cost per property (refer to Item 3 on page 28). The following 45 regional utilities provided such bulk storage: Armidale, Ballina, Bathurst, Bega Valley, Bourke, Brewarrina, Byron (Mullumbimby), Cabonne, Central Tablelands, Clarence Valley, Cobar, Coffs Harbour, Essential Energy, Eurobodalla, Fish River, Glen Innes-Severn, Gosford, Goulburn Mulwaree, Guyra, Inverell, Kempsey, Kyogle, Lachlan, Leeton, Lithgow, MidCoast, Mid-Western Regional, Moree Plains, Orange, Palerang, Parkes, Port Macquarie-Hastings, Richmond Valley, Rous, Shoalhaven, Tamworth, Tenterfield, Tweed, Upper Hunter, Upper Lachlan, Uralla, Warrumbungle, Wingecarribee, Wyong, Yass Valley. Details of each utility's major sources of water are shown in Table 5B of the *2012-13 NSW Benchmarking Report*.
- 11. Unfiltered** – a utility where over 50% of its supply is an unfiltered surface water supply i.e. the utility does not have a water treatment works providing filtration and disinfection for >50% of its supply.
- Groundwater** – a utility with >50% of its supply comprising good quality unfiltered groundwater.
- Reticulator** – a utility which purchases >70% of its source water from a bulk supplier and reticulates water to householders in its area.
- Bulk supplier** – a utility which provides a bulk water supply to other utilities, rather than reticulating water to householders.
- Dual supply** – a utility with a potable reticulated water supply for indoor uses and a separate non-potable supply reticulated for outdoor uses to over 50% of its residential customers (note 6 on page 31).
- 12. National Water Initiative (NWI) indicators** – There are 32 NSW water utilities with > 10,000 connected properties including three metropolitan utilities and 29 regional utilities. These utilities have reported their performance in the *National Performance Report 2012-13* based on a nationally agreed framework of indicator definitions. The reported NWI performance indicators (including key financial performance indicators) have been independently audited. The results that have met the rigorous NWI auditing requirements have been published in the *National Performance Report 2012-13* and are shown in Appendix F of the *2012-13 NSW Water Supply and Sewerage Benchmarking Report* (available on www.water.nsw.gov.au). Appendix F of the *Benchmarking Report* discloses the NSW results for all the approximately 150 NWI performance indicators. Some of the reported non-financial performance indicators failed to meet the NWI auditing requirements. These results have been excluded from both the *National Performance Report 2012-13* and Appendix F of the *Benchmarking Report*. However they have been included in the Figures and in Appendices D, E and F of this report.
- 13. Reported NWI indicators** –
- Appendix D** reports the results for NWI indicators C4, W11, W12, A8, A10, F1, H4, H2, H3, C9, C15, F2, E4, E13, W27, W26, C13, F24, P8, F13, F19, F22, the sum of F28 and F29, and F16.
- Appendix E** reports indicators P1, P1.2, P1.12, P1.3, P1.4, P3, F17, F4, P2.1, W12 and C4.
- Appendix F** reports indicators P4.1, P4.2, P6, F18, W19 and C8.
- The 2012-13 results for NWI indicators C9, W12, A14, W27, E4, E12, F19, F17, F18, F11, F12 and F4 are shown in Figures 6, 8 and 9, 12, 13, 14, 15, 16, 17, 18, 19, 20 and 24 respectively.
- The 2013-14 results for indicators P8, P3, P6 and P1.3 are shown in Figures 1, 2, 3 and 30; results for indicator P8 are also shown in Appendix D on page 80.
- All the NSW LWUs have complied with indicators E6, H1 and H7. Results for indicators H5 and H6 are reported in Table 12 of the *NSW Benchmarking Report*.

Figure 1: Typical Residential Bill (\$ per assessment) - Water Supply & Sewerage 2013-14

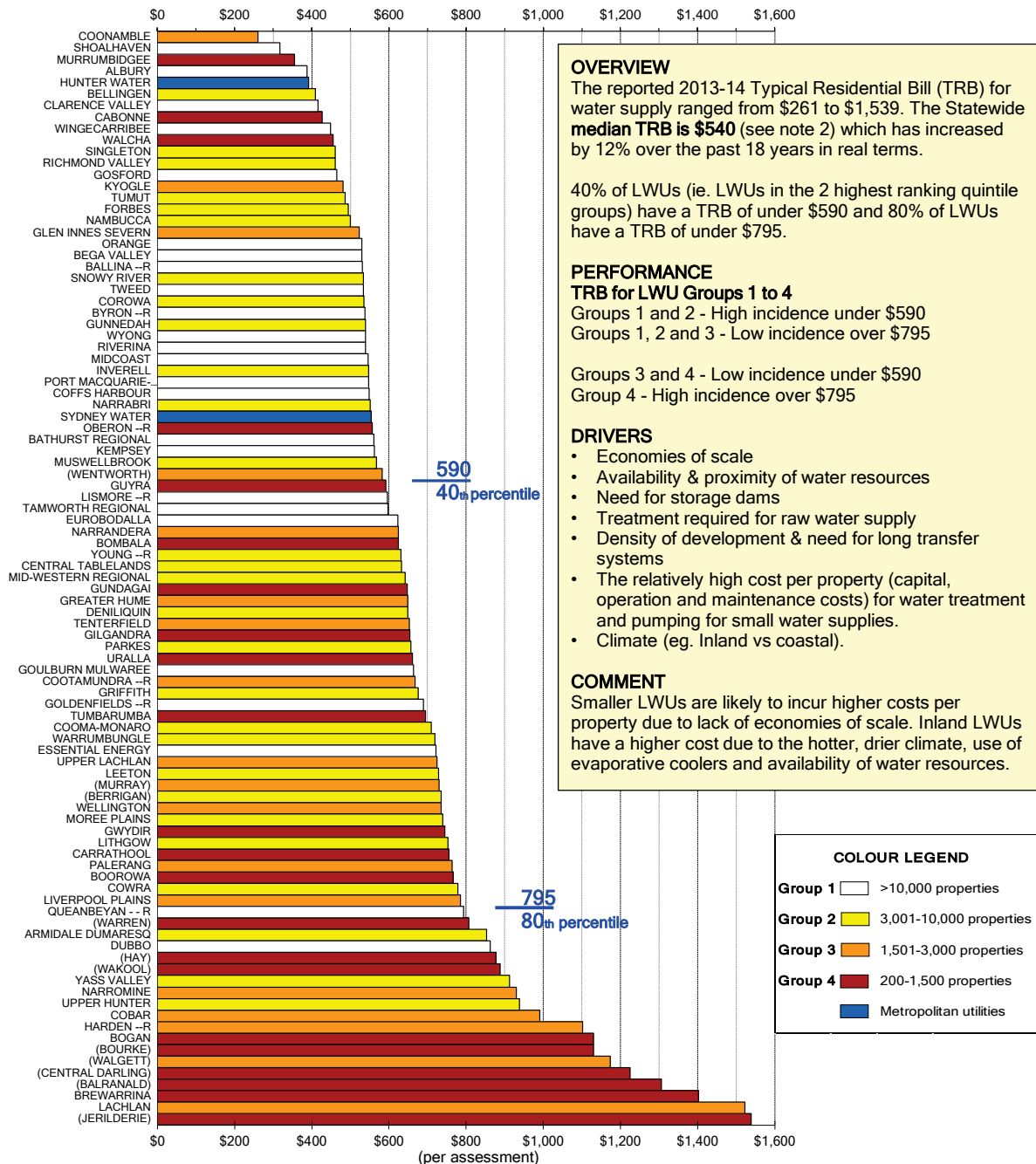


Parameter: (2012-13 Average Residential Water Supplied x 2013-14 Water Usage Charges) + 2013-14 Water and Sewerage Access Charges

Notes:

1. This figure shows ranked values of the 2013-14 typical residential bill for water supply and sewerage [NWI Indicator P8] for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4). The metropolitan water utilities (Sydney Water Corporation and Hunter Water Corporation) are shown in blue.
2. The Statewide median is a weighted median calculated on the basis of connected properties. It best reveals statewide performance of the regional NSW utilities by giving due weight to larger LWUs and reducing the effect of smaller LWUs.
3. Refer also to pages 6, 17, 66 and 80.
4. For general notes see page 30.

Figure 2: Typical Residential Bill (\$ per assessment) - Water Supply 2013-14

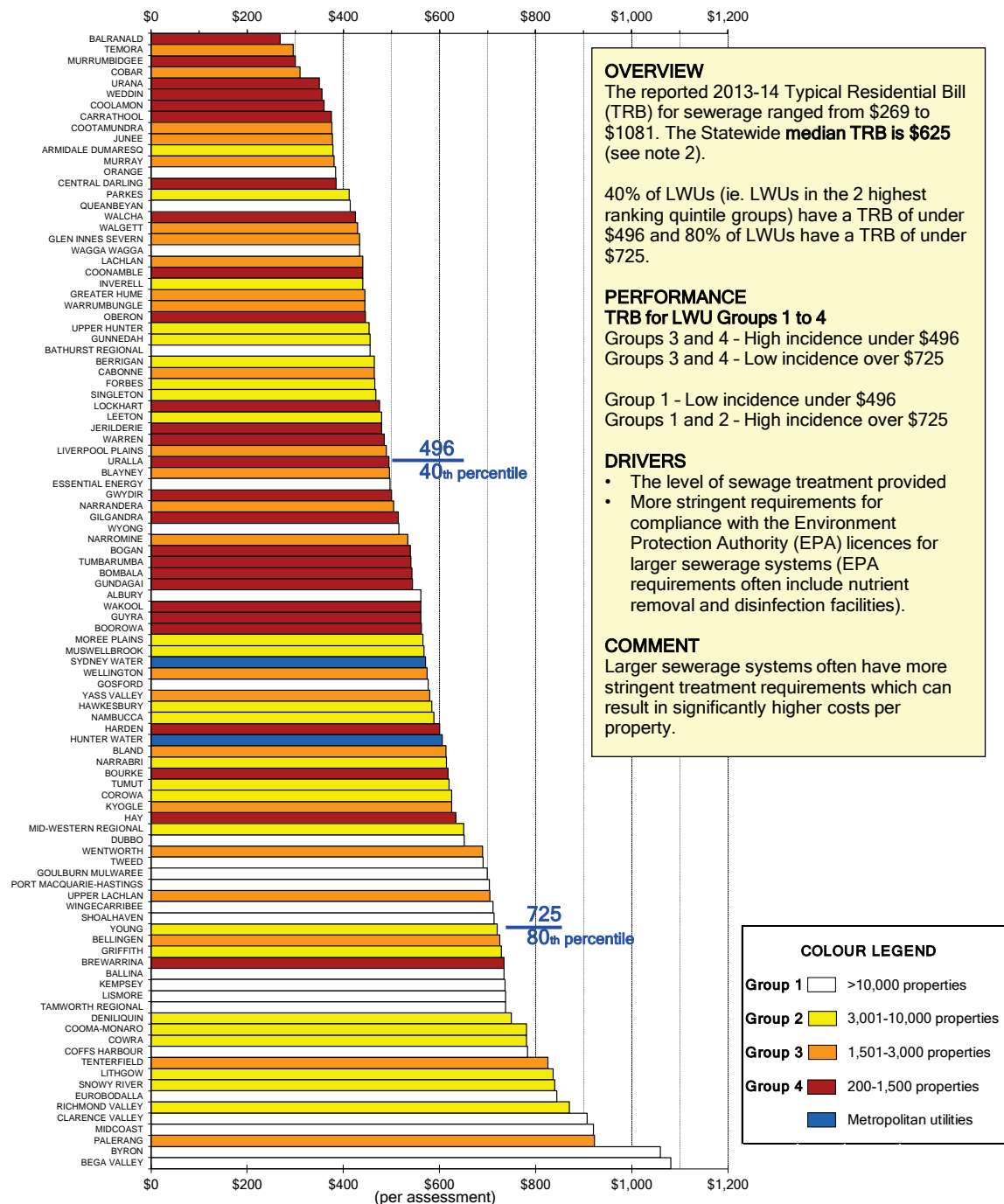


Parameter: (2012-13 Average Residential Water Supplied x 2013-14 Water Usage Charges) + 2013-14 Water Access Charge

Notes:

1. This figure shows ranked values of the 2013-14 typical residential bill for water supply [NWI Indicator P3] for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4). The metropolitan water utilities (Sydney Water Corporation and Hunter Water Corporation) are shown in blue.
2. The Statewide median is a weighted median calculated on the basis of connected properties. It best reveals statewide performance of the regional NSW utilities by giving due weight to larger LWUs and reducing the effect of smaller LWUs.
3. As shown in the box on page 5, the increase in the real water supply Typical Residential Bill (TRB) over the past 18 years has been limited to 12%.
4. Refer also to pages 5, 6, 66 and 84.
5. The 11 LWUs with a dual water supply (ie. a potable supply for indoor use and a non-potable supply for outdoor use) are enclosed in brackets. Reticulators are suffixed by --R. Refer also to Notes 4 and 6 on pages 30 and 31.
6. For general notes see page 30.

Figure 3: Typical Residential Bill (\$ per assessment) - Sewerage 2013-14

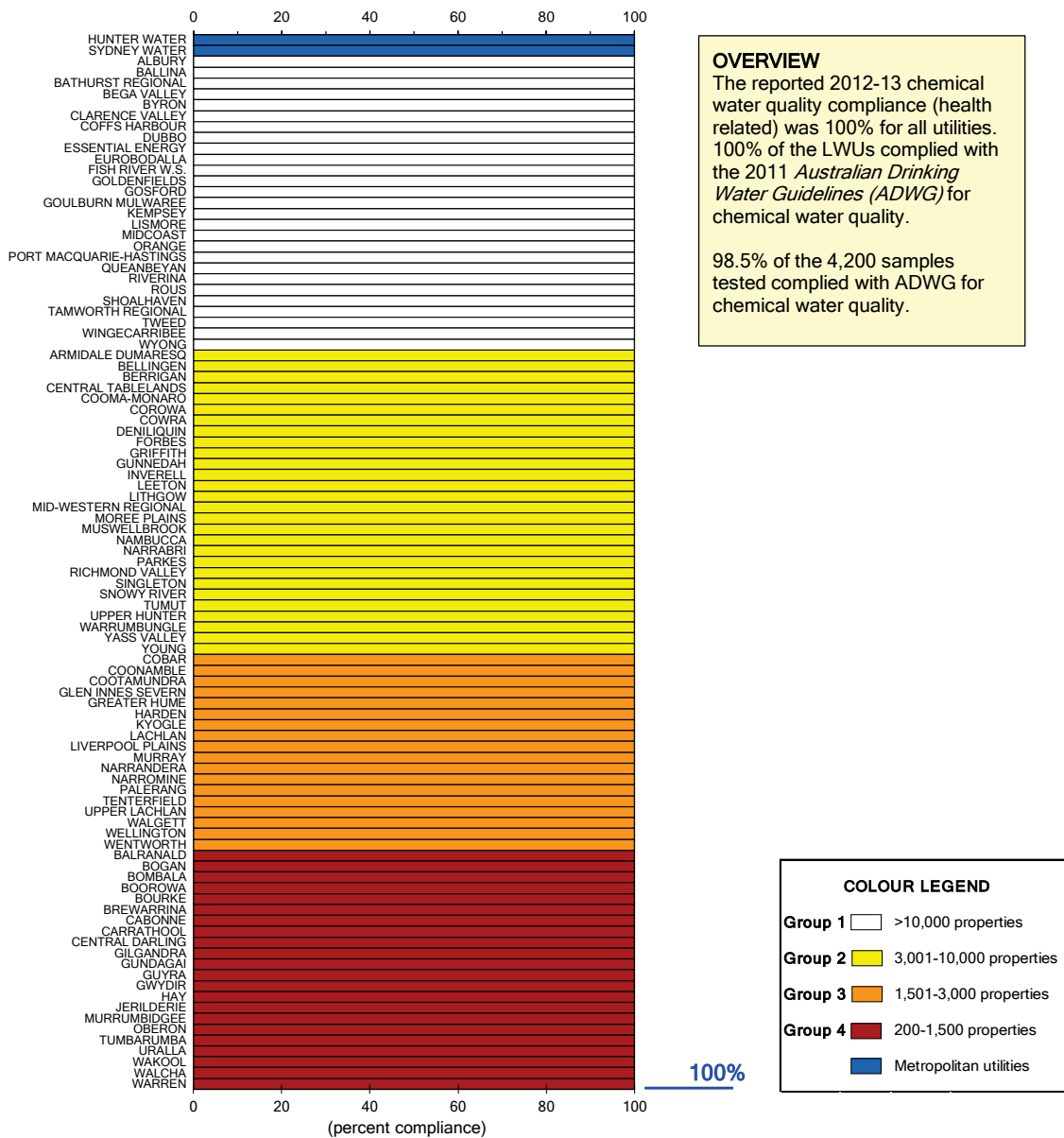


Parameter: Residential Access Charge

Notes:

- This figure shows ranked values of the 2013-14 typical residential bill for sewerage [NWI Indicator P6] for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4). The metropolitan water utilities (Sydney Water Corporation and Hunter Water Corporation) are shown in blue.
- The Statewide median is a weighted median calculated on the basis of connected properties. It best reveals statewide performance of the regional NSW utilities by giving due weight to larger LWUs and reducing the effect of smaller LWUs.
- Refer also to pages 7, 66 and 87.
- For general notes see page 30.

Figure 4: Chemical Water Quality Compliance - Water Supply 2012-13

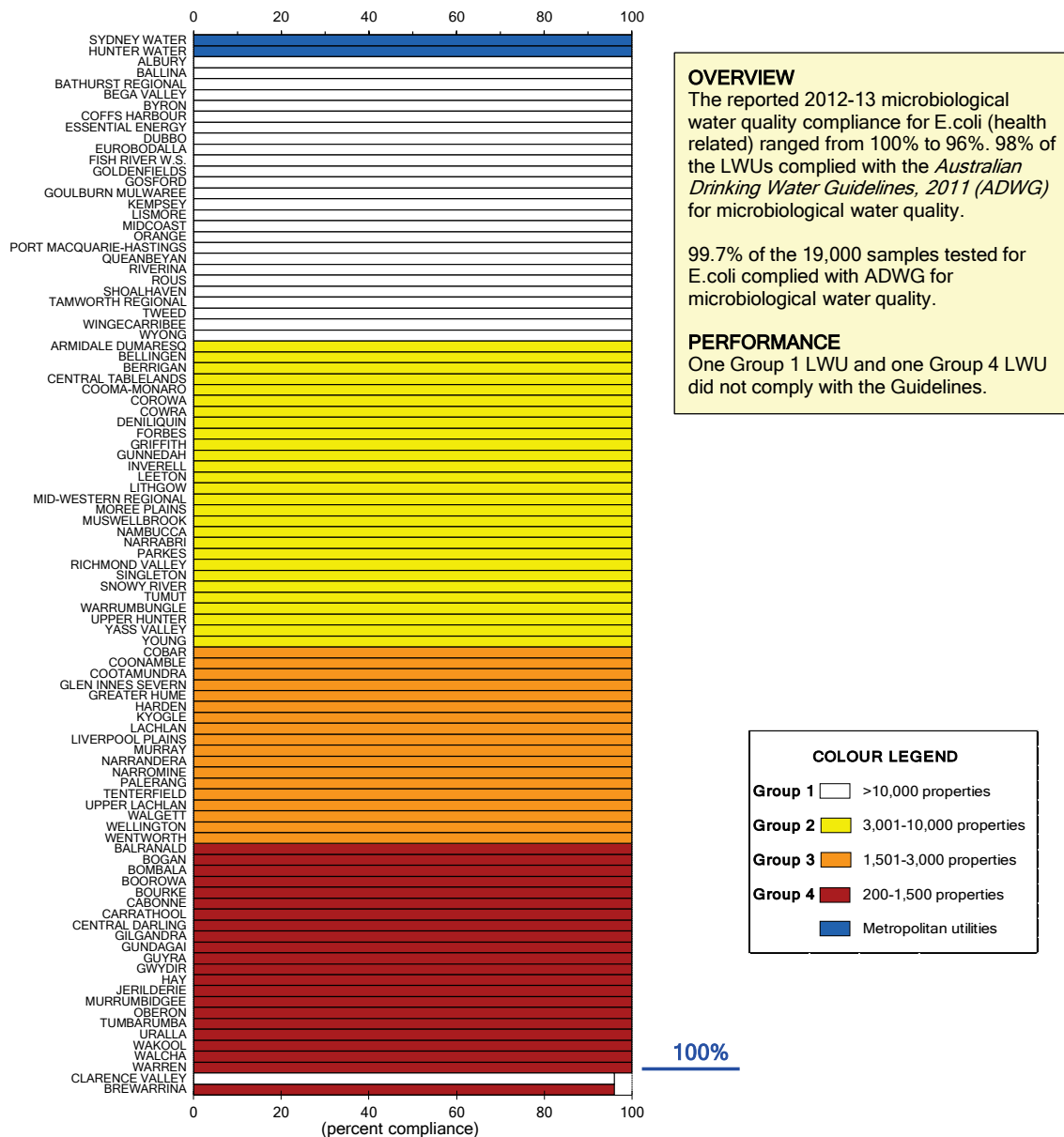


Parameter: Percentage of distribution system water samples complying with the chemical criteria of the 2011 NHMRC/NRMMC *Australian Drinking Water Guidelines*.

Notes:

1. This figure shows ranked values of the 2012-13 distribution system chemical water quality compliance (health related) with the 2011 NHMRC/NRMMC *Australian Drinking Water Guidelines (ADWG)* for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4). The metropolitan water utilities (Sydney Water Corporation and Hunter Water Corporation) are shown in blue.
2. For an LWU to comply with the 2011 ADWG for chemical water quality (health related), the required number of samples must be tested and the 95th percentile of results must be less than the guideline value for each chemical. Non-potable supplies are excluded.
3. For LWUs with more than one water treatment works, the reported compliance has been pro-rated on the basis of the number of samples tested at each treatment works.
4. Refer also to pages 7, 8, 80 and 94.
5. For general notes see page 30.

Figure 5: Microbiological Water Quality Compliance - Water Supply 2012-13

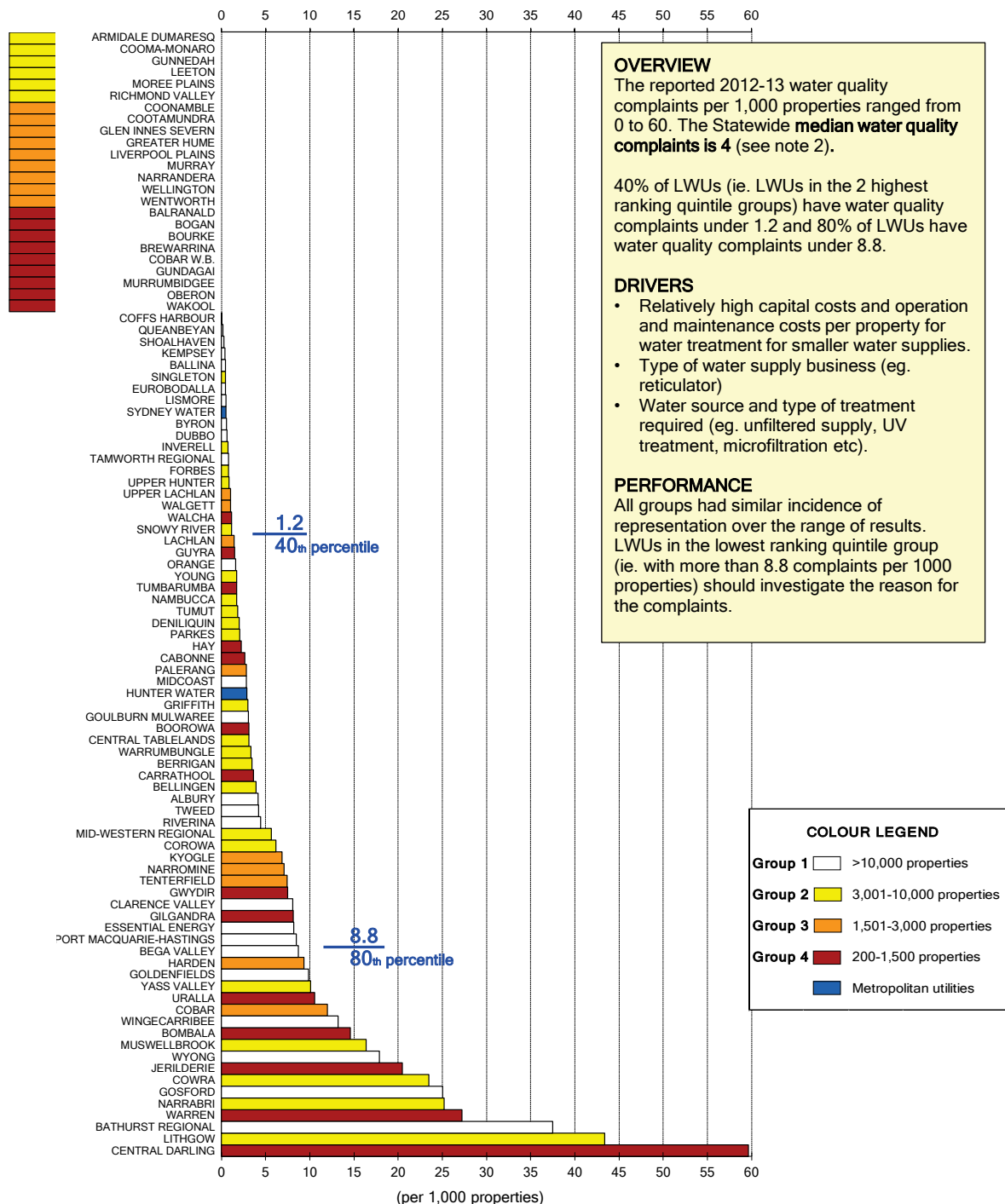


Parameter: Percentage of distribution system water samples complying with the microbiological criteria of the 2011 NHMRC/NRMMC Australian Drinking Water Guidelines.

Notes:

1. This figure shows ranked values of the 2012-13 distribution system microbiological water quality compliance (health related) with the 2011 NHMRC/NRMMC Australian Drinking Water Guidelines for E. coli for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4). The metropolitan water utilities (Sydney Water Corporation and Hunter Water Corporation) are shown in blue.
2. For a LWU to comply with the 2011 Australian Drinking Water Guidelines for microbiological water quality (health related), the required number of samples must be tested and at least 98% of the samples must contain no E.coli. Non-potable water supplies are excluded.
3. For LWUs with more than one water treatment works, the reported compliance has been pro-rated on the basis of the number of samples tested at each treatment works.
4. Only 96% of the samples tested for E. coli complied for each of Clarence Valley and Brewarrina. Clarence Valley was affected by three major floods, as well as defects in bird-proofing of the 21 ML MacLean reservoir, allowing birds and windblown material to enter the stored water. For Brewarrina, only the supply for Goodooga, which received 21% of Council's potable water supply, did not achieve the required 98% compliance.
5. Refer also to pages 7, 8, 67, 80 and 94.
6. For general notes see page 30.

Figure 6: Water Quality Complaints - Water Supply 2012-13

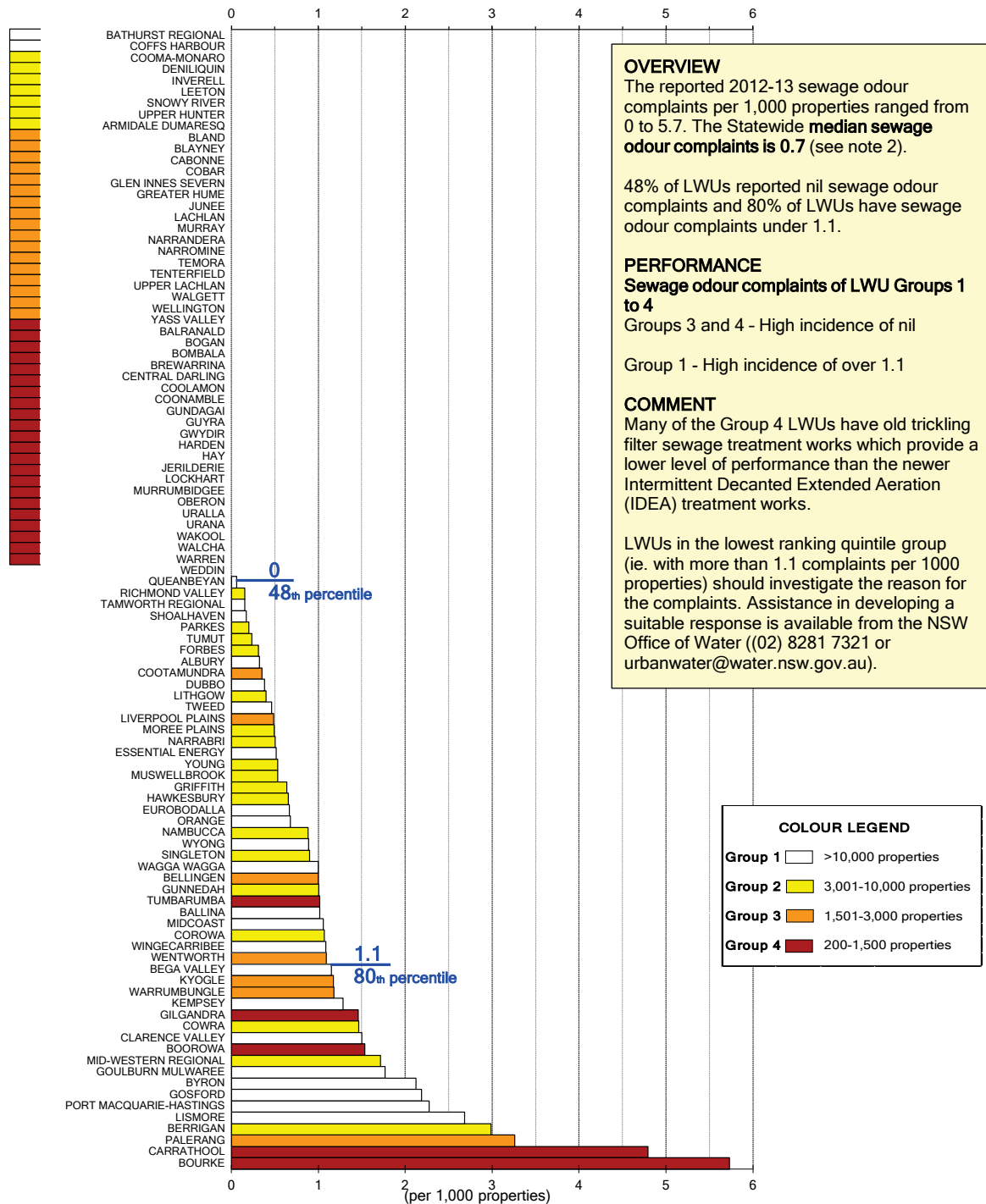


Parameter: $\frac{\text{Number of water quality complaints (W101b)} \times 1,000}{\text{No. connected properties}}$

Notes:

1. This figure shows ranked values of the 2012-13 number of water quality complaints [NWI Indicator C9] per 1000 connected properties for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4).
2. The Statewide median is a weighted median calculated on the basis of connected properties. It best reveals statewide performance of the regional NSW utilities by giving due weight to larger LWUs and reducing the effect of smaller LWUs.
3. Refer also to pages 9, 67 and 80.
4. For general notes see page 30.

Figure 7: Odour Complaints - Sewerage 2012-13

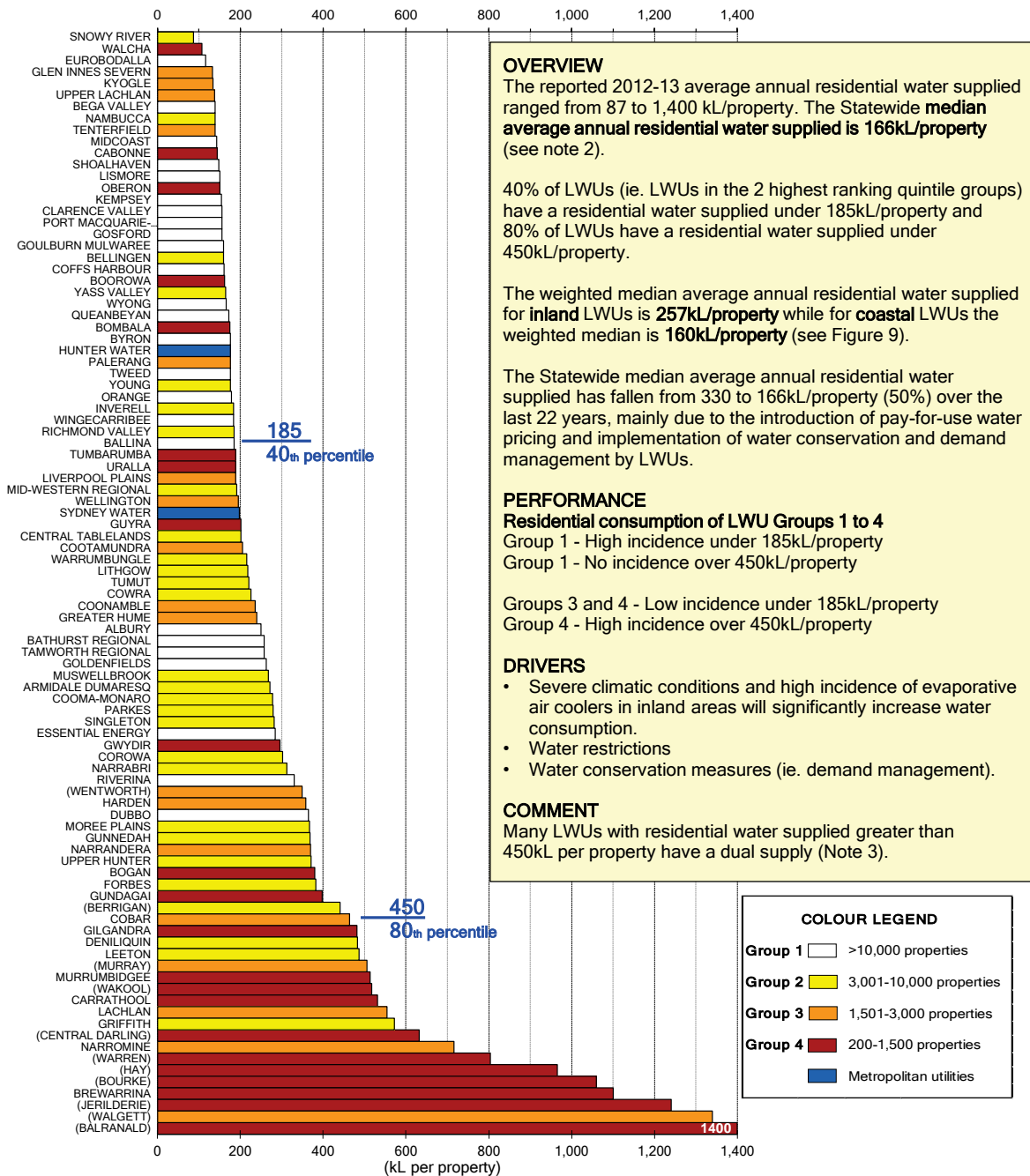


Parameter: $\frac{\text{Number of odour complaints from sewerage treatment works and pumping stations (S39)} \times 1,000}{\text{No. connected properties}}$

Notes:

1. This figure shows ranked values of the 2012-13 number of sewerage odour complaints per 1000 connected properties for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4).
2. The Statewide median is a weighted median calculated on the basis of connected properties. It best reveals statewide performance of the regional NSW utilities by giving due weight to larger LWUs and reducing the effect of smaller LWUs.
3. Refer also to page 9.
4. For general notes see page 30.

Figure 8: Average Annual Residential Water Supplied 2012-13

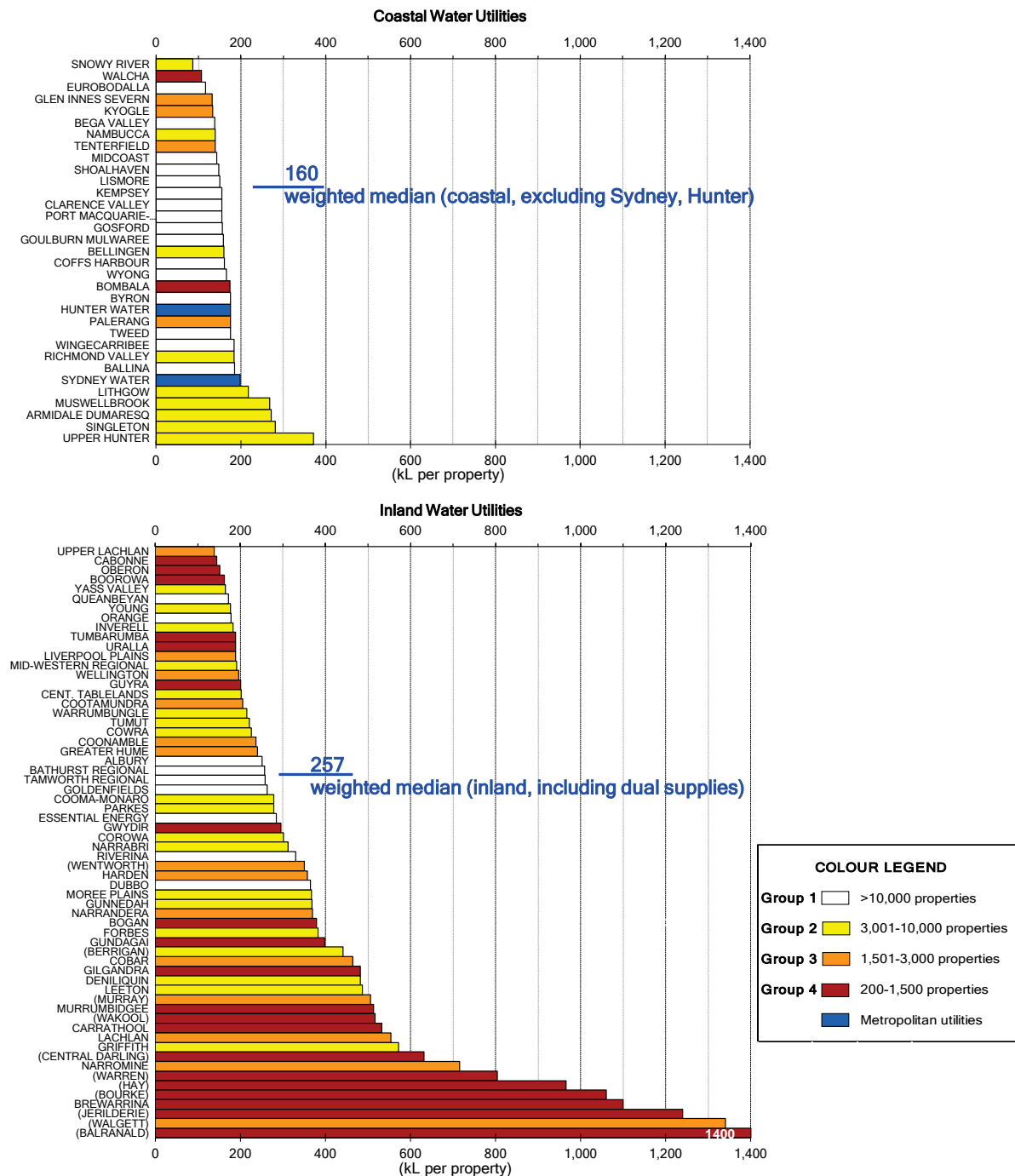


Parameter: $\frac{\text{Annual residential water supplied} \times 1,000}{\text{No. residential connected properties}}$

Notes:

- This figure shows ranked values of the 2012-13 average annual residential water supplied [NWI Indicator W12] per connected property for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4). The metropolitan water utilities (Sydney Water Corporation and Hunter Water Corporation) are shown in blue.
- The Statewide median is a weighted median calculated on the basis of connected properties. It best reveals statewide performance of the regional NSW utilities by giving due weight to larger LWUs and reducing the effect of smaller LWUs.
- The 11 LWUs with a dual water supply (ie. a potable supply for indoor use and a non-potable supply for outdoor use) are enclosed in brackets. Refer to Note 6 on page 31.
- Refer also to pages 5, 9, 17, 68 and 84.
- For general notes see page 30.

Figure 9: Average Annual Residential Water Supplied - Coastal & Inland LWUs 2012-13

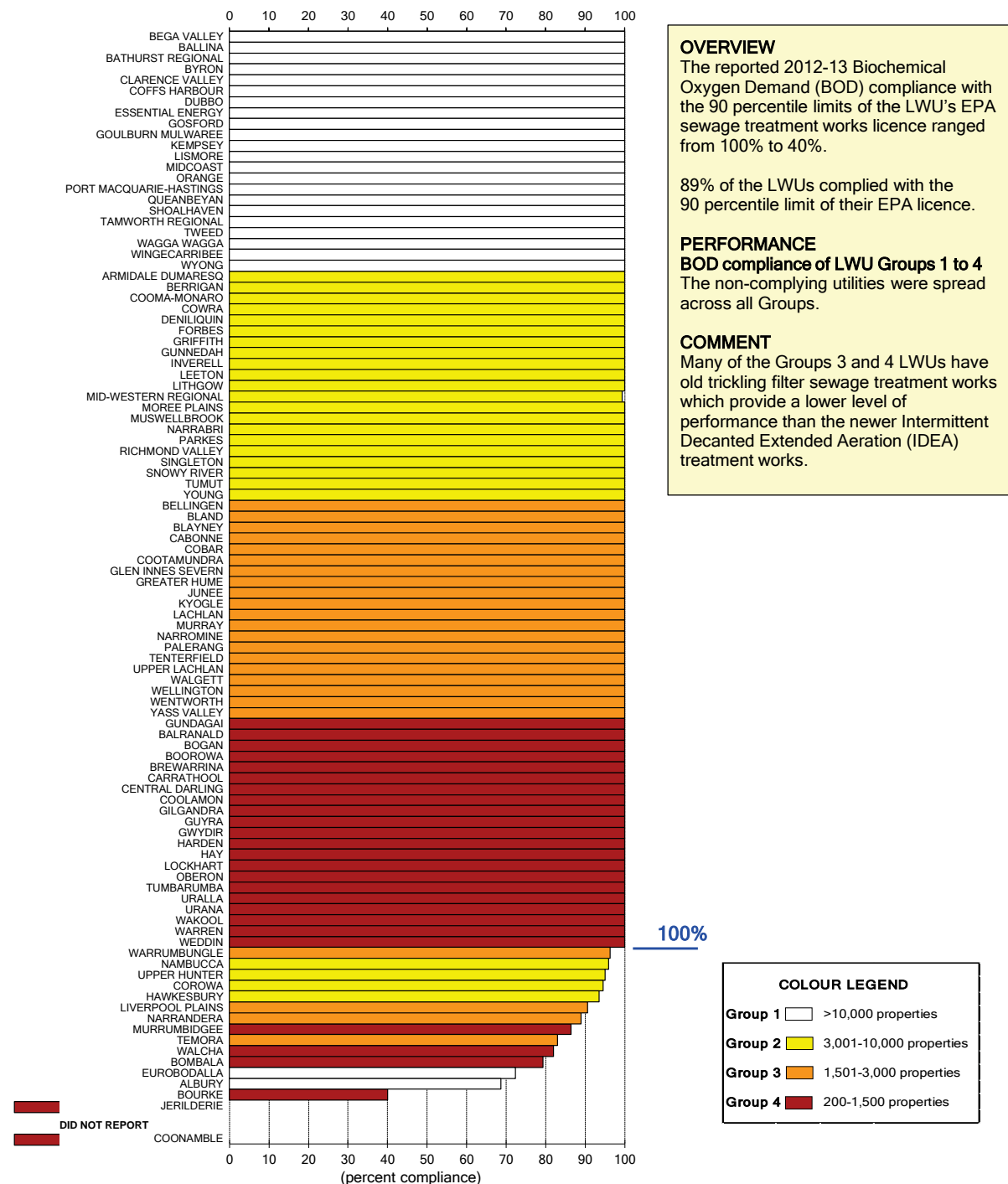


Parameter:
$$\frac{\text{Annual residential water supplied} \times 1,000}{\text{No. residential connected properties}}$$

Notes:

1. This figure shows ranked values of the 2012-13 average annual residential water supplied [NWI Indicator W12] per connected property for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4). The metropolitan water utilities (Sydney Water Corporation and Hunter Water Corporation) are shown in blue.
2. The weighted median is calculated on the basis of connected properties.
3. The 11 LWUs with a dual water supply (ie. a potable supply for indoor use and a non-potable supply for outdoor use) are enclosed in brackets. Refer to Note 6 on page 31.
4. For general notes see page 30.

