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# Review of Regional Water Quality & Security



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**Prepared for Infrastructure Australia** 

# Enhancing and sustaining the world's built, natural and social environments.

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# Water Framework in Australia



Appendices Volume 2

# Appendix A Water Framework in Australia

The water industry is complex, with different governance structures and regulatory requirements existing in each state. Understanding the institutional arrangements and regulatory frameworks provides a baseline for the recommendations provided in this report.

The Commonwealth Government also has a strong, but generally a non-regulatory role in the water industry. The criticality of sustainable water supplies for domestic, environmental, industrial and recreational use has meant that the Commonwealth Government has taken a leading role in driving reform across the country. However, the Commonwealth Government does not have enforcement power in water and as such actual reform is generally implemented by the states.

# Federal

In Australia, water belongs to the Crown, which means the relevant minister in each state or territory. The management of water in Australia is complex with many laws and agencies. In fact, there are up to as many as 800 agencies that are responsible for the administration and management of water, at the federal, state, regional and local level.

In addition to the regulatory bodies, there are a number of other government and non-government organisations with an interest in water. The organisations provide advice to regulatory authorities, work in research, develop new systems, assist regulators during implementation of new initiatives and campaign government for change.

The major responsibilities for water at a Commonwealth level sit with the Department of Water, Environment, Heritage and the Arts (DEWHA), the Council of Australian Governments (COAG), the National Water Commission (NWC) and the Australian Competition and Consumer Commission (ACCC).

While the states and territories own and manage water resources, the Commonwealth Government provides national leadership and strategic direction on water matters. COAG provides a forum for the states and territories to negotiate with the Commonwealth Government over matters of common concern, including water management.

In 1994, COAG separated the land and water title rights. In 2004 the Intergovernmental Agreement on a National Water Initiative (NWI) was created and as of 2006 all states had signed it. The aim of the NWI is to improve the economic efficiency of Australia's water management, while also protecting our resources and the environment. The NWC was formed to review the progress of the NWI and completes a biennial report on progress. The eight principal reform agendas in the NWI were and as of 2010, still are:

- Water access entitlements and planning framework
- Water markets and trading
- Best practice water pricing and institutional arrangements
- Integrated Management of Environmental Water
- Water Resource Accounting
- Urban Water Reform
- Community Partnerships and Adjustment
- Knowledge and Capacity Building

There are also arrangements in place for a number of catchments traversing state boundaries. These arrangements are in place to improve governance of cross-boundary water supplies. Most of these arrangements are legislated, though some are by agreement only. The catchments are the Murray Darling Basin, Lake Eyre Basin, Snowy River, Great Artesian Basin, Vic-SA Border Groundwater Area and NSW-Qld Border Rivers.

The Water Act 2007 commenced in March 2008. The Water Act established Commonwealth environmental water responsibilities, as well as the new Murray-Darling Basin Authority (MDBA) and required the MDBA to prepare a strategic Basin Plan. The Act also gave the ACCC powers to enforce water charge and market rules

The National Competition Council (NCC) administers the National Competition Policy, in which water is included. The Policy endeavours to address both the economic viability and ecological sustainability of the nation's water supply. Of particular reference to this project is the NCC's pricing reform, which is 'based on principles of consumption-based pricing, full-cost recovery, and removal of cross-subsidies'.

In April 2008, the Commonwealth Government established the Water for the Future program in response to the challenge of securing a sustainable water future for Australia. The program's key priorities are:

- Taking action on climate change
- Using water wisely
- Securing water supplies
- Supporting healthy rivers

The Commonwealth Government is also involved in addressing the water skills shortage and improving the knowledge of water industry members across Australia. Government Skills Australia (GSA) has been contracted by the federal Department of Education, Employment and Workplace Relations (DEEWR) to provide training packages and resources. GSA's Water Industry Advisory Committee (WIAC) is responsible for developing and promoting these programs, which extend beyond operations and into cross-discipline problem solving, such as water resources management.

Other key drinking water related requirements or best practice that are driven by the Commonwealth Government include the Australian Drinking Water Guidelines (ADWG). A 2010 draft revision of the ADWG was publicly available for comment in 2010, with the new ADWG to be issued for release in 2011.

Additionally, the NWC, in association with Water Services Association of Australia (WSAA), publishes the annual National Annual Performance Report. This report provides information on approximately 33 of the 150+ criteria collated on water utilities with greater than or equal to 10,000 connections. The NWC also provides a biennial assessment on the implementation of the NWI, the most recent of which was completed in 2009.

In addition to the above, there are a range of other programs that have been established to improve the management and delivery of water supplies in Australia. These programs are summarised on the DEWHA website<sup>1.</sup>

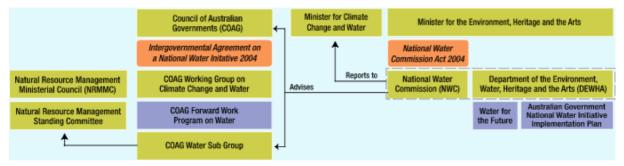


Figure 1: National arrangements for water governance<sup>2</sup>

<sup>&</sup>lt;sup>1</sup> http://www.environment.gov.au/water/policy-programs/index.html

<sup>&</sup>lt;sup>2</sup> http://www.nwc.gov.au/www/html/2354-national-arrangements.asp



Figure 2: Cross-boundary arrangements <sup>3</sup>

# Queensland

In Queensland, water management responsibilities rest with various state organisations. Queensland's water framework has undergone significant change in recent years, including changes to regulatory and institutional arrangements, including the amalgamation of bulk and reticulated water suppliers. The figure and table below describe the various responsibilities in water in Queensland as it related to supply of water to regional towns.

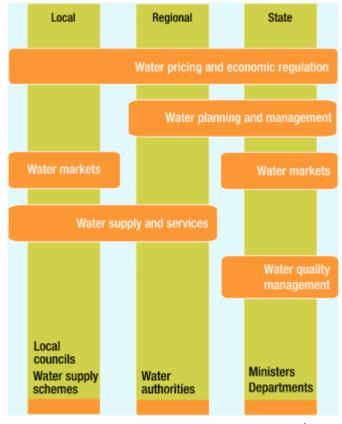


Figure 3: Queensland arrangements for water management <sup>4</sup>

<sup>&</sup>lt;sup>3</sup> http://www.nwc.gov.au/www/html/1540-cross-boundary-arrangements.asp

<sup>&</sup>lt;sup>4</sup> http://www.nwc.gov.au/www/html/1787-queensland---introduction.asp

### Table 1 Summary of water in Queensland

Governance Area	Responsible Party	Responsibilities
Water Pricing	Queensland Competition Authority (QCA) & Water utilities	QCA provide pricing recommendations, review pricing policies & monitor pricing. Local government councils set their own urban bulk and retail prices. SunWater, Seqwater & rural water boards set their own prices.
Rural & Regional Water Planning & Mgmt	Department of Environment & Resource Management (DERM)	Prepare & implement Water Resource Plans, Resource Operations Plans & Regional Water Supply Strategies; administer water licences, water allocations, resource & distribution operations licences, prepare industry guidelines & approve water service provider plans. The key legislation is the Water Act 2000.
Metropolitan Water Planning & Mgmt	Queensland Water Commission (QWC)	Strategy is to keep water supply & demand in balance for the next 50 years in SE Qld. Have prepared & are implementing the SE Qld Regional Water Supply Strategy, SE Qld Water Security Program & SE Qld Regional Water System Operating Plan. They also administer water licences, water allocations, resource & distribution licences.
Water Markets	The Chief Executive & DERM (Resource Mgmt)	The Chief Executive may prepare resource operations plan, which includes trading rules. DERM administer water licences, water allocations & resources & distribution operations licences. They also manage and approve permanent water trades. Key legislation includes the Water Act 2000 and the Water Regulations 2002.
Water Supply & Services	Local government, SunWater, Seqwater, Brisbane City Council, & a number of other water boards.	Local government supplies urban retail water; SunWater, Seqwater & nine rural water boards supply rural retail; Local Government provide for stormwater & drainage, while rural & urban bulk water is supplied by the organisations listed to the left.
Drinking Water Mgmt	DERM (Office of the Water Supply Regulator) & the Department of Health	DERM regulate water supply activities under the Water Supply (Safety and Reliability) Act 2008. This includes the provision of drinking water quality by drinking water service providers. They administer monitoring and reporting requirement notices & Drinking Water Management Plans. Health encourages water supplied to meet the ADWG & samples & tests for compliance with these Guidelines.
Recycled Water Mgmt	DERM (Office of the Water Supply Regulator)	Oversees and implements the Water Supply (Safety and Reliability) Act 2008. Regulates urban & rural water supply functions carried out by water authorities. They have also prepared the Water Quality Guidelines for Recycled Water Schemes.
Environmental Health Mgmt	DERM (Environment)	Administer the Environmental Protection Act 1994, Environmental Protection Regulation 1998, Environmental Protection (Water) Policy 1997 and the Queensland Water Quality Guidelines 2006.

Drinking water has been regulated in Queensland since the introduction of the Water Supply (Safety and Reliability) Act 2008. Under the Act drinking water providers are required to submit draft water management plans to the Office of the Water Supply Regulator.

The submission of draft water management plans are now a legislated requirement for all water providers in Queensland. Previously the water quality requirements were guidelines only and drinking water providers were not mandated by law to provide a level of service to the Australian Drinking Water Guidelines. The guidelines have now been mandated in the Water Supply (Safety and Reliability) Act 2008; however the reporting requirements are to be phased in over the next 4 years as follows:

- Large supply schemes by July 2011
- Medium supply schemes by July 2012
- Small supply schemes by July 2013

Regional Queensland towns will fall under the medium and small supply schemes.

# New South Wales

In New South Wales, water management responsibilities rest with various state, regional and local organisations. The figure and table below describe the various responsibilities in water in NSW as it related to supply of water to regional towns.

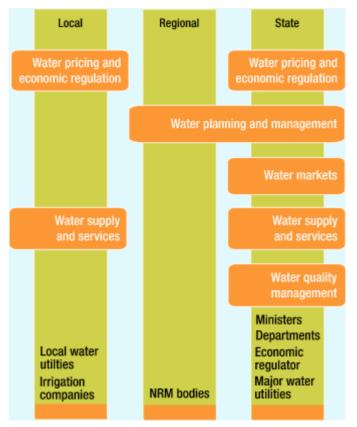


Figure 4: New South Wales arrangements for water management <sup>5</sup>

### Table 2 Summary of water in NSW

Governance Area	Responsible Party	Responsibilities
Water Pricing	Independent Pricing and Regulatory Tribunal (IPART) & Local Water utilities (LWUs)	While IPART set prices for metro bulk and retail water and rural bulk water, local utilities set pricing in non-metro retail and irrigation companies set rural retail prices.
Rural & Regional Water Planning & Mgmt	Department of Climate Change & Water (DECCW)	Administer the Water Management Act 2000 & the Water Act 1912. Lead preparation of sharing plans.
Metropolitan Water Planning & Mgmt	DECCW	Provide advice and guidance to local water utilities in rural & regional areas.
Water Markets	DECCW	Administer the Water Management Act 2000 & the Water Act 1912. Assess all water dealing applications in accordance with the Access Licence Dealings Principles Order.
	LWUs, StateWater,	LWUs – urban retail, stormwater & drainage
Water Supply &	Private Irrigation	State Water – urban & rural bulk & rural retail
Services	Companies &	Private Irrigators & Schemes – rural retail
	Schemes & Local	Local Government – stormwater & drainage

<sup>&</sup>lt;sup>5</sup> http://www.nwc.gov.au/www/html/1204-new-south-wales.asp

Governance Area	Responsible Party	Responsibilities
	Governments	
Drinking Water Mgmt	NSW Health	Develops standards for water quality and drinking water quality mgmt programs. Monitors all water supply schemes against the ADWG.
Recycled Water Mgmt	DECCW & Local Councils	DECCW administer the Protection of the Environment Operations Act 1997 (POEO), including licensing of Sewage Treatment Plants. They issue approvals funder the Local Government Act 1993 to local utilities reusing or supplying reused water. Local councils issues approvals under the LGA to installers and operators of systems of sewage mgmt.
Environmental Health Mgmt	DECCW	Administers the POEO Act. Issues environment protection licences (EPLs) under the POEO Act that set operating and discharge limits for all scheduled activities.

The NSW Office of Water (NOW) administers the two key pieces of legislation for the management of water in NSW. These are the Water Management Act 2000 and the Water Act 1912. In January 2009, new compliance powers were amended into the Water Management Act 2000, providing the government with greater enforcement and penalty capabilities. NOW is also the lead agency for preparation of Water Sharing Plans. Provision of water and wastewater services by local Councils is administered under the Local Government Act 1993.

NOW also administers the NSW Guidelines for Best Practice Management for Water Supply and Sewage (2007). This guideline provides recommendations for the management and operation of water and sewage supplies to promote reasoned planning and cost recovery. For regional NSW, NOW provides managerial, technical and financial support under the Country Towns Water Supply and Sewerage Program. It also administers the Water for Life Education Program.

NSW Health are responsible for the monitoring the performance of water utilities with respect to their drinking water quality. They provide a free of charge drinking water testing service to water supply authorities for indicator bacteria and health-related inorganic chemicals. NSW Health also maintains a Drinking Water Database of water quality information for each utility. NSW health has published two documents to assist water suppliers, namely NSW Health Drinking Water Monitoring Program (2005) and the Guide for Submitting Water Samples to DAL for Analysis (2003). NSW Health support and endorse the Australian Drinking Water Guidelines

While IPART sets and regulates water pricing for metropolitan suppliers, they do not perform this role for nonmetropolitan suppliers.

State Water operates the major dams across regional NSW. Supply of drinking water for domestic purposes is the responsibility of local water utilities (usually local Councils) across most of NSW and State-owned Corporations in the major metropolitan centres.

The NSW Government established thirteen Catchment Management Authorities (CMAs) across the State as part of broad natural resource management reforms. The Authorities were established under the Catchment Management Authorities Act 2003. CMAs are statutory authorities, with responsible and accountable Boards that report directly to the Minister for Natural Resources. Each Catchment Management Authority must develop a Catchment Action Plan to ensure effective implementation of natural resource management measures, in compliance with the NSW Natural Resource Management Standard and Targets.

The NSW Water Directorate provides technical information to its members, which comprise of 94 councils and county councils providing water supply and/or sewerage services to local government areas in NSW. They are available as an independent advisor to councils, promote efficiency in operation, provide technical direction and promote sharing of knowledge.

The recent Independent Inquiry into Secure and Sustainable Urban Water Supply and Sewerage Services for Non-Metropolitan NSW proposed a range of amalgamation models to improve the reliable delivery of water and sewage services in NSW. The result of this inquiry will be announced later this year. However, the present framework model in NSW is shown in Figure 4.

Announcement of the result of the Independent Inquiry into Secure and Sustainable Urban Water Supply and Sewerage Services for Non-Metropolitan NSW, which may result in amalgamation of water and wastewater supply authorities in NSW.

The Office of Water is also positioned to improve their compliance enforcement powers through the introduction of compulsory best practice procedures. This will encourage all water suppliers to maintain a consistent level of service and will also improve accountability.

# Australian Capital Territory

Due to its localised geography, management of water in the ACT is relatively simple compared to most states, with all water management powers sitting with the ACT government. The figure and table below describe the various responsibilities in water in the ACT as it related to supply of water to regional towns.

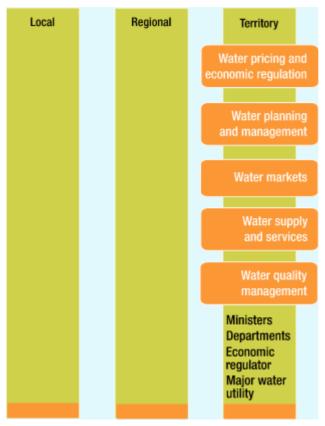


Figure 5: ACT arrangements for water management <sup>6</sup>

Table 3 Summary of water in the AC	Table 3	Summary of water in the ACT
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Governance Area	Responsible Party	Responsibilities
Water Pricing	Independent Competition & Regulatory Commission (ICRC)	Sets prices & investigates competitiveness complaints; regulate urban retail water, bulk water, wastewater & water reuse.
Rural & Regional Water Planning & Mgmt	Department of Environment, Climate Change, Energy & Water (DECCEW)	Responsible for water resource mgmt under the Water Resources Act 2007; implement Think water, act water; administer the Water Sharing Plan & Environmental Flow Guidelines 2006.
Metropolitan Water Planning &	DECCEW & ACTEW	DECCEW develop policies related to future demand for water, including integration of stormwater, water supply & wastewater,

<sup>&</sup>lt;sup>6</sup> http://www.nwc.gov.au/www/html/1118-australian-capital-territory.asp

Governance Area	Responsible Party	Responsibilities
Mgmt		with a target of 20% recycling by 2013.
		ACTEW examine & recommend future water supply options to government under the Future Water Options Strategy.
Water Markets	DECCEW	Approve water trade within & external to the ACT under the Water Resources Act 2007.
Water Supply &	ACTEW & Roads	ACTEW supply urban & rural bulk water and urban retail. There is
Services	ACT	no rural retail water business in the ACT.
		Roads are responsible for stormwater & drainage.
Drinking Water	ACT Health (Chief	Administer the Public Health Act 1997 & issue drinking water utility
Mgmt	Health Officer)	licences. Drinking water standards are outlined in the Drinking
	,	Water Quality Code of Practice 2000, which refers to the ADWG.
		Provide advice on system design & health implications of water
Recycled Water	ACT Health (Chief	reuse; implement Think water, act water, which includes a target
Mgmt	Health Officer)	of 20% recycling by 2013; administer the Greywater Use:
		Guidelines for Residential Properties in Canberra 2007
		Develop & enforce Environmental Authorisations & Environmental
Environmental	DECCEW	Protection Agreements; administer the Environment Protection Act
Health Mgmt		1997, Environmental Protection Regulations 1997 &
		Environmental Protection Agreements.

DECCEW has a number of water management responsibilities in the ACT. It is responsible for a range of water efficiency program, manages the water policy, regulates water resources and monitors and reports on water quality in the ACT.

In the ACT all reticulated water is supplied by ACTEW Corporation.

# Victoria

In Victoria, water management responsibilities rest with various state and regional organisations. The figure and table below describe the various responsibilities in water in Victoria as it related to supply of water to regional towns.

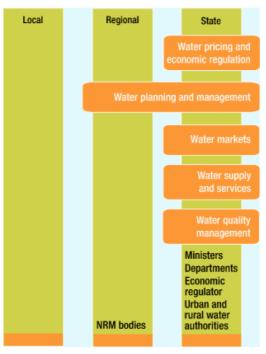


Figure 6: Victorian arrangements for water management <sup>7</sup>

<sup>&</sup>lt;sup>7</sup> http://www.nwc.gov.au/www/html/1808-victoria---introduction.asp

### Table 4 Summary of water in Victoria

Governance Area	Responsible Party	Responsibilities
Water Pricing	Essential Services Commission (ESC).	Price determination & service standards monitoring; regulation of urban bulk water & retail water, sewerage services, metropolitan drainage services, recycled water services, rural bulk water, retail water & irrigation drainage services.
Rural & Regional Water Planning & Mgmt	Department of Sustainability and Environment (DSE)	State-wide water resources policy & strategic planning; prepare regional sustainable water strategies; allocate water rights. Administer key legislation, including Water Act 1989, Our Water Our Future, Bulk Entitlements, groundwater management plans and streamflow management plans
Metropolitan Water Planning & Mgmt	DSE & Metropolitan water authorities (MWAs)	DSE - State-wide water resources policy & strategic planning; prepare the Central Regional Sustainable Water Strategy, which balances the water needs of urban & rural users & the environment; allocate the Melbourne Bulk Entitlement. MWAs - Implement bulk entitlement conditions & the Water Supply-Demand Strategy for Melbourne.
Water Markets	DSE & Rural water authorities	DSE - State-wide water resources policy &strategic planning& allocation of Bulk Entitlements under the Water Act 1989. Rural water authorities - within an irrigation district, trade is subject to the rules & the approval of the relevant Irrigation Authority.
Water Supply & Services	Metro, regional & rural urban retail water businesses & local government	The three metro water businesses supply urban and rural bulk water; urban retail water us supplied by the three metro water businesses and 13 regional businesses; rural retail is supplied by five rural water businesses; stormwater & drainage are managed by Melbourne Water & Local Government.
Drinking Water Mgmt	Department of Human Services (DHS) (Drinking Water Regulatory Unit)	Implement & oversee the Safe Drinking Water Act 2003 and the Safe Drinking Water Regulations 2005, which specifies drinking water quality standards & are based on the ADWG.
Recycled Water Mgmt	Environment Protection Authority (EPA)	Protect water quality & regulation of waste disposal & pollution in Victoria under the Environment Protection Act 1970; administer Our Water Our Future; the Water Recycling Action Plan (2002); Guideline for Environment Management: Use of Reclaimed Water (EPA, 2003); & Reuse options for Household Wastewater
Environmental Health Mgmt	EPA	Administer the Environment Protection Act 1970 & issue works approval to existing industry or new scheduled premises discharging waste to the environment; issue licences that set operating & waste discharge limits.

The key price of drinking water legislation in Victoria is the Safe Drinking Water Act 2003, which came into effect on 1 July 2004. Prior to this, drinking water quality was regulated through the Health Act 1958, the Health (Quality of Drinking Water) Regulations 2002, the Food Act 1984, and contractual and licence deeds between water businesses and the Department of Sustainability and Environment.

The 10 Catchment Management Authorities (CMAs) in Victoria were established under the Catchment and Land Protection Act 1994. Water is Victoria is managed by 19 state-owned businesses that report to the Victorian Government.

Other legislation in place for water management in Victoria includes the Water Industry Act 1994, the Water Industry Regulatory Order 2003 and the Financial Management Act 1994.

Victoria's Our Water, Our Future program was launched in 2004. It was been developed to improve water savings by modernising irrigation systems and encouraging water saving in households and industry; to create new water supplied and improve existing ones; and to expand the existing water grid.

ESC is currently reviewing the Regulatory Accounting Code. The Victorian government is also positioned to improve training to water treatment plant operators through the introduction of a new education and training program with improved requirements for certification of operations staff.

Below is a list of some of the government and non-government organisations with an interest in water in Victoria. The list is not intended to be comprehensive and merely provides a snap-shot of the main stakeholders.

Other: Victorian Water Industry Association (VicWater)

# Tasmania

In Tasmania, water management responsibilities rest with various state, regional and local organisation. Tasmania has undergone significant change in the past year, with the amalgamation of water suppliers to just three. The figure and table below describe the various responsibilities in water in Tasmania as it related to supply of water to regional towns.

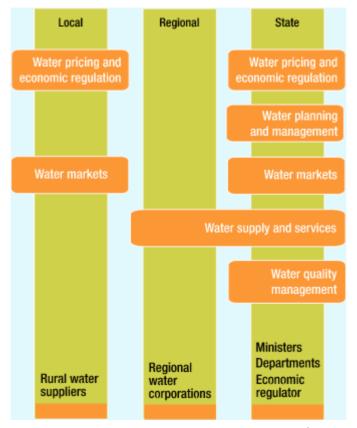


Figure 7: Tasmanian arrangements for water management <sup>8</sup>

### Table 5 Summary of water in Tasmania

Governance Area	Responsible Party	Responsibilities
	Economic Regulator	Regulate water and sewerage prices and licence industry
	of Water &	participants; monitor annual performance; regulate urban bulk
Water Pricing	Sewerage, Water	water & retail water, sewerage services.
	Corporations &	The three Water Corporations set urban retail prices, while the five
	irrigation entities	irrigation entities set rural retail prices.
Rural & Regional	Department of	Oversee mgmt of Tasmania's freshwater resources under Water
Water Planning &	Primary Industries &	Management Act 1999; prepare & implement water management
Mgmt	Water (DPIW)	plans, including environmental provisions.
Metropolitan	DPIW	Water infrastructure & development; water management planning;

<sup>8</sup> http://www.nwc.gov.au/www/html/1804-tasmania.asp

Governance Area	Responsible Party	Responsibilities
Water Planning & Mgmt		administer the Water Management Act 1999
Water Markets	Department of Primary Industries, Parks, Water and Environment (DPIPWE),	Oversee mgmt of Tasmania's freshwater resources under Water Management Act 199; grant water licences & allocations & approve of water transfers. Also administer Guiding Principles for Water Trading – Water Resources Policy #2003/2, Water management plans & Irrigation Clauses Act 1973
Water Supply & Services	Southern Regional Corporation, Northern Regional Corporation, North Western Regional Corporation, Rural water entities, Local Government	Urban & rural bulk water & urban retail water is operated by the three water corporations, rural retail is operated by five rural entities, while local government look after stormwater & drainage.
Drinking Water Mgmt	Department of Health and Human Services (DHHS) (Director of Public Health)	Administer Public Health Act 1997; regulate drinking water supplies through administration & enforcement of Drinking Water Quality Guidelines (2005), which are in accordance with the ADWG.
Recycled Water Mgmt	DHHS, DPIPWE, Local councils	DHHS oversee drinking water supplier responsibilities & investigates threats to public health (Public Health Act 1997, Environmental Management and Pollution Control Act 1994) DPIPWE has a key role in ensuring sustainable reuse through permits or environmental protection notices. Local Councils approve & regulate wastewater re-use schemes either through environmental protection notices, permits or user- supplier agreements.
Environmental Health Mgmt	Board of the Environment Protection Authority (EPA), Local councils	EPA enforce provisions of the Environmental Management and Pollution Control Act 1994 & State Policy on Water Quality Management 1997 Local Councils issue permits to Level 1 & 2 activities (under the Environmental Management and Pollution Control Act 1994).

# South Australia

In South Australia, water management responsibilities rest with various state, regional and local organisations. The figure and table below describe the various responsibilities in water in South Australia as it related to supply of water to regional towns.

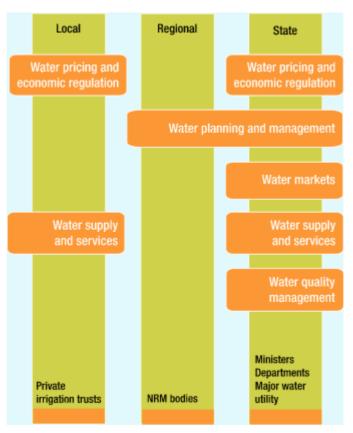


Figure 8: South Australian arrangements for water management <sup>9</sup>

### Table 6 Summary of water in South Australia

Governance Area	Responsible Party	Responsibilities
Water Pricing	Essential Services Commission (ESC), SA Cabinet, irrigation trusts	ESC - Review Government price-setting. SA Cabinet – set prices for urban retail water. Private irrigation trusts (27) – set rural retail water prices.
Rural & Regional Water Planning & Mgmt	Department of Land, Water and Biodiversity Conservation (DLWBC), Natural Resource Mgmt (NRM) Boards	DLWBC - Water resource management & administering the Natural Resources Management Act 2004; develop & implement regional natural resource management plans & water allocation plans. Other legislation includes the State Natural Resource Management Plan 2004; Regional Natural Resource Management Plans; Water Allocation Plans; and River Murray Act 2003
Metropolitan Water Planning & Mgmt	SA Water	Plan & develop water & wastewater assets & to secure water supply for South Australia, including the Water-Proofing Adelaide plan.
Water Markets	Department of Land, Water and Biodiversity Conservation (DLWBC)	Approve water trade; record all water licences & transfers; Water Information & Licensing Management Application. Operate Natural Resources Management Act 2004; Natural Resource Management Plans; &Water Allocation Plans.
Water Supply & Services	SA Water, irrigation trusts, Local Government, (NRM) Boards	SA Water supplies urban & rural bulk water & urban retail water. 27 private irrigation trusts supply rural water ; stormwater & drainage is managed by local government & the NRM Boards.
Drinking Water	Department of	Administer & enforce the Food Act 2001 to ensure drinking water

<sup>9</sup> http://www.nwc.gov.au/www/html/1794-south-australia.asp

Governance Area	Responsible Party	Responsibilities
- N		supplies are safe; operates the Drinking Water Quality Management System. Health has adopted the Australian Drinking Water Guidelines (2004).
Recycled Water Mgmt	Department of Health	Issue approvals under Public and Environmental (Waste Control) Regulations 1995 to WTPs; with the EPA, produced the South Australian Reclaimed Water Guidelines (Treated Effluent); administers Public and Environmental Health Act 1987
Environmental Health Mgmt	Environment Protection Authority	Administer the Environment Protection Act 1993; issue environmental authorisations to activities prescribed in Environment Protection Act 1993; administers Environmental Protection (Water Quality) Policy 2003 & Codes of Practice

# Western Australia

In Western Australia, water management responsibilities rest with various state and local organisations. The figure and table below describe the various responsibilities in water in Western Australia as it related to supply of water to regional towns.

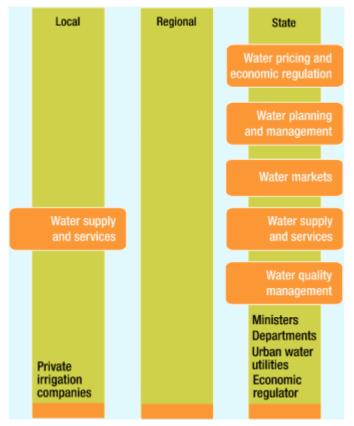


Figure 9: Western Australian arrangements for water management <sup>10</sup>

### Table 7 Summary of water in Western Australia

Governance Area	Responsible Party	Responsibilities
Water Pricing	Economic Regulation Authority (ERA)	Price recommendation. Oversight for urban & rural water pricing practices. Western Australia Cabinet set urban bulk & retail prices, while Irrigation Cooperatives set rural retail prices.

<sup>&</sup>lt;sup>10</sup> http://www.nwc.gov.au/www/html/1812-western-australia.asp

Governance Area	Responsible Party	Responsibilities
Rural & Regional Water Planning & Mgmt	Department of Water (DoW)	Administer the Rights in Water and Irrigation Act 1914; water allocation planning & administration of water entitlements & water rights. Other legislation includes the State Water Plan 2007.
Metropolitan Water Planning & Mgmt	DoW, Water Corporation	DoW - water resources & water industry, planning & policy, management & regulation; supply water & wastewater services to 97% of Western Australia's population. Water Corp - develop Integrated Water Supply Scheme Source Development Plan 2005 - 2050
Water Markets	DoW	Water allocation planning & admin of water entitlements & water rights. Approve trading of water entitlements, in accordance with Rights in Water and Irrigation Act 1914 & State-wide policy No. 6.
Water Supply & Services	Water Corporation, Busselton Water, Aqwest Water, Rottnest Island Authority, Irrigation Corporations, Local Govt	Water Corporation supplues urban & rural bulk water; Water Corporation, Busselton Water, Aqwest Water & Rottnest Island Authority supply urban retail water, private irrigation companies supply rural water; stormwater & drainage are managed by Water Corporation & Local Govt.
Drinking Water Mgmt	Department of Health, ERA, DoW	<ul> <li>Health - advise on the appropriate health standards for drinking water; regulate the Water Corporation's drinking water quality.</li> <li>Health has adopted the ADWG (1996).</li> <li>ERA - issue licences that specify drinking water quality standards.</li> <li>Dow - identify &amp; protect Public Drinking Water Source Areas &amp; prepare Drinking Water Source Protection Assessments &amp; Drinking Water Source Protection Plans.</li> <li>Legislation includes Country Areas Water Supply Act 1947, Metropolitan Water Source Areas (PDWSA) Policy, Statement of Planning Policy 2.7 Public Drinking Water Source Policy, Water Services Licensing Act 2005</li> </ul>
Recycled Water Mgmt	Department of Health; Environmental Protection Authority (EPA), DoW, ERA	<ul> <li>Health administer &amp; enforce the Health Act 1911; and set min design &amp; installation standards in the Code of Practice for the Reuse of Greywater in Western Australia.</li> <li>EPA provides environmental advice to the Minister; prepare environmental protection policies under the Environmental Protection Act 1986.</li> <li>DoW supports the Minister by developing sewerage service policy.</li> <li>ERA issues licences to sewerage service providers, for the provision of water services, including the supply of recycled water.</li> </ul>
Environmental Health Mgmt	Department of Environment & Conservation (DEC), Environment Protection Authority (EPA), Swan River Trust	DEC administers Environmental Protection Act 1986; oversee mgmt of natural resources; license & register water & wastewater related activities; & perform water quality management & monitoring. EPA advises the govt on policy & prepares environmental protection policies. Swan River Trust manage & protect the river system, advises the Minister on development proposals within the Trust's Management Area & controls and prevents pollution of the rivers. Other instruments include Environmental Protection Regulations 1987; Environmental Protection Policies; Environmental Quality Objectives; Swan and Canning Rivers Management Act 2006; and Swan and Canning Rivers Management Regulations 2007.

# **Northern Territory**

In the Northern Territory, water management responsibilities rest with various territory organisations. The figure and table below describe the various responsibilities in water in the Northern Territory as it related to supply of water to regional towns.

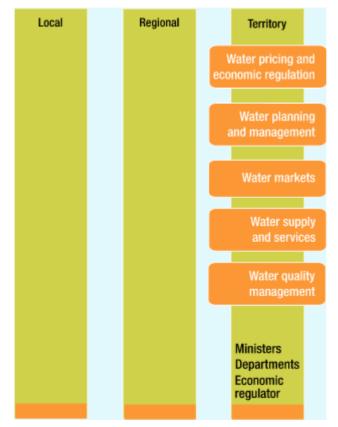


Figure 10: Northern Territory arrangements for water management <sup>11</sup>

 Table 8
 Summary of water in the Northern Territory

Governance Area	Responsible Party	Responsibilities
Water Pricing	Utilities Commission	Monitor & enforce compliance with pricing determinations; regulates urban water supply & sewerage services. The Treasurer (Regulatory Minister) sets water prices.
Rural & Regional Water Planning & Mgmt	Dept of Natural Resources, Environment, The Arts and Sport (NRETAS) (Controller of Water Resources)	Water resource planning & management under the Water Act 1992; prepare Water Allocation Plans.
Metropolitan Water Planning & Mgmt	NRETAS, Power & Water Corporation	Ensure the achievement of water resource management outcomes; investigate & develop water related infrastructure.
Water Markets	NRETAS	Issue, transfer & amend water licences under the Water Act 1992 & Water Regulations 1992; maintain a register of water licences.
Water Supply & Services	Power and Water Corporation, Local Govt, Dept of Planning &	Power and Water Corporation supply urban & rural bulk water, urban retail water; and rural retail water. Local Govt & DPI manage stormwater & drainage.

<sup>11</sup> http://www.nwc.gov.au/www/html/1735-northern-territory.asp

Governance Area	Responsible Party	Responsibilities
	Infrastructure (DPI)	
Drinking Water Mgmt	Dept of Health and Community Services (DHCS), Utilities Commission	DHCS set standards for drinking water quality under Water Services and Sewerage Supply Act 2001 & monitors compliance with those objectives. The minimum drinking water standards are in accordance with the ADWG (2004). The Utilities Commission regulate water supply services, which include issuing & auditing compliance against Operating Licences that specify drinking water quality standards.
Recycled Water Mgmt	DHCS (Chief Health Officer), Utilities Commission, Power & Water Corporation	DHCS provide direction & safeguards for wastewater quality for reclaimed water schemes; set the standards for the quality of recycled water licensed under the Water Services and Sewerage Supply Act 2001. The Utilities Commission regulate water supply services, which include issuing & auditing compliance against Operating Licences that specify recycled water standards. Power and Water Corp also have a Reclaimed Water Policy
Environmental Health Mgmt	NRETAS	Administer the Water Act 1992 & Water Regulations 2001 including issuing of water discharge licences & intervening in cases of pollution.

# **Responsibility for Water Delivery**

It is unsurprising that water management in Australia is complex with many laws and agencies involved in the process. In fact, there are up to as many as 800 agencies that are responsible for the administration and management of water, at the federal, state, regional and local levels.

Water management and supply by utilities is also highly variable across the country, with some states and territories supplied by one very large utility, while others are served by a large number of smaller, mostly local government based, utilities. Table 9 describes potable water distribution in Australia. In some states a utility might only serve one town, though in most cases, utilities serve a number of towns.

State or Territory	Number of Water Utilities <sup>12</sup>	Supplier Description
Queensland	72	Local Councils and Regional water utilities
New South Wales	109	106 Local Councils + 3 Metro
Australian Capital Territory	1	Single State-wide water utility
Victoria	16	Regional water utilities (3 Metro + 13 Regional)
Tasmania	3	Regional water utilities
South Australia	1	Single State-wide water utility
Northern Territory	1	Single State-wide water utility
Western Australia	5	Single State-wide water utility + 4 small Local utilities

Table 9: Drinking water supply utilities in Australia
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<sup>&</sup>lt;sup>12</sup> As of May 2010



# **Project Methodology**



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# **Project Methodology**

# Overview of Methodology

A flow chart describing the overall process is provided below in Figure 11.

# START UP

- Client inception meeting
- Internal inception meeting incorporating risk identification and mitigation
- Internal start up workshop to confirm scope, methodology and responsibilities with project team

### DATA AND INFORMATION COLLECTION

- Shortlist towns within project scope, based on town population
- Identify key data and information sources
- Data and information collection from public sources and stakeholders
- Using data, identify towns for investigation
- Populate town profiles with available data

# DATA ANALYSIS

- Develop Excel and GIS databases using information from the town profiles
- Use database to identify most likely risk precursors
- Use database to identify trends indicating those towns that may be at greatest risk of poor water quality and/or security

# **OPTIONS ASSESSMENT**

- Using database results, identify what types of solutions are suitable
- Assess available information on current and proposed improvements to water reporting, frameworks, training, etc.
- Internal workshop
- Draft solutions in preparation for stakeholder workshop
- Develop implementation plan

# CONSULTATION

- Invitation to key stakeholders to participate in a workshop
- Prepare and issue briefing paper to workshop participants
- AECOM facilitated and organised workshops held across all states
- Follow up discussions with stakeholders where appropriate
- Finalise solutions based on workshop
   outcomes

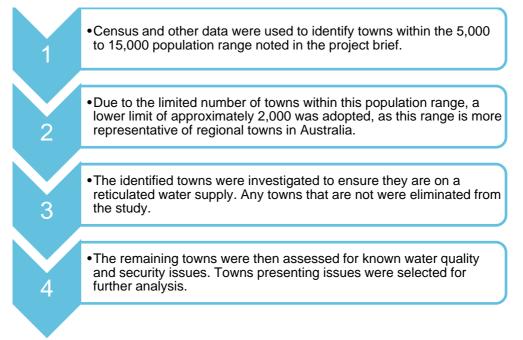
# REPORTING

- Draft Review of Regional Water Quality Report
- IA Review of Draft Reports
- Final Review of Regional Water Quality Report

Figure 11: Overall Project Methodology

# Identification of Towns for Investigation

Identification of towns to be included in the investigation was a four-step process. This process is described below in Figure 12.



### Figure 12: Town Identification Process

It is important to note that it was not the intent of this investigation to study every town in each state and territory that falls within the town scope outlined above. Due to the allocated program and budget for the project, the approach is more strategic and our aim was to investigate a sample of towns in each state or territory.

As there are no towns in the ACT that satisfy the requirements of the scope of this project, no towns in the ACT were selected for further investigation.

# **Town Profiles**

The risks listed in Figure 13 provide a snapshot of some of the physical and organisational risks to water quality and security. Risks such as these were used to identify towns to be included in the study.

AECOM prepared an excel template to capture the major water quality and security risks faced by each town sampled in the investigation. The template used to prepare the town profiles is provided in Appendix C.

# Data and Information Collection

Data and information on the selected towns was sourced via public websites, reports and with assistance from federal, state and local stakeholders. This information was used to populate the town profiles. It should be noted that Western Australia were excluded from this part of the investigation Water Corporation were unable to provide the necessary information, and there was very little publically available information on water quality and security in Western Australia.

Further information on water legislation, frameworks, best practice guidelines, reporting, training, reform and institutional arrangements was also compiled. This information is particularly relevant in establishing appropriate solutions. However, it should be understood that given the timeframe and abundance of information potentially available, that there may be gaps in this review, even following stakeholder liaison during the data and information collection phase.

Organisational Factors	<ul> <li>Inadequate rate base</li> <li>Inadequate funding</li> <li>Insufficient reporting requirements</li> <li>Lack of authority to enforce requirements</li> <li>Poor governance</li> <li>Poor management</li> <li>Poor maintenance</li> <li>Inappropriate quality standards/objectives</li> <li>Inadequate training of staff</li> </ul>
Physical Factors	<ul> <li>Lack of adequate water treatment</li> <li>Variable raw water quality</li> <li>Poor quality of water source</li> <li>Contamination of source water</li> <li>Unprotected catchment</li> <li>Effluent disposal to drinking water source</li> <li>Heavy industry impacting upon catchment</li> <li>Sewer overflows</li> <li>Algal blooms</li> <li>Inadequate disinfection</li> <li>Poor chlorine residuals in distribution system</li> <li>Vandalism and sabotage and acts of terrorism</li> <li>Single water supply source</li> <li>Single type of water source</li> <li>Disconnected supply sources</li> <li>Water intensive industries in town's locality</li> </ul>

Figure 13: Physical and Organisational Risk Factors that may lead to poor water quality and security

# **Options Development**

The development of solution options occurred in three phases:

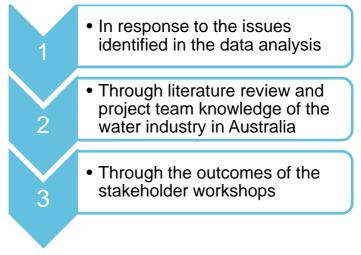


Figure 14: Solution Identification Methodology

Following completion of the town profiles, a nationwide database was established to capture the issues in each town used in the study. This database enabled the project team to determine what the major issues are across the country and within each state. The project team also used the information to attempt to draw cause and effect style conclusions. This allowed us to identify potential trends that may indicate susceptibility to water quality and security risk.

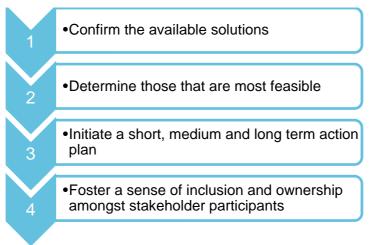
To supplement this process and to close potential information gaps, a literature review was performed to encapsulate other potential issues and solutions confronting the water industry in regional towns. In addition, the knowledge and experience the individual project team members have of the barriers to healthy water quality and reliable water supplies was utilised.

Completion of the two above steps enabled the project team to approach the stakeholder workshops with a broad range of solutions for consideration and discussion. The stakeholders provided information on initiatives and systems currently in place in each state. Additionally, proposed changes and other initiatives under development were also identified and investigated. Stakeholders were asked for alternate and additional solutions to those identified, for their professional opinion on which solutions would be more appropriate, and for their contribution on which solutions would be relatively simple or difficult to implement.

# Stakeholder Workshops

Stakeholder workshops formed part of the options development and assessment, ensuring that realistic solutions were identified and recommended. The workshops also assisted in determining barriers to implementation of proposed solutions.

The objectives of the workshops were to:



The workshops considered what solutions may be implemented from a Commonwealth, state and utility level. While the objective of the project was to provide recommendations for improvement, workshop participants were also asked to focus on what is done well at a Commonwealth, state and utility level.

Workshops were held for each state and territory to ensure local issues and solutions were identified and incorporated. A national stakeholder workshop was also held to capture broader issues, as well as those solutions that may be implemented at a Commonwealth level.

A workshop was not held in Western Australia following a decision by Water Corporation not to participate. Water Corporation also requested that the other stakeholders, the Department of Health and the Department of Water, not participate in the workshop.

The discussion points addressed during the workshop were:

- Introduction to the workshop and project
- Introductions by Stakeholder participants
- The current situation in water
- Overview of towns included in the study and how they were chosen
- Some Results from the investigation so far
- Other issues that may not be conclusive via the data analysis
- Solutions already identified and what other solutions might be available
- "Wish list", i.e. if all options were feasible, what we would do to fix water quality and security
- Barriers to implementation of available options
- Options that may be implemented in the short, medium and long term

- Who should be responsible for implementing these options
- General response to Commonwealth Government's interest in water quality and security in regional Australia

The workshops ran for approximately three hours each. During the workshop, open conversation and debate was encouraged, however, "barrow pushing" was not accepted. An AECOM team member was responsible for recording minutes during the sessions. A workshop summary was circulated to workshop participants for feedback. Submission of additional information was also invited during the week following the workshops.

Invitations to the workshops were issued to a number of key stakeholders. Stakeholders were chosen for their broad knowledge and responsibilities within their study areas. The stakeholders who agreed to participate in the workshops are shown in Table 10.

Table 10: Workshop Participants

Study Area	Organisation	Name	Role
National	Department of Environment, Water,	Steve Costello	Assistant Secretary, Urban Water Security
	Heritage and the Arts (DEWHA)	Craig Bradley	Director, Cities and Towns - Urban Water Security
National	Water Services Association Australia (WSAA)	Adam Lovell	Manager, Science and Sustainability
National	Water Industry Operators Association (WIOA)	George Wall	Executive Officer
National	National Health and Medical Research Council Water Quality Advisory Committee (NHMRC WQAC)	Peter Mosse	Member
NSW	Department of Health	Paul Byleveld	Manager, Water Unit
NSW		Sandy Leask	Water Unit
NSW	NSW Office of Water (Department of Environment Climate Change and	Sam Samra	Manager Water Utility Performance
	Water, or DECCW)	Bill Ho	Manager of Water and Sewerage
NSW	Water Directorate	Gary Mitchell	Executive Officer
11311		Stewart McLeod	Chair
VIC	Department of Human Services (DHS)	David Sheehan	Program Manager, Drinking Water Regulation
VIC	Goulburn Valley Water (and also representing VicWater)	Bruce Hammond	General Manager - Technical Services
VIC	Essential Services Commission	Stuart Christie	-
TAS	Department of Health and Human	Scott Burton	Senior Environmental Health Officer
TAS	Services (DHHS)	Raquel Esteban	State Water Officer, Public & Environmental Health
TAS	OnStream	Cam Crawford	Executive Manager, Development and Strategy
QLD	Department of Environment and Resource Management (DERM)	Richard Priman	Director of Regional Water Supplies
QLD	Office of Water Supply Regulator (DERM)	Dr. Anne Gardiner	Principal Scientist, Office of the Water Supply Regulator
QLD	Queensland Water Directorate	Dr Rob Fearon	Executive Manager
		Dennis Steffensen	Principal Scientific Advisor
SA	SA Water	Amber Lang	Water Quality Performance Manager
		Paul Doherty	Manager Systems Planning
SA	Department of Health	Nerissa Walton	Senior Scientific Officer – Water Quality

Study Area	Organisation	Name	Role
	Water Quality Research Australia	Jodieanne Dawe	CEO
SA/National	(WQRA)	Michelle Akeroyd	Program Manager – Drinking Water
NT	Power and Water	Noel McCarthy	Senior Quality Systems Officer

It should also be noted that the National Water Commission, Australian Water Association, NSW State Water, the Victorian Essential Services Commission, the Victorian Department for Sustainability and the Environment were also invited to the workshops but were unable to attend due to prior commitments.

# Assessment of Solutions

Those issues that the project team and stakeholders determined to pose the most risk and greatest uncertainty were identified. Following this, the project team identified the best policy related solutions for the prominent issues. Policy based solutions, rather than specific engineering based solutions, were utilised to ensure the Commonwealth Government would be able to drive implementation of the proposed reform agenda.

# **Implementation Plan**

An implementation plan was prepared for each of the ten recommended solutions. The implementation plan provides a staged approach or alternative options, where applicable. The implementation plan also nominated an indicative timeframe by which the recommendations should be implemented.



# Town Profile Template



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# Appendix C Town Profile Template

-	z	State/Territory			
		Town Name			
Ĥ	-	Town Population			
		Name of Water Utility			
Ш	È	Rate (\$/kL)			
WAT	UTILITY	Per Capita Water Consumption (L/day)			
		Number of Connections			
	במ	Catchment			
L E	₽₩	Sub-Catchment			
HO	₹ d	Catchment Protection Status			
	SUPPLY	Potable Water Source(s)			
	<b>`</b>	Supply Capacity			
	~	Treatment Plant(s)			
L R	Ê	Level of Treatment			
L AN	QUALITY	Drinking Water Guidelines			
	0	Results			
{	►	Current Water Restrictions			
		Proportion of Potable Water Supplied to Households (%)			
		Distance from the Coast (km)			
L F		Climate			
	~	Average Annual Rainfall			
			YES/NO	NOTES/EXPLANATION	
	<u> </u>	Average Annual Rainfall FACTOR Drought	YES/NO	NOTES/EXPLANATION	
		FACTOR	YES/NO	NOTES/EXPLANATION	
		FACTOR Drought	YES/NO	NOTES/EXPLANATION	
		FACTOR Drought Single drinking water source	YES/NO	NOTES/EXPLANATION	
ISK (CAUSE)		FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into	YES/NO	NOTES/EXPLANATION	
ISK (CAUSE)		FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source	YES/NO	NOTES/EXPLANATION	
ISK (CAUSE)		FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding	YES/NO	NOTES/EXPLANATION	
ISK (CAUSE)		FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake	YES/NO	NOTES/EXPLANATION	
ISK (CAUSE)		FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g.	YES/NO	NOTES/EXPLANATION	
ISK (CAUSE)	Catchment and Water Supply	FACTORDroughtSingle drinking water sourcePoor quality water sourceSewage overflow or disposal into water sourceFloodingFauna defecating in supplyFauna destroying water intake structuresNatural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)	YES/NO	NOTES/EXPLANATION	
ISK (CAUSE)		FACTOR         Drought         Single drinking water source         Poor quality water source         Sewage overflow or disposal into water source         Flooding         Fauna defecating in supply         Fauna destroying water intake structures         Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)         Un-lined landfills	YES/NO	NOTES/EXPLANATION	
		FACTORDroughtSingle drinking water sourcePoor quality water sourceSewage overflow or disposal into water sourceFloodingFauna defecating in supplyFauna destroying water intake structuresNatural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)Un-lined landfillsExtensive agriculture Low vegetation cover (dust,	YES/NO		
ISK (CAUSE)		FACTORDroughtSingle drinking water sourcePoor quality water sourceSewage overflow or disposal into water sourceFloodingFauna defecating in supplyFauna destroying water intake structuresNatural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)Un-lined landfillsExtensive agricultureLow vegetation cover (dust, sediment runoff)	YES/NO		

		Aquifer turning saline due to high extraction							
		Hard water							
		Aging or inadequate pipe work and associated infrastructure							
		Significant water losses due to leaking pipes							
		High per capita water consumption							
		Inappropriate water quality standards / objectives							
	Governance	Lack of infrastructure maintenance							
	erna	Poor management or governance							
	Gov	Vandalism / sabotage / terrorism							
		Insufficient trained personnel							
		Inadequate funding for maintenance or upgrades							
	se	Mining / minerals							
	Industries	Irrigation							
	Ind	Chemicals / process							
	ation	Seasonal population loadings							
	Population	Rapid population growth							
		Pathogenic contamination							
SISK		Algal blooms							
CURITY RISK		Heavy metal contamination							
URI <sup>-</sup>		Poor chlorine residuals							
EC.		Pesticide contamination							
DR S	EC.	Boil water notices		 					
Z Z		Deaths or illness due to water quality		 					
QUALI'	(EFFECT)	Water restrictions (current and historic)		 _	_	_	_	_	_
Ë		Taste and odour issues							
WAT		Other contamination that would affect health							
		Notes							



# Town Profiles – QLD



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own # Z		State/Territory	Qld-North		
TOWN		Town Name	Napranum Aboriginal Shire Council		
		Town Population	830 (Census 2006, Urban Centre/Locality)		
		Name of Water Utility	Napranum Aboriginal Shire Council		
WATER	5	Rate (\$/kL)	No rates charge	ged to users - Aboriginal community	
۲A_	Ē	Per Capita Water Consumption (L/day)	In September 2009, it was approximately 2,000L/person/day.		
>		Number of Connections	218		
z		Catchment	Groundwater		
CA I CHIMEN T AND	WATER SUPPLY	Sub-Catchment	N/A		
5₹	T H	Catchment Protection Status	nil		
ξ⊢	S S	Potable Water Source(s)		ter supply 10 to 30m depth.	
		Supply Capacity		ly - allowable extraction unknown.	
WATER	È	Treatment Plant(s)	N/A refer abov	VA refer above lil. Bores pump to the reservoir, water is then pumped from the reservoir to the old high level tank.	
Ę	AL	Level of Treatment	Nil. Bores pump to the reservoir, water is then pumped from the reservoir to the old high in None. Water quality testing is not undertaken.		
Ś	B	Drinking Water Guidelines Results			
		Current Water Restrictions	No water quality testing is completed. Yes, due to the high lift pumps failing - the bores were diverted to the high level tank and operated		
	≻	Proportion of Potable Water Supplied to Households			
WATER	F	(%)	100% - there i	is a farm, however it is owned by Council and has its separate bore.	
AT	2	Distance from the Coast (km)	<100m		
≥	ы	Climate	<ruom< p=""> Tropical. High rainfall Dec to March, April to November low rainfall periods.</ruom<>		
		Average Annual Rainfall	"over 2 metres" (No information available from BOM, however based on knowledge of area)		
		FACTOR	YES / NO	NOTES / EXPLANATION	
				Council is concerned they will run out of water. Water demand management is require	
				address this issue.	
		Drought	No		
				Napranum is not listed as being drought declared as at 30 September 2009 on	
				www.longpaddock.qld.gov.au	
		Single drinking water source	Yes		
		Poor quality water source	No		
	γo	Sewage overflow or disposal into water source	No	Treated sewage overflows to the ground; may soak into the ground water. Pump statio	
	Catchment and Water Supply			overflows occur perhaps once/year.	
	S S	Flooding	No	The area floods, but this doesn't affect the bores - water table rises.	
	ate	Fauna defecating in supply	No	People de Liondeliem	
	3	Fauna destroying water intake structures	No	People do – vandalism.	
	pue	Natural mineral pollutants (e.g. uranium, nitrates,	No	Suspected high levels of dissolved CO2 in ground water causing damage to the brass,	
(;	ut a	iron, fluoride)	Vee	copper fittings in house plumbing, hydrants, meters etc. Lots of unofficial dump sites - the community dumps dead dogs regularly.	
	ne	Un-lined landfills Extensive agriculture	Yes No	Lots of mining activity in the area - Bauxite, adjacent to Weipa.	
WALER GUALITY OR SECORITY RISK (CAUSE)	tchi	Low vegetation cover (dust, sediment runoff)	Yes	Lots of dust in the dry season.	
	Ca			Only ground water, alternate source not available apart from desalinated supply (no cur	
2	0	Poor access to supply	No	provision).	
Ľ		Unsustainable water extraction	Possibly	Not sure what the licence is. The mines use a lot of ground water.	
-		Aquifer turning saline due to high extraction	No	Not that is known.	
ч Л		Hard water	No	Not that is known.	
ך ח		Aging or inadequate pipe work and associated	¥		
2		infrastructure	Yes	Council is regularly locating and repairing leaks.	
5		Significant water losses due to leaking pipes	Yes	High water usage.	
1		High per capita water consumption	Yes	Approximately 2000L/person/day in the dry season, mixture of high usage and excessiv	
H I		<b>3 1 1</b>		leaks.	
Ú,	a	Inappropriate water quality standards / objectives	N/A	No testing is done.	
r r		Lack of infrastructure maintenance	Yes	Common across all aboriginal communities.	
Ц	Governance			The current manager is good, however, his staff have a low skill and knowledge base.	
AV A	E C	Poor management or governance	Yes	current manager was to leave then level of service would drop. Poor management of w	
-	ove			and sewerage systems is common across all aboriginal communities.	
	ğ	Vandalism / sabotage / terrorism	Ves	Napranum is not too had, however, it is common across all aboriginal communities	
		Vandalism / sabotage / terrorism Insufficient trained personnel	Yes Yes	Napranum is not too bad, however, it is common across all aboriginal communities. Common across all aboriginal communities.	
		Inadequate funding for maintenance or upgrades	Yes	Common across all aboriginal communities.	
	S	Mining / minerals	Yes	Lots of mining activity in the area - Bauxite.	
	Industries				
	Inst	Irrigation	No	The Council farm has its own bore.	
	lnc	Chemicals / process	No		
				Population increased during the "Wet Season" but not much when compared with othe	
	atio	Seasonal population loadings	Yes	aboriginal communities.	
	<ul> <li>Population</li> </ul>			•	
		Rapid population growth	Yes	Growth is greater than State Average based on Census data, however Council records indicate otherwise.	
		Pathogenic contamination	No	None known, due to lack of sampling.	
WATER QUALITY OR	U U	Algal blooms	No	None known, due to lack of sampling.	
ō	Ë	Heavy metal contamination	NO	None known.	
Ł	Ü				
ALI	X	Poor chlorine residuals Pesticide contamination	Yes	No chlorination.	
DC DC	SIN	Boil water notices	No	None known. None known.	
R	≿		No No		
E	E	Deaths or illness due to water quality Water restrictions (current and historic)	Yes	None known. Only when something fails i e, nump/switchhoard etc.	
A.	10		Yes No	Only when something fails i.e. pump/switchboard etc.	
>	U U	Taste and odour issues		None known.	
	0)	Other contamination that would affect health	Unknown	Suspected high levels of dissolved CO2 in ground water. an indigenous community located on the edge of Weipa - North Queensland.	