Figure 10: Compliance with BOD in Licence - Sewerage 2012-13

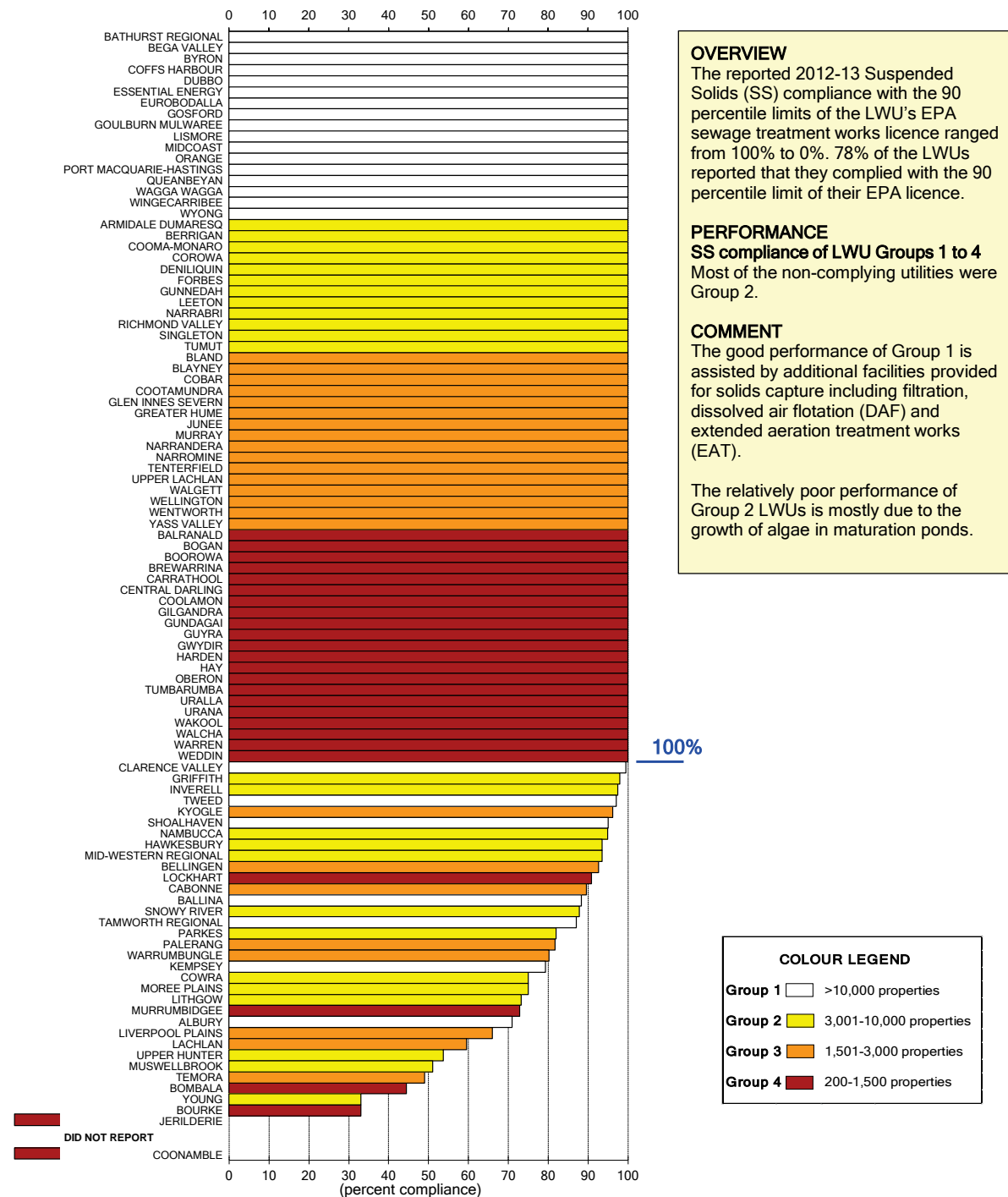


Parameter: Percentage of samples complying with 90 percentile Environment Protection Authority (EPA) licence limits for biochemical oxygen demand (BOD) (ST50)

Notes:

1. This figure shows ranked values of the 2012-13 percent compliance with the 90 percentile Environment Protection Authority (EPA) licence limits for biochemical oxygen demand (BOD) for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4).
2. Refer also to page 10.
3. For general notes see page 30.

Figure 11: Compliance with SS in Licence - Sewerage 2012-13

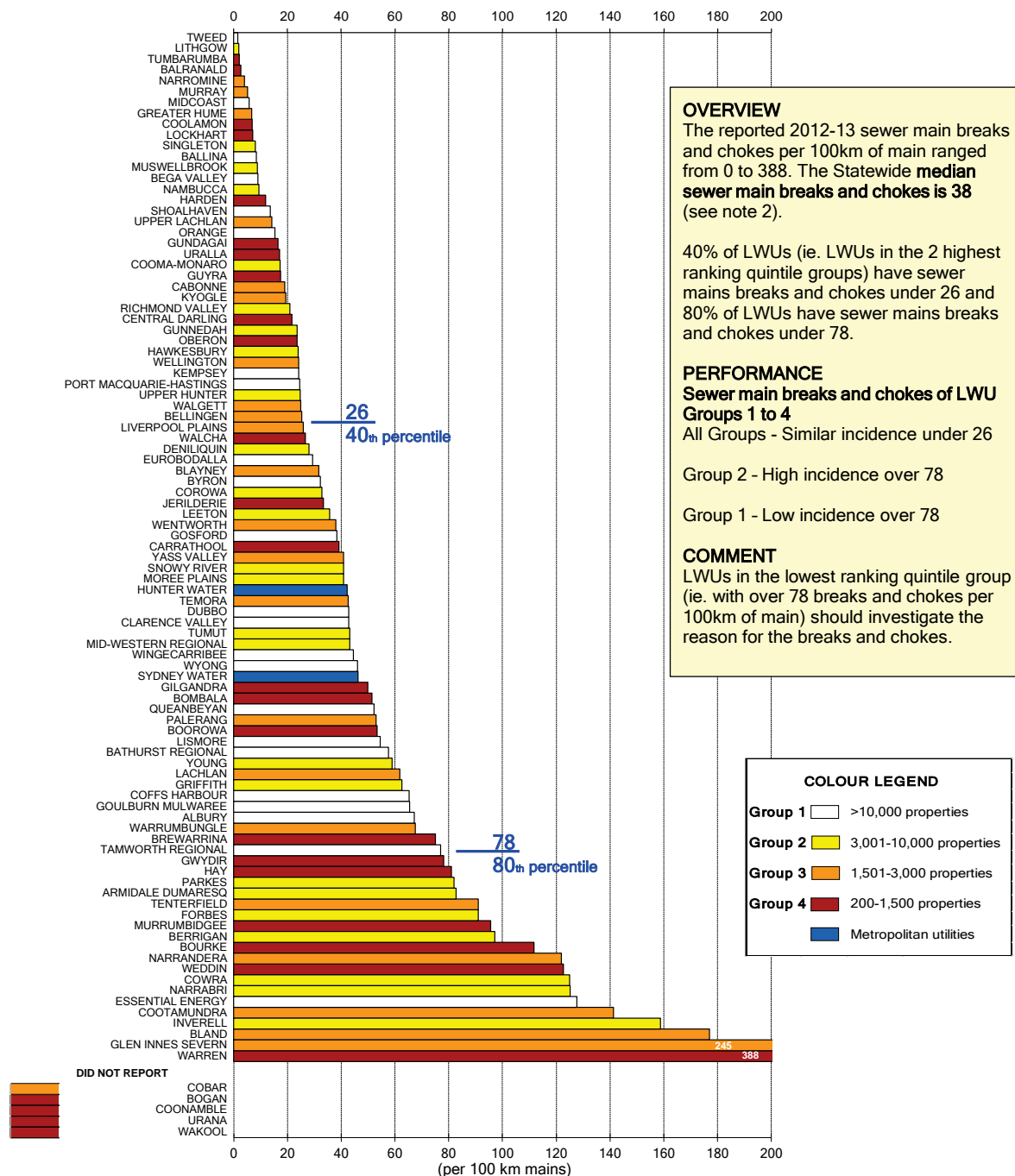


Parameter: Percentage of samples complying with 90 percentile Environment Protection Authority (EPA) licence limits for suspended solids (SS) (ST52)

Notes:

1. This figure shows ranked values of the 2012-13 percent compliance with the 90 percentile Department of Environment Protection Authority (EPA) licence limits for suspended solids (SS) for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4).
2. Refer also to page 10.
3. For general notes see page 30.

Figure 12: Sewer Main Breaks and Chokes - Sewerage 2012-13



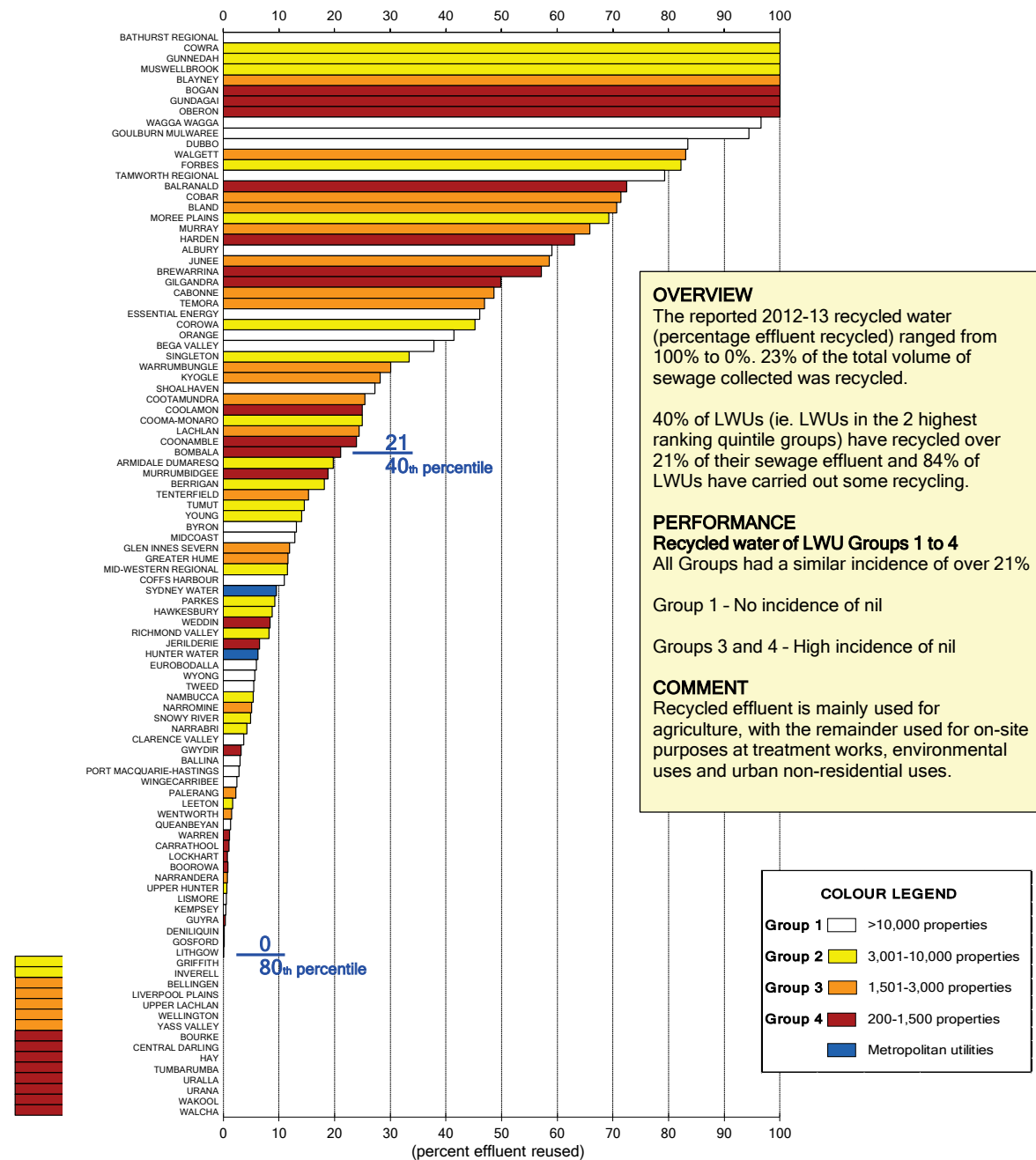
Parameter:

$$\frac{\text{Total number of sewer main breaks and chokes (S64)} \times 100}{\text{Length of reticulation/gravity mains (S7)} + \text{Length of rising/pressure mains (S8)}}$$

Notes:

1. This figure shows ranked values of the 2012-13 sewer main breaks and chokes [NWI Indicator A14] for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4). The metropolitan water utilities (Sydney Water Corporation and Hunter Water Corporation) are shown in blue.
2. The Statewide median is a weighted median calculated on the basis of connected properties. It best reveals statewide performance of the regional NSW utilities by giving due weight to larger LWUs and reducing the effect of smaller LWUs.
3. Refer also to pages 11 and 70.
4. For general notes see page 30.

Figure 13: Recycled Water (percent effluent recycled) - Sewerage 2012-13



Parameter:

$$\frac{\text{Total volume of effluent recycled (W158)} \times 100}{\text{Volume of sewage receiving secondary treatment (ST18)}}$$

Notes:

1. This figure shows ranked values of the 2012-13 recycled water (NWI Indicator W27 - % of sewage effluent recycled) for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4). The metropolitan water utilities (Sydney Water Corporation and Hunter Water Corporation) are shown in blue.
2. For LWUs which did not report their 2012-13 volumes recycled, the 2011-12 percentage has been shown. These utilities are shown in **italics bold** in Column 12 of Appendix D. The volume of water recycled is shown in column 12a of Appendix D.
3. Reuse of recycled water was carried out by 84% of LWUs. Statewide, 23% of the total volume of sewage collected was recycled. The total volume recycled in regional NSW was 40,000ML. 24% of LWUs recycled over 50% of their effluent. The highest volume recycled by a utility was 5,500ML (Wagga Wagga) and a further 7 utilities (Albury, Bathurst, Dubbo, Goulburn Mulwaree, Orange, Shoalhaven and Tamworth) each recycled over 1,000ML.
4. Refer also to pages 10, 18, 69 and 80.
5. For general notes see page 30.

Figure 14: Percent of Sewage Treated that was Compliant 2012-13

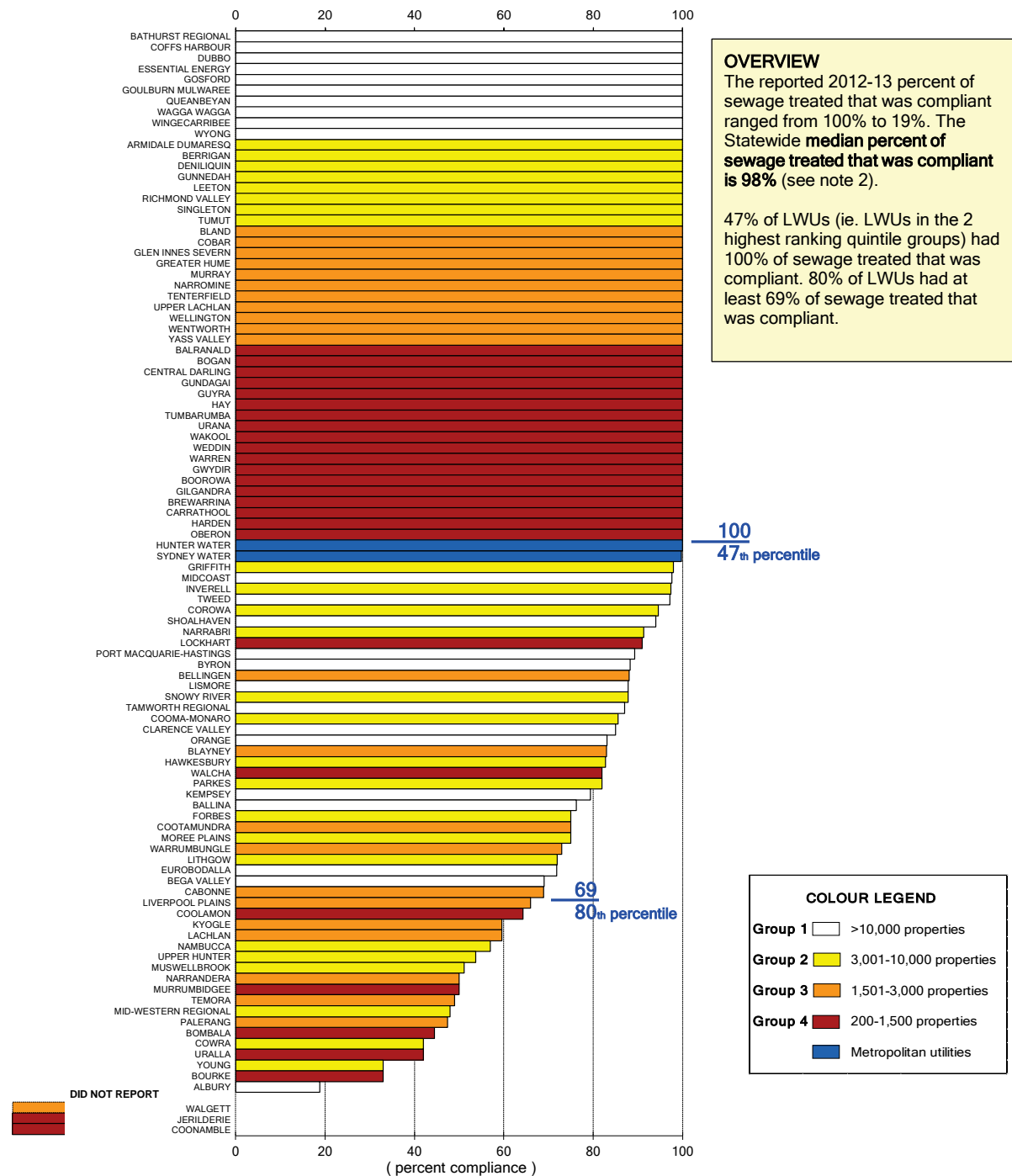
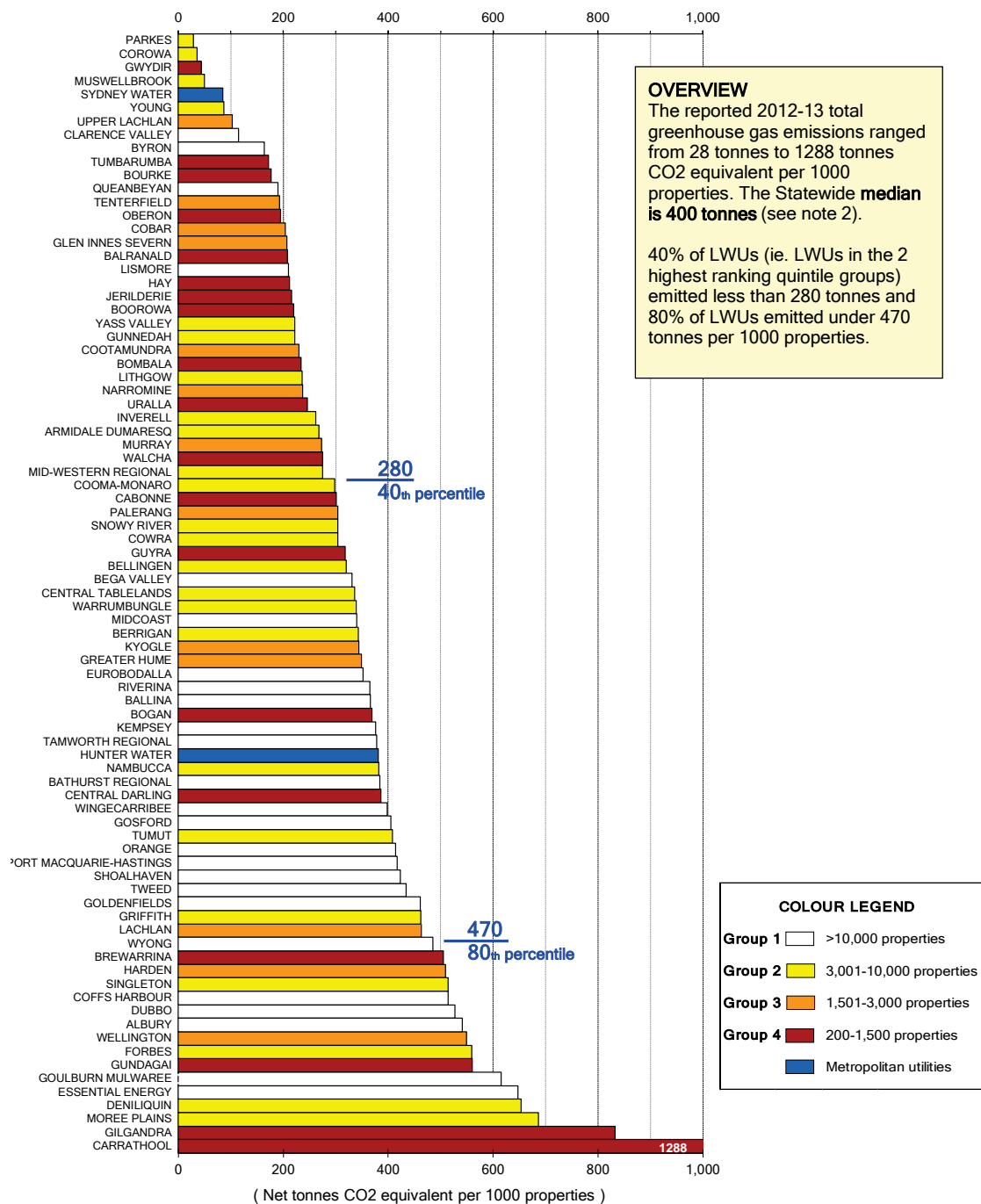


Figure 15: Total Greenhouse Gas Emissions 2012-13

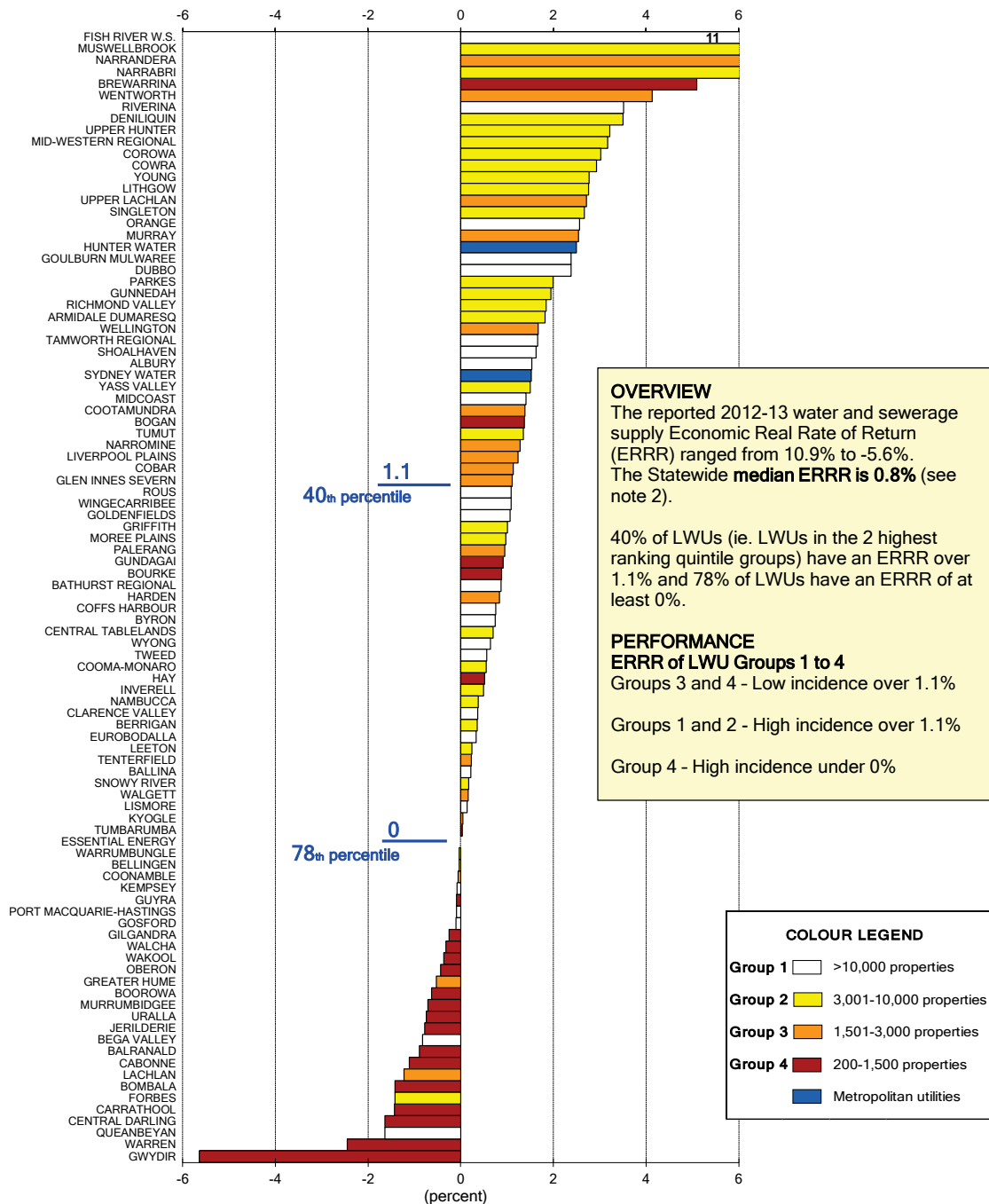


Parameter: $\frac{\text{Total Greenhouse gas emissions (water and sewerage)} \times 1,000}{\text{No. connected properties}}$

Notes:

1. This figure shows ranked values of the 2012-13 total greenhouse gas emissions [NWI Indicator E12] per 1,000 connected properties for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4). The metropolitan water utilities (Sydney Water Corporation and Hunter Water Corporation) are shown in blue.
2. The Statewide median is a weighted median calculated on the basis of connected properties. It best reveals statewide performance of the regional NSW utilities by giving due weight to larger LWUs and reducing the effect of smaller LWUs.
3. Refer also to pages 10, 18 and 70.
4. For general notes see page 30.

Figure 16: Economic Real Rate of Return - Water and Sewerage 2012-13

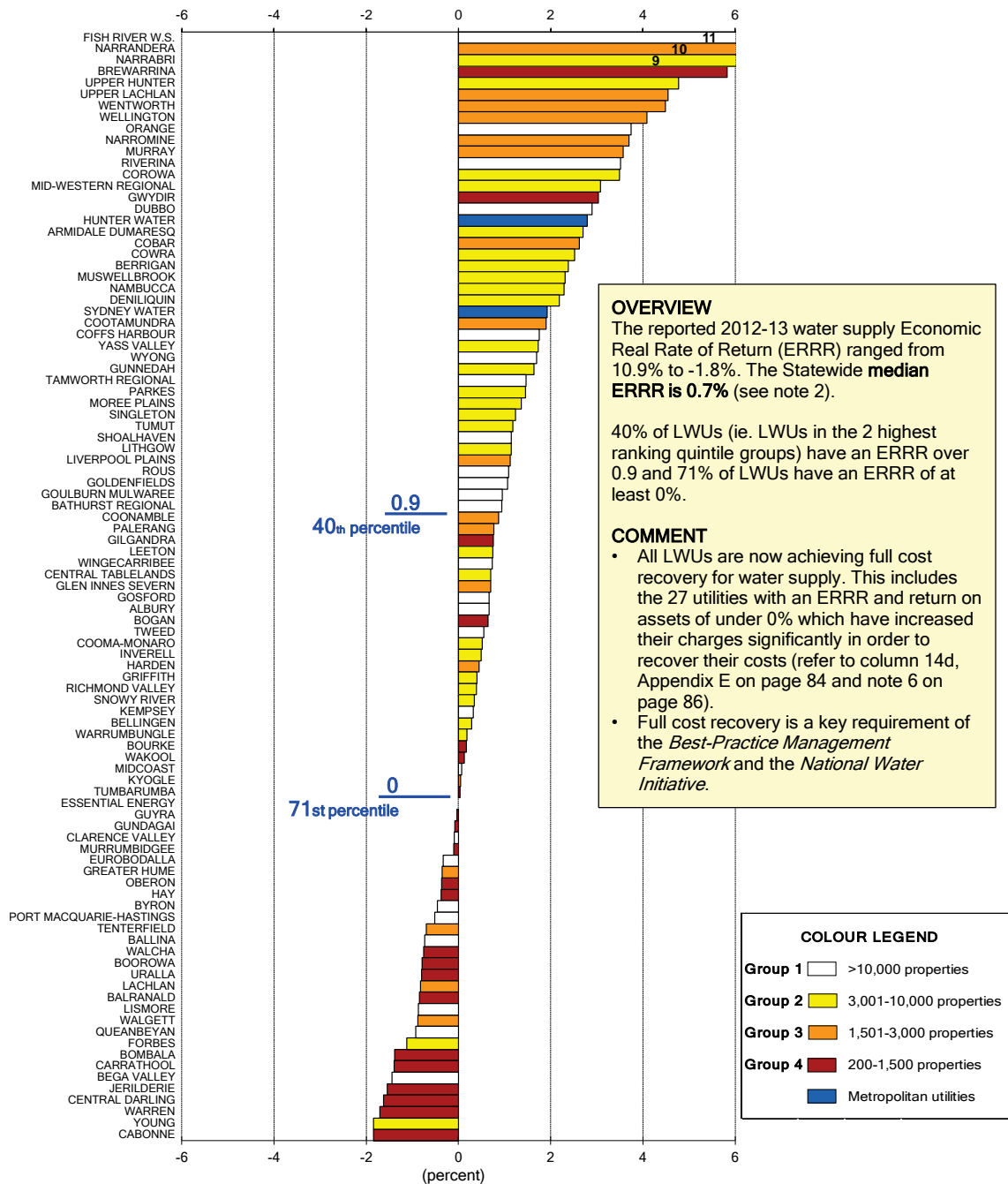


Parameter:
$$\frac{(\text{Operating Result (W15+S16)} + \text{Interest Expense (W4a+S4a)} - \text{Interest Income (W9+S10)} - \text{Grants for acquisition of assets (W11a+S12a)}) \times 100}{\text{Written down replacement cost of system assets, plant and equipment (W33+S34)}}$$

Notes:

1. This figure shows ranked values of the 2012-13 water and sewerage economic real rate of return (ERRR - NWI Indicator F19) for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4). The metropolitan water utilities (Sydney Water Corporation and Hunter Water Corporation) are shown in blue.
2. The Statewide median is a weighted median calculated on the basis of connected properties. It best reveals statewide performance of the regional NSW utilities by giving due weight to larger LWUs and reducing the effect of smaller LWUs.
3. Refer also to pages 11, 19, 71 and 80.
4. For general notes see page 30.

Figure 17: Economic Real Rate of Return - Water Supply 2012-13

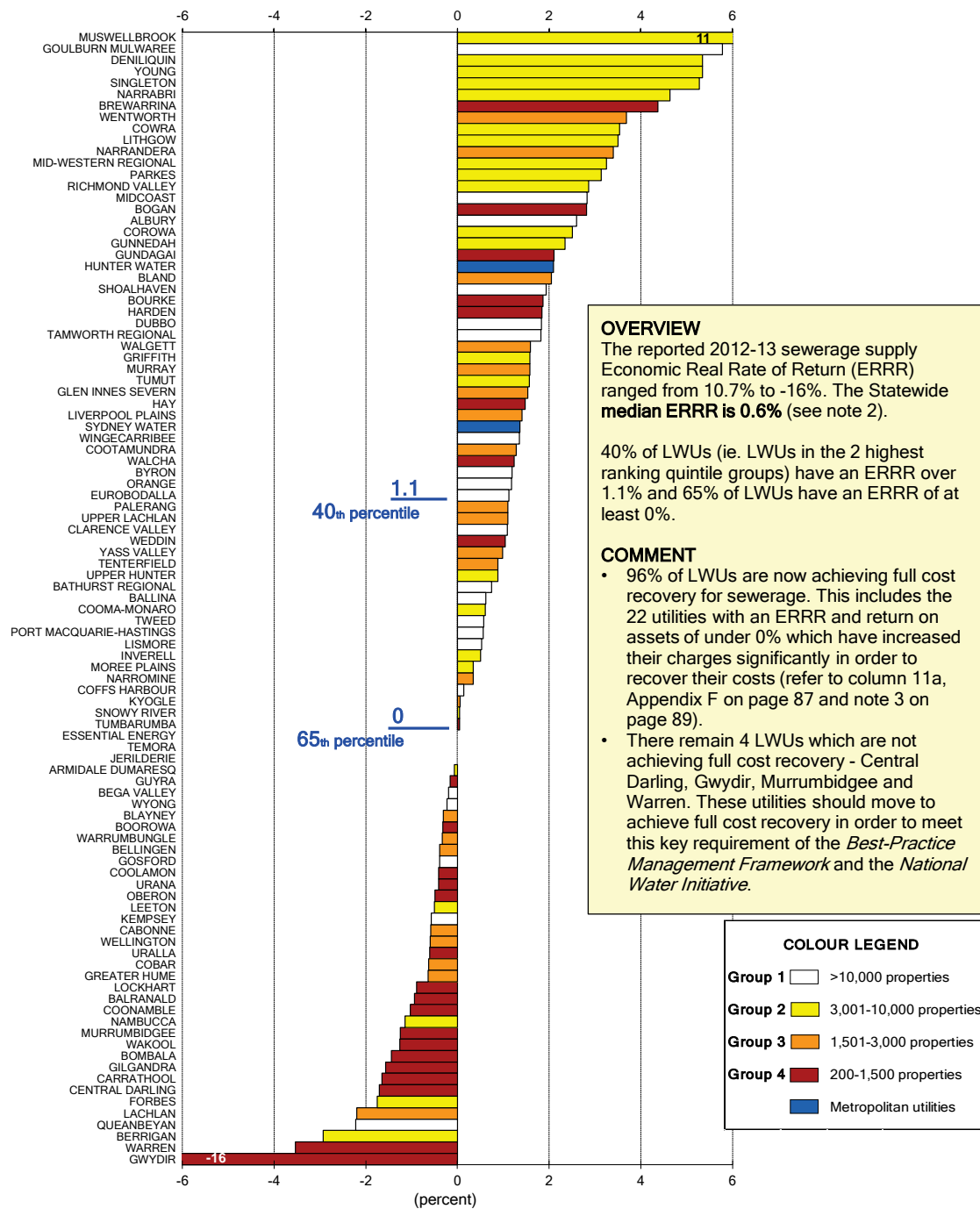


Parameter:
$$\frac{\text{Total Income (W13)} - \text{Interest Income (W9)} - \text{Grants for acquisition of assets (W11a)} - \text{Total Expenses (W5)} + \text{Interest Expenses (W4a)} + \text{Revaluation Decrements (W4b)} + \text{Other Expenses (W4c)}}{\text{Written down replacement cost of system assets, plant and equipment (W33)}} \times 100$$

Notes:

- This figure shows ranked values of the 2012-13 water supply economic real rate of return (ERRR - NWI Indicator F17) for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4). The metropolitan water utilities (Sydney Water Corporation and Hunter Water Corporation) are shown in blue.
- The Statewide median is a weighted median calculated on the basis of connected properties. It best reveals statewide performance of the regional NSW utilities by giving due weight to larger LWUs and reducing the effect of smaller LWUs.
- Refer also to pages 11, 12 and 84.
- For general notes see page 30.

Figure 18: Economic Real Rate of Return - Sewerage 2012-13

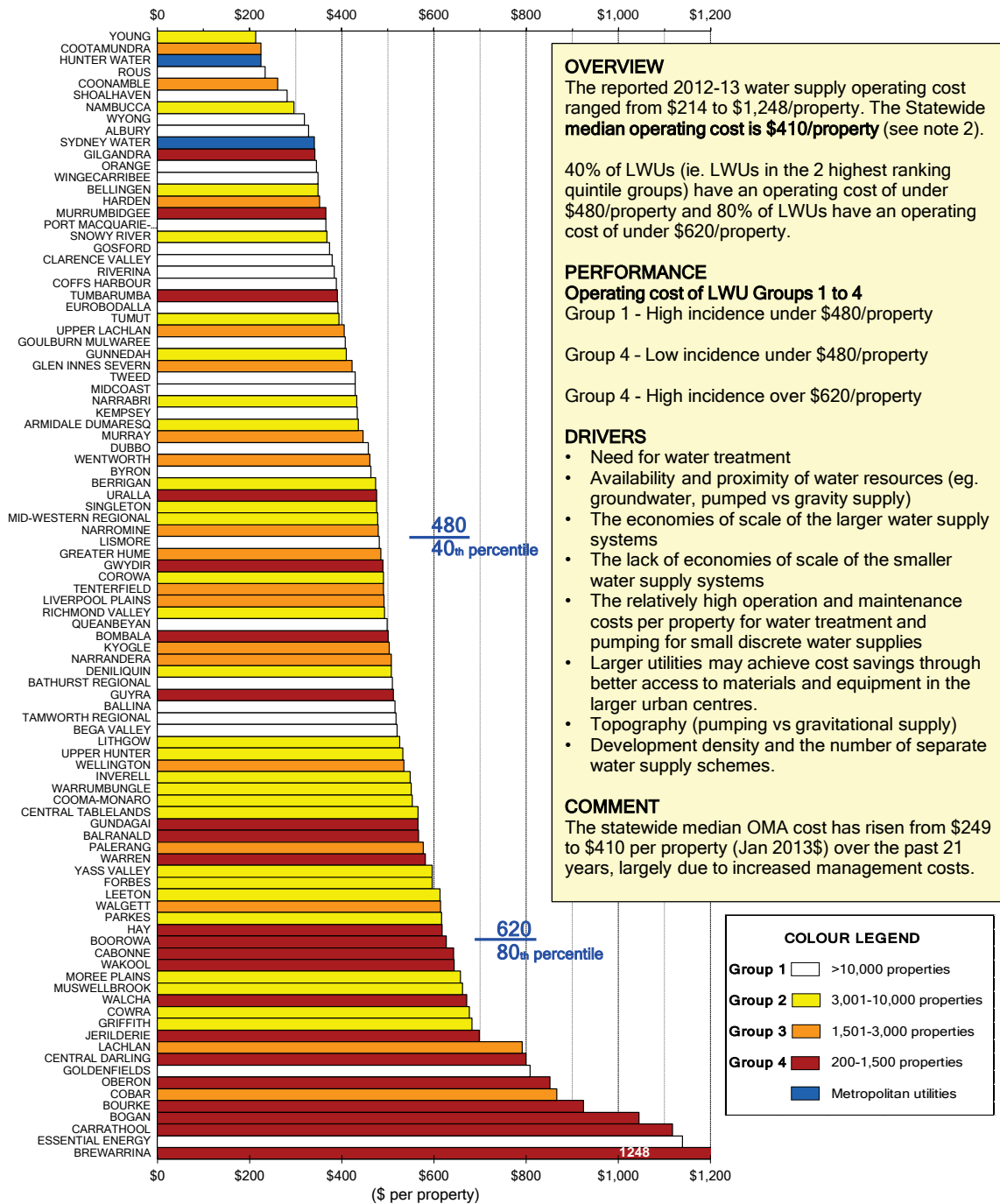


Parameter:
$$\frac{(\text{Total Income (S14)} - \text{Interest Income (S10)} - \text{Grants for acquisition of assets (S12a)} - \text{Total Expenses (S5)} + \text{Interest Expenses (S4a)} + \text{Revaluation Decrements (S4b)} + \text{Other Expenses (S4c)}) \times 100}{\text{Written down replacement cost of system assets, plant and equipment (S34)}}$$

Notes:

- This figure shows ranked values of the 2012-13 sewerage economic real rate of return (ERRR - NWI Indicator F18) for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4). The metropolitan water utilities (Sydney Water Corporation and Hunter Water Corporation) are shown in blue.
- The Statewide median is a weighted median calculated on the basis of connected properties. It best reveals statewide performance of the regional NSW utilities by giving due weight to larger LWUs and reducing the effect of smaller LWUs.
- Refer also to pages 11, 12 and 87.
- For general notes see page 30.