R TOWN	2	State/Territory	Qld-North					
		Town Name	Emerald					
		Town Population	Emerald 10,990 (Census 2006, Urban Centre/Locality)					
LL -		Name of Water Utility	Emerald Shire Council	an control codardy)				
μĒ	Ę	Rate (\$/kL)	Unknown					
WATER	Ē	Per Capita Water Consumption (L/day)	Unknown					
5	_	Number of Connections	Unknown					
		Catchment	Lake Maraboon					
T H		Sub-Catchment	Unknown					
U H	5	Catchment Management Authority (CMA)	Emerald Shire Council					
HS≥	i di	CMA Web-Link	www.emerald.gld.gov.au					
D D D	เม	Catchment Protection Status	Unknown					
CATCHMENT AND WATER SUPPLY		Potable Water Source(s)	Lake Maraboon					
		Supply Capacity	Unknown					
		Treatment Plant(s)	None					
≥		Level of Treatment Drinking Water Guidelines	None ADWG 2008					
<b>WATER QUALITY</b>		Drinking Water Ouldennes	Typical Results	Lake Maraboor	ADWG 2004			
n n			Fluoride (mg/L)	Unknown	1.5 mg/L			
0			pH	Unknown	6.5-8.5			
臣		Results	Chlorine residual (mg/L)	Unknown	5 mg/L			
LA			Alkalinity (mg/L)	Unknown	??			
>			Hardness (mg/L)	Unknown	200 mg/L as CaCO3			
			Turbidity (NTU)	Unknown	5 NTU			
			Sprinkler Ban:					
			Monday - 12 am - 12 pm					
≻			Tuesday-Sunday - 9am - 7 pm					
L'A		Current Water Restrictions						
SC			Refer to:					
S			www.emerald.gld.gov.au/Co	mmunity/Your Neid	hbourhood/Water.htm			
WATER SECURITY		Proportion of Potable Water Supplied to						
A TE		Households (%)	Unknown					
Ň		Distance from the Coast (km)	300km					
		Climate	Dry					
		Average Annual Rainfall	525mm					
		FACTOR	YES / NO	NOT	TES / EXPLANATION			
				Emerald is not listed as being drought declare as at 30 September 2009 on				
		Drought	No		ck.qld.gov.au. It is noted that			
		brought			some areas of Central Highlands Regional			
				Council is droug				
		Single drinking water source	Unknown					
		Poor quality water source	Unknown					
	≥	Sewage overflow or disposal into water	Unknown					
	dd	source		_				
	N,	Flooding	Yes					
	Catchment and Water Supply	Fauna defecating in supply	Yes					
		Fauna destroying water intake structures	Yes					
~		Natural mineral pollutants (e.g. uranium,						
ЭË		nitrates, iron, fluoride)						
Ŭ,		Un-lined landfills	Vaa					
<u>Ú</u>	chn	Extensive agriculture	Yes	+				
X	Cato	Low vegetation cover (dust, sediment runoff)	Yes					
OR SECURITY RISK (CAUSE)	Ö	Poor access to supply		1				
≽		Unsustainable water extraction						
R				1				
C		Aquifer turning saline due to high extraction						
SE		Hard water	1	1				
CR		Aging or inadequate pipe work and						
~		associated infrastructure						
5								
٩N		Significant water losses due to leaking pipes						
ð		High per capita water consumption						
H		Inappropriate water quality standards /						
2	lce	objectives		_				
/ATE	าลท	Lack of infrastructure maintenance						
WATER QUALITY	Governance	Poor management or governance						
WATE	õ	Vandalism / sabotage / terrorism						
WATE		Insufficient trained personnel						
WATE	O			1				
WATE	0	Inadequate funding for maintenance or						
WATE	_	upgrades						
WATE	_							
WATE	_	upgrades						
WAT	Industries	upgrades Mining / minerals Irrigation						
WAT	Industries	upgrades Mining / minerals						
WATE	Industries	upgrades Mining / minerals Irrigation Chemicals / process						
WATE	Industries	upgrades Mining / minerals Irrigation						
WATE	Industries	upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings	YES		er than State Average based (			
WATE	_	upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth	YES	Growth is great Census data	er than State Average based o			
	Population Industries	upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination	YES		er than State Average based of			
_	Population Industries	upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms	YES		er than State Average based o			
_	Population Industries	upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms Heavy metal contamination	YES		er than State Average based (			
	Population Industries	upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms Heavy metal contamination Poor chlorine residuals	YES		er than State Average based o			
_	Population Industries	upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination	YES		er than State Average based o			
	Population Industries	Upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination Bol water notices	YES		er than State Average based o			
	Population Industries	upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms Heavy metal contamination Peor chlorine residuals Pesticide contamination Boil water notices Deaths or illness due to water quality	YES		er than State Average based o			
	Population Industries	upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination Boil water notices Deaths or illness due to water quality Water restrictions (current and historic)	YES		er than State Average based o			
	Population Industries	upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination Boil water notices Deaths or illness due to water quality Water restrictions (current and historic) Taste and odour issues	YES		er than State Average based o			
WATER QUALITY OR	Population Industries	upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination Boil water notices Deaths or illness due to water quality Water restrictions (current and historic)	YES		er than State Average based o			

7		State/Territory	Qld-North				
TOWN		Town Name	Longreach				
2		Town Population	2,976 (Census 2006, Urt				
۲ د ۲	-	Name of Water Utility	Longreach Regional Cou	Incil			
WATER	5	Rate (\$/kL)	\$0.7/kL	ced by water treatment pla	ant - FML /day		
2 ×	5	Per Capita Water Consumption (L/day) Number of Connections	1,500	ced by water treatment pla	anit = SiviL/day		
		Catchment	Thompson River				
CATCHMENT AND	5	Sub-Catchment	-				
	Ļ	Catchment Management Authority (CMA)	Longreach Regional Cou				
Ē	6	CMA Web-Link	www.longreach.gld.gov.a	<u>u</u>			
E E	Ľ L	Catchment Protection Status	Nil Thompson River				
ATO	5	Potable Water Source(s)	Bore Water				
0 -	Supply Capacity		5MI/day and peak day demand at 9ML/day				
		Treatment Plant(s) Level of Treatment	Longreach Water Treatm		sation disinfection		
≻		Drinking Water Guidelines	ADWG 2008	, DAF, granular media filti	auon, disiniection		
WATER QUALITY			Typical Results	Longreach Water	ADWG 2008		
N				Treatment Plant			
20			Fluoride (mg/L) pH	Unknown Unknown	1.5 mg/L 6.5-8.5		
Ē		Results (% compliance for 2008 reporting period)	Chlorine residual (mg/L)	Unknown	5 mg/L		
A		penedy	Alkalinity (mg/L)	Unknown	??		
			Hardness (mg/L)	Unknown	200 mg/L as CaCC		
			Turbidity (NTU)	Unknown	5 NTU		
			Residential				
			Monday to Sunday 6am to 8am				
			5pm to 8pm				
≻			· ·				
WATER SECURITY		Current Water Restrictions	Commercial	idau			
DO:			Monday, Wednesday, Fr 6am to 9am	loay			
SE			4pm to 7pm				
Ë							
VAT			Refer to www.longreach.	qld.gov.au			
5		Proportion of Potable Water Supplied to Households (%)	100%				
		Distance from the Coast (km)	~850km				
		Climate	Dry				
		Average Annual Rainfall	450mm (sourced from w				
	1	FACTOR	YES / NO	NOTES / E	EXPLANATION		
					Council is listed as bein		
		Drought	Yes		ared as at 30 Septembe		
				2009 on www.longpa	ddock.qld.gov.au		
		Single drinking water source	No				
		Poor quality water source					
		Sewage overflow or disposal into water	No				
	ply	source Flooding	Yes				
	Catchment and Water Supply	Fauna defecating in supply	Yes				
	ter	Fauna destroying water intake structures	Yes				
	Na	Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)					
ш	and	Un-lined landfills					
SU S	ant	Extensive agriculture	Yes				
Ő	Ĕ	Low vegetation cover (dust, sediment	Yes				
ЯK	atcl	runoff)					
Ř	O	Poor access to supply Unsustainable water extraction	No				
SECURITY RISK (CAUSE)							
CLF		Aquifer turning saline due to high extraction					
SEC		Hard water					
		Aging or inadequate pipe work and					
×		associated infrastructure Significant water losses due to leaking					
E .		pipes					
NA	ance	High per capita water consumption					
8		Inappropriate water quality standards /	No				
WATER QUALITY OR		objectives Lack of infrastructure maintenance					
WA	ma	Poor management or governance					
	s Governance	Vandalism / sabotage / terrorism					
		Insufficient trained personnel					
		Inadequate funding for maintenance or upgrades					
		Mining / minerals	Yes				
	Industries						
	subr	Irrigation	Yes				
		Chemicals / process	No				
	ion	Seasonal population loadings	No		-		
	Population	second population todarings					
	Idoc	Rapid population growth	No		perienced between 200		
		Pathogenic contamination		and 2006 Census			
r C	2	Algal blooms					
e l		Heavy metal contamination					
ĘĘ	Ū,	Poor chlorine residuals					
JAL V	20	Pesticide contamination					
WATER QUALITY OR	Ľ	Boil water notices Deaths or illness due to water quality					
Ë		Water restrictions (current and historic)	Yes				
TAV	Ş	Taste and odour issues					
< (	ú	Other contamination that would affect health					
- ;	0			1			

		Etoto/Torritory	Old North				
TOWN		State/Territory Town Name	Qld-North Cloncurry				
TO		Town Population	Cloncurry 2,384 (Census 2006, Urban Centre/Locality)				
CATCHMENT AND WATER . WATER SUPPLY UTILITY		Name of Water Utility	Cloncurry Shire Council				
		Rate (\$/kL)		Diant reading a 4 h	AI /J		
		Per Capita Water Consumption Number of Connections	Unknown. Water Treatment Plant produces 4 ML/day. approx 1 200				
		Catchment	approx. 1,200 Chinaman Creek and Cloncurry River Catchment				
		Sub-Catchment	Unknown				
		Catchment Management Authority	Cloncurry Shire Council				
		(CMA) CMA Web-Link	-				
		Catchment Protection Status	www.cloncurry.gld.gov.au Unknown				
		Potable Water Source(s)	Cloncurry River				
			Chinamen Creek Dam				
		Supply Capacity Treatment Plant(s)	4 ML/day Cloncurry Water Treatment Plant				
		Level of Treatment	Coagulation, clarification, media filtration and disinfection with chlorination (chlorine gas).				
<b>WATER QUALITY</b>		Drinking Water Guidelines	ADWG 2008				
T			Typical Results		ADWG 2004		
g			Fluoride (mg/L)	0.30	1.5 mg/L		
Ë		Results	pH Chlorine residual (mg/L)	7.80	6.5-8.5 5 mg/L		
VAT		TC-SUI(3	Alkalinity (mg/L)	194.00	??		
5			Hardness (mg/L)	199.00	200 mg/L as CaCO3		
			Turbidity (NTU)	<1	5 NTU		
			Currently on Level 1 Restric	tions:			
≿		Current Water Restrictions	Sprinkling only between 6:00am to 9:00am and 6:00pm to 9:00pm "odds & evens"				
JRI		Current water Restrictions					
L L			Refer to www.cloncurry.qld.g	gov.au/community/c	community_waterrestrictions.shtml.		
WATER SECURITY		Proportion of Potable Water	100%				
TEF		Supplied to Households (%)					
NA.		Distance from the Coast (km)	~ 400km to the gulf				
2		Climate Average Annual Rainfall	Arid, long hot Summers 472mm				
		FACTOR	YES/NO		NOTES / EXPLANATION		
	1	THOTON .	120/110	Cloncurry is not	t listed as being drought declared as at 30 September 2009 on www.longpaddock.qld.gov.		
				-			
		Drought	No		Cloncurry has faced severe water shortages over the last 15 years when the wet season does not repler the dam supply. Supplemented by flood harvesting from the Cloncurry river into the dam storage, river we		
				extracting water stored in the river bed and bores brought on loine around town when the dam supply run			
		Qia da driabia a contra a contra	NI-	Cloncurry River	and Chinamen Creek Dam. Qld State Government is currently constructing pipeline from		
		Single drinking water source	No	North West Pip	eline to supplement Chinaman Creek Dam.		
		Poor quality water source	No				
		Sewage overflow or disposal into	No				
	~	water source					
	Catchment and Water Supply	Flooding	Yes		urry River caused damage to the Chinaman Creek dam fuse plug in 1997, causing a loss		
				storage. Floodi	ing in Cloncurry River has caused damage to river well system.		
		Fauna defecating in supply	Yes	Cattle in dam st	orage area.		
		Fauna destroying water intake	Unknown				
	anc	structures					
~	ent	Natural mineral pollutants (e.g.	Yes		high levels of iron and manganese in periods of high runoff during wet season. This		
ISE	Ĕ	uranium, nitrates, iron, fluoride)		overloads the V	VTP for short periods resulting in very dirty water.		
SAL	atcl	Un-lined landfills	No				
RISK (CAUSE	0	Extensive agriculture	Yes	Beef cattle in C	hinaman Creek and Cloncurry River upstream catchment.		
SIS		Low vegetation cover (dust,	Yes				
		sediment runoff)	<b>N</b> 1				
RIT		Poor access to supply Unsustainable water extraction	NO	+			
CU		Aquifer turning saline due to high					
SE		extraction					
OR		Hard water					
≿		Aging or inadequate pipe work and	Yes		on network consists of asbestos cement (AC) mains in places. Regular leaks require		
ALI		associated infrastructure Significant water losses due to		patching. Low p	pressure in outer areas of town.		
QU.		leaking pipes	Yes	Believed to be b	but not proven.		
WATER QUALITY OR SECURITY			Vac	> 500 1 /	dav		
ATE		High per capita water consumption	Yes	> 500 L/capita/o	зау		
≥.		Inappropriate water quality standards	No				
	Jce	/ objectives		Danie i			
	Industries Governance	Lack of infrastructure maintenance	Yes		age inadequate for usage, water treatment plant at capacity. Council is pursuing opportur ementary supply from Julius Dam pipeline.		
		Poor management or governance	Unknown	to cource suppl	energy cappy noncourse can pipeline.		
		Vandalism / sabotage / terrorism	No				
		Insufficient trained personnel	Unknown				
		Inadequate funding for maintenance	Yes				
		or upgrades					
		Mining / minerals	Yes		upstream. Dewatering activities for Ernest Mine anecdotally lowers groundwater over a la		
				enough area to	affect Cloncurry township bore supplies.		
		Irrigation	No				
		Chemicals / process	No				
	ч	Seasonal population loadings	No	Donul-fin 1	ing sumarian and between 2001 and 2000 On-		
	Population			Population decli	ine experienced between 2001 and 2006 Census		
	ndc	Rapid population growth	No	New mining acti	ivity can result in rapid population growth. Current water limitations allegedly impacting on		
	ď				attract new mining operations.		
~		Pathogenic contamination	No		U m m m		
ECURITY		Algal blooms	No	1			
4		Heavy metal contamination	No				
		Poor chlorine residuals	No				

CT S	Pesticide contamination	No	
8 문	Boil water notices	Yes	When required under the Act.
ALITY OR K (EFFEC	Deaths or illness due to water quality	Unknown	
RISK	Water restrictions (current and historic)	Yes	
芭	Taste and odour issues	Yes	Associated with fresh runs in river or when dam levels are getting low.
LAW	Other contamination that would affect health		
	Notes		

Ę	5							
2		State/Territory	Qld-North					
TOWN		Town Name	Charters Towers	<b>A</b>				
		Town Population	7,979 (Census 2006, Urban Centre/Locality) Charters Towers Regional Council					
Ľ ř	≿	Name of Water Utility		ouncil				
WATER		Rate (\$/kL)	Unknown	Plant produces 44ML (-1				
2	5	Per Capita Water Consumption (L/day)	Unknown. Water Treatment	Plant produces 14ML/day.				
	_	Number of Connections	>2,500					
93	~	Catchment Burdekin River						
CATCHMENT AND	2	Sub-Catchment	-					
누	£	Catchment Management Authority (CMA)	Charters Towers Regional C					
្រ៍ដ្	S	CMA Web-Link	www.charterstowers.qld.gov.au					
₹£	ж Ж	Catchment Protection Status	Restricted access to public.					
21	Id	Potable Water Source(s)	Burdekin River Weir Burdekin River					
A S	Ś		Burdekin River					
		Supply Capacity	14ML/day					
		Treatment Plant(s)	F E J Butcher Treatment Pla					
≻		Level of Treatment		edia filtration and disinfection with	chiorine (chiorine gas).			
5		Drinking Water Guidelines	ADWG 2004					
<b>ΜΑΤΕ</b> ΩUALITY			Typical Results	F E J Butcher Treatment Plant	ADWG 2004			
ō			Fluoride (mg/L)	0.12	1.5 mg/L			
L L L L L L L L L L L L L L L L L L L			pH	7.30	6.5-8.5			
E		Results	Chlorine residual (mg/L)	2.80	5 mg/L			
Ň			Alkalinity (mg/L)	120.00	??			
			Hardness (mg/L)	100.00	200 mg/L as CaCO3			
			Turbidity (NTU)	0.22	5 NTU			
,	>	Current Water Restrictions	Unknown					
WATER	Ê	Proportion of Potable Water Supplied to	Unknown					
Ë	Ч	Households (%)						
A C	Ú Ú	Distance from the Coast (km)	130km					
> L	S	Climate	Dry					
		Average Annual Rainfall	620mm					
		FACTOR	YES / NO	NO	TES / EXPLANATION			
		Draught	Ne	Charters Towers is not listed as o	drought declared as at 30th September 2009 on			
		Drought	No	www.lonpaddock.gld.gov.au	3			
		Single drinking water source	Yes	······				
		Poor quality water source	No					
			INU					
		Sewage overflow or disposal into water	No					
		Source	¥					
	Catchment and Water Supply	Flooding	Yes					
		Fauna defecating in supply	Yes					
		Fauna destroying water intake structures	No					
		Natural mineral pollutants (e.g. uranium,	Unknown					
		nitrates, iron, fluoride)						
		Un-lined landfills	No	N/A as water supply source is loc	cated some 20 km from town.			
Ш́	p	Extensive agriculture	Yes					
ŝ	tai	Low vegetation cover (dust, sediment	Yes					
ð	en	runoff)	N 1					
¥	μų	Poor access to supply	No					
SIS	atc	Unsustainable water extraction	Unknown					
Ϋ́	C	Aquifer turning saline due to high extraction	N/A					
Ĕ		Llord weter						
5		Hard water	Unknown					
С Ш		Aging or inadequate pipe work and	No	Assets are generally in good con	dition.			
WATER QUALITY OR SECURITY RISK (CAUSE)		associated infrastructure Significant water losses due to leaking			n Qld government to install pressure reducing			
ALITY		pipes	No	valves across network. Council is leaks.	s diligent on water consumption and possible wa			
à		High per capita water consumption	Yes	1				
۲ ۲		Inappropriate water quality standards /						
Ē	e	objectives	No					
<pre>X</pre>	Governance	Lack of infrastructure maintenance	No					
5	Line in the second seco	Poor management or governance	No					
	5 V	Vandalism / sabotage / terrorism	No					
	ğ	Insufficient trained personnel	No					
		Inadequate funding for maintenance or upgrades	No					
	Industries	Mining / minerals	No					
	snp	Irrigation	No					
	Ĕ	Chemicals / process	No	1				
	Population	Seasonal population loadings	Yes	Generally around large events i.e music festival	. Goldfield ashes cricket carnival and Country			
	do	-						
_		Rapid population growth	No	Population decline experienced b	etween 2001 and 2006 Census			
Í	6	Pathogenic contamination	Unknown	Dreviewe externals of				
R	Ш.	Algal blooms	Yes	Previous outbreak of geosmin blo	ooms			
	1	Heavy metal contamination	Unknown					
	Щ.	Poor chlorine residuals	Unknown					
Εļ	б	Pesticide contamination	Unknown					
	r	Boil water notices	Unknown					
	È	Deaths or illness due to water quality	Unknown					
	RIT Y F	Water restrictions (current and historic)	Yes	Odds and evens watering bans b				
	CURITY	Water restrictions (current and historic) Taste and odour issues			ut exact details are unknown. plain of water unsuitable for drinking.			
WATER QUALITY OR	SECURITY	Water restrictions (current and historic)	Yes					

own #	6	State/Territory	Qld-North			
TOWN		Town Name	Innisfail			
		Town Population	8,262 (Census 2006, Urban Centre/Locality)			
≥		Name of Water Utility	Cassowary Coast Regional Co	ouncil		
5			Refer to			
5		Rate (\$/kL)	www.jsc.qld.gov.au/council/Corp		/Financial%20Managemen	
CATCHMENT AND WATER UTILITY SUPPLY			Financial%20Management.shtml			
		Per Capita Water Consumption (L/day)	Unknown. Volume produced by	water treatment	plant - 12ML/day.	
		Number of Connections	4,885	Crook		
μ		Catchment Sub-Catchment	Johnson River Basin, Liverpoo	ol Creek		
CATCHMENT AND WATER	Ϋ́	Catchment Management Authority (CMA)	Cassowary Coast Regional Co	ouncil		
HON	Ч	CMA Web-Link	www.jsc.qld.gov.au			
ND ATC	ซ	Catchment Protection Status	Wet Tropics World Heritage lis Surface water	sted		
ບ ∢		Potable Water Source(s) Supply Capacity	7ML/d and peak day demand a	it 12ML/d		
		Treatment Plant(s)	Innisfail Water Treatment Plan			
			Coagulation, clarification, gran	ular media filtratio	on, disinfection (sodium	
≽		Level of Treatment	hypochlorite).			
L I		Drinking Water Guidelines	ADWG 2008			
		Difficing Water Guidelines	Typical Results	Innisfail WTP	ADWG 2004	
Ц Ц			Fluoride (mg/L)	-	1.5 mg/L	
WATER QUALITY		Desute	pH Oblasica assistual (mail.)	7.20	6.5-8.5	
Ň		Results	Chlorine residual (mg/L) Alkalinity (mg/L)	1.75 20.00	5 mg/L ??	
			Hardness (mg/L)	20.00	200 mg/L as CaCO3	
			Turbidity (NTU)	0.15	5 NTU	
			Level 1 Restrictions:			
			- No watering on Mondays			
È		Current Water Restrictions	- Odds and evens split			
UR			<ul> <li>Watering only allowed between</li> </ul>	5-7 am and 7-9 pr	n	
Ŭ.			Refer to http://www.cassowaryo	oast ald gov au/2	009/09/water-restrictions	
WATER SECURITY		Droportion of Datable Matter Oversited (	no.or to map.//www.cassowaryt	.sust.quu.yuv.au/2	so // o // water -restrictions/	
ATE		Proportion of Potable Water Supplied to Households (%)	Unknown			
Ń		Distance from the Coast (km)	10km			
		Climate	Wet Tropics			
		Average Annual Rainfall	3560mm (sourced from www.b			
	1	FACTOR Drought	YES / NO		S / EXPLANATION sted as being drought	
		Drought Single drinking water source	No No	ininatan is nu( li	and as being a Duynt	
		Poor quality water source	Unknown			
		Sewage overflow or disposal into water	No			
		SOURCE				
	≥	Flooding Fauna defecating in supply	Yes Yes			
	Catchment and Water Supply	Fauna destroying water intake structures	Yes			
		Natural mineral pollutants (e.g. uranium,	Unknown			
	/ate	nitrates, iron, fluoride)				
	≥	Un-lined landfills Extensive agriculture	Unknown Yes	-		
ЭÜ	tan					
AUS	Jen	Low vegetation cover (dust, sediment runoff)	Medium			
0 U	tchn	Poor access to supply	Unknown			
NX X	Cat	Unsustainable water extraction	Unknown			
CURITY RISK (CAUSE)		Aquifer turning saline due to high extraction	Unknown			
RIT		Hard water	Unknown			
D:		Aging or inadequate pipe work and	Unknown			
WATER QUALITY OR SEC		associated infrastructure				
OR		Significant water losses due to leaking pipes	Unknown			
È		High per capita water consumption	Unknown	1		
IAL		Inappropriate water quality standards /	Unknown			
g	Jce	objectives				
ER	Governance	Lack of infrastructure maintenance Poor management or governance	Unknown Unknown	1		
VAT	ove	Vandalism / sabotage / terrorism	Unknown	1		
>	Ğ	Insufficient trained personnel	Unknown			
		Inadequate funding for maintenance or	Unknown			
		upgrades		+		
	Industries	Mining / minerals	Unknown			
	dust	Irrigation	Unknown			
	Ĕ	Chemicals / process	Unknown			
	цС		Linknown			
	ation	Seasonal population loadings	Unknown			
	ılati		No		ine experienced between	
	opulatio	Rapid population growth		2001 and 2006	Census.	
	Population	Rapid population growth				
		Pathogenic contamination	Unknown			
OR		Pathogenic contamination Algal blooms	Unknown			
ITY OR		Pathogenic contamination				
ALITY OR		Pathogenic contamination Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination	Unknown Unknown			
		Pathogenic contamination Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination Boil water notices	Unknown Unknown Unknown Unknown Unknown			
ER QUALITY OR		Pathogenic contamination Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination Boil water notices Deaths or illness due to water quality	Unknown Unknown Unknown Unknown Unknown Unknown			
		Pathogenic contamination Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination Boil water notices Deaths or illness due to water quality Water restrictions (current and historic)	Unknown Unknown Unknown Unknown Unknown Unknown Yes			
WATER QUALITY OR	SECURITY RISK (EFFECT) Population	Pathogenic contamination Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination Boil water notices Deaths or illness due to water quality	Unknown Unknown Unknown Unknown Unknown Unknown			

7		State/Territory	Qld-North		
TOWN		Town Name	Mareeba		
2		Town Population	6806 (Census 2006, Urba	n Centre/Locality)	
		Name of Water Utility	Tablelands Regional Cour		
Ш	Ę	Rate (\$/kL)	Unknown		
CATCHMENT AND WATER WATER SUPPLY UTILITY		Per Capita Water Consumption (L/day)	Unknown		
		Number of Connections	Unknown		
<u> </u>		Catchment	Barron River Catchment		
N N	Ž	Sub-Catchment	-		
μ		Catchment Management Authority (CMA)	Tablelands Regional Cour	ncil	
	ns	CMA Web-Link	www.trc.gld.gov.au/contac	<u>ct-us</u>	
Ę	Ř	Catchment Protection Status	Nil		
ΰ	Ë	Potable Water Source(s)	Barron River		
ج :	×		SunWater irrigation netwo	ork & bores	
0		Supply Capacity	Unknown		
		Treatment Plant(s)	Mareeba Water Treatmen		
		Level of Treatment		on, media filtration and liquid c	hlorine.
È		Drinking Water Guidelines	ADWG 2008		
AL			Typical Results	Mareeba Water Treatment	Plant ADWG 2004
Ŋ					
2			Fluoride (mg/L)	Unknown	1.5 mg/L
WATER QUALITY		Results (% compliance for 2008 reporting	pH Chloring regidual (mg/l)	Unknown	6.5-8.5 5 m a //
Ă		period)	Chlorine residual (mg/L)	Unknown	5 mg/L
>			Alkalinity (mg/L)	Unknown	?? 200 mg/L as CaCO3
			Hardness (mg/L) Turbidity (NTU)	Unknown Unknown	200 mg/L as CaCO3 5 NTU
	_	Current Water Restrictions	None	UIKIIOWII	31010
2	~	Proportion of Potable Water Supplied to			
E E	E	Households (%)	Unknown		
WATER	2	Distance from the Coast (km)	100km		
≥ i	ũ	Climate	Semi dry		
(	.,	Average Annual Rainfall	850mm (sourced from ww	(w.bom.gov.au)	
		FACTOR	YES / NO		EXPLANATION
			120,110	Mareeba is not listed as be	
		Drought	No	September 2009 on www.lo	
		Oin ala, daia bia a constant a constant	NI		0 1 0
		Single drinking water source	No	Sunwater Irrigation canal an	no dore water also available
		Poor quality water source			
		Sewage overflow or disposal into water	No		
		source Flooding	Yes		
	Supply		Yes		
	dn	Fauna defecating in supply			
	S	Fauna destroying water intake structures	Yes		
~	Catchment and Water	Natural mineral pollutants (e.g. uranium,			
SП		nitrates, iron, fluoride) Un-lined landfills	No		
Ĵ	р	Extensive agriculture	No		
Q	rent a	Low vegetation cover (dust, sediment	Yes		
X		runoff)	Yes		
Ř	L L	Poor access to supply			
≿	ato	Unsustainable water extraction			
F	0				
2		Aquifer turning saline due to high extraction	1		
Ш		Hard water			
2		Aging or inadequate pipe work and			
0		associated infrastructure	I		
È		Significant water losses due to leaking			
UALITY OR SECURITY RISK (CAUSE)		pipes	L		
JC DC		High per capita water consumption			
WATER Q		Inappropriate water quality standards /	L.		
Ē	ė	objectives	No		
× ×	Governance	Lack of infrastructure maintenance		T	
>	L L	Poor management or governance			
	ove	Vandalism / sabotage / terrorism		T	
	Ŭ	Insufficient trained personnel			
		Inadequate funding for maintenance or			
		upgrades	I		
	Ē	Mining / minerals	No		
	Popula Industri tion es	Irrigation	Yes		
	ŭ	Chemicals / process	No		
	<u>a</u>	Seasonal population loadings	Yes	Events such as local rodeo	
	ndo	Banid population growth		Population decline experier	nced between 2001 and 200
	PC T	Rapid population growth	No	Census	
í		Pathogenic contamination			
WATER QUALITY OR	<sup>0</sup>	Algal blooms			
ō		Heavy metal contamination			
'∠¦	Ш́	Poor chlorine residuals			
F	¥.	Pesticide contamination		T	
J.C	SN S	Boil water notices			
Ő.	<u>н</u> ≻	Deaths or illness due to water quality			
ШÍ	É	Water restrictions (current and historic)	Yes		
AT A	Ъ	Taste and odour issues			
N S	C)	Other contamination that would affect			
L	S	health	I		
		noutti		1	

≤		State/Territory	Qld-North		
2		Town Name	Atherton		
⊢ Town		Town Population	6247 (Census 2006, Urban	Centre/Locality)	
~ `	_	Name of Water Utility	Tablelands Regional Counc		
WATER	Ę	Rate (\$/kL)	Unknown		
۲, k	Ę	Per Capita Water Consumption (L/day)	Unknown		
> -		Number of Connections	Unknown		
		Catchment	Barron River Catchment		
CATCHMENT AND	2	Sub-Catchment	-		
	Catchment Management Authority (CI		Tablelands Regional Counc		
Ä	D S		www.trc.gld.gov.au/contact	us	
Ę	ř	Catchment Protection Status	Johnstone & Upper Barron	River	
<u>5</u>	Ā	Potable Water Source(s)	Scrubby Creek		
. A	ŝ		Lake Tinaroo & Bores		
		Supply Capacity	Unknown		
		Treatment Plant(s)	Atherton water Treatment F	lant	
≻		Level of Treatment	-		
느		Drinking Water Guidelines	ADWG 2008	Advantant Marten Terrature et Direct	10100.0004
AU			Typical Results Fluoride (mg/L)	Atherton Water Treatment Plant Unknown	ADWG 2004
WATER QUALITY			pH	Unknown	1.5 mg/L 6.5-8.5
		Results (% compliance for 2008 reporting	Chlorine residual (mg/L)	Unknown	5 mg/L
		period)	Alkalinity (mg/L)	Unknown	22
Ś			Hardness (mg/L)	Unknown	200 mg/L as CaCO
			Turbidity (NTU)	Unknown	5 NTU
			Level 1 water restrictions.		at a subsect of the
~				n odd days of month) and even prope	erty numbers (even day
Ê		Current Water Restrictions	month) watering. - watering using only allowe	d between 7.9 am	
Ľ,			- watering using only allowe		
ů.			Refer to www.trc.gld.gov.a	l/infrastructure/water	
WATER SECURITY			www.uo.qlu.quv.a	zaou dotai d/ water.	
Ê		Proportion of Potable Water Supplied to	Unknown		
NA		Households (%)			
-		Distance from the Coast (km)	100km		
		Climate	Tropical		
_		Average Annual Rainfall	1420mm (sourced from ww		
	-	FACTOR	YES / NO	NOTES / EXPL	
		Drought	No	Atherton is not listed as being drou	
				September 2009 on www.longpad	dock.qld.gov.au.
		Single drinking water source	No		
		Poor quality water source			
		Sewage overflow or disposal into water	No		
		source			
	<u></u>	Flooding	Yes		
	Idn	Fauna defecating in supply	Yes		
	Catchment and Water Supply	Fauna destroying water intake structures	Yes		
		Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)			
		Un-lined landfills			
$\widehat{\ldots}$	an	Extensive agriculture	Yes		
ISE	ent	Low vegetation cover (dust, sediment			
SAL	hme	runoff)	Yes		
9	atc	Poor access to supply			
š	0	Unsustainable water extraction			
R		Aquifer turning saline due to high extraction			
Ê				-	
Ľ,		Hard water		-	
OR SECURITY RISK (CAUSE)		Aging or inadequate pipe work and		1	
0)		associated infrastructure		+	
		Significant water losses due to leaking pipes		1	
È		High per capita water consumption		1	
AL		Inappropriate water quality standards /		1	
g	Φ	objectives	No	1	
WATER QUALIT	Governance	Lack of infrastructure maintenance		1	
ATE	Sme	Poor management or governance			
Š.	0 V	Vandalism / sabotage / terrorism			
	0	Insufficient trained personnel			
		Inadequate funding for maintenance or			
	-	upgrades			
	es	Mining / minerals	No		
	stri	Irrigation	Yes		
	Industries	-		1	
	_	Chemicals / process	No		
	5		No		
	Population	Seasonal population loadings	No		
	puls			Atherton is growing slower than the	Oueencland state
	Pop	Rapid population growth	No	average based on 2001 and 2006	
	-			average based on 2001 and 2006	ocrisus uald.
	<b>-</b>	Pathogenic contamination			
í	C L	Algal blooms		-	
R FC	Ľ	Heavy metal contamination		+	
Y OR	<u> </u>	Poor chlorine residuals		+	
LTY OR	Ľ,			1	
	ISK (EF	Pesticide contamination Boil water potices			
	KISK (EF	Boil water notices			
	KILY KISK (EF	Boil water notices Deaths or illness due to water quality	Yes		
	טאווץ אואא (בר	Boil water notices Deaths or illness due to water quality Water restrictions (current and historic)	Yes		
	ECURITY RISK (EF	Boil water notices Deaths or illness due to water quality			

Z		State/Territory	Qld-North					
TOWN	5	Town Name	Sarina 3285 (Census 2006, Urban Centre/Locality)					
	·	Town Population		Centre/Locality)				
~	~	Name of Water Utility Rate (\$/kL)	Mackay Regional Council Unknown					
Ë	5	Trate (WRE)		oduced by the water supply scheme is 1.1	MI /d and the ne			
LT WATER ER UTILITY		Per Capita Water Consumption (L/day)	is 1.4ML/d.	ourses by the water supply scheme is 1.1				
-		Number of Connections	> 500					
_		Catchment	None. Bore water, ground wa	iter.				
CATCHMENT AND WATER	≻	Sub-Catchment	- Maalaa Daaisaal Qaasii					
NH N	SUPPLY	Catchment Management Authority (CMA) CMA Web-Link	Mackay Regional Council www.mackay.gld.gov.au					
D d	, IS	Catchment Protection Status	Unknown					
A C		Potable Water Source(s)	Bore Water					
		Supply Capacity	Treatment plant design capac					
		Treatment Plant(s)	Northern Beaches Water Su		n with oblacinatio			
		Level of Treatment	(sodium hypochlorite).	dia filtration, pH correction and disinfectio	IT WILL CHIOT HALL			
~		Drinking Water Guidelines	ADWG 2008					
WATER QUALITY			T : 10 %	Northern Beaches Water Supply				
			Typical Results	Scheme	ADWG 2004			
E E			Fluoride (mg/L)	0.4	1.5 mg/L			
Ë	;	Results (% compliance for 2008 reporting	pН	7.8	6.5-8.5			
AN AN		period)	Chlorine residual (mg/L)	0.5	5 mg/L			
			Alkalinity (mg/L)	140	?? 200 mg/L as			
			Hardness (mg/L)	146	CaCO3			
			Turbidity (NTU)	0.60	5 NTU			
			Sarina is currently on Level 3	restrictions.				
≻			- Total sprinkler ban					
L		Current Water Restrictions	<ul> <li>Hand held hoses only between the second secon</li></ul>	een 6-7 am and 6-7 pm				
WATER SECURITY	)		Refer to www.mackov.ald.cov	v.au/services/water and waste/water res	trictione			
L, L	)		Refer to www.mackay.qiu.gov	auservices/water and waste/water res	<u>LIICIIOIIS</u>			
Ë	Proportion of Potable Water Supplied to		Unknown					
LAV		Households (%) Distance from the Coast (km)	10					
>		Climate	Tropical					
		Average Annual Rainfall		nformation available from www.bom.gov.au				
	-	FACTOR	YES / NO	NOTES / EXPLANATI	ON			
		Drought	No	Sarina is not listed as being drought de September 2009 on www.longpaddock.				
		Single drinking water source	Yes					
		Poor quality water source	Unknown					
		Sewage overflow or disposal into water	No					
	>	source Flooding	Yes					
	Catchment and Water Supply	Fauna defecating in supply	No	Bore water.				
		Fauna destroying water intake structures	No	Bore water.				
	ate	Natural mineral pollutants (e.g. uranium,	Unknown					
	3	nitrates, iron, fluoride) Un-lined landfills	Unknown					
ЭÜ	anc	Extensive agriculture	Yes					
Ä	lent	Low vegetation cover (dust, sediment runoff)	Yes					
<u>0</u>	- L L	-	100					
š	Cato	Poor access to supply Unsustainable water extraction	Unknown					
Ϋ́	Ŭ							
CURITY RISK (CAUSE)		Aquifer turning saline due to high extraction	Unknown					
D:		Hard water	Unknown					
ß		Aging or inadequate pipe work and	Unknown					
WATER QUALITY OR		associated infrastructure		+				
È		Significant water losses due to leaking pipes	Unknown	1				
ALI		High per capita water consumption	Unknown					
g		Inappropriate water quality standards /						
Ш	nce	objectives Lack of infrastructure maintenance	Unknown					
(AT	rna	Poor management or governance	Unknown Unknown	1				
S	Governance	Vandalism / sabotage / terrorism						
	Ō	Insufficient trained personnel						
		Inadequate funding for maintenance or	Unknown	1				
	Ś	upgrades		+				
	Industries	Mining / minerals	No	4				
	dus	Irrigation	Yes	1				
		Chemicals / process	No					
	ion	Seasonal population loadings	No	1				
	ulat							
	Population	Rapid population growth	Yes	Growth greater than Queensland State 2001 and 2006 Census data.	Average based			
		Pathogenic contamination	Unknown					
	0	Algal blooms	Unknown	1				
~	5	Heavy metal contamination	Unknown	1				
OR	FECT		Unknown					
ITY OR	(EFFECT	Poor chlorine residuals	OTIMIOWIT					
ALITY OR	SK (EFFECT	Poor chlorine residuals Pesticide contamination	Unknown					
QUALITY OR	RISK (EFFECT	Poor chlorine residuals Pesticide contamination Boil water notices	Unknown Unknown					
ER QUALITY OR	ITY RISK (EFFECT	Poor chlorine residuals Pesticide contamination Boil water notices Deaths or illness due to water quality	Unknown Unknown Unknown					
ATER QUALITY OR	URITY RISK (EFFECT	Poor chlorine residuals Pesticide contamination Boil water notices Deaths or illness due to water quality Water restrictions (current and historic)	Unknown Unknown Unknown Yes					
WATER QUALITY OR	ECURITY RISK (EFFECT	Poor chlorine residuals Pesticide contamination Boil water notices Deaths or illness due to water quality	Unknown Unknown Unknown					

Z	10						
3		State/Territory Town Name	Qld-North Ayr				
TOWN		Town Population	8093 (Census 2006, Urban C	entre/l.ocality)			
		Name of Water Utility	Burdekin Shire Council	entre/Locality/			
~ >	_	Rate (\$/kL)	refer to www.burdekin.gld.gov.	au/services/water/billing	/		
WATER	-	Per Capita Water Consumption (L/day)	Unknown				
LA L	ŧ.		Council Chambers WTP - 500				
> _	2	Number of Connections	Nelsons Lagoon WTP - 500				
			South Ayr WTP - 500				
ц		Catchment	Part of the Burdekin River Cat	chment			
CATCHMENT AND WATER SUIPPLY		Sub-Catchment	- Duadalija Obias Osuraji				
Ś		Catchment Management Authority (CMA) CMA Web-Link	Burdekin Shire Council www.burdekin.gld.gov.au				
₽≻	-	Catchment Protection Status	Unknown				
N N			Council Chambers WTP - Bor	e water			
	5	Potable Water Source(s)	Nelsons lagoon WTP - Bore w				
ž			South Ayr WTP - Bore Water				
Ċ			Council Chambers WTP - 3MI				
- Y		Supply Capacity	Nelsons lagoon WTP - 10ML/	d			
			South Ayr WTP - 11ML/d	ala an Oauth Augustan	Tag at a state		
		Treatment Plant(s)	Nelsons lagoon, Council Chan Council Chambers WTT - sen			odium hvno	oblorito)
		Level of Treatment	Nelsons lagoon WTP - semi a				
≧			South Ayr WTP - semi automa				ionic).
ALI		Drinking Water Guidelines	ADWG 2008		(****		
WATER QUALITY			Typical Results	Council Chambers	Nelsons Lagoon		ADWG 2004
Ř			Fluoride (mg/L)	0.10	0.10	0.20	1.5 mg/L
ATE		Depute	pH Oblasias assistant (mark)	7.30	8.50	8.60	6.5-8.5
Ň		Results	Chlorine residual (mg/L) Alkalinity (mg/L)	0.30 69.00	0.30 91.00	0.30 108.00	5 mg/L ??
			Hardness (mg/L)	71.00	58.00	54.00	200 mg/L as CaCO3
			Turbidity (NTU)	<1	1.40	0.90	5 NTU
		Current Water Restrictions	Nil				
WATER		Proportion of Potable Water Supplied to	Unknown				
ËË	5	Households (%)					
N N N		Distance from the Coast (km) Climate	10km Tropical				
U.	0	Average Annual Rainfall	944mm (sourced from www.bo	m dov ali)			
		FACTOR	YES / NO	(in:gov.uu)	NOTES / EXPL/	ANATION	
		1		Ayr is not listed as beir			ntombor 2000 on
		Drought	No	www.longpaddock.qld.g		as at 301136	sptember 2009 on
		Single drinking water source	No				
		Poor quality water source	No	There are multiple sou	ices for bore water.		
		Sewage overflow or disposal into water					
	Supply	source	No				
		Flooding	Yes				
		Fauna defecating in supply	No	Bore water.			
	S	Fauna destroying water intake structures	No				
	Water 8	Natural mineral pollutants (e.g. uranium,	Unknown				
	~	nitrates, iron, fluoride) Un-lined landfills	No				
) E	Catchment and	Extensive agriculture	Yes				
AUS	ent			<b>B</b>	6 I I		
Ŭ	Ę	Low vegetation cover (dust, sediment runoff)	Yes	Does not pose a proble	em for bore water.		
X	atc	Poor access to supply	No				
Ř	0	Unsustainable water extraction	Unknown				
È		Aquifer turning saline due to high extraction	Unknown				
L'R			Linknown				
0		Hard water	Unknown	1			
Щ.							
R SECURITY RISK (CAUSE		Aging or inadequate pipe work and	No				
		Aging or inadequate pipe work and associated infrastructure					
		Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes	Unknown				
		Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption					
		Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards /	Unknown				
	nce	Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives	Unknown Unknown No				
	rnance	Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance	Unknown Unknown No Unknown				
WATER QUALITY OR SEC	wernance	Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance	Unknown Unknown No Unknown No				
	Governance	Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance	Unknown Unknown No Unknown				
	Governance	Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or	Unknown Unknown No Unknown No No No No				
	Governance	Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel	Unknown Unknown No Unknown No No				
WATER QUALITY OR		Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or	Unknown Unknown No Unknown No No No No				
WATER QUALITY OR		Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades	Unknown Unknown No Unknown No No Unknown	Surrounding farmlands	have their own supp	ly sources.	
WATER QUALITY OR		Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation	Unknown Unknown No Unknown No No Unknown No Unknown No No	Surrounding farmlands	have their own supp	ly sources.	
WATER QUALITY OR	Industries	Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals	Unknown Unknown No Unknown No No No Unknown No	Surrounding farmlands	have their own supp	ly sources.	
WATER QUALITY OR	Industries	Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation	Unknown Unknown No Unknown No No Unknown No Unknown No No	Surrounding farmlands	have their own supp	ly sources.	
WATER QUALITY OR	Industries	Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings	Unknown Unknown No Unknown No				
WATER QUALITY OR		Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process	Unknown Unknown No Unknown No	Surrounding farmlands Population decline exp			6 Census
WATER QUALITY OR	Population Industries	Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings	Unknown Unknown No Unknown No				6 Census
WATER QUALITY OR	Population Industries	Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms	Unknown Unknown No Unknown No				6 Census
WATER QUALITY OR	Population Industries	Aging or inadequate pipe work and associated infrastructure         Significant water losses due to leaking pipes         High per capita water consumption Inappropriate water quality standards / objectives         Lack of infrastructure maintenance         Poor management or governance         Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades         Mining / minerals         Irrigation         Chemicals / process         Seasonal population loadings         Rapid population growth         Pathogenic contamination         Algal blooms	Unknown Unknown No Unknown No				6 Census
WATER QUALITY OR	Population Industries	Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Agal blooms Heavy metal contamination Poor chlorine residuals	Unknown Unknown No Unknown No				6 Census
WATER QUALITY OR	Population Industries	Aging or inadequate pipe work and associated infrastructure         Significant water losses due to leaking pipes         High per capita water consumption Inappropriate water quality standards / objectives         Lack of infrastructure maintenance         Poor management or governance         Vandalism / sabotage / terrorism         Insufficient trained personnel         Inadequate funding for maintenance or upgrades         Mining / minerals         Irrigation         Chemicals / process         Seasonal population loadings         Rapid population growth         Pathogenic contamination         Algal booms         Heavy metal contamination         Posticide contamination	Unknown Unknown No Unknown No				6 Census
WATER QUALITY OR	Population Industries	Aging or inadequate pipe work and associated infrastructure         Significant water losses due to leaking pipes         High per capita water consumption Inappropriate water quality standards / objectives         Lack of infrastructure maintenance         Poor management or governance         Vandalism / sabotage / terrorism         Insufficient trained personnel         Inadequate funding for maintenance or upgrades         Mining / minerals         Irrigation         Chemicals / process         Seasonal population loadings         Rapid population growth         Pathogenic contamination         Algal blooms         Heavy metal contamination         Posticide contamination         Bol water notices	Unknown Unknown No Unknown No Unknown No Unknown Un				6 Census
WATER QUALITY OR	Population Industries	Aging or inadequate pipe work and associated infrastructure         Significant water losses due to leaking pipes         High per capita water consumption Inappropriate water quality standards / objectives         Lack of infrastructure maintenance         Poor management or governance         Vandalism / sabotage / terrorism         Insufficient trained personnel         Inadequate funding for maintenance or upgrades         Mining / minerals         Irrigation         Chemicals / process         Seasonal population loadings         Rapid population growth         Pathogenic contamination         Agal booms         Heavy metal contamination         Poorine residuals         Pesticide contamination         Boil water notices         Deatts or illness due to water quality	Unknown Unknown No Unknown No				6 Census
WATER QUALITY OR	Population Industries	Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal booms Heavy metal contamination Poor chlorine residuals Pesticide contamination Boil water notices Deaths or illness due to water quality Water restrictions (current and historic)	Unknown Unknown No Unknown No				6 Census
WATER QUALITY OR	Population Industries	Aging or inadequate pipe work and associated infrastructure         Significant water losses due to leaking pipes         High per capita water consumption Inappropriate water quality standards / objectives         Lack of infrastructure maintenance         Poor management or governance         Vandalism / sabotage / terrorism         Insufficient trained personnel         Inadequate funding for maintenance or upgrades         Mining / minerals         Irrigation         Chemicals / process         Seasonal population loadings         Rapid population growth         Pathogenic contamination         Algal booms         Heavy metal contamination         Posticide contamination         Boil water notices         Deaths or illness due to water quality         Water restrictions (current and historic)         Taste and odour issues	Unknown Unknown No Unknown No				6 Census
WATER QUALITY OR	Population Industries	Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal booms Heavy metal contamination Poor chlorine residuals Pesticide contamination Boil water notices Deaths or illness due to water quality Water restrictions (current and historic)	Unknown Unknown No Unknown No				6 Census

Town #	11	State/Territory	Qld-North			
TOWN		Town Name	Bowen			
10		Town Population	7484 (Census 2006, Urban	Centre/Locality)		
<u>م</u>	~	Name of Water Utility	Whitsundays Regional Cou	ncil		
世史	5	Rate (\$/kL)	Unknown			
WATER	5	Per Capita Water Consumption (L/day)	Unknown			
		Number of Connections	> 5,000			
₽>	≻.	Catchment	Proserpine River Catchmen			
CATCHMENT AND	r T	Sub-Catchment Catchment Management Authority (CMA)	- Whitsunday Regional Coun	cil		
	Ď,	CMA Web-Link	www.whitsunday.gld.gov.au			
	ř.	Catchment Protection Status	None			
	H A	Potable Water Source(s)	Bore water			
S S	Ś	Supply Capacity	Surface water from the Pros		; Bowen Proserpine River Water	Supply System
		Treatment Plant(s)			oserpine River Water Supply Sy	
		Level of Treatment	Disinfection with chlorination			
È		Drinking Water Guidelines	ADWG 2008	1		I
WATER QUALITY			Typical Results	Bowen Bores Water	Bowen Proserpine River Wate	r ADWG 2004
g			Fluoride (mg/L)	0.1	0.6	1.5 mg/L
ER		Results (% compliance for 2008 reporting	pH	7.5	7.8	6.5-8.5
'AT		period)	Chlorine residual (mg/L)	0.6	1.2	5 mg/L
3			Alkalinity (mg/L)	161	51	??
			Hardness (mg/L)	284	48	200 mg/L as CaCO3
			Turbidity (NTU)	<1	5.00	5 NTU
			Level 1 restrictions: - Watering only between 5-9	am and 5.0 pm on alto	mative days	
É		Current Water Restrictions	- watering only between 5-	ann and 5-5 philon alter	mative days	
N N			Refer to			
ы Ш			www.bowen.qld.gov.au/Ser	vicesFees/whitsundaySe	ervices/WaterConservation/tabid	/155/Default.aspx
WATER SECURITY		Proportion of Potable Water Supplied to	Unknown			
LTE		Households (%)	0			
Ś		Distance from the Coast (km) Climate	0 Tropical			
		Average Annual Rainfall	830mm (sourced from www	bom.gov.au)		
		FACTOR	YES / NO		NOTES / EXPLANATION	
				Bowen is not listed as t	being drought declared as at 30	th Sentember 2009 on
		Drought	No	www.longpaddock.qld.		
		Cincle drinking water source	Ne			
		Single drinking water source Poor quality water source	No Unknown			
		Sewage overflow or disposal into water				
	and Water Supply	source	No			
		Flooding	Yes			
		Fauna defecating in supply	Yes	Possible in Proserpine		
		Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium,	Yes	Possible in Proserpine	River water source.	
	Nat	nitrates, iron, fluoride)	Unknown			
SE)	_pc	Un-lined landfills	Unknown			
AUS	nt aı	Extensive agriculture	Moderate			
<u> </u>	ner	Low vegetation cover (dust, sediment runoff)	Yes			
ISK	Catchment	Poor access to supply				
× 2	Ca	Unsustainable water extraction	Unknown			
ST S		Aquifer turning saline due to high	Unknown			
UC 10		extraction				
SECURITY RISK (CAUSE)		Hard water Aging or inadequate pipe work and	Unknown			
		associated infrastructure	Unknown			
Σ		Significant water losses due to leaking				
ALI		Significant water rosses due to reaking	Linknown			
3		pipes	Unknown			
ğ		pipes High per capita water consumption	Unknown			
ER QI	0)	pipes High per capita water consumption Inappropriate water quality standards /				
ATER QI	ance	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance	Unknown			
WATER QUALITY OR	ernance	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance	Unknown No			
WATER QI	Bovernance	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism	Unknown No Unknown			
WATER QI	Governance	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel	Unknown No Unknown Unknown			
WATER QI	Governance	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or	Unknown No Unknown			
WATER QI		pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel	Unknown No Unknown Unknown			
WATER QI		pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals	Unknown No Unknown Unknown Unknown No			
WATER QI		pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation	Unknown No Unknown Unknown Unknown No Yes			
WATER QI	Industries	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process	Unknown No Unknown Unknown Unknown No Yes No			
WATER QI	Industries	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation	Unknown No Unknown Unknown Unknown No Yes			
WATER Q	Industries	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings	Unknown No Unknown Unknown Unknown No Yes No No	Population decline exm	erienced between 2001 and 200	)6 Census
WATER QI		pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth	Unknown No Unknown Unknown Unknown No Yes No No No	Population decline exp	erienced between 2001 and 200	96 Census
	Population Industries	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination	Unknown No Unknown Unknown Unknown No Yes No No No Unknown Unknown No	Population decline exp	erienced between 2001 and 200	)6 Census
	Population Industries	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms	Unknown No Unknown Unknown Unknown No Yes No No No Unknown Unknown	Population decline exp	erienced between 2001 and 200	)6 Census
	Population Industries	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination	Unknown Unknown Unknown Unknown Unknown No Yes No No No Unknown Unknown No	Population decline exp	erienced between 2001 and 200	16 Census
	Population Industries	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms Heavy metal contamination	Unknown Unknown Unknown Unknown Vos Yes No No Unknown Unknown Unknown Unknown Unknown Unknown Unknown	Population decline exp	erienced between 2001 and 200	16 Census
	Population Industries	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination Boil water notices	Unknown No Unknown Unknown Unknown No Yes No No Unknown	Population decline exp	erienced between 2001 and 200	16 Census
	Population Industries	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination Boil water notices Deaths or illness due to water quality	Unknown Unknown Unknown Unknown No Yes No No Unknown	Population decline exp	erienced between 2001 and 200	96 Census
	Population Industries	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Cchemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination Boil water notices Deaths or illness due to water quality Water restrictions (current and historic)	Unknown No Unknown Unknown Unknown Vo Yes No No Unknown	Population decline exp	erienced between 2001 and 200	96 Census
	Population Industries	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination Boil water notices Deaths or illness due to water quality Water restrictions (current and historic) Taste and odour issues	Unknown No Unknown Unknown Unknown Ves No No No Unknown Yes Unknown Yes Unknown	Population decline exp	erienced between 2001 and 200	)6 Census
WATER QUALITY OR WATER QUALITY OR	Population Industries	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Cchemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination Boil water notices Deaths or illness due to water quality Water restrictions (current and historic)	Unknown No Unknown Unknown Unknown Vo Yes No No Unknown	Population decline expo	erienced between 2001 and 200	)6 Census

Town #       12         Image: State/Territory       Qild-South         Town Name       Moranbah         Town Population       7113 (Census 2006, Urban Centre/Locality)         Name of Water Utility       Isaac Regional Council         Rate (\$/kL)       Unknown         Per Capita Water Consumption (L/day)       Unknown         Number of Connections       Unknown         Catchment       Fitzroy         Sub-Catchment       Isaac-Connors         Catchment Management Authority (CMA)       Fitzroy Basin Association         CMA Web-Link       http://www.fba.org.au/ourregion/ourregion.html         Catchment Protection Status       Unknown         Potable Water Source(s)       Burdekin to Moranbah Pipeline         Supply Capacity       Burdekin to Moranbah Pipeline 17000ML/Annum         Treatment Plant(s)       -         Level of Treatment       Sedimentation and Filtration         Drinking Water Guidelines       ADWG 2004         Results       Unknown         Unknown       Ves - external water use, no watering Monday, tues - sun 5am-8am not on Monday, twice weekly 5pm-8pm.         Proportion of Potable Water Supplied to Households (%)       Unknown         Distance from the Coast (km)       156km         Climate       Sub-t	
Moranbah       Moranbah         Town Population       7113 (Census 2006, Urban Centre/Locality)         Name of Water Utility       Isaac Regional Council         Rate (\$/kL)       Unknown         Per Capita Water Consumption (L/day)       Unknown         Number of Connections       Unknown         Catchment       Fitzroy         Sub-Catchment       Isaac-Connors         Catchment       Isaac-Connors         Catchment       Isaac-Connors         Catchment Management Authority (CMA)       Fitzroy Basin Association         CMA Web-Link       http://www.fba.org.au/ourregion/ourregion.html         Catchment Protection Status       Unknown         Potable Water Source(s)       Burdekin to Moranbah Pipeline         Supply Capacity       Burdekin to Moranbah Pipeline         Treatment Plant(s)       -         Level of Treatment       Sedimentation and Filtration         Drinking Water Guidelines       ADWG 2004         Results       Unknown         Proportion of Potable Water Supplied to       Unknown         Households (%)       Unknown         Distance from the Coast (km)       156km         Climate       Sub-tropical         Average Annual Rainfall       589 9mm	
Name of Water Utility       Isaac Regional Council         Rate (\$/kL)       Unknown         Per Capita Water Consumption (L/day)       Unknown         Number of Connections       Unknown         Catchment       Fitzroy         Sub-Catchment       Isaac-Connors         Catchment Management Authority (CMA)       Fitzroy Basin Association         Catchment Protection Status       Unknown         Potable Water Source(s)       Burdekin to Moranbah Pipeline         Supply Capacity       Burdekin to Moranbah Pipeline         Treatment Plant(s)       -         Level of Treatment       Sedimentation and Filtration         Drinking Water Guidelines       ADWG 2004         Results       Unknown         Very       Very         Current Water Restrictions       Yes - external water use, no watering Monday, tues - sun 5am-8am not on Monday, twice weekly 5pm-8pm.         Proportion of Potable Water Supplied to Households (%)       Unknown         Distance from the Coast (km)       156km         Climate       Sub-tropical         Average Annual Rainfall       589.9mm         FACTOR       YES / NO       NOTES / EXPLANATION	
Rate (\$/kL)       Unknown         Per Capita Water Consumption (L/day)       Unknown         Number of Connections       Unknown         Sub-Catchment       Fitzroy         Sub-Catchment       Isaac-Connors         Catchment       Sitzroy         Catchment       Isaac-Connors         Catchment       Isaac-Connors         Catchment       Isaac-Connors         Catchment Management Authority (CMA)       Fitzroy Basin Association         CMA Web-Link       http://www.fba.org.au/ourregion/ourregion.html         Catchment Protection Status       Unknown         Potable Water Source(s)       Burdekin to Moranbah Pipeline         Supply Capacity       Burdekin to Moranbah Pipeline 17000ML/Annum         Treatment Plant(s)       -         Level of Treatment       Sedimentation and Filtration         Drinking Water Guidelines       ADWG 2004         Results       Unknown         Ves - external water use, no watering Monday, tues - sun 5am-8am not on Monday, twice weekly 5pm-8pm.         Proportion of Potable Water Supplied to Households (%)       Unknown         Distance from the Coast (km)       156km         Climate       Sub-tropical         Average Annual Rainfall       589.9mm         FACTOR <td< td=""><td></td></td<>	
Catchment       Fitzroy         Sub-Catchment       Sub-Catchment         Catchment       Isaac-Connors         Catchment Management Authority (CMA)       Fitzroy Basin Association         CAtchment Protection Status       Unknown         Potable Water Source(s)       Burdekin to Moranbah Pipeline         Supply Capacity       Burdekin to Moranbah Pipeline 17000ML/Annum         Treatment Plant(s)       -         Level of Treatment       Sedimentation and Filtration         Drinking Water Guidelines       ADWG 2004         Results       Unknown         Verse       Verse - external water use, no watering Monday, tues - sun 5am-8am not on Monday, twice weekly 5pm-8pm.         Proportion of Potable Water Supplied to Households (%)       Unknown         Distance from the Coast (km)       156km         Climate       Sub-tropical         Average Annual Rainfall       589.9mm         FACTOR       YES / NO       NOTES / EXPLANATION	
Catchment       Fitzroy         Sub-Catchment       Sub-Catchment         Catchment       Isaac-Connors         Catchment Management Authority (CMA)       Fitzroy Basin Association         CAtchment Protection Status       Unknown         Potable Water Source(s)       Burdekin to Moranbah Pipeline         Supply Capacity       Burdekin to Moranbah Pipeline 17000ML/Annum         Treatment Plant(s)       -         Level of Treatment       Sedimentation and Filtration         Drinking Water Guidelines       ADWG 2004         Results       Unknown         Verse       Verse - external water use, no watering Monday, tues - sun 5am-8am not on Monday, twice weekly 5pm-8pm.         Proportion of Potable Water Supplied to Households (%)       Unknown         Distance from the Coast (km)       156km         Climate       Sub-tropical         Average Annual Rainfall       589.9mm         FACTOR       YES / NO       NOTES / EXPLANATION	
Catchment       Fitzroy         Sub-Catchment       Sub-Catchment         Catchment       Isaac-Connors         Catchment Management Authority (CMA)       Fitzroy Basin Association         CAtchment Protection Status       Unknown         Potable Water Source(s)       Burdekin to Moranbah Pipeline         Supply Capacity       Burdekin to Moranbah Pipeline 17000ML/Annum         Treatment Plant(s)       -         Level of Treatment       Sedimentation and Filtration         Drinking Water Guidelines       ADWG 2004         Results       Unknown         Verse       Verse - external water use, no watering Monday, tues - sun 5am-8am not on Monday, twice weekly 5pm-8pm.         Proportion of Potable Water Supplied to Households (%)       Unknown         Distance from the Coast (km)       156km         Climate       Sub-tropical         Average Annual Rainfall       589.9mm         FACTOR       YES / NO       NOTES / EXPLANATION	
Sub-Catchment       Isaac-Connors         Catchment Management Authority (CMA)       Fitzroy Basin Association         CMA Web-Link       http://www.fba.org.au/ourregion/ourregion.html         Catchment Protection Status       Unknown         Potable Water Source(s)       Burdekin to Moranbah Pipeline         Supply Capacity       Burdekin to Moranbah Pipeline 17000ML/Annum         Treatment Plant(s)       -         Level of Treatment       Sedimentation and Filtration         Drinking Water Guidelines       ADWG 2004         Results       Unknown         Ves - external water use, no watering Monday, tues - sun 5am-8am not on Monday, twice weekly 5pm-8pm.         Proportion of Potable Water Supplied to Households (%)       Unknown         Distance from the Coast (km)       156km         Climate       Sub-tropical         Average Annual Rainfall       589.9mm         FACTOR       YES / NO       NOTES / EXPLANATION	
Supply Capacity     Burdekin to Moranbah Pipeline 17000ML/Annum       Yes     Treatment Plant(s)       Level of Treatment     Sedimentation and Filtration       Drinking Water Guidelines     ADWG 2004       Results     Unknown       Current Water Restrictions     Yes - external water use, no watering Monday, tues - sun 5am-8am not on Monday, twice weekly 5pm-8pm.       Proportion of Potable Water Supplied to Households (%)     Unknown       Distance from the Coast (km)     156km       Climate     Sub-tropical       Average Annual Rainfall     589.9mm       FACTOR     YES / NO       NOTES / EXPLANATION	
Supply Capacity     Burdekin to Moranbah Pipeline 17000ML/Annum       Treatment Plant(s)     -       Level of Treatment     Sedimentation and Filtration       Drinking Water Guidelines     ADWG 2004       Results     Unknown       Current Water Restrictions     Yes - external water use, no watering Monday, tues - sun 5am-8am not on Monday, twice weekly 5pm-8pm.       Proportion of Potable Water Supplied to Households (%)     Unknown       Distance from the Coast (km)     156km       Climate     Sub-tropical       Average Annual Rainfall     589.9mm       FACTOR     YES / NO       NOTES / EXPLANATION	
Supply Capacity     Burdekin to Moranbah Pipeline 17000ML/Annum       Treatment Plant(s)     -       Level of Treatment     Sedimentation and Filtration       Drinking Water Guidelines     ADWG 2004       Results     Unknown       Current Water Restrictions     Yes - external water use, no watering Monday, tues - sun 5am-8am not on Monday, twice weekly 5pm-8pm.       Proportion of Potable Water Supplied to Households (%)     Unknown       Distance from the Coast (km)     156km       Climate     Sub-tropical       Average Annual Rainfall     589.9mm       FACTOR     YES / NO       NOTES / EXPLANATION	
Supply Capacity     Burdekin to Moranbah Pipeline 17000ML/Annum       Treatment Plant(s)     -       Level of Treatment     Sedimentation and Filtration       Drinking Water Guidelines     ADWG 2004       Results     Unknown       Current Water Restrictions     Yes - external water use, no watering Monday, tues - sun 5am-8am not on Monday, twice weekly 5pm-8pm.       Proportion of Potable Water Supplied to Households (%)     Unknown       Distance from the Coast (km)     156km       Climate     Sub-tropical       Average Annual Rainfall     589.9mm       FACTOR     YES / NO       NOTES / EXPLANATION	
Supply Capacity     Burdekin to Moranbah Pipeline 17000ML/Annum       Treatment Plant(s)     -       Level of Treatment     Sedimentation and Filtration       Drinking Water Guidelines     ADWG 2004       Results     Unknown       Current Water Restrictions     Yes - external water use, no watering Monday, tues - sun 5am-8am not on Monday, twice weekly 5pm-8pm.       Proportion of Potable Water Supplied to Households (%)     Unknown       Distance from the Coast (km)     156km       Climate     Sub-tropical       Average Annual Rainfall     589.9mm       FACTOR     YES / NO       NOTES / EXPLANATION	
Supply Capacity     Burdekin to Moranbah Pipeline 17000ML/Annum       Treatment Plant(s)     -       Level of Treatment     Sedimentation and Filtration       Drinking Water Guidelines     ADWG 2004       Results     Unknown       Current Water Restrictions     Yes - external water use, no watering Monday, tues - sun 5am-8am not on Monday, twice weekly 5pm-8pm.       Proportion of Potable Water Supplied to Households (%)     Unknown       Distance from the Coast (km)     156km       Climate     Sub-tropical       Average Annual Rainfall     589.9mm       FACTOR     YES / NO       NOTES / EXPLANATION	
Image: Second	
Level of Treatment       Sedimentation and Filtration         Drinking Water Guidelines       ADWG 2004         Results       Unknown         Current Water Restrictions       Yes - external water use, no watering Monday, tues - sun 5am-8am not on Monday, twice weekly 5pm-8pm.         Proportion of Potable Water Supplied to Households (%)       Unknown         Distance from the Coast (km)       156km         Climate       Sub-tropical         Average Annual Rainfall       689.9mm         FACTOR       YES / NO         NOTES / EXPLANATION	
Image: Construction     Yes - external water use, no watering Monday, tues - sun 5am-8am not on Monday, twice weekly 5pm-8pm.       Image: Current Water Restrictions     Yes - external water use, no watering Monday, tues - sun 5am-8am not on Monday, twice weekly 5pm-8pm.       Image: Current Water Restrictions     Unknown       Image: Current Water Restrictions     Sub-tropical       Average Annual Rainfall     S89.9mm       Image: FACTOR     YES / NO       Image: Water restrictions have been enforced. Not Currently of the state of the st	
Image: Construction     Yes - external water use, no watering Monday, tues - sun 5am-8am not on Monday, twice weekly 5pm-8pm.       Image: Current Water Restrictions     Yes - external water use, no watering Monday, tues - sun 5am-8am not on Monday, twice weekly 5pm-8pm.       Image: Current Water Restrictions     Unknown       Image: Current Water Restrictions     Sub-tropical       Average Annual Rainfall     S89.9mm       Image: FACTOR     YES / NO       Image: Water restrictions have been enforced. Not Currently of the state of the st	
Current Water Restrictions         Yes - external water use, no watering Monday, tues - sun 5am-8am not on Monday, twice weekly 5pm-8pm.           Proportion of Potable Water Supplied to Households (%)         Unknown           Distance from the Coast (km)         156km           Climate         Sub-tropical           Average Annual Rainfall         589.9mm           FACTOR         YES / NO           NOTES / EXPLANATION	
FACTOR YES / NO NOTES / EXPLANATION Water restrictions have been enforced. Not Currently d	a and 5pm 8pm sprinkler
FACTOR YES / NO NOTES / EXPLANATION	
FACTOR YES / NO NOTES / EXPLANATION Water restrictions have been enforced. Not Currently d	
FACTOR YES / NO NOTES / EXPLANATION	
FACTOR YES / NO NOTES / EXPLANATION Water restrictions have been enforced. Not Currently d	
Water restrictions have been enforced. Not Currently d	
Water restrictions have been enforced. Not Currently d	
Drought Yes has been previously (Primary Industries and Fisheries)	•
Single drinking water source Yes Sunwater Pipeline, however this is a fairly reliable sour	rce of water
Poor quality water source No Sunwater supply.	
Sewage overflow or disposal into water No	
Flooding	-
Image: Second	-
Natural mineral pollutants (e.g. uranium,	-
nitrates, iron, fluoride)	
Un-lined landfills	
Extensive agriculture	
S E Low vegetation cover (dust, sediment	
O E Poor access to supply	
Unsustainable water extraction	
Aquifer turning saline due to high	
Image: Second	
Hard water No	
Aging or inadequate pipe work and No Rated as operating well, only requires maintenance.	
associated infrastructure	
Significant water losses due to leaking	
Image: pipes	
Inappropriate water quality standards /	
$\vec{\sigma}$ $\vec{\sigma}$ $\vec{\sigma}$ $\vec{\sigma}$ $\vec{\sigma}$ $\vec{\sigma}$ $\vec{\sigma}$	
PO     Inappropriate water quality standards /       objectives	
Poor management or governance	
Y     Objectives       Lack of infrastructure maintenance       Poor management or governance       Vandalism / sabotage / terrorism       Vandalism / sabotage / terrorism	
- insumcient trained personnel	
Inadequate funding for maintenance or	
upgrades	
Mining / minerals Yes Mines around Moranbah, however no evidence to sugg	gest this has effected wate
supply.	
Mining / minerals Yes Mines around Moranbah, however no evidence to sugg supply.	
Seasonal population loadings No Rapid population growth Yes 3.3% growth/annum 2001-2005. During mining boom.	
Rapid population growth Yes 3.3% growth/annum 2001-2005. During mining boom.	
Pathogenic contamination	
Algal blooms	
Heavy metal contamination	
Poor chlorine residuals	
S m Pesticide contamination	
O C     Boil water notices       C C     Depths or illness due to water quality	
U     Deaths or illness due to water quality       U     Water restrictions (current and historic)	
U     Learns or liness due to water quality       Vater restrictions (current and historic)       C     Taste and odour issues	

	13		014 0		
TOWN		State/Territory Town Name	Qld-South Dysart		
Q		Town Name		sus 2006, Urban Centre/Locality)	
		Name of Water Utility		onal Council	
뛰		Rate (\$/kL)	Unknown		
WATER UTILITY		Per Capita Water Consumption (L/day)	826 L/day		
ΝSΞ	5	Number of Connections	Unknown		
		Catchment	Fitzroy		
μĸ		Sub-Catchment	Isaac-Conn	lors	
E E	Ž	Catchment Management Authority (CMA)	Fitzroy Bas	in Association	
ΞŠ	đ	CMA Web-Link	http://www.	fba.org.au/ourregion/ourregion.html	
CATCHMENT AND WATER	ิเร	Catchment Protection Status	0 114		
S≤		Potable Water Source(s)	Ground Wa	ater	
		Supply Capacity Treatment Plant(s)	Unknown		
ЩĘ		Level of Treatment	Sedimentat	tion and Filtration	
AT IAI	1	Drinking Water Guidelines	ADWG 200		
WATER OLIALITY	ž	Results	Unknown		
		Current Water Restrictions		nal water use 3 times per week, 3 hours each day, between 5pm-8pm.	
∠ ≻	-	Proportion of Potable Water Supplied to	Unknown		
EIR		Households (%)			
WATER	5	Distance from the Coast (km)	133km Sub transisel		
_ n	5	Climate	Sub-tropica		
		Average Annual Rainfall FACTOR	589.9mm (I YES / NO	Moranbah is closest recording station). NOTES / EXPLANATION	
				Water restrictions. Not Currently drought declared, however has been	
		Drought	Yes	previously (Primary Industries and Fisheries)	
		Single drinking water source			
		Poor quality water source			
		Sewage overflow or disposal into water			
		source			
	~	Flooding			
	Supply	Fauna defecating in supply			
	Su	Fauna destroying water intake structures			
	Catchment and Water	Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)			
E)		Un-lined landfills			
NUS		Extensive agriculture			
(C/		Low vegetation cover (dust, sediment			
X		runoff)			
Ri		Poor access to supply			
ĭ		Unsustainable water extraction			
JRI		Aquifer turning saline due to high extraction			
SCL					
SE		Hard water Aging or inadequate pipe work and		Infrastructure rated as operating well, only requires maintenance in PB	
OR		associated infrastructure	No	report.	
≿		Significant water losses due to leaking			
UALITY OR SECURITY RISK (CAUSE)		pipes			
		High per capita water consumption			
WATER Q		Inappropriate water quality standards /			
Ë	ce	objectives			
WA	nan	Lack of infrastructure maintenance			
-	Governance	Poor management or governance			
	Ô	Vandalism / sabotage / terrorism Insufficient trained personnel			
		Inadequate funding for maintenance or	-		
		upgrades			
	es		Yes	Mines around Dysart, however no evidence to suggest this has effected	
	Industries	Mining / minerals		water supply.	
	npu	Irrigation	No		
		Chemicals / process	Yes	Mineral process industry in surrounding area.	
	Pop ulati	Seasonal population loadings	No	During mining beem 5.4% growth/oneum 2004.0005	
		Rapid population growth Pathogenic contamination	Yes	During mining boom. 5.4% growth/annum 2001-2005.	
Ê,	5	Algal blooms			
OR	1	Heavy metal contamination			
Ľ	ī	Poor chlorine residuals	L		
K L	-	Pesticide contamination			
SUA SISI		Boil water notices			
~ ~	-	Deaths or illness due to water quality			
目面		Water restrictions (current and historic)			
		Taste and odour issues			
NAT	}				
WATER QUALITY OR SECURITY RISK (FEFECT)		Other contamination that would affect health			

Ę		State/Territory	Qld-South		
TOWN		Town Name	Chinchilla		
Ţ		Town Population		sus 2006, Urban Centre/Locality)	
~ >	_	Name of Water Utility		owns Regional Council	
WATER		Rate (\$/kL)	\$2.26/kL al	nnum, Six monthly charges \$0.99/kL up to 100kL, \$1.35/kL from 101 to 400kL, sove 400kL.	
<pre>&lt; 1</pre>	D	Per Capita Water Consumption (L/day) Number of Connections	Unknown. ( 2004	0.4ML/Connection and 0.3ML/Residential Connection in 05/06 financial year.	
		Catchment	Condamine		
₽>	<u>-</u>	Sub-Catchment	-		
A P	ť	Catchment Management Authority (CMA)		Alliance Incorporated	
CATCHMENT AND	Б,	CMA Web-Link Catchment Protection Status	http://www.c	condaminealliance.com.au/	
N H	Ц	Catchinent Protection Status		Veir on the Condamine River	
ATC VIE	Ę.	Potable Water Source(s)	Charley's C	Creek Weir	
5 2	5			age facilities in the town	
	-	Supply Capacity Treatment Plant(s)		Veir - 9780ML Vater Treatment Plant, Chinchilla.	
ER ER	5	Level of Treatment		n, sedimentation, filtration, pH correction and disinfection.	
WATER	۲Ŋ	Drinking Water Guidelines	ADWG 200	04	
	و	Results	Unknown		
JRITY		Current Water Restrictions		DOL/day/person - hoses and dripper systems 3 days/week from 5pm to 8pm, no th sprinklers, buckets anytime excluding Monday.	
WATER SECURITY		Proportion of Potable Water Supplied to Households (%)	Unknown		
ER		Distance from the Coast (km)	250km		
LAV		Climate	Temperate		
	_	Average Annual Rainfall FACTOR	649.4mm YES / NO	NOTES / EXPLANATION	
				Water restrictions currently in place. Currently drought declared (Primary	
		Drought	Yes	Industries and Fisheries)	
		Single drinking water source	Yes		
		Poor quality water source Sewage overflow or disposal into water			
		source			
	ρlγ	Flooding	Yes	-	
	dns	Fauna defecating in supply Fauna destroying water intake structures	Yes	Open water supply.	
	ter	Natural mineral pollutants (e.g. uranium,			
	Wa	nitrates, iron, fluoride)			
	Catchment and Water Supply	Un-lined landfills	¥		
SE)		Extensive agriculture Low vegetation cover (dust, sediment runoff)	Yes Yes	Agriculture is the primary land use around the township. Clearing for farm use.	
:AU:		Poor access to supply	100		
) X	atc	Unsustainable water extraction			
SIS	0	Aquifer turning saline due to high extraction	No		
Σ		Hard water	No		
JRI <sup>-</sup>		Aging or inadequate pipe work and	Yes	Main breaks/100km of mains: 12.8 in 05/06, 7.6 in 04/05, 14.8 in 03/04, 19.7	
ECI		associated infrastructure	res	in 02/03 and 16.5 in 01/02.	
WATER QUALITY OR SECURITY RISK (CAUSE)		Significant water losses due to leaking pipes			
γo		High per capita water consumption			
LIT		Inappropriate water quality standards /			
٩U۵		objectives Lack of infrastructure maintenance			
R O	ance	Poor management or governance			
ATE	erne	Vandalism / sabotage / terrorism			
Ň	Governance	Insufficient trained personnel			
	Ű	Inadequate funding for maintenance or upgrades		Total Operations Maintenance and Administration Costs/Connection: 316 05/06, 234 04/05, 212 03/04, 168 02/03, 202 01/02; /100km of water main: 1040000 05/06, 713636 04/05, 668852 03/04, 536589 02/03, 541183 01/02	
	S			/ML supplied: 790 05/06	
	strie	Mining / minerals			
	Industries	Irrigation	Yes	Surrounding farms.	
	-	Chemicals / process	Yes	Surrounding farms.	
	Population	Seasonal population loadings			
	Pop	Rapid population growth		1.87% growth/annum 2001-2005.	
C	Ê	Pathogenic contamination		Meeting utility's standards/guidelines for E.coli 05/06: 100%	
R	د L	Algal blooms Heavy metal contamination			
2		Poor chlorine residuals			
ALI	Ý.	Pesticide contamination			
QU,	ř	Boil water notices Deaths or illness due to water quality			
ЯÄ	È	Water restrictions (current and historic)			
VAT VAT	Ľ,	Taste and odour issues			
WATER QUALITY OR	0EC	Other contamination that would affect health		Meeting utility's standards/guidelines for Physical Chemical compliance 05/00 100%, 04/05: 100%, 03/04: 71.43%, 02/03: 88.89%.	
			-	resource management issues in the region include: g further increase in land affected by salinity	
				ig water quality	
		Notes	- controlling	exotic weeds and pests	
		Notes	<ul> <li>controlling</li> <li>improving</li> </ul>		
		Notes	<ul> <li>controlling</li> <li>improving</li> <li>maintainir</li> </ul>	exotic weeds and pests soil health and reduce soil erosion g healthy waterways g biodiversity including flora, fauna and ecosystems	

ž		State/Territory Town Name	Qld-South			
TOWN		Town Name Town Population	Dalby 9778 (Cens	sus 2006, Urban Centre/Locality)		
		Name of Water Utility		owns Regional Council		
WATER UTILITY		Rate (\$/kL)	\$223.6/annum, six monthly charges \$1.24/kL up to 125kL, \$2.47/kL from 125kL to 15,000kL, \$3.71/kL above 15,000kL.			
TERL		Per Capita Water Consumption (L/day)		.4ML/connection in 05/06 financial year.		
WA		Number of Connections	4,465 Total			
ER		Catchment Sub-Catchment	Condamine			
VATI		Catchment Management Authority (CMA)	- Condamine	Alliance Incorporated		
;	-	CMA Web-Link		ondaminealliance.com.au/		
T AN	1 L	Catchment Protection Status	Unknown 10 Undergr	ound Bores		
VEN.	D o	Potable Water Source(s)	Loudoun W			
CHP			Desalinatio Loudoun W	eir - 588 ML		
CATCHMENT AND WATER		Supply Capacity		er bore - unknown n Plant - 20L/s		
		Treatment Plant(s)	Dalby Water Treatment Plant, Dalby Water Supply Desalination Plant, Dalby.			
		Level of Treatment	bore water	Loudoun Weir goes through sedimentation and filtration process, undergrou is chlorinated only, medium to poor quality irrigation (from bores 10 to 12) wa erse osmosis plant.		
M		Drinking Water Guidelines Results	ADWG 2004 Unknown			
~				rget 240L/person/day. 3 days watering with hoses or dripper systems from		
WATER SECURITY		Current Water Restrictions		get 240L/person/day. 3 days watering with hoses of dripper systems from 3.30pm and buckets anytime excluding Mondays.		
SEC		Proportion of Potable Water Supplied to Households (%)	Unknown			
TER		Distance from the Coast (km)	180km			
MA		Climate Average Annual Rainfall	Temperate 606.8mm			
	r	FACTOR	YES/NO	NOTES / EXPLANATION		
		Drought	Yes	Water restrictions. Currently drought declared (Primary Industries and Fisheries)		
		Single drinking water source	No	Surface and ground water.		
		Poor quality water source Sewage overflow or disposal into water	Yes	Desalination plant has been built.		
		source				
	Supply	Flooding Fauna defecating in supply	Yes Yes	Of the surface water catchments. Surface water storages.		
	Catchment and Water Su	Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)				
	∧ p	Un-lined landfills				
JSE)	ntar	Extensive agriculture	Yes	Agriculture is the main land use around the township.		
CAL	hme	Low vegetation cover (dust, sediment runoff)	Yes	Clearing for farming use.		
ISK (	Catcl	Poor access to supply Unsustainable water extraction				
SECURITY RISK (CAUSE)	Ŭ	Aquifer turning saline due to high extraction				
CUR		Hard water Aging or inadequate pipe work and				
OR SE(		associated infrastructure	Yes	Main breaks/100km of mains: 19.4 in 05/06, 9.2 in 04/05, 11.9 in 03/04.		
		Significant water losses due to leaking pipes				
WATER QUALITY		High per capita water consumption Inappropriate water quality standards /				
ER (	nce	objectives Lack of infrastructure maintenance				
NAT	Governance	Poor management or governance Vandalism / sabotage / terrorism				
-	30.6	Insufficient trained personnel				
	-	Inadequate funding for maintenance or		Total Operations Maintenance and Administration Costs/Connection: 227 05/06, 247, 04/05, 234 03/04; /100km of water main: 752592 05/06, 74013		
		upgrades		04/05, 696689 03/04; /ML supplied: 639 05/06.		
	stries	Mining / minerals				
	Industries	Irrigation	Yes	Irrigation of farm land.		
		Chemicals / process Seasonal population loadings	Yes No	Spraying of farming land.		
	Populatio n	Rapid population growth	No			
		Pathogenic contamination		Meeting Utility's standards/guidelines for E.coli 05/06: 100%.		
R	د لل	Algal blooms				
ΣL		Heavy metal contamination Poor chlorine residuals				
JAL	с Х	Pesticide contamination				
sal	r ≻	Boil water notices Deaths or illness due to water quality				
VTEF		Water restrictions (current and historic)				
WATER QUALITY OR	ر د	Taste and odour issues		Meeting Utility's standards/guidelines for Physical Chemical compliance		
č	n	Other contamination that would affect health		05/06: 100%, 02/03:100%.		

z	16	State/Territory	Qld-South	
TOWN		Town Name	Goondiwine	di
6		Town Population		sus 2006, Urban Centre/Locality)
		Name of Water Utility		di Regional Council
~ >	_	Rate (\$/kL)		m, \$0.71/1000L
WATER	-	Per Capita Water Consumption (L/day)		0.8ML/connection in 05/06 financial year.
ΥĒ	1	Fer Capita Water Consumption (Erday)		
< =	J	Number of Connections		di Town Council 2007: 1,960 Residential, 310 Commercial/Industrial, 9
			Rural, 30 C	Other, 2,309 Total.
		Catchment	Border Rive	ers
CATCHMENT AND WATER		Sub-Catchment	-	
ΨĘ	5	Catchment Management Authority (CMA)		d Murray Darling Committee
₽≥	Ĕ,	CMA Web-Link		.qmdc.org.au/
ξą	SI	Catchment Protection Status	Unknown	
Ŭ∢		Potable Water Source(s)	Macintyre F	River
		Supply Capacity Treatment Plant(s)	Unknown	
ЩĔ	Ę	Level of Treatment	Unknown Unknown	
WATER OUNTER	ζ.	Drinking Water Guidelines	ADWG 200	14
≥ 5	ž	Results	Unknown	· · · · · · · · · · · · · · · · · · ·
		Current Water Restrictions	No	
~ 2	-	Proportion of Potable Water Supplied to		
WATER	Ę	Households (%)	Unknown	
E E	Ś	Distance from the Coast (km)	320km	
ŚЦ	5	Climate	Temperate	
		Average Annual Rainfall	594.1mm	
		FACTOR	YES / NO	NOTES / EXPLANATION
		Drought	Yes	Dry inland area. Currently drought declared (Primary Industries and
				Fisheries)
		Single drinking water source	Yes	Water sourced from Macintyre River.
		Poor quality water source		
		Sewage overflow or disposal into water		
		source Flooding	Voo	
	<u>∼</u>	Fauna defecating in supply	Yes Yes	Open water supply.
	ldn	Fauna destroying water intake structures	103	
	r S	Natural mineral pollutants (e.g. uranium,		
	ate	nitrates, iron, fluoride)		
	Š	Un-lined landfills		
	put	Extensive agriculture	Yes	Agricultural area outside of township.
SE	Catchment and Water Supply	Low vegetation cover (dust, sediment		
AU	nei	runoff)	Yes	Clearing for farmland.
<u>0</u>	chr	Poor access to supply		
SK	Cat	Unsustainable water extraction	No	
R	Ũ	Aquifer turning saline due to high extraction	No	
WATER QUALITY OR SECURITY RISK (CAUSE)				
R L		Hard water		Main brooks/100km of mains: 144.2 in 05/00, 443.0 in 04/05, 400.7 in
ы С		Aging or inadequate pipe work and associated infrastructure	Yes	Main breaks/100km of mains: 144.3 in 05/06, 112.8 in 04/05, 168.7 in 03/04 and 126.0 in 01/02.
SE		Significant water losses due to leaking		00/04 and 120.0 III 01/02.
OR		pipes		
≿		High per capita water consumption		
		Inappropriate water quality standards /		
7UX		objectives		
8	e	Lack of infrastructure maintenance		
Ë	and	Poor management or governance		
۲A'	ern	Vandalism / sabotage / terrorism		
>	Governance	Insufficient trained personnel	ļ	
	0	landsmuch finalt for the		Total Operations Maintenance and Administration Costs/Connection: 33
		Inadequate funding for maintenance or		05/06, 294, 04/05, 258 03/04, 253 02/03, 247 01/02; /100km of water m
		upgrades		1247098 05/06, 1102819 04/05, 1145296 03/04, 1118596 02/03, 10878 01/02; /ML supplied: 420 05/06.
	Ð	Mining / minerals	No	01/02, /mL Supplied. 420 03/00.
	strie	Mining / minerals		
	Industrie s	Irrigation	Yes	Irrigation of crops.
	-	Chemicals / process	Yes	Spraying of crops.
	tion	Seasonal population loadings	No	
	Population			
	Ро	Rapid population growth	No	
Ĺ	2	Pathogenic contamination		Meeting utility's standards/guidelines for E.coli 05/06: 100%.
μ Υ		Algal blooms		
0 H	E	Heavy metal contamination		
Ē	Ļ.	Poor chlorine residuals		
K P	Ś	Pesticide contamination		
DO E	Ź	Boil water notices	ļ	
₩ 2	-	Deaths or illness due to water quality		
WATER QUALITY OR SECLIPITY RISK (FEFECT)	<u>c</u>	Water restrictions (current and historic)		
A N	2	Taste and odour issues		Marchine 14006 de standards (* 1110 - C. Dr. 1110 - C. Dr. 1110
- ŭ	0	Other contamination that would affect		Meeting Utility's standards/guidelines for Physical Chemical compliance
		health	1	05/06: 100%, 04/05:100%, 03/04:100%, 02/03:100%.

2		State/Territory	Qld-South	
TOWN		Town Name	Roma	
Ĕ		Town Population	5,983 (Ce	nsus 2006, Urban Centre/Locality)
		Name of Water Utility		Regional Council
2	<u>≻</u>	Rate (\$/kL)	\$11/kL	
WATER	⊒	Per Capita Water Consumption (L/day)	1,660L/da	у
₹ F	5		Roma Tov	vn Council 2007: 2,280 Residential, 170 Commercial/Industrial, 242 Rural, (
-		Number of Connections	Other, 2,6	
		Catchment	Murray Da	rling
누ピ		Sub-Catchment	-	
通知	$\geq$	Catchment Management Authority (CMA)	Queenslar	nd Murray Darling Committee
Ĕ₹	Ч	CMA Web-Link		v.qmdc.org.au/
CATCHMENT AND WATER	SU	Catchment Protection Status	Unknown	
2 A		Potable Water Source(s)	Groundwa	iter
		Supply Capacity	Unknown	
ШÉ	Ê	Treatment Plant(s) Level of Treatment	None	
WATER	Ā	Drinking Water Guidelines	None ADWG 20	04
ŝ	2	Results	Unknown	04
		Current Water Restrictions		3 days per week
WATER	<u>≻</u>	Proportion of Potable Water Supplied to		
Ë	Ŧ	Households (%)	Unknown	
A C	ວິ	Distance from the Coast (km)	426km	
2 5	ž	Climate	Sub-tropic	al
		Average Annual Rainfall	559.9mm	
_	1	FACTOR	YES / NC	NOTES / EXPLANATION Current water restrictions. Currently drought declared (Primary Industries
		Drought	Yes	and Fisheries)
		Single drinking water source	Yes	Groundwater.
		Poor quality water source	No	Does not require treatment.
		Sewage overflow or disposal into water	No	
		source		
		Flooding	No	
	ply	Fauna defecating in supply	No	
	dng	Fauna destroying water intake structures	No	
	er	Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)	No	
	Vat	Un-lined landfills		
	> p	Extensive agriculture	No	In surrounding area, however uses groundwater so not affected.
ŝ	an	Low vegetation cover (dust, sediment		
SL	ent	runoff)	No	In surrounding area, however uses groundwater so not affected.
SAL	Catchment and Water Supply	Poor access to supply	No	
ž	atc	Unsustainable water extraction		
SIS	0	Aquifer turning saline due to high extraction		
Σ		Hard water		
E				Rated as operating well, only requires maintenance (PB report); Main
С		Aging or inadequate pipe work and	No	breaks/100km of mains: 109.3 in 05/06, 142.7 in 04/05, 116.4 in 03/04,
S		associated infrastructure		124.6 in 02/03 and 85.3 in 01/02.
R		Significant water losses due to leaking		
/ATER QUALITY OR SECURITY RISK (CAUSE)		pipes High per capita water consumption		
Ę		Inappropriate water quality standards /		
NUA		objectives		
2	e	Lack of infrastructure maintenance		
Ē	ernance	Poor management or governance		
WA'		Vandalism / sabotage / terrorism		
-	Gov	Insufficient trained personnel		Total Operations Maintenance and
				Total Operations Maintenance and Administration Costs/Connection: 310 05/06, 272, 04/05, 290 03/04, 237 02/03, 215 01/02; /100km of water mai
		Inadequate funding for maintenance or		638760 05/06, 579032 04/05, 619672 03/04, 502459 02/03, 455590 01/02
		upgrades		/ML supplied: 294 05/06.
	s		No	
	strie	Mining / minerals		
	Industries	Irrigation	No	
	-	Chemicals / process	No	
	uo		No	
	lati	Seasonal population loadings		
	Population		No	
	Ă	Rapid population growth	110	
Ĥ	÷.	Pathogenic contamination		Meeting utility's standards/guidelines for E.coli 05/06: 100%.
щ	C L	Algal blooms		
	1 1	Heavy metal contamination		
Ē	Ц	Poor chlorine residuals		
INAL	2	Pesticide contamination Boil water notices		+
Ø	Υ Υ	Deaths or illness due to water quality		
ШĚ		Water restrictions (current and historic)		1
WATER QUALITY OR	Ľ.	Taste and odour issues		
50	Ц	Other contamination that would affect		Meeting Utility's standards/guidelines for Physical Chemical compliance
-		health		04/05:100%, 03/04:25%, 02/03:66.67%.

Town #	18	1		
-		State/Territory	Qld-South	
TOWN		Town Name	Stanthorpe	
		Town Population		sus 2006, Urban Centre/Locality)
WATER	-	Name of Water Utility		Water Supply Scheme
	1	Rate (\$/kL)		um, \$0.87/kL
N N	5	Per Capita Water Consumption (L/day) Number of Connections	2,353	0.3ML/Connection and 0.2ML/Rural Connection in 05/06 financial year.
		Catchment	2,353 Border Rive	ire
0		Sub-Catchment	-	
N N	1	Catchment Management Authority (CMA)	Queensland	d Murray Darling Committee
E		CMA Web-Link		qmdc.org.au/
s E	5	Catchment Protection Status	Unknown	
Z H H	í	Potable Water Source(s)	Storm King	
CATCHMENT AND WATER SUPPLY	2			p Dam (future)
S S	:	Supply Capacity		Dam - 2,180 ML er storages - 5.05 ML TMP
		Supply Supacity		p Dam (future) - 8,000 to 18,000ML
<u>م ک</u>	-	Treatment Plant(s)		Vater Treatment Plant - 5ML/day max treatment.
WATER		Level of Treatment	Unknown	*
	ŝ	Drinking Water Guidelines	ADWG 200	4
> C	8	Results	Unknown	
>	-	Current Water Restrictions	No	
н н	;	Proportion of Potable Water Supplied to	Unknown	
WATER	3	Households (%) Distance from the Coast (km)	165km	
N N	Ĺ	Climate	Temperate	
0,		Average Annual Rainfall	765.2mm	
		FACTOR	YES / NO	NOTES / EXPLANATION
		Drought	Yes	Town has had some form of water restrictions for 46% of 1975-2007 period. Not
		Diougin	165	currently drought declared (Primary Industries and Fisheries)
		Single drinking water source	Yes	Currently water soured from Storm King Dam, however planned construction of Emu
				Swamp Dam.
		Poor quality water source Sewage overflow or disposal into water		
		source		
	≻	Flooding	Yes	
	Supply	Fauna defecating in supply	Yes	Open water supply.
	Su	Fauna destroying water intake structures		
	ater	Natural mineral pollutants (e.g. uranium,		
	and Water	nitrates, iron, fluoride)		
	pu	Un-lined landfills		
SE	nta	Extensive agriculture Low vegetation cover (dust, sediment	Yes	Agricultural area.
AU	Catchment	runoff)	Yes	Clearing for agriculture.
<u> </u>	tch	Poor access to supply		
S X	Ca	Unsustainable water extraction		
R		Aquifer turning saline due to high extraction	No	
Ê				
Ч		Hard water	No	
С Ш		Aging or inadequate pipe work and		Main breaks per 100km of main: 2.8 in 05/06, 11.3 on 04/05, 11.5 in 03/04, 27.8 in
s r		associated infrastructure Significant water losses due to leaking		02/03 and 8.4 in 01/02.
ō		pipes		
ER QUALITY OR SECURITY RISK (CAUSE)		High per capita water consumption		
AL		Inappropriate water quality standards /		
gu		objectives		
Ř	ance	Lack of infrastructure maintenance		
WATE	าลท	Poor management or governance		
Š	Governa	Vandalism / sabotage / terrorism		
	Ô	Insufficient trained personnel		Total Operations Maintenance and Administration Costs/Connection: 256 05/06, 222
		Inadequate funding for maintenance or		04/05, 190 03/04, 287 02/03, 207 01/02; /100km of water main: 595370 05/06,
		upgrades		519811 04/05, 488008 03/04, 1287494 02/03, 528993 01/02; /ML supplied: 807
				05/06.
	S	Mining / minerals	No	
	strie			
	Industries	Irrigation	Yes	
		Chemicals / process	Yes	Industrial & wine production area.
	tio	Seasonal population loadings	No	
	ulat n			
	Populatio n	Rapid population growth	Yes	Rapidly growing industrial area.
	5	Pathogenic contamination Algal blooms		Meeting Utility's standards/guidelines for E.coli 05/06: 100%.
Ê	i i	Heavy metal contamination		
OR TECT)		Poor chlorine residuals		
IY OR			-	
ALITY OR K (EFFECT)	ļ			
NUALITY OR SISK (EFFECT)		Pesticide contamination Boil water notices		
r Quality or Y Risk (Effect)		Pesticide contamination Boil water notices Deaths or illness due to water quality		
TER QUALITY OR RITY RISK (EFFECT)		Pesticide contamination Boil water notices Deaths or illness due to water quality Water restrictions (current and historic)		
VATER QUALITY OR SURITY RISK (FFFECT)		Pesticide contamination Boil water notices Deaths or illness due to water quality Water restrictions (current and historic) Taste and odour issues		
WATER QUALITY OR SECURITY RISK (EFFECT)		Pesticide contamination Boil water notices Deaths or illness due to water quality Water restrictions (current and historic) Taste and odour issues Other contamination that would affect		Meeting utility's standards/guidelines for Physical Chemical compliance 05/06:100%,
WATER QUALITY OR SECURITY RISK (EFFECT)		Pesticide contamination Boil water notices Deaths or illness due to water quality Water restrictions (current and historic) Taste and odour issues		Meeting utility's standards/guidelines for Physical Chemical compliance 05/06:100%, 04/05:100%, 03/04:100%, 02/03:100%.

Town #	19	-		
TOWN		State/Territory	Qld-South	
Q		Town Name Town Population	Warwick	ensus 2006)
	-	Name of Water Utility		Downs Regional Council
WATER	5	Rate (\$/kL)	\$390.6/ann	num, \$1.14/kL, restricted flow access charge \$269.08/annum.
-AV	5	Per Capita Water Consumption (L/day)		0.3ML/Connection in 05/06 financial year.
/-		Number of Connections		hire Council 2006: 7,693 Residential, 7,693 Total.
-		Catchment Sub-Catchment	Condamine	2
CATCHMENT AND WATER SUPPI Y		Catchment Management Authority (CMA)	Condamine	e Alliance Incorporated
4 H		CMA Web-Link		.condaminealliance.com.au/
lev Su	8	Catchment Protection Status	Unknown	
≥ H H H	í	Potable Water Source(s)		n - Sunwater operated
ATC			Connolly D	am n - storage volume = 108,000ML, allocation = 2,707ML
5 S		Supply Capacity		am - storage volume = 2,592ML
			Total alloca	ation = 5,073ML from both sources
WATER OUALITY	-	Treatment Plant(s)		/ater Supply Treatment Plant.
ATE ALL		Level of Treatment	Unknown Unknown	
	) )	Drinking Water Guidelines Results	Unknown	
				ermitted: Hand-held hosing of gardens at any time, drip irrigation systems,
WATER SECURITY		Current Water Restrictions		top-up of pools & spas. Not Permitted: Sprinklers or unattended water
ER SE		Proportion of Potable Water Supplied to Households (%)	Unknown	
ATE		Distance from the Coast (km)	151km	
Š		Climate Average Annual Rainfall	Temperate 689.9mm	
		FACTOR	YES / NO	NOTES / EXPLANATION
		Drought	Yes	Current water restrictions. Not currently drought declared however has
				previously (Primary Industries and Fisheries)
		Single drinking water source	No	Two water supply dams.
		Poor quality water source Sewage overflow or disposal into water		
		source		
	>	Flooding	Yes	
	Catchment and Water Supply	Fauna defecating in supply	Yes	Open water supply.
	Su	Fauna destroying water intake structures		
	ater	Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)		
	Š	Un-lined landfills		
	and	Extensive agriculture	Yes	Agricultural area.
ISE	ant	Low vegetation cover (dust, sediment	Yes	Clearing for farming.
DAU	Ш,	runoff) Poor access to supply		
U V	atc	Unsustainable water extraction		
SISI	0	Aquifer turning saline due to high extraction	No	
ž				
LIN I		Hard water Aging or inadequate pipe work and	No	Main breaks/100km of main: 9.0 in 05/06, 3.2 in 04/05, 10.8 in 03/04, 14.5
no:		associated infrastructure	Yes	in 02/03 and 21.5 in 01/02.
SE		Significant water losses due to leaking		
OR		pipes		
Υ		High per capita water consumption		
ALI		Inappropriate water quality standards / objectives		
au	ø	Lack of infrastructure maintenance		
WATER QUALITY OR SECURITY RISK (CAUSE)	Governance	Poor management or governance		
/AT	/ern	Vandalism / sabotage / terrorism		
5	Go	Insufficient trained personnel		Total Operations Maintenance and Administration Costs/Connection: 272
		Inadequate funding for maintenance or upgrades		05/06, 269 04/05, 253 03/04, 239 02/03, 251 01/02; /100km of water main 652255 05/06, 642581 04/05, 615541 03/04, 571242 02/03, 568289 01/02 /ML supplied: 940 05/06.
	es	Mining / minerals	No	
	Istri	Irrigation	Yes	Irrigation of farming land.
	Industries	Chemicals / process	Yes	Industrial and wine making area.
		Seasonal population loadings	No	
	Population	Rapid population growth	Yes	Rapidly growing industrial area.
-		Pathogenic contamination		Meeting utility's standards/guidelines for E.coli 05/06: 100%.
R C		Algal blooms		
οH		Heavy metal contamination		
Ē	1	Poor chlorine residuals		
WATER QUALITY OR SECURITY RISK (FEFECT)	2	Pesticide contamination Boil water notices		
В Ч С Ч		Deaths or illness due to water quality		
LT F		Water restrictions (current and historic)		
VA_	5	Taste and odour issues		
	1	Other contamination that would affect		Meeting utility's standards/guidelines for Physical Chemical compliance
		health Notes		02/03: 100%.

Town #	20			
		State/Territory	Qld-South	
TOWN		Town Name	Highfields	
Ĕ		Town Population		sus 2006, Urban Centre/Locality)
r i	~	Name of Water Utility		a Regional Council
WATER	5	Rate (\$/kL)	Unknown	
A	Ę	Per Capita Water Consumption (L/day)	Unknown	
<b>S</b> .	<u>ر</u>	Number of Connections	Unknown	
r		Catchment	Moreton	
Ë		Sub-Catchment	Upper Brist	bane
ج\ ا		Catchment Management Authority (CMA)		Queensland Catchments
CATCHMENT AND WATER		CMA Web-Link	http://www.	seqcatchments.com.au/
N N	Ž	Catchment Protection Status	Unknown	
È	1		Cressbrook	
	ns	Potable Water Source(s)	Perseveran	
₹				res - 20 service Toowoomba and surrounding area
Ć				C Dam - 78,847ML
×		Supply Capacity		nce Dam - 26,668ML
				5% of the City's needs
WATER	È	Treatment Plant(s)		Water Treatment Plant
Ë	AL	Level of Treatment		d Filtration Plant
N N	Ď	Drinking Water Guidelines	ADWG 200	14
- (	0	Results	Unknown	
;	~	Current Water Restrictions Proportion of Potable Water Supplied to		o outside watering, topping up pools or washing vehicles using the town supply.
E E	ř	Households (%)	Unknown	
ATI	2	Distance from the Coast (km)	125km	
WATER	Щ.	Climate	Temperate	
		Average Annual Rainfall	944mm (To	powoomba)
	_	FACTOR	YES / NO	NOTES / EXPLANATION
			1207110	
			Yes	Cressbrook Dam currently at 8.4%, Perseverance Dam at 12.3%, however a pipeline is currently under construction to supply water to the Cressbrook Dam from Winneth Dam Construction to supply water to the Cressbrook Dam from
		Drought		Wivenhoe Dam. Currently drought declared (Primary Industries and Fisheries)
		Single drinking water source	No	Multiple dams.
		Poor quality water source		
		Sewage overflow or disposal into water		
	Ś	source		
	ldn	Flooding	Yes	On an annatan annata
	Catchment and Water Supply	Fauna defecating in supply	Yes	Open water supply.
	ate	Fauna destroying water intake structures		
	Š	Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)		
Э Ш	pu	Un-lined landfills		
ŝ	nt a	Extensive agriculture	No	
ð	ner	Low vegetation cover (dust, sediment		
¥	chr	runoff)	No	
SIS	Cat	Poor access to supply		
OR SECURITY RISK (CAUSE)	0	Unsustainable water extraction	Yes	Dams have nearly run out of water.
SH SH		Aquifer turning saline due to high extraction		
2		Hard water		
ы		Aging or inadequate pipe work and		
Ř		associated infrastructure		
0		Significant water losses due to leaking		
È		pipes		
QUALITY		High per capita water consumption		
au		Inappropriate water quality standards /		
ER (	nce	objectives		
Ë	าลท	Lack of infrastructure maintenance		
WAT	/en	Poor management or governance	ļ	
	6	Vandalism / sabotage / terrorism		
	Governa	Insufficient trained personnel		
		Inadequate funding for maintenance or		
	-	upgrades		
	ies	Mining / minerals	No	
	usti	Irrigation	No	
	Industries			
		Chemicals / process	No	
	Population		No	
	ulat	Seasonal population loadings	-	
	opr		Yes	Growing area.
		Rapid population growth		
Í	Ê	Pathogenic contamination		
R	Ш	Algal blooms		
~	1	Heavy metal contamination		
É í	Щ.	Poor chlorine residuals		
JAL	ð	Pesticide contamination	ļ	
ы В	r	Boil water notices	ļ	
WATER QUALITY OR	security risk (effect)	Deaths or illness due to water quality		
ATE .	R	Water restrictions (current and historic)		
N N	្ព	Taste and odour issues Other contamination that would affect		
l	SE	health		
	_	Notes	Cressbrook	Dam will be connected to Wivenhoe Dam within the next year.
		10100	51000000	Sam in as someolog to triveline bain within the next year.

Ę		State/Territory	Qld-South	
TOWN		Town Name		ay - Cooloola Cove
Ĭ		Town Population		sus 2006, Urban Centre/Locality & State Suburb)
		Name of Water Utility		egional Council
WATER UTILITY		Rate (\$/kL)	Unknown	
Ë		Per Capita Water Consumption (L/day)	Unknown.	0.3ML/connection in 05/06 financial year.
≦ 5			Cooloola S	hire Council 2007: 9,900 Residential, 750 Commercial/Industrial, 270 Rur
		Number of Connections	94 Other, 1	1,014 Total.
		Catchment	Mary Basir	
CATCHMENT AND WATER		Sub-Catchment		er and coastal streams north of the Noosa River
E E E	2	Catchment Management Authority (CMA)		ry Regional Group
포함	1	CMA Web-Link		.bmrg.org.au/
주 무 글 경	ns.	Catchment Protection Status	Unknown	
δA		Potable Water Source(s)	Unknown	
		Supply Capacity	Unknown	
ЖĘ		Treatment Plant(s) Level of Treatment	Unknown Unknown	
WATER QUALITY		Drinking Water Guidelines	ADWG 200	14
פ ≷		Results	Unknown	
				ering 4-8pm, Non-Residential (Over 10ML/Year users) watering 4-8pm,
WATER SECURITY		Current Water Restrictions		shing and Cleaning Paving and Driveways only is water saving devices
ER SE		Proportion of Potable Water Supplied to Households (%)	Unknown	
TE		Distance from the Coast (km)	9km	
WP		Climate	Sub-Tropic	
	_	Average Annual Rainfall		(Rainbow Beach), 1292.2mm (Toolara Forestry)
		FACTOR	YES / NO	NOTES / EXPLANATION
		Drought	Yes	Water restrictions however high rainfall area. Not currently drought declared (Primary Industries and Fisheries)
		Single drinking water source	<u> </u>	
		Poor quality water source		
		Sewage overflow or disposal into water		
		source		
	~	Flooding		
	Catchment and Water Supply	Fauna defecating in supply		
	Su	Fauna destroying water intake structures		
	ter	Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)		
	Na	Un-lined landfills		
	pu	Extensive agriculture		
ш	it al	Low vegetation cover (dust, sediment		
N	ner	runoff)		
S	chr	Poor access to supply		
ž	Cat	Unsustainable water extraction		
RIS	-	Aquifer turning saline due to high extraction		
≽		Hard water		
R		Aging or inadequate pipe work and		Main breaks/100km of mains: 13.8 in 05/06, 4.9 in 04/05, 6.1 in 03/04, 5
5		associated infrastructure	Yes	in 02/03 and 5.0 in 01/02.
S		Significant water losses due to leaking		
OR		pipes		
≥		High per capita water consumption		
۲L		Inappropriate water quality standards /		
QUALITY OR SECURITY RISK (CAUSE)		objectives		
	Governance	Lack of infrastructure maintenance		
WATER	ma	Poor management or governance Vandalism / sabotage / terrorism		1
WA	Ne	Insufficient trained personnel	<u> </u>	
	Ö	Inadequate funding for maintenance or upgrades		Total Operations Maintenance and Administration Costs/Connection: 26 05/06, 253, 04/05, 208 03/04, 195 02/03, 213 01/02; /100km of water m 865204 05/06, 754286 04/05, 677994 03/04, 611869 02/03, 667039 01/ /ML supplied: 770 05/06.
	Se	Mining / minerals		
	Industries	Irrigation	İ	
	npu			
		Chemicals / process	ļ	
	Population	Seasonal population loadings		
		Rapid population growth		
E	•	Pathogenic contamination	├	Meeting utility's standards/guidelines for E.coli 05/06: 100%.
WATER QUALITY OR SECURITY RISK (EFFECT)		Algal blooms Heavy metal contamination	<u> </u>	1
≥ H		Poor chlorine residuals		
U V	·	Pesticide contamination		
2UP 2IS		Boil water notices	1	
а Х С Т		Deaths or illness due to water quality		
ATE		Water restrictions (current and historic)		
AN SUC		Taste and odour issues		
_ Ü		Other contamination that would affect		Meeting utility's standards/guidelines for Physical Chemical compliance
		health		05/06:100%, 04/05:100%, 03/04:100%, 02/03:100%.

	22	State/Territory	Qld-Sout	h
TOWN		Town Name		& Kumbia
-		Town Population	7,811 (Ce	ensus 2006, Urban Centre/Locality & State Suburb)
	٢	Name of Water Utility		rnett Regional Council
WATER LITH ITY	5	Rate (\$/kL)	Unknown	
AN T	5	Per Capita Water Consumption (ML/day)		onnection, 0.2ML/Residential Connection in 05/06 financial year.
		Number of Connections	Kingaroy Burnett	Shire Council: 3,820 Residential, 335 Commercial/Industrial, 60 Rural, 95 other, 4,310 Total.
₽>	⊢.	Catchment Sub-Catchment	- Burnett	
CATCHMENT AND		Catchment Management Authority (CMA)	Burnett N	lary Regional Group
E E	r L	CMA Web-Link	http://www	w.bmrg.org.au/
55		Catchment Protection Status	Unknown	
CA_	~	Potable Water Source(s)		rook Dam
		Supply Capacity		rook Dam - 6600ML
WATER	► =	Treatment Plant(s) Level of Treatment	Unknown	rook Water Treatment Plant
ATE	Ę	Drinking Water Guidelines	ADWG 2	
≥ 5	วี	Results	Unknown	
RITY		Current Water Restrictions	Kingaroy watering	Level 4 - 2 hours watering 3 days per week, total ban on all sprinklers. Kumbia Level 7 - No outside
WATER SECURITY		Proportion of Potable Water Supplied to Households (%)	Unknown	
Ц		Distance from the Coast (km)	125km	
AT.		Climate	Subtropic	
3		Average Annual Rainfall	776.2mm	
		FACTOR	YES / NO	
		Drought Single drinking water source	Yes Yes	Water restrictions, nearly ran out of water in 2007. Water from one source.
		Poor quality water source	Yes	Algal blooms.
		Sewage overflow or disposal into water Flooding		
	Supply	Fauna defecating in supply	Yes	Open water supply.
	Sup	Fauna destroying water intake structures		
	and Water	Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)		
	pu	Un-lined landfills Extensive agriculture	Yes	Agricultural area.
Ω	nt a	Low vegetation cover (dust, sediment	Yes	Clearing for farmland.
SUN	ame	Poor access to supply	103	
C)	Catchment	Unsustainable water extraction	Yes	Nearly ran out of water during 2007.
Х	0	Aquifer turning saline due to high	No	
ΥR		Hard water	No	
URIT		Aging or inadequate pipe work and associated infrastructure	Yes	Main breaks/100km of mains: 23.9 in 05/06, 13 in 04/05, 18.1 in 03/04, 27.5 in 02/03 and 26.4 in 01/02
EC		Significant water losses due to leaking		
WATER QUALITY OR SECURITY RISK (CAUSE)		High per capita water consumption Inappropriate water quality standards /		
É	9	objectives Lack of infrastructure maintenance		
NA.		Poor management or governance		
ð	Governar	Vandalism / sabotage / terrorism		
Ē	Ô	Insufficient trained personnel		
WA		Inadequate funding for maintenance or upgrades		Total Operations Maintenance and Administration Costs/Connection: 301 05/06, 264 04/05, 245 03/04 380 02/03, 237 01/02; /100km of water main: 709783 05/06, 575543 04/05, 508791 03/04, 844402 02/03, 766258 01/02; /ML supplied: 965 05/06.
	ies	Mining / minerals	No	
	Industries	Irrigation	Yes	Irrigation of crops.
		Chemicals / process	Yes	Spraying of crops.
	Population	Seasonal population loadings	No	
	Popi	Rapid population growth	No	
í	-	Pathogenic contamination		Meeting Utility's standards/guidelines for E.coli 05/06: 93.06%.
R C	С Ц	Algal blooms Heavy metal contamination	Yes	2.8m average depth in dam, algal blooms have occurred in the past.
Z - 2		Poor chlorine residuals		
WATER QUALITY OR SECURITY DISK (FEEECT)	2	Pesticide contamination		
	0 Y	Boil water notices		
2 H	-	Deaths or illness due to water quality		
ATE	E C	Water restrictions (current and historic)		
2 S	2	Taste and odour issues Other contamination that would affect		Maating utility's standards/guidelines for Dhysical Chamical compliance 05/06:00/04/05:00/
·		Other contamination that would affect		Meeting utility's standards/guidelines for Physical Chemical compliance 05/06:0%, 04/05:0%, 03/04:33.33%, 02/03:100%.