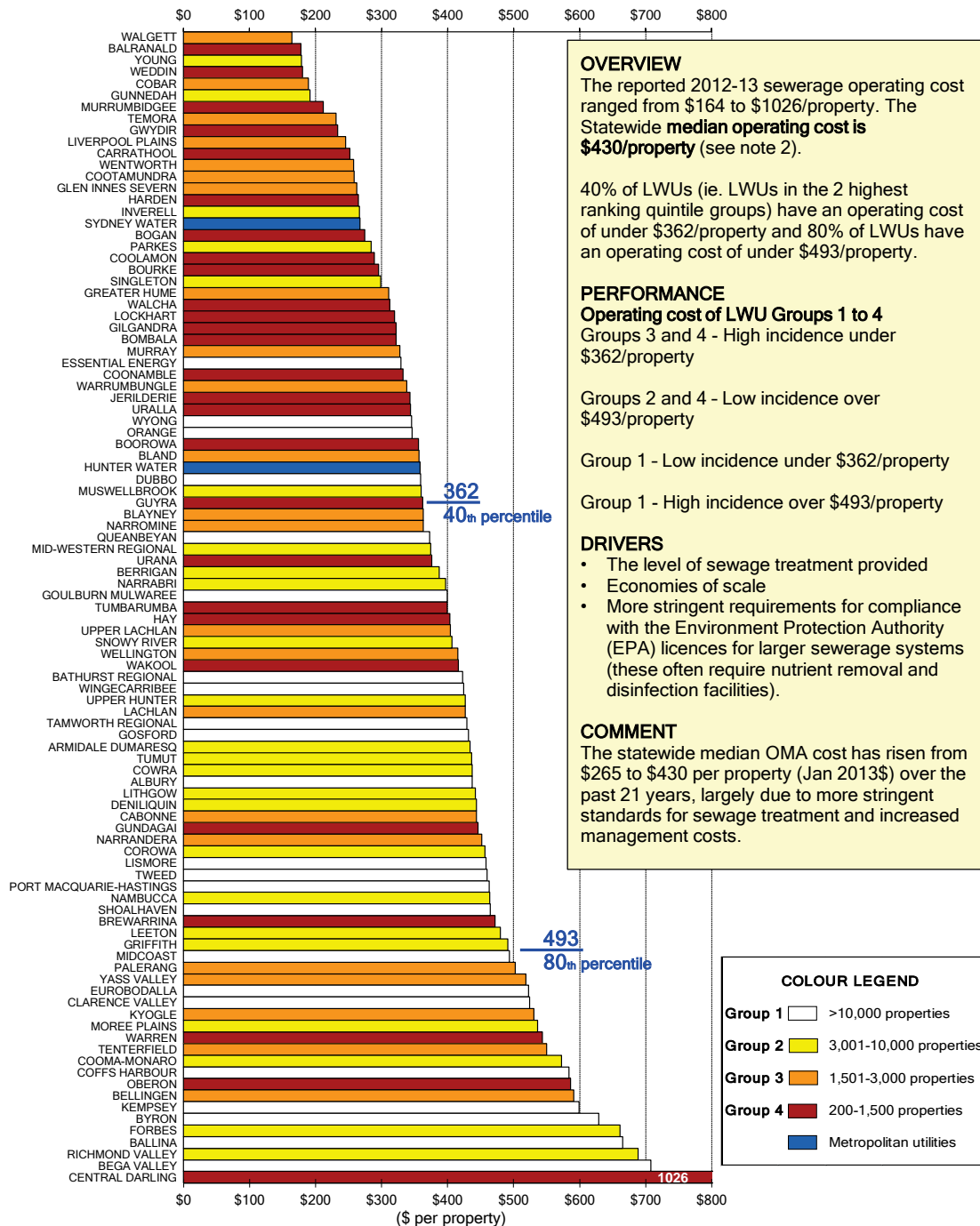
Figure 19: Operating Cost (OMA) per property - Water Supply 2012-13



Parameter: $\frac{\text{Management expenses (SSW1)} + \text{Total operation expenses (SSW2)} - \text{Purchase of water} + \text{Bulk supplier's OMA}}{\text{No. connected properties}}$

- Notes:**
1. This figure shows ranked values of the 2012-13 water supply operating cost (OMA - operation, maintenance and administration - NWI Indicator F11) per property for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4). The metropolitan water utilities (Sydney Water Corporation and Hunter Water Corporation) are shown in blue.
 2. The Statewide median is a weighted median calculated on the basis of connected properties. It best reveals statewide performance of the regional NSW utilities by giving due weight to larger LWUs and reducing the effect of smaller LWUs.
 3. Refer also to pages 13, 19 and 71.
 4. For general notes see page 30.

Figure 20: Operating Cost (OMA) per property - Sewerage 2012-13

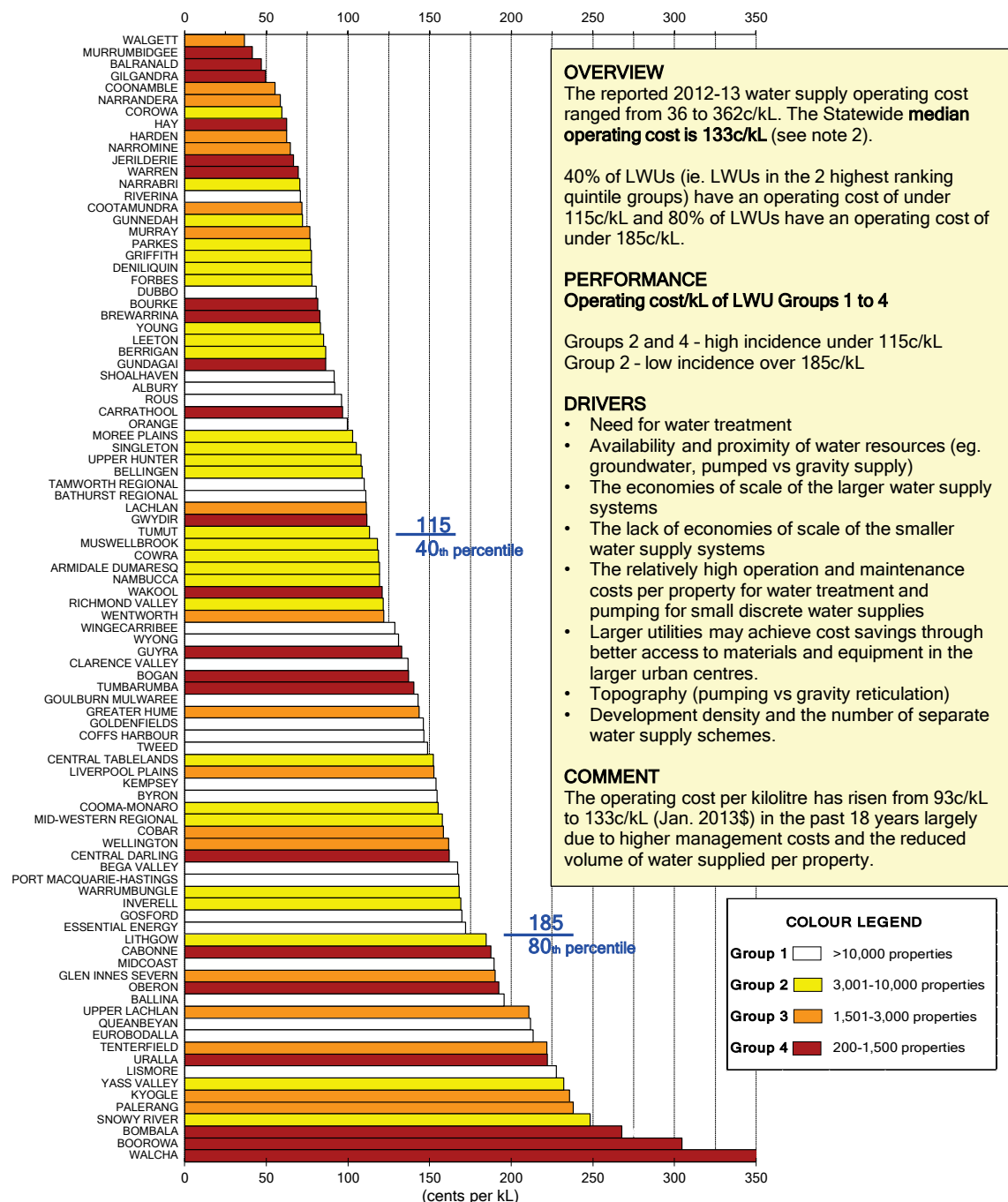


Parameter: $\frac{\text{Management expenses (S1)} + \text{Total operation expenses (S2)}}{\text{No. connected properties}}$

Notes:

1. This figure shows ranked values of the 2012-13 sewerage operating cost (OMA - operation, maintenance and administration - NWI Indicator F12) per property for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4). The metropolitan water utilities (Sydney Water Corporation and Hunter Water Corporation) are shown in blue.
2. The Statewide median is a weighted median calculated on the basis of connected properties. It best reveals statewide performance of the regional NSW utilities by giving due weight to larger LWUs and reducing the effect of smaller LWUs.
3. Refer also to pages 13, 19 and 71.
4. For general notes see page 30.

Figure 21: Operating Cost (OMA) per kilolitre - Water Supply 2012-13

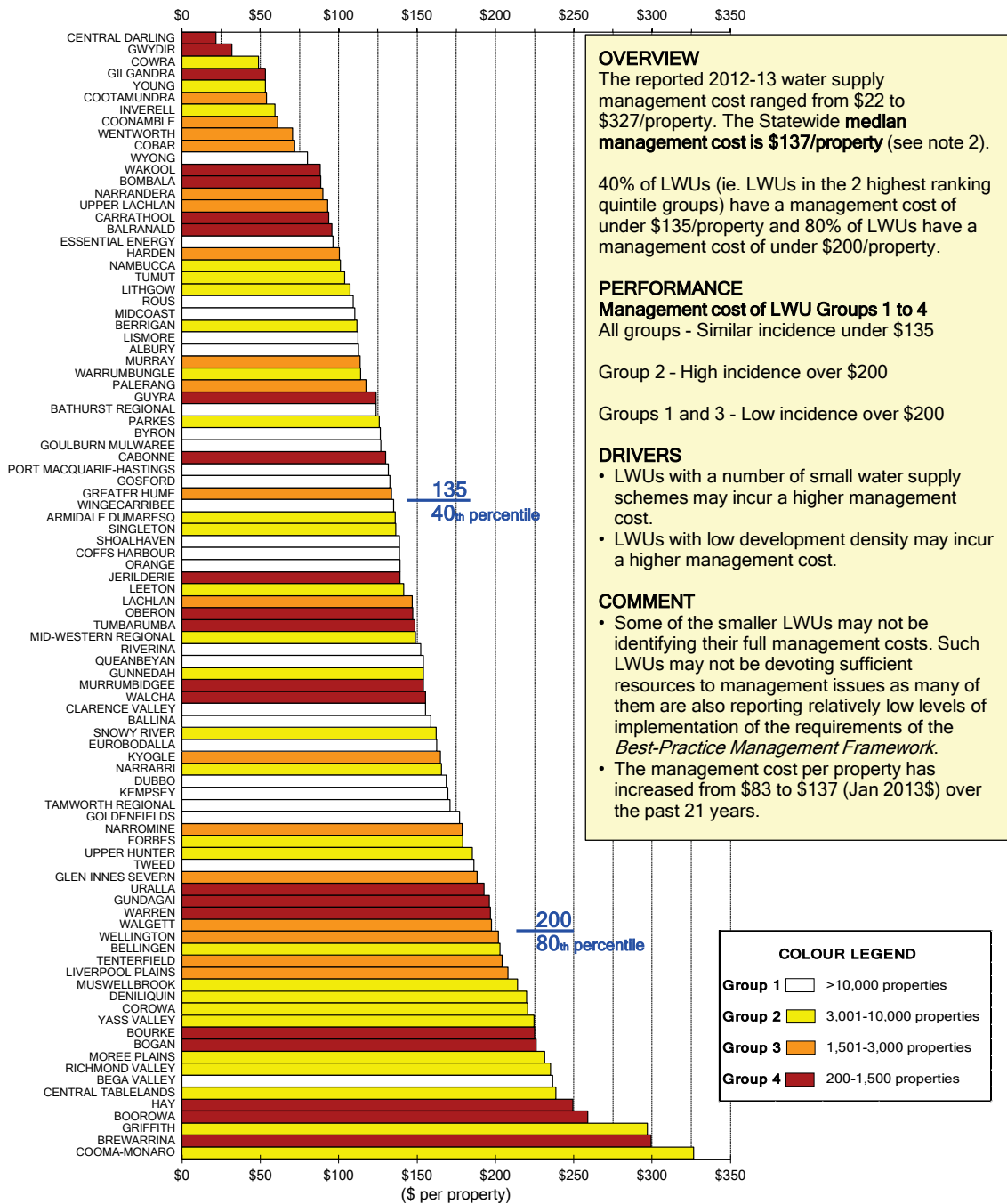


Parameter: $\frac{\text{Management expenses (W1)} + \text{Total operation expenses (W2)} - \text{Purchase of water (W2o)} + \text{Bulk Supplier's OMA}}{\text{Total Potable Water Supplied (Q62)}}$

Notes:

1. This figure shows ranked values of the 2012-13 water supply operating cost (OMA - operation, maintenance and administration) per kL for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4).
2. The Statewide median is a weighted median calculated on the basis of connected properties. It best reveals statewide performance of the regional NSW utilities by giving due weight to larger LWUs and reducing the effect of smaller LWUs.
3. Refer also to pages 14 and 84.
4. For general notes see page 30.

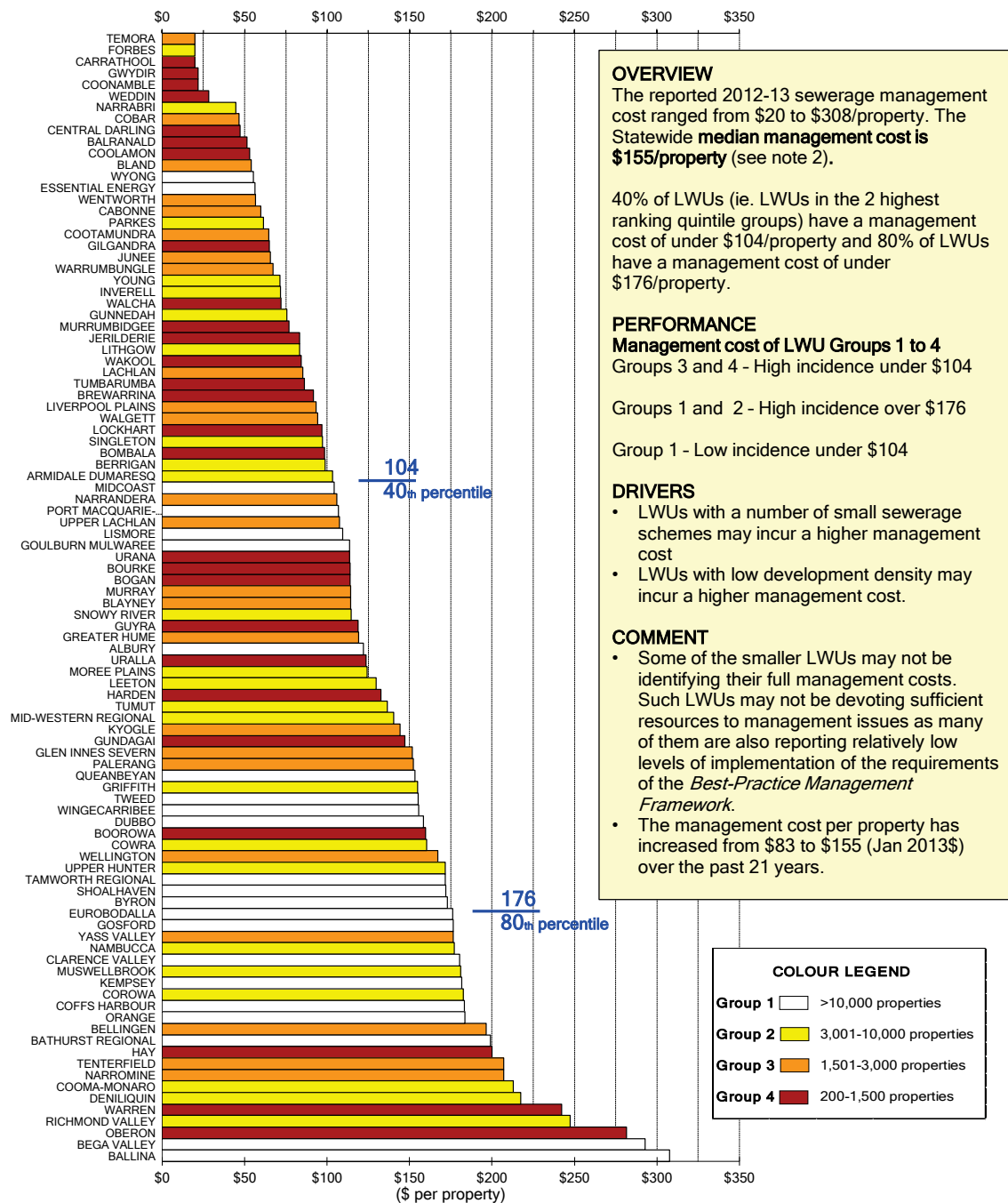
Figure 22: Management Cost per property - Water Supply 2012-13



Parameter:
$$\frac{\text{Administration Cost (W1a)} + \text{Engineering Cost (W1b)}}{\text{No. of connected properties}}$$

- Notes:**
1. This figure shows ranked values of the 2012-13 water supply management cost per property for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4).
 2. The Statewide median is a weighted median calculated on the basis of connected properties. It best reveals statewide performance of the regional NSW utilities by giving due weight to larger LWUs and reducing the effect of smaller LWUs.
 3. Refer also to page 14.
 4. For general notes see page 30.

Figure 23: Management Cost per property - Sewerage 2012-13

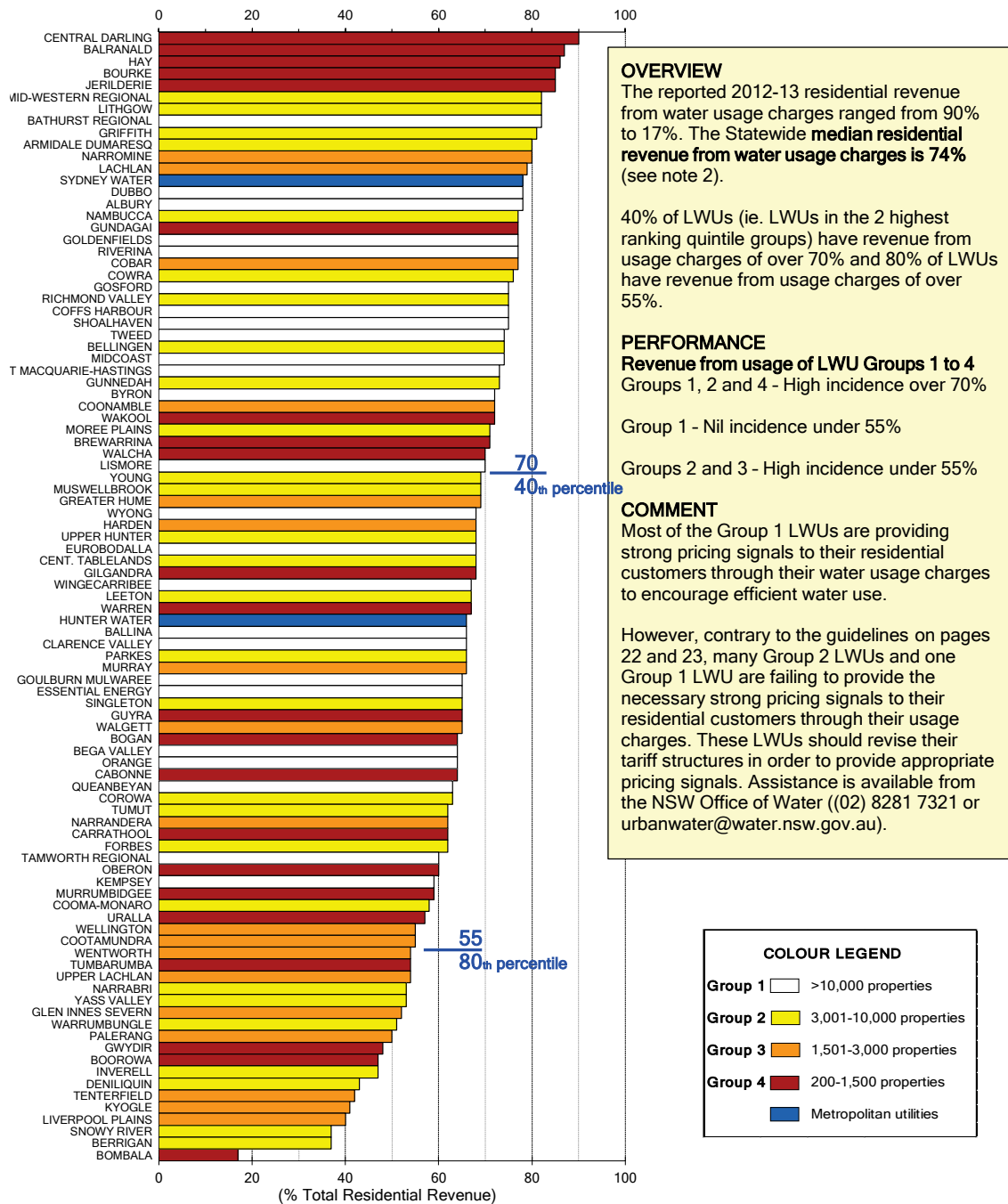


Parameter: $\frac{\text{Administration Cost (S1a)} + \text{Engineering Cost (S1b)}}{\text{No. of connected properties}}$

Notes:

- This figure shows ranked values of the 2012-13 sewerage management cost per property for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4).
- The Statewide median is a weighted median calculated on the basis of connected properties. It best reveals statewide performance of the regional NSW utilities by giving due weight to larger LWUs and reducing the effect of smaller LWUs.
- Refer also to page 14.
- For general notes see page 30.

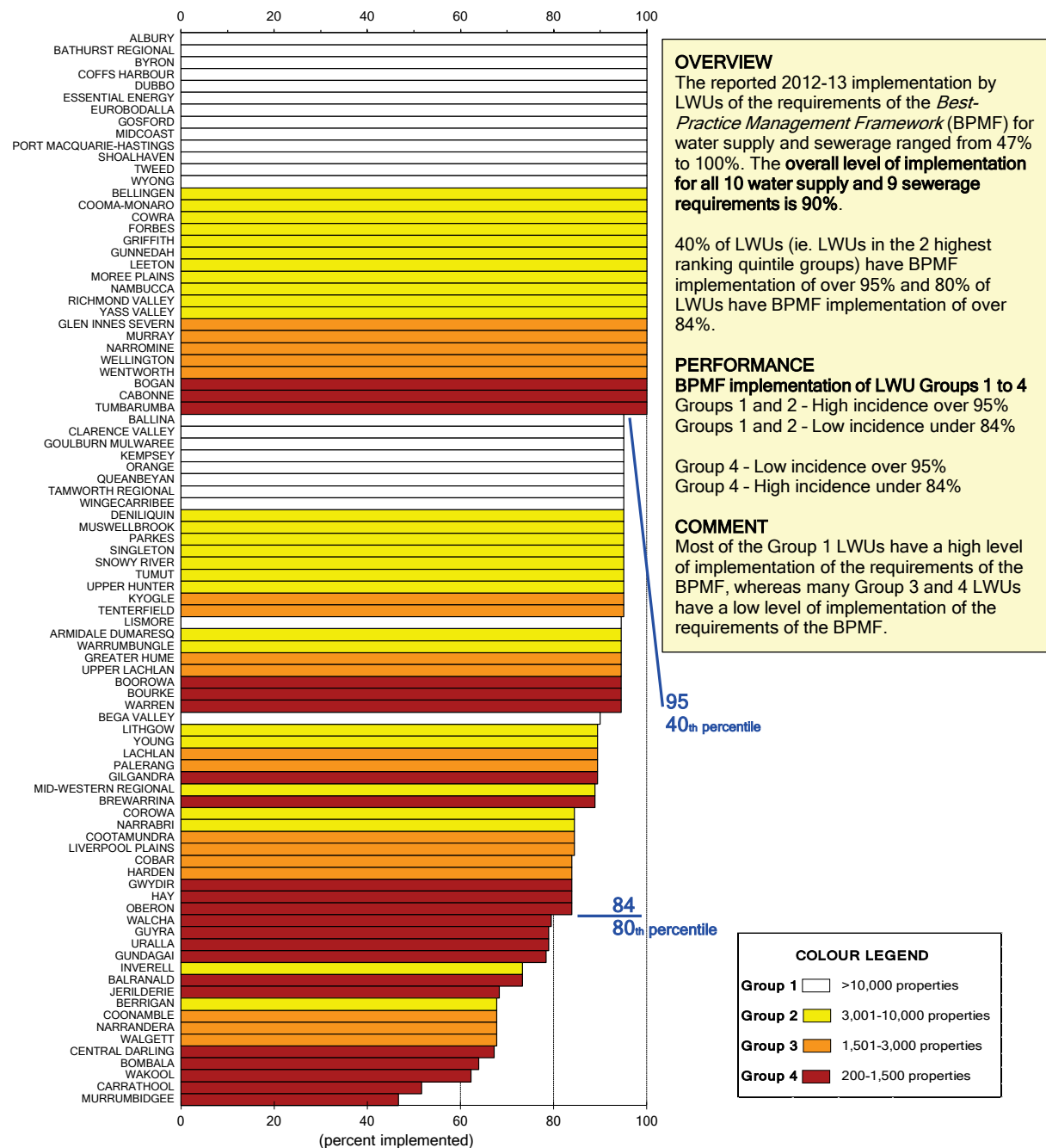
Figure 24: Residential Revenue from Usage Charges - Water Supply 2012-13



Parameter: $\frac{\text{Revenue from Residential Water Usage Charges (W7b)} \times 100}{\text{Revenue from Residential Access Charges (W7a)} + \text{Revenue from Residential Water Usage Charges (W7b)}}$

- Notes:**
1. This figure shows ranked values of the 2012-13 percentage revenue from residential water usage charges [NWI Indicator F4] for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4). The metropolitan water utilities (Sydney Water Corporation and Hunter Water Corporation) are shown in blue.
 2. The Statewide median is a weighted median calculated on the basis of connected properties. It best reveals statewide performance of the regional NSW utilities by giving due weight to larger LWUs and reducing the effect of smaller LWUs.
 3. As shown in the box on page 5, the increase in the real water supply Typical Residential Bill (TRB) over the past 18 years has been limited to 12%.
 4. Refer also to the box on page 5 and pages 16, 66 and 84.
 5. For general notes see page 30.

Figure 25: Best-Practice Management Implementation (%) - Water Supply & Sewerage 2012-13

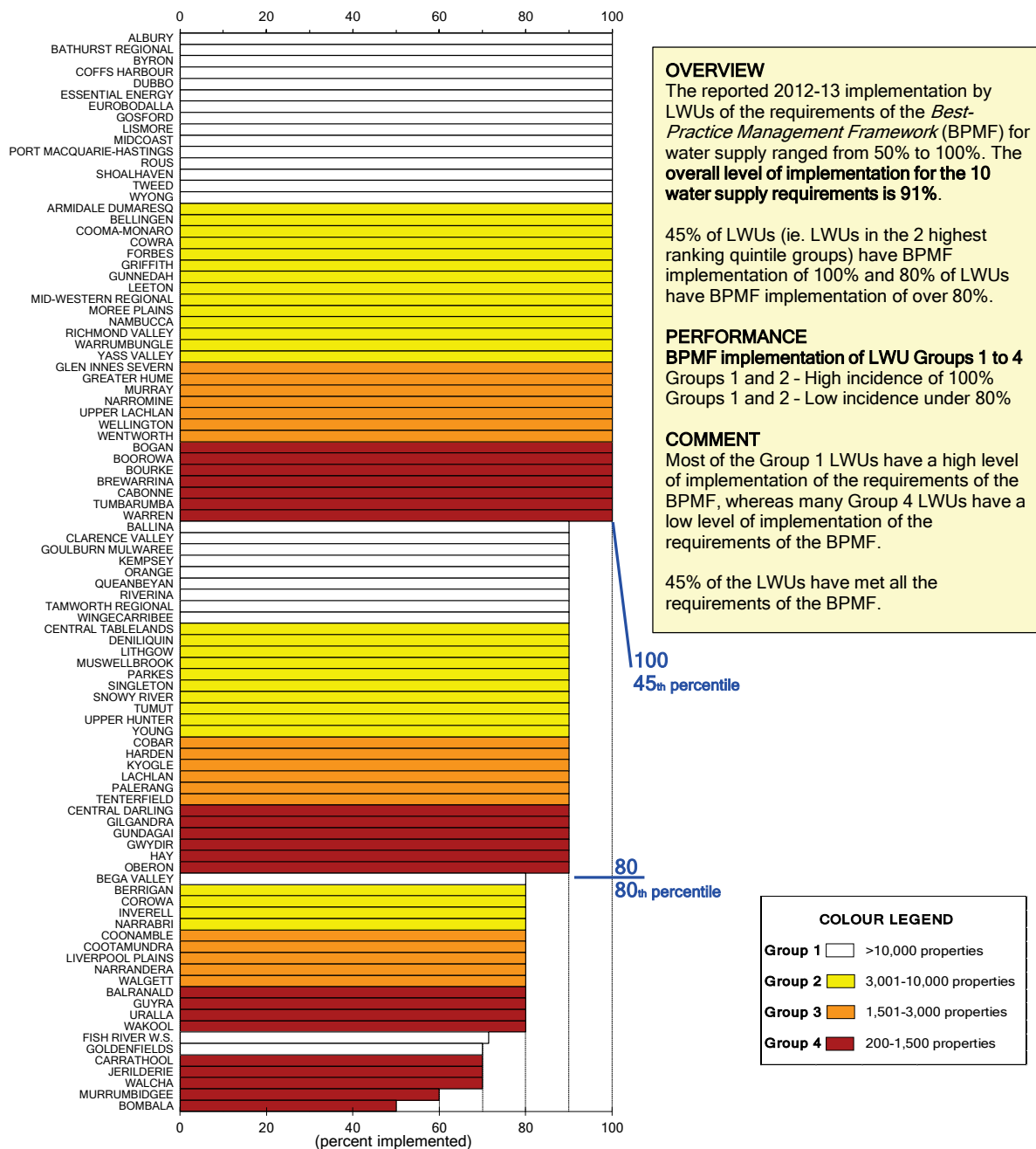


Parameter: Implementation of the 19 water supply and sewerage Best-Practice Management Requirements (%)

Notes:

- This figure shows ranked values of the 2012-13 level of implementation of the 19 planning, pricing and management requirements of the *NSW Best-Practice Management of Water Supply and Sewerage Framework* for water supply and sewerage for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4).
- Refer also to pages viii and 23 and Appendix C on page 77.
- For general notes see page 30.

Figure 26: Best-Practice Management Implementation (%) - Water Supply 2012-13

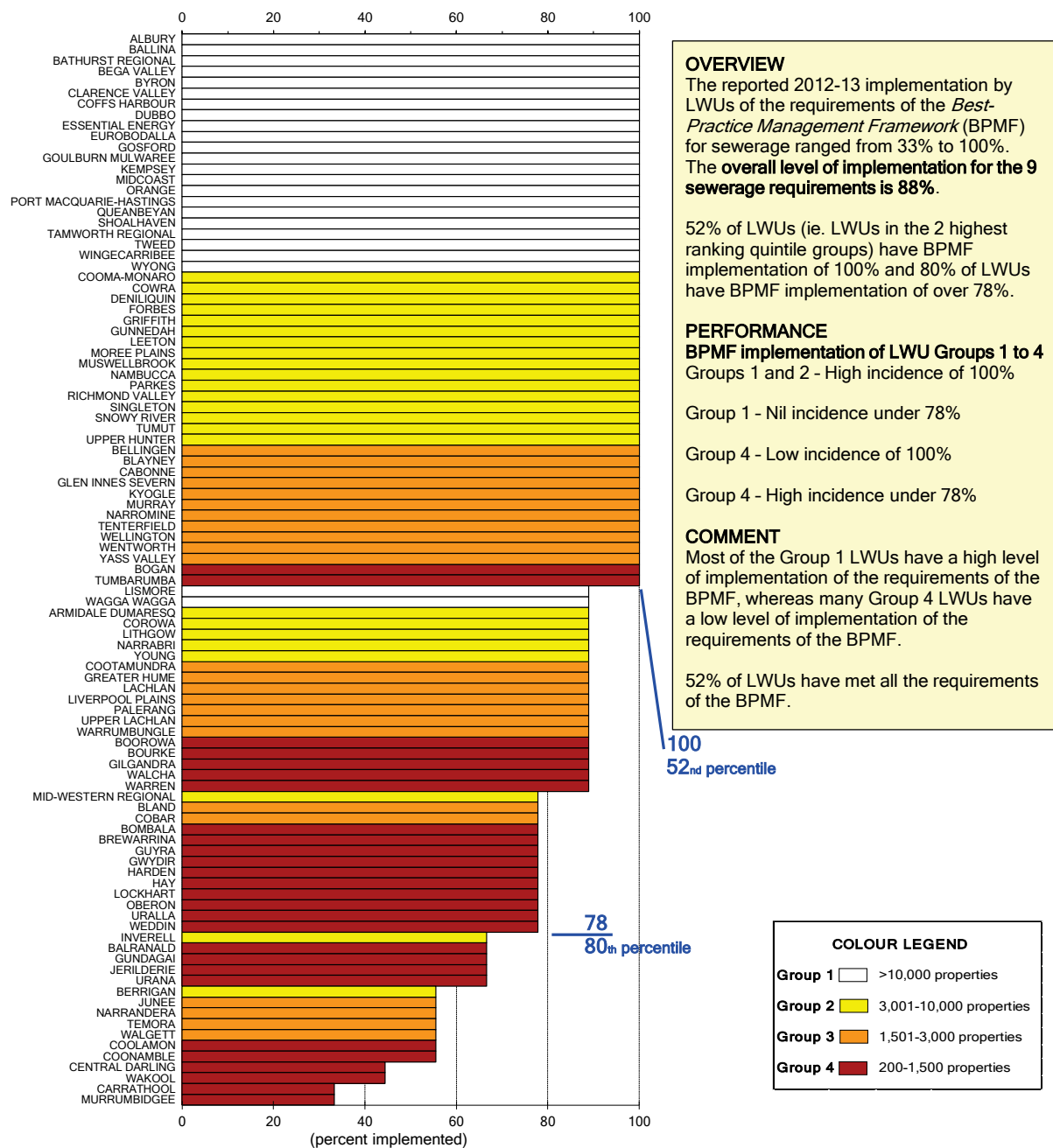


Parameter: Implementation of the 10 water supply Best-Practice Management Requirements (%)

Notes:

1. This figure shows ranked values of the 2012-13 level of implementation of the requirements of the *NSW Best-Practice Management of Water Supply and Sewerage Framework* for water supply for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4).
2. The 10 requirements for implementing best-practice for water supply are: complete sound Strategic Business Plan & Financial Plan; Pricing with full cost-recovery, without significant cross subsidies; appropriate residential charges; required residential revenue from water usage charges; appropriate non-residential charges; sound Water Conservation implemented; sound Drought Management implemented; Development Servicing Plan with commercial developer charges; complete Performance Reporting by 15 September; and Integrated Water Cycle Management strategy commenced (page viii).
3. Refer also to page 23 and Appendix C on page 77.
4. For general notes see page 30.

Figure 27: Best-Practice Management Implementation (%) - Sewerage 2012-13

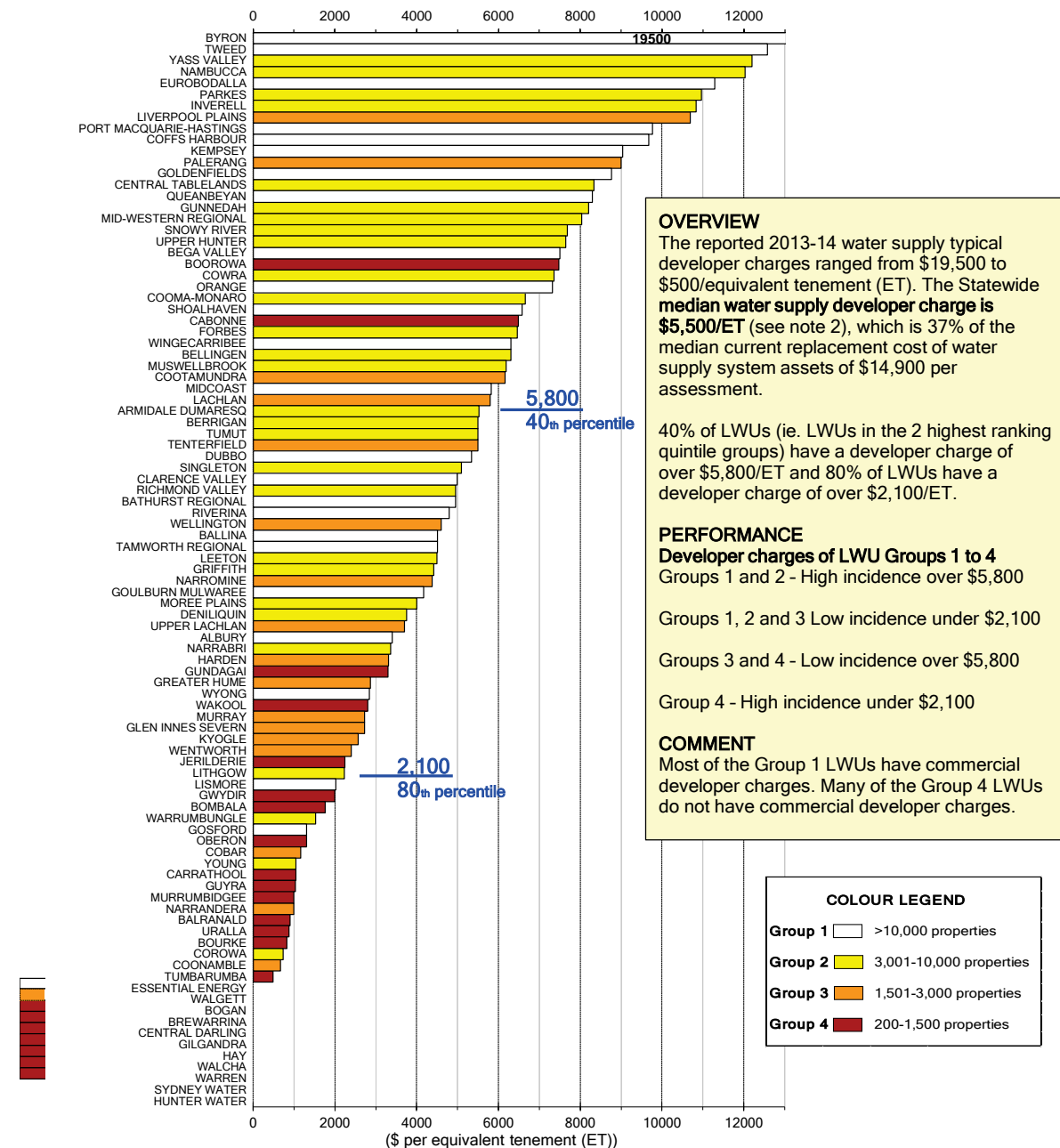


Parameter: Implementation of the 9 sewerage Best-Practice Management Requirements (%)

Notes:

- This figure shows ranked values of the 2012-13 level of implementation of the requirements of the *NSW Best-Practice Management of Water Supply and Sewerage Framework* for sewerage for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4).
- The 9 requirements for implementing best-practice for sewerage are: complete sound Strategic Business Plan & Financial Plan; Pricing with full cost-recovery, without significant cross subsidies; appropriate residential charges; appropriate non-residential charges; appropriate trade waste fees & charges; Development Servicing Plan with commercial developer charges; liquid trade waste approvals & current Trade Waste Policy; complete Performance Reporting by 15 September; and Integrated Water Cycle Management strategy commenced (page viii).
- Refer also to page 23 and Appendix C on page 77.
- For general notes see page 30.

Figure 28: Typical Developer Charges - Water Supply 2013-14

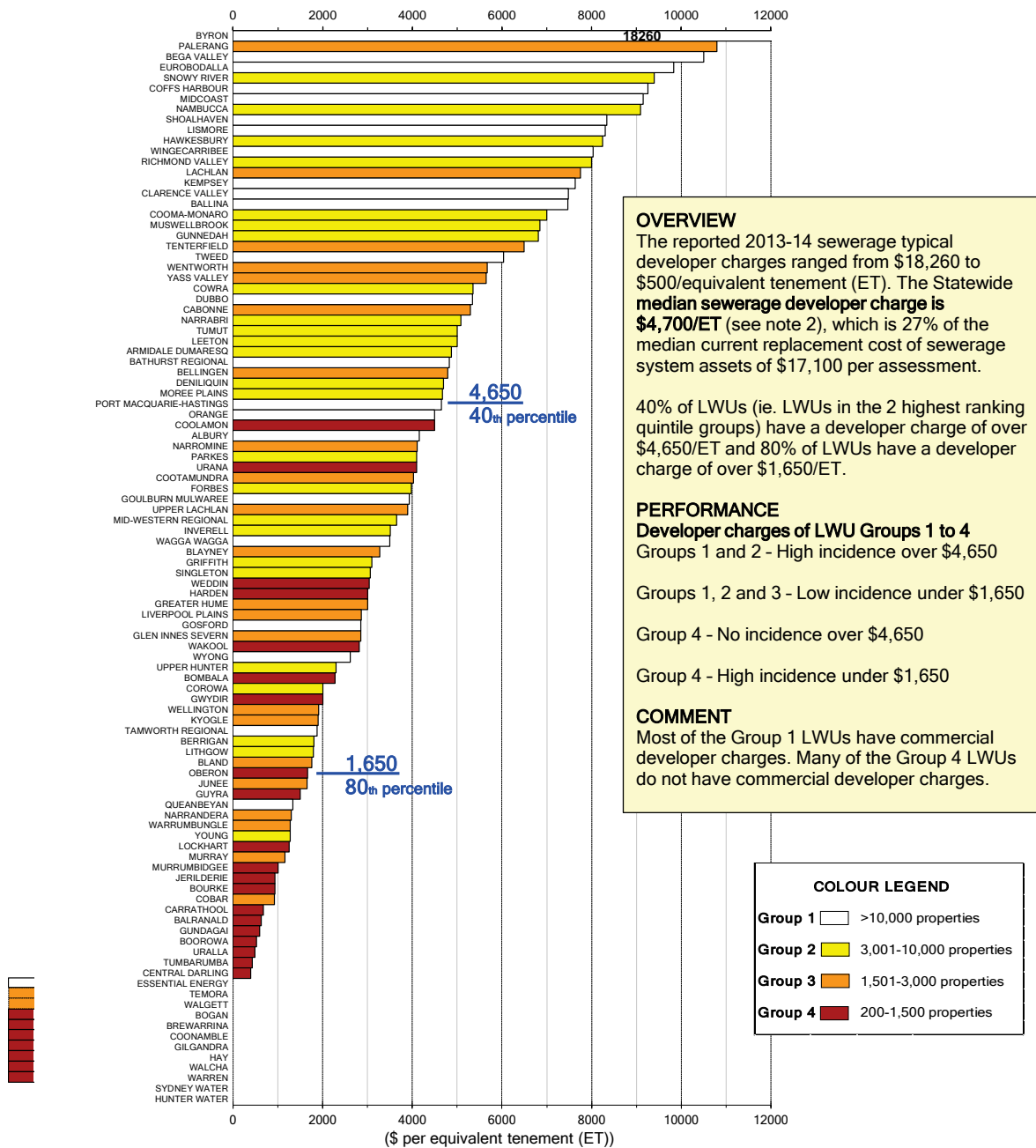


Parameter: Typical Water Supply Developer Charge (W36)

Notes:

1. This figure shows ranked values of the 2013-14 typical developer charge for water supply for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4).
2. The Statewide median is a weighted median calculated on the basis of connected properties. It best reveals statewide performance of the regional NSW utilities by giving due weight to larger LWUs and reducing the effect of smaller LWUs.
3. 84 LWUs levied water supply developer charges.
4. 84% of LWUs have an appropriate water supply Development Servicing Plan (DSP) with commercial developer charges. This includes the following 12 utilities which have received an exemption from needing to levy commercial water supply developer charges due to their low growth of under 5 lots/a - Bogan, Boorowra, Bourke, Brewarrina, Central Darling, Coonamble, Essential Energy, Gilgandra, Hay, Kyogle, Tumbarumba and Warren.
5. Refer also to pages 6 and 84.
6. For general notes see page 30.