## Town Profiles – NSW



Appendices Volume 2

_				
<	State/Territory	NSW		
TOWN	Town Name	Lithgow		
	Town Population		alth, 2009); 11,298 (Census 2006, Urban Centre/Locality)	
≿	Name of Water Utility	Lithgow City Cou		
	Council Web-Link	http://www.counc		
5	Rate (\$/kL)		rates = \$403/property for the 2001-2002 reporting period.	
WATER UTILITY	Per Capita Water Consumption (L/day)	domestic water c	imate = 221 L/day (using NSW Health 2009 population statistics, and onsumption reported in the 2007/2008 Lithgow SoE Report).	
	Number of Connections		E 07-08 Performance Monitoring Database)	
Ř	Catchment	Hawkesbury Nep	ean	
ATE	Sub-Catchment	Northern Valleys		
Ň	Catchment Management Authority (CMA) CMA Web-Link	Hawkesbury Nep http://www.hn.cm		
₽≻	Catchment Protection Status		river catchment or protected.	
PPL			Supply Scheme (State Water): Oberon Dam and Duckmaloi Weir	
CATCHMENT AND WATER SUPPLY	Potable Water Source(s)		ncil System: Farmers Creek Dam and Clarence Colliery Transfer System	
W.		Oberon Dam Stor		
с С	Supply Capacity	Duckmaloi Weir S		
AT SAT	Supply Capacity		am Storage = 450ML	
0			Transfer System = up to 5 to 6 ML/day	
	Treatment Plant(s)	Oakey Water Trea	atment Plant	
	Level of Treatment	operating capacit alum and polyele	vater from Farmers Creek Dam; current design capacity = 15 ML/d; y is reduced to 12ML/day; treatment includes chemical addition of soda ash, ctrolyte, flocculation, clarification, filtration and post dosing of chlorine and e daily output during winter = 4ML/d to 8ML per day in the summer months.	
	Drinking Water Guidelines	ADWG 2004		
		NSW Health Mor	nitoring Location: LG01-Lithgow	
		Aluminium	86	
	% compliance for water quality parameters	E. coli	99	
	achieving < 100%, 2003-2004	NICKEI	86	
		pH Total California	79	
		Total Coliforms	66 Antimony (14), Arsenic (14), Barium (14), Boron (14), Cadmium (14),	
	Calcium (14), Chloride Parameter(s) tested and number of samples (1) 2003-2004 Nitrate (14), Nitrite (14)		ad (14), Chromium (14), Copper (14), Copin (14), Solidin (14), E.Coli (76), Flouride ad (14), Magnesium (14), Manganese (14), Molybdenum (14), Nickel (14), e (14), PH (14), Selenium (14), Silver (14), Sulfate (14), Total Coliforms (76), iolids (TDS) (14), Total Hardness as CaCO3 (14), True Colour (6), Turbidity	
	% compliance for water quality parameters	Manganese Nickel	97 55	
	achieving < 100%, 2004-2005	рн	48	
		Total Coliforms Turbidity	77 97	
WATER QUALITY	Parameter(s) tested and number of samples ( ) 2004-2005	Aluminium (31), Antimony (31), Arsenic (31), Barium (31), Boron (31), Cadmium (31), Calcium (31), Chloride (31), Chromium (31), Copper (31), Cyanide (1), E.Coli (73), Flouride (31), Iron (31), Lead (31), Magnesium (31), Manganese (31), Molybdenum (31), Nickel (31), Nitrate (31), Nitrite (31), pH (31), Selenium (31), Silver (31), Sulfate (31), Total Coliforms (73) Total Dissolved Solids (TDS) (31), Total Hardness as CaCO3 (31), True Colour (31), Turbidity (31), Zinc (31)		
ğ		Aluminium	92	
ER		Iron	92	
'AT	% compliance for water quality parameters		69	
3	achieving < 100%, 2005-2006	pH Total Coliforms	71 90	
		Turbidity	90	
	Parameter(s) tested and number of samples ( ) 2005-2006	Aluminium (13), A Calcium (13), Chl (13), Free Chlorin Molybdenum (13) Sodium (13), Sulf	Antimony (13), Arsenic (13), Barium (13), Boron (13), Cadmium (13), loride (13), Chromium (13), Copper (13), Cyanide (13), E.Coli (67), Flouride le (1), lodine (13), Iron (13), Lead (13), Magnesium (13), Manganese (13), ), Nickel (13), Nitrate (13), Nitrite (13), pH (14), Selenium (13), Silver (13), fate (13), Total Coliforms (67), Total Dissolved Solids (TDS) (13), Total Co3 (13), True Colour (13), Turbidity (13), Zinc (13)	
	% compliance for water quality parameters achieving < 100%, 2006-2007	Iron Nickel Total Coliforms	92 92 79	
	Parameter(s) tested and number of samples ( ) 2006-2007	Aluminium (12), A Calcium (12), Chl (12), Iron (12), Le Nitrate (12), Nitrit Coliforms (71), To	Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), loride (12), Chromium (12), Copper (12), E.Coli (71), Flouride (12), lodine ad (12), Magnesium (12), Manganese (12), Molybdenum (12), Nickel (12), e (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Total Josolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True idity (12), Zinc (12)	
	% compliance for water quality parameters	Aluminium pH	70 81	
	achieving < 100%, 2007-2008	Total Coliforms	73	
	Parameter(s) tested and number of samples ( ) 2007-2008	Aluminium (23), A Calcium (23), Chl (field result WSA) Manganese (23), (23), Silver (23), S	Antimony (23), Arsenic (23), Barium (23), Boron (23), Cadmium (23), loride (23), Chromium (23), Copper (23), E.Coli (152), Flouride (23), Flouride ) (1), Free Chlorine (17), lodine (23), Iron (23), Lead (23), Magnesium (23), Molybdenum (23), Nickel (23), Nitrate (23), Mitrite (23), PH (26), Selenium Sodium (23), Sulfate (23), Total Chlorine (1), Total Coliforms (152), Total (TDS) (23), Total Hardness as CaCO3 (23), True Colour (23), Turbidity (23),	

Current Water Restrictions           Current Water Restrictions         hours = 4 hrs a day between 6am -8am 8.5 pm -7 pm on an odds and even system, hours = 4 hrs day between 6am -8am 8.5 pm -7 pm on an odds and even system, hours = 4 hrs day between 6am -8am 8.5 pm -7 pm on an odds and even system, hours = 4 hrs day between 6am -8am 8.5 pm -7 pm on an odds and even system, hours = 4 hrs day between 6am -8am 8.5 pm -7 pm on an odds and even system, hours = 4 hrs day between 6am -8am 8.5 pm -7 pm on an odds and even system, hours = 4 hrs day between 6am -8am 8.5 pm -7 pm on an odds and even system, hours = 4 hrs day between 6am -8am 8.5 pm -7 pm on an odds and even system, hours = 4 hrs day between 6am -8am 8.5 pm -7 pm on an odds and even system, hours = 4 hrs day between 6am -8am 8.5 pm -7 pm on an odds and even system, hours = 4 hrs day between 6am -8am 8.5 pm -7 pm on an odds and even system, hours = 4 hrs day between 6am -8am 8.5 pm -7 pm on an odds and even system, hours = 4 hrs day between 6am -8am 8.5 pm -7 pm on an odds and even system, hours = 4 hrs day between 6am -8am 8.5 pm -7 pm on an odds and even system, hours = 4 hrs day between 6am -8am 8.5 pm -7 pm on an odds and even system, hours = 4 hrs day between 6am -8am 8.5 pm -7 pm on an odds and even system, hours = 4 hrs day between 6am -8am 8.5 pm -7 pm on an odds and even system, hours = 4 hrs day between 6am -8am 8.5 pm -7 pm on an odds and even system, hours = 4 hrs day between 6am -8am 8.5 pm -7 pm on an odds and even system, hours = 4 hrs day between 6am -8am 8.5 pm -7 pm on an odds and even system.           Clarating water source         FACTOR         YES / NO         NOTES / EPUANITON           For quality water source         No         No         No         No           Single drinking water source         No         No         No         No	n the 07-08 through s in river beds.
Average Annual Rainfall       715 mm (Source: BoM gauge number 63164, period 2004-2008)         FACTOR       YES / NO       NOTES / EXPLANATION         Experienced drought for 4 months of the period 07/08 (Litting of 7/08). Classified as 'Marginal or Satisfactory' according to Drought Map October 2009.       Drought       No         Single drinking water source       No       Drought water source       No         Poor quality water source       No       No       No indication that source water is poor quality.         Sewage overflow or disposal into water source       Yes       Two sewer overflow incidents at pump stations. Reported in Litting with City Council Annual Report.         Flooding       No       No       No         Fauna defecating in supply       No       No       No         Natural mineral pollutants (e.g. uranium, nitrates, iron, flouride)       Yes       Coal mining operations cause leeching of natural minerals exposure of rock to air and moisture, and creation of cracks Unsure of what minerals.         Un-lined landfills       No       No indication of leaking landfills.         Extensive agriculture       No       Farming exists nearby, but the area is not based on extensi intensive agriculture. Large portions of land nearby are foreed or extensi intensive agriculture. Large portions of land nearby are foreed or extensi intensive agriculture.	n the 07-08 through s in river beds.
Average Annual Rainfall       715 mm (Source: BoM gauge number 63164, period 2004-2008)         FACTOR       YES / NO       NOTES / EXPLANATION         Experienced drought for 4 months of the period 07/08 (Litting to 07/08). Classified as 'Marginal or Satisfactory' according to Drought Map October 2009.       Drought       No         Single drinking water source       No       Drought water source       No         Poor quality water source       No       No       No         Sewage overflow or disposal into water source       Yes       Two sewer overflow incidents at pump stations. Reported in Littigow City Council Annual Report.         Flooding       No       No       No         Fauna defecating in supply       No       No       No         Natural mineral pollutants (e.g. uranium, nitrates, iron, flouride)       Yes       Coal mining operations cause leeching of natural minerals exposure of rock to air and moisture, and creation of cracks Unsure of what minerals.         Un-lined landfills       No       No indication of leaking landfills.         Extensive agriculture       No       Farming exists nearby, but the area is not based on extensi intensive agriculture. Large portions of land nearby are fore	n the 07-08 through s in river beds.
FACTOR         YES / NO         NOTES / EXPLANATION           Drought         No         Experienced drought for 4 months of the period 07/08 (Lithg 07/08). Classified as 'Marginal or Satisfactory' according to Drought Map October 2009.           Single drinking water source         No         No           Poor quality water source         No         No indication that source water is poor quality.           Sewage overflow or disposal into water source         Yes         Two sewer overflow incidents at pump stations. Reported in Lithgow City Council Annual Report.           Flooding         No         No         No reports of this being a cause of contamination.           Fauna defecating in supply         No         No reports of this being a cause of contamination.           Natural mineral pollutants (e.g. uranium, nitrates, iron, flouride)         Yes         Coal mining operations cause leeching of natural minerals exposure of rock to air and moisture, and creation of cracks Unsure of what minerals.           Un-lined landfills         No         No         No indication of leaking landfills.           Extensive agriculture         No         Farming exists nearby, but the area is not based on extensi intensive agriculture. Large portions of land nearby are fore: intensive agriculture. Large portions of land nearby are fore:	n the 07-08 through s in river beds.
Drought         No         Experienced drought for 4 months of the period 07/08 (Lithg 07/08). Classified as 'Marginal or Satisfactory' according to Drought Map October 2009.           Single drinking water source         No         Drought Map October 2009.           Poor quality water source         No         No indication that source water is poor quality.           Sewage overflow or disposal into water source         Yes         Two sewer overflow incidents at pump stations. Reported in Lithgow City Council Annual Report.           Flooding         No         No         No           Fauna defecating in supply         No         No erports of this being a cause of contamination.           Fauna defecating in supply         No         No erports of this being a cause of contamination.           Fauna defecating in supply         No         No erports of this being a cause of contamination.           Fauna defecating in supply         No         No erports of this being a cause of contamination.           Fauna defecating in supply         No         No erports of this being a cause of contamination.           Fauna defecating in supply         No         No erports of this being a cause of contamination.           Fauna defecating in supply         No         No erports of this being a cause of contamination.           Vest         Yes         Coal mining operations cause leeching of natural minerals exposure of rock to air and moisture, an	n the 07-08 through s in river beds.
Single drinking water source       No         Poor quality water source       No       No indication that source water is poor quality.         Sewage overflow or disposal into water       Yes       Two sewer overflow incidents at pump stations. Reported in Lithgow City Council Annual Report.         Flooding       No       No       No reports of this being a cause of contamination.         Fauna defecating in supply       No       No reports of this being a cause of contamination.         Natural mineral pollutants (e.g. uranium, nitrates, iron, flouride)       Yes       Coal mining operations cause leeching of natural minerals exposure of rock to air and moisture, and creation of cracks Unsure of what minerals.         Un-lined landfills       No       No indication of leaking landfills.         Extensive agriculture       No       Farming exists nearby, but the area is not based on extensi intensive agriculture. Large portions of land nearby are forest	through s in river beds. ive and
Sewage overflow or disposal into water source       Yes       Two sewer overflow incidents at pump stations. Reported in Lithgow City Council Annual Report.         Flooding       No       No         Fauna defecating in supply       No       No reports of this being a cause of contamination.         Fauna destroying water intake structures       No       Coal mining operations cause leeching of natural minerals exposure of rock to air and moisture, and creation of cracks Unsure of what minerals.         Un-lined landfills       No       No indication of leaking landfills.         Extensive agriculture       No       Farming exists nearby, but the area is not based on extensi intensive agriculture. Large portions of land nearby are forest	through s in river beds. ive and
source     Yes     Lithgow City Council Annual Report.       Flooding     No       Fauna defecating in supply     No       No     No reports of this being a cause of contamination.       Fauna destroying water intake structures     No       Natural mineral pollutants (e.g. uranium, nitrates, iron, flouride)     Yes       Un-lined landfills     No       Extensive agriculture     No       No     No indication of leaking landfills.       Extensive agriculture     No	through s in river beds. ive and
Fauna defecating in supply       No       No reports of this being a cause of contamination.         Fauna destroying water intake structures       No       Coal mining operations cause leeching of natural minerals exposure of rock to air and moisture, and creation of cracks Unsure of what minerals.         Nu-lined landfills       No       No indication of leaking landfills.         Extensive agriculture       No       Farming exists nearby, but the area is not based on extensi intensive agriculture. Large portions of land nearby are forest	s in river beds.
Fauna destroying water intake structures       No         Natural mineral pollutants (e.g. uranium, nitrates, iron, flouride)       Yes       Coal mining operations cause leeching of natural minerals exposure of rock to air and moisture, and creation of cracks Unsure of what minerals.         Un-lined landfills       No       No indication of leaking landfills.         Extensive agriculture       No       Farming exists nearby, but the area is not based on extensi intensive agriculture. Large portions of land nearby are forest	s in river beds.
Natural mineral pollutants (e.g. uranium, nitrates, iron, flouride)     Yes     Coal mining operations cause leeching of natural minerals exposure of rock to air and moisture, and creation of cracks Unsure of what minerals.       Un-lined landfills     No     No indication of leaking landfills.       Extensive agriculture     No     Farming exists nearby, but the area is not based on extensi intensive agriculture. Large portions of land nearby are forest	s in river beds.
Un-lined landfills       No       No indication of leaking landfills.         Extensive agriculture       No       Farming exists nearby, but the area is not based on extensi intensive agriculture. Large portions of land nearby are fore: intensive agriculture. Large portions of land nearby are fore: nunoff)         No       Surrounds are grassed or tree covered areas.         Poor access to supply       No         Unsustainable water extraction       Yes         Residents have historically been on water restrictions. Curre restrictions.	
Extensive agriculture No Farming exists nearby, but the area is not based on extensi intensive agriculture. Large portions of land nearby are fore Low vegetation cover (dust, sediment nunoff) No Surrounds are grassed or tree covered areas. Poor access to supply No Unsustainable water extraction Yes Residents have historically been on water restrictions. Currur restrictions.	
Image: Second	ະຣເປັນ.
Poor access to supply     No       Vision     Poor access to supply       Vision     Vision       Vision     Vis	
O     Tool decess is ouppry     No       Y     No     Residents have historically been on water restrictions. Current restrictions.       Y     No     Yes       Assident share bias advantation     No	
22 Aquifes turbing calling due to bish extension. No	rently on Level 4
Aquifer turning saline due to high extraction No	
Hard water No No reports that the source water is 'hard' water.	
Aging or inadequate pipework and associated infrastructure Aging or inadequate pipework and Aging or inadequate pipework and Aging or inadequate pipework and Test and Aging or inadequate pipework and Agin	
Significant water losses due to leaking pipes No Unknown. No reports of water losses in the system.	
High per capita water consumption No Per capita water consumption is below the national average the National Water Commission, 04-05 reporting period.	e reported by
Inappropriate water quality standards / No Council report to NSW Health, who use the ADWG.	
Image: Second	ertaking
Poor management or governance Yes Water treatment plant not maintained adequately. Council g Land and Environment Court. Many concerned community regarding adequacy and quality of supply.	
Vandalism / sabotage / terrorism No	
Insufficient trained personnel No No indication of training issues.	
upgrades	
Mining / minerals         Yes           9         8         Irrigation         No         No extensive irrigation industry nearby.           Chemicals / process         No         No         No         No	
Seasonal population loadings     No       Rapid population growth     No   Average Annual Population growth = 0.5% (from 2001 to 20 which is less than the NSW average (1.6%) reported by AB	
Bacteriological and / or viral contamination Yes Only 73% compliance for Faecal Coliforms in 07-08 reportin Health, 2009).	ng period (NSW
≻     Algal blooms	
Heavy metal contamination Yes	ariad (NRM
Poor chlorine residuals No Free Chlorine met ADWG guidelines for 07-08 reporting per Health, 2009).	100 (NSW
O High suspended solids No	
Market No       Pesticide contamination       Yes       Only 73% compliance for Faecal Coliforms in 07-08 reportin         Heavy metal contamination       Yes       Pesticide contamination       Yes         Poor chlorine residuals       No       Free Chlorine met ADWG guidelines for 07-08 reporting per Health, 2009).         High suspended solids       No       Free Chlorine met ADWG guidelines for 07-08 reporting per Health, 2009).         Boil water notices       No       No         Boil water notices       No       No reports of boil water notices according to NSW Health s spreadsheet.         Deaths or illness due to water quality       No       No         Water restrictions (current and historic)       Yes       Taste and odour issues         Other contamination that would affect health       Yes       Levels of aluminium compliant with ADWG only 70% of the 08 reporting period (NSW Health. 2009).	summary
Deaths or illness due to water quality No	
Water restrictions (current and historic) Yes	
Taste and odour issues No Other contamistion that would affect Other contamistic that would affect Other contamistion that	time for the 07
Yes Uter contamination that would affect Health Yes Levels of aluminium compliant with ADWG only 70% of the 08 reporting period (NSW Health, 2009).	
Notes jed reporting period (Now Health, 2003).	

Ę	State/Territory	NSW				
TOWN	Town Name	Bourke				
I	Town Population		2,145 (Census 2006, Urban Centre/Locality)			
≥	Name of Water Utility	Bourke Shire Council				
Ē	Council Web-Link	http://www.bourke.local-e.nsw.gov				
5	Rate (\$/kL)	Unknown. \$627/property for	the 2001-2002 reporting period.			
WATER UTILITY	Per Capita Water Consumption (L/day)	Unknown. 285 kL/household SoE Report, 07-08)	per year (according to graph presented in the Central West Region			
MA		,				
	Number of Connections	1180				
μĸ	Catchment Sub-Catchment	Western				
CATCHMENT AND WATER SUPPLY	Catchment Management Authority (CMA)	Western				
HNNH	CMA Web-Link	http://www.western.cma.nsw.gov.a	u/			
	Catchment Protection Status	None.				
A C	Potable Water Source(s)	Darling River (Watercourse)				
	Supply Capacity		olled river with reduced flow (DECCW, 2009).			
	Treatment Plant(s) Level of Treatment	Yes Filtration Floogulation Sodiu	nentation, Chlorination (NSW Health, 2009)			
	Drinking Water Guidelines	ADWG 2004 (NSW Health)				
	Dimining Water Caldelines	NSW Health Monitoring	Location: BK01-Bourke			
		Chloride	67			
		E. coli	98			
	% compliance for water quality parameters	Sodium	89			
	achieving < 100%, 2003-2004	Total Coliforms	66			
		Total Dissolved Solids (TDS)	67 44			
		Total Hardness as CaCO3 Aluminium (9) Antimony (9)	Arsenic (9), Barium (9), Boron (9), Cadmium (9), Calcium (9), Chlo			
	Parameter(s) tested and number of samples ( ) 2003-2004	(9), Chromium (9), Copper (9) Iron (9), Lead (9), Magnesiur (9), Nitrite (9), pH (9), Seleni	(a) Standar (9), Bardar (9), Bolor (9), Calardar (9), Calardar (9), Chardar (9), Nickel (9), Nitr um (9), Silver (9), Sodium (9), Sulfate (9), Total Coliforms (44), Tota Colar Hardness as CaCO3 (9), True Colour (6), Turbidity (9), Zinc (9)			
		Aluminium	27			
		Copper	67			
		E. coli	96			
	% compliance for water quality parameters	Iron	73 53			
	achieving < 100%, 2004-2005	Lead Nickel	87			
	uomeening + 100,0, 2004 2000	pH	73			
		Total Coliforms	75			
		Turbidity	47			
		Zinc	93 5), Arsenic (15), Barium (15), Boron (15), Cadmium (15), Calcium (			
	Parameter(s) tested and number of samples ( ) 2004-2005	Chloride (15), Chromium (15), Copper (15), Cyanide (2), E.Coli (51), Flouride (15), Free Chlorine (15), Iodine (15), Iron (15), Lead (15), Magnesium (15), Manganese (15), Mercury (15), Molybdenu (15), Nickel (15), Nitrate (15), PH (15), PH (15), Selenium (15), Silver (15), Sodium (15), Sulfate (15), Total Coliforms (51), Total Dissolved Solids (TDS) (15), Total Hardness as CaCO3 (15), True Colour (15), Turbidity (15), Zinc (15)				
Ł		Aluminium	58			
WATER QUALITY		Copper	75 96			
DQ	% compliance for water quality parameters	E. coli Iron	67			
Ϋ́.	achieving < 100%, 2005-2006	Lead	83			
ATE	, , , , , , , , , , , , , , , , , , ,	Nickel	92			
×.		Total Coliforms	75			
		Turbidity	58			
	Parameter(s) tested and number of samples() 2005-2006	Chloride (12), Chromium (12 (12), Magnesium (12), Mang Nitrite (12), pH (12), Selenium	<ol> <li>Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium ( ), Copper (12), E.Coli (53), Flouride (12), Iodine (12), Iron (12), Lead anese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12 n (12), Silver (12), Sodium (12), Sulfate (12), Total Coliforms (53), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zir</li> </ol>			
		Aluminium	83			
		Copper	92			
	% compliance for water quality parameters	E. coli	88			
	achieving < 100%, 2006-2007	Iron	92			
		Lead Total Coliforms	92 75			
		Turbidity	92			
			2), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (			
	Parameter(s) tested and number of samples ( ) 2006-2007	Chloride (12), Chromium (12 (12), Magnesium (12), Mang Nitrite (12), pH (12), Selenium Dissolved Solids (TDS) (12), (12)	), Copper (12), E.Coli (52), Flouride (12), Iodine (12), Iron (12), Lead anese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12 n (12), Silver (12), Sodium (12), Sulfate (12), Total Coliforms (52), T Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zir			
		Chloride	78			
	% compliance for water quality parameters	E. coli Total Califorma	94			
	achieving < 100%, 2007-2008	Total Coliforms Total Dissolved Solids (TDS)	67 78			
		Total Hardness as CaCO3	78			
	Parameter(s) tested and number of samples ( ) 2007-2008	Aluminium (9), Antimony (9) (9), Chromium (9), Copper (9	Arsoic (9), Barium (9), Boron (9), Cadmium (9), Calcium (9), Chlo ), E.Coli (51), Flouride (9), Iodine (9), Iron (9), Lead (9), Magnesium Molybdenum (9), Nickel (9), Nitrate (9), Nitrite (9), pH (9), Selenium			

WATER SECURITY	bly	Proportion of Potable Water Supplied to Households (%) Reuse Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source	Unknown None (Central West Regional S ~ 700 km Grassland (BoM, 2005) 219mm (Source: BoM station n YES / NO No Yes No	umber 48245, period 2004-2008) NOTES / EXPLANATION Classified as 'Marginal' according to NSW DPI Drought Map October 2009. According to the Bourke Shire Council Annual Report (07-08), Council is planning on drilling an artesian bore to supplement
WATE	ly	Reuse Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water	~ 700 km Grassland (BoM, 2005) 219mm (Source: BoM station n YES / NO No	umber 48245, period 2004-2008) NOTES / EXPLANATION Classified as 'Marginal' according to NSW DPI Drought Map October 2009. According to the Bourke Shire Council Annual Report (07-08), Council is planning on drilling an artesian bore to supplement
MA	ly	Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water	Grassland (BoM, 2005) 219mm (Source: BoM station n YES / NO No Yes	NOTES / EXPLANATION Classified as 'Marginal' according to NSW DPI Drought Map October 2009. According to the Bourke Shire Council Annual Report (07-08), Council is planning on drilling an artesian bore to supplement
	Ny	Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water	219mm (Source: BoM station n YES / NO No Yes	NOTES / EXPLANATION Classified as 'Marginal' according to NSW DPI Drought Map October 2009. According to the Bourke Shire Council Annual Report (07-08), Council is planning on drilling an artesian bore to supplement
	ly	FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water	YES / NO No Yes	NOTES / EXPLANATION Classified as 'Marginal' according to NSW DPI Drought Map October 2009. According to the Bourke Shire Council Annual Report (07-08), Council is planning on drilling an artesian bore to supplement
	ły	Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water	No Yes	Classified as 'Marginal' according to NSW DPI Drought Map October 2009. According to the Bourke Shire Council Annual Report (07-08), Council is planning on drilling an artesian bore to supplement
	ly	Poor quality water source Sewage overflow or disposal into water		Council is planning on drilling an artesian bore to supplement
	Ŋ	Poor quality water source Sewage overflow or disposal into water	No	supply.
	ly.			
	Ŋ		Yes	Central West Regional SoE Report states that water quality in the catchment is affected by wastewater discharges and overflows.
	Ŋ	Flooding	No	
	<u>&gt;</u>	Fauna defecating in supply	Yes	
		Fauna destroying water intake structures	No	
	Supply	Natural mineral pollutants (e.g. uranium, nitrates, iron, flouride)	No	
	Catchment and Water S	Un-lined landfills	No	It is stated in the 05-06 Bourke Shire Council SoE Report that the management of illegal dumping is a priority for Council.
	and V	Extensive agriculture	Yes	Cotton farming, sheep and cattle production (Bourke Shire Council SoE Report, 05-06)
INSE	nent a	Low vegetation cover (dust, sediment runoff)	Yes	
CA	chn	Poor access to supply	No	
RISK (	Cat	Unsustainable water extraction	Yes	Drinking water source is the Darling River, which is a controlled river with reduced flow.
URITY F		Aquifer turning saline due to high extraction	Yes	Salinity is monitored at various points along the river. Historically, salinity levels have exceeded drinking water guidelines.
SEC		Hard water	Yes	22% of water quality results were non-compliant for water hardness for the 07-08 reporting period.
WATER QUALITY OR SECURITY RISK (CAUSE)		Aging or inadequate pipework and associated infrastructure	Yes	Facility built or refurbished in 1988 (DECCW 07-08 Water Treatment Performance Report). Recent minor refurbishments to water filtration plant. New pumps and control buildings installed (Bourke Shire Council Annual Report, 07-08).
IR OI		Significant water losses due to leaking pipes	No	No report of water losses.
ATE		High per capita water consumption	No	Water consumption is essentially the state average.
/M	e	Inappropriate water quality standards / objectives	No	Council report to NSW Health, who use the ADWG.
	Governance	Lack of infrastructure maintenance	No	
	em.	Poor management or governance	No	
	õ	Vandalism / sabotage / terrorism	No	No indication of technic income
	0	Insufficient trained personnel Inadequate funding for maintenance or	No	No indication of training issues.
		upgrades	No	No indication of funding issues.
	Industries	Mining / minerals	Yes	Stated to be an industry in the Bourke region (mineral/mining, chemical wholesaling), in the Central West Regional SoE Report, 07-08.
70	pu	Irrigation	Yes	Agriculture such as cotton in the LGA.
	Population	Chemicals / process	No Yes	Approximately 20,000 tourists visited the Bourke Tourist Information Centre in 05-06 (Bourke Shire Council SoE Report, 05- 06); however there is no information on the number of tourists staying in the township during peak season.
	o 1	Rapid population growth	Yes	Average Annual Population growth = 3.8% (from 2001-2006 Census), which is greater than the NSW average of 1.6%.
		Bacteriological and / or viral contamination	Yes	The levels of E.Coli and Total Coliforms were not 100% compliant for the 07-08 reporting period.
NSI:		Algal blooms	No	
× R			Yes	Some heavy metals have been repeatedly non-compliant up to the
RIT		Heavy metal contamination Poor chlorine residuals	Yes	07-08 reporting period. Free chlorine is not tested.
WATER QUALITY OR SECURITY RISK (EFFECT)		Pesticide contamination	Yes	The Central West Regional SoE Report 07-08 identifies pesticide runoff as a risk factor in the region. Pesticides are not tested for in the drinking water supply according to the NSW Health database.
IALIT'		High suspended solids	Yes	Levels of Total Dissolved Solids were not 100% compliant for the 07-08 reporting period.
au		Boil water notices	No	
Ц		Deaths or illness due to water quality	No	
ITA'		Water restrictions (current and historic)	Yes	
3		Taste and odour issues Other contamination that would affect	No	+
		health	No	
	_	Notes		·

Ž.		State/Territory	NSW	
TOWN		Town Name	Narromine	
		Town Population		Ith, 2009); 3,599 (Census 2006, Urban Centre/Locality)
È		Name of Water Utility	Narromine Shire	
WATER UTILITY		Council Web-Link Rate (\$/kL)	http://www.narror \$0.80/kL	nine.nsw.gov.au/_
5		Rate (\$/RL)		
Ш		Per Capita Water Consumption (L/day)		on the NSW Health 2009 population statistics, and 703ML of potable wat
AT (AT			was supplied to c	ustomers in the 07-08 period (DWE, 2009)
\$		Number of Connections	2090	
<b>L</b>		Catchment	Central West	
лщ У		Sub-Catchment	Macquarie-Bogar	1
PLAIM		Catchment Management Authority (CMA)	Central West	
ç≤₽		CMA Web-Link		.gov.au/cwcma_ourcatchment.htm
CATCHMENT AND WATER SUPPLY		Catchment Protection Status Potable Water Source(s)	None. Narromine Bore (	aroundwater
04		Supply Capacity	Unknown	groundwater)
		Treatment Plant(s)	None	
		Level of Treatment	Aeration (NSW H	ealth. 2009)
		Drinking Water Guidelines	ADWG 2004 (NS	
				pring Location: NM01-Narrowmine
		% compliance for water quality parameters	Total Coliforms	84
		achieving < 100%, 2003-2004		
		Parameter(s) tested and number of	E.Coli (50), Total	Coliforms (50)
		samples () 2003-2004	Table 10	
		% compliance for water quality parameters	Total Coliforms	92
		achieving < 100%, 2004-2005		Coliforme (12)
≻		Parameter(s) tested and number of samples () 2004-2005	E.Coli (13), Total	
Ę		% compliance for water quality parameters	Total Coliforms	70
WATER QUALITY		achieving < 100%, 2005-2006	. Star Comornis	
ð		Parameter(s) tested and number of	E.Coli (20), Total	Coliforms (20)
Ë		samples () 2005-2006	( ),	
-AV		% compliance for water quality parameters	Total Coliforms	96
5		achieving < 100%, 2006-2007		
		Parameter(s) tested and number of	E.Coli (25), Total	Coliforms (25)
		samples () 2006-2007		
		% compliance for water quality parameters	Total Coliforms	90
		achieving < 100%, 2007-2008		 htimony (2), Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2
		Parameter(s) tested and number of		langanese (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrate (2), Nitrit
		samples ( ) 2007-2008	(2), pH (2), Selen	(TDS) (2), Total Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zi
		Current Water Restrictions	(2), pH (2), Seleni Dissolved Solids (2)	ium (2), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (51), Total
жĘ		Current Water Restrictions Proportion of Potable Water Supplied to	(2), pH (2), Selen Dissolved Solids (2) No water restriction	ium (2), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (51), Total (TDS) (2), Total Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zi
NTER URITY		Current Water Restrictions Proportion of Potable Water Supplied to Households (%)	(2), pH (2), Seleni Dissolved Solids (2) No water restrictio Unknown	ium (2), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (51), Total (TDS) (2), Total Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zi
WATER ECURITY		Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km)	(2), pH (2), Seleni Dissolved Solids (2) No water restriction Unknown ~ 400km	ium (2), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (51), Total (TDS) (2), Total Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zi ons advertised on the Narromine Council website.
WATER SECURITY		Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate	(2), pH (2), Seleni Dissolved Solids (2) No water restriction Unknown ~ 400km Temperate (neari	ium (2), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (51), Total (TDS) (2), Total Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Z ons advertised on the Narromine Council website.
WATER SECURITY		Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall	(2), pH (2), Selen Dissolved Solids (2) No water restrictie Unknown ~ 400km Temperate (neari 488mm (Source:	ium (2), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (51), Total (TDS) (2), Total Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zi ons advertised on the Narromine Council website. ng 'Grassland') (BoM, 2005) BoM station number 51037, period 2004-2008)
WATER SECURITY		Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR	(2), pH (2), Seien Dissolved Solids (2) No water restrictie Unknown ~ 400km Temperate (neari 488mm (Source: YES / NO	ium (2), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (51), Total (TDS) (2), Total Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Z ons advertised on the Narromine Council website. ng 'Grassland') (BoM, 2005) BoM station number 51037, period 2004-2008) NOTES / EXPLANATION
WATER		Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall	(2), pH (2), Selen Dissolved Solids (2) No water restrictie Unknown ~ 400km Temperate (neari 488mm (Source:	ium (2), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (51), Total (TDS) (2), Total Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zi ons advertised on the Narromine Council website. ng 'Grassland') (BoM, 2005) BoM station number 51037, period 2004-2008)
WATER		Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR	(2), pH (2), Seien Dissolved Solids (2) No water restrictie Unknown ~ 400km Temperate (neari 488mm (Source: YES / NO	ium (2), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (51), Total (TDS) (2), Total Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Z ons advertised on the Narromine Council website. ng 'Grassland') (BoM, 2005) BoM station number 51037, period 2004-2008) NOTES / EXPLANATION Classified as 'In Drought' according to NSW DPI Drought Map October
WATER		Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source	(2), pH (2), Seien Dissolved Solids (2) No water restriction Unknown ~ 400km Temperate (neari 488mm (Source: YES / NO Yes	ium (2), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (51), Total (TDS) (2), Total Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Z ons advertised on the Narromine Council website. ng 'Grassland') (BoM, 2005) BoM station number 51037, period 2004-2008) NOTES / EXPLANATION Classified as 'In Drought' according to NSW DPI Drought Map October 2009.
WATER		Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water	(2), pH (2), Seien Dissolved Solids (2) No water restriction Unknown ~ 400km Temperate (neari 488mm (Source: YES / NO Yes Yes No	ium (2), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (51), Total (TDS) (2), Total Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Z ons advertised on the Narromine Council website. ng 'Grassland') (BoM, 2005) BoM station number 51037, period 2004-2008) NOTES / EXPLANATION Classified as 'In Drought' according to NSW DPI Drought Map October 2009. Groundwater bore.
WATER SECURITY		Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source	(2), pH (2), Seien Dissolved Solids (2) No water restriction Unknown ~ 400km Temperate (neari 488mm (Source: YES / NO Yes Yes No No	ium (2), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (51), Total (TDS) (2), Total Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Z ons advertised on the Narromine Council website. ng 'Grassland') (BoM, 2005) BoM station number 51037, period 2004-2008) NOTES / EXPLANATION Classified as 'In Drought' according to NSW DPI Drought Map October 2009.
WATER SECURITY		Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water	(2), pH (2), Seien Dissolved Solids (2) No water restriction Unknown ~ 400km Temperate (neari 488mm (Source: YES / NO Yes Yes No	ium (2), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (51), Total (TDS) (2), Total Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Z ons advertised on the Narromine Council website. ng 'Grassland') (BoM, 2005) BoM station number 51037, period 2004-2008) NOTES / EXPLANATION Classified as 'In Drought' according to NSW DPI Drought Map October 2009. Groundwater bore. Groundwater source. Contamination via sewage overflows is unlikely.
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- Water Sunnly	Catchment and water Supply	Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna defecating in supply Fauna defecating in supply Fauna defecating in supply Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards /	(2), pH (2), Seien Dissolved Solids (2) No water restrictie Unknown ~ 400km Temperate (neari 488mm (Source: YES / NO Yes Yes No No No No No Yes Yes Yes Yes Yes Yes Yes Yes No No No Yes No No No No	ium (2), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (51), Total (TDS) (2), Total Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Z ons advertised on the Narromine Council website. ng 'Grassland') (BoM, 2005) BoM station number 51037, period 2004-2008) NOTES / EXPLANATION Classified as 'In Drought' according to NSW DPI Drought Map October 2009. Groundwater bore. Groundwater source. Contamination via sewage overflows is unlikely. Repeated non-compliances reported for Total Coliforms, however due t their widespread occurrence in most soil and water environments, they no longer regarded as the most reliable indicator of human or animal contamination. The Central West Regional SoE Report 07-08 reports that there are 50 potentially contaminated sites in the Narromine area. Livestock, grains, citrus and cotton industries (Council website). Narromine has a 'moderate' water salinity hazard rating according to th Central West Regional SoE Report, 07-08. No reports on the condition of existing infrastructure. Age of infrastructure, No indication of the age of the existing reticulation system.
ATER QUALITY OR SECURITY RISK (CAUSE) Catchment and Water Stinnly	_	Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna defecating in supply Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives	(2), pH (2), Seien Dissolved Solids (2) No water restrictie Unknown ~ 400km Temperate (neari 488mm (Source: YES / NO Yes Yes No No No No No Yes Yes Yes Yes Yes No No No Yes No No No Yes No No	ium (2), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (51), Total (TDS) (2), Total Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Z ons advertised on the Narromine Council website. ng 'Grassland') (BoM, 2005) BoM station number 51037, period 2004-2008) NOTES / EXPLANATION Classified as 'In Drought' according to NSW DPI Drought Map October 2009. Groundwater bore. Groundwater source. Contamination via sewage overflows is unlikely. Repeated non-compliances reported for Total Coliforms, however due I their widespread occurrence in most soil and water environments, they no longer regarded as the most reliable indicator of human or animal contamination. The Central West Regional SoE Report 07-08 reports that there are 50 potentially contaminated sites in the Narromine area. Livestock, grains, citrus and cotton industries (Council website). No reports on the condition of existing infrastructure. Age of infrastructur not report to DECCW (07-08 Water Treatment Performance Report). No indication of the age of the existing reticulation system. Council reports to NSW Health who use ADWG.
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- Water Sunnly	_	Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna defecating in supply Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives	(2), pH (2), Seien Dissolved Solids (2) No water restrictie Unknown ~ 400km Temperate (neari 488mm (Source: YES / NO Yes Yes No No No No No Yes Yes Yes Yes Yes No No No Yes No No No Yes No No	ium (2), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (51), Total (TDS) (2), Total Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Z ons advertised on the Narromine Council website. ng 'Grassland') (BoM, 2005) BoM station number 51037, period 2004-2008) NOTES / EXPLANATION Classified as 'In Drought' according to NSW DPI Drought Map October 2009. Groundwater bore. Groundwater source. Contamination via sewage overflows is unlikely. Repeated non-compliances reported for Total Coliforms, however due I their widespread occurrence in most soil and water environments, they no longer regarded as the most reliable indicator of human or animal contamination. The Central West Regional SoE Report 07-08 reports that there are 50 potentially contaminated sites in the Narromine area. Livestock, grains, citrus and cotton industries (Council website). No reports on the condition of existing infrastructure. Age of infrastructur not report to DECCW (07-08 Water Treatment Performance Report). No indication of the age of the existing reticulation system. Council reports to NSW Health who use ADWG.

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1	1	Inadaguata funding far maintananaa ar		
		Inadequate funding for maintenance or upgrades	No	
	se	Mining / minerals	No	
	Industries	Irrigation	Yes	Cropping/pasture stated to be a major industry in the region in the Central West Regional SoE Report, 07-08.
	<u>n</u>	Chemicals / process	No	
	<sup>o</sup> opulation	Seasonal population loadings	Unknown	
	Popu	Rapid population growth	No	Negative population growth between 2001 and 2006 census.
≽		Bacteriological and / or viral contamination	No	E.Coli samples have historically been compliant.
R		Algal blooms	No	
SECURITY	-	Heavy metal contamination	No	No detection of heavy metals for the 07-08 reporting period when metals were tested (in previous years metals were not tested).
OR	)	Poor chlorine residuals	Yes	No chlorine is added to the water supply.
		Pesticide contamination	No	
드 드 끈	1	High suspended solids	No	
QUALITY RISK (EF	5	Boil water notices	No	
ਕ ਕ		Deaths or illness due to water quality	No	
ĸ		Water restrictions (current and historic)	No	No water restrictions advertised on the Council website.
Ë		Taste and odour issues	No	
WATER		Other contamination that would affect health	Yes	Narromine has a 'moderate' water salinity hazard rating according to the Central West Regional SoE Report, 07-08.
		Notes		water rates to one community member due to dissatisfaction with water Central West Regional SoE Report, 07-08).

Town #	26				
Z		State/Territory	NSW		
TOWN		Town Name Town Population	Coonabarabran	, 2009); 2,609 (Census 2006, Urban Centre/Locality)	
		Name of Water Utility	Warrumbungle Shir		
5		Council Web-Link	http://www.warrumbungl		
5		Rate (\$/kL)	Unknown		
WATER UTILITY		Per Capita Water Consumption (L/day)	1000L/day. Based on statistic of average annual resident use = 365kL (04-05 reporting period, Warrumbungle Shire Council SoE Report, 07-08).		
3		Number of Connections	3280 (Warrumbung	le system)	
Δ.		Catchment	Central West Castlereagh		
AN A	1	Sub-Catchment Catchment Management Authority (CMA)	Castlereagn Central West		
T A	5	CMA Web-Link		jov.au/cwcma ourcatchment.htm	
N ME	2	Catchment Protection Status	None.		
포트	1	Potable Water Source(s)	Castlereagh River (watercourse) (NSW Health, 2009) Timor Dam (surface storage) (NSW Health, 2009)		
CATCHMENT AND WATER SLIPPLY		,			
0-		Supply Capacity	Castlereagh River = unknown Timor Dam = unknown		
		Treatment Plant(s)	No		
		Level of Treatment	Flocculation, filtratio		
		Drinking Water Guidelines	ADWG 2004 (NSW		
			No information.	ng Location: Coonabarabran (01)	
		% compliance for water quality parameters achieving < 100%, 2003-2004			
		% compliance for water quality parameters achieving < 100%, 2004-2005	No information.	-	
~		% compliance for water quality parameters achieving < 100%, 2005-2006	Total Coliforms	59	
WATER QUALITY		Parameter(s) tested and number of	E.Coli (49), Free Ch	lorine (2), Total Coliforms (49)	
AUA		samples () 2005-2006		· · · · · · · · · · · · · · · · · · ·	
Н С			Aluminium	0	
ATE		% compliance for water quality parameters	E. coli Iron	98 0	
Ń		achieving < 100%, 2006-2007	Total Coliforms	73	
			Turbidity	0	
		Parameter(s) tested and number of samples ( ) 2006-2007	Aluminium (1), Antimony (1), Arsenic (1), Barium (1), Boron (1), Cadmium (1), Calcium (1), Chloride (1), Chromium (1), Copper (1), E.Coli (45), Fluoride (1), Iodine (1), Iron (1), Lead (1), Magnesium (1), Manganese (1), Mercury (1), Molybdenum (1), Nickel (1), Nitrate (1), Nitrite (1), pH (1), Selenium (1), Silver (1), Sodium (1), Sulfate (1), Total Coliforms (45), Total Dissolved Solids (TDS) (1), Total Hardness as CaCO3 (1), True Colour (1), Turbidity (1), Zinc (1)		
		% compliance for water quality parameters achieving < 100%, 2007-2008	E. coli	98	
		Parameter(s) tested and number of samples () 2007-2008	E.Coli (48), Free Ch		
>	-	Current Water Restrictions	No record of water r	estrictions on Council's website.	
ER T	2	Proportion of Potable Water Supplied to Households (%)	Unknown		
WATER	5	Distance from the Coast (km)	~ 340km		
≤ ŭ	5	Climate		of Subtropical, Grassland and Temperate) (BoM, 2005)	
		Average Annual Rainfall		M station number 64008, period 2004-2008)	
FACTOR		T	YES / NO	NOTES / EXPLANATION	
		Drought	Yes	Classified as 'In Drought' according to NSW DPI Drought Map October 2009.	
		Single drinking water source	No		
		Poor quality water source	Yes	Castlereagh River quality stated as 'Fair' based on the Warrumbungle	
		Sewage overflow or disposal into water		Shire Council SoE Report, 07-08.	
		source	Yes	Coonabarabran STP discharges to the Castlereagh River.	
		Flooding	No		
	ylq	Fauna defecating in supply	Yes	River and dam water sources.	
	Sup	Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium,	No	Iron and aluminium samples were non-compliant in the 06-07 sampling	
	ter	nitrates, iron, fluoride)	Yes	period.	
(II)	nd Wa	Un-lined landfills	Yes	Illegal dumping reported in the Warrumbungle Shire Council SoE Report, 07-08.	
VUSE	nt aı	Extensive agriculture	Yes	Wool and beef cattle production, cereal cropping and vine growing and horticulture (Council website).	
SK (C/	Catchment and Water Supply	Low vegetation cover (dust, sediment runoff)	No		
Ř	ö	Poor access to supply	No		
É		Unsustainable water extraction	No	No record of water restrictions on Council's website.	
ECUF		Aquifer turning saline due to high extraction Hard water	Unknown No		
WATER QUALITY OR SECURITY RISK (CAUSE)		Aging or inadequate pipe work and associated infrastructure	No	Infrastructure was built or upgraded in 1993 according to the DECCW 07- 08 Water Treatment Performance Report.	
É,		Significant water losses due to leaking	No	No record of losses.	
JAL		pipes High per capita water consumption	Yes	1000L/day.	
ð		Inappropriate water quality standards /			
ATEF	overnance	objectives Lack of infrastructure maintenance	No No	Council reports to NSW Health who use ADWG.	
2	č	Poor management or governance	No		
>	er	Vandalism / sabotage / terrorism	No		

	Supp	Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)	Yes	
ŝE)	Catchment and Water	Un-lined landfills	Yes	The Central West Regional SoE Report 07-08 states that there are 24 potentially contaminated sites in the Wellington area, including the gasworks remediation site.
WATER QUALITY OR SECURITY RISK (CAUSE)	ent ar	Extensive agriculture	Yes	Cropping, wool, beef and prime lamb are major industries (Wellington Annual Report, 07-08).
RISK (	atchm	Low vegetation cover (dust, sediment runoff)	Yes	Extensive agricultural areas, low forested cover.
ш ≻	ő	Poor access to supply	No	Town is immediately adjacent to the Macquarie River.
É		Unsustainable water extraction	Yes	
ECUR		Aquifer turning saline due to high extraction	Yes	Wellington has a water salinity hazard rating of 'high' (Central West Regional SoE Report, 07-08).
SE		Hard water	No	
Y OR		Aging or inadequate pipe work and associated infrastructure	No	Infrastructure built or augmented in 1993 according to DECCW 07-08 Water Treatment Performance Report.
JALIT		Significant water losses due to leaking pipes	No	
ಠ		High per capita water consumption	No	Per capita water consumption is not reported.
ATER	e	Inappropriate water quality standards / objectives	No	Council reports to NSW Health, who use ADWG.
× ×	and	Lack of infrastructure maintenance	No	
-	Governance	Poor management or governance	No	
	Ň	Vandalism / sabotage / terrorism	No	
	Ğ	Insufficient trained personnel	No	
		Inadequate funding for maintenance or upgrades	No	
	Populatio Industries n	Mining / minerals	No	
		Irrigation	Yes	Council parks and other areas consume a significant amount of water (Central West Regional SoE Report, 07-08).
		Chemicals / process	No	
		Seasonal population loadings	No	
		Rapid population growth	No	Wellington experienced a negative average annual population growth (approximately 2%) between the 2001 and 2006 Census.
WATER QUALITY OR SECURITY BISK (FEFECT)		Bacteriological and / or viral contamination	Yes	Some samples of E.Coli were non-compliant for the 07-08 reporting period.
Inc		Algal blooms	No	
Щ с		Heavy metal contamination	Yes	Historical issues with Aluminium.
QUALITY OR SE	)	Poor chlorine residuals	No	
0 H	-	Pesticide contamination	No	
	j	High suspended solids	No	
K AL	ś	Boil water notices	No	No boil water notices according to NSW Health summary spreadsheet.
DO DO	ź	Deaths or illness due to water quality	No	
Ľ		Water restrictions (current and historic)	No	No record of water restrictions on the Council website.
Ë		Taste and odour issues	No	Wellington has a water calinity beyond only a of thight (Or should be
Ŵ		Other contamination that would affect health	Yes	Wellington has a water salinity hazard rating of 'high' (Central West Regional SoE Report, 07-08).
		Notes	(Central West Regional Sol	dirty water complaints from the community in the 07-08 reporting period E Report, 07-08). Groundwater in Wellington is being studied by a university lers University) as part of \$60 Million of funding to secure Australia's water

Ϋ́,	State/Territory	NSW			
TOWN	Town Name	Wellington			
P	Town Population	4,947 (NSW Health, 2009);	4,118 (Census 2006, State Suburb)		
	Name of Water Utility	Wellington Council			
£	Council Web-Link	http://www.wellington.nsw.gov.au			
WATER UTILITY	Rate (\$/kL)	\$1.64 - \$2.02/kL (Council website, 'Fees and Charges 2009/2010')			
₹t	Per Capita Water Consumption (L/day)		d use = 230kL (Central West Regional SoE Report, 07-08).		
//	Number of Connections	2860			
	Catchment	Central West			
CATCHMENT AND WATER SUPPLY	Sub-Catchment	Macquarie-Bogan			
町正と	Catchment Management Authority (CMA)				
₽ĕ₫	CMA Web-Link	Central West http://www.western.cma.nsw.gov.au/			
5 <u>2</u> <u>5</u>	Catchment Protection Status	None.			
N N S	Potable Water Source(s)	Macquarie River (watercour			
	Supply Capacity	Unknown	se)		
	Treatment Plant(s)				
	Level of Treatment	Yes	enteting able in the distribution (NON/ Uselik 0000)		
			nentation, chlorination, fluoridation (NSW Health, 2009).		
	Drinking Water Guidelines	ADWG 2004 (NSW Health)	Leasting MILOA Mallington		
			Location: WL01-Wellington		
		Aluminium	91		
	% compliance for water quality parameters	Fluoride (daily WSA)	82		
	achieving < 100%, 2003-2004	Fluoride (weekly WSA)	61		
	<b>J</b>	Fluoride Ratio	70		
		Total Coliforms	70		
			11), Arsenic (11), Barium (11), Boron (11), Cadmium (11), Calcium (11),		
	Parameter(s) tested and number of samples ( ) 2003-2004	(332), Fluoride (field result V (11), Lead (11), Magnesium (11), Nitrite (11), pH (11), Se (TDS) (11), Total Hardness	<ol> <li>Copper (11), Cyanide (11), E. Coli (64), Fluoride (11), Fluoride (daily W VSA) (10), Fluoride (weekly WSA) (88), Fluoride Ratio (10), Iodine (11), I (11), Manganese (11), Mercury (11), Molydenum (11), Nickel (11), Nitre elenium (11), Silver (11), Sodium (11), Sulfate (11), Total Dissolved Solids as CaCO3 (11), True Colour (6), Turbidity (11), Zinc (11)</li> </ol>		
		Fluoride (daily WSA)	82		
		Fluoride (weekly WSA)	70		
	achieving < 100%, 2004-2005	Fluoride Ratio	91		
		Total Coliforms	78		
	Parameter(s) tested and number of samples ( ) 2004-2005	Chloride (12), Chromium (12) (336), Fluoride (field result V (12), Lead (12), Magnesium (12), Nitrite (12), pH (12), Se	<ol> <li>Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12),</li> <li>Copper (12), Cyanide (2), E.Coli (58), Fluoride (12), Fluoride (daily W3 VSA) (11), Fluoride (weekly WSA) (96), Fluoride Ratio (11), Iodine (12), (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nirslenium (12), Silver (12), Sodium (12), Sulfate (12), Total Coliforms (58),</li> <li>Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zinc (1</li> </ol>		
WATER QUALITY	% compliance for water quality parameters	Fluoride Fluoride (daily WSA) Fluoride (field result WSA)	91 63 91 40		
ð	achieving < 100%, 2005-2006	Fluoride (weekly WSA)			
Ř		Fluoride Ratio Total Coliforms	55 95		
LAW	Parameter(s) tested and number of samples() 2005-2006	Aluminium (11), Antimony ( Chloride (11), Chromium (1 Fluoride (field result WSA) ( Lead (11), Magnesium (11), Nitrite (11), pH (11), Seleniu	<ol> <li>Jasenic (11), Barium (11), Boron (11), Cadmium (11), Calcium (11),</li> <li>Copper (11), E.Coli (57), Fluoride (11), Fluoride (daily WSA) (105),</li> <li>Fluoride (weekly WSA) (80), Fluoride Ratic (11), Iodine (11), Iron (11)</li> <li>Manganese (11), Mercury (11), Molybdenum (11), Nickel (11), Nitrate (11),</li> <li>Silver (11), Sodium (11), Sulfate (11), Total Coliforms (57), Total</li> <li>Total Hardness as CaCO3 (11), True Colour (11), Turbidity (11), Zinc (11)</li> </ol>		
		Aluminium	86		
	% compliance for water quality agrees the	Fluoride (daily WSA)	79		
	% compliance for water quality parameters	Fluoride (weekly WSA)	75		
	achieving < 100%, 2006-2007	Fluoride Ratio	50		
		Total Coliforms	88		
	Parameter(s) tested and number of samples ( ) 2006-2007	Aluminium (7), Antimony (7 Chromium (7), Copper (7), E WSA) (4), Fluoride (weekly Manganese (7), Mercury (7)	, Arsenic (7), Barium (7), Boron (7), Cadmium (7), Calcium (7), Chloride Coli (43), Fluoride (7), Fluoride (daily WSA) (257), Fluoride (field result WSA) (72), Fluoride Ratio (4), Iodine (7), Iron (7), Lead (7), Magnesium ( Molydenum (7), Nickel (7), Nitrate (7), Nitrite (7), pH (7), Selenium (7), te (7), Total Coliforms (43), Total Dissolved Solids (TDS) (7), Total Hardn		
		E. coli	98		
	% compliance for water quality parameters	Fluoride (daily WSA)	68		
	achieving < 100%, 2007-2008	Fluoride (weekly WSA)	42		
	<b>U</b>	Total Coliforms	88		
	Parameter(s) tested and number of samples() 2007-2008	Total Conforms (1), Antimony (1), Arsenic (1), Barium (1), Boron (1), Cadmium (1), Calcium (1), Chloride Aluminium (1), Antimony (1), Arsenic (1), Barium (1), Boron (1), Cadmium (1), Calcium (1), Chloride Chromium (1), Copper (1), E.Coli (41), Fluoride (1), Fluoride (daily WSA) (200), Fluoride (field result WSA) (1), Fluoride (weekly WSA) (60), Fluoride Ratio (1), Free Chlorine (6), Iodine (1), Iron (1), Lead Magnesium (1), Manganese (1), Mercury (1), Molybdenum (1), Nickel (1), Nitrate (1), Nitrite (1), pH (1) Selenium (1), Silver (1), Sodium (1), Sulfate (1), Total Coliforms (41), Total Dissolved Solids (TDS) (1) Total Hardness as CaCO3 (1), True Colour (1), Turbidity (1), Zinc (1)			
	Current Water Restrictions	No restrictions on Council w	ebsite.		
~ È	Proportion of Potable Water Supplied to				
ЦШ	Households (%)	Unknown.			
DC DC	Distance from the Coast (km)	~ 310km			
WATER SECURITY	Climate	Temperate (BoM, 2005)			
S			tion number 65034, period 2004-2008)		
	Average Annual Rainfall				
	FACTOR	YES / NO	NOTES / EXPLANATION		
	Drought	Yes	Classified as 'In Drought' according to NSW DPI Drought Map October		
			2009.		
	Single drinking water source	Yes	No reuse.		
	Poor quality water source	No			
	Sewage overflow or disposal into water	No	No reports of source overflows		
		No	No reports of sewer overflows.		
	Sewage overflow or disposal into water	No	No reports of sewer overflows.		

	≥	Fauna destroying water intake structures	No	
	Supply	Natural mineral pollutants (e.g. uranium,		
	Su	nitrates, iron, fluoride)	Yes	
E)	d Water	Un-lined landfills	Yes	The Central West Regional SoE Report 07-08 states that there are 24 potentially contaminated sites in the Wellington area, including the gasworks remediation site.
CAUS	Catchment and	Extensive agriculture	Yes	Cropping, wool, beef and prime lamb are major industries (Wellington Annual Report, 07-08).
ISK (	tchme	Low vegetation cover (dust, sediment runoff)	Yes	Extensive agricultural areas, low forested cover.
R	Ca	Poor access to supply	No	Town is immediately adjacent to the Macquarie River.
Ê		Unsustainable water extraction	Yes	
WATER QUALITY OR SECURITY RISK (CAUSE)		Aquifer turning saline due to high extraction	Yes	Wellington has a water salinity hazard rating of 'high' (Central West Regional SoE Report, 07-08).
SI		Hard water	No	
Y OR		Aging or inadequate pipe work and associated infrastructure	No	Infrastructure built or augmented in 1993 according to DECCW 07-08 Water Treatment Performance Report.
JALIT		Significant water losses due to leaking pipes	No	
ð		High per capita water consumption	No	Per capita water consumption is not reported.
ATER	ø	Inappropriate water quality standards / objectives	No	Council reports to NSW Health, who use ADWG.
Ń	an	Lack of infrastructure maintenance	No	
	Governance	Poor management or governance	No	
	Š	Vandalism / sabotage / terrorism	No	
	9	Insufficient trained personnel	No	
		Inadequate funding for maintenance or upgrades	No	
	Populatio Industries n	Mining / minerals	No	
		Irrigation	Yes	Council parks and other areas consume a significant amount of water (Central West Regional SoE Report, 07-08).
		Chemicals / process	No	
		Seasonal population loadings	No	
		Rapid population growth	No	Wellington experienced a negative average annual population growth (approximately 2%) between the 2001 and 2006 Census.
RITY		Bacteriological and / or viral contamination	Yes	Some samples of E.Coli were non-compliant for the 07-08 reporting period.
C.		Algal blooms	No	
U U	2	Heavy metal contamination	Yes	Historical issues with Aluminium.
ц Ц Ц	2	Poor chlorine residuals	No	
	-	Pesticide contamination	No	
E	j	High suspended solids	No	
QUALITY OR SE RISK (FFFFCT)	5	Boil water notices	No	No boil water notices according to NSW Health summary spreadsheet.
D R I R		Deaths or illness due to water quality	No	No record of water restrictions on the Council waterite
Ľ		Water restrictions (current and historic) Taste and odour issues	No No	No record of water restrictions on the Council website.
WATER QUALITY OR SECURITY RISK (FEFECT)		Other contamination that would affect health	Yes	Wellington has a water salinity hazard rating of 'high' (Central West Regional SoE Report, 07-08).
		Notes	(Central West Regional SoE	dirty water complaints from the community in the 07-08 reporting period Report, 07-08). Groundwater in Wellington is being studied by a university ers University) as part of \$60 Million of funding to secure Australia's water

T WATER UTILITY TOWN	State/Territory Town Name Town Population Name of Water Utility Council Web-Link	NSW Gloucester			
WATER UTILITY	Town Population Name of Water Utility				
WATER UTILITY	Name of Water Utility		); 2,445 (Census 2006, Urban Centre/Locality)		
		Gloucester Shire Council	,, , , , , , , , , , , , , , , , , , ,		
		http://www.gloucester.nsw.gov.au	<u>//</u>		
	Rate (\$/kL)	\$1.55/kL up to 50kL (per a charges, 09/10 period)	nnum), \$1.96/kL over 50kL (per annum) (Gloucester Shire Council fees		
	Per Capita Water Consumption (L/day)	System capacity is 5ML/day, 390ML produced during the 07-08 reporting period.			
Ļγ	Number of Connections	1,700			
	Catchment	Hunter/Central Rivers			
ΞĒ≻	Sub-Catchment	Manning River			
₽ ĕ ₽	Catchment Management Authority (CMA) CMA Web-Link	Hunter/Central Rivers http://www.hcr.cma.nsw.gov.au/o	aur catchmont php?		
CATCHMENT AND WATER SUPPLY	Catchment Protection Status	None	di catchinent.php3		
N S N	Potable Water Source(s)	Barrington River (watercou	(rse)		
04	Supply Capacity	Unknown			
	Treatment Plant(s)	Unknown			
	Level of Treatment	Conventional Water Treatr	ment (DECCW inventory on NSW water utilities). Chlorination, coagulati idation, sedimentation, softening (NSW Health database)		
	Drinking Water Guidelines	ADWG 2004 (NSW Health	n)		
		NSW Health Monito	ring Location: Gloucester		
	% compliance for water guality parameters	Fluoride (daily WSA)	24		
	achieving < 100%, 2003-2004	Fluoride (weekly WSA)	11		
		Fluoride Ratio	71		
	Parameter(s) tested and number of samples ( ) 2003-2004	(2), Chromium (2), Copper Fluoride (field result WSA) Lead (2), Magnesium (2), 5 (2), pH (2), Selenium (2), 5	<ol> <li>Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), Chlorid (2), Oyanide (2), E.Coli (51), Fluoride (8), Fluoride (daily WSA) (230), ) (7), Fluoride (weekly WSA) (70), Fluoride Ratio (7), Iodine (2), Iron (2), Manganese (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrate (2), Nit Silver (2), Sodium (2), Sulfate (2), Total Coliforms (51), Total Dissolved rdness as CaCO3 (2), True Colour (1), Turbidity (2), Zinc (2)</li> </ol>		
		E. coli	98		
		Fluoride (daily WSA)	62		
	% compliance for water quality parameters		16		
	achieving < 100%, 2004-2005	Fluoride Ratio	0		
		pH	50		
		Total Coliforms	88		
WATER QUALITY	Parameter(s) tested and number of samples ( ) 2004-2005	(2), Chromium (2), Copper result WSA) (5), Fluoride ( Magnesium (2), Manganes Selenium (2), Silver (2), So	<ol> <li>Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), Chlorid (2), E.Coli (50), Fluoride (7), Fluoride (daily WSA) (122), Fluoride (field weekly WSA) (31), Fluoride Ratio (5), Iodine (2), Iorn (2), Lead (2), se (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrate (2), Nitrite (2), pH odium (2), Sulfate (2), Total Coliforms (50), Total Dissolved Solids (TDS) (2), True Colour (2), Turbidity (2), Zinc (2)</li> </ol>		
AW .	% compliance for water quality parameters		96		
	achieving < 100%, 2005-2006	Total Coliforms	94		
	Parameter(s) tested and number of samples ( ) 2005-2006	(2), Chromium (2), Copper Manganese (2), Mercury (2 Silver (2), Sodium (2), Sulf	<ol> <li>Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), Chloric (2), E.Coli (49), Fluoride (2), Iodine (2), Iron (2), Lead (2), Magnesium (2), Molybdenum (2), Nickel (2), Nitrate (2), Nitrite (2), pH (2), Selenium (2) fate (2), Total Coliforms (49), Total Dissolved Solids (TDS) (2), Total Frue Colour (2), Turbidity (2), Zinc (2)</li> </ol>		
	% compliance for water quality parameters achieving < 100%, 2006-2007	Total Coliforms	92		
	Parameter(s) tested and number of samples ( ) 2006-2007	(2), Chromium (2), Copper Manganese (2), Mercury (2 Silver (2), Sodium (2), Sulf	<ol> <li>Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), Chlorid (2), E.Coli (51), Fluoride (2), Iodine (2), Iron (2), Lead (2), Magnesium (2), Molybdenum (2), Nickel (2), Nitrate (2), Nitrite (2), pH (2), Selenium (2) fate (2), Total Coliforms (51), Total Dissolved Solids (TDS) (2), Total Frue Colour (2), Turbidity (2), Zinc (2)</li> </ol>		
	% compliance for water quality parameters	Aluminium	50		
	achieving < 100%, 2007-2008	Total Coliforms	71		
	Parameter(s) tested and number of samples ( ) 2007-2008	(2), Chromium (2), Copper Manganese (2), Mercury (2) Silver (2), Sodium (2), Sulf Hardness as CaCO3 (2), T	<ol> <li>Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), Chloric (2), E.Coli (52), Fluoride (2), Iodine (2), Iron (2), Lead (2), Magnesium (2), Molydoenum (2), Nickel (2), Nitritate (2), Nitrite (2), pH (2), Selenium (2), fate (2), Total Coliforms (52), Total Dissolved Solids (TDS) (2), Total frue Colour (2), Turbidity (2), Zinc (2)     </li> </ol>		
	Current Water Restrictions	No. Restrictions not adver-	tised on the Council website or in the Gloucester Advocate.		
≻	Proportion of Potable Water Supplied to	Unknown			
R F	Households (%)				
ШМ	Distance from the Coast (km)	~ 55km			
ATE	Climate Average Annual Rainfall		ation number 60015, period 2004-2008) or 985mm per annum according		
WATER SECURITY		Council website.			
WATE	FACTOR	YES / NO	NOTES / EXPLANATION Classified as 'Marginal' according to NSW DPI Drought Map October 2		
SECUR	FACTOR Drought				
WATE	Drought	Yes			
WATE SECUR	Drought Single drinking water source	Yes Yes	Eaecal contamination and high aluminium levels		
SECUR	Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water	Yes Yes	Faecal contamination and high aluminium levels.		
SECUR	Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source	Yes			
SECUR	Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water		Faecal contamination and high aluminium levels. Significant flooding in 2001. Open water source.		
	Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna defecating in supply	Yes	Significant flooding in 2001.		
WATE SECUR	Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna defecating in supply	Yes Yes Yes	Significant flooding in 2001.		

	_
Reportedly a 'major' industry according to the Council website. Traditionally in beef and dairying, with more "boutique" industries such as aqua-culture, olive groves, escargot, vineyards and wineries, table rabbits, specialist nuts and alpacas now established.	
Extensive clearing for agriculture. The area does have grass cover though.	

	Catchment and Wat	Extensive agriculture	Yes	Reportedly a 'major' industry according to the Council website. Traditionally in beef and dairying, with more "boutique" industries such as aqua-culture, olive groves, escargot, vineyards and wineries, table rabbits, specialist nuts and alpacas now established.
	hmer	Low vegetation cover (dust, sediment runoff)	Yes	Extensive clearing for agriculture. The area does have grass cover though.
	Cato	Poor access to supply	No	
E)	0	Unsustainable water extraction		
CAUS		Aquifer turning saline due to high extraction		
ISK (		Hard water	Yes	NSW Health report that the Gloucester treatment system incorporates water softening.
T R		Aging or inadequate pipe work and associated infrastructure	Yes	Plant built in 1981.
CUR		Significant water losses due to leaking pipes		
R SE		High per capita water consumption	Unknown	Domestic consumption (and per capita consumption) is not isolated from total water production, so this statistic is unknown.
o ⊱E		Inappropriate water quality standards / objectives	No	Council reports to NSW Health, who use ADWG
IAL		Lack of infrastructure maintenance	Yes	
WATER QUALITY OR SECURITY RISK (CAUSE)	Governance	Poor management or governance	Yes	Council measured some basic water quality parameters from the major river systems in the Gloucester catchment area during 07-08. Due to faulty equipment all measurements taken during the reporting period could not be used for reporting purposes (Gloucester SoE Report, 07-08).
	ove	Vandalism / sabotage / terrorism	No	
	ğ	Insufficient trained personnel	Yes	Council measured some basic water quality parameters from the major river systems in the Gloucester catchment area during 07-08. Due to faulty equipment all measurements taken during the reporting period could not be used for reporting purposes (Gloucester SoE Report, 07-08). This may have been avoided if adequately trained personnel had identified the issue.
		Inadequate funding for maintenance or upgrades		
	s	Mining / minerals	Yes	There is a Coal Mine at Stratford (Gloucester Shire Council website).
	Industries	Irrigation	Yes	Agriculture is a major local industry.
		Chemicals / process	Yes	Timber mill nearby (Council website).
	Population	Seasonal population loadings		
	Popu	Rapid population growth		
< (EFFECT)		Bacteriological and / or viral contamination	Yes	Several samples during April and May from Barrington failed to meet the NSW Health Departments Drinking Water Guidelines. In response to the failures council notified all residents to boil their water before use. Council also flushed the water mains through the affected area to assist in improving the quality (Gloucester SoE Report, 07-08).
SIS		Algal blooms		
<u>ب</u> ۲		Heavy metal contamination		
2IT		Poor chlorine residuals	Yes	Free chlorine is not tested.
ľ,		Pesticide contamination	Unknown	Pesticides not tested.
Э.		High suspended solids		Several samples during April and May from Barrington failed to meet the
WATER QUALITY OR SECURITY RISK (EFFECT)		Boil water notices	Yes	Several samples ouring April and May from Barnington failed to meet the NSW Health Departments Drinking Water Guidelines. In response to the failures council notified all residents to boil their water before use. Council also flushed the water mains through the affected area to assist in improving the quality (Gloucester SoE Report, 07-08).
Ъ		Deaths or illness due to water quality		
Ľ		Water restrictions (current and historic)	No	No current water restrictions based on Council website.
ATE		Taste and odour issues		
Ŵ		Other contamination that would affect health		
		Notes		

Z	State/Territory	NSW	NSW		
TOWN	Town Name	Dungog			
¥	Town Population		09); 2,102 (Census 2006, Urban Centre/Locality)		
Ł	Name of Water Utility	Hunter Water Corporation			
Ę	Council Web-Link	http://www.dungog.nsw.gov.au/			
Ľ	Rate (\$/kL)	\$1.22/kL (Hunter Water Corporation website)			
WATER UTILITY	Per Capita Water Consumption (L/day)	Unknown. 674,337kL purchased from Hunter Water in the 03-04 reporting period. This is not restricted to domestic consumption. Dungog WTP produces 150ML/day.			
Ň	Number of Connections	205 000 (entire Hunter	Water network) (07-08 reporting period, National Performance Report to		
	Catchment		water network) (07-00 reporting period, National Periornance Report to		
μĸ	Sub-Catchment	Hunter/Central Rivers Hunter River			
町モイ	Catchment Management Authority (CMA)	Hunter/Central Rivers			
₹ ₹ Ē	CMA Web-Link	http://www.hcr.cma.nsw.gov.a	au/our catchment.php3		
CATCHMENT AND WATER SUPPLY	Catchment Protection Status	None			
CATCHMENT AND WATER SUPPLY	Potable Water Source(s)	Chichester Dam (surface	ce water storage)		
	Supply Capacity	Average daily supply =	90ML, capacity = 21,500ML.		
	Treatment Plant(s)	Dungog Water Treatme			
	Level of Treatment	At the WTP, coagulation anthracite and gravel),	chester Dam), then flows under gravity to Dungog Water Treatment Plar n and flocculation using alum and polyelectrolyte, contact filtration (sand chlorination, fluoridation and lime and carbon dioxide dosing for pH g, before being returned to the Chichester Main (Hunter Water Corporatio		
	Drinking Water Guidelines	ADWG 2004 (NSW He	alth)		
	Dimking Water Ouldennes		Monitoring Location:		
		E. coli	98		
		Fluoride (daily WSA)	94		
	% compliance for water quality parameters	Iron	90		
	achieving < 100%, 2003-2004	pH	94		
		Total Coliforms	85		
	Parameter(s) tested and number of samples ( ) 2003-2004	(10), Chloride (10), Chr (daily WSA) (62), Fluor Magnesium (10), Mang (10), pH (17), Selenium	Aluminium (10), Antimony (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10), Chloride (10), Chromium (10), Copper (10), Cyanide (10), E.Coli (82), Fluoride (10), Fluoride (daily WSA) (62), Fluoride (weekly WSA) (4), Free Chlorine (8), lodine (10), Iron (10), Lead (10), Magnesium (10), Manganese (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate (10), Pit (10), Selenium (10), Silver (10), Sodium (10), Sulfate (10), Total Coliforms (82), Total Dissolved Solids (TDS) (10), Total Hardness as CaCO3 (10), True Colour (5), Turbidity (10), Zinc (10)		
	% compliance for water quality parameters	pН	96		
	achieving < 100%, 2004-2005	Total Coliforms	92		
WATER QUALITY	Parameter(s) tested and number of samples ( ) 2004-2005	Chlorine (19), Iodine (11), Iron (11), Lead (11), Magnesium (11), Manganese (11), Mercury (11), Molybdenum (11), Nickel (11), Nitrate (11), Nitrite (11), pH (28), Selenium (11), Silver (11), Sodiu (11), Sulfate (11), Total Coliforms (77), Total Dissolved Solids (TDS) (11), Total Hardness as CaCO3 (11), True Colour (11), Turbidity (11), Zinc (11)			
ATE	% compliance for water quality parameters achieving < 100%, 2005-2006	pH Total Coliforms	92 85		
>	Parameter(s) tested and number of samples ( ) 2005-2006	Aluminium (10), Antimony (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10), Chloride (10), Chromium (10), Copper (10), E.Coli (75), Fluoride (10), Free Chlorine (3), Io (10), Iron (10), Lead (10), Magnesium (10), Manganese (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate (10), Nitrite (10), pH (13), Selenium (10), Silver (10), Sodium (10), Sulfate (1 Total Coliforms (75), Total Dissolved Solids (TDS) (10), Total Hardness as CaCO3 (10), True Co (10), Turbidity (10), Zinc (10)			
	% compliance for water quality parameters achieving < 100%, 2006-2007	Total Coliforms 91			
	Parameter(s) tested and number of samples ( ) 2006-2007	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12), Chloride (12), Chromium (12), Copper (12), E.Coli (77), Fluoride (12), Iodine (12), Iron (12) Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitri (12), Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Total Coliforms Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity ( Zinc (12)			
	% compliance for water quality parameters achieving < 100%, 2007-2008	Total Coliforms	95		
	Parameter(s) tested and number of samples ( ) 2007-2008	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12), Chloride (12), Chromium (12), Copper (12), E.Coli (78), Fluoride (12), Iodine (12), Iron (12), Lead (12), Magnaesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nit (12), Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Total Coliforms Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (Zinc (12))			
	Current Water Restrictions	No report of water restr	ictions on the Council website.		
WATER SECURITY	Proportion of Potable Water Supplied to		non-residential, 15% non-metered (statistics are for the entire Hunter Wa		
Щ. Ч.	Households (%)	supply system).			
CU	Distance from the Coast (km)	~ 70km			
≥ü	Climate	Temperate (BoM, 2005	)		
	Average Annual Rainfall		, station number 61017, period 2004-2008)		
•	FACTOR	YES / NO	NOTES / EXPLANATION		
		L			
	Drought	No			
	Drought Single drinking water source	Yes			
	Drought	-	Classified as 'Marginal' according to NSW DPI Drought Map October 20 Tillegra Dam is currently being constructed by Hunter Water to suppler supply. Closed system from Chichester		

Ā	Flooding	Yes	Hunter Water website mentions challenges associated with providing drinking water during flood.
ddr	Fauna defecating in supply	Yes	Open water source, but treatment should eliminate this.
เริ	Fauna destroying water intake structures	No	
Nater	Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)	No	These are not an issue due to the WTP.
p	Un-lined landfills		
tar	Extensive agriculture	Yes	Extensive cleared farmland.
Iment	runoff)	Yes	Widespread clearing for farming, however there is grass cover.
tc	Poor access to supply	No	Water flows under gravity from Chichester Dam to the Dungog WTP.
S	Unsustainable water extraction	Yes	Tillegra Dam is currently being constructed by Hunter Water to supplement supply.
	Aquifer turning saline due to high extraction		
	Hard water	No	This is not an issue due to the Dungog WTP.
		Yes	Dungog WTP was completed in 1987.
	Significant water losses due to leaking pipes		
	High per capita water consumption	Unknown	Per capita consumption is not well reported.
e	Inappropriate water quality standards /	No	
anc	Lack of infrastructure maintenance	No	
Ĕ	Poor management or governance	No	
0Ve	Vandalism / sabotage / terrorism	No	
Ğ	Insufficient trained personnel		
	Inadequate funding for maintenance or upgrades		
tries	Mining / minerals	No	
ndust	Irrigation	Yes	Farming nearby.
_	Chemicals / process		
lation	Seasonal population loadings	Unknown	
Рорц	Rapid population growth	No	Negative population growth between the 2001 and 2006 Census.
	Bacteriological and / or viral contamination	Yes	Total coliforms.
	Algal blooms	No	
2		No	However there was iron in the water supply in 03-04.
) I		Yes	Free chlorine not tested.
-			Pesticides not tested.
Ū.		No	
Ś		No	
Ż			
		No	
	health		
	Population Industries Governance Catchment and Water Supply	Fauna defecating in supply           Fauna defecating in supply           Fauna destroying water intake structures           Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)           Un-lined landfills           Extensive agriculture           Low vegetation cover (dust, sediment runoff)           Poor access to supply           Unsustainable water extraction           Aquifer turning saline due to high extraction           Hard water           Aging or inadequate pipe work and associated infrastructure           Significant water losses due to leaking pipes           Lack of infrastructure maintenance           Poor management or governance           Vandalism / sabotage / terrorism           Insufficient trained personnel Inadequate funding for maintenance or upgrades           Seasonal population loadings           Rapid population growth           Bacteriological and / or viral contamination Algal blooms	Pana defecating in supply         Yes           Fauna destroying water intake structures         No           Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)         No           Un-lined landfills         Extensive agriculture         Yes           Extensive agriculture         Yes           Low vegetation cover (dust, sediment runoff)         Yes           Poor access to supply         No           Unsustainable water extraction         Yes           Aquifer turning saline due to high extraction         Hard water           Aging or inadequate pipe work and associated infrastructure         Yes           Significant water losses due to leaking pipes         No           Poor anagement or governance         No           Poor management or governance         No           Vandalism / sabotage / terrorism         No           Insufficient trained personnel         Indequate funding for maintenance or upgrades           Seasonal population loadings         Unknown           Rapid population growth         No           Rapid population growth         No           Rapid population growth         No           Heavy metal contamination         Yes           Algal blooms         No           Heavts or illness due to water quality

Construction of Tillegra Dam is underway.

Notes

TOWN						
TO	State/Territory	NSW Cowra				
	Town Name Town Population	9,100 (NSW Health, 2009); 8,430 (C	ensus 2006 Lirban Centre/Locality)			
	Name of Water Utility	Cowra Shire Council	child 2000, Orban Ochild/Eddanly)			
≝≿	Council Web-Link	http://www.cowraregion.com.au/home/				
WATER UTILITY	Rate (\$/kL)	Unknown.				
≥5	Per Capita Water Consumption (L/day)	Unknown.				
	Number of Connections	5240				
₽≻	Catchment	Lachlan				
CATCHMENT AND WATER SUPPLY	Sub-Catchment Catchment Management Authority (CMA)	- Lachlan				
TH H	CMA Web-Link	http://www.lachlan.cma.nsw.gov.au/				
R S	Catchment Protection Status	None.				
호별	Potable Water Source(s)	Lachlan River (watercourse) (Cowra supply source according to NSW Health)				
LAC AV	.,	Wyangala Dam (Cowra supply source according to Council website)				
<u> </u>	Supply Capacity	Unknown.				
	Treatment Plant(s)	None				
	Level of Treatment	Filtration, chlorination, fluoridation. NSW Health Monitoring Lo	poption: CO01 Cours			
		Aluminium	27			
		E. coli	99			
		Fluoride (daily WSA)	93			
		Fluoride (weekly WSA)	91			
		Fluoride Ratio	91			
	achieving < 100%, 2003-2004	pH	91			
		Thermotolerant Coliforms Total Coliforms	83 78			
		Total Dissolved Solids (TDS)	91			
		Total Hardness as CaCO3	73			
	Parameter(s) tested and number of samples ( ) 2003-2004	(11), Chromium (11), Copper (11), C (field result WSA) (9), Fluoride (weel Magnesium (11), Manganese (11), N Selenium (11), Silver (11), Sodium (	nic (11), Barium (11), Boron (11), Cadmium (11), Calcium (11), Chloride yanide (11), E.Coli (139), Fluoride (13), Fluoride (daily WSA) (279), Fluorid kly WSA) (82), Fluoride Ratio (11), Iodine (11), Iron (11), Lead (11), flercury (11), Molybdenum (11), Nickel (11), Nitrate (11), Nitrite (11), Sulfate (11), Thermotolerant Coliforms (6), Total Coliforms (139), Total ardness as CaCO3 (11), True Colour (5), Turbidity (11), Zinc (11)			
		Aluminium	8			
		E. coli	99			
	% compliance for water quality parameters	Fluoride (daily WSA)	95			
	achieving < 100%, 2004-2005	Fluoride (weekly WSA) pH	98 92			
		Total Coliforms	79			
		Total Hardness as CaCO3	83			
WATER QUALITY	Parameter(s) tested and number of samples ( ) 2004-2005	(12), Chromium (12), Copper (12), C (field result WSA) (12), Fluoride (wer Magnesium (12), Manganese (12), N Selenium (12), Silver (12), Sodium (1	nic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12), Chloride yanide (2), E.Coli (124), Fluoride (12), Fluoride (daily WSA) (286), Fluoride ekly WSA) (88), Fluoride Ratio (12), Iodine (12), Iron (12), Lead (12), fercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12 12), Sulfate (12), Thermotolerant Coliforms (124), Total Coliforms (124), tal Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zinc (12)			
σn		Aluminium	44			
Ľ.		E. coli	98			
ATI	% compliance for water quality parameters	Fluoride (daily WSA) Fluoride (weekly WSA)	<u>96</u> 99			
Ň	achieving < 100%, 2005-2006	Iron	94			
		Total Coliforms	85			
		Total Hardness as CaCO3	94			
	Parameter(s) tested and number of samples ( ) 2005-2006	(16), Chromium (16), Copper (16), E WSA) (13), Fluoride (weekly WSA) ( Manganese (16), Mercury (16), Moly Silver (16), Sodium (16), Sulfate (16) as CaCO3 (16), True Colour (16), Tu				
		Aluminium	50			
	% compliance for water quality parameters	E. coli	96			
	achieving < 100%, 2006-2007	Fluoride (daily WSA) Fluoride (weekly WSA)	98 97			
		Total Coliforms	71			
	Parameter(s) tested and number of samples ( ) 2006-2007	Aluminium (12), Antimony (12), Arse	nic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12), Chloride Coli (119), Fluoride (12), Fluoride (daily WSA) (363), Fluoride (field result			
		WSA) (9), Fluoride (weekly WSA) (1 Manganese (12), Mercury (12), Moly	02), Fluoride Ratio (9), Iodine (12), Iron (12), Lead (12), Magnesium (12), bdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), , Total Coliforms (119), Total Dissolved Solids (TDS) (12), Total Hardness			
		WSA) (9), Fluoride (weekly WSA) (1 Manganese (12), Mercury (12), Moly Silver (12), Sodium (12), Sulfate (12) as CaCO3 (12), True Colour (12), Tu Aluminium	02), Fluoride Ratio (9), Iodine (12), Iron (12), Lead (12), Magnesium (12), bdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), , Total Coliforms (119), Total Dissolved Solids (TDS) (12), Total Hardness rididity (12), Zinc (12) 36			
		WSA) (9), Fluoride (weekly WSA) (1 Manganese (12), Mercury (12), Moly Silver (12), Sodium (12), Sulfate (12) as CaCO3 (12), True Colour (12), Tu Aluminium E. coli	02), Fluoride Ratio (9), Iodine (12), Iron (12), Lead (12), Magnesium (12), bdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), , Total Coliforms (119), Total Dissolved Solids (TDS) (12), Total Hardness rbidity (12), Zinc (12) 36 98			
	samples ( ) 2006-2007	WSA) (9), Fluoride (weekly WSA) (1 Manganese (12), Mercury (12), Moly Silver (12), Sodium (12), Sulfate (12) as CaCO3 (12), True Colour (12), Tu Aluminium E. coli Fluoride (daily WSA)	02), Fluoride Ratio (9), Iodine (12), Iron (12), Lead (12), Magnesium (12), bdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), , Total Coliforms (119), Total Dissolved Solids (TDS) (12), Total Hardness rbidity (12), Zinc (12) 36 98 97			
	samples () 2006-2007 % compliance for water quality parameters	WSA) (9), Fluoride (weekly WSA) (1 Manganese (12), Mercury (12), Moly Silver (12), Sodium (12), Sulfate (12) as CaCO3 (12), True Colour (12), Tu Aluminium E. coli Fluoride (daily WSA) Iodine	02), Fluoride Ratio (9), Iodine (12), Iron (12), Lead (12), Magnesium (12), bdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), , Total Coliforms (119), Total Dissolved Solids (TDS) (12), Total Hardness tridity (12), Zinc (12) 36 98 97 82			
	samples () 2006-2007 % compliance for water quality parameters	WSA) (9), Fluoride (weekly WSA) (1 Manganese (12), Mercury (12), Moly Silver (12), Sodium (12), Sulfate (12) as CaCO3 (12), True Colour (12), Tu Aluminium E. coli Fluoride (daily WSA) Iodine Total Coliforms Aluminium (11), Antimony (11), Arse (11), Chromium (11), Copper (11), C (field result WSA) (7), Fluoride (weel Magnesium (11), Manganese (11), M	02), Fluoride Ratio (9), Iodine (12), Iron (12), Lead (12), Magnesium (12), bdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), , Total Coliforms (119), Total Dissolved Solids (TDS) (12), Total Hardness rbidity (12), Zinc (12) 36 98 97 101 11), Barium (11), Boron (11), Cadmium (11), Calcium (11), Chloride yanide (11), E.Coli (125), Fluoride (11), Fluoride (daily WSA) (180), Fluorid kly WSA) (50), Fluoride Ratio (7), Iodine (11), Icad (11), dercury (11), Molydenum (11), Nickel (11), Nitrate (11), Nitrite (11), pH (11), Nufrate (11), Total Coliforms (125), Total Dissolved Solids (TDS) (11),			
	samples () 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of	WSA) (9), Fluoride (weekly WSA) (1 Manganese (12), Mercury (12), Moly Silver (12), Sodium (12), Sulfate (12) as CaCO3 (12), True Colour (12), Tu Aluminium E. coli Fluoride (daily WSA) Iodine Total Coliforms Aluminium (11), Antimony (11), Arse (11), Chromium (11), Copper (11), C (field result WSA) (7), Fluoride (weel Magnesium (11), Manganese (11), N Selenium (11), Silver (11), Sodium (1	02), Fluoride Ratio (9), Iodine (12), Iron (12), Lead (12), Magnesium (12), bdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), , Total Coliforms (119), Total Dissolved Solids (TDS) (12), Total Hardness rbidity (12), Zinc (12) 36 98 97 101 11), Barium (11), Boron (11), Cadmium (11), Calcium (11), Chloride yanide (11), E.Coli (125), Fluoride (11), Fluoride (daily WSA) (180), Fluorid kly WSA) (50), Fluoride Ratio (7), Iodine (11), Icad (11), dercury (11), Molydenum (11), Nickel (11), Nitrate (11), Nitrite (11), pH (11), Nufrate (11), Total Coliforms (125), Total Dissolved Solids (TDS) (11),			
VATER CURITY	samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008	WSA) (9), Fluoride (weekly WSA) (1 Manganese (12), Mercury (12), Moly Silver (12), Sodium (12), Sulfate (12) as CaCO3 (12), True Colour (12), Tu Aluminium E. coli Fluoride (daily WSA) Iodine Total Coliforms Aluminium (11), Antimony (11), Arse (11), Chromium (11), Copper (11), C (field result WSA) (7), Fluoride (weel Magnesium (11), Manganese (11), N Selenium (11), Silver (11), Sodium (1 Total Hardness as CaCO3 (11), True	02), Fluoride Ratio (9), Iodine (12), Iron (12), Lead (12), Magnesium (12), bdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), , Total Coliforms (119), Total Dissolved Solids (TDS) (12), Total Hardness rbidity (12), Zinc (12) 36 98 97 101 11), Barium (11), Boron (11), Cadmium (11), Calcium (11), Chloride yanide (11), E.Coli (125), Fluoride (11), Fluoride (daily WSA) (180), Fluoride kly WSA) (50), Fluoride Ratio (7), Iodine (11), Iorad (11), dercury (11), Molydenum (11), Nickel (11), Nitrate (11), Nitrite (11), pH (1 11), Sulfate (11), Total Coliforms (125), Total Dissolved Solids (TDS) (11),			
	samples () 2006-2007 % compliance for water quality parameters	WSA) (9), Fluoride (weekly WSA) (1 Manganese (12), Mercury (12), Moly Silver (12), Sodium (12), Sulfate (12) as CaCO3 (12), True Colour (12), Tu Aluminium E. coli Fluoride (daily WSA) Iodine Total Coliforms	02), Fluoride Ratio (9), lodine (12), Iron (12), Lead (12), Magnesi bdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Seler , Total Coliforms (119), Total Dissolved Solids (TDS) (12), Total rididty (12), Zinc (12) 36 98 97 82 72			
	samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008	WSA) (9), Fluoride (weekly WSA) (1 Manganese (12), Mercury (12), Moly Silver (12), Sodium (12), Sulfate (12) as CaCO3 (12), True Colour (12), Tu Aluminium E. coli Fluoride (daily WSA) Iodine Total Coliforms Aluminium (11), Antimony (11), Arse (11), Chromium (11), Copper (11), C (field result WSA) (7), Fluoride (weel Magnesium (11), Manganese (11), N Selenium (11), Silver (11), Sodium (1 Total Hardness as CaCO3 (11), True	02), Fluoride Ratio (9), Iodine (12), Iron (12), Lead (12), Magnesium (12) bdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12) , Total Coliforms (119), Total Dissolved Solids (TDS) (12), Total Hardnes rbidity (12), Zinc (12) 36 98 97 102 111, Barium (11), Boron (11), Cadmium (11), Calcium (11), Chloride yanide (11), E.Coli (125), Fluoride (11), Fluoride (daily WSA) (180), Fluo kly WSA) (50), Fluoride Ratio (7), Iodine (11), Iron (11), Lead (11), dercury (11), Molybdenum (11), Nickel (11), Nitrate (11), Nitrite (11), pH ( 11), Sulfate (11), Total Coliforms (125), Total Dissolved Solids (TDS) (11)			
rr È	samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions	WSA) (9), Fluoride (weekly WSA) (1 Manganese (12), Mercury (12), Moly Silver (12), Sodium (12), Sulfate (12) as CaCO3 (12), True Colour (12), Tu Aluminium E. coli Fluoride (daily WSA) Iodine Total Coliforms Aluminium (11), Antimony (11), Arse (11), Chromium (11), Copper (11), C (field result WSA) (7), Fluoride (weel Magnesium (11), Manganese (11), N Selenium (11), Silver (11), Sodium (1 Total Hardness as CaCO3 (11), True Yes. Level 2 water restrictions.	02), Fluoride Ratio (9), Iodine (12), Iron (12), Lead (12), Magnesium (12), bdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), , Total Coliforms (119), Total Dissolved Solids (TDS) (12), Total Hardnes rbidity (12), Zinc (12) 36 98 97 102 111, Barium (11), Boron (11), Cadmium (11), Calcium (11), Chloride yanide (11), E.Coli (125), Fluoride (11), Fluoride (daily WSA) (180), Fluor kly WSA) (50), Fluoride Ratio (7), Iodine (11), Icad (11), Lead (11), Hercury (11), Molybdenum (11), Nickel (11), Nitrate (11), Nitrite (11), pH ( 11), Sulfate (11), Total Coliforms (125), Total Dissolved Solids (TDS) (11)			

S m S		Climate	Temperate (BoM, 2005)	
		Average Annual Rainfall	640mm per annum. Cowra Shire	
		FACTOR	YES / NO	NOTES / EXPLANATION
		Drought	Yes	Classified as 'In Drought' according to NSW DPI Drought Map October 2009.
		Single drinking water source	Yes	
		Poor quality water source	No	
		Sewage overflow or disposal into water source	No	
		Flooding	No	
		Fauna defecating in supply	Yes	Source is river water and large reservoir (dam); contamination due to wildlife is likely.
	ð	Fauna destroying water intake structures	No	
	r Supply	Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)	Yes	Iron and aluminium.
	ate	Un-lined landfills	No	No reports of unlined landfills.
JSE)	Catchment and Water	Extensive agriculture	Yes	Agriculture is stated as a major industry in the Cowra Shire Council Annual Report, 07-08, including irrigation cropping and fodder production, mixed farming enterprises, and other intensive agriculture.
(CAI	chmer	Low vegetation cover (dust, sediment runoff)	No	
NX N	Cat	Poor access to supply	No	
R	0	Unsustainable water extraction	No	
JRITY		Aquifer turning saline due to high extraction	No	No reports of aquifer turning saline. Salinity levels monitored and reported in the Cowra Shire Council Annual Report, 07-08.
WATER QUALITY OR SECURITY RISK (CAUSE)		Hard water	No	No reports of overly hard water. Total hardness 100% compliant for 07-08 reporting period.
Y OR		Aging or inadequate pipe work and associated infrastructure	No	
ALITY		Significant water losses due to leaking pipes	No	No reports of water system losses.
5		High per capita water consumption	No	Water consumption per capita unknown.
TER (	e,	Inappropriate water quality standards / objectives	No	Reports to NSW Health, who use ADWG.
×.	Governance	Lack of infrastructure maintenance	No	
>	Ĕ	Poor management or governance	No	
	Š	Vandalism / sabotage / terrorism	No	
	ğ	Insufficient trained personnel	No	
		Inadequate funding for maintenance or upgrades	No	
	Industries	Mining / minerals	Yes	Stated as a major industry in the region in the Cowra Shire Council Annual Report, 07-08.
	snp	Irrigation	Yes	
	Ĕ	Chemicals / process	No	
	Population	Seasonal population loadings	Yes	Tourism is stated to be one of the major industries in the shire (Cowra Annual Report, 07-08).
	Popul	Rapid population growth	No	Population growth = 0.84% between 2001 and 2006 Census, which is less than the NSW average of 1.6% (ABS, 2009).
WATER QUALITY OR SECURITY RISK (EFFECT)		Bacteriological and / or viral contamination	Yes	Historical non-compliance for E.Coli.
In		Algal blooms	No	No report of algal blooms.
J E		Heavy metal contamination	Yes	Aluminium and iron in supply.
QUALITY OR SF RISK (EFFECT)		Poor chlorine residuals	Yes	Free chlorine not tested.
O H		Pesticide contamination	No	No reports of pesticide issues.
ΤË		High suspended solids	Yes	Reports of colour issues on the Cowra Shire Council website.
H AL		Boil water notices	No	No boil water notices according to NSW Health summary spreadsheet.
SIS		Deaths or illness due to water quality	No	
с С		Water restrictions (current and historic)	Yes	Level 2 water restrictions currently in place.
Ë		Taste and odour issues	No	
		Other contamination that would affect	No	
ΨM		health Notes	-	

Town #	¥ 31			
Z	State/Territory	NSW		
TOWN	Town Name	Wentworth		
Ĕ	Town Population		h, 2009); 1,303 (Census 2006, Urban Centre/Locality)	
~	Name of Water Utility	Wellington Shire C		
É	Council Web-Link	http://www.wentwo		
WATER UTILITY	Rate (\$/kL) Per Capita Water Consumption (L/day)	Unknown. WTP su 08), 226ML treated	kL, \$2.70 over 250kL. ipply capacity is 1ML/day (NSW DECCW inventory of NSW water utilities 07- I to potable in 07-08 reporting period. Average annual household consumption and Murray Regional Organisation of Councils SoE Report, 07-08).	
_	Number of Connections	2,230		
₽ >	Catchment		Lower Murray Darling	
F, A	Sub-Catchment	-		
L L L	Catchment Management Authority (CMA)	Lower Murray Darl		
E N N	CMA Web-Link	http://www.lmd.cm	a.nsw.gov.au/	
CATCHMENT AND WATER SUPPLY	Catchment Protection Status	None.		
AT WA	Potable Water Source(s)	Murray River (wate	ercourse)	
0.1	Supply Capacity	Unknown		
	Treatment Plant(s) Level of Treatment		ment (DECCW), filtration, flocculation, coagulation, sand filter, activated	
		carbon, chlorination	n (NSW Health).	
	Drinking Water Guidelines	ADWG 2004 (NSW		
			oring Location: WW01-Wentworth	
		Aluminium	75	
	% compliance for water quality parameters		77	
	achieving < 100%, 2003-2004	pH Total Califorma	60	
		Total Coliforms	63	
	Parameter(s) tested and number of samples ( ) 2003-2004	Aluminium (4), Antimony (4), Arsenic (4), Barium (4), Boron (4), Cadmium (4), Calcium (4), Chloride (4), Chromium (4), Copper (4), Cyanide (4), E.Coli (57), Fluoride (4), Free Chlorine (3) Iodine (4), Iron (4), Lead (4), Magnesium (4), Manganese (4), Mercury (4), Molybdenum (4), Nickel (4), Nitrate (4), Nitrite (4), pH (5), Selenium (4), Silver (4), Sodium (4), Sulfate (4), Total Coliforms (57), Total Dissolved Solids (TDS) (4), Total Hardness as CaCO3 (4), True Colour (1), Turbidity (4), Zinc (4)		
	% compliance for water quality parameters	s E. coli 88		
	achieving < 100%, 2004-2005	Total Coliforms	76	
WATER QUALITY	Parameter(s) tested and number of samples ( ) 2004-2005	Aluminium (2), Antimony (2), Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), Chloride (2), Chromium (2), Copper (2), Cyanide (2), E.Coli (51), Fluoride (2), Iodine (2), Iron (2), Lead (2), Magnesium (2), Manganese (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrate (2), Nitrite (2), pH (2), Selenium (2), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (51), Total Dissolved Solids (TDS) (2), Total Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zinc (2)		
IER QI	% compliance for water quality parameters achieving < 100%, 2005-2006	Total Coliforms	94	
.WA	Parameter(s) tested and number of samples ( ) 2005-2006	Aluminium (2), Antimony (2), Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), Chloride (2), Chromium (2), Copper (2), Cyanide (2), E.Coli (52), Fluoride (2), Iodine (2), Iron (2), Lead (2), Magnesium (2), Manganese (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrate (2), Nitrite (2), pH (2), Selenium (2), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (52), Total Dissolved Solids (TDS) (2), Total Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zinc (2)		
	% compliance for water quality parameters achieving < 100%, 2006-2007		98	
	Parameter(s) tested and number of	Aluminium (1), Antimony (1), Arsenic (1), Barium (1), Boron (1), Cadmium (1), Calcium (1), Chloride (1), Chromium (1), Copper (1), E. Coli (48), Fluoride (1), Iodine (1), Iron (1), Lead (1), Magnesium (1), Manganese (1), Mercury (1), Molybdenum (1), Nickel (1), Nitrate (1), Nitrite (1), pH (1), Selenium (1), Silver (1), Sodium (1), Sulfate (1), Total Coliforms (48), Total Dissolved Solids (TDS) (1), Total Hardness as CaCO3 (1), True Colour (1), Turbidity (1), Zinc (1)		
		Aluminium	50	
	% compliance for water quality parameters	Total Coliforms	92	
	achieving < 100%, 2007-2008	Total Dissolved So		
		Aluminium (2), Antimony (2), Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), Chloride (2), Chromium (2), Copper (2), E.Coli (52), Fluoride (2), Iodine (2), Iron (2), Lead (2), Magnesium (2), Manganese (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrate (2), Nitrite (2), pH (2), Selenium (2), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (52), Total Dissolved Solids (TDS) (2), Total Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zinc (2)		
WATER SECURITY	Current Water Restrictions	Yes. Level 2 water hours of 6pm and 7	restrictions. Hours of watering = 12 hours per week on any day between the 10am.	
3 SEC	Proportion of Potable Water Supplied to Households (%)	Unknown		
Ē	Distance from the Coast (km)	~ 475km		
VA-	Climate	Grassland (BoM, 2		
>	Average Annual Rainfall		e: BoM station number 47041)	
	FACTOR	YES / NO	NOTES / EXPLANATION	
	Drought	Yes	Classified as 'In Drought' according to NSW DPI Drought Map October 2009.	
	Single drinking water source Poor quality water source	Yes Yes	Murray River. Council's submission to the NSW Inquiry into Secure and Sustainable Water Supply and Sewerage Services for Non Metropolitan NSW states that that there are, by necessity, three water treatment plants for a small population	
		due to the local water quality.		

		Sewage overflow or disposal into water	[	
	>	Flooding		
	bp			
	Su	Fauna defecating in supply	Yes	Open water source. Should not be an issue due to the water treatment plant.
	and W	Fauna destroying water intake structures	No	
		Natural mineral pollutants (e.g. uranium,	Yes	Aluminium
		nitrates, iron, fluoride) Un-lined landfills		
		Extensive agriculture	Yes	
_		Low vegetation cover (dust, sediment	Yes	
С З	tch	Poor access to supply	No	
AU	Ca	Unsustainable water extraction	Yes	Water source is a regulated river subject to interstate processes.
Ŭ		Aquifer turning saline due to high		
Хs		extraction	No	SoE Report suggests that the Murray is not overly saline in this location.
R		Hard water	No	Results indicate good compliance for hardness.
É		Aging or inadequate pipe work and	No	Infrastructure was built or augmented in 1991 (NSW DECCW inventory of
LR N		associated infrastructure	110	water utilities 07-08).
U L L		Significant water losses due to leaking	Unknown	
s r		pipes		
Ö		High per capita water consumption	Unknown	
WATER QUALITY OR SECURITY RISK (CAUSE)		Inappropriate water quality standards / objectives	No	Council reports to NSW Health who use ADWG.
J∩ Z		Lack of infrastructure maintenance	Yes	Infrastructure upgrade and maintenance required, but capital expenditure
2	e			cannot be raised (according to Council submission to the NSW Inquiry).
Ë	าลท	Poor management or governance	No	
MA M	/er	Vandalism / sabotage / terrorism	No	
-	Governance	Insufficient trained personnel	No	Council's submission to the NSW Inquiry into Secure and Sustainable Water
		Inadequate funding for maintenance or upgrades	Yes	Supply and Sewerage Services for Non Metropolitan NSW states that that there are, by necessity, three water treatment plants for a small population due to the local water quality, making the financial viability of the water services very doubtful without funding grants for capital works.
	jë.	Mining / minerals	Yes	Snapper and Ginko mineral mines.
		Irrigation	Yes	Agriculture.
		Chemicals / process		
	Population	Seasonal population loadings	Yes	High tourism as the town is located near the junction of the Murray and Darling Rivers.
	Popu	Rapid population growth	No	Negative population growth between 2001 and 2006 Census.
Ł		Bacteriological and / or viral contamination	No	
UR		Algal blooms	No	One major outbreak (lasting 6 months) in 06-07 reporting period.
U U U	_	Heavy metal contamination	Yes	Aluminium
QUALITY OR SE RISK (FFFFCT)		Poor chlorine residuals	Yes	Free chlorine is not measured.
O H	-	Pesticide contamination		Unknown. Pesticides not measured.
Ē	į	High suspended solids	Yes	
SK P	5	Boil water notices	No	None reported
B		Deaths or illness due to water quality	No	None reported. The town has been on repeated water restrictions of various levels. Recently
WATER QUALITY OR SECURITY RISK (FFFECT)		Water restrictions (current and historic)	Yes	downgraded from Level 3 to Level 2.
WA		Taste and odour issues		
		Other contamination that would affect	No	
		Notes		

5		State/Territory	NSW	
Ş		Town Name	Tumbarumba	
TOWN		Town Population		, 2009); 1,487 (Census 2006, Urban Centre/Locality)
		Name of Water Utility	Tumbarumba Shire	
É		Council Web-Link	http://www.tumbash	
Ę		Rate (\$/kL)	\$1.04/kL up to 200kL, \$1.74/kL over 200kL	
$\supset$				
WATER UTILITY		Per Capita Water Consumption (L/day)		npleted a water balance in the Drought Mitigation Strategy but daily demanction of domestic consumption.
\$		Number of Connections	1,140	
		Catchment	Murray River	
ΞH,		Sub-Catchment	-	
- 믲 듡 (	2	Catchment Management Authority (CMA)	Murray River	
포종문		CMA Web-Link	http://www.murray.c	cma.nsw.gov.au/
CATCHMENT AND WATER	D	Catchment Protection Status	None.	
A C		Potable Water Source(s)	Tumbarumba Creek	(
		Supply Capacity	0.5ML/day for past 3	3 years (supply restricted in conjunction with water restrictions)
		Treatment Plant(s)	None	
		Level of Treatment	Chlorination	
		Drinking Water Guidelines	ADWG 2004 (NSW	Health)
			NSW Health Monitori	ing Location: TM01-Tumbarumba
		% compliance for water quality parameters	E. coli	98
		achieving < 100%, 2003-2004	Total Coliforms	37
		Parameter(s) tested and number of samples ( ) 2003-2004	Aluminium (2), Antii Chloride (2), Chrom Lead (2), Magnesiu Nitrite (2), pH (2), Se	mony (2), Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), ium (2), Copper (2), Cyanide (2), E.Coli (51), Flouride (2), Iodine (2), Iron m (2), Manganese (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrate (2) elenium (2), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (51), Total DS) (2), Total Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zinc
		% compliance for water quality parameters	E. coli	96
		% compliance for water quality parameters achieving < 100%, 2004-2005	Iron	50
		achieving < 100%, 2004-2005	Total Coliforms	49
		Parameter(s) tested and number of samples ( ) 2004-2005	Chloride (2), Chrom Magnesium (2), Ma pH (2), Selenium (2	mony (2), Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), ium (2), Copper (2), E.Coli (53), Flouride (2), Iodine (2), Iron (2), Lead (2 nganese (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrate ), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (53), Total Dissolvec tal Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zinc (2)
È		% compliance for water quality parameters	Total Coliforms	54
AL		achieving < 100%, 2005-2006		
WATER QUALITY		Parameter(s) tested and number of samples ( ) 2005-2006	Chloride (2), Chrom Magnesium (2), Ma pH (2), Selenium (2	mony (2), Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), ium (2), Copper (2), E.Coli (52), Flouride (2), Iodine (2), Iron (2), Lead (2), nganese (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrate ), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (52), Total Dissolvec 14 Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zinc (2)
			Aluminium	33
		% compliance for water quality parameters	Iron	67
		% compliance for water quality parameters achieving < 100%, 2006-2007	Lead	67
			Total Coliforms	39
			Turbidity	33
		Parameter(s) tested and number of samples ( ) 2006-2007	Chloride (3), Chrom Magnesium (3), Ma pH (3), Selenium (3	mony (3), Arsenic (3), Barium (3), Boron (3), Cadmium (3), Calcium (3), ium (3), Copper (3), E.Coli (51), Flouride (3), Iodine (3), Iron (3), Lead (3) nganese (3), Mercury (3), Molybdenum (3), Nickel (3), Nitrate (3), Nitrite ), Silver (3), Sodium (3), Sulfate (3), Total Coliforms (51), Total Dissolved tal Hardness as CaCO3 (3), True Colour (3), Turbidity (3), Zinc (3)
		% compliance for water quality parameters	Iron	0
			Tabal Oalifamaa	48
		achieving < 100%, 2007-2008	Total Coliforms	40
			Aluminium (2), Antii Chloride (2), Chrom Magnesium (2), Mai pH (2), Selenium (2 Solids (TDS) (2), To	mony (2), Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), ium (2), Copper (2), E.Coli (50), Flouride (2), Iodine (2), Iron (2), Lead (2), nganese (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrite ), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (50), Total Dissolved tal Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zinc (2)
SECURITY		achieving < 100%, 2007-2008 Parameter(s) tested and number of	Aluminium (2), Antii Chloride (2), Chrom Magnesium (2), Mal pH (2), Selenium (2 Solids (TDS) (2), To Yes. Level 2. The us between the hours of between 3pm and 6 only; washing of vet hosing of pavement	mony (2), Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), ium (2), Copper (2), E.Coli (50), Flouride (2), Iodine (2), Iron (2), Lead (2) nganese (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrate (2), Nitrite ), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (50), Total Dissolved tal Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zinc (2) se of sprinklers & watering systems is permitted seven (7) days a week of 3pm and 6pm; garden watering is permitted seven (7) days a week spm daily, with trigger nozzle hand held hoses only; no pool filling, top up nicles is permitted on lawn areas, with trigger nozzle hand held hoses or
ATER SECURITY		achieving < 100%, 2007-2008 Parameter(s) tested and number of samples () 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%)	Aluminium (2), Antii Chloride (2), Chrom Magnesium (2), Ma pH (2), Selenium (2 Solids (TDS) (2), To Yes. Level 2. The us between 3pm and 6 only; washing of veh hosing of pavement Mayor and General Unknown	mony (2), Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), ium (2), Copper (2), E.Coli (50), Flouride (2), Iodine (2), Iron (2), Lead (2) nganese (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrate (2), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (50), Total Dissolved 14 Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zinc (2) se of sprinklers & watering systems is permitted seven (7) days a week of 3pm and 6pm; garden watering is permitted seven (7) days a week spm daily, with trigger nozzle hand held hoses only; no pool filling, top up hicles is permitted n lawn areas, with trigger nozzle hand held hoses on is is NOT permitted unless for health reasons as approved by Council; th
WATER SECURITY		achieving < 100%, 2007-2008 Parameter(s) tested and number of samples () 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km)	Aluminium (2), Antii Chloride (2), Chrom Magnesium (2), Ma pH (2), Selenium (2 Solids (TDS) (2), To Yes. Level 2. The us between the hours of between 3pm and 6 only; washing of vel hosing of pavement Mayor and General Unknown ~ 200km	mony (2), Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), ium (2), Copper (2), E.Coli (50), Flouride (2), Iodine (2), Iron (2), Lead (2), nganese (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrite (2), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (50), Total Dissolved tal Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zinc (2) se of sprinklers & watering systems is permitted seven (7) days a week of 3pm and 6pm; garden watering is permitted seven (7) days a week of mand 6pm; garden watering is permitted seven (7) days a week of spm and 6pm; garden watering is permitted seven (7) days a week of spm and 6pm; garden watering is permitted seven (7) days a week of spm and 6pm; garden watering is permitted seven (7) days a week of spm and 6pm; garden watering is permitted seven (7) days a week of spm and 6pm; garden watering is permitted seven (7) days a week of spm and 6pm; garden watering is permitted seven (7) days a week of spm and 6pm; garden watering is permitted seven (7) days a week of spm and 6pm; garden watering is permitted seven (7) days a week of spm and 6pm; garden watering is permitted seven (7) days a week of spm and 6pm; garden watering is permitted seven (7) days a week of sis NOT permitted unless for health reasons as approved by Council; th Manager are to approve volumes for industrial and commercial users.
WATER SECURITY		achieving < 100%, 2007-2008 Parameter(s) tested and number of samples () 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate	Aluminium (2), Antii Chloride (2), Chrom Magnesium (2), Ma pH (2), Selenium (2 Solids (TDS) (2), To Yes. Level 2. The us between the hours of between the hours of between 3pm and 6 only; washing of vet hosing of pavement Mayor and General Unknown ~ 200km Temperate (BoM, 20	mony (2), Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), ium (2), Copper (2), E.Coli (50), Flouride (2), Iodine (2), Iron (2), Lead (2) nganese (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrate (2), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (50), Total Dissolved tal Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zinc (2) se of sprinklers & watering systems is permitted seven (7) days a week of 3pm and 6pm; garden watering is permitted seven (7) days a week spm daily, with trigger nozzle hand held hoses only; no pool filling, top up nicles is permitted unless for health reasons as approved by Council; th Manager are to approve volumes for industrial and commercial users.
WATER SECURITY		achieving < 100%, 2007-2008 Parameter(s) tested and number of samples () 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall	Aluminium (2), Antii Chloride (2), Chrom Magnesium (2), Ma pH (2), Selenium (2 Solids (TDS) (2), To Yes. Level 2. The us between the hours of between 3pm and 6 only; washing of vet hosing of pavement Mayor and General Unknown ~ 200km Temperate (BoM, 20 791mm (Source: Bo	mony (2), Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), ium (2), Copper (2), E.Coli (50), Flouride (2), Iodine (2), Iron (2), Lead (2) nganese (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrate (2), Sodium (2), Sulfate (2), Total Coliforms (50), Total Dissolved tal Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zinc (2) se of sprinklers & watering systems is permitted seven (7) days a week of 3pm and 6pm; garden watering is permitted seven (7) days a week spm daily, with trigger nozzle hand held hoses only; no pool filling, top up hicles is permitted on lawn areas, with trigger nozzle hand held hoses or is is NOT permitted unless for health reasons as approved by Council; th Manager are to approve volumes for industrial and commercial users.
WATER SECURITY		achieving < 100%, 2007-2008 Parameter(s) tested and number of samples () 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate	Aluminium (2), Antii Chloride (2), Chrom Magnesium (2), Ma pH (2), Selenium (2 Solids (TDS) (2), To Yes. Level 2. The us between the hours of between the hours of between 3pm and 6 only; washing of vet hosing of pavement Mayor and General Unknown ~ 200km Temperate (BoM, 20	mony (2), Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), ium (2), Copper (2), E.Coli (50), Flouride (2), Iodine (2), Iron (2), Lead (2) nganese (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrate (2), Solidm (2), Sulfate (2), Total Coliforms (50), Total Dissolved tal Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zinc (2) se of sprinklers & watering systems is permitted seven (7) days a week of 3pm and 6pm; garden watering is permitted seven (7) days a week spm daily, with trigger nozzle hand held hoses only; no pool filling, top up nicles is permitted unless for health reasons as approved by Council; th Manager are to approve volumes for industrial and commercial users.
WATER SECURITY		achieving < 100%, 2007-2008 Parameter(s) tested and number of samples () 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall	Aluminium (2), Antii Chloride (2), Chrom Magnesium (2), Ma pH (2), Selenium (2 Solids (TDS) (2), To Yes. Level 2. The us between the hours of between 3pm and 6 only; washing of vet hosing of pavement Mayor and General Unknown ~ 200km Temperate (BoM, 20 791mm (Source: Bo	mony (2), Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), ium (2), Copper (2), E.Coli (50), Flouride (2), Iodine (2), Iron (2), Lead (2) nganese (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrate (2), Nitrite (2), Soliwer (2), Sodium (2), Sulfate (2), Total Coliforms (50), Total Dissolved ital Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zinc (2) se of sprinklers & watering systems is permitted seven (7) days a week of 3pm and 6pm; garden watering is permitted seven (7) days a week spm daily, with trigger nozzle hand held hoses only; no pool filling, top up nicles is permitted on lawn areas, with trigger nozzle hand held hoses or is is NOT permitted unless for health reasons as approved by Council; th Manager are to approve volumes for industrial and commercial users.
WATER SECURITY		achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source	Aluminium (2), Antii Chloride (2), Chrom Magnesium (2), Ma pH (2), Selenium (2 Solids (TDS) (2), To Yes. Level 2. The us between the hours of between the hours of between 3pm and 6 only; washing of vet hosing of pavement Mayor and General Unknown ~ 200km Temperate (BoM, 20 791mm (Source: Bo YES / NO No	mony (2), Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), ium (2), Copper (2), E.Coli (50), Flouride (2), Iodine (2), Iron (2), Lead (2) nganese (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrate (2), Solime (2), Solime (2), Sulfate (2), Total Coliforms (50), Total Dissolved tal Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zinc (2) se of sprinklers & watering systems is permitted seven (7) days a week of 3pm and 6pm; garden watering is permitted seven (7) days a week spm daily, with trigger nozzle hand held hoses only; no pool filling, top up nicles is permitted unless for health reasons as approved by Council; th Manager are to approve volumes for industrial and commercial users. D05) DM station number 72043) Classified as 'Marginal' according to NSW DPI Drought Map October 20 Council alse use Burra Creek for supply. The GHD Draft Drought Mitiga Strategy also states that Council have recently commissioned a new groundwater bore. Further work is currently being commissioned to enlarge the Tumbarumba Reservoir.
WATER SECURITY		achieving < 100%, 2007-2008 Parameter(s) tested and number of samples () 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source	Aluminium (2), Antii Chloride (2), Chrom Magnesium (2), Ma pH (2), Selenium (2 Solids (TDS) (2), To Yes. Level 2. The us between the hours of between 3pm and 6 only; washing of vet hosing of pavement Mayor and General Unknown ~ 200km Temperate (BoM, 20 791mm (Source: Bo YES / NO No	mony (2), Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), ium (2), Copper (2), E.Coli (50), Flouride (2), Iodine (2), Iron (2), Lead (2) nganese (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrate (2), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (50), Total Dissolved tal Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zinc (2) se of sprinklers & watering systems is permitted seven (7) days a week of 3pm and 6pm; garden watering is permitted seven (7) days a week spim daily, with trigger nozzle hand held hoses only; no pool filling, top up incles is permitted unless for health reasons as approved by Council; th Manager are to approve volumes for industrial and commercial users.         0005)         005)         005)         005 </td
WATER SECURITY		achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water	Aluminium (2), Antii Chloride (2), Chrom Magnesium (2), Ma pH (2), Selenium (2 Solids (TDS) (2), To Yes. Level 2. The us between the hours of between the hours of between 3pm and 6 only; washing of vet hosing of pavement Mayor and General Unknown ~ 200km Temperate (BoM, 20 791mm (Source: Bo YES / NO No	mony (2), Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), ium (2), Copper (2), E.Coli (50), Flouride (2), Iodine (2), Iron (2), Lead (2) nganese (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrate (2), Solime (2), Sulfate (2), Total Coliforms (50), Total Dissolved tal Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zinc (2) se of sprinklers & watering systems is permitted seven (7) days a week of 3pm and 6pm; garden watering is permitted seven (7) days a week spm daily, with trigger nozzle hand held hoses only; no pool filling, top up nicles is permitted unless for health reasons as approved by Council; th Manager are to approve volumes for industrial and commercial users. D05) DM station number 72043) MOTES / EXPLANATION Classified as 'Marginal' according to NSW DPI Drought Map October 24 Council alse use Burra Creek for supply. The GHD Draft Drought Mitiga Strategy also states that Council have recently commissioned a new groundwater bore. Further work is currently being commissioned to enlarge the Tumbarumba Reservoir.
WATER SECURITY	<u></u>	achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source	Aluminium (2), Antii Chloride (2), Chrom Magnesium (2), Ma pH (2), Selenium (2 Solids (TDS) (2), To Yes. Level 2. The us between the hours of between the hours of between 3pm and 6 only; washing of vet hosing of pavement Mayor and General Unknown ~ 200km Temperate (BoM, 20 791mm (Source: Bo YES / NO No	mony (2), Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), ium (2), Copper (2), E.Coli (50), Flouride (2), Iodine (2), Iron (2), Lead (2) nganese (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrate (2), Solime (2), Sulfate (2), Total Coliforms (50), Total Dissolved tal Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zinc (2) se of sprinklers & watering systems is permitted seven (7) days a week of 3pm and 6pm; garden watering is permitted seven (7) days a week spm daily, with trigger nozzle hand held hoses only; no pool filling, top up nicles is permitted unless for health reasons as approved by Council; th Manager are to approve volumes for industrial and commercial users. D05) DM station number 72043) MOTES / EXPLANATION Classified as 'Marginal' according to NSW DPI Drought Map October 24 Council alse use Burra Creek for supply. The GHD Draft Drought Mitiga Strategy also states that Council have recently commissioned a new groundwater bore. Further work is currently being commissioned to enlarge the Tumbarumba Reservoir.
WATER SECURITY	pply	achieving < 100%, 2007-2008 Parameter(s) tested and number of samples () 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Sewage overflow or disposal into water source Flooding	Aluminium (2), Antii Chloride (2), Chrom Magnesium (2), Ma pH (2), Selenium (2 Solids (TDS) (2), To Yes. Level 2. The us between the hours of between 3pm and 6 only; washing of vet hosing of pavement Mayor and General Unknown ~ 200km Temperate (BoM, 20 791mm (Source: Bo YES / NO No Yes	mony (2), Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), ium (2), Copper (2), E.Coli (50), Flouride (2), Iodine (2), Iron (2), Lead (2) nganese (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrate (2), Sodium (2), Sulfate (2), Total Coliforms (50), Total Dissolved tal Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zinc (2)         se of sprinklers & watering systems is permitted seven (7) days a week of 3pm and 6pm; garden watering is permitted seven (7) days a week spm daily, with trigger nozzle hand held hoses only; no pool filling, top up incicles is permitted unless for health reasons as approved by Council; th Manager are to approve volumes for industrial and commercial users.         005)       Dot         005)       NOTES / EXPLANATION         Classified as 'Marginal' according to NSW DPI Drought Map October 20 Gouncil alse use Burra Creek for supply. The GHD Draft Drought Mitiga Strategy also states that Council have recently commissioned a new groundwater bore. Further work is currently being commissioned to enlarge the Tumbarumba Reservoir.         GHD report suggests poor quality in Tumbarumba Creek.
WATER SECURITY	Supply	achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply	Aluminium (2), Antii Chloride (2), Chrom Magnesium (2), Ma pH (2), Selenium (2) Solids (TDS) (2), To Yes. Level 2. The us between the hours of between 3pm and 6 only; washing of vel hosing of pavement Mayor and General Unknown ~ 200km Temperate (BoM, 20 791mm (Source: Bo YES / NO No Yes Yes	mony (2), Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), ium (2), Copper (2), E.Coli (50), Flouride (2), Iodine (2), Iron (2), Lead (2) nganese (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrate (2), Solime (2), Sulfate (2), Total Coliforms (50), Total Dissolved tal Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zinc (2) se of sprinklers & watering systems is permitted seven (7) days a week of 3pm and 6pm; garden watering is permitted seven (7) days a week spm daily, with trigger nozzle hand held hoses only; no pool filling, top up nicles is permitted unless for health reasons as approved by Council; th Manager are to approve volumes for industrial and commercial users. D05) DM station number 72043) MOTES / EXPLANATION Classified as 'Marginal' according to NSW DPI Drought Map October 24 Council alse use Burra Creek for supply. The GHD Draft Drought Mitiga Strategy also states that Council have recently commissioned a new groundwater bore. Further work is currently being commissioned to enlarge the Tumbarumba Reservoir.
WATER SECURITY	ter Supply	achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures	Aluminium (2), Antii Chloride (2), Chrom Magnesium (2), Ma pH (2), Selenium (2 Solids (TDS) (2), To Yes. Level 2. The us between the hours of between 3pm and 6 only; washing of vet hosing of pavement Mayor and General Unknown ~ 200km Temperate (BoM, 20 791mm (Source: Bo YES / NO No Yes	mony (2), Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), ium (2), Copper (2), E.Coli (50), Flouride (2), Iodine (2), Iron (2), Lead (2) nganese (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrate (2), Sodium (2), Sulfate (2), Total Coliforms (50), Total Dissolved tal Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zinc (2)         se of sprinklers & watering systems is permitted seven (7) days a week of 3pm and 6pm; garden watering is permitted seven (7) days a week spm daily, with trigger nozzle hand held hoses only; no pool filling, top up incicles is permitted unless for health reasons as approved by Council; th Manager are to approve volumes for industrial and commercial users.         005)       Dot         005)       NOTES / EXPLANATION         Classified as 'Marginal' according to NSW DPI Drought Map October 20 Gouncil alse use Burra Creek for supply. The GHD Draft Drought Mitiga Strategy also states that Council have recently commissioned a new groundwater bore. Further work is currently being commissioned to enlarge the Tumbarumba Reservoir.         GHD report suggests poor quality in Tumbarumba Creek.
WATER SECURITY	nd Water Supply	achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply	Aluminium (2), Antii Chloride (2), Chrom Magnesium (2), Ma pH (2), Selenium (2) Solids (TDS) (2), To Yes. Level 2. The us between the hours of between 3pm and 6 only; washing of vel hosing of pavement Mayor and General Unknown ~ 200km Temperate (BoM, 20 791mm (Source: Bo YES / NO No Yes Yes	mony (2), Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), ium (2), Copper (2), E.Coli (50), Flouride (2), Iodine (2), Iron (2), Lead (2) nganese (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrate (2), Sodium (2), Sulfate (2), Total Coliforms (50), Total Dissolved tal Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zinc (2)         se of sprinklers & watering systems is permitted seven (7) days a week of 3pm and 6pm; garden watering is permitted seven (7) days a week spm daily, with trigger nozzle hand held hoses only; no pool filling, top up incicles is permitted unless for health reasons as approved by Council; th Manager are to approve volumes for industrial and commercial users.         005)       Dot         005)       NOTES / EXPLANATION         Classified as 'Marginal' according to NSW DPI Drought Map October 20 Gouncil alse use Burra Creek for supply. The GHD Draft Drought Mitiga Strategy also states that Council have recently commissioned a new groundwater bore. Further work is currently being commissioned to enlarge the Tumbarumba Reservoir.         GHD report suggests poor quality in Tumbarumba Creek.