Figure 29: Typical Developer Charges - Sewerage 2013-14



OVERVIEW
 The reported 2013-14 sewerage typical developer charges ranged from \$18,260 to \$500/equivalent tenement (ET). The Statewide median sewerage developer charge is \$4,700/ET (see note 2), which is 27% of the median current replacement cost of sewerage system assets of \$17,100 per assessment.

40% of LWUs (ie. LWUs in the 2 highest ranking quintile groups) have a developer charge of over \$4,650/ET and 80% of LWUs have a developer charge of over \$1,650/ET.

PERFORMANCE
Developer charges of LWU Groups 1 to 4
 Groups 1 and 2 - High incidence over \$4,650
 Groups 1, 2 and 3 - Low incidence under \$1,650
 Group 4 - No incidence over \$4,650
 Group 4 - High incidence under \$1,650

COMMENT
 Most of the Group 1 LWUs have commercial developer charges. Many of the Group 4 LWUs do not have commercial developer charges.

COLOUR LEGEND

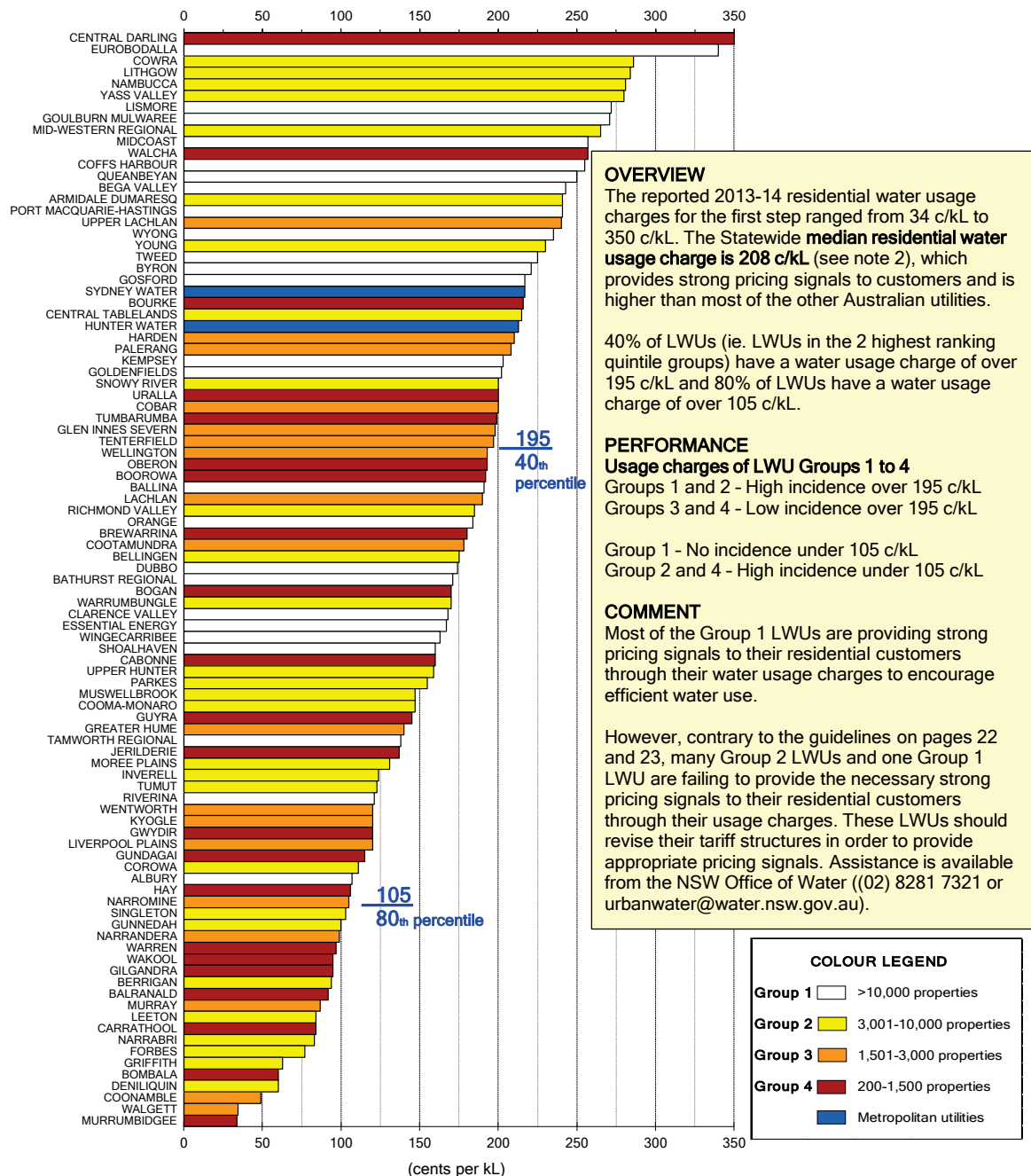
Group 1	>10,000 properties
Group 2	3,001-10,000 properties
Group 3	1,501-3,000 properties
Group 4	200-1,500 properties

Parameter: Typical Sewerage Developer Charge (\$36)

Notes:

1. This figure shows ranked values of the 2013-14 typical developer charge for sewerage for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4).
2. The Statewide median is a weighted median calculated on the basis of connected properties. It best reveals statewide performance of the regional NSW utilities by giving due weight to larger LWUs and reducing the effect of smaller LWUs.
3. 91 LWUs levied sewerage developer charges.
4. 82% of LWUs have an appropriate sewerage Development Servicing Plan (DSP) with commercial developer charges. This includes the following 12 utilities which have received an exemption from needing to levy commercial sewerage developer charges due to their low growth of under 5 lots/a - Bogan, Boorowa, Bourke, Brewarrina, Central Darling, Coonamble, Essential Energy, Gilgandra, Hay, Kyogle, Tumbarumba and Warren.
5. Refer also to pages 6 and 87.
6. For general notes see page 30.

Figure 30: Residential Water Usage Charge 2013-14

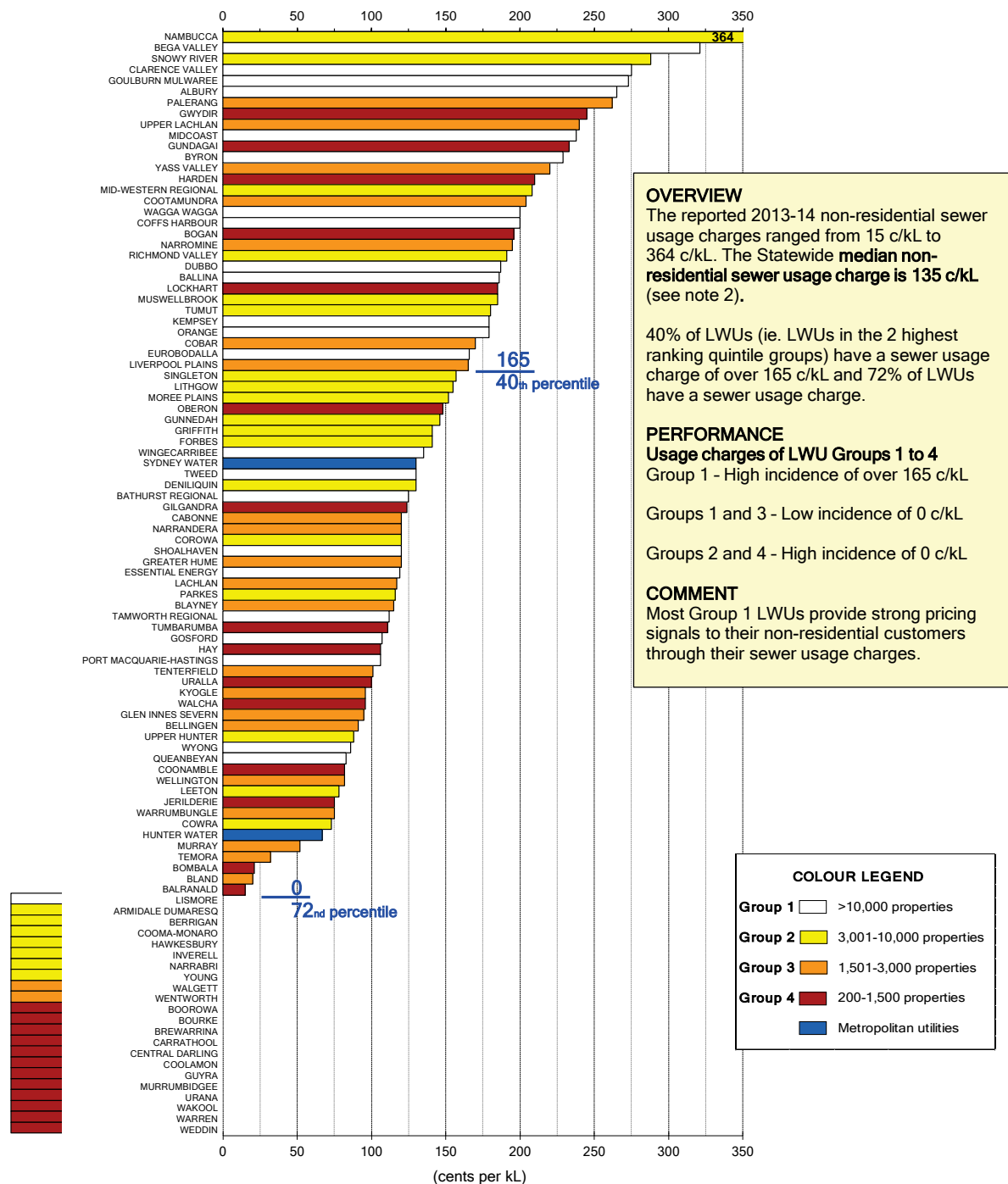


Parameter: Residential Water Usage Charge

Notes:

1. This figure shows ranked values of the 2013-14 residential water usage charge [NWI Indicator P1.3] for the first step for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4). The metropolitan water utilities (Sydney Water Corporation and Hunter Water Corporation) are shown in blue.
2. The Statewide median is a weighted median calculated on the basis of connected properties. It best reveals statewide performance of the regional NSW utilities by giving due weight to larger LWUs and reducing the effect of smaller LWUs.
3. As shown in the box on page 5, the real increase in the Statewide median water supply Typical Residential Bill (TRB) over the past 18 years has been limited to 12%.
4. Refer also to pages 5, 66 and 84.
5. For general notes see page 30.

Figure 31: Non-residential Sewer Usage Charge 2013-14



Parameter: Non-residential Sewer Usage Charge

Notes:

1. This figure shows ranked values of the 2013-14 non-residential sewer usage charge for each Local Water Utility (LWU) in 4 groups, based on the number of connected properties served - over 10,000 (Group 1), 3,001 to 10,000 (Group 2), 1,501 to 3,000 (Group 3) and 200 to 1,500 (Group 4). The metropolitan water utilities (Sydney Water Corporation and Hunter Water Corporation) are shown in blue.
2. The Statewide median is a weighted median calculated on the basis of connected properties. It best reveals statewide performance of the regional NSW utilities by giving due weight to larger LWUs and reducing the effect of smaller LWUs.
3. Refer also to pages 6, 66 and 87.
4. For general notes see page 30.

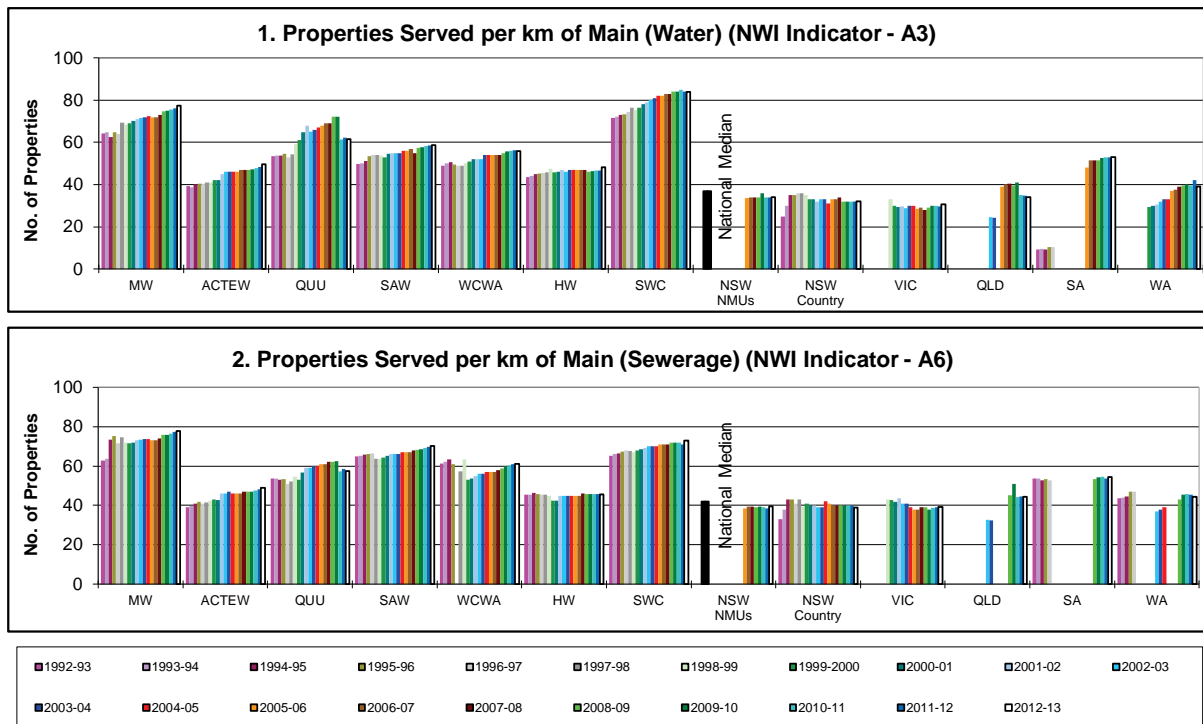
Appendix A

National performance comparisons 1992-93 to 2012-13

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PERFORMANCE COMPARISONS - Utility Characteristics



Metropolitan Water Utilities

MW	Melbourne Water Consolidated (see note 1)
ACTEW	ACT Electricity and Water
QUU	Queensland Urban Utilities (Brisbane) (see note 3)
SAW	SA Water Corporation (Adelaide)
WCWA	WA Water Corporation (Perth)
HW	Hunter Water Corporation
SWC	Sydney Water Corporation

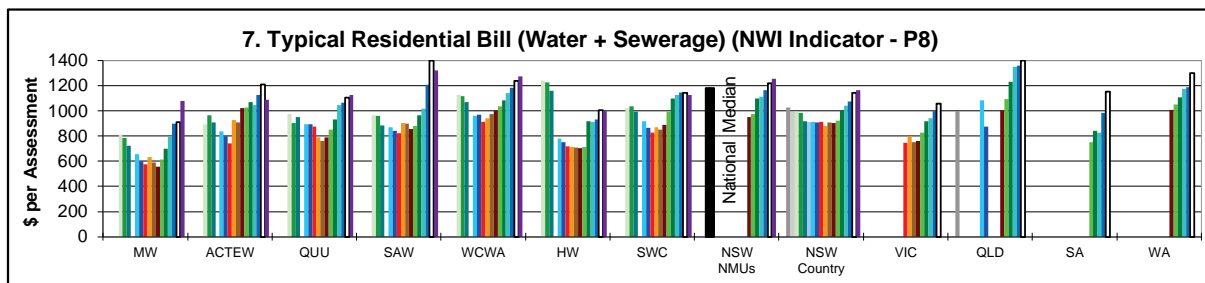
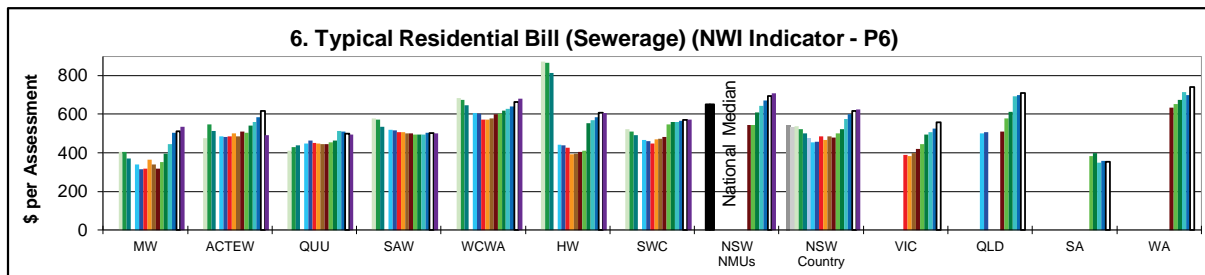
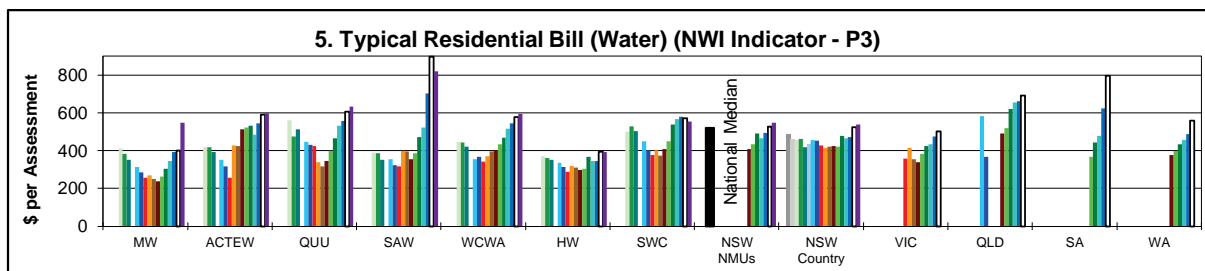
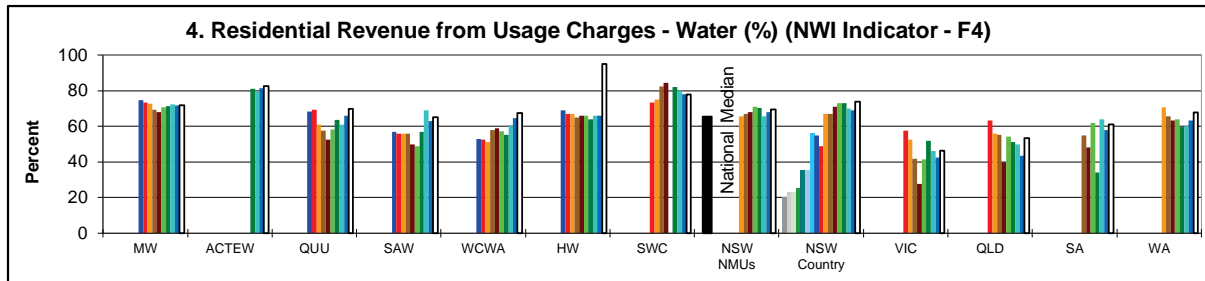
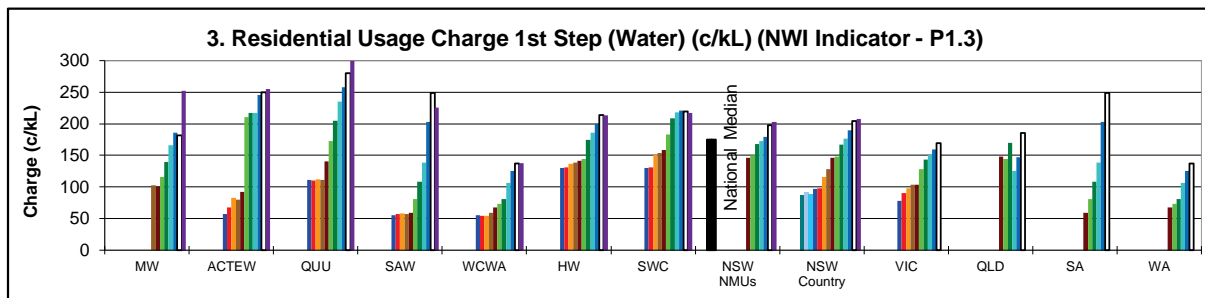
Country Water Utilities

NSW NMUs	Median of NSW regional LWUs with > 10,000 connected properties
NSW Country	Statewide median for all NSW regional LWUs
VIC	VIC Country (see note 4)
QLD	QLD Country (see note 6)
SA	SA Country (see note 5)
WA	WA Country (see note 7)

NOTES:

- Melbourne Water was disaggregated into 4 constituent utilities in 1994. Melbourne Water Consolidated results for 1994-95 to 2012-13 are either aggregated results of the constituent utilities or consolidated results reported in the *National Performance Report 2012-13*, *WSAA Facts* (note 2) or reported in *Urban Water Review* (note 4).
- Metropolitan Utilities - *National Performance Report 2012-13* used to obtain results from 2001-02 to 2012-13 (www.nwc.gov.au). *WSAA Facts 2005* and *WSAA Facts 1999* (published by the Water Services Association of Australia) used to obtain results from 1994-95 to 1999-00.
- Queensland Urban Utilities (QUU) was formed by aggregating Brisbane Water, Ipswich City Council, Scenic Rim Regional Council, Lockyer Valley Regional Council and Somerset Regional Council. QUU commenced operations on 1 July 2010. The results shown for QUU prior to 2010-11 are those reported in the NPR and WSAA Facts for Brisbane Water.
- Victorian Country - *Urban Water Review 1998* and *2004-2005*, (published by the Victorian Water Industry Association) used to obtain results for Victoria Country from 1996-97 to 2004-05. Results from 2005-06 to 2012-13 obtained from median of Victorian utilities (excluding Melbourne Water and its constituents) published in the *2012-13 National Performance Report*.
- SA Country - *Government Trading Enterprises Performance Indicators 1992-93 to 1996-97 and 1990-91 to 1994-95*, (published by Steering Committee on National Performance Monitoring of Government Trading Enterprises), used to obtain results for 1990-91 to 1996-97. Results from 2005-06 to 2012-13 obtained from median of SA NMUs (Whyalla and Mt Gambier) published in the *National Performance Report 2012-13*. **The results shown from 2005-06 do not report the overall performance of SA country utilities.** The 2012-13 results are for 2 utilities.
- QLD Country - *Urban Water Service Providers Queensland Report 2003-2004*, (published by Queensland Department of Natural Resources and Mines), used to obtain results from 2002-03 and 2003-04. These results are for 18 large and medium utilities and exclude Brisbane City Council. Results from 2005-06 to 2012-13 obtained from median of QLD NMUs (Cairns, Mackay, Gold Coast, Logan, Rockhampton, Toowoomba, Townsville, Unity Water, Wide Bay Water) published in the *National Performance Report 2012-13*. **The results shown for 2005-06 to 2011-12 report a maximum of 7 of the approximately 70 Queensland country utilities.** The 2012-13 results are for 9 utilities.
- WA Country - *Government Trading Enterprises Performance Indicators 1992-93 to 1996-97 and 1990-91 to 1994-95*, (published by Steering Committee on National Performance Monitoring of Government Trading Enterprises), used to obtain results for 1990-91 to 1996-97. Results from 1999-2005 obtained from *Water Performance Information* on 32 Major WA Towns 1999-2003 and 2001-2005 prepared by the Western Australia Economic Regulation Authority. The results are for regional towns and do not include Perth. Results from 2005-06 to 2012-13 obtained from median of WA NMUs (Albany, Australind/Eaton, Bunbury, Busselton, Geraldton, Kalgoorlie-Boulder, Mandurah) published in the *National Performance Report 2012-13*. **The results shown from 1999 do not report the overall performance of WA country utilities.** The 2012-13 results are for 7 water supply and sewerage utilities.
- Except for Graphs 3 and 5 to 7, which are in 2013-14 dollars, financial data is presented in 2012-13 dollars.
- The National Median is the median value of the 2012-13 results published in the *National Performance Report 2012-13*.
- Hobart and Darwin results have not been included in the graphs due to space limitations and the limited data coverage by these utilities. For Darwin, 2012-13 results for NWI indicators W12, P8, F13, A8, C9 and H3 are 456, 1777, 1097, 17, 2 and 100% respectively. For Southern Water, which includes Hobart, results are available for only 2 of these indicators - F13 (829) and H3 (100%).

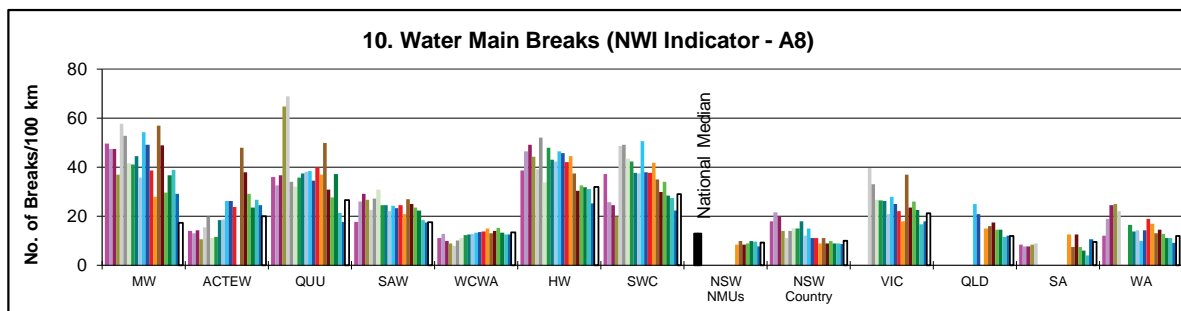
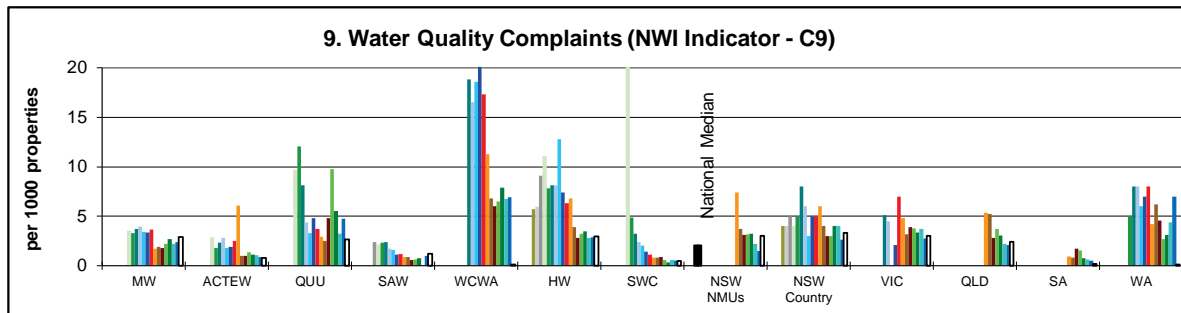
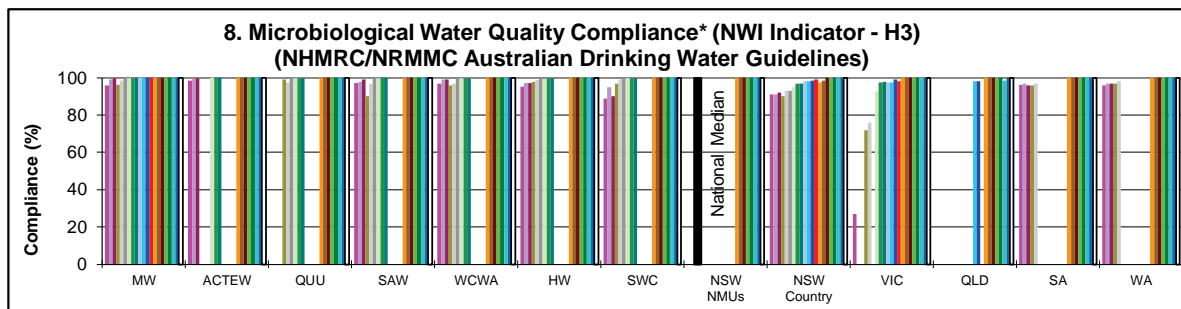
PERFORMANCE COMPARISONS - Social



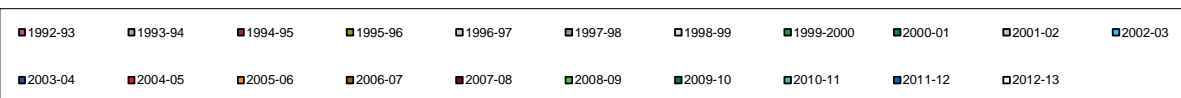
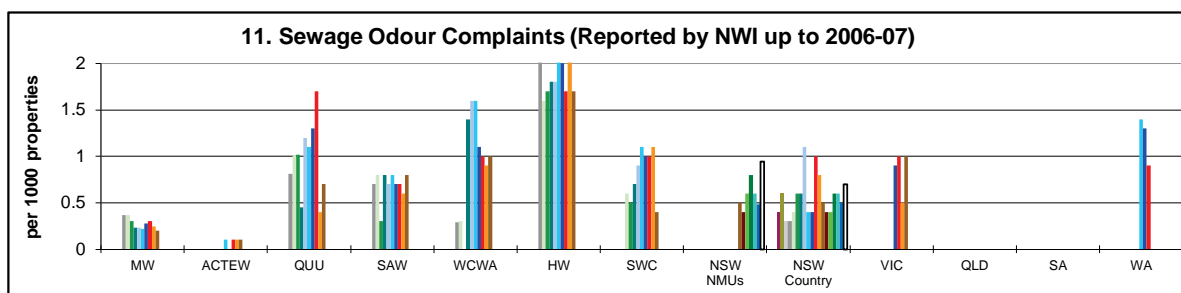
1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-01	2001-02	2002-03
2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14

- NOTES**
- The Typical Residential Bill (TRB) is the annual bill paid by a residential customer using the utility's average annual residential water supplied.
 - The TRB is the principal indicator of the overall cost of a water supply or sewerage system.
 - The 2013-14 Usage Charge and TRB (graphs 3 and 5 to 7) for the metropolitan water utilities have been determined from data published on each utility's website.
 - As the 2009-10 to 2012-13 values for Indicator F4 were not reported by ACTEW, they have been conservatively estimated in graph 4 from the utility's reported TRB and fixed charge for these years: $(TRB - \text{Fixed Charge}) / TRB \times 100$.

PERFORMANCE COMPARISONS - Social (Water)



PERFORMANCE COMPARISONS - Social (Sewerage)



*** Microbiological Water Quality Compliance**

1991 to 1998 results are generally on the basis of the 1987 NHMRC/AWRC Drinking Water Quality Guidelines.

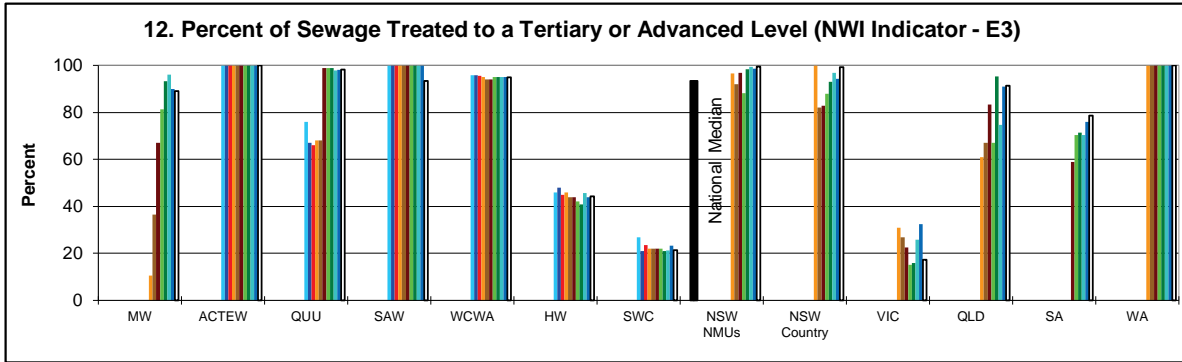
1998-99 and subsequent results are generally on the basis of E. coli in the more stringent 1996 NHMRC/ARMCANZ and 2004 NHMRC/NRMMC Australian Drinking Water Guidelines (ADWG).

The exceptions are Victorian country utilities where results up to 2003-04 are on the basis of the less stringent 1984 World Health Organisation Guidelines and which are now on the basis of the Victorian Safe Drinking Water Regulations 2005, and also Melbourne Water where prior to 2004-05 the results are on the basis of the above 1987 Guidelines and which were subsequently on the basis of the 2004 ADWG.

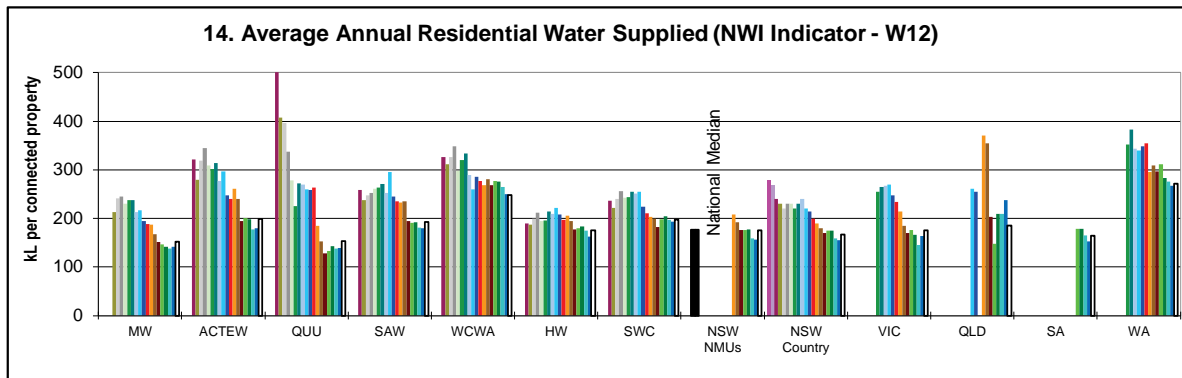
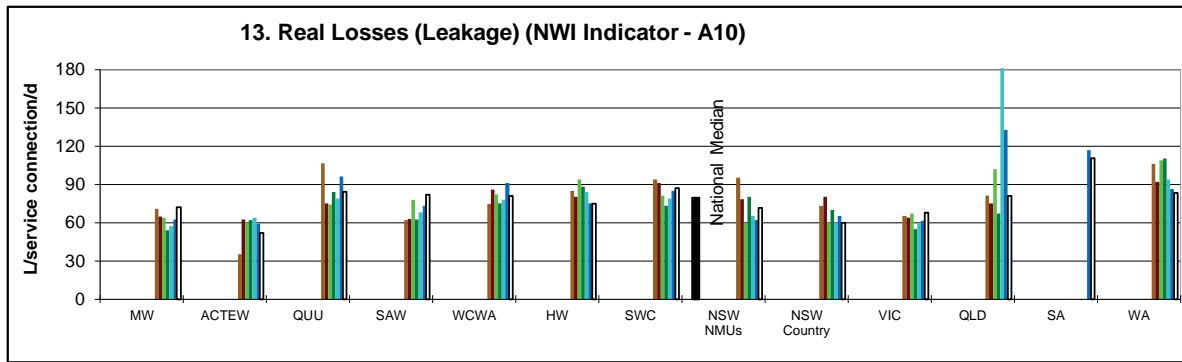
For 2005-06 to 2012-13, the results shown are for "% of population where microbiological compliance was achieved", in accordance with NWI Indicator H3.

As noted on page 8, in 2012-13 the water supply for 99.9% of the urban population in regional NSW complied with 2011 ADWG for both microbiological and chemical water quality. 99.7% of the 19,000 samples tested complied for microbiological water quality (health related) and 98.5% of the 4,200 samples tested complied for chemical water quality (health related).

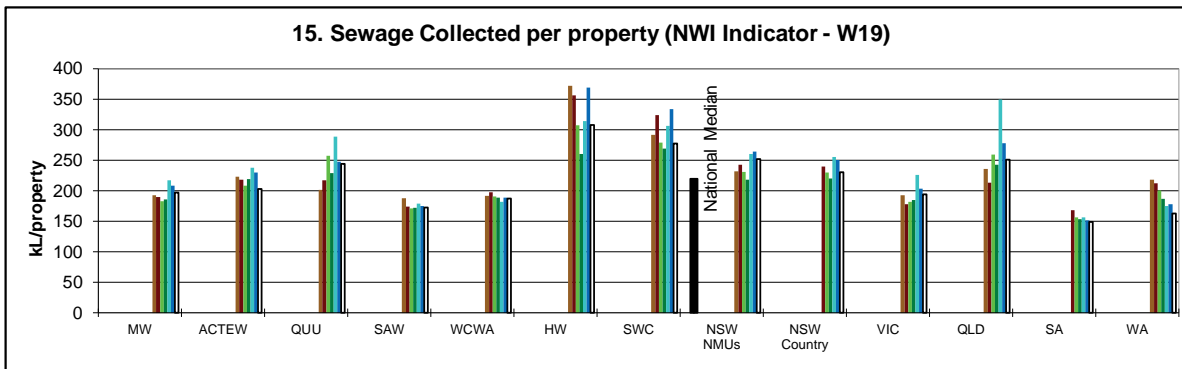
PERFORMANCE COMPARISONS - Social (Sewerage)



PERFORMANCE COMPARISONS - Environmental (Water)

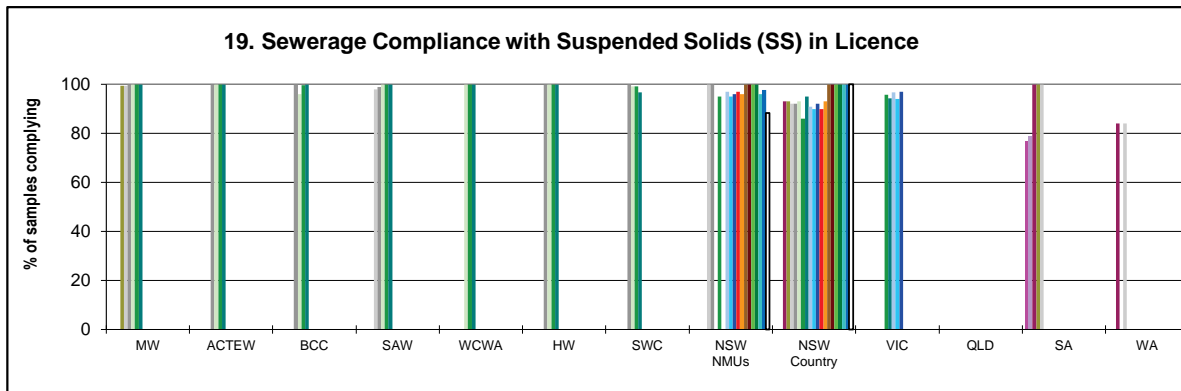
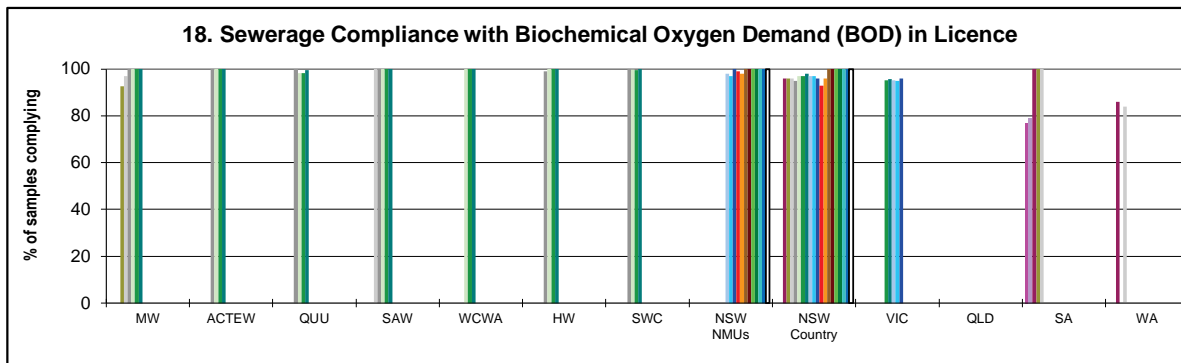
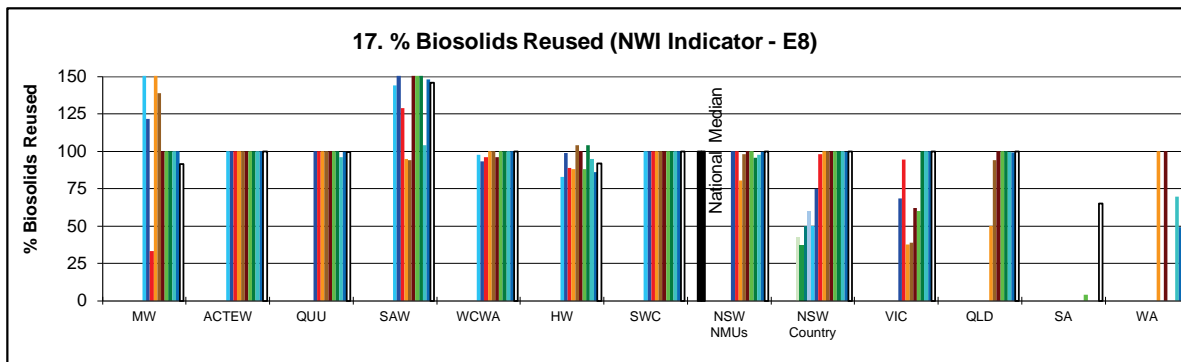
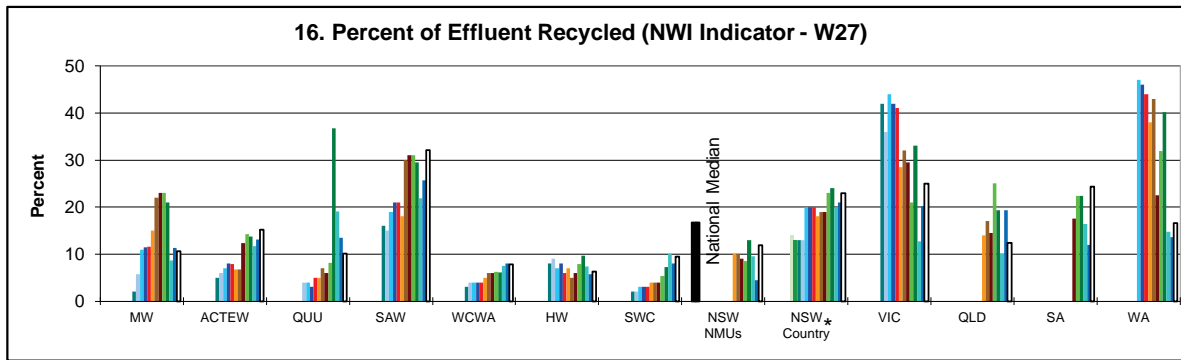


PERFORMANCE COMPARISONS - Environmental (Sewerage)



1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-01	2001-02	2002-03
2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	

PERFORMANCE COMPARISONS - Environmental (Sewerage)

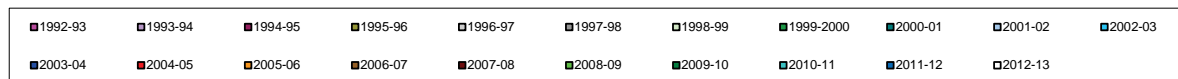
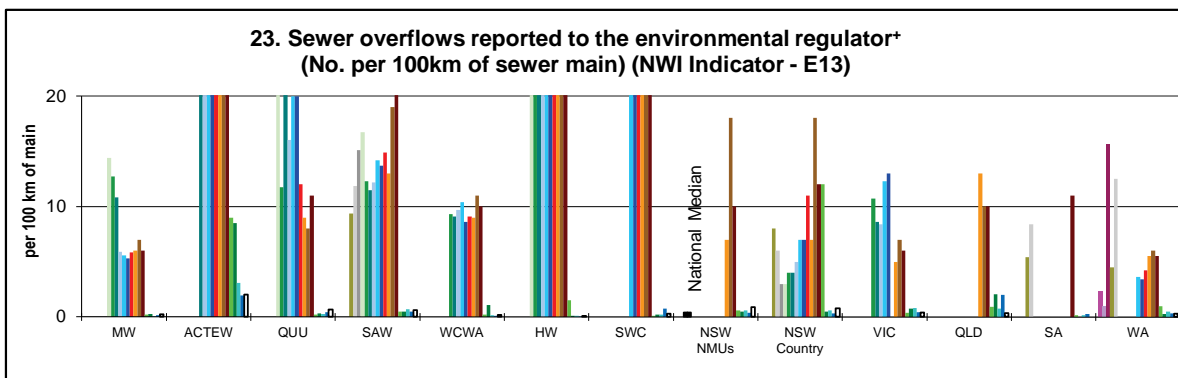
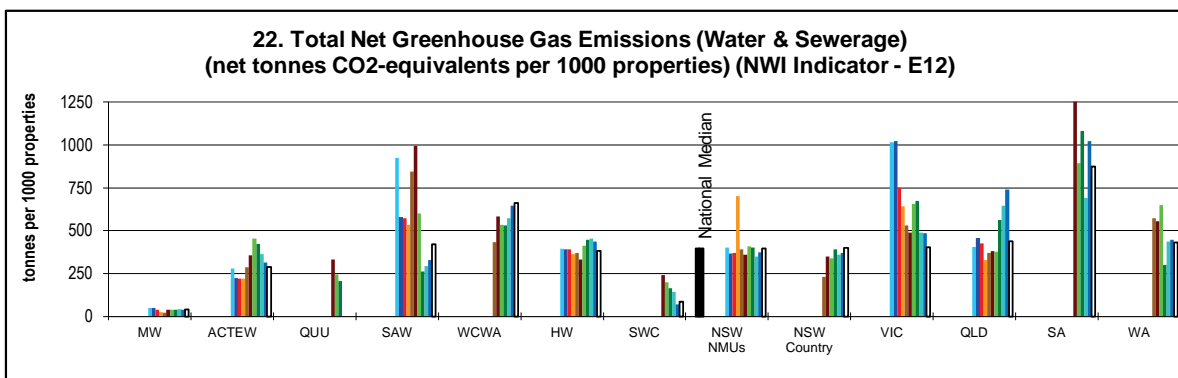
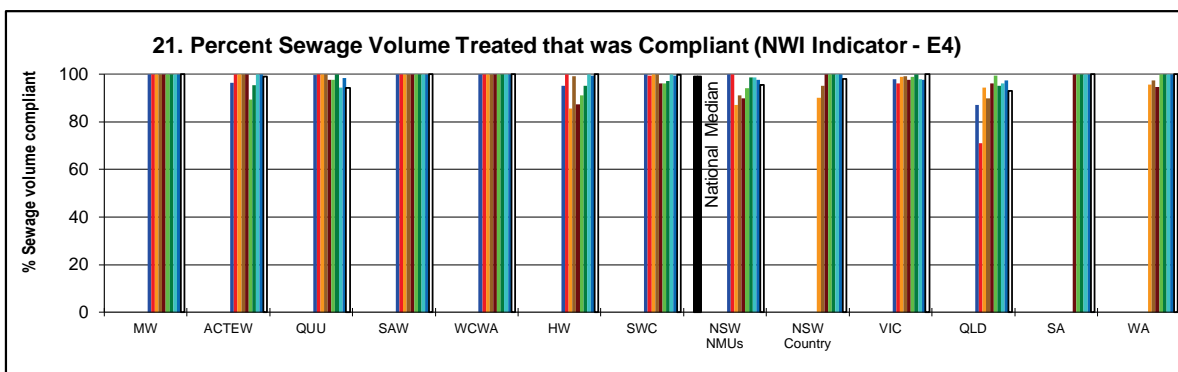
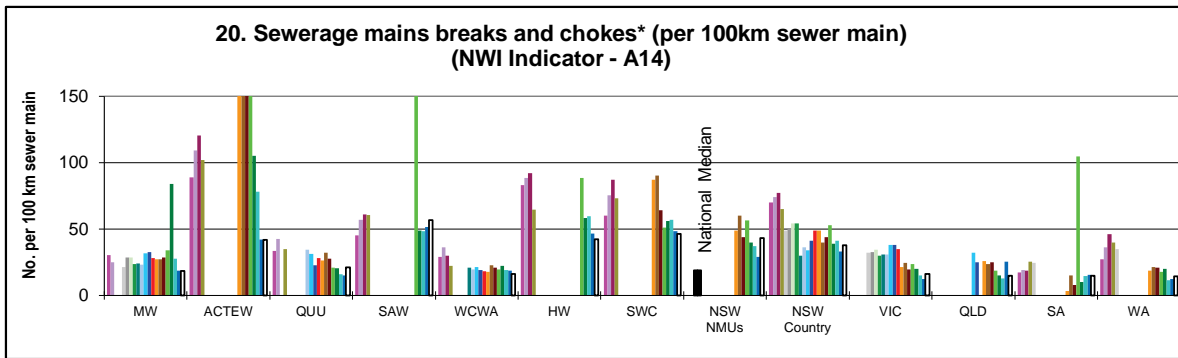


1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-01	2001-02	2002-03
2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	

*** NSW Effluent Result**

The values shown for country NSW are the percentages of total volume of sewage collected in regional NSW that was recycled. For country NSW, 40,000 ML of wastewater was recycled in 2012-13, which is 23 per cent of the total volume of sewage collected and was carried out by 84 per cent of the utilities, mostly for agriculture.

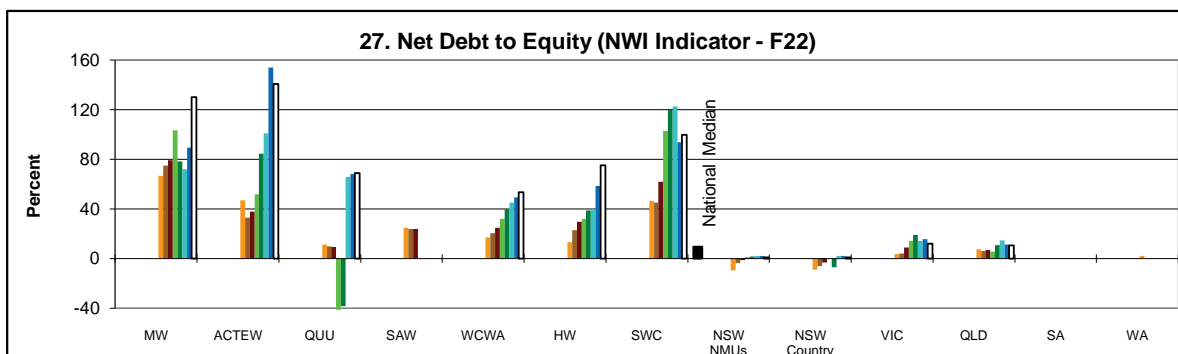
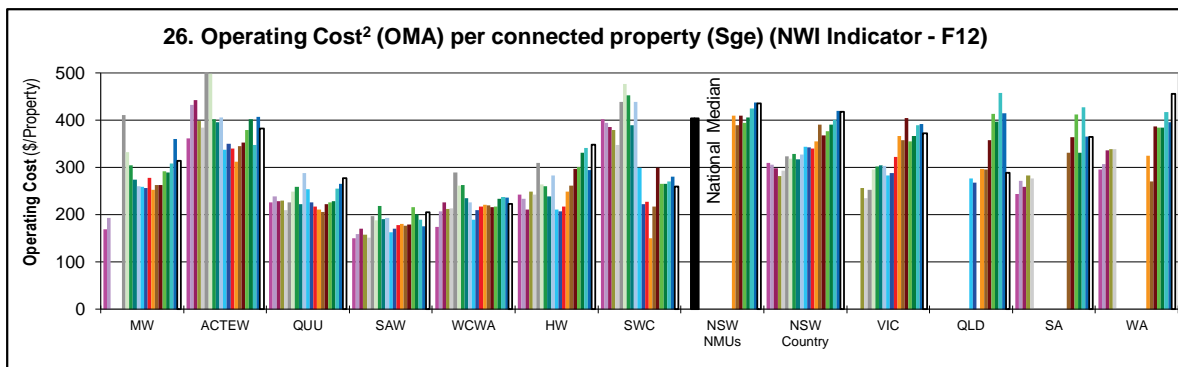
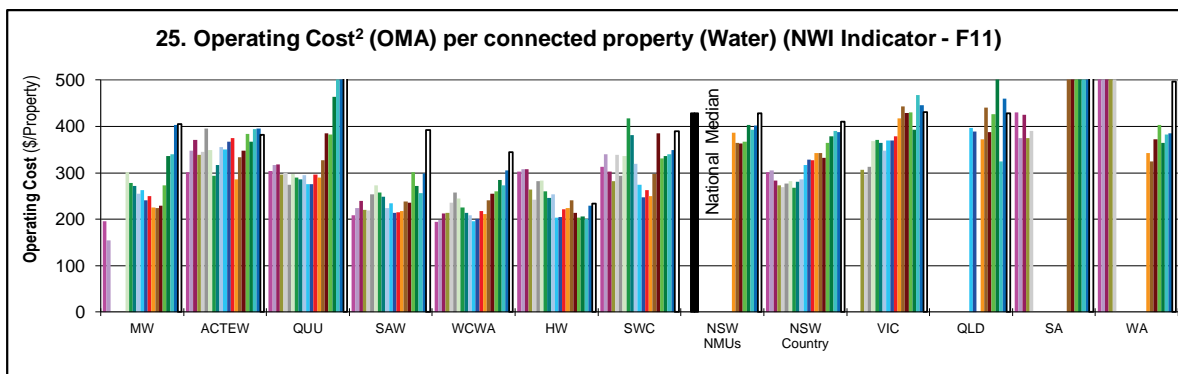
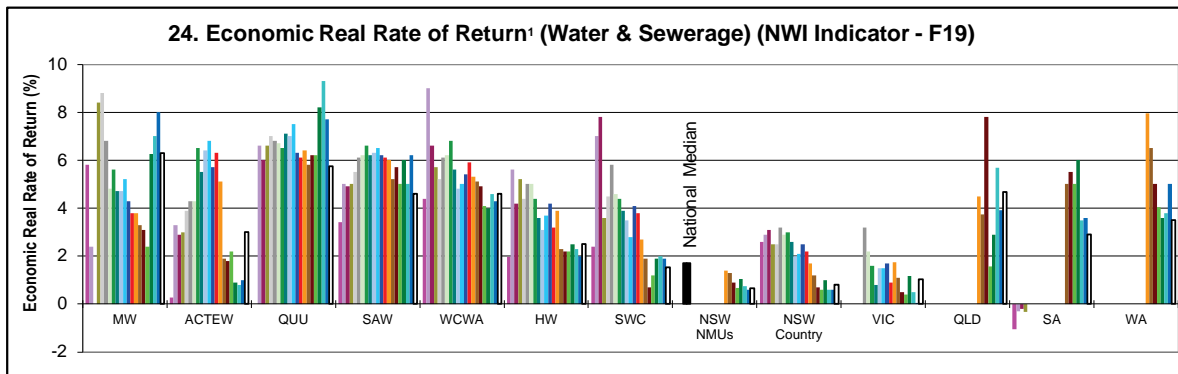
PERFORMANCE COMPARISONS - Environmental (Sewerage)



* The values shown prior to 2010-11 are the reported values for sewerage breaks and chokes for indicator A12 in the National Performance Framework 2008-09 Urban Water Performance Indicators and Definitions Handbook.

+ The values shown prior to 2008-09 are all reported sewer overflows in accordance with definition for indicator E13 in the National Performance Framework 2007-08 Urban Water Performance Indicators and Definitions Handbook.

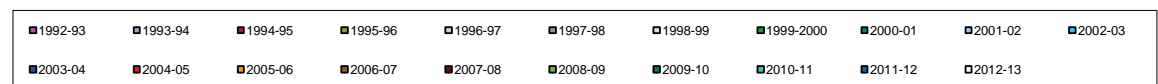
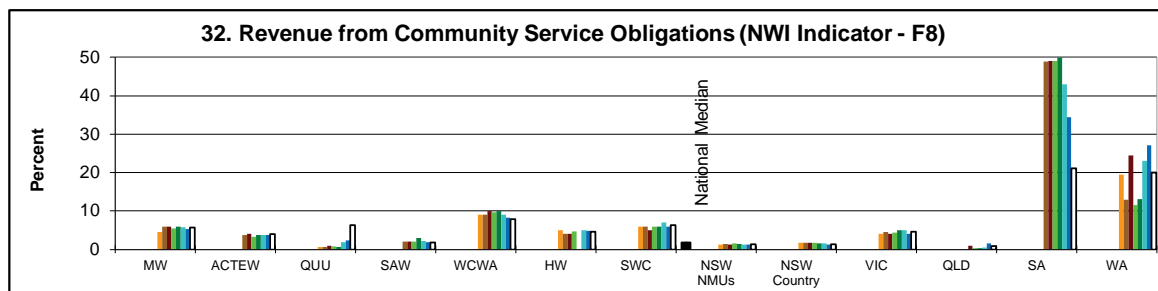
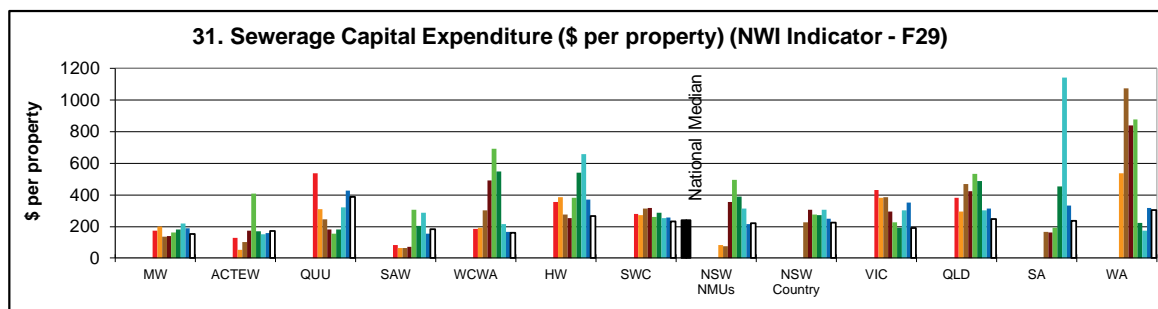
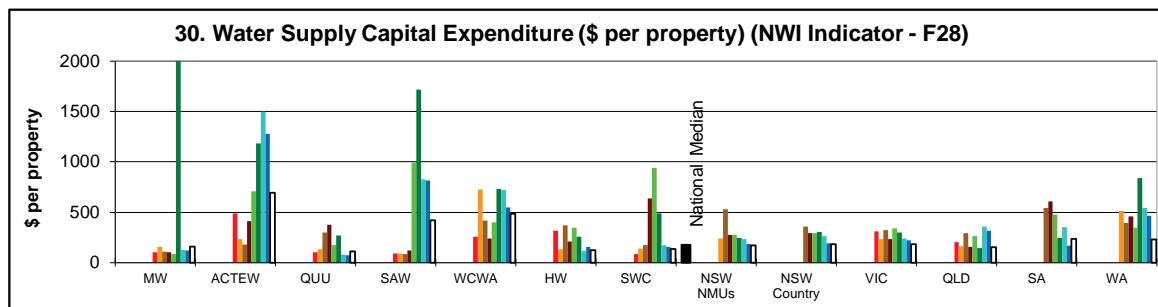
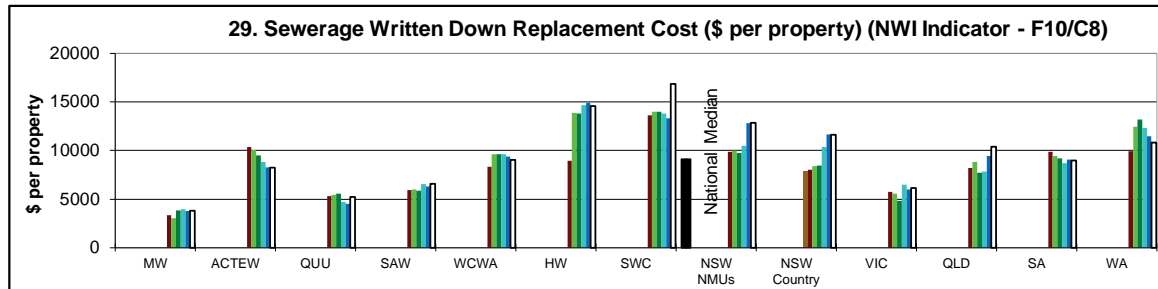
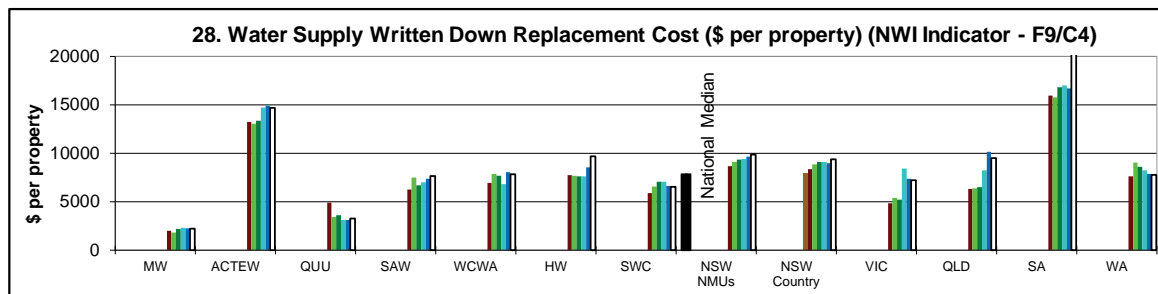
PERFORMANCE COMPARISONS - Economic



1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-01	2001-02	2002-03
2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	

NOTES: 1. As the economic real rate of return (ERRR) was not reported by utilities other than NSW NMUs and Country NSW in 2001/02 to 2004/05, the reported values for "return on assets" has been shown in graph 24 for all the other utilities for these years.
2. Operating Cost (OMA) is the Operation, Maintenance and Administration Cost in 2012-13\$.

PERFORMANCE COMPARISONS - Economic



NOTES: 1. The Water Supply Capital Expenditure per property shown for Melbourne Water for 2009-10 includes the full \$3.5B capital expenditure by a private consortium for the Victorian Desalination Plant project.
2. The Water Supply Capital Expenditure per property shown for Queensland Urban Utilities (QUU) for 2009-10 includes the \$230M capital expenditure by SEQ Water and LinkWater.

Appendix B

Example TBL Water Supply Performance Report and Action Plan

Coffs Harbour City Council Water Supply – Action Plan Page 1

Summary

In 2012-13, Coffs Harbour City Council has implemented all 19 planning, pricing and management requirements (10 water, 9 sewerage) of the NSW Best-Practice Management Framework and its performance has continued to be very good.

The key actions required are shown below for Indicators 20 and 32.

Key action from Council's Strategic Business Plan:

- Strategic business plan and financial plan completed in May 2012

(<http://www.coffsharbour.nsw.gov.au/places-for-living/Documents/Strategic-Business-Plans-Water-Supply-Sewerage.pdf>).

INDICATOR		RESULT ²		COMMENT/DRIVERS	ACTION
	Best-Practice Management Framework	Implemented all the Best-Practice Requirements ¹	Very good	Implementation of the requirements demonstrates effectiveness and sustainability of water supply business. 100% implementation is required for eligibility to pay an 'efficiency dividend'.	Continue the periodic review and update of Integrated Water Cycle Management (IWCM) Strategy, Drought Management Plan and Development Servicing Plan (DSP).
CHARACTERISTICS					
5	Connected property density	38 per km of main Highest ranking (1, 1)		A connected property density below 30 can significantly increase the cost per property of providing services, as will also a high number of small discrete water supply schemes.	
9	Renewals expenditure	0.5% High ranking (2, 2)	Good	Adequate funds must be programmed for works outlined in the Asset Management Plan – page 3 of the 2012-13 NSW Performance Monitoring Report.	Satisfactory. Appropriate renewals included in capital works program reported in Council's Strategic Business Plan 2012.
10	Employees	1.6 per 1,000 props Low ranking (4, 2)	May require review		Satisfactory in view of Council's storage dam and water treatment works.
SOCIAL - CHARGES					
12	Residential water usage charge	255 c/kL Highest ranking (1, 1)	Good	Benefits of strong pricing signals are shown on page 5 of the 2012-13 NSW Performance Monitoring Report.	Good. Consider replacing the existing inclining block tariff with a two-part tariff [refer to Circular LWU11] with a uniform usage charge for all water use, as recommended by the NSW Government and the Productivity Commission.
13	Residential access charges	\$139 per assessment High ranking (2, 1)	Good		See 12.
14	Typical residential bill ³ (TRB)	\$549 per assessment Low ranking (4, 2)	Good	TRB should be consistent with projection in the financial plan. Drivers – OMA Management Cost and Capital Expenditure.	The TRB of \$549 is satisfactory as it is within 1% of the projection of \$552 (2013/14\$) in Council's Strategic Business Plan. The 2014-15 tariff will be determined in accordance with Circular LWU11 of March 2011.
15	Typical developer charges	\$9680 per ET Highest ranking (1, 1)	Good		
16	Residential revenue from usage charges	75% of residential High ranking (2, 2)	Good	≥ 75% of residential revenue should be generated through usage charges.	See 12.
SOCIAL – HEALTH					
19	Physical quality compliance	Yes Highest ranking (1, 1)	Very good		
19 a	Chemical quality compliance	Yes Highest ranking (1, 1)	Very good		
20	Microbiological compliance ⁴	Yes Highest ranking (1, 1)	Very good	Critical indicator. LWUs should develop a risk based water quality management system.	Prepare a risk-based Drinking Water Management System in accordance with NSW Guidelines for drinking water quality management systems, NSW Health and NSW Office of Water, 2013.

1. Review of Council's TBL Performance Report and Preparation of an **Action Plan** to Council required annually.

Strategic Business Plan review and update required after 4 years. **Financial Plan** update and report to Council required annually. **New IWCM Strategy** required after 8 years. **Development Servicing Plan** review and updating is required after 4 to 6 years.

2. The ranking relative to similar size LWUs is shown first (Col. 2 of TBL Report) followed by the ranking relative to all LWUs (Col. 3 of TBL Report).

3. Review and comparison of the 2013-14 **Typical Residential Bill (Indicator 14)** with the projection in your Strategic Business Plan is **mandatory**. In addition, if both indicators 43 and 44 are negative, you must report your proposed 2014-15 typical residential bill to achieve full cost recovery.

Coffs Harbour City Council Water Supply – Action Plan Page 2

INDICATOR	RESULT	COMMENT/DRIVERS	ACTION
SOCIAL – LEVELS OF SERVICE			
25	Water quality complaints 0 per 1,000 props Highest ranking (1, 2)	Very good Critical indicator of customer service. Can be influenced by the type of business - e.g. unfiltered supply.	
26	Service complaints 0 per 1,000 props Highest ranking (1, 1)	Very good Key indicator of customer service.	Council's reporting system has been revised to record complaints only, [ie. expressions of dissatisfaction], in accordance with the definition of this indicator.
27	Incidence of unplanned interruptions 35 per 1,000 props Median ranking (3, 4)	Satisfactory Key indicator of customer service, condition of network and effectiveness of operation.	
30	Number of main breaks 10 per 100km of main Median ranking (3, 3)	Satisfactory Drivers – condition and age of water mains, ground conditions.	Satisfactory, as result is equal to the Statewide Median of 10 breaks per 100 km of main.
32	Total Days Lost 5% Lowest ranking (5, 5)	May require review	Will be reviewed.
ENVIRONMENTAL			
33	Average annual residential water supplied 161 kL per prop High ranking (2, 2)		Drivers – available water supply, climate, location (Inland or coastal), pricing signals (Indicator 12), restrictions.
34	Real losses (leakage) 70 L/c/d Median ranking (3, 2)	Satisfactory	Loss reduction is important where an LWU is facing drought water restrictions or the need to augment its water supply system.
ECONOMIC			
43	Economic Real Rate of Return (ERRR) 1.8% Highest ranking (1, 2)	Good Reflects the rate of return generated from operating activities (excluding interest income and grants). An ERRR or ROA of ≥ 0% is required for full cost recovery.	Satisfactory. See 14.
44	Return on assets (ROA) 0.6% High ranking (2, 3)		See 43.
45	Net debt to equity – water and sewerage 15% Highest ranking (1, 1)	Very good	LWUs facing significant capital investment are encouraged to make greater use of borrowings – page 13 of the 2012-13 NSW Performance Monitoring Report.
46	Interest cover 2 Highest ranking (1, 1)	Very good	Drivers – in general, an interest cover > 2 is satisfactory.
47	Loan payment \$526 per prop Highest ranking (1, 1)	Very good	The component of TRB required to meet debt payments. Drivers – expenditure on capital works, short term loans.
49	Operating cost (OMA) \$388 per prop High ranking (2, 1)	Good	Prime indicator of the financial performance of an LWU. Drivers – development density, level of treatment, management cost, topography, number of discrete schemes and economies of scale.
51	Management cost \$139 per prop Median ranking (3, 3)	Satisfactory	Typically about 40% of the OMA. Drivers – No. of employees. No. of small discrete water schemes.
52	Treatment cost \$70 per prop Low ranking (4, 2)	May require review	Drivers – type and quality of water source. Size of treatment works.
53	Pumping cost \$14 per prop High ranking (2, 1)	Good	Drivers – topography, development density and location of water source.
55	Water main cost \$92 per prop Low ranking (4, 4)	May require review	Drivers – age and condition of mains. Ground conditions. Development density.
56	Capital expenditure \$137 per prop Low ranking (4, 3)		An indicator of the level of investment in the business. Drivers – age and condition of assets, asset life cycle and water source.

4. **Microbiological compliance (Indicator 20)** is a **high priority** for each NSW LWU. Corrective action for non-compliance (≤97%), or any 'boil water alerts' must be reported in your Action Plan. Refer to pages 7, 8 and 26 of the 2012-13 NSW Water Supply and Sewerage Performance Monitoring Report (www.water.nsw.gov.au).

Coffs Harbour City Council Water Supply TBL Report (Page 1)

Coffs Harbour City Council	TBL Water Supply Performance	2012-13
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WATER SUPPLY SYSTEM - Coffs Harbour City Council serves a population of 69,200 (24,750 connected properties). Water is sourced from the Nymboida River (part of the Regional Water Supply which includes Shannon Creek Dam) and also from the Orara River. Water is transferred to Karangi Dam where it is treated and supplied to the Coffs Harbour area which stretches from Sawtell to Corindi. Council has 2 storage dams at Karangi and Woolgoolga (total storage capacity 5870ML), not including Shannon Creek Dam. Council has 2 smaller systems providing treated water to Coramba and Nana Glen villages. The water supply network comprises a dissolved air flotation treatment works, a conventional water treatment works and a chlorinator, 18 service reservoirs (88 ML), 7 pumping stations, 42.6 ML/d delivery capacity into the distribution system, 177 km of transfer and trunk mains and 489 km of reticulation.

PERFORMANCE - Coffs Harbour City Council achieved 100% implementation of Best-Practice requirements. The 2013-14 typical residential bill was \$549 which was close to the statewide median of \$540 (Indicator 14). The economic real rate of return was 1.8% which was greater than the statewide median (Indicator 43). The operating cost (OMA) per property was \$388 which was close to the statewide median of \$410 (Indicator 49). Water quality complaints were negligible compared to the statewide median of 3 (Indicator 25). Compliance was achieved for microbiological water quality (100% of the population, 3 of 3 zones compliant), chemical water quality and physical water quality. There were no failures of the chlorination system or the treatment system. Coffs Harbour City Council reported no water supply public health incidents. Current replacement cost of system assets was \$400M (\$15,200 per assessment). Cash and investments were \$36M, debt was \$90M and revenue was \$21.4M (excluding capital works grants).

IMPLEMENTATION OF REQUIREMENTS OF BEST-PRACTICE MANAGEMENT FRAMEWORK

<p>(1) Complete Current Strategic Business Plan & Financial Plan</p> <p>(2) (2a) Pricing - Full Cost Recovery, without significant cross subsidies (2b,2c) Pricing - Appropriate Residential Charges (2d) Pricing - Appropriate Non-residential Charges (2e) Pricing - DSP with Commercial Developer Charges</p>	YES Yes Yes Yes Yes	<p>(3) Sound water conservation implemented</p> <p>(4) Sound drought management implemented</p> <p>(5) Complete performance reporting (by 15 September)</p> <p>(6) Integrated water cycle management strategy</p>	YES YES YES YES 100%
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TRIPLE BOTTOM LINE (TBL) PERFORMANCE INDICATORS

				LWU RESULT		RANKING			MEDIANS			
						All LWUs			Statewide			
						>10,000 properties			National			
						Note 1			Note 3			
						Col 2			Col 4			
						Note 2			Col 5			
						Col 3						
NW1 No.												
UTILITY	CHARACTERISTICS	C1	1	Population served:	69200							
		C4	2	Number of connected properties:	24750	Number of assessments: 26330						
			3	Residential connected properties (% of total)		%	94				91	
			4	New residences connected to water supply (%)		%	1.1		2	2	0.8	
		A3	5	Properties served per kilometre of water main		Prop/km	38				32	35
			6	Rainfall (% of median annual rainfall)		%	123		1	1	108	
		W11	7	Total urban water supplied at master meters (ML)		ML	6,150				6,500	8,610
			8	Peak week to average consumption (%)		%	124		1	1	160	
			9	Renewals expenditure (% of current replacement cost of system assets)		%	0.5		2	2	0.5	
			10	Employees per 1000 properties		per 1,000 prop	1.6		4	2	1.4	
SOCIAL	CHARGES & BILLS	P1		Residential tariff structure for 2013-14: inclining block; independent of land value; access charge \$139								
		P1.3	12a	Residential water usage charge for 2012-13 for usage <365 kL (c/kL)	c/kL (2012-13)	248		1	1	199	167	
			12	Residential water usage charge for 2013-14 for usage <365 kL (c/kL)	c/kL (2013-14)	255		1	1	208		
		P3	14a	Typical residential bill for 2012-13 (\$/assessment)	\$ (2012-13)	534		4	2	510	474	
			14	Typical residential bill for 2013-14 (\$/assessment)	\$ (2013-14)	549		4	2	540		
		15	Typical developer charge for 2013-14 (\$/equivalent tenement)	\$ (2013-14)	9,700		1	1	5,500			
	F4	16	Residential revenue from usage charges (% of residential bills)	%	75		2	2	74	65		
	F5	17	Revenue per property - water (\$/property)	\$/prop	860		4	4	750	691		
	HEALTH	H6	18	Water Supply Coverage (% of Urban Population with reticulated WS)	% of population	99.1		3	2	99.2		
			18a	Risk based drinking water quality plan?		No						
			19	Physical compliance achieved? Note 10		Yes		1	1			
			19a	Chemical compliance achieved? Note 10		Yes		1	1			
		H4	19b	Number of zones with chemical compliance		3 of 3						
			20	Microbiological (E. coli) compliance achieved? Note 10		Yes		1	1			
		H3	20a	% population with microbiological compliance	% of population	100		1	1	100	100	
	SERVICE LEVELS	C9	25	Water quality complaints per 1000 properties	per 1,000 prop	0.04		1	2	3	3	
		C10	26	Water service complaints per 1000 properties	per 1,000 prop	0.04		1	1	4	1	
C17		27	Incidence of unplanned interruptions per 1000 properties	per 1,000 prop	35		3	4	47	69		
C15		28	Average duration of interruption (min)	min	120		1	2	160	119		
A8		30	Number of water main breaks per 100 km of water main	per 100km	10		3	3	10	13		
		31	Drought water restrictions (% of time)	% of time	0		1	1	0			
		32	Total days lost (%)	%	4.6		5	5	2.0			
ENVIRONMENTAL		NATURAL RESOURCE MANAGEMENT	W12	33	Average annual residential water supplied - STATEWIDE (kL/property)	kL/prop	161		2	2	166	167
				33a	Average annual residential water supplied - COASTAL LWUs (kL/property)	kL/prop	161		3	3	160	
				33b	Average annual residential water supplied - INLAND LWUs (kL/property)	kL/prop					257	
	A10	34	Real losses (leakage) (L/service connection/day)	L/connection/day	70		3	2	60	73		
		35	Energy consumption per Megalitre (kiloWatt hours)	kWh	435		2	3	650			
		36a	Renewable energy consumption (% of total energ consumption)	%	0		1	1	0			
ECONOMIC	FINANCE	E12	36a	Net greenhouse gas emissions - WS & Sae (net tonnes CO2 - equivalents per 1000 properties)	t CO2	510		5	5	400	390	
		F17	43	Economic real rate of return - Water (%)	%	1.8		1	2	0.7	0.6	
			44	Return on assets - Water (%)	%	0.6		2	3	0.3		
		F22	45	Net Debt to equity - WS&Sae (%)	%	15		1	1	1	11	
		F23	46	Interest cover - WS&Sae		2		3	3	1	2	
		47	Loan payment per property - Water (\$)	\$	526		1	1	66			
		47b	Net profit after tax - WS & Sae (\$'000)	\$/'000	-2,160		3	5	-497	2591		
	EFFICIENCY	F11	48	Operating cost (OMA) per 100km of main (\$'000)	\$/'000	1,470		3	4	1,375		
			49	Operating cost (OMA) per property (\$/prop) Note 8	\$/prop	388		2	1	410	393	
			50	Operating cost (OMA) per kilolitre (cents)	c/kL	146		3	4	133		
		51	Management cost (\$/prop)	\$/prop	139		3	3	137			
		52	Treatment cost (\$/prop)	\$/prop	70		4	2	56			
	53	Pumping cost (\$/prop)	\$/prop	14		2	1	39				
	54	Energy cost (\$/prop)	\$/prop	11		2	1	27				
	55	Water main cost (\$/prop)	\$/prop	92		4	4	71				
	F28	56	Capital Expenditure (\$/prop)	\$/prop	137		4	3	180	213		

NOTES :

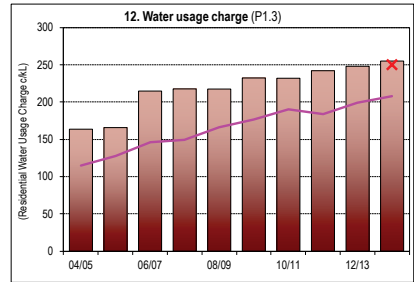
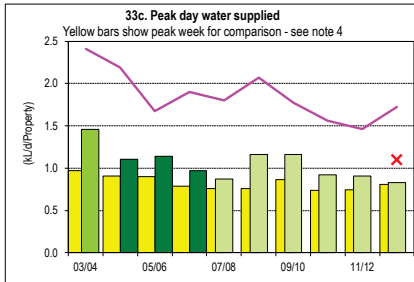
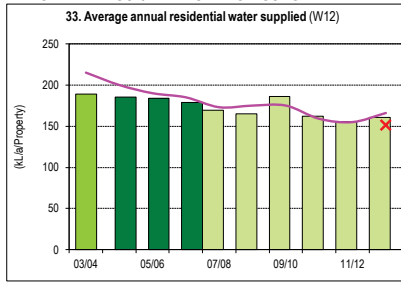
- Col 2 rankings are on a % of LWUs basis - best reveals performance compared to similar sized LWUs (ie. Col 1 is compared with LWUs with >10,000 properties).
- Col 3 rankings are on a % of LWUs basis - best reveals performance compared to all LWUs (ie. Col 1 is compared with all LWUs).
- Col 4 (Statewide Median) is on a % of connected properties basis - best reveals statewide performance (gives due weight to larger LWUs & reduces effect of smaller LWUs).
- Col 5 (National Median) is the median value for the 72 utilities reporting water supply performance in the National Performance Report 2012-13 (www.nwc.gov.au).
- LWUs are required to annually review key projections & actions in their Strategic Business Plan and annually update their financial plan. The SBP should be updated after 4 years.
- 2012-13 Non-residential Tariff: Access Charge based on Meter Size: 40mm \$556, Two Part Tariff; Usage Charge 255c/kL.
- Non-residential water supplied was 27% of potable water supplied excluding non-revenue water.
- Non-residential revenue was 23% of annual rates and charges, indicating fair pricing of services between the residential and non-residential sectors.
- The operating cost (OMA) per property was \$388. Components were: management (\$139), operation (\$111), maintenance (\$108), energy (\$11) and chemical (\$16).
- Council rehabilitations included 0.2% of water mains, 0.04% of service connections and 1.4% of water meters. Renewals expenditure was \$333,000/100km of main.
- Compliance with ADWG 2011 for drinking water quality is shown as "Yes" if compliance has been achieved (indicators 19, 19a & 20), otherwise the % of samples complying is shown.
- Council has 3 operators who meet the requirements of the National Certification Framework for Water Treatment Operators.

Coffs Harbour City Council Water Supply TBL Report (Page 2)

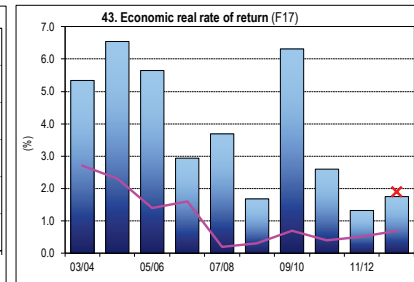
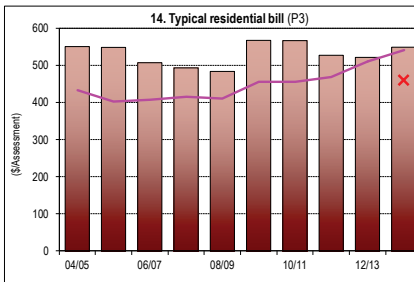
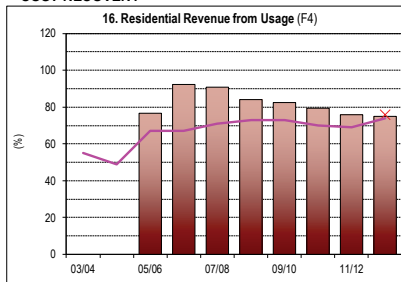
Coffs Harbour City Council TBL Water Supply Performance (page 2) 2012-13

(Results shown for 10 years together with 2012-13 Statewide Median and Top 20%)

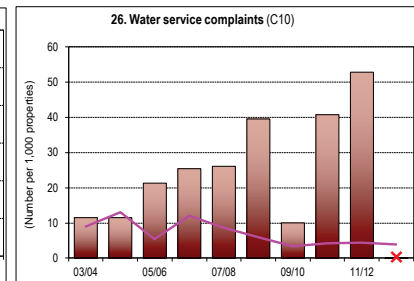
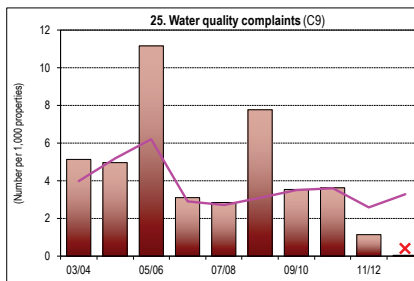
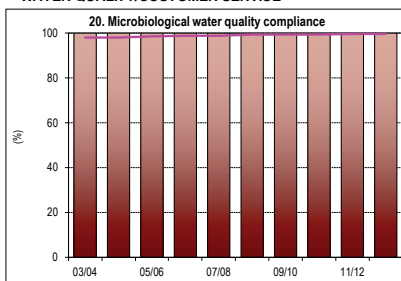
RESIDENTIAL USE/REVENUE FROM USAGE



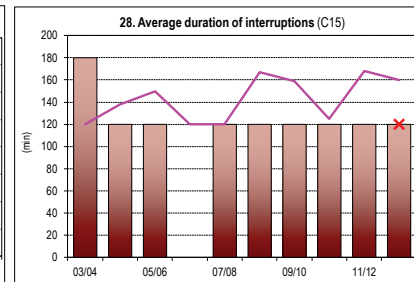
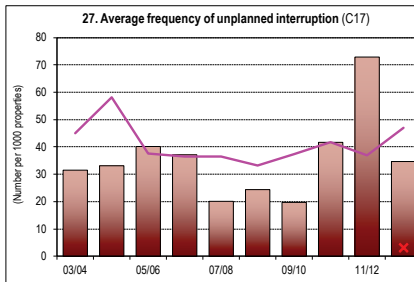
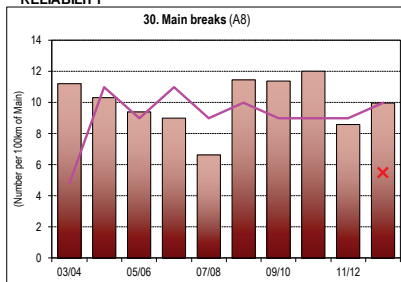
COST RECOVERY



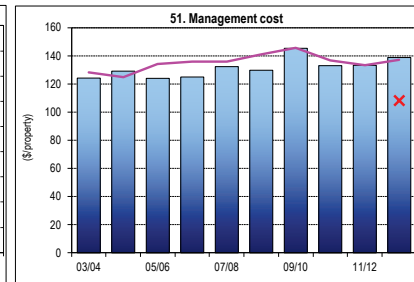
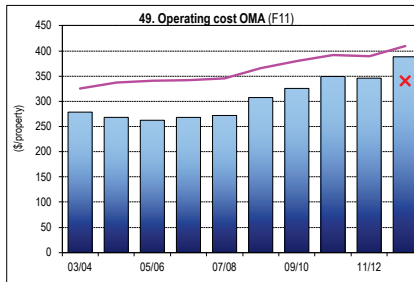
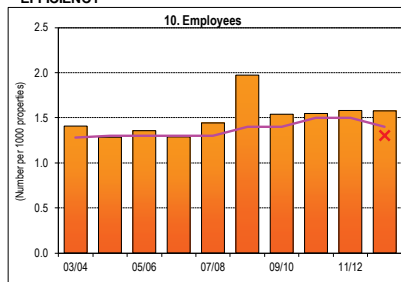
WATER QUALITY/CUSTOMER SERVICE



RELIABILITY



EFFICIENCY



NOTES:

- Costs are in Jan 2013\$ except for graphs 12 and 14, which are in Jan 2014\$.
- Microbiological water quality compliance for 2003-04 was on the basis of 1996 NHMRC/ARMCANZ Australian Drinking Water Guidelines for E. coli; from 2004-05 to 2010-11 compliance was on the basis of the 2004 NHMRC/NRMMC Australian Drinking Water Guidelines (ADWG) and for 2011-12 and 2012-13 compliance was on the basis of the 2011 ADWG.
- Indicators 33 and 33c - Green shading shows % of Time Drought Water Restrictions applied in each year:
- Indicator 33c - Yellow bars show Peak Week Water Supplied for comparison with Peak Day Water Supplied shown in green.