(CAU	nent ;	Extensive agriculture	Yes	Grazing, timber, grapes, horticulture, fishing and other agriculture industries.
WATER QUALITY OR SECURITY RISK (CAU	Catchment	Low vegetation cover (dust, sediment runoff)	No	Local clearing, but township is close to the Bago State Forsest, which is an extensive tract of vegetated forest.
≻	U	Poor access to supply	No	
E C		Unsustainable water extraction	Yes	The town draws water from a major regulated river with reduced flow.
ECUI		Aquifer turning saline due to high extraction	No	
0) 2		Hard water	No	Compliant with guidelines for hardness.
TY OF		Aging or inadequate pipework and associated infrastructure	Yes	Inadequate supply. Council is undertaking works to improve the situation.
INALI		Significant water losses due to leaking pipes	Unknown	The GHD Drought Mitigation Strategy did not include water losses in the water balance - these were considered negligible.
o ~		High per capita water consumption	Unknown	No confident description of per capita consumption.
ATEF	e	Inappropriate water quality standards / objectives	No	Council reports to NSW Health who use ADWG.
≥	ano	Lack of infrastructure maintenance	No	
	Ë	Poor management or governance	No	
	Governance	Vandalism / sabotage / terrorism	No	
	Ō	Insufficient trained personnel	No	
		Inadequate funding for maintenance or upgrades	No	Currently commissioning and undertaking upgrades.
	ie.	Mining / minerals	No	
	Population Industrie s	Irrigation	Yes	Some.
		Chemicals / process	Yes	Grapes/wine industry.
		Seasonal population loadings	No	Tourism industry, but doesn't appear to be highly seasonal.
	Popu	Rapid population growth	No	Negative population growth between the 2001 and 2006 Census.
WATER QUALITY OR SECURITY		Bacteriological and / or viral contamination	Yes	Total coliforms non-compliant.
D.		Algal blooms		
Щ с	-	Heavy metal contamination	Yes	
μ μ	2 C	Poor chlorine residuals	Unknown	Free chlorine is not tested.
Ö	-	Pesticide contamination	Unknown	Not tested.
Ľ Ľ	Ľ,	High suspended solids	Yes	33% compliance for turbidity in 06-07 reporting period.
K FI	4	Boil water notices	No	
QUALITY OR SE	2	Deaths or illness due to water quality	No	
2	_	Water restrictions (current and historic)	Yes	
Ë		Taste and odour issues	No	
LAW		Other contamination that would affect health		
		Notes	2 water service com	plaints per 1000 customers in the 07-08 reporting period.

Z	State/Territory	NSW			
TOWN	Town Name	Berrigan			
Ĕ	Town Population		399 (Census 2006, Urban Centre/Locality)		
	Name of Water Utility	Berrigan Shire Council			
WATER UTILITY	Council Web-Link	http://www.berriganshire.nsw.gov.au/			
Ϋ́́	Rate (\$/kL)	\$0.90/kL (treated supply), \$0.45/kL unfiltered supply (dual supply).			
≥⊃	Per Capita Water Consumption (L/day)	220L/day. 114ML treated to potable in 07-08 period (DECCW inventory of NSW water utilities).			
	Number of Connections	3,490 Murray River			
₽≻	Catchment Sub-Catchment	Murray River			
Z d	Catchment Management Authority (CMA)	) Murray River			
Lu n	CMA Web-Link	http://www.murray.cma.nsw.gov.au/			
M N	Catchment Protection Status	None.	<u>sorraa</u>		
CATCHMENT AND WATER SUPPLY		Berrigan Channel (watercour	rse)		
A A A	Potable Water Source(s)	Murray River (watercourse)	·		
0-	Supply Capacity	Unknown. Capacity of the tre	eatment plant is 1ML/day.		
	Treatment Plant(s)	Yes			
	Level of Treatment		Ilation, sedimentation, chlorination, fluoridation.		
	Drinking Water Guidelines	ADWG 2004 (NSW Health)	g Location: BR02-Berrigan		
		Fluoride (daily WSA)	97		
	% compliance for water quality parameters	Fluoride (weekly WSA)	99		
	achieving < 100%, 2003-2004	Fluoride Ratio	91		
		Total Coliforms	98		
			, Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), Chloride		
	Parameter(s) tested and number of samples ( ) 2003-2004	(field result WSA) (11), Fluor Magnesium (2), Manganese Selenium (2), Silver (2), Sod	Syanide (2), E.Coli (49), Fluoride (11), Fluoride (daily WSA) (366), Fluorid ride (weekly WSA) (104), Fluoride Ratio (11), Iodine (2), Iron (2), Lead (2) (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrate (2), Nitrite (2), pH (2) ium (2), Sulfate (2), Total Coliforms (49), Total Dissolved Solids (TDS) (2) 2), True Colour (1), Turbidity (2), Zinc (2)		
	% compliance for water quality parameters	Fluoride (daily WSA)	93		
	achieving < 100%, 2004-2005	Fluoride (weekly WSA)	93		
		Fluoride Ratio	75 Aroopia (2) Parium (2) Paran (2) Cadmium (2) Calaium (2) Chlorida		
ALITY	Parameter(s) tested and number of samples ( ) 2004-2005	Chromium (2), Copper (2), C (field result WSA) (12), Fluor Magnesium (2), Manganese Selenium (2), Silver (2), Sod	, Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), Chloride ;yanide (2), E.Coli (45), Fluoride (12), Fluoride (daily WSA) (367), Fluorid ride (weekly WSA) (104), Fluoride Ratio (12), Iodine (2), Iron (2), Lead (2 (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrate (2), Nitrite (2), pH (2 ium (2), Sulfate (2), Total Coliforms (45), Total Dissolved Solids (TDS) (2 2), True Colour (2), Turbidity (2), Zinc (2)		
л С	% compliance for water quality parameters	Fluoride (daily WSA)	90		
Ř	achieving < 100%, 2005-2006	Fluoride (weekly WSA)	97		
WATER QUALITY	Parameter(s) tested and number of samples ( ) 2005-2006	Chromium (1), Copper (1), E WSA) (11), Fluoride (weekly (1), Manganese (1), Mercury Silver (1), Sodium (1), Sulfat	, Arsenic (1), Barium (1), Boron (1), Cadmium (1), Calcium (1), Chloride ( .Coli (47), Fluoride (11), Fluoride (daily WSA) (366), Fluoride (field result WSA) (100), Fluoride Ratio (11), Iodine (1), Iron (1), Lead (1), Magnesiu (1), Molybdenum (1), Nickel (1), Nitrate (1), Nitrite (1), pH (1), Selenium e (1), Total Coliforms (47), Total Dissolved Solids (TDS) (1), Total Hardne		
		Fluoride (daily WSA)	82		
	% compliance for water quality parameters	Fluoride (weekly WSA)	94		
	achieving < 100%, 2006-2007	Iron	50 98		
	Parameter(s) tested and number of samples () 2006-2007	Chromium (2), Copper (2), E WSA) (12), Fluoride (weekly (2), Manganese (2), Mercury Silver (2), Sodium (2), Sulfat	Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), Chloride ( Coli (44), Fluoride (12), Fluoride (daily WSA) (366), Fluoride (field result WSA) (96), Fluoride Ratio (12), lodine (2), Iron (2), Lead (2), Magnesium (2), Molybdenum (2), Nickel (2), Nitrate (2), Nitrite (2), pH (2), Selenium e (2), Total Chlorine (29), Total Coliforms (44), Total Dissolved Solids (TE D3 (2), True Colour (2), Turbidity (2), Zinc (2)		
	% compliance for water quality parameters achieving < 100%, 2007-2008	Fluoride (daily WSA)	97		
	Parameter(s) tested and number of samples ( ) 2007-2008	Chromium (2), Copper (2), E WSA) (10), Fluoride (weekly (2), Magnesium (2), Mangan (2), Selenium (2), Silver (2), Dissolved Solids (TDS) (2), T	, Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (2), Chloride .Coli (42), Fluoride (10), Fluoride (daily WSA) (366), Fluoride (field result WSA) (102), Fluoride Ratio (10), Free Chlorine (1), Iodine (2), Iron (2), L ese (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrate (2), Nitrite (2), Sodium (2), Sulfate (2), Total Chlorine (35), Total Coliforms (42), Total Total Hardness as CaCO3 (2), True Colour (2), Turbidity (2), Zinc (2)		
WATER SECURITY	Current Water Restrictions	pm to 8 pm on allocation day or with a watering can or but	awns can be watered on specified watering days from 7 am to 9 am and ys (odds and evens system), with a hand-held hose fitted with trigger noz cket or by a manual dripper system and/or movable sprinklers operating automatic watering system from Midnight to 4am on allocated days.		
rer s	Proportion of Potable Water Supplied to Households (%)		d consumption = 250kL in 07-08.		
VA.	Distance from the Coast (km)	~ 410km	a harder of both alimetic regional (D-M, 0005)		
-	Climate Average Annual Rainfall		e border of both climatic regions) (BoM, 2005) n number 74009, period 2006-2008)		
	FACTOR	YES / NO	NOTES / EXPLANATION		
	Drought	Yes	Classified as 'In Drought' according to NSW DPI Drought Map October		
	Single drinking water source	No			
	Poor quality water source	No	Compliance is pretty good, except for iron results in 06-07 period. Wate		
		110	treatment plant appears effective.		
	Sewage overflow or disposal into water	No	No reports of sewer overflows in Regional SoE Report 07-08.		
	Flooding	No	No report of recent flooding in the Regional SoE Report 07-08.		
	Fauna defecating in supply	Yes	Open water sources. Should not be an issue due to water treatment pla		
ply	Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium,	No			
d Water Supply	nitrates, iron, fluoride)	Yes	Iron.		
		Yes Iron. Berrigan annual report states that Council is required by law to restore the			

	an	Extensive agriculture	Yes	
)E)		Low vegetation cover (dust, sediment	Yes	
ŝ	Catchment	runoff)	163	
C⊳	tch	Poor access to supply	No	
ISK (	Са	Unsustainable water extraction	Yes	Water restrictions, plus the town draws from the Murray, which is a river subject to interstate processes.
П≺в		Aquifer turning saline due to high extraction	No	Murray River showed reasonable results for the 07-08 reporting period (Regional SoE Report, 07-08).
R		Hard water	No	Hardness was compliant for the reporting period.
SECI		Aging or inadequate pipe work and associated infrastructure	Yes	Last upgrade or retrofit was completed in 1990.
Y OR		Significant water losses due to leaking pipes	Yes	In 2006, 100ML were lost from the raw water supply, and 64ML was lost from the treated water supply.
WATER QUALITY OR SECURITY RISK (CAUSE)		High per capita water consumption	No	Per capita consumption is ok for this region, although it is still higher than Melbourne, who have an average per capita consumption of 170L/day (Berrigan Demand Management Plan, 2006).
ATER	Governance	Inappropriate water quality standards / objectives	No	Council reports to NSW Health who use ADWG.
Ŵ	Ë	Lack of infrastructure maintenance	No	
	Ň	Poor management or governance	No	
	Q	Vandalism / sabotage / terrorism	No	
		Insufficient trained personnel		
		Inadequate funding for maintenance or upgrades		
	ies	Mining / minerals	Yes	Pine Lodge Gravel Pit for the supply of road making materials, sand and
	Industries	Irrigation	Yes	Stated on the Council website to be their major industry.
	pul	Chemicals / process		
	Population	Seasonal population loadings	No	No reports of high seasonal loadings for the area on Council website or in Regional SoE Report.
	Popu	Rapid population growth	No	Negative population growth between the 2001 and 2006 Census.
зіту		Bacteriological and / or viral contamination	No	
5		Algal blooms	No	One outbreak in the previous year (07) that lasted 8 weeks.
Щ,	-	Heavy metal contamination	Yes	Poor historical compliance regarding Iron.
8 5	5	Poor chlorine residuals	Unknown	Free chlorine is not tested.
0 11	-	Pesticide contamination	Unknown	Pesticides are not tested.
Ľ Ľ	j	High suspended solids	No	
QUALITY OR SE	ś	Boil water notices	No	
		Deaths or illness due to water quality		
а С		Water restrictions (current and historic)	Yes	
WATER QUALITY OR SECURITY BISK (FEFECT)		Taste and odour issues	No	No water quality complaints recorded in the DECCW inventory of NSW Water Utilities.
\$		Other contamination that would affect	No	None reported.
		Notes		e Water4Food program, which is a community-based program aimed at veen the community and government bodies regarding the provision of water

WATER QUALITY WATER QUALITY WATER QUALITY WATER SUPPLY WATER SUPPLY WATER SUPPLY WATER SUPPLY UTILITY WATER SUPPLY UTILITY WATER SUPPLY UTILITY WATER RUPPLY UTILITY WATER RUPPLY UTILITY WATER RUPPLY WATER RUPPLY W	tate/Territory own Name own Population ame of Water Utility ouncil Web-Link ate (\$/kL) er Capita Water Consumption (L/day) umber of Connections atchment ub-Catchment atchment Management Authority (CMA) MA Web-Link atchment Protection Status otable Water Source(s) Supply Capacity reatment Plant(s) evel of Treatment rinking Water Guidelines o compliance for water quality parameters chieving < 100%, 2003-2004 arameter(s) tested and number of amples ( ) 2004-2005 arameter(s) tested and number of amples ( ) 2004-2005	Narrandera Shire ( http://www.narrand \$0.595 per kL plus Unknown (not repo 2010 Murrumbidgee - <u>http://www.murrur</u> None Narrandera Bore ( Unknown None Aeration and chlori Aluminium Iodide Iodine Aluminium (11), Art Calcium (11), Chlo (11), Iodide (3), Ioc (11), Iodide (3), Ioc (11), Nolybdenum (11), Sodium (11), Hardness as CaC( Aluminium Iodine Lead Total Coliforms Aluminium (7), Ant Chloride (7), Chro (7), Lead (7), Magi	dera.nsw.qov.au/cmst/n/nova.asp \$ \$200 access charge per annum orted in the Murray Regional Organisation of Councils SoE Report, 07-08 mbidgee.cma.nsw.gov.au/ groundwater) ination
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Ach Par san Auter Ach Par san Par san Par Par Par	chieving < 100%, 2004-2005	Lead Total Coliforms Aluminium (7), Ant Chloride (7), Chror (7), Lead (7), Magr	86 93 timony (7), Arsenic (7), Barium (7), Boron (7), Cadmium (7), Calcium (7)
Par san Attex outer ach Par san % c ach Par Par Par	arameter(s) tested and number of	Total Coliforms Aluminium (7), Ant Chloride (7), Chror (7), Lead (7), Magr	93 timony (7), Arsenic (7), Barium (7), Boron (7), Cadmium (7), Calcium (7)
San % c ach Par San % c ach Par Par		Aluminium (7), Ant Chloride (7), Chror (7), Lead (7), Magr	timony (7), Arsenic (7), Barium (7), Boron (7), Cadmium (7), Calcium (7)
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% c ach Par		(7), Lead (7), Magnesium (7), Manganese (7), Mercury (7), Molybdenum (7), Nickel (7), Nitrate (7), Nitrite (7), pH (7), Selenium (7), Silver (7), Sodium (7), Sulfate (7), Total Coliforr (61), Total Dissolved Solids (TDS) (7), Total Hardness as CaCO3 (7), True Colour (7), Turbidity (7), Zinc (7) Iodine 0	
% c ach Par	compliance for water quality parameters	lodine 0 Iron 70	
% c ach Par	chieving < 100%, 2005-2006	Iron Turbidity	90
ach Par	arameter(s) tested and number of amples() 2005-2006	Aluminium (10), Antimony (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10), Chloride (10), Chromium (10), Copper (10), E.Coli (65), Fluoride (10), Iodide (8), Iodine (10), Iron (10), Lead (10), Magnesium (10), Manganese (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate (10), Nitrite (10), pH (17), Selenium (10), Silver (10), Sodium (10), Sulfate (10), Total Coliforms (65), Total Dissolved Solids (TDS) (10), Total Hardness as CaCO3 (10), True Colour (10), Turbidity (10), Zinc (10)	
ach Par		lodine	73
Par	compliance for water quality parameters	Iron	91
	chieving < 100%, 2006-2007	Total Coliforms	99
	arameter(s) tested and number of amples ( ) 2006-2007	Aluminium (11), Antimony (11), Arsenic (11), Barium (11), Boron (11), Cadmium (11), Calcium (11), Chloride (11), Chromium (11), Copper (11), E.Coli (72), Fluoride (11), Iod (3), Iodine (11), Iron (11), Lead (11), Magnesium (11), Manganese (11), Mercury (11), Molybdenum (11), Nickel (11), Nitrate (11), Nitrite (11), pH (11), Selenium (11), Silver (1 Sodium (11), Sulfate (11), Total Coliforms (72), Total Dissolved Solids (TDS) (11), Total Hardness as CaCO3 (11), True Colour (11), Turbidity (11), Zinc (11)	
		E. coli	95
		lodine	67
	compliance for water quality parameters	Iron	75
ach	chieving < 100%, 2007-2008	Lead	83
		Total Coliforms	90
		Turbidity	92
	arameter(s) tested and number of amples ( ) 2007-2008	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12), Chloride (12), Chromium (12), Copper (12), E.Coli (78), Fluoride (12), Iodid (5), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), Silver (12 Sodium (12), Sulfate (12), Total Coliforms (78), Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zinc (12)	
Cur		Yes. No fixed sprin	nkler, no washing cars (Narrandera Shire Council SoE Report, 07-08).
~ ≿ Pro	urrent Water Restrictions		
<u> </u>	urrent Water Restrictions roportion of Potable Water Supplied to	Unknown	
	roportion of Potable Water Supplied to	~ 380km	
S LL Clir	roportion of Potable Water Supplied to ouseholds (%)	- JOUNIII	2005)
Δve	roportion of Potable Water Supplied to ouseholds (%) istance from the Coast (km)	~ 380km Grassland (BoM, 2005)	
	roportion of Potable Water Supplied to ouseholds (%) istance from the Coast (km) limate	Grassland (BoM, 2	a to Council website)
Dro	roportion of Potable Water Supplied to ouseholds (%) istance from the Coast (km)		g to Council website) NOTES / EXPLANATION

				Council have attempted to provide multiple groundwater sources for
		Single drinking water source	Yes	drinking, but have had issues with bores collapsing and the water being
				high in iron and manganese.
		Poor quality water source	Yes	Iron content in one groundwater bore means it is now inoperable.
		Sewage overflow or disposal into water	No	No reports of sewer overflows.
		Flooding	No	
	≥	Fauna defecating in supply	No	Drinking water source is groundwater bore.
	dd	Fauna destroying water intake structures	No	
	รเ	, , ,	INU	Description is bight in income and management and is alightly associate
	ter	Natural mineral pollutants (e.g. uranium,	Yes	Bore water is high in iron and manganese and is slightly corrosive
	Na	nitrates, iron, fluoride)		(Council website and Narrandera Shire Council SoE Report, 07-08).
	and Water Supply	Un-lined landfills	No	No reports of unlined landfills in the area.
	tar	Extensive agriculture	Yes	Pig farming, flour mill and aquaculture identified in the Murray Regional
ß	en			Organisation of Councils SoE Report (07-08).
AU	Catchment	Low vegetation cover (dust, sediment	Yes	
Ú	atc	Poor access to supply	Yes	
X	C		N	Current supply is not adequate. Council have attempted to access more
RIG		Unsustainable water extraction	Yes	groundwater but have not been successful.
≥		Aquifer turning saline due to high		Reports of salinity issues in Narrandera. Water table only 3 metres under
R		extraction	Yes	surface in some locations.
2		Hard water	No	
Ш		Aging or inadequate pipe work and		
Ř		associated infrastructure	Yes	One of Council's operating bores collapsed.
WATER QUALITY OR SECURITY RISK (CAUSE)		Significant water losses due to leaking	No	No report of water leases
È				No report of water losses.
AL		High per capita water consumption	Unknown	Water consumption per capita unknown.
SC		Inappropriate water quality standards /	No	Reports to NSW Health, who use ADWG.
Ř		objectives		
Ë	e	Lack of infrastructure maintenance	No	
۸A	aŭ	Poor management or governance	Yes	Groundwater bores have been installed and abandoned due to high
-	em	Tool management of governance	163	levels of iron and manganese in supply.
	Bovernance	Vandalism / sabotage / terrorism	No	
	Ċ	Insufficient trained personnel	Yes	Groundwater bores have been installed and abandoned due to high
		insumcient trained personnel	163	levels of iron and manganese in supply.
		Inadequate funding for maintenance or	Yes	Issues with groundwater bore have not yet been resolved.
		upgrades	165	issues with groundwater bore have not yet been resolved.
	es	Mining / minerals	No	
	stri	Irrigation	Yes	
	Industries	Chemicals / process	No	
	-		110	
	E	Seasonal population loadings	No	No report of seasonal population loadings.
	atic	ocasonal population rodalligo		no report of occorran population readingo.
	Population			Average annual population growth between 2001 and 2006 = 4%, which
	Pol	Rapid population growth	Yes	is greater than the NSW average of 1.6% (ABS, 2009).
≻		Bacteriological and / or viral contamination	Yes	5% of samples were non-compliant for the 07-08 reporting period (NSW
F			100	Health, 2009).
Ľ,		Algal blooms	No	According to the Murray Regional Organisation of Councils SoE Report,
С Ш	_	Heavy metal contamination	Yes	See 07-08 water guality results (NSW Health, 2009).
S LC	5	Poor chlorine residuals	Yes	Free chlorine not sampled.
ЬË	1	Pesticide contamination	No	Pesticides were not sampled for the reporting period.
≥⊞		High suspended solids	No	· · · · · · · · · · · · · · · · · · ·
WATER QUALITY OR SECURITY RISK (FFFFCT)	-	Boil water notices	Yes	Boil water alert issued on the 27 March 2007.
	2	Deaths or illness due to water quality	No	
0 4	-	Water restrictions (current and historic)	Yes	
Щ		Taste and odour issues	Yes	High iron content in bore water.
IAT		Other contamination that would affect	103	Salinity issues in the area (Murray Regional Organisation of Councils SoE
3			Yes	
		health		Report, 07-08).
		Notes	According to the Co	ouncil website, options are currently being investigated to improve water
		NULES	quality.	
			1	

	35			
Z >	State/Territory	NSW		
TOWN	Town Name Town Population	Yamba 4,700 (NSW Health, 2009); 5,514 (Census 2006, Urban Centre/Locality)		
	Name of Water Utility	Clarence Valley Council		
≝≿	Council Web-Link	http://www.clarence.nsw.gov.au/cmst/cvc009/nova.asp		
WATER UTILITY	Rate (\$/kL)	\$2.30/KL		
₹5	Per Capita Water Consumption (L/day)	Unknown.		
	Number of Connections	20560		
ц	Catchment	Northern Rivers Lower Clarence		
CATCHMENT AND WATER SUPPLY	Sub-Catchment			
A M	Catchment Management Authority (CMA) CMA Web-Link	Northern Rivers http://www.northern.cma.nsw.gov.au/map_nrcma.php		
∃≻	Catchment Protection Status	Appears to be in or near a Wild Rivers Catchment.		
A Å		Nymboida River (watercourse)		
T D	Potable Water Source(s)	Rushforth Reservoir (surface storage)		
Σ		Rushforth Rd Reservoir 100ML		
CH	Quarte Quarte it.	Additional reservoir 32ML		
AT	Supply Capacity	On 19th October 2009, Clarence Valley Council were supplying 341 ML/day, and consumption was		
0		20.48ML (Clarence Valley Council website).		
	Treatment Plant(s)	None		
		Chloramination, Fluoridation: Raw water from Nymboida River is initially held in the 100 ML reservoir at		
		Rushforth Rd, South Grafton, where algae are destroyed by electronic pulse emissions. Sediment is		
	Lough of Tractment	allowed to settle to the bottom, and water is taken from mid level of the 100ML reservoir to the 32 ML		
	Level of Treatment	reservoir. Before the water enters the 32 ML reservoir it is disinfected with a mixture of chlorine and		
		ammonia (chloramination). Fluoride is also added at this stage, at the rate of 1ppm. From the 32 ML reservoir the water is transferred into the trunk (pipe) system.		
		reservon me water is transieneu into the trunk (pipe) system.		
	Drinking Water Guidelines	ADWG 2004 (NSW Health)		
		NSW Health Monitoring Location: CV08-Lower Clarence		
		Aluminium 86		
		E. coli 96		
		Fluoride (daily WSA) 93 Fluoride (weekly WSA) 90		
	% compliance for water quality parameters	Fluoride (weekly WSA) 90 Fluoride Ratio 90		
	achieving < 100%, 2003-2004	Molybdenum 93		
		pH 93		
		Thermotolerant Coliforms 95		
		Total Coliforms 5		
		Aluminium (14), Antimony (14), Arsenic (14), Barium (14), Boron (14), Cadmium (14), Calcium (14),		
		Chloride (14), Chromium (14), Copper (14), Cyanide (14), E.Coli (303), Fluoride (14), Fluoride (daily		
	Decemptor(a) tested and number of	WSA) (334), Fluoride (field result WSA) (10), Fluoride (weekly WSA) (92), Fluoride Ratio (10), Iodine		
	Parameter(s) tested and number of samples () 2003-2004	(14), Iron (14), Lead (14), Magnesium (14), Manganese (14), Mercury (14), Molybdenum (14), Nickel (14		
		Nitrate (14), Nitrite (14), pH (14), Selenium (14), Silver (14), Sodium (14), Sulfate (14), Thermotolerant		
		Coliforms (303), Total Coliforms (303), Total Dissolved Solids (TDS) (14), Total Hardness as CaCO3 (14		
		True Colour (6), Turbidity (14), Zinc (14)		
		Aluminium 83		
		E. coli 98		
	% compliance for water quality parameters	Fluoride (daily WSA) 95 Iron 92		
	achieving < 100%, 2004-2005	Iron 92 Thermotolerant Coliforms 98		
		Total Coliforms 7		
		Total Coliforms 7 Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12),		
		Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12),		
		Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12), Chloride (12), Chromium (12), Copper (12), Cyanide (2), E.Coli (298), Fluoride (12), Fluoride (daily WSA (361), Fluoride (field result WSA) (8), Fluoride (weekly WSA) (100), Fluoride Ratio (8), Iodine (12), Iron		
Ł	Parameter(s) tested and number of	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12), Chloride (12), Chromium (12), Copper (12), Cyanide (2), E.Coli (298), Fluoride (12), Fluoride (daily WSA (361), Fluoride (field result WSA) (8), Fluoride (weekly WSA) (100), Fluoride Ratio (8), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate		
ALITY	Parameter(s) tested and number of samples ( ) 2004-2005	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12), Chloride (12), Chromium (12), Copper (12), Cyanide (2), E. Coli (298), Fluoride (12), Fluoride (daily WSA (361), Fluoride (field result WSA) (8), Fluoride (weekly WSA) (100), Fluoride Ratio (8), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pl (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Thermotolerant Coliforms		
DUALITY		Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12), Chloride (12), Chromium (12), Copper (12), Cyanide (2), E.Coli (298), Fluoride (12), Fluoride (daily WSA (361), Fluoride (field result WSA) (8), Fluoride (weekly WSA) (100), Fluoride Ratio (8), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Thermotolerant Coliform: (298), Total Coliforms (298), Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True		
R QUALITY		Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12), Chloride (12), Chromium (12), Copper (12), Cyanide (2), E. Coli (298), Fluoride (12), Fluoride (daily WSA (361), Fluoride (field result WSA) (8), Fluoride (weekly WSA) (100), Fluoride Ratio (8), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pl (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Thermotolerant Coliforms		
TER QUALITY		Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12), Chloride (12), Chromium (12), Copper (12), Cyanide (2), E. Coli (298), Fluoride (12), Fluoride (daily WSA (361), Fluoride (field result WSA) (8), Fluoride (weekly WSA) (100), Fluoride Ratio (8), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nirtate (12), Nitrite (12), Selenium (12), Silfate (12), Thermotolerant Coliforms (298), Total Coliforms (298), Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zinc (12)         E. coli       98		
WATER QUALITY		Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12),         Chloride (12), Chromium (12), Copper (12), Cyanide (2), E.Coli (298), Fluoride (12), Fluoride (daily WSA (361), Fluoride (field result WSA) (8), Fluoride (weekly WSA) (100), Fluoride Ratio (8), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), Soliver (12), Solium (12), Sulfate (12), Thermotolerant Coliforms (298), Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zinc (12)         E. coli       98         Fluoride (daily WSA)       92		
WATER QUALITY		Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12),         Chloride (12), Chromium (12), Copper (12), Cyanide (2), E.Coli (298), Fluoride (12), Fluoride (daily WSA (361), Fluoride (field result WSA) (8), Fluoride (weekly WSA) (100), Fluoride Ratio (8), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrate (12), Nitrate (12), PH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Thermotolerant Coliforms (298), Total Coliforms (298), Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zinc (12)         E. coli       98         Fluoride (daily WSA)       92         Fluoride (weekly WSA)       96		
WATER QUALITY	samples ( ) 2004-2005	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12),           Chloride (12), Chromium (12), Copper (12), Cyanide (2), E. Coli (298), Fluoride (12), Fluoride (daily WSA (361), Fluoride (field result WSA) (3), Fluoride (weekly WSA) (100), Fluoride Ratio (8), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite (12), PH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Thermotolerant Coliforms (298), Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zinc (12)           E. coli         98           Fluoride (daily WSA)         92           Fluoride (weekly WSA)         96           Iron         92		
WATER QUALITY	samples () 2004-2005	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12), Chloride (12), Chromium (12), Copper (12), Cyanide (2), E. Coli (298), Fluoride (12), Fluoride (daily WSA (36), Fluoride (ield result WSA) (30), Fluoride (12), Fluoride (12), Income (12), Income (12), Income (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pt (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Thermotolerant Coliform (298), Total Coliforms (298), Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zinc (12)         E. coli       98         Fluoride (daily WSA)       92         Fluoride (daily WSA)       92         Fluoride (weekly WSA)       96         Iron       92         pH       85		
WATER QUALITY	samples () 2004-2005	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12),         Chloride (12), Chromium (12), Copper (12), Cyanide (2), E.Coli (298), Fluoride (12), Fluoride (daily WSA (361), Fluoride (field result WSA) (8), Fluoride (12), Fluoride (12), Nicrate (12), Nagnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite (12), PH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Thermotolerant Coliform (298), Total Coliforms (298), Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zinc (12)         E. coli       98         Fluoride (daily WSA)       92         Fluoride (daily WSA)       96         Iron       92         pH       85         Thermotolerant Coliforms       99		
WATER QUALITY	samples () 2004-2005	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12),         Chloride (12), Chromium (12), Copper (12), Cyanide (2), E.Coli (298), Fluoride (12), Fluoride (daily WSA (36), Fluoride (field result WSA) (8), Fluoride (12), Fluoride (12), Ion (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Thermotolerant Coliform (298), Total Coliforms (298), Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zinc (12)         E. coli       98         Fluoride (daily WSA)       92         Fluoride (weekly WSA)       96         Iron       92         PH       85         Thermotolerant Coliforms       99         Total Coliforms       6		
WATER QUALITY	samples () 2004-2005	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12),         Chloride (12), Chromium (12), Copper (12), Cyanide (2), E.Coli (298), Fluoride (12), Fluoride (daily WS/         (361), Fluoride (field result WSA) (8), Fluoride (weekly WSA) (100), Fluoride Ratio (8), Iodine (12), Iron         (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate         (12), Lead (12), Magnesium (12), Silver (12), Sodium (12), Sulfate (12), Thermotolerant Coliform         (12), Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Thermotolerant Coliform         (12), Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Thermotolerant Coliform         (12), Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Thermotolerant Coliform         (12), Nitrite (12), pH (12), Zinc (12)         E. coli       98         Fluoride (daily WSA)       92         Fluoride (daily WSA)       96         Iron       92         pH       85         Thermotolerant Coliforms       99		
WATER QUALITY	samples ( ) 2004-2005 % compliance for water quality parameters achieving < 100%, 2005-2006	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12),           Chloride (12), Chromium (12), Copper (12), Cyanide (2), E.Coli (298), Fluoride (12), Fluoride (daily WS/           (361), Fluoride (field result WSA) (8), Fluoride (2), E.Coli (298), Fluoride (12), Fluoride (daily WS/           (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrate (12), Nitrate (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Thermotolerant Coliform (298), Total Coliforms (298), Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zinc (12)           E. coli         98           Fluoride (daily WSA)         92           Fluoride (daily WSA)         92           Fluoride (daily WSA)         96           Iron         92           pH         85           Thermotolerant Coliforms         99           Total Coliforms         6           Aluminium (13), Antimony (13), Arsenic (13), Barium (13), Boron (13), Cadmium (13), Calcium (13), Chloride (13), Fluoride (13), Fluoride (13), Iron (13), Chloride (13), Iron (13), Copper (13), E.Coli (67), Fluoride (13), Fluoride (14), MSA) (361), Fluoride (field result WSA) (31), Fluoride (Weekly WSA) (90), Fluoride (14), Ironi (13), Iron (13), Copper (13), E.Coli (67), Fluoride (13), Fluoride (13), Iron (13), Copper (13), E.Coli (67), Fluoride (13), Fluoride (13), Iron (13), Copper (13), E.Coli (67), Fluoride (13), Fluoride (14), Ironi (13), Iron (13), Copper (13), E.Coli (67), Fluoride (13), Fluoride (14), Ironi (13), Ironi (13), Ironide (13)		
WATER QUALITY	samples () 2004-2005 % compliance for water quality parameters achieving < 100%, 2005-2006 Parameter(s) tested and number of	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12),         Chloride (12), Chromium (12), Copper (12), Cyanide (2), E.Coli (298), Fluoride (12), Fluoride (daily WS/         (361), Fluoride (field result WSA) (8), Fluoride (weekly WSA) (100), Fluoride Ratio (8), Iodine (12), Iron         (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate         (12), Lead (12), Magnesium (12), Silver (12), Sodium (12), Sulfate (12), Thermotolerant Coliform         (12), Lead (12), Magnesium (12), Silver (12), Sodium (12), Sulfate (12), Thermotolerant Coliform         (12), Natratic Coliforms (298), Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True         Colour (12), Turbidity (12), Zinc (12)         E. coli       98         Fluoride (daily WSA)       92         Fluoride (daily WSA)       96         Iron       92         pH       85         Thermotolerant Coliforms       99         Total Coliforms       6         Aluminium (13), Antimony (13), Arsenic (13), Barium (13), Boron (13), Cadmium (13), Calcium (13), Chloride (13), Chromium (13), Corper (13), E.Coli (67), Fluoride (13), Fluoride (daily WSA) (361), Fluoride (field result WSA) (11), Fluoride (Weekly WSA) (90), Fluoride (13), Fluoride (13), Notyber (13), Iron (13), I		
WATER QUALITY	samples ( ) 2004-2005 % compliance for water quality parameters achieving < 100%, 2005-2006	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12),         Chloride (12), Chromium (12), Copper (12), Cyanide (2), E.Coli (298), Fluoride (12), Fluoride (daily WSA) (361), Fluoride (field result WSA) (8), Fluoride (weekly WSA) (100), Fluoride Ratio (8), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrate (12), Nitrate (12), Solium (12), Sulfate (12), Thermotolerant Coliform (298), Total Coliforms (298), Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zinc (12)         E. coli       98         Fluoride (daily WSA)       92         Fluoride (daily WSA)       96         Iron       92         pH       85         Thermotolerant Coliforms       99         Total Coliforms       6         Aluminium (13), Antimony (13), Arsenic (13), Barium (13), Boron (13), Cadmium (13), Calcium (13), Chloride (13), Chromium (13), Copper (13), E.Coli (67), Fluoride (13), Fluoride (daily WSA) (361), Fluoride (field result WSA) (11), Fluoride (weekly WSA) (90), Fluoride Ratio (11), Iodine (13), Irrate (13), Irrate (13), Magnese (13), Marganese (13), Mercury (13), Molybenum (13), Nickel (13), Irrate (13), Nitrate (13), Recruit (13), Solium (13), Sulfate (13), Thermotolerant Coliforms (28)		
WATER QUALITY	samples () 2004-2005 % compliance for water quality parameters achieving < 100%, 2005-2006 Parameter(s) tested and number of	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12),         Chloride (12), Chromium (12), Copper (12), Cyanide (2), E.Coli (298), Fluoride (12), Fluoride (daily WS/         (361), Fluoride (field result WSA) (8), Fluoride (2), E.Coli (298), Fluoride (12), Fluoride (daily WS/         (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrate (12), Nitrate (12), Nitrate (12), Nitrate (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Thermotolerant Coliform (298), Total Coliforms (298), Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zinc (12)         E. coli       98         Fluoride (daily WSA)       92         Fluoride (daily WSA)       92         Fluoride (daily WSA)       96         Iron       92         PH       85         Thermotolerant Coliforms       99         Total Coliforms       6         Aluminium (13), Antimony (13), Arsenic (13), Barium (13), Boron (13), Cadmium (13), Calcium (13), Chloride (13), Fluoride (13), Fluoride (13), Fluoride (13), Ion (13), Copper (13), E.Coli (67), Fluoride Ratio (11), Iodine (13), Ion (13), Lead (13), Manganese (13), Mercury (13), Molybdenum (13), Nickel (13), Nitrate (13), Nitrite (13), Soliour (13), Soliour (13), Solidum (13), Sulfate (13), Thermotolerant Coliforms (28)         Total Coliforms       (13), Fola Dissolved Solids (TDS) (13), Total Hardness as CaCO3 (13), True Colour		
WATER QUALITY	samples () 2004-2005 % compliance for water quality parameters achieving < 100%, 2005-2006 Parameter(s) tested and number of	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12),         Chloride (12), Chromium (12), Copper (12), Cyanide (2), E.Coli (298), Fluoride (12), Fluoride (daily WS/         (361), Fluoride (field result WSA) (8), Fluoride (weekly WSA) (100), Fluoride Ratio (8), Iodine (12), Iron         (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate         (12), Lead (12), Magnesium (12), Silver (12), Sodium (12), Sulfate (12), Thermotolerant Coliform         (12), Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Thermotolerant Coliform         (12), Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Thermotolerant Coliform         (28), Total Coliforms (298), Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True         Colour (12), Turbidity (12), Zinc (12)         E. coli       98         Fluoride (daily WSA)       92         Fluoride (daily WSA)       92         Fluoride (daily WSA)       92         PH       85         Thermotolerant Coliforms       6         Aluminium (13), Antimony (13), Arsenic (13), Barium (13), Boron (13), Fluoride (daily WSA) (361),         Fluoride (field result WSA) (11), Fluoride (weekly WSA) (90), Fluoride Ratio (11), Iodine (13), Ion (13),         Lead (13), Magnesium (13), Marganese (13), Mercury (13), Molybdenum (13), Nickel (13), Nitrate (13),         Nitrite (13), pH (13), Seeleni		
WATER QUALITY	samples () 2004-2005 % compliance for water quality parameters achieving < 100%, 2005-2006 Parameter(s) tested and number of	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12),         Chloride (12), Chromium (12), Copper (12), Cyanide (2), E.Coli (298), Fluoride (12), Fluoride (daily WS/         (361), Fluoride (field result WSA) (8), Fluoride (2), E.Coli (298), Fluoride (12), Iolon (12), Iron         (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate         (12), Lead (12), Magnesium (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Thermotolerant Coliform         (12), Natrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Thermotolerant Coliform         (12), Natrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Thermotolerant Coliform         (298), Total Coliforms (298), Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True         Colour (12), Turbidity (12), Zinc (12)         E. coli       98         Fluoride (daily WSA)       92         Fluoride (daily WSA)       96         Iron       92         pH       85         Thermotolerant Coliforms       99         Total Coliforms       6         Aluminium (13), Antimony (13), Arsenic (13), Barium (13), Boron (13), Cadmium (13), Calcium (13), Chloride (13), Fluoride (13), Iron (13), Lead (13), Magnesium (13), Manganese (13), Mercury (13), Molybdenum (13), Nickel (13), Nitrate (13), Nitrite (13), Philoride (13), Solifate (13), Thermotolerant Coliforms (28         Total Coliforms (298), Total		
WATER QUALITY	samples ( ) 2004-2005 % compliance for water quality parameters achieving < 100%, 2005-2006 Parameter(s) tested and number of samples ( ) 2005-2006	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12),         Chloride (12), Chromium (12), Copper (12), Cyanide (2), E.Coli (298), Fluoride (12), Fluoride (daily WS/         (361), Fluoride (field result WSA) (8), Fluoride (weekly WSA) (100), Fluoride Ratio (8), Iodine (12), Iron         (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate         (12), Nagnesium (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Thermotolerant Coliform         (12), National Coliforms (298), Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True         Colour (12), Turbidity (12), Zinc (12)         E. coli       98         Fluoride (daily WSA)       92         Fluoride (daily WSA)       96         Iron       92         PH       85         Thermotolerant Coliforms       99         Total Coliforms       6         Aluminium (13), Antimony (13), Arsenic (13), Barium (13), Boron (13), Cadmium (13), Calcium (13), Chloride (13), Chromium (13), Cooper (13), E.Coli (67), Fluoride (13), Fluoride (daily WSA) (361), Fluoride (13), Manganese (13), Mercury (13), Molybdenum (13), Nickel (13), Nitrate (13), Nitrate (13), Marganese (13), Mercury (13), Molybdenum (13), Nickel (13), Nitrate (13), Nitrate (13), Solium (13), Sulfate (13), True Coliur (13), Ture Coliur (13), Turbidity (13), Zinc (13)         E. coli       99         Fluoride (daily WSA)       98		
WATER QUALITY	samples ( ) 2004-2005 % compliance for water quality parameters achieving < 100%, 2005-2006 Parameter(s) tested and number of samples ( ) 2005-2006 % compliance for water quality parameters	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12),         Chloride (12), Chromium (12), Copper (12), Cyanide (2), E. Coli (298), Fluoride (12), Fluoride (daily WS) (361), Fluoride (field result WSA) (8), Fluoride (weekly WSA) (100), Fluoride Ratio (8), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Thermotolerant Coliform (298), Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zinc (12)         E. coli       98         Fluoride (daily WSA)       92         Fluoride (daily WSA)       92         Fluoride (meekly WSA)       96         Iron       92         pH       85         Thermotolerant Coliforms       99         Total Coliforms       6         Aluminium (13), Antimony (13), Arsenic (13), Barium (13), Boron (13), Cadmium (13), Calcium (13), Chloride (13), Fluoride (13), Fluoride (13), Fluoride (13), Isolenium (13), Copper (13), E.Coli (67), Fluoride (13), Fluoride (13), Isolenium (13), Lead (13), Manganese (13), Mercury (13), Molybdenum (13), Nickel (13), Nitrite (13), Nelenium (13), Solidur (13), Solidur (13), Sulfate (13), Nickel (13), Nitrite (13), Fluoride Sa CaCO3 (13), True Colour (13), Turbidity (13), Zinc (13)         E. coli       99         Fluoride (daily WSA)       98         Iron       64		
WATER QUALITY	samples ( ) 2004-2005 % compliance for water quality parameters achieving < 100%, 2005-2006 Parameter(s) tested and number of samples ( ) 2005-2006	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12),         Chloride (12), Chromium (12), Copper (12), Cyanide (2), E.Coli (298), Fluoride (12), Fluoride (daily WS) (361), Fluoride (field result WSA) (8), Fluoride (weekly WSA) (100), Fluoride Ratio (8), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Thermotolerant Coliform (298), Total Coliforms (298), Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zinc (12)         E. coli       98         Fluoride (daily WSA)       92         Fluoride (daily WSA)       92         Fluoride (daily WSA)       92         Fluoride (daily WSA)       96         Iron       92         pH       85         Thermotolerant Coliforms       69         Total Coliforms       6         Aluminium (13), Antimony (13), Arsenic (13), Barium (13), Boron (13), Cadmium (13), Calcium (13), Chloride (13), Choride (13), Fluoride (13), Fluoride (13), Iron (13), Lead (13), Manganese (13), Mercury (13), Molybdenum (13), Nickel (13), Nitrate (13), Nitrite (13), Selenium (13), Sodium (13), Sodium (13), Sulfate (13), Thermotolerant Coliforms (28)         Total Coliforms (298), Total Dissolved Solids (TDS) (13), Total Hardness as CaCO3 (13), True Colour (13), Turbidity (13), Zinc (13)         Benium (13), Silver (13), Sodium (13), Sulfate (13), Thermotolerant Coliforms (28)         Total Colifo		
WATER QUALITY	samples ( ) 2004-2005 % compliance for water quality parameters achieving < 100%, 2005-2006 Parameter(s) tested and number of samples ( ) 2005-2006 % compliance for water quality parameters	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12),         Chloride (12), Chromium (12), Copper (12), Cyanide (2), E. Coli (298), Fluoride (12), Fluoride (daily WSA) (361), Fluoride (field result WSA) (3), Fluoride (12), Fluoride (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrate (12), Natrate (12), Thermotolerant Coliform (298), Total Coliforms (298), Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zinc (12)         E. coli       98         Fluoride (daily WSA)       92         Fluoride (daily WSA)       96         Iron       92         pH       85         Thermotolerant Coliforms       99         Total Coliforms       6         Aluminium (13), Antimony (13), Arsenic (13), Barium (13), Boron (13), Cadmium (13), Calcium (13), Chloride (13), Chormium (13), Copper (13), E.Coli (67), Fluoride (13), Fluoride (13), Nitrate (13), Manganese (13), Mercury (13), Molybdenum (13), Nickel (13), Nitrate (13), Nitrate (13), Manganese (13), Mercury (13), Molybdenum (13), Nickel (13), Nitrate (13), Nitrite (13), pH (13), Selenium (13), Silver (13), Sodium (13), Sulfate (13), Thermotolerant Coliforms (28)         Total Coliforms (298), Total Dissolved Solids (TDS) (13), Total Hardness as CaCO3 (13), True Colour (13), Turbidity (13), Zinc (13)         E. coli       99         Fluoride (daily WSA)       98         Iron       64         OpH       91		
WATER QUALITY	samples ( ) 2004-2005 % compliance for water quality parameters achieving < 100%, 2005-2006 Parameter(s) tested and number of samples ( ) 2005-2006 % compliance for water quality parameters	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12),         Chloride (12), Chromium (12), Copper (12), Cyanide (2), E.Coli (298), Fluoride (12), Fluoride (daily WSA) (361), Fluoride (field result WSA) (8), Fluoride (weekly WSA) (100), Fluoride Ratio (8), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrate (12), Nitrate (12), Solium (12), Sulfate (12), Thermotolerant Coliform (298), Total Coliforms (298), Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zinc (12)         E. coli       98         Fluoride (daily WSA)       92         Fluoride (daily WSA)       96         Iron       92         pH       85         Thermotolerant Coliforms       99         Total Coliforms       6         Aluminium (13), Antimony (13), Arsenic (13), Barium (13), Boron (13), Cadmium (13), Calcium (13), Chloride (13), Chromium (13), Copper (13), E.Coli (67), Fluoride (13), Fluoride (daily WSA) (361), Fluoride (field result WSA) (11), Fluoride (weekly WSA) (90), Fluoride Ratio (11), Iodine (13), Iron (13), Icad (13), Molybdenum (13), Nickel (13), Nitrate (13), Nitrite (13), Manganese (13), Mercury (13), Molybdenum (13), Nickel (13), Nitrate (13), Nitrite (13), pH (13), Selenium (13), Silver (13), Sodium (13), Sulfate (13), True Colour (13), True Colour (13), Turbidity (13), Zinc (13)         E. coli       99         Fluoride (daily WSA)       98         Iron       64         pH       91		
WATER QUALITY	samples ( ) 2004-2005 % compliance for water quality parameters achieving < 100%, 2005-2006 Parameter(s) tested and number of samples ( ) 2005-2006 % compliance for water quality parameters	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12),         Chloride (12), Chromium (12), Copper (12), Cyanide (2), E.Coli (298), Fluoride (12), Fluoride (dily WSA) (361), Fluoride (field result WSA) (8), Fluoride (weekly WSA) (100), Fluoride Ratio (8), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Thermotolerant Coliform (298), Total Coliforms (298), Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zinc (12)         E. coli       98         Fluoride (daily WSA)       92         Fluoride (daily WSA)       96         Iron       92         pH       85         Thermotolerant Coliforms       99         Total Coliforms       6         Aluminium (13), Antimony (13), Arsenic (13), Barium (13), Boron (13), Cadmium (13), Calcium (13), Chloride (13), Chormium (13), Copper (13), E.Coli (67), Fluoride (13), Fluoride (13), Iron (13), Lead (13), Magnesium (13), Manganese (13), Mercury (13), Molybdenum (13), Nickel (13), Nitrate (13), Nitrite (13), pH (13), Selenium (13), Soliver (13), Solfate (13), Thermotolerant Coliforms (28)         Total Coliforms (298), Total Dissolved Solids (TDS) (13), Total Hardness as CaCO3 (13), True Colour (13), Turbidity (13), Zinc (13)       99         Fluoride (daily WSA)       98       100, Fluoride (13), Thermotolerant Coliforms (28)         Total Coliforms (298), Total Dissolved Solids (TDS) (13), Total Hardness as CaC		
WATER QUALITY	samples () 2004-2005 % compliance for water quality parameters achieving < 100%, 2005-2006 Parameter(s) tested and number of samples () 2005-2006 % compliance for water quality parameters achieving < 100%, 2006-2007	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12),         Chloride (12), Chromium (12), Copper (12), Cyanide (2), E.Coli (298), Fluoride (12), Fluoride (dily WSA) (361), Fluoride (field result WSA) (8), Fluoride (12), Nioride (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrate (12), Nitrate (12), Solium (12), Sulfate (12), Thermotolerant Coliform (298), Total Coliforms (298), Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zinc (12)         E. coli       98         Fluoride (daily WSA)       92         Fluoride (daily WSA)       92         Fluoride (weekly WSA)       96         Iron       92         pH       85         Thermotolerant Coliforms       99         Total Coliforms       6         Aluminium (13), Antimony (13), Arsenic (13), Barium (13), Boron (13), Cadmium (13), Calcium (13), Chloride (13), Chormium (13), Colper (13), E.Coli (67), Fluoride (13), Fluoride (13), Iron (13), Lead (13), Magnesium (13), Manganese (13), Mercury (13), Molybdenum (13), Nickel (13), Nitrate (13), Nitrite (13), pH (13), Selenium (13), Soliver (13), Solfate (13), Thermotolerant Coliforms (28)         Total Coliforms (298), Total Dissolved Solids (TDS) (13), Total Hardness as CaCO3 (13), True Colour (13), Turbidity (13), Zinc (13)         E. coli       99         Fluoride (daily WSA)       98         Ironn       64         pH       91		
WATER QUALITY	samples () 2004-2005 % compliance for water quality parameters achieving < 100%, 2005-2006 Parameter(s) tested and number of samples () 2005-2006 % compliance for water quality parameters achieving < 100%, 2006-2007	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12),         Chloride (12), Chromium (12), Copper (12), Cyanide (2), E.Coli (298), Fluoride (12), Fluoride (daily WS/         (361), Fluoride (field result WSA) (8), Fluoride (weekly WSA) (100), Fluoride Ratio (8), Iodine (12), Iron         (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate         (12), Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Thermotolerant Coliform         (298), Total Coliforms (298), Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True         Colour (12), Turbidity (12), Zinc (12)         E. coli       98         Fluoride (daily WSA)       92         Fluoride (daily WSA)       92         Fluoride (daily WSA)       92         PH       85         Thermotolerant Coliforms       6         Aluminium (13), Antimony (13), Arsenic (13), Barium (13), Boron (13), Cadmium (13), Calcium (13), Chloride (13), Fluoride (13), Fluoride (13), Fluoride (13), Iron (13), Lead (13), Manganese (13), Mercury (13), Molybdenum (13), Nickel (13), Nitrite (13), Nickel (13), Silver (13), Sodium (13), Sulfat (13), Nickel (13), Nitrate (13), Relenium (13), Silver (13), Sodium (13), Sulfat (13), Nickel (13), True Colour (13), Turbidity (13), Zinc (13)         E. coli       99         Fluoride (daily WSA)       98         Iron       64         DH       91      <		
WATER QUALITY	samples () 2004-2005 % compliance for water quality parameters achieving < 100%, 2005-2006 Parameter(s) tested and number of samples () 2005-2006 % compliance for water quality parameters achieving < 100%, 2006-2007	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12),         Chloride (12), Chromium (12), Copper (12), Cyanide (2), E.Coli (298), Fluoride (12), Fluoride (daily WS4) (361), Fluoride (field result WSA) (8), Fluoride (12), Nickel (12), Nickel (12), Nickel (12), Nitrate (12), Maganesse (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrate (12), Nitrate (12), Nitrate (12), Turbidity (12), Zinc (12)         E. coli       98         Fluoride (daily WSA)       92         Fluoride (daily WSA)       92         Fluoride (daily WSA)       96         Iron       92         pH       85         Thermotolerant Coliforms       69         Collorforms       6         Aluminium (13), Antimony (13), Arsenic (13), Barium (13), Boron (13), Cadmium (13), Calcium (13),         Chloride (13), Chromium (13), Copper (13), E.Coli (67), Fluoride (13), Fluoride (13), Nickel (13), Turbidity (13), Zinc (13)         E. coli       99         Total Coliforms (298), Total Dissolved Solids (TDS) (13), Total Hardness as CaCO3 (13), True Colur (13), Nitrite (13), Silver (13), Sodium (13), Sulfate (13), Thermotolerant Coliforms (28)         Total Coliforms (298), Total Dissolved Solids (TDS) (13), Total Hardness as CaCO3 (13), True Colur (13), Turbidity (13), Zinc (13)		
WATER QUALITY	samples () 2004-2005 % compliance for water quality parameters achieving < 100%, 2005-2006 Parameter(s) tested and number of samples () 2005-2006 % compliance for water quality parameters achieving < 100%, 2006-2007	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12),         Chloride (12), Chromium (12), Copper (12), Cyanide (2), E.Coli (298), Fluoride (12), Fluoride (daily WSA) (361), Fluoride (field result WSA) (8), Fluoride (12), Niorate (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrate (12), Nitrate (12), Solium (12), Sulfate (12), Thermotolerant Coliform (298), Total Coliforms (298), Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zinc (12)         E. coli       98         Fluoride (daily WSA)       92         Fluoride (daily WSA)       92         Fluoride (daily WSA)       92         pH       85         Thermotolerant Coliforms       99         Total Coliforms       6         Aluminium (13), Antimony (13), Arsenic (13), Barium (13), Boron (13), Cadmium (13), Calcium (13), Chloride (13), Chromium (13), Copper (13), E.Coli (67), Fluoride (13), Fluoride (daily WSA) (361), Fluoride (field result WSA) (11), Fluoride (weekly WSA) (90), Fluoride Ratio (11), Iodine (13), Iron (13), Lead (13), Magnesium (13), Sofuer (13), Sodium (13), Sulfate (13), Nitrate (13), Nitrite (13), pH (13), Selenium (13), Silver (13), Sodium (13), Sulfate (13), Thermotolerant Coliforms (28)         Total Coliforms (280, Total Dissolved Solids (TDS) (13), Total Hardness as CaCO3 (13), True Colour (13), Turbidity (13), Zinc (13)         E. coli       99         Fluoride (daily WSA)       98         Iron       64		
	samples () 2004-2005 % compliance for water quality parameters achieving < 100%, 2005-2006 Parameter(s) tested and number of samples () 2005-2006 % compliance for water quality parameters achieving < 100%, 2006-2007	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12),         Chloride (12), Chromium (12), Copper (12), Cyanide (2), E.Coli (298), Fluoride (12), Fluoride (daily WS4) (361), Fluoride (field result WSA) (8), Fluoride (12), Nickel (12), Nickel (12), Nickel (12), Nitrate (12), Maganesse (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrate (12), Nitrate (12), Nitrate (12), Turbidity (12), Zinc (12)         E. coli       98         Fluoride (daily WSA)       92         Fluoride (daily WSA)       92         Fluoride (daily WSA)       96         Iron       92         pH       85         Thermotolerant Coliforms       69         Collorforms       6         Aluminium (13), Antimony (13), Arsenic (13), Barium (13), Boron (13), Cadmium (13), Calcium (13),         Chloride (13), Chromium (13), Copper (13), E.Coli (67), Fluoride (13), Fluoride (13), Nickel (13), Turbidity (13), Zinc (13)         E. coli       99         Total Coliforms (298), Total Dissolved Solids (TDS) (13), Total Hardness as CaCO3 (13), True Colur (13), Nitrite (13), Silver (13), Sodium (13), Sulfate (13), Thermotolerant Coliforms (28)         Total Coliforms (298), Total Dissolved Solids (TDS) (13), Total Hardness as CaCO3 (13), True Colur (13), Turbidity (13), Zinc (13)		