LEGEND

State Median for all years —

Top 20% for 2012-13 X

Nil or < 30%	30-50%	>50%
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Appendix C - 2012-13 Best-Practice Management Implementation

WATER UTILITY (sorted on connected properties)	WATER SUPPLY & SEWERAGE REVENUE (\$M)	WATER SUPPLY											SEWERAGE										
		IMPLEMENTATION OF BPM REQUIREMENTS (see Note 1)											IMPLEMENTATION OF BPM REQUIREMENTS (see Note 1)										
		(1) Strategic Business Plan	(2) Pricing and Developer Charges (Yes/No)					(3) Sound Water Conservation Plan implemented (Yes/No)	(4) Sound Drought Management Plan implemented (Yes/No)	(5) Complete performance Reporting by 15 September each year (Yes/No)	(6) Integrated Water Cycle Management Strategy Commenced (Yes/No)	Overall implementation of all 10 requirements (Note 2) (%)	Proposed Dividend from Surplus \$'000	(1) Strategic Business Plan	(2) Pricing and Developer Charges (Yes/No)					(3) Complete performance Reporting by 15 September each year (Yes/No)	(4) Integrated Water Cycle Management Strategy Commenced (Yes/No)	Overall implementation of all 9 requirements (Note 3) (%)	Proposed Dividend from Surplus \$'000
Complete Current 20 to 30-year SBP & FP (Yes/No)	(2a) Full cost-recovery, minimal cross subsidies	(2b) Appropriate Residential Charges	(2c) Revenue from Residential Usage Charges >=75% (Note 8)	(2d) Appropriate Non-Residential Charges	(2e) DSP with Commercial Developer Charges							Complete Current 20 to 30-year SBP & FP (Yes/No)	(2a) Full cost-recovery, minimal cross subsidies	(2b) Appropriate Residential Charges	(2c) Appropriate Non-Residential Charges	(2d) Appropriate Trade Waste Fees & Charges	(2e) DSP with commercial developer charges	(2f) Liquid trade waste regulation policy and approvals implemented					
100 Balranald (Dual Supply)	1.0	Yes*	Yes	Yes	Yes	Yes		Yes	Yes	Yes		80	Yes*	Yes	Yes	Yes	Yes		Yes	Yes			67
101 Murrumbidgee (Groundwater)	0.6	Yes*	Yes	Yes	Yes	Yes				Yes		60	Yes*					Yes	Yes			33	
102 Lockhart (NO WS)	0.4												Yes	Yes	Yes	Yes	Yes		Yes	Yes	YesE		78
103 Central Darling (Dual Supply)	0.9	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		67
104 Boorowa	1.0	Yes	Yes	Yes	Yes*	Yes	Yes	Yes	Yes	Yes	Yes	100	Yes	Yes	Yes	Yes	Yes	Yes*	Yes	Yes	Yes		89
105 Brewarrina	1.8	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	YesE	100	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	YesE		78
106 Jerilderie (Dual Supply)	0.7	Yes*	Yes	Yes	Yes	Yes	Yes*					70	Yes*	Yes	Yes	Yes		Yes	Yes	Yes		67	
107 Urana (NO WS)	0.2												Yes*	Yes	Yes		Yes	Yes	Yes	YesE		67	
% of LWUs 'Yes' (200 - 1,500 connected properties)		82%	100%	100%	95%	91%	68%	77%	86%	100%	59%	86% Overall	82%	86%	96%	57%	61%	68%	64%	100%	61%	75% Overall	
TOTAL 'YES' for large LWUs (>\$10M Revenue)⁶		34	34	32	21	31	32	33	32	34	32	19	30	29	30	27	29	29	29	30	30	24	
% of Large LWUs (34 WS LWUs and 30 SGE LWUs)		100%	100%	100%	62%	91%	94%	97%	94%	100%	94%	56%	100%	97%	100%	90%	97%	97%	97%	100%	100%	80%	
TOTAL 'YES' for remainder of LWUs (<\$10M Revenue)⁶		56	62	61	46	59	48	58	58	62	44	25	63	65	68	49	50	52	54	69	48	26	
% of Small LWUs (62 WS LWUs and 69 SGE LWUs)		90%	100%	100%	74%	95%	77%	94%	94%	100%	71%	40%	91%	94%	99%	71%	72%	75%	78%	100%	70%	38%	
TOTAL 'YES' for all LWUs		90	96	93	67	90	80	90	90	96	76	44	93	94	98	76	79	81	83	99	78	50	
% all LWUs		94%	100%	100%	72%	97%	83%	94%	94%	100%	79%	46%	94%	95%	99%	77%	80%	82%	84%	100%	79%	51%	

Overall Implementation for all WS Businesses 91%

Overall Implementation for all SGE Businesses 88%

Notes:

- Best-Practice Management requirements are set out in "Best-Practice Management of Water Supply and Sewerage Guidelines August 2007" (BPMG).
- There are 10 requirements which must be satisfied for water supply. These are (1), (2a), (2b), (2c), (2d), (2e), (3), (4), (5) and (6) shown in the table above for water supply.
- There are 9 requirements which must be satisfied for sewerage. These are (1), (2a), (2b), (2c), (2d), (2e), (2f), (3) and (4) shown in the table above for sewerage.
- The level of implementation of the 19 planning, pricing and management requirements of the BPMG shown in the table above is from Notes 2 or 3 of the Special Purpose Financial Statements reported by each LWU in their Annual Financial Statements, supplemented by other data provided to the NSW Office of Water by the LWU. Documents which have met the requirements (including strategic business plans and IWCM evaluations and strategies) provided by LWUs to the NSW Office of Water by February 2014 are included in the results reported.
- As shown in Table 8C of the 2012-13 NSW Water Supply and Sewerage Benchmarking Report, 35 LWUs have completed their IWCM studies (shown as 'YesC' in columns (6) and (4) above for water supply and sewerage respectively). Each of these LWUs has completed a 30-year IWCM strategy. A further 32 LWUs have completed an IWCM Evaluation, and are shown as 'YesE' above. A further 14 LWUs are currently preparing their IWCM Evaluation and are shown as 'Yes' above. The IWCM Evaluations and Strategies have been reviewed by the NSW Office of Water and found to be soundly based. Similarly, the strategic business plans and trade waste policies shown as Yes above have been found to be soundly based. However, the water conservation and drought management plans have only been briefly examined to confirm that they address the required issues.
- The revenue for LWUs with water supply only or sewerage only is shown left justified above. For these LWUs, the relevant revenue to be classified as a "large LWU" is \$5M.
- For requirement (2c) utilities with 4,000 or more connected properties which obtained 70% to 74% of residential revenue from usage charges are shown as 'Yes*'. 'Yes*' is also shown for Wyong and Essential Energy, whose prices are determined by IPART. 'Yes**' is shown for Eurobodalla which obtained 68% of its residential revenue from usage charges as the Minister has approved replacement of the 75% requirement with 70% (due to the high incidence of holiday houses, which are unoccupied for most of the year). Utilities with fewer than 4,000 connected properties serve 11% of the connected properties in regional NSW and are only required to achieve 50% for requirement (2c). Such utilities which have obtained 45% to 49% residential revenue from water usage charges are shown as 'Yes*'. Bulk water suppliers are not required to meet requirements (2b), (2c) or (2d) which refer to residential water tariffs.
- 'Yes*' for requirement (1) indicates that the LWU's strategic business plan and financial plan need to be updated. Refer also to pages 4 and 21.
- 'Yes*' for requirement (2e) for water supply or for sewerage indicates that the LWU has commercial developer charges in place but is yet to complete and implement its Development Servicing Plan (DSP). 'Yes*' for these requirements indicates the LWU is exempt from the requirement to prepare a DSP due to low growth (under 5 lots/a).
- 'Yes*' for requirement (2f) for sewerage indicates that the LWU has a year 2006 or earlier trade waste policy, which needs to be updated.
- As shown above, the overall levels of implementation of the requirements of the Best-Practice Management Guidelines for water supply (for all 10 requirements) were: 93% for LWUs with >10,000 properties; 94% for LWUs with 3,001 - 10,000 properties; 88% for LWUs with 1,501 - 3,000 properties and 86% for LWUs with 200 - 1,500 properties respectively. The overall level of implementation for water supply for all LWUs was 91%.
- As shown above, the overall levels of implementation of the requirements of the Best-Practice Management Guidelines for sewerage (for all 9 requirements) were: 99% for LWUs with >10,000 properties; 93% for LWUs with 3,001 - 10,000 properties; 86% for LWUs with 1,501 - 3,000 properties and 75% for LWUs with 200 - 1,500 properties respectively. The overall level of implementation for sewerage for all LWUs was 88%.
- The overall implementation of requirements for water supply and sewerage was 90%.

Appendix D - 2012-13 NSW Water Utility Performance Summary

WATER UTILITY	Water Supply													Sewerage				Water Supply & Sewerage - Current (2012-13) unless noted as 2013-14												
	Water Supply Connected Properties (No.) ⁵	Total Urban Water Supplied (ML) ^{2,3}	Average Annual Residential Water Supplied (kL/connected property)	Water Main Breaks (per 100km of Main)	Real Losses (L/connected m ³)	Revenue (SM) ^{3,8}	Water Quality Compliance (2011 ADWG)				Water Quality Complaints (per 1000 props)	Ave Duration of Unplanned Interruption (mins)	Revenue (SM) ^{2,3,8}	% Sge Treated that was Compliant (%)	Sewer Overflows (reported to regulator) (per 100km of main)	Recycled Water (% of effluent recycled)	Total WS and SGE Complaints (No./1000 props)	Net Profit After Tax (\$M)	2013/14 Typical Residential Bill (\$/assessment)	2013/14 Typical Developer Charge (\$/ET)	Current Replacement Cost per Assessment (\$/assessment)	OMA Cost (\$/connected property)	Mgmt Cost (\$/connected property)	ERRR (%)	Net Debt to Equity (%)	Capital Expenditure		Strategic Business Plans Completed? Note 14 (Yes/No)		
							Chemical Compliance Achieved?	Zones (7a) H4	E. coli Compliance Achieved?	Zones (8a) H2																% Pop'n with E. coli Compliance (8b) H3	(\$/prop)		(\$M)	
	(1) C4	(2) W11	(3) W12	(3a) A8	(3b) A10	(4) F1	(7)	(8)	(8a) H2	(8b) H3	(8c) C9	(8d) C15	(9) F2	(10) E4	(11) E13	(12) W27	(12a) W26	(13a) C13	(13b) F24	(13c) P8	(14)	(15)	(17) F13	(18)	(19) F19	(19a) F22	(19b) F28 + F29	(19c) F16	(21)	
Sydney Water	1,844,000	523,509	198	29	87	1,231	Yes	12 of 13	Yes	13 of 13	100	0.5	153	1,220	99.7	0.3	10	46,951	3910	415	1112		657		1.5	100	367	665		
Hunter Water	232,964	70,238	176	32	75	134	Yes	5 of 5	Yes	5 of 5	100	2.9	142	158	100.0	0.1	6		7050	25	976		592		2.5	75	390	87.7		
Sydney Catchment Authority		536,949				198								NO SGE											49			17.7		
LWUs with > 10,000 Properties																														
1 Gosford	70,740	14,400	156	23	30	43.2	Yes	2 of 2	Yes	2 of 2	100	25	199	41.6	100	3.0	0	28		-7.6	1,041	4,160	42,095	805	309	-0.1	5	657	45.7	Yes
2 Wyong	60,620	14,200	166	10	30	45.7	Yes	1 of 1	Yes	1 of 1	100	18	204	31.4	100	1.0	6	877	15	-8.1	1,055	5,450	31,563	665	136	0.6	10	427	25.7	Yes
3 Shoalhaven	46,600	14,300	148	10	40	23.4	Yes	4 of 4	Yes	4 of 4	100	0.3	194	38.3	94	0.6	27	1,992	1	12.8	1,031	14,920	25,042	746	311	1.6	1	497	21.0	Yes
4 Rous (Bulk Supplier) (NO SGE)	45,540	1,370		36		19.8	Yes	3 of 3	Yes	3 of 3	100	0.0	180	NO SGE				0	0.6			8,860	9,148	234	109	1.1	6	55	2.5	Yes
5 MidCoast	38,480	8,700	143	8	60	30.6	Yes	4 of 5	Yes	5 of 5	100	3	-	39.3	98	0.7	13	848	3	-6.6	1,467	14,970	34,347	922	214	1.4	25	583	21.3	Yes*
6 Tweed	31,860	9,090	176	4	60	22.8	Yes	3 of 3	Yes	3 of 3	100	4	160	26.9	97	0.9	5	431	31	-1.7	1,225	18,620	41,207	888	342	0.6	3	434	13.3	Yes*
7 Port Macquarie-Hastings (Unfiltered)	29,730	6,470	155	3	40	20.0	Yes	5 of 5	Yes	5 of 5	100	8	163	23.6	89	1.4	3	242	27	-2.4	1,252	14,410	30,443	828	238	-0.1	-4	478	13.5	Yes
8 Riverina (Groundwater) (NO SGE)	29,350	15,900	330	14	80	25.0	Yes	14 of 14	Yes	14 of 14	100	4	308	NO SGE				9	3.8	540	4,800	10,909	384	152	3.5	-4	188	5.5	Yes	
10 Coffs Harbour	24,750	6,150	161	10	70	21.4	Yes	3 of 3	Yes	3 of 3	100	0.0	120	26.0	100	12.6	11	801	1	-2.2	1,332	18,940	39,867	972	322	0.8	15	355	8.5	Yes
11 Albury	23,260	7,940	250	8	60	14.4	Yes	1 of 1	Yes	1 of 1	100	4	104	17.6	19	1.6	59	2,733	7	5.1	948	7,560	30,792	765	234	1.5	1	256	5.8	Yes*
12 Fish River WS (Unfiltered, Bulk Supplier)	23,500	7,380		5		8.8	Yes	1 of 1	Yes	1 of 1	100	0.0	1640	NO SGE				0	3.5				192	66	10.9	0	17	0.4	Yes*	
13 Tamworth Regional	21,240	9,990	258	8	80	18.0	Yes	7 of 7	Yes	6 of 7	99	0.8	-	18.4	87	0.0	79	3,595	74	5.9	1,335	6,390	29,892	946	343	1.7	-2	608	12.7	Yes
14 Clarence Valley	21,350	5,920	155	12	100	12.9	Yes	6 of 6	96	1 of 6	73	8	120	15.1	85	0.0	4	128	66	-3.8	1,324	12,470	39,100	904	336	0.4	10	750	11.7	Yes
15 Eurobodalla (Unfiltered)	19,460	3,570	116	11	50	12.6	Yes	2 of 2	Yes	2 of 2	100	0.5	240	17.7	72	6.8	6	189	1	-2.3	1,467	21,120	39,428	914	339	0.3	2	358	6.6	Yes
16 Wingecarribe	18,730	5,080	184	5	120	12.2	Yes	3 of 3	Yes	3 of 3	100	13	91	13.2	100	9.1	2	98	130	0.2	1,159	14,340	34,979	773	291	1.1	0	902	13.8	Yes
17 Queanbeyan (Reticulator)	16,280	3,830	172	5	120	15.0	Yes	1 of 1	Yes	1 of 1	100	0.2	180	6.9	100	0.9	1		45	-4.0	1,207	9,620	23,982	870	307	-1.6	-17	54	0.9	Yes*
18 Dubbo	16,940	9,600	365	4	100	16.4	Yes	1 of 1	Yes	1 of 1	100	0.6	152	12.9	100	1.0	83	2,178	16	6.1	1,515	10,680	28,907	817	327	2.4	0	446	7.3	Yes
19 Orange	16,930	5,860	178	9	60	15.5	Yes	2 of 2	Yes	2 of 2	100	1.6	240	10.3	83	0.0	41	1,681	87	9.1	914	11,820	30,932	691	323	2.6	-13	440	7.4	Yes*
20 Goulburn Mulwaree	9,930	2,830	159	11	70	9.5	Yes	2 of 2	Yes	2 of 2	100	3	180	10.7	100	1.1	94	1,567	53	5.4	1,362	8,100	44,031	806	241	2.4	-2	438	4.3	Yes
21 Bathurst Regional	15,230	6,990	257	5	80	12.6	Yes	1 of 1	Yes	1 of 1	100	37	120	9.6	100	0.0	100	4,788	100	1.9	1,018	9,770	31,907	933	323	0.9	-11	439	6.7	Yes
22 Lismore (Reticulator)	14,240	3,010	151	25	40	9.8	Yes	2 of 2	Yes	2 of 2	100	0.5	288	11.0	88	0.0	1		5	-0.5	1,334	10,330	33,958	940	222	0.1	-1	677	8.8	Yes
23 Bega Valley (Unfiltered)	14,340	4,460	139	8	140	8.9	Yes	8 of 8	Yes	7 of 8	100	9	120	14.8	69	0.2	38	680	19	-3.2	1,611	18,000	41,968	1,228	529	-0.8	-2	330	4.3	Yes
24 Ballina (Reticulator)	13,980	3,680	185	12	160	10.0	Yes	3 of 3	Yes	3 of 3	100	0.4	120	13.6	76	1.2	3	132	1	-2.7	1,265	11,980	31,943	1,180	467	0.2	8	2,010	27.6	Yes
25 Kempsey (Groundwater)	12,620	3,520	155	7	50	9.8	Yes	7 of 7	Yes	7 of 7	100	0.4	165	7.7	79	6.3	0	10	2	-3.2	1,298	16,670	43,958	1,032	351	-0.1	8	600	6.8	Yes
26 Essential Energy	10,510	6,960	285	24	100	16.9	Yes	2 of 2	Yes	2 of 2	100	8	-	6.2	100	0.0	46	629	10		1,219		1,468	153		0	523	5.3	Yes	
27 Byron (Reticulator)	11,040	3,310	175	7	80	7.4	Yes	2 of 2	Yes	2 of 2	100	0.5	120	13.5	88	0.8	13	596	6	-3.2	1,598	37,740	25,506	1,092	299	0.7	21	231	2.5	Yes
28A Goldenfields (Reticulator) (NO SGE)	10,150	5,520	263	26	90	11.7	Yes	1 of 1	Yes	1 of 1	100	10	235	NO SGE				0		689	8,760	10,205	809	177	1.1	-9			Yes	
28B Goldenfields (Bulk Supplier) (NO SGE)	19,020			0		4.8	Yes	2 of 3	Yes	3 of 3	100			NO SGE								5,372	147	43	0.7	-10				Yes
Totals or Medians (% of LWUs basis excl NO SGE suppliers) for >10,000 Properties	598,000	190,030	169	9	70	47.9		27 of 27 complied with chemical guidelines 26 of 27 complied with E. coli guidelines				164	426				11	24,220	13		1,265	12,225	32,951	904	310.5	0.7	1	446	290	21 Yes 6 Yes*
LWUs with 3,001 - 10,000 Properties																														
29 Armidale Dumaresq	8,520	3,120	272	15	60	9.9	Yes	1 of 1	Yes	1 of 1	100	0.0	134	5.0	100	0.0	20	535	0	4.8	1,232	10,390	30,983	870	239	1.8	-4	267	2.2	Yes
30 Griffith	8,390	7,380	572	20	100	8.2	Yes	2 of 2	Yes	2 of 2	100	3	90	7.5	98	0.0	0	0	19	2.0	1,405	7,520	34,606	1,174	452	1.0	5	424	3.4	Yes
31 Lithgow	8,060	2,290	218	-	50	5.6	Yes	1 of 1	Yes	1 of 1	100	43	180	6.3	72	3.7	0		1	0.0	1,589	4,020	22,720	967	191	2.8	10	353	2.8	Yes
32 Mid-Western Regional	7,780	2,360	191	8	60	7.1	Yes	3 of 3	Yes	3 of 3	100	6	-	6.2	54	17.6	12	152	48	3.6	1,293	11,680	28,600	852	290	3.2	3	1,763	12.4	Yes
33 Richmond Valley	7,120	2,890	184	3	70	4.9	Yes	1 of 1	Yes	1 of 1	100	0.0	-	8.3	100	0.0	8	167	0	1.2	1,331	12,950	28,232	1,181	483	1.8	3	1,055	7.1	Yes
34 Nambucca (Groundwater)	6,320	1,570	139	10	70	4.2	Yes	1 of 1	Yes	1 of 1	100	1.7	120	3.5	57	0.0	5	79	9	0.5	1,088	21,120	30,823	760	278	0.4	-5	2,586	16.2	Yes*
35 Singleton	6,590	2,990	282	20	70	5.6	Yes	1 of 1	Yes	1 of 1	100	0.5	120	4.4	100	0.0	33	389	9	4.8	929	8,160	25,962	774	233	2.7	-32	318	11.9	Yes
36 Parkes	5,880	4,600	279	9	1																									

Appendix D - 2012-13 NSW Water Utility Performance Summary

WATER UTILITY	Water Supply											Sewerage					Water Supply & Sewerage - Current (2012-13) unless noted as 2013-14														
	Water Supply Connected Properties (No.) ⁵	Total Urban Water Supplied (ML) ^{2,3}	Average Annual Residential Water Supplied (ML/connected property)	Water Main Breaks (per 100km of Main)	Real Losses (L/connected mld)	Revenue (SM) ^{3,8}	Water Quality Compliance (2011 ADWG)					Water Quality Complaints (per 1000 props)	Ave Duration of Unplanned Interruption (mins)	Revenue (SM) ^{2,3,5}	% Sge Treated that was Compliant (%)	Sewer Overflows (reported to regulator) (per 100km of main)	Recycled Water (% of effluent recycled)	Total WS and SGE Complaints (No./1000 props)	Net Profit After Tax (\$M)	2013/14 Typical Residential Bill (\$/assessment)	2013/14 Typical Developer Charge (\$/ET)	Current Replacement Cost per Assessment (\$/assessment)	OMA Cost (\$/connected property)	Mgmt Cost (\$/connected property)	ERRR (%)	Net Debt to Equity (%)	Capital Expenditure		Strategic Business Plans Completed? Note 14 (Yes/No)		
							Chemical Compliance Achieved?	Zones (7a) H4	E. coli Compliance Achieved?	Zones (8a) H2	% Pop'n with E. coli Compliance (8b) H3																(\$/prop)	(\$M)			
	(1) C4	(2) W11	(3) W12	(3a) A8	(3b) A10	(4) F1	(7)	(7a) H4	(8)	(8a) H2	(8b) H3	(8c) C9	(8d) C15	(9) F2	(10) E4	(11) E13	(12) W27	(12a) W26	(13a) C13	(13b) F24	(13c) P8	(14)	(15)	(17) F13	(18)	(19) F19	(19a) F22	(19b) F28 + F29	(19c) F16	(21)	
37 Inverell	5,480	1,780	183	3	50	4.1	Yes	3 of 3	Yes	3 of 3	100	0.7	60	2.2	97	0.0	0	43	0.8	987	14,340	29,090	815	131	0.5	-6	116	0.6	Yes		
38 Moree Plains (Groundwater)	4,610	2,930	367	67	160	4.7	Yes	6 of 6	Yes	6 of 6	100	0.0	90	3.2	75	0.0	69	824	24	0.2	1,305	11,320	27,627	1,194	356	1.0	7	93	0.4	Yes	
39 Cowra	5,360	3,050	226	22	90	6.5	Yes	1 of 1	Yes	1 of 1	100	23	180	3.2	42	0.0	100	673	41	0.6	1,559	12,720	33,349	1,114	209	2.9	5	318	1.7	Yes	
40 Central Tablelands (NO SGE)	5,430	1,730	201	9	80	5.2	Yes	2 of 2	Yes	2 of 2	100	3	180	NO SGE				0	0.4	633	8,330	20,410	565	239	0.7	-1	199	1.1	Yes		
41 Muswellbrook	5,750	3,220	268	33	90	6.3	Yes	3 of 3	Yes	3 of 3	100	16	163	7.8	51	0.6	100	943	1	7.0	1,136	13,040	25,622	1,022	395	6.4	-22	815	4.6	Yes	
42 Corowa	5,370	4,430	302	9	130	4.8	Yes	3 of 3	Yes	3 of 3	100	6	120	3.7	95	0.0	45	387	20	1.7	1,160	2,740	18,986	947	403	3.0	-7		2.2	Yes	
43 Turmut	4,430	1,540	221	7	50	3.4	Yes	4 of 4	Yes	4 of 4	100	2	120	3.3	100	-	15	141	38	0.7	1,107	10,500	24,742	830	240	1.4	3	632	2.7	Yes	
44 Gunnedah (Groundwater)	4,680	2,670	369	5	70	3.4	Yes	4 of 4	Yes	4 of 4	100	0.0	104	2.1	100	0.9	100	587	9	1.8	995	15,010	25,715	602	230	2.0	-20	277	1.2	Yes	
45 Upper Hunter	4,660	2,300	371	24	90	5.4	Yes	4 of 4	Yes	4 of 4	100	0.9	45	2.9	54	0.0	1	7	15	2.8	1,392	9,950	26,906	960	357	3.2	-9	1,296	5.9	Yes	
46 Narrabri (Groundwater)	4,450	2,730	312	115	100	3.3	Yes	6 of 6	Yes	6 of 6	100	25	110	2.8	91	0.0	4	36	53	2.2	1,167	8,440	17,648	829	210	6.2	-31	124	0.5	Yes	
47 Bellinger (Unfiltered)	4,080	1,310	159	5	150	2.3	Yes	2 of 2	Yes	2 of 2	100	4	120	2.5	88	1.1	0	12	0.2	1,135	11,090	29,973	940	399	0.0	-19	286	1.0	Yes		
48 Leeton	3,730	2,690	487	13	110	3.7	Yes	3 of 3	Yes	3 of 3	100	0.0	120	2.2	100	0.0	2	16	0	0.5	1,208	9,500	32,470	1,092	271	0.2	-20	311	1.1	Yes	
49 Young (Reticulator)	4,690	1,200	177	13	50	3.0	Yes	1 of 1	Yes	1 of 1	100	1.7	120	2.8	33	14.7	14	78	32	1.1	1,351	2,330	25,190	393	125	2.8	-8	4,357	16.4	Yes	
50 Cooma-Monaro	3,660	1,300	279	-	60	3.3	Yes	3 of 3	Yes	3 of 3	100	0.0	-	3.0	86	0.0	25	184	60	0.5	1,490	13,650	35,151	1,125	539	0.6	-7	428	1.5	Yes	
51 Forbes	3,650	2,420	382	22	100	2.4	Yes	1 of 1	Yes	1 of 1	100	0.8	120	2.1	75	0.0	82	609	4	-0.5	961	10,440	33,156	1,258	199	-1.4	-14	2.1	Yes		
52 Snowy River (Unfiltered)	5,160	760	87	7	40	3.0	Yes	5 of 5	Yes	5 of 5	100	1.2	120	3.1	88	2.2	5	27	19	0.2	1,374	17,080	31,357	774	277	0.2	-4		3.4	Yes	
53 Berrigan (Dual Supply)	3,510	1,930	441	15	100	2.9	Yes	4 of 4	Yes	4 of 4	100	3	90	1.4	100	0.0	18	135	58	0.1	1,199	7,300	22,200	861	211	0.4	-13	123	0.4	Yes	
54 Deniliquin	3,510	2,290	483	101	150	2.8	Yes	1 of 1	Yes	1 of 1	100	2	60	2.8	100	0.0	0	11	1.4	1,399	8,460	24,975	951	437	3.5	-7	1,500	4.8	Yes		
55 Warrumbungle	3,320	1,090	215	34	210	2.7	Yes	8 of 8	Yes	8 of 8	100	3	120	1.2	73	0.0	30	122	44	0.0	1,164	2,810	30,856	889	181	0.0	-5		0.4	Yes*	
56 Yass Valley	3,170	810	165	14	80	3.3	Yes	1 of 1	Yes	1 of 1	100	10	240	1.9	100	2.6	0	24	0.0	1,492	17,850	38,102	1,114	401	1.5	20	2,812	8.9	Yes		
Totals or Medians (% of LWUs basis) for 3,001 - 10,000 Properties	147,000	69,380	270	14	85	128	28 of 28 complied with chemical guidelines 28 of 28 complied with E. coli guidelines					120	98			12	6,196	19		1,204	10,470	28,416	920	256	2	-7	335	108	26 Yes* 2 Yes*		
LWUs with 1,501 - 3,000 Properties																															
57 Wellington	2,890	960	196	5	80	2.9	Yes	2 of 2	Yes	2 of 2	100	0.0	120	1.7	100	0.0	0	11	0.1	1,310	6,510	24,011	950	369	1.7	16	34	0.1	Yes		
58 Cootamundra (Reticulator)	3,000	940	205	77	70	2.1	Yes	1 of 1	Yes	1 of 1	100		120	1.2	75	0.0	25	202	72	0.3	1,043	10,190	17,191	483	119	1.4	-13	0	0.1	Yes	
59 Lachlan	2,830	1,990	554	7	120	3.0	Yes	3 of 3	Yes	2 of 3	89	1.4	100	1.0	59	0.0	24	119	5	-0.3	1,963	13,550	53,122	1,218	232	-1.2	-13	334	0.9	Yes	
60 Glen Innes Severn	2,950	660	133	2	140	1.8	Yes	2 of 2	Yes	2 of 2	100	0.0	180	1.4	100	2.0	12	73	86	0.2	957	5,570	19,676	685	340	1.1	4	391	1.1	Yes	
61 Liverpool Plains	2,770	860	189	19	90	2.4	Yes	2 of 2	Yes	2 of 2	100	0	45	1.1	66	1.7	0		36	1.0	1,276	13,550	32,170	736	301	1.2	-5	2,027	5.6	Yes	
62 Narramine (Groundwater)	2,120	1,570	716	15	110	1.5	Yes	1 of 1	Yes	1 of 1	100	7	60	1.2	100	0.0	5	30	1	0.5	1,464	8,490	20,005	843	386	1.3	-28		0.4	Yes	
63 Narrandera (Groundwater)	2,080	1,800	370	6	130	2.2	Yes	1 of 1	Yes	1 of 1	100		120	1.3	50	2.4	1	2	88	1.5	1,129	2,300	18,777	959	196	6.4	-30	1,107	2.1	Yes	
65 Murray (Dual Supply)	2,910	1,690	506	5	70	2.2	Yes	2 of 2	Yes	2 of 2	100	0.0	90	1.6	100	0.0	66	191	2	0.9	1,111	3,890	14,676	774	228	2.5	-10	189	0.6	Yes	
67 Cobar	2,260	1,240	464	12	70	2.6	Yes	1 of 1	Yes	1 of 1	100	12	60	0.6	100	0.0	71	200	27	0.2	1,302	2,080	20,377	1,056	118	1.1	-6	94	0.2	Yes	
66 Cobar Water Board		2,670	0	0		2.4	Yes		Yes				60	NO SGE				0													
68 Tenterfield	2,020	390	139	14	30	1.4	Yes	3 of 3	Yes	3 of 3	100	7	120	1.6	100	0.0	15	37	35	-0.2	1,479	12,000	36,301	1,041	411	0.2	6	357	0.7	Yes	
70 Kyogle	1,900	410	134	9	30	1.1	Yes	2 of 2	Yes	2 of 2	100	7	90	1.1	60	0.0	28	126	9	-0.1	1,107	4,470	26,512	1,034	309	0.1	1	326	0.6	Yes*	
71 Palerang	2,120	510	176	33	40	1.8	Yes	3 of 3	Yes	3 of 3	67	3	90	2.1	47	0.0	2	9	27	0.0	1,685	19,800	34,363	1,079	270	1.0	4	2,813	6.0	Yes	
73 Upper Lachlan	1,960	380	138	3	30	1.6	Yes	4 of 4	Yes	4 of 4	100	1.0	100	1.2	100	0.0	0		5	0.5	1,430	7,600	26,790	810	201	2.2	-17	1,503	2.8	Yes*	
74 Wentworth (Dual Supply)	2,340	880	350	-	80	2.3	Yes	3 of 3	Yes	3 of 3	100	0.0	-	1.4	100	2.3	1	31	13	1.3	1,273	8,070	34,285	719	127	4.1	-8	50	0.1	Yes	
76 Harden (Reticulator)	1,820	1,030	358	6	70	2.0	Yes	1 of 1	Yes	1 of 1	100	9	60	0.6	100	0.0	63	274	5	0.3	1,702	6,310	28,365	617	233	0.8	-9	117	0.2	Yes*	
75 Coonamble (Groundwater)	1,690	800	236	-	290	0.8	Yes	3 of 3	Yes	3 of 3	100		60	0.7	-	-	24	76	0	0.3	701		31,205	593	83	-0.1	-20	2,911	4.9	Yes*	
79 Walgett (Dual Supply)	1,930	3,260	1,340	16	190	1.6	Yes	3 of 3	Yes	2 of 3	93	1.0	7200	0.8		4.2	83	241	6	0.0	1,604		23,520	778	292	0.2	-16	0			
80 Greater Hume	1,820	600	240	6	50	1.4	Yes	2 of 2	Yes	2 of 2	100																				

Appendix D - 2012-13 NSW Water Utility Performance Summary

WATER UTILITY	Water Supply														Sewerage						Water Supply & Sewerage - Current (2012-13) unless noted as 2013-14												
	Water Supply Connected Properties (No.) ⁵	Total Urban Water Supplied (ML) ^{2,3}	Average Annual Residential Water Supplied (L/connected property)	Water Main Breaks (per 100km of Main)	Real Losses (L/connected m/d)	Revenue (SM) ^{3,6}	Water Quality Compliance (2011 ADWG)				Water Quality Complaints (per 1000 props)	Ave Duration of Unplanned Interruption (mins)	Revenue (SM) ^{2,3}	% Gte Treated that was Compliant (%)	Sewer Overflows (reported to regulator) (per 100km of main)	Recycled Water		Total WS and SGE Complaints (No./1000 props)	Net Profit After Tax (SM)	2013/14 Typical Residential Bill (\$/assessment)	2013/14 Typical Developer Charge (\$/ET)	Current Replacement Cost per Assessment (\$/assessment)	OMA Cost (\$/connected property)	Mgmt Cost (\$/connected property)	ERRR (%)	Net Debt to Equity (%)	Capital Expenditure		Strategic Business Plans Completed? Note 14 (Yes/No)				
							Chemical Compliance Achieved?	Zones (7a) H4	E. coli Compliance Achieved?	Zones (8a) H2						% Pop'n with E. coli Compliance (8b) H3	Total ML (12a) W26										(\$/prop) (19b) F28 + F29	(\$M) (19c) F16					
																														(7) (17)	(8) (18)	(9) (19)	(10) (20)
(1) C4	(2) W11	(3) W12	(3a) A8	(3b) A10	(4) F1	(7a) H4	(8a) H2	(8b) H3	(8c) C9	(8d) C15	(9) F2	(10) E4	(11) E13	(12) W27	(12a) W26	(13a) C13	(13b) F24	(13c) P8	(14)	(15)	(17) F13	(18)	(19) F19	(19a) F22	(19b) F28 + F29	(19c) F16	(21)						
LWUs with 200 - 1,500 Properties																																	
81 Gwydir	1,470	640	295	29	120	1.3	Yes	3 of 3	Yes	3 of 3	100	7	180	0.7	100	0.0	3	10	0	-1.5	1,244	4,000	19,332	723	54	-5.6	-4	405	0.5	Yes			
83 Oberon (Reticulator)	1,330	590	151	8	70	1.3	Yes	1 of 1	Yes	1 of 1	100	0.0	120	0.8	100	0.0	100	318	9	-0.1	1,003	2,970	23,578	1,438	429	-0.4	-4	160	0.2	Yes			
84 Gilgandra (Groundwater)	1,350	930	482	33	150	0.8	Yes	1 of 1	Yes	1 of 1	100	8	90	0.7	100	0.0	50	241	47	-0.1	1,169		23,655	663	118	-0.2	-12	198	0.3	Yes			
85 Uralla	1,420	300	189	16	30	0.8	Yes	2 of 2	Yes	2 of 2	100	11	100	0.5	42	0.0	0	0	1	0.0	1,156	1,370	17,648	819	316	-0.7	-7	81	0.1	Yes			
86 Hay (Dual Supply)	1,330	1,320	966	106	30	1.1	Yes	1 of 1	Yes	1 of 1	100	2	120	0.9	100	0.0	0	0	39	0.2	1,511		31,992	1,021	450	0.5	-14	212	0.3	Yes			
87 Bourke (Dual Supply)	1,310	1,490	1,060	68	110	1.6	Yes	1 of 1	Yes	1 of 1	100	0.0	60	0.7	33	0.0	0	0	88	-0.2	1,749	1,760	29,042	1,220	339	0.9	-16	471	0.6	Yes			
88 Wakool (Dual Supply)	1,470	780	517	2	90	1.4	Yes	5 of 5	Yes	5 of 5	100	0.0	0	0.7	100	0.0	0	0	4	-1.3	1,449	5,615	42,874	1,060	173	-0.4	-8	1,083	1.3	Yes			
89 Bogan	1,120	850	379	19	300	1.7	Yes	1 of 1	Yes	1 of 1	100	0.0	90	0.6	100	0.0	100	55	27	0.4	1,670		37,211	1,320	340	1.4	-12	0	0	Yes			
90 Guyra	1,350	520	201	6	70	1.1	Yes	1 of 1	Yes	1 of 1	100	1.5	180	0.6	100	0.0	0	0	8	0.0	1,153	2,540	33,728	874	243	-0.1	-4	80	0.1	Yes			
91 Cabonne	1,140	390	144	19	130	0.8	Yes	1 of 1	Yes	2 of 3	100	3	15	1.5	69	0.0	49	230	21	-0.7	891	11,790	49,228	1,087	190	-1.1	-7	734	1.6	Yes			
92 Carrathool (Groundwater)	1,110	1,020	532	24	60	1.7	Yes	3 of 3	Yes	3 of 3	100	4	60	0.3	100	0.0	1	1	72	-0.9	1,130	1,730	84,768	1,369	114	-1.4	3	390	0.4	Yes			
93 Tumbarumba (Unfiltered)	1,160	320	188	8	40	0.9	Yes	2 of 2	Yes	2 of 2	100	1.7	120	0.6	100	0.0	0	0	8	-0.1	1,236	920	43,355	790	235	0.0	-5	748	0.8	Yes*			
94 Gundagai	910	590	398	17	90	0.8	Yes	1 of 1	Yes	1 of 1	100	60	60	0.6	100	0.0	100	117	16	0.2	1,191	3,900	32,259	1,012	343	0.9	-8	63	0.1	Yes			
96 Warren (Dual Supply)	960	800	804	103	90	0.6	Yes	3 of 3	Yes	3 of 3	100	27	120	0.5	100	0.0	1	2	106	-0.2	1,292		27,090	1,124	439	-2.4	-20	187	0.2	Yes			
97 Bombala	890	170	175	33	30	0.6	Yes	2 of 2	Yes	2 of 2	100	15	40	0.4	44	0.0	21	36	13	-0.2	1,168	4,030	55,077	823	187	-1.4	-13	138	0.1	Yes			
98 Walcha	870	160	107	0	30	0.6	Yes	1 of 1	Yes	1 of 1	100	1.2	120	0.4	82	26.7	0	0	10	0.0	881		26,419	983	228	-0.3	-7	31	0.0	Yes*			
100 Balranald (Dual Supply)	910	1,100	1,400	3	60	0.7	Yes	2 of 2	Yes	2 of 2	100	60	60	0.3	100	0.0	73	130	4	-0.1	1,575	1,540	28,204	745	147	-0.9	-2	106	0.1	Yes*			
101 Murrumbidgee (Groundwater)	790	700	513	59	130	0.4	Yes	2 of 2	Yes	2 of 2	100	0.0	120	0.2	50	0.0	19	26	57	0.0	655	2,000	23,514	577	231	-0.7	-15	107	0.1	Yes*			
103 Central Darling (Dual Supply)	740	360	632	18	30	0.7	Yes	2 of 2	Yes	2 of 2	100	60	180	0.2	100	0.0	0	0	395	-0.4	1,610		62,887	1,825	69	-1.6	0	0	0	Yes			
104 Boorowa	640	130	163	15	50	0.6	Yes	1 of 1	Yes	1 of 1	100	3	75	0.4	100	0.0	1	1	28	-0.1	1,329	7,990	47,145	983	419	-0.6	0	459	0.3	Yes			
105 Brewarrina	510	780	1,100	68	60	1.2	Yes	2 of 2	96	1 of 2	79	15	15	0.6	100	0.0	57	200	24	-0.1	2,136		40,444	1,720	391	5.1	-14	103	0.1	Yes			
106 Jerilderie (Dual Supply)	490	510	1,240	7	40	0.4	Yes	1 of 1	Yes	1 of 1	100	20	120	0.2	0.0	6	5	0	0.0	2,019	3,180	31,623	1,042	223	-0.8	-28	94	0.0	Yes*				
Totals or Medians (% of LWUs basis) for 200 - 1,500 Properties	23,000	14,450	440	18	65	21.0	22 of 22 complied with chemical guidelines 21 of 22 complied with E. coli guidelines				110	12.4			2	1,371	18			1,240	2,970	32,125	1,017	233	-1	-7	149	7.1	12 Yes 5 Yes*				
LWUs without Water Supply																																	
9 Wagga Wagga (NO WS)	26,060	331												16.7	100	0.3	97	5,543	54	-0.8	434	3,500	9,774	413	62	0.5	0	138	3.6	Yes			
30A Hawkesbury	7,650	11												5.6	83	1.6	9	156	19	-0.2	584	8,250	19,966	555		-0.2	-2	464	3.5	Yes*			
69 Temora	2,130	44												0.7	49	0.0	47	281	19	0.0	296	0	8,350	231	20	0.0	1	158	0.3	Yes*			
72 Bland	1,830	169												1.1	100	0.0	77	169	65	0.2	614	1,760	11,272	357	54	2.1	1	76	0.1	Yes*			
77 Junee	1,620	122												0.7	100	2.3	59	123	0	0.0	378	1,650	11,772	296	65	-0.2	0	3	0.0	Yes			
78 Blayney	1,980	154												1.2	83	1.3	100	154	12	0.0	496	3,270	14,158	363	114	-0.3	1		0.0	Yes			
95 Weddin	930	14												0.3	100	0.0	8	14	41	0.0	356	3,040	12,000	180	28	1.0	1	53	0.0	Yes*			
99 Coolamon	1,000													0.4	64	0.0	25	26	4	-0.1	360	4,500	12,812	289	53	-0.4	1	113	0.1	Yes			
102 Lockhart	870	1												0.4	91	0.0	1	1	27	0.0	475	1,250	13,866	319	97	-0.9	1		0.0	Yes			
107 Urana	320													0.2	100	0.0	0		0	0.0	350	4,100	24,814	376	114	-0.4	0		0.0	Yes*			
Totals or Medians (% of LWUs basis) for LWUs without WS	37,000	846												21.6			36	6,467			406	3,155	12,406	338	62	-0.2	1	113	7.8	5 Yes 4 Yes*			
Statewide Totals & Medians ⁶	834,000 WS Connected Properties	297,000 ML (note 6)	Median 166kL (note 7)	Median 10 Breaks per 100km (note 7)	Median 60 L/connected on/d (note 7)	Total \$640M (note 6)	95 of 95 LWUs (100%) complied with the chemical guidelines. 93 of 95 LWUs (98%) complied with E.coli guidelines				Median 3 Quality Complaints per 1000 props (note 6)	Median 160 (Mins)	Total \$580M (note 6)	90% of LWUs and 98% of samples complied with BOD licences	Median 0.8 Overflows reported per 100km of main	84% of LWUs reused effluent. 23% of effluent collected was recycled	Total 40,000 ML	Median 33 no. per 1000 props	Median \$1165 per assessment (note 7)	Median \$10,200 per ET (note 7)	Median \$32,000 per assessment (note 7)	Median \$840 per connected property (note 7)	Median \$297 per connected property (note 7)	Median 0.8% (note 7)	Median 1% (note 7)	Median \$404 per property (note 7)	Total \$440M (note 7)	Total 76 Yes 21 Yes* (note 14)					