		// compliance for water quality parameters	Iron	70
		achieving < 100%, 2007-2008	Total Coliforms	11
		Parameter(s) tested and number of samples ( ) 2007-2008	Chloride (10), Chromium (10) Fluoride (field result WSA) (8 (10), Magnesium (10), Manga (10), pH (10), Selenium (10),	)), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10), , Copper (10), E.Coli (295), Fluoride (10), Fluoride (daily WSA) (298), ), Fluoride (weekly WSA) (78), Fluoride Ratio (8), Iodine (10), Iron (10), Le nese (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrite Silver (10), Sodium (10), Sulfate (10), Thermotolerant Coliforms (249), Tot red Solids (TDS) (10), Total Hardness as CaCO3 (10), True Colour (10),
	Proportion of Potable Water Supplied to United Households (%)		Yes. The use of sprinklers and day.	d fixed hoses are banned permanently between 9.00am and 4.00pm even
ATER			Unknown.	
≤ ŭ		Distance from the Coast (km)	0km	
		Climate	Subtropical (BoM, 2005)	
		Average Annual Rainfall		n number 58012, period 2004-2008)
	r –	FACTOR	YES / NO	NOTES / EXPLANATION
		Drought	No	Classified as 'Satisfactory' according to NSW DPI Drought Map October
		Single drinking water source	Yes	
		Poor quality water source	Yes	Very high levels of faecal contamination.
		Sewage overflow or disposal into water	Yes	High faecal contamination. Potentially due to sewer overflows.
		Flooding	Yes	History of flooding in this region.
	ply	Fauna defecating in supply	Yes	
	dn	Fauna destroying water intake structures	No	
	and Water Supply	Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)	Yes	Iron.
	Ň	Un-lined landfills	No	
ш	p	Extensive agriculture	Yes	
WATER QUALITY OR SECURITY RISK (CAUSE)	Catchment a	Low vegetation cover (dust, sediment runoff)	No	
Ň	hn		N 1	
ISI	atc	Poor access to supply	No	Environmental flavor affactad (Olanzara) (allass Oromail usabaita)
Υ Έ	C	Unsustainable water extraction	Yes	Environmental flows affected (Clarence Valley Council website).
É		Aquifer turning saline due to high extraction	No	Not reported as an issue.
ECUR		Hard water Aging or inadequate pipe work and	No No	
S		associated infrastructure		
В В		Significant water losses due to leaking	No	
≥		High per capita water consumption	No	
UALIT	e	Inappropriate water quality standards / objectives	No	Council reports to NSW Health, who use ADWG.
ā	Governance	Lack of infrastructure maintenance	No	
ШШ	err	Poor management or governance	No	
AT	ò	Vandalism / sabotage / terrorism	No	
×.	0	Insufficient trained personnel	No	
		Inadequate funding for maintenance or upgrades	No	
	es	Mining / minerals	Unknown	
	ŝti	Irrigation	Yes	
	Industries			
		Chemicals / process	Unknown	
	Population	Seasonal population loadings	Yes	Peak season occurs in Summer.
	Po	Rapid population growth	No	Negative population growth between the 2001 and 2006 Census.
WATER QUALITY OR SECURITY RISK (FFFECT)	$\hat{\boldsymbol{\Sigma}}$	Bacteriological and / or viral contamination Algal blooms	Yes	Total Coliform levels are very high, and some non-compliances for E.Co
0		Heavy metal contamination	No	None reported.
Ē	j	Poor chlorine residuals	Yes	Free Chlorine not sampled.
A X	Ś	Pesticide contamination	No	
DC SIZ	ź	High suspended solids	No	
£ ≻	-	Boil water notices	No	No record of boil water notices in NSW Health summary spreadsheet.
E E	2	Deaths or illness due to water quality	No	no receite or boil water notices in now mean aunmary spicadsheet.
A L	S	Water restrictions (current and historic)	Yes	
ц –	Ĺ	Taste and odour issues	Yes	Iron non-compliances.
0.	,	Other contamination that would affect	Yes	Very high contamination by faecal coliforms.
		and notice the second second		ng major sewage augmentation, that will incorporate a major reuse
		Notes		a Regional Water Supply Strategy with Coffs Harbour Council (see

5	State/Territory	NSW		
TOWN	Town Name	Bega		
Ĕ	Town Population		); 4,537 (Census 2006, Urban Centre/Locality)	
	Name of Water Utility	Bega Valley Shire Council		
WATER UTILITY	Council Web-Link	www.begavalley.nsw.gov.au \$2.10/kL		
ΤΗ	Rate (\$/kL)	\$2.10/kL Unknown. Residential water use = 1800ML/Yr for 07-08 reporting period.		
≥⊃	Per Capita Water Consumption (L/day)			
	Number of Connections	13,800		
⊢γ	Catchment	Southern Rivers		
副門と	Sub-Catchment Catchment Management Authority (CMA)	Bega River           Southern Rivers		
₩ A A	CMA Web-Link	http://www.southern.cma.nsw.gov.au/		
D D D	Catchment Protection Status	None	<u>3w.qov.ad/</u>	
CATCHMENT AND WATER SUPPLY	Potable Water Source(s)	Bega Bores (groundwater)		
0 1	Supply Capacity		ticulated water was consumed in the shire for the 07-08 reporting period.	
	Treatment Plant(s)	None		
	Level of Treatment	Chlorination, fluoridation.		
	Drinking Water Guidelines	ADWG 2004 (NSW Health	n)	
		NSW Health N	Monitoring Location:	
	% compliance for water quality parameters	Fluoride (daily WSA)	57	
	achieving < 100%, 2003-2004	Fluoride Ratio	71	
	usine wing + 100 %, 2000 2004	Total Coliforms	98	
			(12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)	
			(12), Copper (12), Cyanide (12), E.Coli (91), Fluoride (12), Fluoride (daily	
	Parameter(s) tested and number of		d result WSA) (7), Fluoride Ratio (7), Iodine (12), Iron (12), Lead (12),	
	samples ( ) 2003-2004		ese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite	
			2), Silver (12), Sodium (12), Sulfate (12), Total Coliforms (91), Total	
			2), Total Hardness as CaCO3 (12), True Colour (5), Turbidity (12), Zinc (1	
	% compliance for water quality parameters	Fluoride (daily WSA) Fluoride Ratio	80 82	
	achieving < 100%, 2004-2005	Total Coliforms	99	
			(12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)	
			(12), Alsenic (12), Banum (12), Boron (12), Cadmum (12), Calcium (12), (12), (12), Calcium (12),	
	Parameter(s) tested and number of		d result WSA) (11), Fluoride Ratio (11), Iodine (12), Iron (12), Lead (12),	
	samples () 2004-2005		ese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite	
	samples () 2004-2005		2), Silver (12), Sodium (12), Sulfate (12), Total Coliforms (89), Total	
			2), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zinc (	
		. , .		
≻	% compliance for water quality parameters	Fluoride (daily WSA) Fluoride Ratio	76 89	
5	achieving < 100%, 2005-2006	Total Coliforms	99	
WATER QUALITY			(11), Arsenic (11), Barium (11), Boron (11), Cadmium (11), Calcium (11	
Ø			(11), Copper (11), E.Coli (88), Fluoride (11), Fluoride (daily WSA) (339),	
Ë	Parameter(a) tooted and number of		) (9), Fluoride Ratio (9), Iodine (11), Iron (11), Lead (11), Magnesium (11)	
AT	Parameter(s) tested and number of		(11), Molybdenum (11), Nickel (11), Nitrate (11), Nitrite (11), pH (11),	
3	samples ( ) 2005-2006		Sodium (11), Sulfate (11), Total Coliforms (72), Total Dissolved Solids	
		(TDS) (11), Total Hardness	s as CaCO3 (11), True Colour (11), Turbidity (11), Zinc (11)	
			s as CaCO3 (11), True Colour (11), Turbidity (11), Zinc (11)	
	% compliance for water quality parameters	Fluoride (daily WSA)	79	
	% compliance for water quality parameters achieving < 100%, 2006-2007	Fluoride (daily WSA) Fluoride (weekly WSA)	79 80	
		Fluoride (daily WSA) Fluoride (weekly WSA) Total Coliforms	79 80 97	
		Fluoride (daily WSA) Fluoride (weekly WSA) Total Coliforms Aluminium (10), Antimony	79 80 97 (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10	
	achieving < 100%, 2006-2007	Fluoride (daily WSA) Fluoride (weekly WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium (	79 80 97 (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10 (10), Copper (10), E.Coli (98), Fluoride (10), Fluoride (daily WSA) (343),	
	achieving < 100%, 2006-2007 Parameter(s) tested and number of	Fluoride (daily WSA) Fluoride (weekly WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (field result WSA	79 80 97 (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10 (10), Copper (10), E.Coli (98), Fluoride (10), Fluoride (daily WSA) (343), (7), Fluoride (weekly WSA) (109), Fluoride Ratio (7), Iodine (10), Iron (1	
	achieving < 100%, 2006-2007	Fluoride (daily WSA) Fluoride (weekly WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (field result WSA Lead (10), Magnesium (10	79 80 97 (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10 (10), Copper (10), E.Coli (98), Fluoride (10), Fluoride (daily WSA) (343), (7), Fluoride (weekly WSA) (109), Fluoride Ratio (7), Iodine (10), Iron (1 b), Manganese (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate	
	achieving < 100%, 2006-2007 Parameter(s) tested and number of	Fluoride (daily WSA) Fluoride (weekly WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (field result WSA Lead (10), Magnesium (1 Nitrite (10), pH (17), Selen	79 80 97 (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10 (10), Copper (10), E.Coli (98), Fluoride (10), Fluoride (daily WSA) (343), ) (7), Fluoride (weekly WSA) (109), Fluoride Ratio (7), Iodine (10), Iron (1 ), Manganese (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate ium (10), Silver (10), Sodium (10), Sulfate (10), Total Coliforms (98), Total	
	achieving < 100%, 2006-2007 Parameter(s) tested and number of	Fluoride (daily WSA) Fluoride (weekly WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (10), Magnesium (11 Nitrite (10), pH (17), Selen Dissolved Solids (TDS) (11 Fluoride (daily WSA)	79 80 97 (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10 (10), Copper (10), E.Coli (98), Fluoride (10), Fluoride (daily WSA) (343), ) (7), Fluoride (weekly WSA) (109), Fluoride Ratio (7), Iodine (10), Iron (1 ), Manganese (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate ium (10), Silver (10), Sodium (10), Sulfate (10), Total Coliforms (98), Total	
	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007	Fluoride (daily WSA) Fluoride (weekly WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (field result WSA Lead (10), Mganesium (10 Nitritie (10), pH (17), Selen Dissolved Solids (TDS) (11	79           80           97           (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10           10), Copper (10), E.Coli (98), Fluoride (10), Fluoride (daily WSA) (343),           (17), Fluoride (weekly WSA) (109), Fluoride Ratio (7), lodine (10), Iron (1           (10), Manganese (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate (10), Silver (10), Sodium (10), Sulfate (10), Total Coliforms (98), Tota), Total Hardness as CaCO3 (10), True Colour (10), Turbidity (10), Zinc (10), Total Coliforms (10), Sulfate (10), Turbidity (10), Zinc (10), Sulfate (10), Turbidity (10), Zinc (10), Total Coliforms (10), Sulfate (10), Turbidity (10), Zinc (10), Total Coliforms (10), Sulfate (10), Turbidity (10), Zinc (10), Total Coliforms (10), Sulfate (10), Turbidity (10), Zinc (10), Total Coliforms (10), Sulfate (10), Turbidity (10), Zinc (10),	
	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters	Fluoride (daily WSA) Fluoride (weekly WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (10), Magnesium (11 Nitrite (10), pH (17), Selen Dissolved Solids (TDS) (11 Fluoride (daily WSA)	79           80           97           (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10)           (10), Copper (10), E.Coli (98), Fluoride (10), Fluoride (daily WSA) (343),           (7), Fluoride (weekly WSA) (109), Fluoride Ratio (7), Iodine (10), Iron (1           (10), Manganese (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate           (10), Silver (10), Sodium (10), Sulfate (10), Total Coliforms (98), Tota           (10), True Colour (10), Turbidity (10), Zinc (62           52           89	
	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007	Fluoride (daily WSA) Fluoride (weekly WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (10), Nganesium (10 Nitrite (10), pH (17), Selen Dissolved Solids (TDS) (11 Fluoride (daily WSA) Fluoride (weekly WSA) Fluoride Ratio Iron	79           80           97           (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10           10), Copper (10), E.Coli (98), Fluoride (10), Fluoride (daily WSA) (343),           (17), Fluoride (weekly WSA) (109), Fluoride Ratio (7), lodine (10), Iron (1           (10), Marganese (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate (10), Silver (10), Sodium (10), Sulfate (10), Total Colforms (98), Tota), Total Hardness as CaCO3 (10), True Colour (10), Turbidity (10), Zinc (62           52           89           92	
	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters	Fluoride (daily WSA) Fluoride (weekly WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (10), Chromium ( Fluoride (10), Magnesium (11 Nitrite (10), pH (17), Selem Dissolved Solids (TDS) (11 Fluoride (daily WSA) Fluoride (ality WSA) Fluoride Ratio Iron Total Coliforms	79           80           97           (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10           10), Copper (10), E.Coli (98), Fluoride (10), Fluoride (daily WSA) (343),           (17), Fluoride (weekly WSA) (109), Fluoride Ratio (7), Iodine (10), Iron (1)           ), Manganese (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate           ium (10), Silver (10), Sodium (10), Sulfate (10), Total Coliforms (98), Tota           O, Total Hardness as CaCO3 (10), True Colour (10), Turbidity (10), Zinc (62           62           89           92           99	
	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters	Fluoride (daily WSA) Fluoride (weekly WSA) <b>Total Coliforms</b> Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (field result WSA) Lead (10), Magnesium (10 Nitrite (10), pH (17), Selen Dissolved Solids (TDS) (11 Fluoride (daily WSA) Fluoride (daily WSA) Fluoride Ratio Iron <b>Total Coliforms</b> Aluminium (12), Antimony	79           80           97           (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10)           10), Copper (10), E.Coli (98), Fluoride (10), Fluoride (daily WSA) (343),           (7), Fluoride (weekly WSA) (109), Fluoride Ratio (7), Iodine (10), Iron (1)           Manganese (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate (10), Nitrate (10), Solium (10), Sulfate (10), Total Coliforms (98), Tota           0), Total Hardness as CaCO3 (10), True Colour (10), Turbidity (10), Zinc (62           62           52           89           92           99           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)	
	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters	Fluoride (daily WSA) Fluoride (weekly WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (10), DH (17), Selen Dissolved Solids (TDS) (11 Fluoride (daily WSA) Fluoride (alily WSA) Fluoride (alily WSA) Fluoride Ratio Iron Total Coliforms Aluminium (12), Antimony Chloride (12), Chromium (	79           80           97           (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10)           10), Copper (10), E.Coli (98), Fluoride (10), Fluoride (daily WSA) (343),           (17), Fluoride (weekly WSA) (109), Fluoride Ratio (7), lodine (10), Iron (1           (10), Silver (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate (10), Silver (10), Sodium (10), Sulfate (10), Total Colforms (98), Tota           (10), Silver (10), Sodium (10), Sulfate (10), Total Colforms (98), Tota           (10), Total Hardness as CaCO3 (10), True Colour (10), Turbidity (10), Zinc (62           52           89           92           99           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12           (12), Copper (12), E.Coli (114), Fluoride (12), Fluoride (daily WSA) (333),	
	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008	Fluoride (daily WSA) Fluoride (weekly WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (10), Chromium ( Fluoride (10), Magnesium (11), Nitrite (10), pH (17), Selen Dissolved Solids (TDS) (11) Fluoride (daily WSA) Fluoride (daily WSA) Fluoride Ratio Iron Total Coliforms Aluminium (12), Chromium ( Fluoride (field result WSA)	79           80           97           (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10)           10), Copper (10), E.Coli (98), Fluoride (10), Fluoride (daily WSA) (343),           (17), Fluoride (weekly WSA) (109), Fluoride Ratio (7), Iodine (10), Iron (1           (10), Salver (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate i           (10), Silver (10), Sodium (10), Sulfate (10), Total Coliforms (98), Total           (10), Silver (10), Sodium (10), Sulfate (10), Total Coliforms (98), Total           (10), Silver (10), Sodium (10), True Colour (10), Turbidity (10), Zinc (62           52           89           92           99           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12), Calcium (12), Capper (12), E.Coli (14), Fluoride (12), Fluoride (daily WSA) (333), (9), Fluoride (weekly WSA) (85), Fluoride Ratio (9), Free Chlorine (1),	
	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters	Fluoride (daily WSA) Fluoride (weekly WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (10), Chromium ( Fluoride (10), Magnesium (11 Nitrite (10), pH (17), Selem Dissolved Solids (TDS) (11 Fluoride (10), H (17), Selem Fluoride (daily WSA) Fluoride (ality WSA) Fluoride (ality WSA) Fluoride (Ratio Iron Total Coliforms Aluminium (12), Antimony Chloride (12), Iron (12), Lead	79           80           97           (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10)           (10), Copper (10), E.Coli (98), Fluoride (10), Fluoride (daily WSA) (343),           (17), Fluoride (weekly WSA) (109), Fluoride Ratio (7), Iodine (10), Iron (1           (10), Sanganese (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate (10), Silver (10), Sodium (10), Sulfate (10), Total Coliforms (98), Tota           (10), Total Hardness as CaCO3 (10), True Colour (10), Turbidity (10), Zinc (62           62           89           92           99           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Arsenic (12), Barium (12), Boron (12), Fluoride (daily WSA) (333), (9), Fluoride (weekly WSA) (85), Fluoride Ratio (9), Free Chlorine (1), (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12)	
	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of	Fluoride (daily WSA) Fluoride (weekly WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (field result WSA Lead (10), Magnesium (10 Nitrite (10), pH (17), Selen Dissolved Solids (TDS) (11 Fluoride (daily WSA) Fluoride (daily WSA) Fluoride (ataly WSA) Fluoride (Ratio Iron Total Coliforms Aluminium (12), Antimony Chloride (12), Chromium ( Fluoride (field result WSA Iodine (12), Intrate (12), Nitrate (12), Nitrate (12), Nitrate	79           80           97           (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10)           10), Copper (10), E.Coli (98), Fluoride (10), Fluoride (daily WSA) (343),           (17), Fluoride (weekly WSA) (109), Fluoride Ratio (7), lodine (10), Nir (1           (10), Manganese (10), Mercury (10), Molybdenum (10), Nickel (10), Nir (1           (10), Silver (10), Sodium (10), Sulfate (10), Total Coliforms (98), Total           (10), Silver (10), Sodium (10), Sulfate (10), Total Coliforms (98), Total           (10), Total Hardness as CaCO3 (10), True Colour (10), Turbidity (10), Zinc (62           52           89           92           99           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12           12), Gopper (12), E.Coli (114), Fluoride (12), Fluoride (daily WSA) (333), (9), Fluoride (weekly WSA) (85), Fluoride Ratio (9), Free Chlorine (1), d (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12, d (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), fluoride (12), Sulfate (12), Solium (	
	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of	Fluoride (daily WSA) Fluoride (weekly WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (10), DH (17), Selen Dissolved Solids (TDS) (11 Fluoride (daily WSA) Fluoride (daily WSA) Fluoride (daily WSA) Fluoride (daily WSA) Fluoride Ratio Iron Total Coliforms Aluminium (12), Antimony Chloride (12), Chromium ( Fluoride (12), Nitrate (12), Ni Nickel (12), Nitrate (12), Ni Total Coliforms (114), Tota	79           80           97           (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10)           (10), Copper (10), E.Coli (98), Fluoride (10), Fluoride (daily WSA) (343),           (1), Fluoride (weekly WSA) (109), Fluoride Ratio (7), Iodine (10), Iron (1           (10), Manganese (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate (10), Nitrate (10), Nitrate (10), Nitrate (10), Nitrate (10), Nitrate (10), Total Coliforms (98), Tota           (10), Silver (10), Sodium (10), Sulfate (10), Total Coliforms (98), Tota           (10), Total Hardness as CaCO3 (10), True Colour (10), Turbidity (10), Zinc (10)           (12)           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Angenesium (12), Barium (12), Boron (12), Calcium (12), Sal(33),           (13), Fluoride (weekly WSA) (85), Fluoride Ratio (9), Free Chlorine (1),           (12), Magnesium (12), Magnaese (12), Mercury (12), Molybdenum (12)           (12), PH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12),           (12), Deved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colo	
	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of	Fluoride (daily WSA) Fluoride (weekly WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (10), Chromium ( Fluoride (10), PH (17), Selen Dissolved Solids (TDS) (11 Fluoride (alily WSA) Fluoride (alily WSA) Fluoride (weekly WSA) Fluoride (weekly WSA) Fluoride (weekly WSA) Fluoride (12), Chromium ( Fluoride (12), Chromium ( Fluoride (12), Nitrate (12), National Iotal Coliforms (114), Tota (12), Turbidity (12), Zinc (1	79           80           97           (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10)           (10), Copper (10), E.Coli (98), Fluoride (10), Fluoride (daily WSA) (343),           (), Fluoride (weekly WSA) (109), Fluoride Ratio (7), lodine (10), Iron (1           (10), Manganese (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate           (10), Silver (10), Sodium (10), Sulfate (10), Total Colforms (98), Tota           (10), Silver (10), Sodium (10), Sulfate (10), Total Colforms (98), Tota           (10), Total Hardness as CaCO3 (10), True Colour (10), Turbidity (10), Zinc (10)           (12)	
kity	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of	Fluoride (daily WSA) Fluoride (weekly WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (10), Chromium ( Fluoride (10), Magnesium (11) Nitrite (10), pH (17), Selen Dissolved Solids (TDS) (11) Fluoride (30) (WSA) Fluoride (30) (WSA) Fluoride Ratio Iron Total Coliforms Aluminium (12), Antimony Chloride (12), Chromium ( Fluoride (12), Iron (12), Leaa Nickel (12), Nitrate (12), N Total Coliforms (114), Tota (12), Turbidity (12), Zinc (1)	79           80           97           (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10)           10), Copper (10), E.Coli (98), Fluoride (10), Fluoride (daily WSA) (343),           (17), Fluoride (weekly WSA) (109), Fluoride Ratio (7), Iodine (10), Iron (1           (10), Manganese (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate e           (10), Silver (10), Sodium (10), Sulfate (10), Total Coliforms (98), Tota           (10), Total Hardness as CaCO3 (10), True Colour (10), Turbidity (10), Zinc (62           52           89           92           99           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Angnesium (12), Manganese (12), Mercury (12), Molybdenum (12)           (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), itirte (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), al Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colo (2)           tions advertised on the Council website, but irrigation water allocation water	
urity	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions	Fluoride (daily WSA) Fluoride (weekly WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (10), Chromium ( Fluoride (10), PH (17), Selen Dissolved Solids (TDS) (11 Fluoride (alily WSA) Fluoride (alily WSA) Fluoride (weekly WSA) Fluoride (weekly WSA) Fluoride (weekly WSA) Fluoride (12), Chromium ( Fluoride (12), Chromium ( Fluoride (12), Nitrate (12), Mitate Ichoride (12), Irinta (12), Lead Nickel (12), Nitrate (12), Nitrate (12), Total Coliforms (114), Tota (12), Turbidity (12), Zinc (111)	79           80           97           (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10)           10), Copper (10), E.Coli (98), Fluoride (10), Fluoride (daily WSA) (343),           (17), Fluoride (weekly WSA) (109), Fluoride Ratio (7), Iodine (10), Iron (1           (10), Manganese (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate e           (10), Silver (10), Sodium (10), Sulfate (10), Total Coliforms (98), Tota           (10), Total Hardness as CaCO3 (10), True Colour (10), Turbidity (10), Zinc (62           52           89           92           99           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Angnesium (12), Manganese (12), Mercury (12), Molybdenum (12)           (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), itirte (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), al Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colo (2)           tions advertised on the Council website, but irrigation water allocation water	
ECURITY	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to	Fluoride (daily WSA) Fluoride (weekly WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (10), Chromium ( Fluoride (10), DH (17), Selen Dissolved Solids (TDS) (11 Fluoride (daily WSA) Fluoride (daily WSA) Fluoride (daily WSA) Fluoride (daily WSA) Fluoride (alily WSA) Fluoride (10), DH (17), Selen Iron Total Coliforms Aluminium (12), Antimony Chloride (12), Chromium ( Fluoride (12), Chromium ( Fluoride (12), Nirtate (12), N Total Coliforms (114), Tota (12), Turbidity (12), Zinc (1 No domestic water restrict zero from July - September	79           80           97           (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10)           10), Copper (10), E.Coli (98), Fluoride (10), Fluoride (daily WSA) (343),           (17), Fluoride (weekly WSA) (109), Fluoride Ratio (7), Iodine (10), Iron (1           (10), Manganese (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate e           (10), Silver (10), Sodium (10), Sulfate (10), Total Coliforms (98), Tota           (10), Total Hardness as CaCO3 (10), True Colour (10), Turbidity (10), Zinc (62           52           89           92           99           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Angnesium (12), Manganese (12), Mercury (12), Molybdenum (12)           (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), itirte (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), al Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colo (2)           tions advertised on the Council website, but irrigation water allocation water	
RSECURITY	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%)	Fluoride (daily WSA) Fluoride (weekly WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (10), Chromium ( Fluoride (10), PH (17), Selen Dissolved Solids (TDS) (11 Fluoride (daily WSA) Fluoride (daily WSA) Fluoride (alily WSA) Fluoride (ation Iron Total Coliforms Aluminium (12), Antimony Chloride (12), Chromium ( Fluoride (12), Nirrate (12), N Total Coliforms (114), Tota (12), Turbidity (12), Zinc (1 No domestic water restrict zero from July - September 60%	79           80           97           (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10)           10), Copper (10), E.Coli (98), Fluoride (10), Fluoride (daily WSA) (343),           (17), Fluoride (weekly WSA) (109), Fluoride Ratio (7), Iodine (10), Iron (1           (10), Manganese (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate e           (10), Silver (10), Sodium (10), Sulfate (10), Total Coliforms (98), Tota           (10), Total Hardness as CaCO3 (10), True Colour (10), Turbidity (10), Zinc (62           52           89           92           99           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Angnesium (12), Manganese (12), Mercury (12), Molybdenum (12)           (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), itirte (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), al Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colo (2)           tions advertised on the Council website, but irrigation water allocation water	
IER SECURITY	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km)	Fluoride (daily WSA) Fluoride (weekly WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (10), Magnesium (10 Nitrite (10), pH (17), Selen Dissolved Solids (TDS) (11 Fluoride (daily WSA) Fluoride (daily WSA) Fluoride Ratio Iron Total Coliforms Aluminium (12), Antimony Chloride (12), Chromium ( Fluoride (12), Chromium ( Fluoride (12), Iron (12), Leac Nickel (12), Nitrate (12), N Total Coliforms (114), Tota (12), Turbidity (12), Zinc (1 No domestic water restrict zero from July - September 60% ~ 29km	79           80           97           (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10)           10), Copper (10), E.Coli (98), Fluoride (10), Fluoride (daily WSA) (343),           (17), Fluoride (weekly WSA) (109), Fluoride Ratio (7), Iodine (10), Iron (1           (10), Manganese (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate e           (10), Silver (10), Sodium (10), Sulfate (10), Total Coliforms (98), Tota           (10), Total Hardness as CaCO3 (10), True Colour (10), Turbidity (10), Zinc (62           52           89           92           99           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)           (12), Angnesium (12), Manganese (12), Mercury (12), Molybdenum (12)           (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), itirte (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), al Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colo (2)           tions advertised on the Council website, but irrigation water allocation water	
ATER SECURITY	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate	Fluoride (daily WSA) Fluoride (weekly WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (10), Chromium ( Fluoride (10), Magnesium (11) Nitrite (10), pH (17), Selem Dissolved Solids (TDS) (11) Fluoride (10), H(17), Selem Fluoride (alily WSA) Fluoride Ratio Iron Total Coliforms Aluminium (12), Antimony Chloride (12), Chromium ( Fluoride (12), Chromium ( Fluoride (12), Nitrate (12), N Notal Coliforms (114), Tota (12), Turbidity (12), Zinc (1 No domestic water restrict zero from July - September 60% ~ 29km Temperate	79         80         97         (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10)         10), Copper (10), E.Coli (98), Fluoride (10), Fluoride (daily WSA) (343),         (17), Fluoride (weekly WSA) (109), Fluoride Ratio (7), lodine (10), Iron (1),         (10), Salver (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate inium (10), Silver (10), Sodium (10), Sulfate (10), Total Coliforms (98), Total         (10), Silver (10), Sodium (10), Sulfate (10), Total Coliforms (98), Total         (10), Silver (10), Sodium (10), Sulfate (10), Turbidity (10), Zinc (10)         (12)         (12)         (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)         (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)         (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)         (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)         (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)         (12), Arsenic (12), Barium (12), Mercury (12), Molybdenum (12)         (12), Copper (12), E.Coli (114), Fluoride (12), Fluoride (daily WSA) (333),         (9), Fluoride (weekly WSA) (85), Fluoride Ratio (9), Free Chlorine (1),         (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12),         (12), Horode Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colo (2)         tions advertised on the Council website, but	
WATER SECURITY	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall	Fluoride (daily WSA) Fluoride (daily WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (10), Chromium ( Fluoride (10), Magnesium (11 Nitrite (10), pH (17), Selem Dissolved Solids (TDS) (11 Fluoride (10), H(17), Selem Fluoride (daily WSA) Fluoride (daily WSA) Fluoride (daily WSA) Fluoride (ality WSA) Fluoride Ratio Iron Total Coliforms Aluminium (12), Antimony Chloride (12), Chromium ( 12), Chromium (12), Lead Nickel (12), Nitrate (12), Ni Total Coliforms (114), Tota (12), Turbidity (12), Zinc (1 No domestic water restrict zero from July - September 60% ~ 29km Temperate 608mm (Source: BoM stai	79         80         97         (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10)         10), Copper (10), E.Coli (98), Fluoride (10), Fluoride (daily WSA) (343),         (17), Fluoride (weekly WSA) (109), Fluoride Ratio (7), lodine (10), Iron (1)         (10), Salver (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate (ium (10), Silver (10), Sodium (10), Sulfate (10), Total Coliforms (98), Total         (10), Total Hardness as CaCO3 (10), True Colour (10), Turbidity (10), Zinc (62         52         89         92         99         (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)         (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)         (12), Copper (12), E.Coli (114), Fluoride (12), Fluoride (daily WSA) (333),         (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12)         Itrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12),         al Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colo         (2)         tions advertised on the Council website, but irrigation water allocation water are 2009.         tion number 69139, period 2004-2008)	
WATER SECURITY	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR	Fluoride (daily WSA) Fluoride (weekly WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (10), Chromium ( Fluoride (10), PH (17), Selen Dissolved Solids (TDS) (11 Fluoride (daily WSA) Fluoride (daily WSA) Fluoride (alily WSA) Fluoride (alily WSA) Fluoride Ratio Iron Total Coliforms Aluminium (12), Antimony Chloride (12), Chromium ( Fluoride (12), Chromium ( Fluoride (12), Nirtate (12), N Total Coliforms (114), Tota (12), Turbidity (12), Zinc (1 No domestic water restrict zero from July - September 60% ~ 29km Temperate 608mm (Source: BoM stat 95 / NO	79         80         97         (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10)         10), Copper (10), E. Coli (98), Fluoride (10), Fluoride (daily WSA) (343),         (17), Fluoride (weekly WSA) (109), Fluoride Ratio (7), lodine (10), Iron (1         (10), Manganese (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate (10), Silver (10), Sodium (10), Sulfate (10), Total Coliforms (98), Total Unit (10), Sulfate (10), Total Coliforms (98), Total Optimum (12), Sulfate (10), Total Coliforms (98), Total (12), Turbidity (10), Zinc (12)         62       52         89       92         99       (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)         (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)         (12), Copper (12), E. Coli (114), Fluoride (12), Fluoride (daily WSA) (333), (9), Fluoride (weekly WSA) (85), Fluoride Ratio (9), Free Chlorine (1), (12), Magnesium (12), Magnanese (12), Mercury (12), Sulfate (12), sulfate (12), al Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colo (2)         ions advertised on the Council website, but irrigation water allocation water 2009.         tion number 69139, period 2004-2008)         NOTES / EXPLANATION	
WATER SECURITY	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought	Fluoride (daily WSA) Fluoride (daily WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (10), DH (17), Selen Dissolved Solids (TDS) (11 Fluoride (10), pH (17), Selen Dissolved Solids (TDS) (11 Fluoride (daily WSA) Fluoride (daily WSA) Fluoride Ratio Iron Total Coliforms Aluminium (12), Antimony Chloride (12), Chromium ( Fluoride (12), Chromium ( Fluoride (12), Iron (12), Leac Nickel (12), Nitrate (12), N Total Coliforms (114), Tota (12), Turbidity (12), Zinc (1 No domestic water restrict zero from July - Septembe 60% ~ 29km Temperate 608 mm (Source: BoM stat YES / NO Yes	79         80         97         (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10)         (10), Copper (10), E. Coli (98), Fluoride (10), Fluoride (daily WSA) (343),         (17), Fluoride (weekly WSA) (109), Fluoride Ratio (7), lodine (10), Iron (1         (10), Silver (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate (10), Silver (10), Sodium (10), Sulfate (10), Total Colforms (98), Total Onitorms (98), Total Hardness as CaCO3 (10), True Colour (10), Turbidity (10), Zinc (62         52         99         91         92         93         94         95         97         98         99         91         92         93         94         95         96         97         98         99         99         91         92         93         94         95         96         97         98         99         99         91         92         93         94         95         96	
WATER SECURITY	achieving < 100%, 2006-2007	Fluoride (daily WSA) Fluoride (weekly WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (10), Chromium ( Fluoride (10), Chromium ( Fluoride (10), Magnesium (11) Nitrite (10), pH (17), Selem Dissolved Solids (TDS) (11) Fluoride (daily WSA) Fluoride (daily WSA) Fluoride (ality WSA) Fluoride Ratio Iron Total Coliforms Aluminium (12), Antimony Chloride (12), Chromium ( Fluoride (12), Chromium ( Fluoride (12), Chromium ( Fluoride (12), Nitrate (12), N Notal Coliforms (114), Tota (12), Turbidity (12), Zinc (1 No domestic water restrict zero from July - September 60% ~ 29km Temperate 608mm (Source: BoM stat YES / NO Yes	79         80         97         (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10)         10), Copper (10), E. Coli (98), Fluoride (10), Fluoride (daily WSA) (343),         (17), Fluoride (weekly WSA) (109), Fluoride Ratio (7), lodine (10), lron (1),         Maganese (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate taium (10), Silver (10), Sodium (10), Sulfate (10), Total Coliforms (98), Total Volta Hardness as CaCO3 (10), True Colour (10), Turbidity (10), Zinc (62         52         89         92         99         (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12         12), Copper (12), E. Coli (114), Fluoride (12), Fluoride (daily WSA) (333),         (9), Fluoride (weekly WSA) (85), Fluoride Ratio (9), Free Chlorine (1),         12), Copper (12), E. Coli (114), Fluoride (12), Mercury (12), Molybdenum (12         (12), Arsenic (12), Barium (12), Manganese (12), Mercury (12), Molybdenum (12),         (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12),         12), Magnesium (12), Silver (12), Sodium (12), Sulfate (12),         10 Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Color (2)         tions advertised on the Council website, but irrigation water allocation water 2009.         NOTES / EXPLANATION         Classified as 'In Drought' according to NSW DPI Drought Map October	
WATER SECURITY	achieving < 100%, 2006-2007	Fluoride (daily WSA) Fluoride (daily WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (10), Chromium ( Fluoride (10), Magnesium (11) Nitrite (10), pH (17), Selem Dissolved Solids (TDS) (11) Fluoride (10), H(17), Selem Fluoride Katio Iron Total Coliforms Aluminium (12), Antimony Chloride (12), Chromium ( Fluoride (12), Chromium ( Fluoride (12), Nitrate (12), N Total Coliforms (114), Total Coliforms (114), Total Coliforms (114), Total Colomestic water restrict zero from July - September 60% ~ 29km Temperate 608mm (Source: BoM stal YES / NO Yes No	79         80         97         (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10)         10), Copper (10), E.Coli (98), Fluoride (10), Fluoride (daily WSA) (343),         (10), Fluoride (weekly WSA) (109), Fluoride Ratio (7), Iodine (10), Iron (1         (10), Manganese (10), Mercury (10), Molybdenum (10), Nickel (10), Nirate         (10), Silver (10), Sodium (10), Sulfate (10), Total Colforms (98), Total         (10), Total Hardness as CaCO3 (10), True Colour (10), Turbidity (10), Zinc (10)         (12)         (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)         (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)         (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)         (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)         (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)         (12), Arsenic (12), Barium (12), Silver (12), Sodium (12), Molybdenum (12)         (12), Agnesium (12), Manganese (12), Mercury (12), Molybdenum (12), al Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colcula)         (12)         toins advertised on the Council website, but irrigation water allocation water are 2009.         toin number 69139, period 2004-2008)         Classified as 'In Drought' according to NSW DPI Drought Map October         Good compliance even though only using disinfection and fluor	
WATER SECURITY	achieving < 100%, 2006-2007	Fluoride (daily WSA) Fluoride (aliy WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (10), Chromium ( Fluoride (10), PH (17), Selen Dissolved Solids (TDS) (11 Fluoride (aliy WSA) Fluoride (aliy MSA) Fluoride (aliy MSA) Fluoride (aliy Chromium ( Fluoride (field result WSA Iodine (12), Iron (12), Lead Nickel (12), Nitrate (12), Nitrat	79         80         97         (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10)         (10), Copper (10), E.Coli (98), Fluoride (10), Fluoride (daily WSA) (343),         (17), Fluoride (weekly WSA) (109), Fluoride Ratio (7), lodine (10), Nirrate         (10), Silver (10), Sodium (10), Sulfate (10), Total Colforms (98), Total         (10), Silver (10), Sodium (10), Sulfate (10), Total Colforms (98), Total         (10), Total Hardness as CaCO3 (10), True Colour (10), Turbidity (10), Zinc (10)         (12	
	achieving < 100%, 2006-2007	Fluoride (daily WSA) Fluoride (alily WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (10), Chromium ( Fluoride (10), DH (17), Selen Dissolved Solids (TDS) (11 Fluoride (daily WSA) Fluoride (daily WSA) Fluoride (alily WSA) Fluoride Ratio Iron Total Coliforms Aluminium (12), Antimony Chloride (12), Chromium ( Fluoride (12), Nitrate (12), N Nickel (12), Nitrate (12), N Total Coliforms (114), Tota (12), Turbidity (12), Zinc (1 No domestic water restrict zero from July - Septembe 60% ~ 29km Temperate 608mm (Source: BoM stat YES / NO Yes Yes Yes	79         80         97         (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10)         (10), Copper (10), E. Coli (98), Fluoride (10), Fluoride (daily WSA) (343),         (17), Fluoride (weekly WSA) (109), Fluoride Ratio (7), lodine (10), Iron (10), Nitrate (10), Nitrate (10), Nitrate (10), Nitrate (10), Silver (10), Sodium (10), Sulfate (10), Total Colforms (98), Tota (10), Silver (10), Sodium (10), Sulfate (10), Total Colforms (98), Tota (11), Silver (10), Sodium (12), Sulfate (10), Total Colforms (98), Tota (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12), Sodium (12), Calcium (12	
	achieving < 100%, 2006-2007	Fluoride (daily WSA) Fluoride (daily WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (10), Chromium ( Fluoride (10), Magnesium (11 Vitrite (10), pH (17), Selen Dissolved Solids (TDS) (11 Fluoride (10), PH (17), Selen Dissolved Solids (TDS) (11 Fluoride (daily WSA) Fluoride (ality WSA) Fluoride Ratio Iron Total Coliforms Aluminium (12), Antimony Chloride (12), Chromium ( Fluoride (12), Chromium ( Fluoride (12), Iron (12), Leac Nickel (12), Nitrate (12), N Total Coliforms (114), Tota (12), Turbidity (12), Zinc (1 No domestic water restricl zero from July - September 60% - 29km Temperate 608mm (Source: BoM stat YES / NO Yes Yes No	79         80         97         (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10)         (10), Copper (10), E.Coli (98), Fluoride (10), Fluoride (daily WSA) (343),         (17), Fluoride (weekly WSA) (109), Fluoride Ratio (7), lodine (10), Nirrate         (10), Silver (10), Sodium (10), Sulfate (10), Total Colforms (98), Total         (10), Silver (10), Sodium (10), Sulfate (10), Total Colforms (98), Total         (10), Total Hardness as CaCO3 (10), True Colour (10), Turbidity (10), Zinc (10)         (12	
	achieving < 100%, 2006-2007	Fluoride (daily WSA) Fluoride (daily WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (10), Chromium ( Fluoride (10), DH (17), Selen Dissolved Solids (TDS) (11 Fluoride (daily WSA) Fluoride (daily WSA) Fluoride (daily WSA) Fluoride Ratio Iron Total Coliforms Aluminium (12), Antimony Chloride (12), Chromium ( Fluoride (12), Nitrate (12), Ni Nickel (12), Nitrate (12), Ni Nickel (12), Nitrate (12), Ni Nickel (12), Nitrate (12), Total Coliforms (114), Total (12), Turbidity (12), Zinc (1 No domestic water restrict zero from July - Septembe 60% ~ 29km Temperate 608mm (Source: BoM stat YES / NO Yes Yes	79         80         97         (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10)         (10), Copper (10), E. Coli (98), Fluoride (10), Fluoride (daily WSA) (343),         (17), Fluoride (weekly WSA) (109), Fluoride Ratio (7), lodine (10), Iron (1         (10), Manganese (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate (10), Silver (10), Solum (10), Sulfate (10), Total Colforms (98), Tota         (10), Silver (10), Sodium (10), Sulfate (10), Total Colforms (98), Tota         (11), Silver (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)         (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)         (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)         (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)         (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)         (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)         (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)         (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12)         (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12)         (12), Magnesium (12), Silver (12), Sodium (12), Sulfate (12), al Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colo (2)         tion advertised on the Council website, but irrigation water allocation was ar 2009.          NOTES / EXPLANATION	
Supply	achieving < 100%, 2006-2007	Fluoride (daily WSA) Fluoride (daily WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (10), Chromium ( Fluoride (10), Magnesium (11) Vitrite (10), pH (17), Selen Dissolved Solids (TDS) (11 Fluoride (daily WSA) Fluoride (daily WSA) Fluoride Ratio Iron Total Coliforms Aluminium (12), Antimony Chloride (12), Chromium ( Fluoride (12), Chromium ( Fluoride (12), Chromium ( Fluoride (12), Iron (12), Leac Nickel (12), Nitrate (12), N Total Coliforms (114), Tota (12), Turbidity (12), Zinc (1 No domestic water restricl zero from July - September 60% ~ 29km Temperate 608mm (Source: BoM stat Yes Yes No No No	79         80         97         (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10)         (10), Copper (10), E. Coli (98), Fluoride (10), Fluoride (daily WSA) (343),         (17), Fluoride (weekly WSA) (109), Fluoride Ratio (7), lodine (10), Iron (1         (10), Maganese (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate of ioum (10), Silver (10), Soliant (10), Sulfate (10), Total Colforms (98), Tota (20), Total Hardness as CaCO3 (10), True Colour (10), Turbidity (10), Zinc (62         52         99         91         92         99         91         92         93         94         95         96         97         98         99         99         91         92         93         94         95         96         97         98         99         99         91         91         91         91         91         92         93         94         94         95      95	
	achieving < 100%, 2006-2007	Fluoride (daily WSA) Fluoride (daily WSA) Total Coliforms Aluminium (10), Antimony Chloride (10), Chromium ( Fluoride (10), Chromium ( Fluoride (10), Magnesium (11 Vitrite (10), pH (17), Selen Dissolved Solids (TDS) (11 Fluoride (10), PH (17), Selen Dissolved Solids (TDS) (11 Fluoride (daily WSA) Fluoride (ality WSA) Fluoride Ratio Iron Total Coliforms Aluminium (12), Antimony Chloride (12), Chromium ( Fluoride (12), Chromium ( Fluoride (12), Iron (12), Leac Nickel (12), Nitrate (12), N Total Coliforms (114), Tota (12), Turbidity (12), Zinc (1 No domestic water restricl zero from July - September 60% - 29km Temperate 608mm (Source: BoM stat YES / NO Yes Yes No	79         80         97         (10), Arsenic (10), Barium (10), Boron (10), Cadmium (10), Calcium (10)         (10), Copper (10), E. Coli (98), Fluoride (10), Fluoride (daily WSA) (343),         (17), Fluoride (weekly WSA) (109), Fluoride Ratio (7), lodine (10), Iron (1         (10), Manganese (10), Mercury (10), Molybdenum (10), Nickel (10), Nitrate (10), Silver (10), Solum (10), Sulfate (10), Total Colforms (98), Tota         (10), Silver (10), Sodium (10), Sulfate (10), Total Colforms (98), Tota         (11), Silver (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)         (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)         (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)         (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)         (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)         (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)         (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (12)         (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12)         (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12)         (12), Magnesium (12), Silver (12), Sodium (12), Sulfate (12), al Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colo (2)         tion advertised on the Council website, but irrigation water allocation was ar 2009.          NOTES / EXPLANATION	

AU:	nt å	Low vegetation cover (dust, sediment	Νο	Extensive clearing for agriculture in the local Bega area, but good ground
Ć	Catchment	runoff)		cover with grasses and crops.
×	tc -	Poor access to supply	No	
50	Cat	Unsustainable water extraction	No	No water restrictions.
7	-	Aquifer turning saline due to high extraction	No	No issues with salt detected in the water quality testing.
Ē		Hard water	No	Compliant with hardness.
ECUI		Aging or inadequate pipe work and associated infrastructure		
s s		Significant water losses due to leaking	Unknown	
Ö		High per capita water consumption	Unknown	
WATER QUALITY OR SECURITY RISK (CAU:	e	Inappropriate water quality standards / objectives	No	Council reports to NSW Health who use ADWG.
n ng	Governance	Lack of infrastructure maintenance	No	Council are active in maintenance and gaining funding for upgrades.
~	Ê	Poor management or governance	No	
Ë	Š	Vandalism / sabotage / terrorism	No	
-A	G	Insufficient trained personnel	No	
>		Inadequate funding for maintenance or upgrades	No	
	ŝ	Mining / minerals		
	Industries	Irrigation	Yes	
		Chemicals / process	No	
	Population	Seasonal population loadings	Yes	Large tourism industry.
		Rapid population growth	No	Average yearly population growth = 0.50% in comparison to the state average of 1.6% for the same period (2001-2006) (ABS, 2009).
WATER QUALITY OR SECURITY BISK (FEFECT)		Bacteriological and / or viral contamination	No	
D.		Algal blooms	No	
Щ с	~	Heavy metal contamination	No	
QUALITY OR SE	5	Poor chlorine residuals	No	Only one test completed.
ŌH	-	Pesticide contamination	Unknown	
2 1	J	High suspended solids	No	Compliant for this parameter.
ALI K	ź	Boil water notices	No	
	Ş	Deaths or illness due to water quality		
۲ ۲		Water restrictions (current and historic)	Yes	Historic water restrictions. Recent restrictions on irrigation allocations.
Ë		Taste and odour issues	Yes	Taste issues.
WA <sup>-</sup>		Other contamination that would affect health		
		Notes		