Notes

1. This table shows the key 2012-13 performance indicators/characteristics for NSW water utilities.
A more detailed breakdown is provided in Tables 6 to 18 and Figures 1 to 65 of the *2012-13 NSW Water Supply and Sewerage Benchmarking Report*.
2. **No WS** means not responsible for water supply;
No SGE means not responsible for sewerage. For LWUs with water supply only or sewerage only, the results are shown left justified and are not included in the median calculation for water supply and sewerage.
3. Where an LWU has not reported an item for 2012-13, the value previously reported has been used where available. Such values are shown in this table in **italics bold**.
4. The number of connected properties for LWUs responsible for sewerage only (column (1)) is sewerage properties.
5. **NSW Water Utilities**
In NSW there are 109 water utilities comprising:
 - 4 metropolitan water utilities (Sydney and Hunter Water Corporations, Sydney Catchment Authority (SCA) and Hawkesbury Council), and
 - 105 regional Local Water Utilities (LWUs).
 The 105 LWUs comprise:
 - 100 local government councils (under *Local Government Act 1993*),
 - 5 LWUs (Gosford Council, Wyong Council, Cobar WB, Fish River WS, Essential Energy) under the *Water Management Act 2000*.
 Of the 105 LWUs,
 - 96 were responsible for water supply (including 3 for bulk supply - Cobar WB, Fish River WS & Rous Water)
 - 99 were responsible for sewerage.
 - 90 were responsible for both water supply and sewerage, 6 for water supply only and 9 for sewerage only.
6. **Totals for Regional NSW**
The totals shown below are for regional NSW & therefore exclude Sydney & Hunter Water Corporations, the SCA and Hawkesbury Council. The totals exclude double-counting where bulk water suppliers are involved.
 - **Total number of water supply connected properties** in regional NSW was 834,000 (col (1)).
 - **Total annual water supplied** was 297,000 ML (column (2)).
 - **Total revenue** for water supply and sewerage was \$1,220M (columns (4) and (9)) and the current replacement cost of assets was \$25,700M.
7. **Statewide medians (regional LWUs) were:**
 - **Average annual residential water supplied** - 166kL/connected property (column (3)).
 - **Typical residential bill (TRB)** for water and sewerage - \$1165/assessment (column(13c)). The 2013-14 TRB for water supply has been calculated on the basis of each LWU's 2013-14 tariff using the 2012-13 average annual residential water supplied (column (3)). The TRB for sewerage is based on the LWU's access charge (col(1)) of Appendix F except for 1 LWU where account was also taken of the sewer usage charge/kL. The TRB in col (13c) is for 2013-14. However, NWI indicator P8 is defined as the TRB for 2012-13 and will therefore differ from those shown in column (13c). The 2012-13 TRBs are shown in column 8 of Appendices E and F on pages 84 and 87.
 - **Typical developer charge** for water and sewerage - \$10,200/ET for 2013-14 (col (14) and Appendices E and F).
 - **Economic real rate of return (ERRR)** for water and sewerage - 0.8% (column (19)). As shown in Figures 17 and 18, 100% of LWUs are achieving full cost recovery for water supply and 96% are achieving full cost recovery for sewerage. The remaining 4 sewerage utilities which are not achieving full cost recovery need to do so. Refer also to Appendices E and F on pages 84 and 87.
 - **Net debt/equity** for water and sewerage was 1% (column (19a)).
 - **Water main breaks** - 10 breaks per 100km of main (column (3a)).
 - **Average duration of unplanned interruptions (water supply)** - 160 minutes (column (8d)).
 - **Water quality complaints** - 3 per 1000 properties (column (8c)).

7. cont'd **Statewide medians (regional LWUs):**
 - **Operation, maintenance and administration (OMA)** cost (water & sewerage) - \$840/connected property (column (17)). OMA cost includes part of the OMA cost of the bulk water supplier but excludes the purchase cost of water. However, NWI indicator F13 includes the purchase cost of water and therefore may differ from column (17). Refer to page 94 of Appendix G.
 - **Management cost** for water supply and sewerage - \$297/connected property (column (18)).
 - **Current replacement cost** for water supply and sewerage - \$32,000/assessment (column (15)).
 - **Capital expenditure** for water supply and sewerage - \$404/property (column (19b)). The total capital expenditure for water supply and sewerage was \$430M (column (19c)).
8. **Category 1 Businesses** - Category 1 businesses are defined as having an annual revenue of over \$2M (*NSW Government's Policy Statement on Application of National Competition Policy to Local Government, June 1996*). 75 LWUs are Category 1 businesses (shown in bold in Cols (4) & (9)). Column (4) shows there were 61 LWUs responsible for water supply with a revenue of over \$2M; and 48 such utilities responsible for sewerage (column (9)).
9. **Pay-for-use water supply tariff** - All of the 93 LWUs providing reticulated water have a pay-for-use water supply tariff in 2013-14 (ie. a two-part tariff or an inclining block tariff). Such tariffs comply with IPART recommendations and the *COAG Strategic Framework for Water Reform*.
10. **Pay-for-Use Pricing & Full Cost Recovery** - For water supply, all LWUs have pay-for-use pricing in 2013-14, together with residential tariffs independent of land value. All LWUs also had full cost recovery (col 2 of Appendix C). For sewerage, 96% of LWUs have tariffs independent of land value and full cost recovery (col 2 of Appendix C). Such LWUs comply with the *COAG Strategic Framework for Water Reform* and the *National Water Initiative*.
11. **Physical and chemical water quality** - 99.2% of the 4,200 physical samples and 98.5% of the 4,200 chemical samples tested for NSW LWUs achieved 100% compliance with the 2011 Australian Drinking Water Guidelines. All LWUs complied with chemical water quality (health related) and are shown as 'Yes' in col (7). Refer also to pages 7, 8, 36 and 94. All LWUs complied for physical water quality.
12. **Microbiological water quality** - E.coli contamination is the primary health-related indicator.
 - **E.coli** - 99.7% of the 19,000 samples tested for NSW LWUs achieved 100% compliance with the 2011 Australian Drinking Water Guidelines. 98% of LWUs complied with these guidelines and are shown as 'Yes' in col (8). For the 2 LWUs that did not comply, the percentage of samples complying is shown in col (8). Refer also to pages 7, 8, 37 and 94.
13. **Compliance with EPA Discharge Licence for Sewerage**
 - **BOD** - 98% of the 3,984 sampling days for NSW LWUs achieved 100% compliance with the 90-percentile limit of their EPA licence for BOD (Biochemical Oxygen Demand). 90% of LWUs complied with the EPA licence (col 10).
 - **SS** - 94% of the 3,984 sampling days for NSW LWUs achieved 100% compliance with the 90-percentile limit of their EPA licence for SS (Suspended Solids). 78% of LWUs complied with their EPA licence for SS. (17 LWUs had no EPA discharge licence limit and 1 did not report BOD or SS).
14. **Strategic Business Plans** (pages 4 & 21) - 97 LWUs have completed a sound water &/or sewerage Strategic Business Plan (col 21) and have demonstrated long term financial sustainability of their water and sewerage businesses to comply with National Competition Policy. The plans of 21 of these LWUs now need updating (these are shown as "Yes*" in column 21).
15. **Total Urban Water Supplied** (col (2)) includes non-potable and recycled water. Similarly, the average annual residential water supplied (col (3)) includes non-potable and recycled water.
16. **Reuse of recycled water** comprised 40,000ML which is 23% of the volume of sewage collected and was carried out by 84% of utilities, mostly for agriculture. Refer also to Figure 12 on page 44 and graph 16 on page 69.
17. **National Water Initiative (NWI) Indicators** - The 32 NSW water utilities with over 10,000 connected properties (3 metropolitan utilities and 29 regional utilities) are required to report their performance under the NWI. The results that have met the rigorous NWI auditing requirements have been published in the *National Performance Report 2012-13*. Refer also to Notes 12 and 13 on page 32. These results are shown in Appendix F of the 2012-13 NSW Water Supply and Sewerage Benchmarking Report.
18. The performance indicators for Sydney and Hunter Water Corporations and Sydney Catchment Authority are from the *National Performance Report 2012-13 for Urban Water Utilities* (www.nwc.gov.au).

Appendix E - Water Supply - Residential Charges & Bills, Cost Recovery

WATER UTILITY	RESIDENTIAL CHARGES															COST RECOVERY										Total Connected Properties (15) C4																				
	Type of Tariff	Fixed Charge (or Minimum) (\$)	Special Leases (\$)	Usage Charge (for Step 1 and Step 2)								Billing (2006 National Guidelines) (% Implementation) (5e)	Operating Cost (OMA) (c/kL) (6)	Typical Developer Charge (\$/ET) (7)	Typical Residential Bill based on Col(14b) (Includes Special Leases) (8) P3	Return on Assets (%) (11)	ERRR (Water Supply) (%) (12) F17	Residential Revenue from Usage Charges (% of residential bills) (13) F4	Avg Annual Residential Water Supplied*			Full Cost Recovery? (FCR) (Y/Y/N) (14d)																								
				Step 1				Step 2											Potable (14a) P2.1	Potable + Non Potable (14b) W12	L/c/d (14c) 12/13																									
				(5a) P1.3	(5b) P1.3	(5c) P1.4	(5d) P1.4	(5a) P1.3	(5b) P1.3	(5c) P1.4	(5d) P1.4																																			
Sydney Water	Two Part	148	135	125	All	All	All	216	213	217	100	100	565	546	555	2.6	2.4	1.9	78	78	193	198	193	196	Y	1,844,000																				
Hunter Water	Two Part	19	19	17	All	All	All	195	208	213	100	100	336	358	392	3.3	2.2	2.8	66	66	163	176	163	176	Y	232,964																				
LWUs with > 10,000 Properties																																														
1 Gosford	Two Part	96	99	126	All	All	All	198	212	217	100	100	146	176	170	2,570	1,230	1,310	399	446	465	0.0	-1.5	-0.2	0.8	-0.5	0.7	77	76	145	156	145	156	177	Y	70,740										
2 Wyong	Two Part	142	167	175	All	All	All	198	212	235	100	100	156	123	131	2,820	2,820	2,840	458	512	539	-0.7	-1.3	-0.2	0.6	1.1	1.7	67*	68*	151	155	151	166	177	Y	60,620										
3 Shoalhaven	Inclining Block	78	81	81	<450	<450	All	150	155	160	100	100	92	101	92	6,390	6,580	6,580	273	310	317	1.2	1.2	2.0	0.4	0.5	1.2	71	76	130	147	130	148	196	Y	46,600										
4 Rous (Bulk Supplier) (No Sge)													75	73	96	8,380	8,650	8,860				-0.3	0.3	0.8	0.3	1.0	1.1							Y	45,540											
5 MidCoast	Inclining Block	168	174	180	<200	<200	<200	238	250	257	>200	>200	>200	266	279	288	95	97	137	223	190	5,480	5,650	5,820	480	531	547	-1.5	-3.7	-1.5	-0.2	-2.2	0.1	72	75	131	143	131	143	171	Y	38,480				
6 Tweed	Inclining Block	118	128	138	<300	<300	<300	185	205	225	>300	>300	>300	280	310	340	90	90	132	143	149	6,390	12,150	12,580	420	489	534	-1.0	-0.3	-0.2	-0.2	0.4	0.6	75	75	163	176	163	176	186	Y	31,560				
7 Port Macquarie-Hastings (Unfilt)	Inclining Block	154	163	173	<270	<270	<270	214	227	241	>270	>270	>270	428	454	482	33	33	157	168	168	9,380	9,610	9,760	460	516	548	0.8	0.7	-0.2	0.9	0.6	-0.5	68	73	144	155	144	155	144	Y*	29,730				
8 Riverina (Groundwater) (No Sge)	Inclining Block	100	120	140	<500	<500	<500	95	110	121	>500	>500	>500	142	166	183	100	100	85	75	71	3,700	3,800	4,800	343	483	540	-0.3	1.5	3.6	-0.5	1.5	3.5	72	77	256	330	256	330	346	Y	29,350				
10 Coffs Harbour	Inclining Block	131	135	139	<365	<365	<365	236	248	255	>365	>365	>365	354	372	383	100	100	128	127	146	9,130	9,190	9,680	499	534	549	0.8	-0.3	0.6	2.6	1.3	1.8	74*	75*	156	161	156	161	147	Y	24,750				
11 Albury City	Inclining Block	90	90	94	<225	<225	<225	77	92	107	>225	>225	>225	157	187	206	100	100	108	99	92	3,400	3,400	3,400	247	344	387	-1.6	-1.0	0.8	-1.7	-1.1	0.7	69	79	203	250	203	250	295	Y	23,260				
12 Fish River WS (Bulk Supplier) (No Sge)		MAQ	MAQ	MAQ																															Y	23,500										
13 Tamworth Regional	Inclining Block	222	235	242	<400	<400	<400	126	134	138	400-800	400-800	400-800	189	201	207	80	80	101	129	110	4,270	4,400	4,510	479	580	597	1.6	2.7	1.9	1.3	2.3	1.5	58	60	204	258	204	258	307	Y	21,240				
14 Clarence Valley	Inclining Block	122	146	156	<450	<450	<450	147	157	168	>450	>450	>450	221	236	252	95	95	119	127	137	5,000	4,870	4,990	323	390	417	-0.3	-0.6	-0.5	0.1	-0.2	-0.1	65	67	137	155	139	155	177	Y*	21,350				
15 Eurobodalla (Unfiltered)	Two Part	167	167	228	All	All	All	290	299	340											10,690	11,020	11,290	469	514	623	1.1	0.0	-0.5	1.3	0.2	-0.3	65	68	104	116	104	116	188	Y*	19,460					
16 Wingecarribee	Inclining Block	120	144	148	<225	<225	<225	151	160	163	>225	>225	>225	225	240	245	80	80	128	146	129	6,080	6,150	6,310	356	439	448	0.0	0.1	0.9	-0.2	-0.2	0.7	65	68	157	184	157	184	218	Y	18,730				
17 Queanbeyan (Reticulator)	Inclining Block	288	318	348	<160	<160	<160	206	228	250	>160	>160	>160	303	335	367	100	100	195	192	212	8,060	8,110	8,290	692	724	793	-2.5	-1.3	-0.7	-3.0	-1.8	-0.9	62	63	185	172	185	172	190	Y*	16,280				
18 Dubbo	Two Part	181	188	228	All	All	All	158	164	174											4,900	5,180	5,340	574	787	863	0.7	1.4	2.1	-1.3	2.1	2.9	71	78	249	365	249	365	434	Y	16,940					
19 Orange	Inclining Block	185	192	201	<450	<450	<450	170	175	184	>450	>450	>450	255	265	278	25	25	114	90	100	7,030	7,150	7,320	457	504	529	0.8	2.5	4.3	0.3	1.9	3.7	61	64	160	178	160	178	186	Y	16,930				
20 Goulburn Mulwaree	Inclining Block	255	217	157	75	<292	<292	167	204	271	>292	>292	>292	225	275	365	25	25	156	171	143	4,170	4,170	4,170	560	617	663	0.4	0.1	0.6	0.6	0.5	1.0	62*	65*	138	159	138	159	177	Y	9,930				
21 Bathurst Regional	Inclining Block	130	112	116	<250	<250	<250	132	152	171	>250	>250	>250	198	228	257			124	104	111	2,650	4,080	4,950	367	508	562	0.9	0.8	1.1	0.5	0.5	0.9	71	83	180	257	180	257	291	Y	15,230				
22 Lismore (Reticulator)	Two Part	159	167	185	All	All	All	236	248	272											2,020	2,020	2,020	496	541	596	-1.7	-2.6	-0.8	-1.7	-2.6	-0.9	69	70	143	151	143	151	166	Y*	14,240					
23 Bega Valley (Unfiltered)	Two Part	180	187	193	All	All	All	227	235	243											12,000	12,430	7,500	476	512	530	1.3	0.6	-1.1	0.4	0.1	-1.4	66	64*	130	139	130	139	205	Y*	14,340					
24 Ballina (Reticulator)	Inclining Block	156	165	178	<350	<350	<350	167	177	191	>350	>350	>350	251	266	287	100	100	159	159	196	4,510	4,510	4,510	434	492	531	0.8	-0.6	-0.2	0.2	-1.3	-0.7	66	67	166	185	166	185	172	Y*	13,980				
25 Kempsey (Groundwater)	Inclining Block	235	230	248	<250	<250	<250	167	187	203	>250	>250	>250	235	275	292	47	71	145	154	154	8,660	8,800	9,040	474	520	562	-0.8	-1.5	-0.3	-0.3	-0.9	0.3	54*	59	143	155	143	155	182	Y	12,620				
26 Essential Energy	Inclining Block	244	254	254	<400	<400	<400	147	167	167	>400	>400	>400	268	280	280	100	100	228	239	172	592	722	722														61*	66	237	280	237	285	391	Y*	10,510
27 Byron (Reticulator)	Inclining Block	135	145	150	<450	<450	<450	202	210	221	>450	>450	>450	303	315	332	80	90	126	141	154	8,230	18,600	19,480	475	514	538	0.4	1.6	0.1	-0.4	0.9	-0.5	73	73	168	175	168	175	223	Y	11,040				
28A Goldenfields (Reticulator) (No Sge)	Two Part	150	158	165	All	All	All	183	192	202											7,920	8,340	8,760	513	655	689	-0.9	0.2	1.4	-1.3	-0.1	1.1	73	77	199	259	199	263	218	Y	10,150					
28B Goldenfields (Bulk Supplier) (No Sge)																					40	43	31				-1.7	-1.1	1.2	-2.8	-1.8	0.7								Y	19,020					
<i>Medians (% of LWUs basis excl bulk suppliers) for >10,000 Properties</i>																																														
					173					203											146		6,065		547		0.0		0.7		70	172	172	188	0	LWU without FCR										
LWUs with 3,001 - 10,000 Properties																																														
29 Armidale Dumaresq	Inclining Block	230	225	220	<400	<400	<400	205	236	241	400-1000	400-1000	400-1000	272	313	320	10	10	177	194	119	5,030																								

Appendix E - Water Supply - Residential Charges & Bills, Cost Recovery

WATER UTILITY	RESIDENTIAL CHARGES													COST RECOVERY										Total Connected Properties (15) C4 12/13
	Type of Tariff	Fixed Charge (or Minimum) (\$)	Special Leases (\$)	Usage Charge (for Step 1 and Step 2)								Billing (2006 National Guidelines) (\$ Implementation) (5e)	Operating Cost (OMA) (c/kL) (6)	Typical Developer Charge (\$/ET) (7)	Typical Residential Bill based on Col(14b) (Includes Special Leases) (8) (P3) (13) F4	Return on Assets (%) (11)	ERRR (Water Supply) (%) (12) F17	Residential Revenue from Usage Charges (% of residential bills) (13) F17	Avg Annual Residential Water Supplied ^a			Full Cost Recovery? (Y/Y/N) (14d)		
				Step 1				Step 2											Potable	Potable + Non Potable			L/c/d (14c) 12/13	
				(1) P1 12/13 13/14	(2) P1.2 11/12 12/13 13/14	(4) P1.12 13/14	(5a) P1.3 11/12 12/13 13/14	(5b) P1.3 11/12 12/13 13/14	(5c) P1.4 11/12 12/13 13/14	(5d) P1.4 11/12 12/13 13/14	(5e) P1.4 11/12 12/13 13/14								(10) P1.1 11/12 12/13 13/14	(10) P1.2 11/12 12/13 13/14	(10) P1.3 11/12 12/13 13/14			
40 Central Tablelands (No Sge)	Inclining Block	Inclining Block	160 200 200	<450 <450 <450	184 199 215	>450 >450 >450	276 299 323	80 80	161 167 152	8,480 8,730 8,330	443 601 633	-1.5 -1.3 0.7	-1.3 -1.0 0.7	65 68*	154 201	154 201	183	Y	5,430					
41 Muswellbrook	Inclining Block	Inclining Block	175 175 175	<350 <350 <350	133 140 147	>350 >350 >350	200 210 220	100 100	155 113 118	2,990 3,090 6,190	465 550 568	3.4 2.9 3.7	2.1 1.4 2.3	64* 69*	218 268	218 268	298	Y	5,750					
42 Corowa	Two Part	Two Part	180 200 200	All All All	100 105 111			100 95	53 66 59	730 730 730	398 517 535	1.3 2.1 4.1	0.8 1.1 3.5	53* 63*	218 302	218 302	398	Y	5,370					
43 Tumut	Inclining Block	Inclining Block	141 219 221	<300 <300 <300	137 122 123	>300 >300 >300	211 244 246	50 50	137 147 113	4,990 5,170 5,500	371 483 487	-0.8 -0.8 0.5	-0.9 -1.1 1.2	68 63	168 216	168 221	274	Y	4,430					
44 Gunnedah (Groundwater)	Inclining Block	Inclining Block	175 170 170	<400 <400 <400	90 96 100	>400 >400 >400	135 144 150		82 83 72	4,530 7,920 8,200	361 524 539	2.9 2.8 2.6	1.8 1.6 1.6	64 74	207 369	207 369	433	Y	4,680					
45 Upper Hunter	Inclining Block	Inclining Block	280 290 300	<300 <300 <300	136 148 159	>300 >300 >300	195 212 228	75 75	87 91 108	5,340 6,550 7,650	812 884 938	4.5 2.8 4.9	2.3 1.4 4.8	67* 68*	364 371	364 371	389	Y	4,660					
46 Narrabri (Groundwater)	Two Part	Two Part	255 280 293	All All All	75 79 83				105 155 70	2,980 3,100 3,360	422 526 552	9.7 9.5 13.0	5.3 5.7 8.6	51 54	223 312	223 312	272	Y	4,450					
47 Bellingen (Unfiltered)	Inclining Block	Inclining Block	123 127 131	<365 <365 <365	160 168 175	>365 >365 >365	240 252 263	85 85	110 115 109	6,300 6,300 6,300	361 395 410	2.5 1.6 1.0	0.9 0.3 0.3	75 75	149 159	149 159	166	Y	4,080					
48 Leeton	Inclining Block	Inclining Block	230 238 246	<300 <300 <300	78 81 84	300-600 300-600 300-600	115 119 123		111 92 85	4,400 4,500 4,500	591 704 728	-1.4 0.9 1.5	-2.6 0.1 0.7	63 68	411 487	411 487	481	Y	3,730					
49 Young (Reticulator)	Inclining Block	Inclining Block	175 200 225	<300 <300 <480	204 214 230	>360 >360 >480	306 321 345	50 50	96 99 83	950 1,020 1,050	483 578 631	-2.9 1.1 -1.2	-0.9 -0.7 -1.8	66 69	151 177	151 177	201	Y*	4,690					
50 Cooma-Monaro	Inclining Block	Inclining Block	280 290 300	<300 <300 <300	125 140 147	>300 >300 >300	197 221 232	100 100	160 194 155	6,360 6,470 6,650	466 680 709	2.0 0.4 0.8	1.5 0.1 0.5	45 58*	149 279	149 279	345	Y	3,660					
51 Forbes	Inclining Block	Inclining Block	165 175 201	<600 <600 <600	71 75 77	>600 >600 >600	105 109 113	25 30	76 91 78	6,040 6,250 6,460	361 462 495	-1.0 -0.9 -0.1	-3.2 -2.2 -1.1	54* 63	276 382	276 382	436	Y*	3,650					
52 Snowy River (Unfiltered)	Inclining Block	Inclining Block	396 366 360	<300 <300 <300	152 175 200	>250 >300 >300	200 290 325		105 255 248	4,000 4,000 7,680	521 518 534	-0.2 0.6 0.6	-0.5 0.3 0.3	32 38	82 87	82 87	282	Y	5,160					
53 Berrigan (Dual Supply)	Two Part	Two Part	431 446 461	All All All	90 94 94			20 25	101 119 86	4,360 5,500 5,500	601 720 735	0.9 1.3 2.7	0.6 1.0 2.4	31 37*	133 142	246 441	554	Y	3,510					
53 Berrigan (Non Potable)	Two Part	Two Part		All All All	45 47 47				101 119 86						Nonpotable supply see Note 3				3,510					
54 Deniliquin	Inclining Block	Inclining Block	444 453 368	<400 <800 <800	42 55 60	>400 >800 >800	84 95 100	10 10	80 71 78	3,310 3,660 3,760	608 711 649	3.9 2.6 2.7	0.9 1.4 2.2	34 43*	390 468	390 483	609	Y	3,510					
55 Warrumbungle	Two Part	Two Part	345 345 355	All All All	144 160 170				219 205 168	1,350 1,350 1,530	606 687 719	-1.3 -0.6 0.3	-1.3 -0.6 0.2	46* 51	181 214	181 215	276	Y	3,320					
56 Yass Valley	Two Part	Two Part	440 440 450	All All All	260 270 280			50 50	184 183 232	10,000 10,300 12,200	800 886 912	-2.6 3.5 -0.3	-1.0 3.8 1.7	48 54	139 165	139 165	198	Y	3,170					
<i>Medians (% of LWUs basis) for 3,000 to 10,000 Properties</i>					221		147		109	6,245	637	1.3	1.3	68	240	272	286	0 LWU without FCR						
<i>LWUs with 1,501 - 3,000 Properties</i>																								
57 Wellington	Inclining Block	Inclining Block	267 346 358	<300 <300 <300	155 187 193	300-1000 300-500 300-500	180 190 196	100 100	146 159 162	4,480 4,640 4,600	563 712 736	-1.5 -1.5 2.6	0.2 0.2 4.1	53 55	191 196	191 196	211	Y	2,890					
58 Cootamundra (Reticulator)	Two Part	Two Part	268 284 302	<450 All All	147 165 178	>450	294	20 20	109 106 72	5,570 5,870 6,160	494 622 667	-2.0 6.3 1.9	-2.0 6.3 1.9	47 55*	154 205	154 205	265	Y	3,000					
59 Lachlan	Inclining Block	Inclining Block	265 278 410	<450 <450 <450	160 180 190	>450 >450 >450	250 275 285	100 100	101 116 111	5,800 5,800 5,800	914 1337 1523	3.7 -0.7 -0.3	2.5 -1.2 -0.8	72* 79*	406 541	406 554	627	Y*	2,830					
60 Glen Innes Severn	Inclining Block	Inclining Block	100 250 260	<450 <450 <450	192 192 198	>450 >450 >450	288 288 298		161 187 190	3,390 3,470 2,720	364 505 523	-2.4 -3.2 0.0	-3.2 -2.7 0.7	73 52	137 133	137 133	150	Y	2,950					
61 Liverpool Plains	Inclining Block	Inclining Block	493 543 559	<300 <300 <300	106 116 120	>300 >300 >300	174 191 197	50 50	152 148 153	7,130 10,690 10,690	708 762 786	1.0 0.9 1.3	0.8 0.6 1.1	42 40	303 189	303 189	236	Y*	2,770					
62 Narromine (Groundwater)	Two Part	Two Part	165 174 183	All All All	90 100 105			90 91	97 93 65	4,210 4,240 4,380	489 886 930	4.9 2.4 5.4	1.9 -0.1 3.7	67* 80*	260 716	260 716	739	Y	2,120					
63 Narrandera (Groundwater)	Two Part	Two Part	242 250 258	All All All	92 97 99				56 62 59	1,000 1,000 1,000	628 609 624	8.5 10.5 12.7	4.8 6.7 9.6	62* 63	420 370	420 370	375	Y	2,080					
65 Murray (Dual Supply)	Two Part	Two Part	227 238 250	All All All	78 83 87				123 99 77	2,130 2,130 2,730	508 695 729	0.0 1.2 3.7	0.0 1.2 3.6	56* 66*	194 262	194 262	486	Y	2,910					
65 Murray (Non Potable)	Two Part	Two Part	84 88 92	All All All	59 63 66				123 99 77						Nonpotable supply see Note 3				2,910					
67 Cobar	Inclining Block	Inclining Block	210 220 227	<450 <450 <450	100 115 200	450-550 450-550 450-550	170 200 290		193 129 158	1,410 1,510 1,160	565 660 992	-3.9 0.9 2.6	-3.9 0.8 2.6	66 77*	355 382	355 464	406	Y	2,260					
66 Cobar WB									54 58			-1.9 -2.0	-1.9 -2.1					Y*						
68 Tentersfield	Inclining Block	Inclining Block	344 361 379	<450 <450 <450	179 188 197	>450 >450 >450	206 216 227		192 206 222	1,500 4,500 5,500	632 623 653	-1.1 -3.5 -0.8	-0.9 -3.4 -0.7	46* 42*	161 139	161 139	180	Y*	2,020					
70 Kyogle	Inclining Block	Inclining Block	266 283 321	<200 <200 <200	118 120 120	>200 >200 >200	180 180 180	90 90	237 239 236	2,000 2,570 2,570	459 444 482	-1.5 0.4 -0.1	-1.3 0.6 0.1	43 42	163 134	163 134	165	Y	1,900					
71 Palerang	Inclining Block	Inclining Block	371 384 397	<200 <200 <200	195 202 208	>200 >200 >200	307 318 328	100 100	192 213 236	8,400 8,700 9,000	642 740 763	3.6 5.4 0.9	2.8 4.8 0.8	47 50	139 176	139 176	191	Y	2,120					
73 Upper Lachlan	Inclining Block	Inclining Block	339 370 393	<200 <200 <200	205 226 240	>200 >200 >200	273 300 318	80 90	213 229 211	3,440 3,530 3,700	623 683 725	0.7 0.5 5.2	0.3 0.3 4.5	49 54	139 138	139 138	225	Y	1,960					
74 Wentworth (Dual Supply)	Inclining Block	Inclining Block	240 250 260	<250 <250 <250	120 120 120	>250 >250 >250	280 280 280		130 95 122	2,320 2,440 2,400	629 568 583	0.6 3.2 5.0	0.2 2.7 4.5	61* 55	106 60	448 350	521	Y	2,340					
74 Wentworth (Non Potable)	Inclining Block	Inclining Block	125 130 135	<700 <700 <700	40 40 40	>700 >700 >700	110 110 110		130 95 122						Nonpotable supply see Note 3				2,340					
75 Coonamble (Groundwater)	Inclining Block	Inclining Block	110 121 145	<370 <370 <370	44 44 49	>370 >370 >370	67 67 74		44 68 55	670 670 670	271 225 261	1.8 1.1 2.3	-2.8 -1.7 0.9	58 73	366 236	366 236	312	Y	1,690					
76 Harden (Reticulator)	Inclining Block	Inclining Block	322 338 350	<450 <450 <450	191 201 210	>450 >450 >450	286 300 314	90 90	70 65 62	3,310 3,310 3,310	1011 1058 1102	-1.2 0.0 0.7	-1.4 -0.2 0.5	68* 68*	361 358	361 358	292	Y	1,820					
79 Walgett (Dual Supply)	Inclining Block	Inclining Block	965 411 411	All <500 <500	35 35	>500 >500	49 49		54 71 36		965 1174 1174	-4.8 -2.2 -1.1	-4.6 -2.7 -0.9	64* 65*	748 721	1030 1337	914	Y*	1,930					
79 Walgett (Non Potable)	Inclining Block	Inclining Block	411 411	All <600 <600	11 11	>600 >600	16 16		54 71 36						Nonpotable supply see Note 3				1,930					
80 Greater Hume	Inclining Block	Inclining Block	205 235 280	<200 <200 <200	120 140 140	>200 >200 >200	190 220 220	20 75	194 179 144	1,400 1,400 2,870	429 604 649	-0.1 -0.6												

Appendix F - Sewerage - Residential Charges & Bills, Cost Recovery

WATER UTILITY	RESIDENTIAL CHARGES									NON-RESIDENTIAL CHARGES						TYPICAL RESIDENTIAL BILL			COST RECOVERY													
	Fixed Charge (\$) (or Minimum)			Res Sewer Usage Charge*	Operating Cost (OMA)			Non-Res Sewer Usage Charge		Liquid Trade Waste Charges		Non-Res & Trade Waste		Typical Developer Charge		Typical Residential Bill (\$/assessment)	Return on Assets (%)			Economic Real Rate of Return (Sewerage) (%)			Full Cost Recovery?	Recycled Water Usage Charge	Sewage Collected	Connected Properties						
	(\$)				(c/kL)	(Not including SDF)		Usage Charge (c/kL) (3a)	Appropriate TW Charges? (4)	Charges (% of Annual Charges) (5)	Volume (% of sge collected) (6)	(\$/Equivalent Tenement [ET]) (7)		(\$/assessment) (8) P6	(9)			(11) F18			(FCR) (Y/Y*/N) (11a)	(c/kL) (11b)	(kL/prop) (11c) W19	(No.) (12) C8								
	11/12	12/13	13/14	10/11		11/12	12/13					12/13	13/14		12/13	13/14	12/13	13/14	11/12	12/13	13/14	10/11	11/12	12/13	10/11	11/12	12/13	12/13	12/13	12/13		
Sydney Water	553	555	571				140	130			Y	Y			540	555	571		1.6	1.6	1.4	Y		277	1,795,000							
Hunter Water	534	553	569				67	67			Y	Y			556	589	606		1.8	1.8	2.1	Y		308	221,434							
LWUs with > 10,000 Properties																																
1 Gosford	508	535	576		126	134	189	113	107	158	162	Y	Y	16	16	4,130	2,650	2,850	508	535	576	0.9	-0.1	-0.4	0.9	-0.1	-0.4	Y*	113	228	68,970	
2 Wyong	450	463	516		131	112	126	83	86	80	83	Y	Y	13	25	2,500	2,500	2,610	450	463	516	-1.3	-0.4	-0.2	-1.6	-0.4	-0.2	Y*	106	273	59,570	
3 Shoalhaven	645	678	714		231	216	255	110	120	156	161	Y	Y	14	19	8,100	8,340	8,340	645	678	714	1.5	1.6	1.4	2.1	2.1	1.9	Y		182	41,130	
5 MidCoast (Combined)	884	920	920		244	215	263	238	238	243	243	Y	Y	14	19	8,620	8,890	9,150	884	920	920	-0.1	0.9	1.3	1.3	2.2	2.8	Y		188	34,920	
6 Tweed	609	650	691		148	154	175	120	130	180	190	Y	Y	16	23	5,560	5,840	6,040	609	650	691	0.8	1.0	0.5	0.3	1.0	0.6	Y		263	30,070	
7 Port Macquarie-Hastings	645	674	704		113	103	145	102	106	145	150	Y	Y	11	5	4,100	4,450	4,650	645	674	704	4.0	1.4	0.7	2.2	1.1	0.6	Y	115	319	27,250	
9 Wagga Wagga	434	434	434		116	150	188	200	200	165	170	Y	Y		14	3,500	3,500	3,500	434	434	434	0.0	0.0	-0.3	0.7	0.6	0.5	Y	81	220	26,600	
10 Coffs Harbour	720	760	783		140	164	199	194	200	153	158	Y	Y	21	19	8,730	8,790	9,260	720	760	783	0.6	0.6	-0.4	2.0	1.5	0.1	Y		294	23,400	
11 Albury City	446	489	561		166	177	205	247	265	150	158	Y	Y	31	30	4,160	4,160	4,160	446	489	561	0.6	0.5	2.2	1.1	0.9	2.6	Y		214	21,630	
13 Tamworth Regional	716	716	738		122	141	152	109	112	163	168	Y	Y	25	43	1,780	1,830	1,880	716	716	738	5.5	1.0	0.9	5.2	2.1	1.8	Y		282	19,170	
15 Eurobodalla	778	816	844		236	291	296	138	166	129	133	Y	Y	12	13	9,300	9,590	9,830	778	816	844	1.4	1.0	0.7	1.5	1.6	1.1	Y		176	17,920	
17 Queanbeyan	352	365	414		153	176	205	73	83	150	180	Y	Y	12	19	1,300	1,310	1,330	352	365	414	-0.6	-1.9	-1.0	-2.2	-3.5	-2.2	Y*		182	16,280	
19 Orange	337	349	384		102	115	137	163	179	163	179	Y	Y		28	3,890	3,960	4,500	337	349	384	-0.1	1.6	2.2	-1.4	0.7	1.2	Y		252	16,200	
18 Dubbo	575	615	652		193	197	204	176	187	153	161	Y	Y		34	4,900	5,180	5,340	575	615	652	1.6	2.1	2.3	1.3	1.7	1.8	Y		176	15,840	
16 Wingecarribee	615	662	711		128	123	151	125	135	161	161	Y	Y	15	25	7,730	7,830	8,030	615	662	711	0.6	0.5	0.8	1.2	1.1	1.4	Y		282	14,690	
14 Clarence Valley	757	829	907		171	203	232	251	275	238	255	Y	Y	17	10	7,300	7,300	7,480	757	829	907	0.2	0.2	-0.3	1.4	1.2	1.1	Y		226	14,640	
21 Bathurst Regional	419	433	456		143	125	137	115	125	190	200	Y	Y	37	43	4,540	4,680	4,820	419	433	456	0.7	0.4	1.1	0.1	0.0	0.7	Y	-	308	15,120	
24 Ballina	630	674	734		152	169	201	171	186	144	148	Y	Y	19	3	7,050	7,260	7,470	630	674	734	3.9	0.2	-0.2	3.6	0.4	0.6	Y		331	13,740	
22 Lismore	667	701	738		116	116	128			7,950	8,080	8,310	Y	Y	20	24	7,950	8,080	8,310	667	701	738	-0.5	-0.5	1.0	-1.0	-0.8	0.5	Y		359	12,670
23 Bega Valley	988	1045	1081		415	369	455	311	321	100	100	Y	Y	8	34	9,120	9,450	10,500	988	1045	1081	0.5	0.7	-0.7	1.4	1.2	-0.2	Y*		156	12,150	
27 Byron	680*	735*	758*	172 c/kL	168	173	171	220	229	220	229	Y	Y	24	24	9,730	17,430	18,260	935	1013	1060	-0.5	0.0	-1.5	1.8	2.3	1.2	Y	100	367	10,370	
26 Essential Energy	465	497	497		209	257	234	119	119	190	190	Y	Y	21	40				465	497	497							Y*	17	140	9,720	
20 Goulburn Mulwaree	652	675	699		246	237	215	264	273	227	240	Y	Y	29	25	3,780	3,840	3,930	652	675	699	4.0	4.0	5.6	4.6	4.3	5.8	Y		186	9,620	
25 Kempsey	663	680	736		169	158	216	170	179	170	179	Y	Y	24	16	7,300	7,420	7,630	663	680	736	-0.7	-0.6	-1.2	0.0	0.0	-0.6	Y*	67	277	9,330	
Medians (% of LWUs basis excl bulk suppliers) for >10,000 Properties																																
			704				200	23 out of 24 have non-res sewer usage charges			24 out of 24 have trade waste charges			6,040			708	0.7			0.7			0 LWU did not achieve FCR								
LWUs with 3,001 - 10,000 Properties																																
29 Armidale Dumaresq	357	368	379		143	148	164			140	145	Y	Y	34		4,480	4,640	4,870	357	368	379	2.4	1.4	0.5	2.0	0.9	-0.1	Y		264	8,330	
31 Lithgow	431*	488*	836		167	132	155	123	155	160	160	Y	Y	14		1,790	1,790	1,790	677	767	836	-1.9	0.2	1.8	-2.1	1.8	3.5	Y		285	7,470	
30A Hawkesbury	543	570	584		151	166	238			119	119	Y	Y	27		7,330	8,050	8,250	543	570	584	5.5	-1.6	-0.1	5.1	-1.9	-0.2	Y*	160	233	7,650	
30 Griffith	690	708	729		134	254	199	137	141	113	116	Y	Y	22	14	1,960	2,050	3,100	690	708	729	1.8	1.6	0.6	1.7	1.5	1.6	Y		246	7,860	
33 Richmond Valley	800	829	870		132	190	220	182	191	142	146	Y	Y	17		19,400	24,320	8,000	800	829	870	2.0	0.1	1.6	2.8	1.5	2.9	Y		314	6,620	
32 Mid Western Regional	528	586	651		136	152	198	186	208					18	21	4,300	3,560	3,650	528	586	651	0.6	1.4	2.8	-0.4	1.0	3.2	Y		189	6,990	
34 Nambucca	452	448	588		129	145	178	343	364	161	169	Y	Y	34	7	4,280	8,890	9,090	452	448	588	0.8	-0.1	-1.5	0.8	0.5	-1.1	Y*		261	5,680	
35 Singleton	411	441	468		137	122	142	154	157	141	144	Y	Y	24		2,860	2,960	3,060	411	441	468	4.7	6.0	8.6	2.3	3.7	5.3	Y		210	5,560	
37 Inverell	415	427	440		139	131	106							8	8	3,420	3,420	3,510	415	427	440	1.1	0.2	1.1	0.7	0.2	0.5	Y		250	4,690	
41 Muswellbrook	535	550	568		164	214	212	176	185	120	125	Y	Y	14		5,300	5,460	6,850	535	550	568	6.5	5.3	11.9	5.3	4.2	10.7	Y		170	5,650	
36 Parkes	380	400	412		85	102	127	110	116	165	175	Y	Y	25	19	4,100	4,100	4,100	380	400	412	6.5	3.9	5.2	4.3	3.1	3.1	Y		224	5,020	
42 Corowa	575	600	625		219	287	249	116	120	162		Y	Y	14	8	2,010	2,010	2,010	575	600	625	1.5	1.2	2.0	1.6	1.0	2.5	Y		183	4,670	

Appendix F - Sewerage - Residential Charges & Bills, Cost Recovery

WATER UTILITY	RESIDENTIAL CHARGES									NON-RESIDENTIAL CHARGES						COST RECOVERY																	
	Fixed Charge (\$) (or Minimum)			Res Sewer Usage Charge ^a	Operating Cost (OMA)			Non-Res Sewer Usage Charge		Liquid Trade Waste Charges		Non-Res & Trade Waste		Typical Developer Charge		Typical Residential Bill			Return on Assets			Economic Real Rate of Return (Sewerage)			Full Cost Recovery?	Recycled Water Usage Charge	Sewage Collected	Connected Properties					
	(\$)				(c/kL)	(Not including SDF)		Usage Charge	Appropriate TW Charges ?	Charges (% of Annual Charges)	Volume (% of sge collected)	(\$/Equivalent Tenement [ET])		(\$/assessment)			(%)			(%)			(FCR) (Y/Y*/N)	(c/kL)	(kL/prop)	(No.)							
	(1) P4.1	12/13	13/14	(1a) P4.2		10/11	11/12	12/13	13/14	(3a)	(3b)	(4)	(5)	(6)	(7)	(8) P6	10/11	11/12	12/13	(9)	(10)	(11) F18	(11a)	(11b)	(11c) W19	(12) C8							
11/12	12/13	13/14	13/14	10/11	11/12	12/13	13/14	12/13	13/14	12/13	13/14	12/13	13/14	11/12	12/13	13/14	11/12	12/13	13/14	10/11	11/12	12/13	10/11	11/12	12/13	12/13	12/13	12/13					
38	Moree Plains	628	650	565		135	162	184	152	152	156	163	Y	Y	32	16	4,370	4,530	4,670	628	650	565	2.6	1.3	0.4	2.5	1.3	0.3	Y	10	292	4,080	
44	Gunnedah	395	422	456		126	96	111	139	146	130	135	Y	Y	28	18	2,150	6,580	6,810	395	422	456	1.5	2.7	3.2	0.3	1.6	2.3	Y		174	3,990	
46	Narrabri	542	590	615		158	173	184			200	200	Y	Y	7		4,590	4,680	5,080	542	590	615	3.7	2.2	5.5	3.0	1.6	4.6	Y		216	3,950	
43	Turnut	585	600	620		143	195	218	175	180			Y	Y	25		5,020	5,200	5,000	585	600	620	1.5	0.7	2.0	0.9	0.0	1.6	Y		200	4,190	
49	Young	625	700	720		59	75	97			156	156	Y	Y	33	20	1,100	1,250	1,280	625	700	720	13.6	12.8	5.1	14.5	11.5	5.3	Y		184	3,770	
39	Cowra	597	750	781		206	175	222	71	73	151	155	Y	Y	22		5,010	5,190	5,360	729	755	781	0.9	0.7	1.3	3.1	3.2	3.5	Y		197	3,420	
45	Upper Hunter	424	439	454		137	165	170	82	88			Y	Y	18	7	2,300	2,300	2,300	424	439	454	0.1	-0.5	1.9	-1.3	-1.8	0.9	Y		251	4,240	
52	Snowy River	696	780	840		464	432	315	212	288	170	175	Y	Y	20	32	5,400	5,400	9,400	696	780	840	-0.6	0.5	0.1	-1.1	0.1	0.0	Y		129	4,700	
51	Forbes	439	452	466		145	175	285	136	141	63	65	Y	Y	19	31	3,710	3,850	3,980	439	452	466	1.2	1.1	-1.6	1.1	0.9	-1.8	Y*		232	3,190	
50	Cooma-Monaro	722	751	781		274	201	255			162	170	Y	Y	16		6,690	6,800	7,000	722	751	781	0.8	0.2	1.1	0.6	-0.3	0.6	Y		225	3,270	
53	Berrigan	369	382	464		171	122	214					Y	Y	18	11	1,710	1,750	1,800	369	382	464	-0.8	-1.0	-2.0	-2.3	-2.4	-2.9	Y*	25	181	3,350	
48	Leeton	450	465	480		121	145	162	75	78	165	171	Y	Y	32	15	5,000	5,000	5,000	450	465	480	2.6	1.0	1.0	0.8	-0.6	-0.5	Y		297	3,270	
54	Deniliquin	574	750	750		222	220	246	93	130	158	162	Y	Y	23	7	4,420	4,580	4,700	574	750	750	1.5	1.1	5.5	0.7	0.5	5.3	Y	4	180	3,170	
Medians (% of LWUs basis excl bulk suppliers) for 3,000 to 10,000 Properties		602			191			18 out of 24 have non-res sewer usage charges			21 out of 24 have trade waste charges			4,685			602			1.7			2.0			0 LWU did not achieve FCR							
LWUs with 1,501 - 3,000 Properties																																	
47	Bellingen	570	677	725		199	233	241	88	91	132	136	Y	Y	8	10	4,530	4,450	4,790	570	677	725	-0.8	-0.6	0.0	-1.8	-1.3	-0.4	Y*		245	2,990	
60	Glen Innes Severn	408	420	434		143	127	120	90	95	150	162	Y	Y	Y	8	8	2,440	2,500	2,850	408	420	434	-0.1	0.8	1.3	-0.2	0.8	1.5	Y		219	2,800
58	Cootamundra	320	328	376		89	82	114	182	204	130	135	Y	Y	26	12	2,880	2,960	4,030	320	328	376	0.2	0.0	1.3	0.2	0.0	1.3	Y		227	2,830	
57	Wellington	535	555	574		164	201	199	79	82	143	148	Y	Y	23	9	1,910	1,910	1,910	535	555	574	0.6	-0.7	-1.3	1.3		-0.6	Y*		209	2,660	
91	Cabonne	209	337	465		147	266	305	233	120	150	160	Y	Y	12	7	5,060	5,060	5,300	434	450	465	-0.4	-0.1	-0.5	-0.6	-0.5	-0.6	Y*		146	2,260	
80	Greater Hume	336	386	445		166	174	177	104	120	160	160	Y	Y	21	13	1,300	3,000	3,000	336	386	445	-1.3	-0.5	-0.4	-1.8	-0.8	-0.6	Y*	60	176	2,590	
59	Lachlan	410	422	440		140	157	190	113	117	129	134	Y	Y	5	25	7,750	7,750	7,750	410	422	440	-0.2	0.2	-0.7	-2.4	-1.5	-2.2	Y*		225	2,170	
65	Murray	374	377	381		128	132	143	52	52	158	162	Y	Y	26	28	2,050	2,050	1,160	374	377	381	1.6	2.9	2.2	1.2	2.3	1.6	Y		230	2,960	
62	Narromine	483	508	534		103	127	122	185	195	185	195	Y	Y	27		3,920	4,010	4,110	483	508	534	3.9	0.5	0.8	2.2	-0.2	0.3	Y		298	1,960	
56	Yass Valley	550	570	580		157	175	240	200	220	145	150	Y	Y		29	4,900	5,050	5,650	550	570	580	0.9	1.1	1.4	0.5	0.6	1.0	Y		216	2,280	
61	Liverpool Plains	410	475	490		131	167	170	160	165	3		Y	Y	14	27	2,700	2,780	2,860	410	475	490	0.8	0.5	2.0	-0.2	0.0	1.4	Y		145	2,070	
55	Warrumbungle	417	432	445		190	303	211	73	75			Y	Y	28	30	1,320	1,320	1,280	417	432	445	1.9	-0.2	0.4	1.1	-0.5	-0.3	Y		160	2,540	
69	Temora	269	282	296		237	112	155	30	32			Y	Y	22	3				269	282	296	2.4	0.9	0.3	1.7	0.4	0.0	Y	40	149	2,130	
71	Palerang	861	892	922		204	192	282	254	262	170	170	Y	Y	6		10,080	10,440	10,800	861	892	922	3.5	5.5	0.3	3.1	5.7	1.1	Y	150	178	2,150	
72	Bland	578	598	614		178	175	184	16	20	16	20	Y	Y			1,620	1,690	1,760	578	598	614	0.7	1.2	2.2	0.3	1.0	2.1	Y		194	1,830	
63	Narrandera	470	490	505		100	94	256	120	120			Y	Y	16				1,300	470	490	505	3.3	2.5	3.9	0.5	1.1	3.4	Y	20	176	1,700	
67	Cobar	260	300	310		103	111	76		170	160	165	Y	Y	3	7	770	800	920	260	300	310	-0.4	-1.6	-0.6	-0.4	-1.8	-0.6	Y	35	251	1,740	
74	Wentworth	650	670	690		24	25	22					Y	Y	10		5,490	5,770	5,670	650	670	690	0.4	1.1	3.7	0.6	1.3	3.7	Y		1,160	1,840	
75	Coonamble	396	426	440		128	135	143	82	82			Y	Y	18					396	426	440	-3.3	0.2	0.4	-7.4	-1.4	-1.0	Y		-	1,370	
70	Kyogle	586	606	625		113	160	202	96	96	100	100	Y	Y	18	19	1,900	1,900	1,900	586	606	625	0.0	0.3	-0.2	0.3	0.5	0.1	Y		262	1,710	
77	Juneee	355	365	378		97	94	124					Y	Y	13	16	1,650	1,650	1,650	355	365	378	-0.3	-0.2	0.4	-0.9	-0.9	-0.2	Y	50	239	1,620	
78	Blayney	465	479	496		207	172	235	110	115	140	150	Y	Y	9	10	3,120	3,180	3,270	465	479	496	1.2	1.0	0.2	0.3	0.4	-0.3	Y		154	1,980	
79	Walgett	391	430	430		82	109	96					Y	Y						391	430	430	0.3	-0.1	1.7	0.2	-0.8	1.6	Y		171	1,700	
68	Tenterfield	760	787	826		235	271	303	96	101	134	141	Y	Y	19	6	5,500	5,500	6,500	760	787	826	-1.3	-0.8	0.1	-0.4	-0.4	0.9	Y		181	1,710	
Medians (% of LWUs basis excl bulk suppliers) for 1,500 to 3,000 Properties		478			180			21 out of 24 have non-res sewer usage charges			18 out of 24 have trade waste charges			3,000			478			0.4			0.2			0 LWU did not achieve FCR							

Appendix G – Data Validation Processes for the NSW Performance Monitoring System

G1 INTRODUCTION

The NSW Performance Monitoring System (page 1) is a 'one stop shop' which minimises red tape, avoids duplication in reporting and enables the NSW Office of Water to annually provide the required local water utility (LWU) data to the National Water Commission [for the annual National Performance Report for Urban Water Utilities (www.nwc.gov.au)], the Australian Bureau of Statistics and the Australian Bureau of Meteorology.

A prime objective of the NSW Performance Monitoring System is to reliably determine the Statewide performance of the regional NSW local water utilities. This requires analysis of statewide medians and totals for key performance indicators in order to reveal historical trends and enable interstate performance comparisons²⁵. A further objective is to publish performance data which is accurate and which is not misleading, both for individual LWUs and for statewide indicators. The achievement of these objectives is contingent on obtaining a full and accurate data set. To this end, the NSW Office of Water annually critically reviews all reported data to identify any anomalies or inconsistencies and undertakes actions where appropriate to validate and/or correct such anomalous data. In addition, in order to obtain a fully representative data set for six of the more critical performance indicators, the Office of Water adopts the previous year's reported data for those few LWUs that omitted to report such data for the current year. Such data is shown in **italics bold** in Appendices C, D, E and F (section G3 on page 91).

In addition to the extensive independent auditing of the reported NSW data (page vii and footnote 26 on page 92), this appendix outlines the data validation processes undertaken by the Office of Water to identify and address apparent anomalies in the reported data and to develop a full data set which assures ongoing data reliability for the NSW Performance Monitoring System.

The NSW Office of Water is responsible for managing the NSW Government's *Country Towns Water Supply and Sewerage (CTWSS) Program* (www.water.nsw.gov.au), which is a major reform Program. The Office of Water oversees and monitors utility performance, provides leadership, guidance, software and training (page 15) to the utilities and is the primary regulator for the 105 regional LWUs.

G2 ANOMALOUS DATA

The quality and consistency of data reported by LWUs in the *NSW Performance Monitoring Database* varies significantly. To assist LWUs in reporting their data, the database includes a facility that screens the data and provides an alert to notify the user where data is inconsistent, out of range or incomplete. Most LWUs accurately report their performance data. However, review by the Office of Water of the full data set from all LWUs consistently reveals a small but significant percentage of anomalous data. This may arise due to misinterpretation of an indicator definition, due to errors in data handling (input or misreading), due to inconsistencies in the data stream or due to errors/omissions in the data itself.

Data that is inconsistent or anomalous includes:

- **Incomplete data** - data that is not reported or left blank in the current year's reported data.
- **Inconsistent data** - reported data that is inconsistent with historic values or out of expected range.

²⁵ Refer to page 16 and Appendix A on page 64. Such performance comparisons may provide valuable insights on opportunities for continuing to improve performance and to provide better value for money to residents.

- **Errors in data** - reported data that is in error (e.g. text instead of numerals, percentage greater than 100, data where the summation does not agree etc.).
- **Unsubstantiated data** - reported data that is out of expected range with no substantiating evidence (e.g. leakage less than 6% of the total water supplied or a reported number of assessments which differs significantly from historical trends or from that reported in the utility's Annual Financial Statements).
- **Data that conflicts with data from other sources** - reported data that differs significantly from data available elsewhere (e.g. drinking water quality compliance results from NSW Health, data from the LWU's annual financial statements, IWCM Strategies etc.).

Anomalous data must be reviewed and either validated or rejected. The procedures undertaken by the Office of Water to validate data are outlined in the following sections.

G3 VALIDATION OF DATA

The Office of Water undertakes various broad screening procedures and follows this up with intensive manual and computerised validation procedures. The criteria used in the validation process for the more critical indicators are shown in section G4 on page 93. Following screening and validation, the Office of Water reviews all anomalous reported values and anomalies are either:

- referred to the LWU for confirmation, or
- adjusted where relevant data from other sources is available, or
- rejected and left as blank, or
- adjusted where the reported value is unsubstantiated or does not meet adopted criteria.

In addition, in order to enable reporting of Statewide totals and medians for six of the more critical indicators (Total Urban Water Supplied, Operating Cost, Management Cost, Current Replacement Cost, Total Volume of Sewage Collected and Volume of Effluent Recycled), where a LWU has not reported current data, the data reported for the previous year has been adopted and is shown in *italics bold* in Appendices C, D, E and F of this Report and Tables 3 to 18 of the *2012-13 NSW Water Supply and Sewerage Benchmarking Report*.

It is noted that the 105 NSW LWUs each report more than 180 water supply indicators and a similar number of sewerage indicators together with their financial indicators (from the LWUs' Annual Financial Statements). Of these indicators, approximately 50 for each of water supply and sewerage are key indicators which are shown on each LWU's annual TBL Performance Report (pages 75 and 76). Of these 50 key indicators, 20 are considered to be critical indicators to determine a LWU's performance and the criteria for validating these critical indicators are described in section G4 on page 93.

Screening and validation procedures identify the more significant anomalies, and anomalies occurring in key indicators will be followed up with the LWU. However, there may be instances where an error is not identified. To allow for this, the Office of Water also provides a draft copy of tables of performance indicators to each LWU for its review prior to finalisation of the annual report.

The Office of Water procedures for validation and adjustment of selected data are detailed below.

Incomplete data - Where a LWU has not reported data, the validation process is as follows:

- For critical indicators, refer to the criteria outlined in section G4.
- For other key indicators, the Office of Water will contact the LWU to obtain such data, unless the reported value can be adjusted in accordance with data obtained from an alternative source.

- For less significant indicators, the field will be left blank.

Inconsistent data - Where the reported value is inconsistent with historic values, out of expected range or otherwise inconsistent, the validation process is as follows:

- For critical indicators, refer to the criteria outlined in section G4.
- For other key indicators, the Office of Water will contact the LWU to review the reported data, unless the reported value can be adjusted in accordance with data obtained from an alternative source.
- For less significant indicators, the reported value will be deleted and the field left blank.

Errors in data - Where a reported value is obviously in error (e.g. numbers reported as text, values reported as \$M instead of \$'000 etc.), the Office of Water will correct the error. Where there is some doubt, if it is a key indicator the LWU will be requested to review the reported value, otherwise it will be deleted and the field left blank.

Unsubstantiated data - Where the reported value is out of the expected range and is unsubstantiated, the validation process is as follows:

- For critical indicators, refer to the criteria outlined in section G4.
- For other key indicators, the Office of Water will contact the LWU to review the reported data, unless the reported value can be adjusted in accordance with data obtained from an alternative source.
- For less significant indicators, the reported value will be deleted and the field left blank.

Data that conflicts with data from other sources - Where reported data conflicts with data obtained from alternative sources (e.g. the utility's strategic business plan or IWCM Strategy, NSW Health, Environment Protection Authority, Special Schedules etc.) the Office of Water will review the data and will either adjust the data to agree with the alternative source or request confirmation of the data from the LWU.

Audited data - The NWI requires an independent audit to be undertaken every 3 years²⁶ of the water supply and sewerage performance reporting for those LWUs with over 10,000 connected properties. The Office of Water approves each LWU's proposed auditor, after confirming that the auditor has met the NWI Auditing Requirements and reviews the audit findings for the non-financial data and requests confirmation or follow up by the LWU's auditor for indicators that fail the audit.

Financial data – the financial data is reviewed by the Office of Water and any omissions or inconsistencies are referred to the LWU for confirmation. Independent audits are conducted annually for all of the 30 NWI financial performance indicators, which are reported in Notes 2 and 3 of the Special Purpose Financial Statements to each LWU's annual financial statements.

LWUs are required to annually report the fair value²⁷ and the current replacement cost depreciation of their water supply and sewerage assets in their audited Annual Financial Statements.

²⁶ Independent audits of the auditable indicators in the *National Performance Framework 2012-13* for the 29 LWUs required to report nationally were undertaken in 2006-07, 2009-10 and 2012-13. Indicators which met the rigorous national auditing requirements have been published in the *National Performance Report 2012-13*. These LWUs serve 74% of the connected properties in regional NSW. In addition the reported values for the 30 NWI financial performance indicators have been independently audited annually since 2006-07 for all of the LWUs.

²⁷ In accordance with the Australian Accounting Standards Board's AASB116 Property Plant and Equipment. The *NSW Reference Rates Manual for Valuation of Water Supply, Sewerage and Stormwater Assets*, NSW Office of Water 2014 provides current unit rates and guidance on the valuation and depreciation of such assets. Available at www.water.nsw.gov.au.

G4 CRITERIA FOR ADJUSTMENT OF CRITICAL INDICATORS

The Office of Water takes care to ensure that the critical indicators are consistent and accurate. The criteria adopted by the Office of Water to review and where necessary adjust anomalous data for critical indicators are outlined below.

G4.1 AGGREGATED BUSINESSES

The performance indicators in the NSW Performance Monitoring System are determined for each LWU's aggregated water supply or sewerage businesses rather than for individual water supply or sewerage systems. This is done to align with national performance reporting and to facilitate comparisons. In addition, detailed data showing the performance of each of the 531 LWU water and sewerage treatment works is published in Appendices D1 and D2 of the annual *NSW Water Supply and Sewerage Benchmarking Report* (www.water.nsw.gov.au). Refer also to Section G4.6 on page 94.

G4.2 CONNECTED PROPERTIES

Performance indicators are determined on a 'per connected property' basis for consistency with the National Performance Framework. A connected property is a property that is connected to the water supply or sewerage system, as opposed to an assessment, which is a bill issued by a water utility.

Determination of number of assessments – The number of assessments is determined from a review of the data reported by the LWU in the NSW Performance Monitoring Database and the number of assessments reported by the LWU in its annual financial statements (Special Schedule Nos 3 and 5) together with the historic data. The number of assessments adopted must be consistent with historic data.

Calculation of connected properties – The number of connected properties is calculated as the product of the number of assessments times the ratio of the number of connected properties per assessment for each of water supply and sewerage (Tables 9 and 14 of the *NSW Benchmarking Report*). The Office of Water has worked with LWUs to establish these ratios which do not change significantly from year to year.

G4.3 CHARGES AND BILLS

Charges – water supply and sewerage charges (access charges and usage charges) are shown in Appendices E and F on pages 84 and 87 for a LWU's principal water supply or sewerage system (charges are also shown for the non-potable supply component in dual supply systems). LWUs with multiple residential tariffs (i.e. those with different charges for separate water supply or sewerage systems) are shown in Tables 6A and 7A of the *NSW Benchmarking Report*. The charges shown in Appendices E and F include the charges for the current reporting year (2012-13) and also for the forthcoming year (2013-14) and are obtained by the Office of Water from each LWU's website.

Typical residential bill (TRB) – the TRB is calculated for each LWU's principal water supply system. The TRB is calculated from the utility's average annual volume of residential water supplied per connected property multiplied by the usage charge and added to the access charge. If the LWU has a dual supply system, the above calculation is repeated to obtain the non-potable water component which is added to the potable component to obtain the total TRB.

The current TRB is calculated from the current charges and the current residential water supplied. The TRB for the forthcoming reporting year is estimated from the forthcoming year's charges applied to the current residential water supplied. In the following year, the TRB will be recalculated using the actual volume of residential water supplied in that year. Therefore the current TRB shown in column 8 of Appendix E may differ from the corresponding TRB shown in the previous year's reports. Refer also to page 30.

G4.4 URBAN WATER SUPPLIED

Total potable urban water supplied – Where a LWU has not reported its total potable urban water supplied, the data reported for the previous year has been adopted (shown in italics bold in the tables).

Residential water supplied – Where a LWU has reported residential water use but not commercial or industrial use, the reported residential use has been reduced and a commercial component has been included. Similarly, where a LWU has not reported residential water use, a residential component has been included. The residential component in each case has been calculated on the basis of the statewide average percentage of 57% of the LWU's total potable urban water supplied (NWI Indicator W11.1).

Real Losses (mostly leakage) - Where a LWU has reported a real loss of less than 6% of the total potable urban water supplied and has not provided evidence to substantiate such a low value of leakage, the reported real loss has been increased to 6%. In this case, the total potable urban water supplied has also been increased to include the additional leakage component. These adjusted values of real losses are shown in italics bold in column 8 of Table 8 of the *2012-13 Benchmarking Report*. Refer also to page 10 and note 8 on page 31.

Non Revenue Water (NRW) (Real losses (mostly leakage), Apparent Losses (under-registration of customer meters and illegal use) plus Unbilled Water supplied (eg. mains flushing and firefighting)) – Where a LWU has reported NRW of less than 10% of the total potable urban water supplied (W11.1), the reported NRW has been increased to 10%, unless the LWU has provided evidence of a Real Loss of less than 6%. In such cases, the adopted value for NRW has been determined as the Real Loss plus 4%. The adjusted values of NRW and total potable urban water supplied (W11.1) are shown in italics bold in columns 9 and 10 of Table 8 of the *Benchmarking Report*. Refer also to note 8 on page 31.

G4.5 EFFICIENCY

Operating Cost (OMA) – NWI indicators F11 and F13 (water supply operating cost per property and water and sewerage operating cost per property respectively) are calculated in accordance with the NWI definitions and reported accordingly in the *National Performance Report* and in Appendix F of the *NSW Benchmarking Report*.

However in this *Performance Monitoring Report* and in Tables 5 and 11 and Figures 31 to 33 of the *NSW Benchmarking Report*, where a LWU purchases water from a bulk water provider, the operating cost calculated for the LWU excludes the purchase cost of the bulk water but includes an appropriate proportion of the operating cost of the bulk water provider. The cost allocated to the LWU is calculated by multiplying the operating cost of the bulk provider by the ratio of the water purchased by the LWU to the total water supplied by the bulk provider to all customers. This is done in order to provide a 'level playing field' comparison of operating costs by not penalising reticulators through inclusion of the capital cost component of providing the bulk supply, which is included in the purchase price of the water.

Where a LWU has not reported its operating cost, the previous year's operating cost per property has been adopted (shown in italics bold in the tables).

Management Cost – Where a LWU has not reported its management cost, the previous year's management cost per property has been adopted (shown in italics bold in the tables).

G4.6 DRINKING WATER QUALITY COMPLIANCE

Drinking Water Quality Compliance for each LWU is based on the number of samples tested as part of the *NSW Health Drinking Water Monitoring Program* supplemented with samples reported by the LWU in the *NSW Performance Monitoring Database*. A LWU has complied with the 2011 NHMRC/NRMMC Australian Drinking Water Guidelines (2011 ADWG) for microbiological water quality (i.e. it is shown as 'Yes' in column (8) of page 80) if the required number of samples has been tested and at least 98% of

samples had no *E.coli*²⁸. Where *E. coli* is detected in a microbiological sample, further investigation is needed to determine whether there is a real problem with drinking water quality in accordance with the NSW Health protocol:

(<http://www.health.nsw.gov.au/environment/water/Pages/nswhrp-microbiological.aspx>).

E.g. if the chlorine residual at the sampling location was about 0.2mg/L, there is unlikely to be a problem in the microbiological water quality.

Similarly, chemical water quality (health related²⁹) is satisfactory (shown as 'Yes' in column (7) of page 80) if the required number of samples has been tested and the 95th percentile of results does not exceed the guideline value for each chemical. Non-potable supplies are excluded.

Physical (aesthetic) water quality is satisfactory if the required number of samples has been tested and the mean of results does not exceed the guideline value for each characteristic.

Where a LWU has more than one treatment works, the reported compliance has been pro-rated on the basis of the number of samples tested at each treatment works. Where a LWU has not reported the number of samples tested or the compliance of samples from a particular treatment works and no details are available from NSW Health, the percentage of complying samples for that treatment works is deemed to be zero. Refer also to pages 7 and 8.

It is important that key LWU infrastructure is fit for purpose, robust, cost-effective and without wasteful 'gold plating' which causes unwarranted increases to the customer bills. In this regard, any LWU proposals for the construction or modification of a dam, or a water or sewage treatment works require NSW Office of Water approval under section 60 of the *Local Government Act, 1993* (www.water.nsw.gov.au). Similarly, acceptance of a high or medium risk trade waste discharge to a LWU sewerage system requires a NSW Office of Water Section 90(1) concurrence (page 98).

The section 60 approval involves an independent and objective review which allows the NSW Office of Water to share its insights and expertise in overseeing the 531 LWU water and sewage treatment works and 119 LWU dams. The section 60 review provides assurance to the community that the proposed specialist infrastructure is fit for purpose and provides a robust, safe, cost-effective and soundly based solution, without 'gold plating'.

In addition, under section 61 of the *Local Government Act, 1993*, the NSW Office of Water carries out regular inspections of the 531 LWU water and sewage treatment works and provides feedback and mentoring to the LWU operators.

Each operator in charge of a water or sewage treatment works in regional NSW is required to have appropriate qualifications and experience (www.water.nsw.gov.au). NOW conducts comprehensive operator training courses for LWU water and sewage treatment works operators (www.water.nsw.gov.au and urbanwater@water.nsw.gov.au [page 15]). The detailed performance of each of these treatment works is publicly disclosed annually in Appendices D1 and D2 of the *NSW Benchmarking Report* (www.water.nsw.gov.au).

Similarly, under the Aboriginal Communities Water and Sewerage Program (www.water.nsw.gov.au), the NSW Office of Water carries out regular inspections of the water and sewerage infrastructure for 60 discrete Aboriginal Communities in NSW. The 2012-13 drinking water quality results for these communities are disclosed in Appendix D3 of the *2012-13 NSW Benchmarking Report* (www.water.nsw.gov.au).

²⁸ This value (98%) has been determined by NSW Health in accordance with section 10.3.1 on page 10-11 of 2011 ADWG and is the same value as applied for the 2004 ADWG.

Where a LWU has not complied with 2011 ADWG, the percentage of samples which complied is shown in columns (8) and (7) of page 80 for microbiological and chemical compliance respectively.

²⁹ The 2011 ADWG specify guideline limits for chemical water quality (health related). Aesthetic parameters such as aluminium, calcium, chloride, iodine, iron, magnesium, sodium, total dissolved solids (TDS) and zinc are excluded.

G4.7 SEWERAGE

Sewage Collected – Where a LWU did not report the current year's volume of sewage collected, either the previous year's value or the current year's volume of sewage treated has been adopted, whichever is the larger (shown in italics bold in the tables).

Effluent Recycled – Where a LWU has not reported a value for effluent recycled but has reported greater than 10% recycling in previous years, the percentage recycled for the current reporting year is assumed to be the same as that for the previous year (shown in italics bold in the tables).

Compliance with Licence for Prescribed Indicators – LWU Licence limits are generally 90 percentile limits. A LWU is deemed to comply with its licence for each prescribed indicator (i.e. compliance is 100%) if it achieves $\geq 90\%$ compliance. Where there is no licence limit for a prescribed indicator, compliance is shown as 100%. Where a LWU has not reported the compliance for a sewage treatment works, compliance for that treatment works is deemed to be zero.

Sewage Treatment Works (STW) Compliance – An STW is fully compliant if it meets the licence conditions for all prescribed indicators. However, if any indicator which is prescribed in the licence fails to meet the licence conditions (e.g. BOD, Suspended Solids, Total Nitrogen, Ammonia, Oil and Grease, pH, Phosphorous, E. coli etc), then the STW is deemed not to comply with its licence. Refer also to page 10.

G5 IMPLEMENTATION OF THE BEST-PRACTICE MANAGEMENT FRAMEWORK

LWUs must implement the 19 planning, pricing and management requirements of the *NSW Best-Practice Management Framework* (page viii) in order to achieve appropriate, affordable, cost-effective and sustainable piped water supply and sewerage services and to comply with *National Competition Policy* and with the *National Water Initiative*. Meeting the requirements of the Framework is also a pre-requisite for payment of a dividend from the surplus of the water supply or sewerage businesses to the council's general revenue and is also a pre-requisite for financial assistance towards the capital cost of backlog infrastructure (as at 1996) under the CTWSS Program (page 24 and page 12).

Each LWU reports its implementation of the requirements of the *Best-Practice Management Framework* in Notes 2 and 3 of the Special Purpose Financial Statements to its annual financial statements. The Office of Water assesses this reported implementation against the 19 requirements set out in Table 1 of the *Best-Practice Management Guidelines, 2007* (10 for water supply and 9 for sewerage – refer to page 23 and page viii). The assessment procedure for each requirement is shown below. Where a LWU has not reported its implementation against one or more of the requirements, the Office of Water will assess the LWU's implementation from other available data (e.g. annual financial statements, Strategic Business Plans submitted previously and completion of performance reporting via the *NSW Performance Monitoring Database*). Otherwise, the LWU will be deemed not to have implemented that particular requirement. Each LWU's implementation results are shown in Appendix C on page 77.

Strategic Business Plan and Financial Plan – The strategic business plan is a LWU's peak planning document for water supply and sewerage: *NSW Water and Sewerage Strategic Business Planning Guidelines, NSW Office of Water, July 2011* (http://www.water.nsw.gov.au/ArticleDocuments/36/utilities_nsw_water_sewerage_strategic_planning_guidelines.pdf.aspx).

As noted on page 4, the NSW Office of Water reviews LWU strategic business plans and financial plans in order to ensure they are soundly based. A LWU has met the requirement if it has prepared a sound 20 to 30-year water and/or sewerage strategic business plan and financial plan. Such a plan must include a sound asset management plan and capital works program (page 21) and demonstrates the long-term financial sustainability of the LWU's water and/or sewerage businesses and compliance with National Competition Policy. Where a LWU has a strategic business plan but the plan is more than 4 years old, it

is deemed to have provisionally met the requirement, and is shown as Yes* in Appendix C on page 77 (columns 1) and Appendix D on page 80 (column 21). Such a LWU needs to update its plan.

As noted on pages 25 and 26 each LWU needs to annually review and update its 20 to 30-year financial plan. A brief report to Council should be provided on the updated financial plan, including any necessary corrective action (an example Report to Council is provided on page 131 of the NSW Strategic Business Planning Guidelines).

Pricing – The **11 pricing requirements** of the NSW Best-Practice Management Framework (page viii) are outlined below. These incorporate implementation of the NSW Framework for Regulation of Sewerage and Trade Waste³⁰, which includes implementation of appropriate sewerage and trade waste charges and developer charges, as well as a sound trade waste regulation policy and an approval for each trade waste discharger. As noted on page 98, the pricing requirements include a non-residential sewer usage charge/kL and non-compliance trade waste usage and excess mass charges. In addition, the framework for regulation of sewerage and trade waste also involves mentoring and coaching of dischargers and enforcement measures which include financial penalties and finally, disconnection of a trade waste discharger in the event of persistent failure to comply with approval conditions (pages viii and 22).

Full cost recovery – Full cost recovery (lower bound pricing) is achieved if either the economic real rate of return or the return on assets is ≥ 0 (shown as 'Y' in column 14d of Appendix E on page 84 and column 11a of Appendix F on page 87). As noted on page 92, assets must be valued at fair value and current replacement cost depreciation must be applied.

Alternatively, if a LWU has significantly increased its charges in order to recover its costs, it is also deemed to have full cost recovery (shown as 'Y*' in column 14d of Appendix E on page 84 and column 11a of Appendix F on page 87). Refer also to page 12 of this report and to Appendix G on page 84 of the *2010-11 NSW Water Supply and Sewerage Performance Monitoring Report* (www.water.nsw.gov.au).

Pay-for-use-pricing – For water supply, this requires pay-for-use pricing, with the residential tariff independent of land value and no free water allowance. Refer to column 2a of Appendix C on page 77. Refer also to columns 1, 5b and 5d of Appendix E on page 84. All the NSW utilities have now met this requirement (page 5).

Residential revenue from water usage charges > 75% - In order to provide strong pricing signals to residents and encourage efficient water use, the water supply tariff for LWUs with 4,000 or more connected properties must be such that at least 75% of residential revenue is obtained through water usage charges. At least 50% of residential revenue from usage charges is required for LWUs with fewer than 4,000 properties. Where a LWU has not met the above requirements but has obtained at least 70% (or 45% for fewer than 4,000 properties) of residential revenue from usage charges, it is deemed to have provisionally met the requirement and is shown as Yes*. Refer also to page 5, page 16, column 2c of Appendix C on page 77 and to column 13 of Appendix E on page 84.

Appropriate non-residential water supply charges – Appropriate water usage charge per kL and access charge relative to customer's capacity requirements. Refer to column 2d of Appendix C on page 77.

Residential sewerage charges – Residential tariff is independent of land value. Refer to column 2b of Appendix C on page 77 and to column 3 of Appendix F on page 87.

³⁰ The NSW Framework for Regulation of Sewerage and Trade Waste is a preventative risk management approach for achieving effective and efficient use of the sewerage system, which is a common pool resource (page viii).

Non-residential sewerage charges – This requires a two part tariff, with an appropriate sewer usage charge per kL and an access charge that is reflective of the customer's load on the sewerage system. Refer to column 2c of Appendix C on page 77 and to column 3a of Appendix F on page 87.

Liquid trade waste fees and charges – This requires appropriate trade waste fees and charges to be applied to all liquid trade waste dischargers. These include non-compliance trade waste usage and excess mass charges (page viii). Refer to column 2d of Appendix C on page 77 and to column 4 of Appendix F on page 87.

A sound liquid **trade waste regulation policy** (endorsed by the NSW Office of Water) and an appropriate approval for each trade waste discharger is a further requirement. Refer to column 2f of Appendix C on page 77. Refer also to page 22.

In view of the potential risks to sewerage infrastructure, public health and safety and the environment, from uncontrolled trade waste discharges, the acceptance of trade waste discharges³¹ to the sewerage system requires the Office of Water's concurrence under section 90(1) of the *Local Government Act, 1993* (www.water.nsw.gov.au).

Developer charges – The requirement is met if an appropriate Development Servicing Plan (DSP) with commercial developer charges is implemented. Utilities which have commercial developer charges but have not completed a DSP are assigned provisional implementation and are shown as Yes*. In addition utilities with growth of under 5 lots/a are granted an exemption and are shown as Yes^e. Refer to columns 2e of Appendix C on page 77. Refer also to column 7 of Appendix E on page 84 (water supply) and column 7 of Appendix F on page 87 (sewerage).

Complete Performance Report by due date – A LWU meets the requirement if it completes its performance reporting for water supply and/or sewerage by the due date (currently 15 September each year). Refer to column 5 of Appendix C on page 77 (water supply) and column 3 on page 77 (sewerage). Refer also to page 23.

Water conservation – The requirement is met if the LWU has a water conservation and demand management plan. Refer to column 3 of Appendix C on page 77. Refer also to page 22.

Drought management – The requirement is met if the LWU has a drought management plan. Refer to column 4 of Appendix C on page 77. Refer also to page 22.

Integrated water cycle management – As noted on page 21, a utility's IWCM Strategy needs to identify a 30-year strategy for water supply, sewerage and stormwater which provides the best value for money on the triple bottom line (TBL) basis of social, environmental and economic considerations. The Office of Water reviews each LWU's IWCM Evaluation and IWCM Strategy to ensure they are soundly based. The IWCM Strategy needs to identify the best mix of capital works, non-build solutions, policies and operation and maintenance activities. Note that the 19 Best-Practice Management requirements aid the development of such a strategy through the required sound planning, pricing and management of services.

The requirement is met if the LWU has commenced an integrated water cycle management (IWCM) study. Refer to column 6 of Appendix C on page 77 (water supply) and to column 4 on page 77 (sewerage). As indicated in Note 5 on page 79, a utility which has completed its IWCM Strategy is shown as 'YesC' on page 77 and a utility which has only completed its IWCM Evaluation (Part 1 of the IWCM study) is shown as 'YesE' on page 77. Refer also to pages 15 and 24.

³¹ Liquid Trade Waste Regulation Guidelines, 2009 (www.water.nsw.gov.au) Refer also to pages 10, 15, 22, 23 and 97.

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Note:

Page numbers shown in:

- **black bold** are the main reference to each topic;
- **blue bold** refer to figures comparing the performance of the **NSW utilities**; and
- **red bold** refer to graphs of **Interstate performance comparisons**.

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RELEASE OF RESTRICTION ON USE - 3B DUNLOP DRIVE, BOAMBEE EAST

Purpose:

To obtain Council approval to execute the necessary documents to release a restriction over 3B Dunlop Drive, Boambree East which was created to restrict building or paving within part of the encumbered property.

Description of Item:

This report is procedural and is required to obtain Council's authority to execute a legal document under seal. Currently Council is the party which is legally empowered to release, vary or modify an existing restriction which impacts on 3B Dunlop Drive, Boambree East which is legally described as Lot 221 DP1104020. The property comprises an urban residential allotment upon which is proposed to be constructed a residential dwelling. The restriction does not seem to serve a particular purpose and as it currently stands will preclude any construction being undertaken on the part of the property encumbered. The owner of the land wishes to encroach with building works into this area and there would appear to be no reason to preclude the works. The attachment to this report shows the property and the location of the restriction to be released.

Sustainability Assessment:

- **Environment**

There are no environmental issues.

- **Social**

There are no social impacts.

- **Civic Leadership**

There are no major impacts in relation to this private matter.

- **Economic**

Broader Economic Implications

The change will enable the more efficient use of the property and will provide development potential that has been acted upon by a recent conditional development consent.

Delivery Program/Operational Plan Implications

All costs in relation to the matter will be borne by the owners of Lot 221 DP 1104020.

Risk Analysis:

The risk in relation to this matter has been assessed as minor and insignificant.

Consultation:

Comments were obtained from Councils Development Assessment Division in relation to the proposal. It was confirmed that a development application (860/13DA) for a dwelling house and pool had been submitted, which proposed paving and part of a garage over the area encumbered by the restriction. It appeared that the restriction was created to assist with the overland flow of stormwater from the undeveloped land.

In consideration of the application, Council officers requested an engineering assessment from the proponent to confirm the stormwater design was adequate, the overland flow path was no longer required and the restriction could therefore be released. The development application was subsequently approved having regard to the engineering assessment which supported the proposal and the consent was conditional on the proponent initiating and paying for the release of the restriction.

Related Policy and / or Precedents:

Council has in the past consented to the release of restrictions when considered appropriate and in the interests of the parties involved.

Statutory Requirements:

Council cannot affix its seal without a resolution of Council. This requirement has generated the need for this report.

Issues:

The only issue for Council to consider is whether it should consent to the proposed change. In the circumstances there is no reason why Council should not grant approval.

Implementation Date / Priority:

The matter will be dealt with immediately following Council's resolution.

Recommendation:

1. **That Council execute under seal all necessary documents to release the existing restriction on the use of land over Lot 221 DP 1104020.**
2. **That all costs associated with this matter be borne by the owners of Lot 221 DP1104020.**