~	37 State/Territory	NSW		
TOWN	Town Name	Bundanoon		
	Town Population	2,228 (NSW Health, 2009)	); 2,035 (Census 2006, Urban Centre/Locality)	
F	Name of Water Utility	Wingecarribee Shire Cour	ncil	
WATER UTILITY	Council Web-Link	http://www.wsc.nsw.gov.a	<u>u</u>	
5	Rate (\$/kL)	\$2.05/kL		
Ř		Unknown, 5.273ML used f	for residential consumption, Wingecarribee Shire Council SoE Report, 0	
Ë	Per Capita Water Consumption (L/day)	08.		
₹	Number of Connections	1.1		
>	Number of Connections	17,870		
- ~	Catchment	Southern Rivers		
記憶と	Sub-Catchment	Shoalhaven		
∎ E I	Catchment Management Authority (CMA)	Southern Rivers		
ہ ≥ 5	CMA Web-Link	http://www.southern.cma.u	nsw.gov.au/	
CATCHIMENT AND WATER SUPPLY	Catchment Protection Status	None		
5∢	Potable Water Source(s)	Bundanoon Creek Dam (s	urface storage)	
	Supply Capacity	Unknown		
	Treatment Plant(s)	Yes		
	Level of Treatment		filtration, dissolved air flotation,	
	Drinking Water Guidelines	ADWG 2004 (NSW Health		
			Location: WI03-Bundanoon	
		E. coli	99	
	% compliance for water quality parameters	Fluoride (daily WSA)	81	
	achieving < 100%, 2003-2004	Fluoride (weekly WSA)	69	
	achieving < 100%, 2003-2004	Fluoride Ratio	60	
		Total Coliforms	86	
		Aluminium (12), Antimony	(12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (1	
			12), Copper (12), Cyanide (4), E.Coli (276), Fluoride (12), Fluoride (dail	
			d result WSA) (10), Fluoride (weekly WSA) (48), Fluoride Ratio (10), loc	
	Parameter(s) tested and number of		Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nic	
	samples ( ) 2003-2004		2), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Total	
			solved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (	
		Turbidity (12), Zinc (12)		
			00	
		Aluminium	92	
		E. coli	99	
	% compliance for water quality parameters	Fluoride (daily WSA)	77	
	achieving < 100%, 2004-2005	Fluoride (weekly WSA)	61	
		Fluoride Ratio	67	
		Total Coliforms	86	
			(12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (1	
			12), Copper (12), Cyanide (2), E.Coli (271), Fluoride (12), Fluoride (dail	
	Parameter(s) tested and number of		d result WSA) (12), Fluoride (weekly WSA) (46), Fluoride Ratio (12), loc	
	samples () 2004-2005		Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nic	
	samples ( ) 2004-2005	(12), Nitrate (12), Nitrite (1	2), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Total	
		Coliforms (271), Total Diss	solved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (	
		Turbidity (12), Zinc (12)		
≻		Aluminium	92	
WATER QUALITY		Fluoride (daily WSA)	73	
A	% compliance for water quality parameters	Fluoride (weekly WSA)	73	
ā	achieving < 100%, 2005-2006	Fluoride Ratio	82	
н Ш	, , , , , , , , , , , , , , , , , , ,	pH	77	
F		Total Coliforms	87	
ŝ			(13), Arsenic (13), Barium (13), Boron (13), Cadmium (13), Calcium (1	
			13), Copper (13), E.Coli (267), Fluoride (13), Fluoride (daily WSA) (364	
			) (11), Fluoride (weekly WSA) (66), Fluoride Ratio (11), Iodine (13), Iron	
	Parameter(s) tested and number of		<ol> <li>Manganese (13), Mercury (13), Molybdenum (13), Nickel (13), Nitrate</li> </ol>	
	samples () 2005-2006			
			Selenium (13), Silver (13), Sodium (13), Sulfate (13), Total Coliforms (20)	
			S) (13), Total Hardness as CaCO3 (13), True Colour (13), Turbidity (13)	
		Zinc (13) Fluoride (daily WSA)	74	
		Fluoride (weekly WSA)	76	
		IL IUUIUE IWEENIV VVOA)	10	
	% compliance for water quality parameters		01	
	% compliance for water quality parameters achieving < 100%, 2006-2007	Fluoride Ratio	91	
		Fluoride Ratio pH	91	
		Fluoride Ratio pH Total Coliforms	91 91	
		Fluoride Ratio pH Total Coliforms Aluminium (11), Antimony	91 91 (11), Arsenic (11), Barium (11), Boron (11), Cadmium (11), Calcium (1	
	achieving < 100%, 2006-2007	Fluoride Ratio pH Total Coliforms Aluminium (11), Antimony Chloride (11), Chromium (	91 91 (11), Arsenic (11), Barium (11), Boron (11), Cadmium (11), Calcium (1 11), Copper (11), E.Coli (280), Fluoride (11), Fluoride (daily WSA) (365	
	achieving < 100%, 2006-2007	Fluoride Ratio pH Total Coliforms Aluminium (11), Antimony Chloride (11), Chromium ( Fluoride (field result WSA)	91 91 (11), Arsenic (11), Barium (11), Boron (11), Cadmium (11), Calcium (1 11), Copper (11), E.Coli (280), Fluoride (11), Fluoride (daily WSA) (365 ) (11), Fluoride (weekly WSA) (75), Fluoride Ratio (11), Iodine (11), Iron	
	achieving < 100%, 2006-2007	Fluoride Ratio pH Total Coliforms Aluminium (11), Antimony Chloride (11), Chromium ( Fluoride (field result WSA) Lead (11), Magnesium (11	91 (11), Arsenic (11), Barium (11), Boron (11), Cadmium (11), Calcium (1 11), Copper (11), E.Coli (280), Fluoride (11), Fluoride (daily WSA) (365 (11), Fluoride (weekly WSA) (75), Fluoride Ratio (11), Iodine (11), Iron ), Manganese (11), Mercury (11), Molybdenum (11), Nickel (11), Nitrate	
	achieving < 100%, 2006-2007	Fluoride Ratio pH Total Coliforms Aluminium (11), Antimony Chloride (11), Chromium ( Fluoride (field result WSA, Lead (11), Magnesium (11 (11), Nitrite (11), pH (11), S	91 (11), Arsenic (11), Barium (11), Boron (11), Cadmium (11), Calcium (1 11), Copper (11), E.Coli (280), Fluoride (11), Fluoride (daily WSA) (365 ) (11), Fluoride (weekly WSA) (75), Fluoride Ratio (11), Iodine (11), Iron ), Manganese (11), Mercury (11), Molybdenum (11), Nickel (11), Nitrate Selenium (11), Silver (11), Sodium (11), Sulfate (11), Total Coliforms (20	
	achieving < 100%, 2006-2007	Fluoride Ratio pH Total Coliforms Aluminium (11), Antimony Chloride (11), Chromium ( Fluoride (field result WSA) Lead (11), Magnesium (11 (11), Nitrite (11), pH (11), S Total Dissolved Solids (TD	91 [91 (11), Arsenic (11), Barium (11), Boron (11), Cadmium (11), Calcium (1 11), Copper (11), E.Coli (280), Fluoride (11), Fluoride (daily WSA) (365 ) (11), Fluoride (weekly WSA) (75), Fluoride Ratio (11), Iodine (11), Iron ), Manganese (11), Mercury (11), Molybdenum (11), Nickel (11), Nirate Selenium (11), Silver (11), Sodium (11), Sulfate (11), Total Coliforms (2 §) (11), Total Hardness as CaCO3 (11), True Colour (11), Turbidity (11)	
	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007	Fluoride Ratio pH Total Coliforms Aluminium (11), Antimony Chloride (11), Chromium ( Fluoride (field result WSA) Lead (11), Magnesium (11 (11), Nitrite (11), pH (11), S Total Dissolved Solids (TD Fluoride (daily WSA)	91 (11), Arsenic (11), Barium (11), Boron (11), Cadmium (11), Calcium (1 11), Copper (11), E. Coli (280), Fluoride (11), Fluoride (daily WSA) (365 ) (11), Fluoride (weekly WSA) (75), Fluoride Ratio (11), Iodine (11), Iron ), Manganese (11), Mercury (11), Molybdenum (11), Nickel (11), Nitrate Selenium (11), Silver (11), Sodium (11), Sulfate (11), Total Coliforms (21 S) (11). Total Hardness as CaCO3 (11). True Colour (11). Turbidity (11) 78	
	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters	Fluoride Ratio pH Total Coliforms Aluminium (11), Antimony Chloride (11), Chromium ( Fluoride (field result WSA) Lead (11), Magnesium (11 (11), Nitrite (11), pH (11), S Total Dissolved Solids (TD Fluoride (daily WSA) Fluoride (weekly WSA)	91 (11), Arsenic (11), Barium (11), Boron (11), Cadmium (11), Calcium (1 11), Copper (11), E.Coli (280), Fluoride (11), Fluoride (daily WSA) (365 (11), Fluoride (weekly WSA) (75), Fluoride Ratio (11), Iodine (11), Iron ), Manganese (11), Mercury (11), Molybdenum (11), Nickel (11), Nitrate Selenium (11), Silver (11), Sodium (11), Sulfate (11), Total Coliforms (21 (25) (11). Total Hardness as CaCO3 (11). True Colour (11). Turbidity (11) 78	
	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007	Fluoride Ratio pH Total Coliforms Aluminium (11), Antimony Chloride (11), Chromium ( Fluoride (field result WSA) Lead (11), Magnesium (11 (11), Nitrite (11), pH (11), Total Dissolved Solids (TD Fluoride (daily WSA) Fluoride (weekly WSA) Fluoride Ratio	91 (11), Arsenic (11), Barium (11), Boron (11), Cadmium (11), Calcium (1 11), Copper (11), E.Coli (280), Fluoride (11), Fluoride (daily WSA) (365 ) (11), Fluoride (weekly WSA) (75), Fluoride Ratio (11), Iodine (11), Iron ), Manganese (11), Mercury (11), Molybdenum (11), Nickel (11), Nitrate Selenium (11), Silver (11), Sodium (11), Sulfate (11), Total Coliforns (28) (11). Total Hardness as CaCO3 (11). True Colour (11). Turbidity (11) 78 50 71	
	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters	Fluoride Ratio pH Total Coliforms Aluminium (11), Antimony Chloride (11), Chromium ( Fluoride (field result WSA) Lead (11), Nagnesium (11 (11), Nitrite (11), pH (11), S Total Dissolved Solids (TD Fluoride (daily WSA) Fluoride (weekly WSA) Fluoride Ratio pH	91 91 (11), Arsenic (11), Barium (11), Boron (11), Cadmium (11), Calcium (1 11), Copper (11), E.Coli (280), Fluoride (11), Fluoride (daily WSA) (365 ) (11), Fluoride (weekly WSA) (75), Fluoride Ratio (11), Iodine (11), Iron ), Manganese (11), Mercury (11), Molybdenum (11), Nickel (11), Nirate Selenium (11), Silver (11), Sodium (11), Sulfate (11), Total Coliforms (2 S) (11), Total Hardness as CaCO3 (11), True Colour (11), Turbidity (11) 78 50 71 83	
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	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters	Fluoride Ratio pH Total Coliforms Aluminium (11), Antimony Chloride (11), Chromium ( Fluoride (field result WSA) Lead (11), Nitrite (11), gH (11), S Total Dissolved Solids (TD Fluoride (daily WSA) Fluoride (weekly WSA) Fluoride Ratio pH Total Coliforms Aluminium (12), Antimony Chloride (12), Chromium (	91 91 (11), Arsenic (11), Barium (11), Boron (11), Cadmium (11), Calcium (1 11), Copper (11), E.Coli (280), Fluoride (11), Fluoride (daily WSA) (365 ) (11), Fluoride (weekly WSA) (75), Fluoride Ratio (11), Iodine (11), Iron ), Manganese (11), Mercury (11), Molybdenum (11), Nickel (11), Nirate Selenium (11), Silver (11), Sodium (11), Sulfate (11), Total Coliforms (2 S) (11). Total Hardness as CaCO3 (11). True Colour (11). Turbidity (11) 78 50 71 83 93 93 (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (1 2), Copper (12), E.Coli (281), Fluoride (12), Fluoride (daily WSA) (230	
	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008	Fluoride Ratio pH Total Coliforms Aluminium (11), Antimony Chloride (11), Chromium ( Fluoride (field result WSA) Lead (11), Nagnesium (11 (11), Nitrite (11), pH (11), S Total Dissolved Solids (TD Fluoride (daily WSA) Fluoride (daily WSA) Fluoride Ratio pH Total Coliforms Aluminium (12), Antimony Chloride (12), Chromium ( Fluoride (field result WSA)	91 91 91 (11), Arsenic (11), Barium (11), Boron (11), Cadmium (11), Calcium (1 11), Copper (11), E.Coli (280), Fluoride (11), Fluoride (daily WSA) (365 ) (11), Fluoride (weekly WSA) (75), Fluoride Ratio (11), Iodine (11), Iron ), Manganese (11), Mercury (11), Molybdenum (11), Nickel (11), Nitrate Selenium (11), Silver (11), Sodium (11), Sulfate (11), Total Coliforms (2 S) (11). Total Hardness as CaCO3 (11). True Colour (11). Turbidity (11) 78 50 71 83 93 (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (1 2), Copper (12), E.Coli (281), Fluoride (12), Fluoride (daily WSA) (230 (10), Fluoride (weekly WSA) (54), Fluoride Ratio (7), Iodine (12), Iron (	
	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of	Fluoride Ratio pH Total Coliforms Aluminium (11), Antimony Chloride (11), Chromium ( Fluoride (field result WSA) Lead (11), Magnesium (11 (11), Nitrite (11), pH (11), S Total Dissolved Solids (TD Fluoride (daily WSA) Fluoride (aily WSA) Fluoride Ratio pH Total Coliforms Aluminium (12), Antimony Chloride (field result WSA) Lead (12), Magnesium (12	91 91 91 (11), Arsenic (11), Barium (11), Boron (11), Cadmium (11), Calcium (1 11), Copper (11), E. Coli (280), Fluoride (11), Fluoride (daily WSA) (365 ) (11), Fluoride (weekly WSA) (75), Fluoride Ratio (11), Iodine (11), Iron ), Manganese (11), Mercury (11), Molybdenum (11), Nickel (11), Nitrate Selenium (11), Silver (11), Sodium (11), Sulfate (11), Total Coliforms (21) (21), 11), Total Hardness as CaCO3 (11). True Colour (11). Turbidity (11) 78 50 71 83 93 (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (1 12), Copper (12), E. Coli (281), Fluoride (12), Fluoride (daily WSA) (230 (10), Fluoride (weekly WSA) (54), Fluoride Ratio (7), Iodine (12), Iron (2), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate	
	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008	Fluoride Ratio pH Total Coliforms Aluminium (11), Antimony Chloride (11), Chromium ( Fluoride (field result WSA) Lead (11), Magnesium (11 (11), Nitrite (11), pH (11), S Total Dissolved Solids (TD Fluoride (veekly WSA) Fluoride (veekly WSA) Fluoride (veekly WSA) Fluoride Ratio pH Total Coliforms Aluminium (12), Antimony Chloride (12), Chromium ( Fluoride (field result WSA) Lead (12), Magnesium (12 (12), Nitrite (12), pH (12), S	91 91 91 91 91 (11), Arsenic (11), Barium (11), Boron (11), Cadmium (11), Calcium (1 11), Copper (11), E.Coli (280), Fluoride (11), Fluoride (daily WSA) (365 ) (11), Fluoride (weekly WSA) (75), Fluoride Ratio (11), Iodine (11), Iron ), Manganese (11), Mercury (11), Molybdenum (11), Nickel (11), Nitrat Selenium (11), Silver (11), Sodium (11), Sulfate (11), Total Coliforms (2 (11), Total Hardness as CaCO3 (11). True Colour (11). Turbidity (11) 78 50 71 83 93 93 93 93 93 93 93 93 93 9	
	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of	Fluoride Ratio pH Total Coliforms Aluminium (11), Antimony Chloride (11), Chromium ( Fluoride (field result WSA) Lead (11), Magnesium (11 (11), Nitrite (11), pH (11), S Total Dissolved Solids (TD Fluoride (veekly WSA) Fluoride (veekly WSA) Fluoride (veekly WSA) Fluoride Ratio pH Total Coliforms Aluminium (12), Antimony Chloride (12), Chromium ( Fluoride (field result WSA) Lead (12), Magnesium (12 (12), Nitrite (12), pH (12), S	91 91 91 91 91 (11), Arsenic (11), Barium (11), Boron (11), Cadmium (11), Calcium (1 11), Copper (11), E.Coli (280), Fluoride (11), Fluoride (daily WSA) (365 ) (11), Fluoride (weekly WSA) (75), Fluoride Ratio (11), Iodine (11), Iron ), Manganese (11), Mercury (11), Molybdenum (11), Nickel (11), Nitrat Selenium (11), Silver (11), Sodium (11), Sulfate (11), Total Coliforms (2 (11), Total Hardness as CaCO3 (11). True Colour (11). Turbidity (11) 78 50 71 83 93 93 93 93 93 93 93 93 93 9	
	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of	Fluoride Ratio pH Total Coliforms Aluminium (11), Antimony Chloride (11), Chromium ( Fluoride (field result WSA) Lead (11), Magnesium (11 (11), Nitrite (11), pH (11), S Total Dissolved Solids (TD Fluoride (veekly WSA) Fluoride (veekly WSA) Fluoride (veekly WSA) Fluoride Ratio pH Total Coliforms Aluminium (12), Antimony Chloride (12), Chromium ( Fluoride (field result WSA) Lead (12), Magnesium (12 (12), Nitrite (12), pH (12), S	91 91 91 91 91 (11), Arsenic (11), Barium (11), Boron (11), Cadmium (11), Calcium (1 11), Copper (11), E.Coli (280), Fluoride (11), Fluoride (daily WSA) (365 ) (11), Fluoride (weekly WSA) (75), Fluoride Ratio (11), Iodine (11), Iron ), Manganese (11), Mercury (11), Molybdenum (11), Nickel (11), Nitrat Selenium (11), Silver (11), Sodium (11), Sulfate (11), Total Coliforms (2 (11), Total Hardness as CaCO3 (11). True Colour (11). Turbidity (11) 78 50 71 83 93 93 93 93 93 93 93 93 93 9	
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	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of	Fluoride Ratio pH Total Coliforms Aluminium (11), Antimony Chloride (11), Chromium ( Fluoride (field result WSA) Lead (11), Nitrite (11), pH (11), S Total Dissolved Solids (TD Fluoride (daily WSA) Fluoride (aily WSA) Fluoride (atal) pH Total Coliforms Aluminium (12), Antimony Chloride (12), Chromium ( Fluoride field result WSA) Lead (12), Magnesium (12 (12), Nitrite (12), pH (12), S Total Dissolved Solids (TD Zinc (12) Yes. Level 1. Hand held ho	91 91 91 91 91 91 91 91 91 91	
	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of	Fluoride Ratio pH Total Coliforms Aluminium (11), Antimony Chloride (11), Chromium ( Fluoride (field result WSA) Lead (11), Magnesium (11 (11), Nitrite (11), pH (11), S Total Dissolved Solids (TD Fluoride (aliy WSA) Fluoride Ratio pH Total Coliforms Aluminium (12), Antimony Chloride (field result WSA) Lead (12), Magnesium (12 (12), Nitrite (12), pH (12), S Total Dissolved Solids (TD Zinc (12) Yes. Level 1. Hand held ho like paths, driveways, pave	91 91 91 91 91 91 91 91 91 91	
ΤΙΥ	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008	Fluoride Ratio pH Total Coliforms Aluminium (11), Antimony Chloride (11), Chromium ( Fluoride (field result WSA) Lead (11), Nagnesium (11 (11), Nitrite (11), pH (11), S Total Dissolved Solids (TD Fluoride (daily WSA) Fluoride (alug WSA) Fluoride (weekly WSA) Fluoride (alug WSA) Fluorid	91 91 91 91 91 (11), Arsenic (11), Barium (11), Boron (11), Cadmium (11), Calcium (1 11), Copper (11), E.Coli (280), Fluoride (11), Fluoride (daily WSA) (365 9) (11), Fluoride (weekly WSA) (75), Fluoride Ratio (11), Iodine (11), Iron 9), Manganese (11), Mercury (11), Molybdenum (11), Nickel (11), Nitrate 91) 93 93 93 93 93 93 93 93 93 94 93 93 94 95 95 97 12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium (1 12), Copper (12), E.Coli (281), Fluoride (12), Fluoride (daily WSA) (230 9), Fluoride (weekly WSA) (54), Fluoride Ratio (7), Iodine (12), Iron 9), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate Selenium (12), Silver (12), Sodium (12), Sulfate (12), Total Coliforms (2 (S) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12) poses on the garden at any time of the day or night. Hosing of hard surfa 64 areas and houses is banned. Cars can be washed anytime with a n a hand held hose fitted with a trigger nozzle. Fixed hoses and sprinkle	
JRITY	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of	Fluoride Ratio pH Total Coliforms Aluminium (11), Antimony Chloride (11), Chromium ( Fluoride (field result WSA) Lead (11), Magnesium (11 (11), Nitrie (11), pH (11), § Total Dissolved Solids (TD Fluoride (weekly WSA) Fluoride (daily WSA) Fluoride (weekly WSA) Fluoride (aveekly WSA) Fluoride (12), Chromium ( Fluoride (field result WSA) Lead (12), Magnesium (12 (12), Nitrie (12), pH (12), § Total Dissolved Solids (TD Zinc (12) Yes. Level 1. Hand held ho like paths, driveways, pave bucket, then hosed off witt may be used at any time c	91 91 91 91 91 91 91 91 91 91	
SECURITY	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008	Fluoride Ratio pH Total Coliforms Aluminium (11), Antimony Chloride (11), Chromium ( Fluoride (field result WSA) Lead (11), Magnesium (11 (11), Nitrie (11), pH (11), § Total Dissolved Solids (TD Fluoride (weekly WSA) Fluoride (daily WSA) Fluoride (weekly WSA) Fluoride (aveekly WSA) Fluoride (12), Chromium ( Fluoride (field result WSA) Lead (12), Magnesium (12 (12), Nitrie (12), pH (12), § Total Dissolved Solids (TD Zinc (12) Yes. Level 1. Hand held ho like paths, driveways, pave bucket, then hosed off witt may be used at any time c	91           91           91           91           91           91           91           91           91           91           91           91           91           91           91           91           (11), Arsenic (11), Barium (11), Boron (11), Fluoride (daily WSA) (365)           11), Fluoride (weekly WSA) (75), Fluoride Ratio (11), lodine (11), Nirate Selenium (11), Silver (11), Molybdenum (11), Nickel (11), Nirate Selenium (11), Silver (11), Sodium (11), Sulfate (11), Total Coliforms (24)           S0         111. Total Hardness as CaCO3 (11). True Colour (11). Turbidity (11)           78         93           93         93           93         93           93         93           93         93           93         93           93         93           93         93           93         93           93         93           93         93           93         93           93         93           93         93           93         93           94         94	

WATEF		Proportion of Potable Water Supplied to	Unknown	
NA.		Households (%) Distance from the Coast (km)	~ 50km	
-		Climate	Temperate	
		Average Annual Rainfall		tion number 68100, period 2004-2008)
-		FACTOR	YES / NO	NOTES / EXPLANATION
		Drought	Yes	Classified as 'In Drought' according to NSW DPI Drought Map October 2009.
		Single drinking water source	Yes	
		Poor quality water source		
		Sewage overflow or disposal into water		
		Flooding		
	Catchment and Water Supply	Fauna defecating in supply	Yes	Open water source. Faecal coliform bacteria levels are high, and increase dramatically with rain events. Dry weather sources are probably direct faecal contamination by unfenced stock (Wingecarribee Shire Council SoE Report 07-08).
	Na	Fauna destroying water intake structures	No	
WATER QUALITY OR SECURITY RISK (CAUSE)	and \	Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)		
A	ent	Un-lined landfills	Yes	Incidences of illegal dumping are high in the shire.
Õ	ĥ	Extensive agriculture		
X	atc	Low vegetation cover (dust, sediment		
Ř	Ö	Poor access to supply	No	
≽		Unsustainable water extraction		
E		Aquifer turning saline due to high extraction		
C		Hard water	No	Compliant for hardness.
SE		Aging or inadequate pipe work and		
К		associated infrastructure		
$\stackrel{\circ}{\succ}$		Significant water losses due to leaking		
5	Governance	High per capita water consumption		
A		Inappropriate water quality standards /	No	Council reports to NSW Health, who use ADWG.
ð		objectives		
ЦЦ		Lack of infrastructure maintenance		
AT (AT		Poor management or governance		
\$		Vandalism / sabotage / terrorism Insufficient trained personnel		
		Inadequate funding for maintenance or upgrades	No	Council has ~\$100,000 water fund surplus for the 07-08 period.
	Ś	Mining / minerals	Yes	26 quarries and 2 coal mines operate in the Wingecarribee Shire.
	strie	Irrigation	Yes	
	Industries	Chemicals / process		
	_			
	Population	Seasonal population loadings		
	Popu	Rapid population growth		
Y RISK		Bacteriological and / or viral contamination	Yes	Faecal coliform bacteria levels are high, and increase dramatically with rain events. Dry weather sources are probably direct faecal contamination by unfenced stock (Wingecarribee Shire Council SoE Report 07-08).
CURIT		Algal blooms		Nutrient levels (P&N) routinely exceed guideline values in many locations (Wingecarribee Shire Council SoE Report, 07-08).
Ц,	~	Heavy metal contamination		
201	2	Poor chlorine residuals		
WATER QUALITY OR SECURITY RISK	(EFFECI)	Pesticide contamination High suspended solids	Yes	Turbidity levels are high, and correlate with soil and bank erosion, level of development and impervious surfaces (Wingecarribee Shire Council SoE Report, 07-08).
ð		Boil water notices		
ШК		Deaths or illness due to water quality		
AT		Water restrictions (current and historic)		
≥		Taste and odour issues		
		Other contamination that would affect		
		Notes		

Z	State/Territory	NSW	
TOWN	Town Name	Tenterfield	
Ĕ	Town Population	3300 (NSW Health	n, 2009); 2,035 (Census 2006, Urban Centre/Locality)
	Name of Water Utility	Tenterfield Shire C	
≻	Council Web-Link	http://www.tenterfi	
WATER UTILITY			
른	Rate (\$/kL)		c supply for 08/09 period, Tenterfield Shire Council Annual Report, 07-08
5	(1)	and \$3.30/kL for b	ulk water purchases (Tenterfield Revenue Policy, 07-08)
Ř		148I /day Based o	on 54.08kL/person/yr (Tenterfield SoE Report, 07-08) and 2006 Census
Ę	Per Capita Water Consumption (L/day)		cs. Water use in the Tenterfield Shire = 369,563kL for the 07-08 reporting
₹	r el Capita Water Consumption (L/uay)		SoE Report, 07-08).
>			30E Repuil, 07-00).
	Number of Connections	1780	
	Catchment	Border Rivers - Gv	vydir
₽≻	Sub-Catchment	Border Rivers	
2 Z	Catchment Management Authority (CMA)	Border Rivers - Gv	vvdir
부욕	CMA Web-Link		.gov.au/index.php?page=home page
ы IS	Catchment Protection Status	None.	
⋛ []			Dam (dam on watercourse) (NSW Health)
Ω₽	Potable Water Source(s)		(Tenterfield Shire Council Annual Report, 07-08)
CATCHMENT AND WATER SUPPLY			
0-	Supply Capacity		Dam total storage = 1300ML (Tenterfield Shire Council Annual Report, 0
			= licensed annual yield 160ML (Tenterfield Shire Council Annual Report
	Treatment Plant(s)		nent Plant. Average weekly production 6.6ML.
	Level of Treatment	Tertiary	
	Treader and Decement	Filtration, coagulat	tion, sedimentation, powdered activated carbon, soda ash, chlorination
	Treatment Process	(NSW Health, 200	9).
	Drinking Water Guidelines	ADWG 2004 (NSV	
			oring Location: TF01-Tenterfield
		Total Coliforms	
	% compliance for water quality parameters	Total Comorms	43
	achieving < 100%, 2003-2004		
	Parameter(s) tested and number of	E.Coli (30) Therm	otolerant Coliforms (30), Total Coliforms (30)
	samples () 2003-2004		
	% compliance for water quality parameters	Total Coliforms	53
		Total Collionns	55
≥	achieving < 100%, 2004-2005		
WATER QUALITY	Parameter(s) tested and number of	E.Coli (36), Therm	otolerant Colifrms (36), Total Coliforms (36)
٩	samples ( ) 2004-2005		
ð	% compliance for water quality parameters	Total Coliforms	82
Ř	achieving < 100%, 2005-2006		
Ë	Parameter(s) tested and number of	E.Coli (33), Therm	otolerant Colifrms (33), Total Coliforms (33)
A	samples () 2005-2006		
>	% compliance for water quality parameters	Lead	50
	achieving < 100%, 2006-2007	Total Coliforms	98
	domoting 10070, 2000 2001		timony (2), Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium (1)
	Parameter(s) tested and number of	Chloride (1), Chroi (1), Iron (2), Lead	(2), Magnesium (2), Manganese (2), Mercury (2), Molybdenum (2), Nicke
	Parameter(s) tested and number of samples ( ) 2006-2007	(1), Iron (2), Lead (2), Nitrate (2), Nitr Thermotolerant Co	rite (2), pH (2), Selenium (2), Silver (2), Sodium (2), Sulfate (2),
		(1), Iron (2), Lead (2), Nitrate (2), Nitr Thermotolerant Co	rite (2), pH (2), Selenium (2), Silver (2), Sodium (2), Sulfate (2), bliforms (42), Total Coliforms (42), Total Dissolved Solids (TDS) (2), Total
	samples () 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008	(1), Iron (2), Lead (2), Nitrate (2), Nitrate (2), Nitr Thermotolerant Co Hardness as CaCo Total Coliforms	rite (2), pH (2), Selenium (2), Silver (2), Sodium (2), Sulfate (2), Jiforms (42), Total Coliforms (42), Total Dissolved Solids (TDS) (2), Tota D3 (2), True Colour (1), Turbidity (2), Zinc (1) 86
	samples () 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of	(1), Iron (2), Lead (2), Nitrate (2), Nitrate (2), Nitr Thermotolerant Co Hardness as CaCo Total Coliforms	rite (2), pH (2), Selenium (2), Silver (2), Sodium (2), Sulfate (2), Iliforms (42), Total Coliforms (42), Total Dissolved Solids (TDS) (2), Tota O3 (2), True Colour (1), Turbidity (2), Zinc (1)
~	samples () 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008	(1), Iron (2), Lead (2), Nitrate (2), Nit Thermotolerant Cc Hardness as CaCt Total Coliforms E.Coli (36), Therm	<ul> <li>(2), pH (2), Selenium (2), Silver (2), Sodium (2), Sulfate (2), liforms (42), Total Coliforms (42), Total Dissolved Solids (TDS) (2), Total O3 (2), True Colour (1), Turbidity (2), Zinc (1) </li> <li>a6 </li> <li>otolerant Coliforms (27), Total Coliforms (36) </li> </ul>
Σ	samples () 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples () 2007-2008	(1), Iron (2), Lead (2), Nitrate (2), Nitr Thermotolerant Cc Hardness as CaCo Total Coliforms E.Coli (36), Therm Yes. Level 1 water	<ul> <li>(2), pH (2), Selenium (2), Silver (2), Sodium (2), Sulfate (2), liforms (42), Total Coliforms (42), Total Dissolved Solids (TDS) (2), Total O3 (2), True Colour (1), Turbidity (2), Zinc (1) </li> <li>action of the selection of the s</li></ul>
JRITY	samples () 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of	(1), Iron (2), Lead (2), Nitrate (2), Nitr Thermotolerant Cc Hardness as CaCo Total Coliforms E.Coli (36), Therm Yes. Level 1 water	<ul> <li>(2), pH (2), Selenium (2), Silver (2), Sodium (2), Sulfate (2), liforms (42), Total Coliforms (42), Total Dissolved Solids (TDS) (2), Total O3 (2), True Colour (1), Turbidity (2), Zinc (1) </li> <li>86 </li> <li>otolerant Coliforms (27), Total Coliforms (36) </li> </ul>
CURITY	samples () 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples () 2007-2008 Current Water Restrictions	(1), Iron (2), Lead (2), Nitrate (2), Nitr Thermotolerant Cc Hardness as CaCl Total Coliforms E.Coli (36), Therm Yes. Level 1 water daily. Micro-sprays	<ul> <li>(2), pH (2), Selenium (2), Silver (2), Sodium (2), Sulfate (2), liforms (42), Total Coliforms (42), Total Dissolved Solids (TDS) (2), Total O3 (2), True Colour (1), Turbidity (2), Zinc (1) </li> <li>action of the selection of the s</li></ul>
SECURITY	samples () 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples () 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to	(1), Iron (2), Lead (2), Nitrate (2), Nitr Thermotolerant Cc Hardness as CaCo Total Coliforms E.Coli (36), Therm Yes. Level 1 water	<ul> <li>(2), pH (2), Selenium (2), Silver (2), Sodium (2), Sulfate (2), liforms (42), Total Coliforms (42), Total Dissolved Solids (TDS) (2), Total O3 (2), True Colour (1), Turbidity (2), Zinc (1) </li> <li>action of the selection of the sel</li></ul>
ERSECURITY	samples () 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples () 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%)	(1), Iron (2), Lead I (2), Nitrate (2), Nitr Thermotolerant Cc Hardness as CaCi Total Coliforms E. Coli (36), Therm Yes. Level 1 water daily. Micro-sprays Unknown	<ul> <li>(2), pH (2), Selenium (2), Silver (2), Sodium (2), Sulfate (2), liforms (42), Total Coliforms (42), Total Dissolved Solids (TDS) (2), Total O3 (2), True Colour (1), Turbidity (2), Zinc (1) </li> <li>action of the selection of the sel</li></ul>
TER SECURITY	samples () 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples () 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km)	(1), Iron (2), Lead (2), Nitrate (2), Nitr Thermotolerant CC Hardness as CaCO Total Coliforms E.Coli (36), Therm Yes. Level 1 water daily. Micro-sprays Unknown ~ 130km	<ul> <li>(2), pH (2), Selenium (2), Silver (2), Sodium (2), Sulfate (2), liforms (42), Total Coliforms (42), Total Dissolved Solids (TDS) (2), Total O3 (2), True Colour (1), Turbidity (2), Zinc (1) </li> <li>action of the selection of the sel</li></ul>
MATER SECURITY	samples () 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples () 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate	(1), Iron (2), Lead (2), Nitrate (2), Nitr Thermotolerant Cc Hardness as CaCt Total Coliforms E.Coli (36), Therm Yes. Level 1 water daily. Micro-sprays Unknown ~ 130km Temperate	<ul> <li>(2), pH (2), Selenium (2), Silver (2), Sodium (2), Sulfate (2), liforms (42), Total Coliforms (42), Total Dissolved Solids (TDS) (2), Total O3 (2), True Colour (1), Turbidity (2), Zinc (1)</li> <li>action of the selection of the selec</li></ul>
WATER SECURITY	samples () 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples () 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall	(1), Iron (2), Lead (2), Nitrate (2), Nitr Thermotolerant Cc Hardness as CaCl Total Coliforms E.Coli (36), Therm Yes. Level 1 water daily. Micro-sprays Unknown ~ 130km Temperate 850mm (Tenterfiel	<ul> <li>rite (2), PH (2), Selenium (2), Silver (2), Sodium (2), Sulfate (2), liforms (42), Total Coliforms (42), Total Dissolved Solids (TDS) (2), Total Colour (1), Turbidity (2), Zinc (1) </li> <li>action (2), Total Coliforms (36) </li> <li>restrictions. Fixed hoses/sprinklers 2 hrs/day between 530 and 730pm /garden watering systems 2 hrs/day between 530 and 730pm daily. </li> <li>d SoE Report, 07-08) </li> </ul>
WATER SECURITY	samples () 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples () 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate	(1), Iron (2), Lead (2), Nitrate (2), Nitr Thermotolerant Cc Hardness as CaCt Total Coliforms E.Coli (36), Therm Yes. Level 1 water daily. Micro-sprays Unknown ~ 130km Temperate	<ul> <li>d SoE Report, 07-08)</li> <li>NOTES / EXPLANATION</li> </ul>
WATER SECURITY	samples () 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples () 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall	(1), Iron (2), Lead (2), Nitrate (2), Nitr Thermotolerant Cc Hardness as CaCl Total Coliforms E.Coli (36), Therm Yes. Level 1 water daily. Micro-sprays Unknown ~ 130km Temperate 850mm (Tenterfiel	<ul> <li>d SoE Report, 07-08)</li> <li>Classified as 'Satisfactory/Marginal' according to NSW DPI Drought Marginal' according t</li></ul>
WATER SECURITY	samples () 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples () 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought	(1), Iron (2), Lead (2), Nitrate (2), Nitr Thermotolerant Cc Hardness as CaCl Total Coliforms E.Coli (36), Therm Yes. Level 1 water daily. Micro-sprays Unknown ~ 130km Temperate 850mm (Tenterfiel YES / NO No	<ul> <li>d SoE Report, 07-08)</li> <li>NOTES / EXPLANATION</li> </ul>
WATER SECURITY	samples () 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples () 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source	(1), Iron (2), Lead I (2), Nitrate (2), Nitr Thermotolerant Cc Hardness as CaCl Total Coliforms E.Coli (36), Therm Yes. Level 1 water daily. Micro-sprays Unknown ~ 130km Temperate 850mm (Tenterfiel YES / NO No Yes	<ul> <li>d SoE Report, 07-08)</li> <li>Classified as 'Satisfactory/Marginal' according to NSW DPI Drought Marginal' according t</li></ul>
WATER SECURITY	samples () 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples () 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought	(1), Iron (2), Lead (2), Nitrate (2), Nitr Thermotolerant Cc Hardness as CaCl Total Coliforms E.Coli (36), Therm Yes. Level 1 water daily. Micro-sprays Unknown ~ 130km Temperate 850mm (Tenterfiel YES / NO No	tite (2), PH (2), Selenium (2), Silver (2), Sodium (2), Sulfate (2), Ilforms (42), Total Coliforms (42), Total Dissolved Solids (TDS) (2), Total Color (1), Turbidity (2), Zinc (1) <b>86</b> otolerant Coliforms (27), Total Coliforms (36)      restrictions. Fixed hoses/sprinklers 2 hrs/day between 530 and 730pm daily.      d SoE Report, 07-08) <b>NOTES / EXPLANATION</b> Classified as 'Satisfactory/Marginal' according to NSW DPI Drought Ma October 2009.
WATER SECURITY	samples () 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples () 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source	(1), Iron (2), Lead I (2), Nitrate (2), Nitr Thermotolerant Cc Hardness as CaCl Total Coliforms E.Coli (36), Therm Yes. Level 1 water daily. Micro-sprays Unknown ~ 130km Temperate 850mm (Tenterfiel YES / NO No Yes	<ul> <li>d SoE Report, 07-08)</li> <li>d SoE Report, 07-08)</li> <li>Classified as 'Satisfactory/Marginal' according to NSW DPI Drought Margony Comparison of the environment protection license, as the effluent is discharged to Tenterfield Creek. A new STP is currently being construction construction construction construction construction protection according to restriction according to Tenterfield Creek. A new STP is currently being construction constructio</li></ul>
WATER SECURITY	samples () 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples () 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water	(1), Iron (2), Lead (2), Nitrate (2), Nitr Thermotolerant Cc Hardness as CaCt Total Coliforms E.Coli (36), Therm Yes. Level 1 water daily. Micro-sprays Unknown ~ 130km Temperate 850mm (Tenterfiel YES / NO No Yes Yes	ific (2), pH (2), Selenium (2), Silver (2), Sodium (2), Sulfate (2), ifforms (42), Total Coliforms (42), Total Dissolved Solids (TDS) (2), Tota O3 (2), True Colour (1), Turbidity (2), Zinc (1)
WATER SECURITY	samples () 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples () 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source	(1), Iron (2), Lead I (2), Nitrate (2), Nitr Thermotolerant Cc Hardness as CaCl Total Coliforms E.Coli (36), Therm Yes. Level 1 water daily. Micro-sprays Unknown ~ 130km Temperate 850mm (Tenterfiel YES / NO No Yes Yes	<ul> <li>d SoE Report, 07-08)</li> <li>A SoE Report, 07-08)</li> <li>Classified as 'Satisfactory/Marginal' according to NSW DPI Drought Magnetic Solution (2000)</li> <li>Classified as 'Satisfactory/Marginal' according to NSW DPI Drought Magnetic Solution (2000)</li> <li>Tenterfield STP was constructed for 2000EP and was processing approximately 3500EP until recently (~2008). The STP was found to be non-compliant with its environment protection license, as the effluent h non-compliant pH and Total Suspended Solids levels. Effluent is discharged to Tenterfield Creek. A new STP is currently being construct (DAL technology is being used). Severe flooding in January 2008 (Tenterfield Shire Council Annual Rep</li> </ul>
WATER SECURITY	samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding	(1), Iron (2), Lead (2), Nitrate (2), Nitr Thermotolerant Cc Hardness as CaCl Total Coliforms E.Coli (36), Therm Yes. Level 1 water daily. Micro-sprays Unknown ~ 130km Temperate 850mm (Tenterfiel YES / NO No Yes Yes Yes	ifte (2), pH (2), Selenium (2), Silver (2), Sodium (2), Sulfate (2), iliforms (42), Total Coliforms (42), Total Dissolved Solids (TDS) (2), Total O3 (2), True Colour (1), Turbidity (2), Zinc (1)
	samples () 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples () 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply	(1), Iron (2), Lead I (2), Nitrate (2), Nitr Thermotolerant Cc Hardness as CaCl Total Coliforms E.Coli (36), Therm Yes. Level 1 water daily. Micro-sprays Unknown ~ 130km Temperate 850mm (Tenterfiel YES / NO No Yes Yes Yes Yes No	difference       Selenium (2), Silver (2), Sodium (2), Sulfate (2), Silver (2), Total Dissolved Solids (TDS) (2), Total Coliforms (42), Total Dissolved Solids (TDS) (2), Total Col, Tue Colour (1), Turbidity (2), Zinc (1)         86       otolerant Coliforms (27), Total Coliforms (36)         restrictions. Fixed hoses/sprinklers 2 hrs/day between 530 and 730pm daily.         garden watering systems 2 hrs/day between 530 and 730pm daily.         d SoE Report, 07-08)         NOTES / EXPLANATION         Classified as 'Satisfactory/Marginal' according to NSW DPI Drought Ma October 2009.         Tenterfield STP was constructed for 2000EP and was processing approximately 3500EP until recently (~2008). The STP was found to be non-compliant with its environment protection license, as the effluent h non-compliant pH and Total Suspended Solids levels. Effluent is discharged to Tenterfield Creek. A new STP is currently being construct (IDAL technology is being used).         Severe flooding in January 2008 (Tenterfield Shire Council Annual Rep 07-08).         Drinking water source is river water.
	samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium,	(1), Iron (2), Lead I (2), Nitrate (2), Nitr Thermotolerant Cc Hardness as CaCl Total Coliforms E.Coli (36), Therm Yes. Level 1 water daily. Micro-sprays Unknown ~ 130km Temperate 850mm (Tenterfiel YES / NO No Yes Yes Yes Yes	ifte (2), pH (2), Selenium (2), Silver (2), Sodium (2), Sulfate (2), iliforms (42), Total Coliforms (42), Total Dissolved Solids (TDS) (2), Total O3 (2), True Colour (1), Turbidity (2), Zinc (1)
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	samples ( ) 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium,	(1), Iron (2), Lead I (2), Nitrate (2), Nitr Thermotolerant Cc Hardness as CaCl Total Coliforms E.Coli (36), Therm Yes. Level 1 water daily. Micro-sprays Unknown ~ 130km Temperate 850mm (Tenterfiel YES / NO No Yes Yes Yes Yes No	<ul> <li>(2), PH (2), Selenium (2), Silver (2), Sodium (2), Sulfate (2), Jifforms (42), Total Coliforms (42), Total Dissolved Solids (TDS) (2), Total Col, True Colour (1), Turbidity (2), Zinc (1)</li> <li>86</li> <li>otolerant Coliforms (27), Total Coliforms (36)</li> <li>restrictions. Fixed hoses/sprinklers 2 hrs/day between 530 and 730pm //garden watering systems 2 hrs/day between 530 and 730pm daily.</li> <li>d SoE Report, 07-08)</li> <li>NOTES / EXPLANATION</li> <li>Classified as 'Satisfactory/Marginal' according to NSW DPI Drought Ma October 2009.</li> <li>Tenterfield STP was constructed for 2000EP and was processing approximately 3500EP until recently (~2008). The STP was found to be non-compliant with its environment protection license, as the effluent h non-compliant with its environment protection license, as the effluent h is clickarged to Tenterfield Creek. A new STP is currently being construct (DAL technology is being used).</li> <li>Severe flooding in January 2008 (Tenterfield Shire Council Annual Rep 07-08).</li> <li>Drinking water source is river water.</li> <li>Unlikely that lead is naturally occurring in the drinking water.</li> <li>No reports of unlined landfills but illegal dumping is an ongoing issue in</li> </ul>
	samples () 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples () 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)	(1), Iron (2), Lead I (2), Nitrate (2), Nitr Thermotolerant Cc Hardness as CaCl Total Coliforms E. Coli (36), Therm Yes. Level 1 water daily. Micro-sprays Unknown ~ 130km Temperate 850mm (Tenterfiel YES / NO No Yes Yes Yes Yes No No	<ul> <li>A constructed for 2000EP and was processing approximately 3500EP until recently (~2008). The STP was found to be for any constructed for 2000EP and was processing approximately 3500EP until recently (~2008). The STP was found to be for any constructed for 2000EP and was processing approximately 3500EP until recently (~2008). The STP was found to be for any constructed for 2000EP and was processing approximately 3500EP until recently (~2008). The STP was found to be for any constructed for 2000EP and was processing approximately 3500EP until recently (~2008). The STP was found to be for any constructed for 2000EP and was processing approximately 3500EP until recently (~2008). The STP was found to be for any constructed for 2000EP and was processing approximately 3500EP until recently (~2008). The STP was found to be for any constructed for 2000EP and was processing approximately 3500EP until recently (~2008). The STP was found to be for any constructed for 2000EP and was processing approximately 3500EP until recently (~2008). The STP was found to be for any constructed for 2000EP and was processing approximately 3500EP until recently (~2008). The STP was found to be for any constructed for 2000EP and was processing approximately 3500EP until recently (~2008). The STP was found to be for any constructed for 2000EP and was processing approximately 3500EP until recently (~2008). The STP was found to be for any constructed for 2000EP and was processing approximately 3500EP until recently (~2008). The STP was found to be for any constructed for 2000EP and was processing approximately 3500EP until recently (~2008). The STP was found to be for any constructed for 2000EP and was processing approximately 3500EP until recently (~2008). The STP was found to be for any constructed for 2000EP and was processing approximately 3500EP until recently (~2008). The STP was found to be for any constructed for 2000EP and was processing approximately 3500EP until recently (~2008). The STP was found to be for a provide to</li></ul>
nd Water Supply	samples () 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples () 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)	(1), Iron (2), Lead I (2), Nitrate (2), Nitr Thermotolerant Cc Hardness as CaCl Total Coliforms E. Coli (36), Therm Yes. Level 1 water daily. Micro-sprays Unknown ~ 130km Temperate 850mm (Tenterfiel YES / NO No Yes Yes Yes Yes No No	itite (2), PH (2), Selenium (2), Silver (2), Sodium (2), Sulfate (2),         itiforms (42), Total Coliforms (42), Total Dissolved Solids (TDS) (2), Total Coliforms (42), Total Dissolved Solids (TDS) (2), Total Col, Tue Colour (1), Turbidity (2), Zinc (1)         86         otolerant Coliforms (27), Total Coliforms (36)         restrictions. Fixed hoses/sprinklers 2 hrs/day between 530 and 730pm s/garden watering systems 2 hrs/day between 530 and 730pm daily.         d SoE Report, 07-08)         NOTES / EXPLANATION         Classified as 'Satisfactory/Marginal' according to NSW DPI Drought Ma October 2009.         Tenterfield STP was constructed for 2000EP and was processing approximately 3500EP until recently (~2008). The STP was found to be non-compliant with its environment protection license, as the effluent han on-compliant pH and Total Suspended Solids levels. Effluent is discharged to Tenterfield Creek. A new STP is currently being construct (IDAL technology is being used).         Severe flooding in January 2008 (Tenterfield Shire Council Annual Report, 07-08).         Drinking water source is river water.         Unlikely that lead is naturally occurring in the drinking water.         No reports of unlined landfills but illegal dumping is an ongoing issue ir the Shire (Tenterfield Shire Council Annual Report, 07-08).         Vegetable production. Sheep and cattle grazing. Rapid expansion of tim plantations on private land since 2002. (Tenterfield Shire Council Annual Report or Council Annual Report or Council Annual Report or Council Annual Report.
nd Water Supply	samples () 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples () 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff)	(1), Iron (2), Lead I (2), Nitrate (2), Nitr Thermotolerant Cc Hardness as CaCl Total Coliforms E.Coli (36), Therm Yes. Level 1 water daily. Micro-sprays Unknown - 130km Temperate 850mm (Tenterfiel YES / NO No Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes	<ul> <li>itic (2), PH (2), Selenium (2), Silver (2), Sodium (2), Sulfate (2), itiforms (42), Total Coliforms (42), Total Dissolved Solids (TDS) (2), Tota Col (2), True Colour (1), Turbidity (2), Zinc (1)</li> <li>a</li> <li>b</li> <li>a</li> <li>a</li> <li>a</li> <li>a</li> <li>a</li> <li>a</li> <li>b</li> <li>a</li> <li>a</li> <li>a</li> <li>a</li> <li>a</li> <li>a</li> <li>a</li> <li>b</li> <li>a</li> <li>b</li> <li>a</li> <li>a</li> <li>a</li> <li>a</li> <li>a</li> <li>b</li> <li>a</li> <li>a</li> <li>a</li> <li>a</li> <li>a</li> <li>a</li> <li>a</li> <li>b</li> <li>a</li> <li>a</li> <li>b</li> <li>a</li> <li>b</li> <li>a</li> <li>b</li> <li>a</li> <li>b</li> <li>a</li> <li>b</li> <li>a</li> <li>a</li> <li>a</li> <li>a</li> <li>a</li> <li>a</li> <li>a</li> <li>a</li> <li>a</li> <li>a</li></ul>
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E) and Water Supply	samples () 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of samples () 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff)	(1), Iron (2), Lead I (2), Nitrate (2), Nitr Thermotolerant Cc Hardness as CaCl Total Coliforms E.Coli (36), Therm Yes. Level 1 water daily. Micro-sprays Unknown - 130km Temperate 850mm (Tenterfiel YES / NO No Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes	itite (2), PH (2), Selenium (2), Silver (2), Sodium (2), Sulfate (2), Ifforms (42), Total Coliforms (42), Total Dissolved Solids (TDS) (2), Total Col, True Colour (1), Turbidity (2), Zinc (1) 86 otolerant Coliforms (27), Total Coliforms (36) restrictions. Fixed hoses/sprinklers 2 hrs/day between 530 and 730pm s/garden watering systems 2 hrs/day between 530 and 730pm daily. d SoE Report, 07-08) NOTES / EXPLANATION Classified as 'Satisfactory/Marginal' according to NSW DPI Drought Ma October 2009. Tenterfield STP was constructed for 2000EP and was processing approximately 3500EP until recently (~2008). The STP was found to be non-compliant with its environment protection license, as the effluent ha non-compliant pH and Total Suspended Solids levels. Effluent is discharged to Tenterfield Creek. A new STP is currently being construct (IDAL technology is being used). Severe flooding in January 2008 (Tenterfield Shire Council Annual Report, 07-08). Unlikely that lead is naturally occurring in the drinking water. No reports of unlined landfills but illegal dumping is an ongoing issue in the Shire (Tenterfield Shire Council Annual Report, 07-08). Vegetable production. Sheep and cattle grazing. Rapid expansion of tim plantations on private land since 2002. (Tenterfield Shire Council Annual Report, 07-08).

D,		Hard water	No	
s sec		Aging or inadequate pipe work and associated infrastructure	Yes	Dam built in 1930 and upgraded in 1974. Water treatment plant built in 1930 and upgraded in 1958 and 1985.
WATER QUALITY OR SECU		Significant water losses due to leaking pipes	Yes	Council is one of 34 Water Supply Authorities in NSW that has secured funding from the Federal Government for the investigation and implementation of a Water Loss Reduction Program. Stage 1 of the works, involving the investigation of the Tenterfield Water reticulation system and reservoirs for water losses due to leaks, etc has been completed by a consultant. The results indicate that further investigation is required to ascertain the extent and location of the water loss within Tenterfield . This work will be undertaken in 2008/09 by a contractor. (Tenterfield Annual Report, 07-08).
		High per capita water consumption	No	Lower than Aus average of 285L/day.
		Inappropriate water quality standards / objectives	No	Council reports to NSW Health who use ADWG.
	Governance	Lack of infrastructure maintenance	No	Council have undertaken infrastructure upgrades as required and are currently awaiting the completion of a new sewage treatment plant (Tenterfield Shire Council Annual Report, 07-08).
	ð	Poor management or governance	No	
	Q	Vandalism / sabotage / terrorism	No	
		Insufficient trained personnel	No	
		Inadequate funding for maintenance or upgrades	Yes	Council's planned upgrades were delayed (installation of fluoridation unit and sewage treatment plant upgrades) due to inadeguate funding.
	Se	Mining / minerals	No	
	Populatio Industries n	Irrigation	Yes	
		Chemicals / process	No	
		Seasonal population loadings	No	Negative population growth between the 2001 and 2006 Census.
	Popu	Rapid population growth	No	Population growth was negative (approximately 7% change) for the period between the 2001 and 2006 Census.
WATER QUALITY OR	Ę	Bacteriological and / or viral contamination	Yes	Some issues with Total Coliforms.
R	ú	Algal blooms	No	None reported.
WATER QUALITY OR	L	Heavy metal contamination	Yes	Non-compliance issues for lead (see above).
	-	Poor chlorine residuals	Yes	Free Chlorine is not measured.
IAI	0	Pesticide contamination	No	
50	r	High suspended solids	No	
뜺	-	Boil water notices	No	
E E	Ę	Deaths or illness due to water quality	No	
1 A	۲ ۲	Water restrictions (current and historic)	Yes	
L U	0	Taste and odour issues	No	
		Other contamination that would affect	No	
		Notes		higher than normal dirty water complaints between January and March 2008. The a program of scour to rectify the issue (Tenterfield Shire Council Annual

	State/Territory	NSW	
TOWN	Town Name	Corowa	
	Town Population	5,500 (NSW Health, 2009); 5,628 (Census 2006, (Corowa Part) Urban Centre/Locality)	
rr ≻	Name of Water Utility Council Web-Link	Corowa Shire Council http://www.corowa.nsw.gov.gu/	
WATER UTILITY	Rate (\$/kL)	Unknown.	
-A E	Per Capita Water Consumption (L/day)	Unknown. Average annual water use per household = 220kL.	
> _	Number of Connections	4800	
	Catchment	Murray River	
누氏	Sub-Catchment		
핀란기	Catchment Management Authority (CMA)	Murray River	
HNN	CMA Web-Link	http://www.murray.cma.nsw.gov.au/	
CATCHMENT AND WATER SUPPLY	Catchment Protection Status	None.	
CATCHMENT AND WATER SUPPLY	Potable Water Source(s)	Murray River (watercourse)	
	Supply Capacity	Unknown	
	Treatment Plant(s)	Yes. Mulwala Filtration Plant, Gulai Road, Mulwala	
	Level of Treatment	Dissolved Air Flotation, Coagulation, Chlorination	
	Drinking Water Guidelines	ADWG 2004 (NSW Health)	
		NSW Health Monitoring Location: CW01-Corowa	
	% compliance for water quality parameters	pH 75	
	achieving < 100%, 2003-2004	Total Coliforms 98	
	Parameter(s) tested and number of samples ( ) 2003-2004	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium ( Chloride (12), Chromium (12), Copper (12), Cyanide (12), E.Coli (47), Fluoride (12), Iodine (12), (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Total Coliforms (47), Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (5 Turbidity (12), Zinc (12)	
	% compliance for water quality parameters achieving < 100%, 2004-2005	pH 83	
	Parameter(s) tested and number of samples ( ) 2004-2005	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium ( Chloride (12), Chromium (12), Copper (12), Cyanide (2), E.Coli (51), Fluoride (12), Iodine (12), Ir (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Total Coliforms (51), Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour ( Turbidity (12), Zinc (12)	
>		Fluoride (daily WSA) 86	
É	% compliance for water quality parameters	Fluoride (weekly WSA) 67	
IAL	achieving < 100%, 2005-2006	pH 75	
B		Total Coliforms 96	
WATER QUALITY	Parameter(s) tested and number of samples ( ) 2005-2006	Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadinium (12), Calcium ( Chloride (12), Chromium (12), Copper (12), E.Coli (49), Fluoride (12), Fluoride (daily WSA) (22), Fluoride (field result WSA) (1), Fluoride (weekly WSA) (6), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitr (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Total Coliforms (49), Total Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zir (12)	
	% compliance for water quality parameters	pH 64	
	achieving < 100%, 2006-2007	Total Coliforms 96	
	Parameter(s) tested and number of samples ( ) 2006-2007	Aluminium (11), Antimony (11), Arsenic (11), Barium (11), Boron (11), Cadmium (11), Calcium ( Chloride (11), Chromium (11), Copper (11), E.Coli (45), Fluoride (11), Iodine (11), Iron (11), Leac (11), Magnesium (11), Manganese (11), Mercury (11), Molybdenum (11), Nickel (11), Nitrate (11 Nitrite (11), pH (11), Selenium (11), Silver (11), Sodium (11), Sulfate (11), Total Coliforms (45), T Dissolved Solids (TDS) (11), Total Hardness as CaCO3 (11), True Colour (11), Turbidity (11), Zir (11)	
		Aluminium 92	
	% compliance for water quality parameters	pH 67	
	achieving < 100%, 2007-2008		
		Total Coliforms         98           Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium ( Chloride (12), Chromium (12), Copper (12), E.Coli (50), Fluoride (12), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molydenum (12), Nickel (12), Nirtae (12) Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Total Coliforms (50), T	
ECURITY	achieving < 100%, 2007-2008 Parameter(s) tested and number of	Total Coliforms         98           Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium ( Chloride (12), Chromium (12), Copper (12), E.Coli (50), Fluoride (12), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12) Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Total Coliforms (50), T Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zir (12)           Yes. Stage 3A water restrictions. 4 hours of garden watering per week (7.00am – 8.00am and 6.00pm – 7.00pm, 2 days per week); odd numbered houses Tuesday and Saturday; even numb	
TER SECURITY	achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%)	Total Coliforms         98           Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium ( Chloride (12), Chromium (12), Copper (12), E.Coli (50), Fluoride (12), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Total Coliforms (50), T Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zir (12)           Yes. Stage 3A water restrictions. 4 hours of garden watering per week (7.00am – 8.00am and 6.00pm – 7.00pm, 2 days per week); odd numbered houses Tuesday and Saturday; even numb houses Wednesday and Sunday; no lawn watering allowed; car washing with hand held hose w trigger nozzle allowed on lawn any time.           Unknown.	
WATER SECURITY	achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km)	Total Coliforms         98           Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium ( Chloride (12), Chromium (12), Copper (12), E.Coli (50), Fluoride (12), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Total Coliforms (50), T Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zir (12)           Yes. Stage 3A water restrictions. 4 hours of garden watering per week (7.00am – 8.00am and 6.00pm – 7.00pm, 2 days per week); odd numbered houses Tuesday and Saturday; even numb houses Wednesday and Sunday; no lawn watering allowed; car washing with hand held hose w trigger nozzle allowed on lawn any time.           Unknown.         ~ 340km	
WATER SECURITY	achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate	Total Coliforms         98           Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium ( Chloride (12), Chromium (12), Copper (12), E.Coli (50), Fluoride (12), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12) Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Total Coliforms (50), T Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zir (12)           Yes. Stage 3A water restrictions. 4 hours of garden watering per week (7.00am – 8.00am and 6.00pm – 7.00pm, 2 days per week); odd numbered houses Tuesday and Saturday; even numb houses Wednesday and Sunday; no lawn watering allowed; car washing with hand held hose w trigger nozzle allowed on lawn any time.           Unknown.         - 340km           - 340km	
WATER SECURITY	achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km)	Total Coliforms         98           Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium ( Chloride (12), Chromium (12), Copper (12), E.Coli (50), Fluoride (12), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Total Coliforms (50), T Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zir (12)           Yes. Stage 3A water restrictions. 4 hours of garden watering per week (7.00am – 8.00am and 6.00pm – 7.00pm, 2 days per week); odd numbered houses Tuesday and Saturday; even numb houses Wednesday and Sunday; no lawn watering allowed; car washing with hand held hose w trigger nozzle allowed on lawn any time.           Unknown.         - 340km           - 340km         - 455mm (Source: BoM station number 69139, period 2004-2008)	
WATER SECURITY	achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR	Total Coliforms         98           Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium ( Chloride (12), Chromium (12), Copper (12), E.Coli (50), Fluoride (12), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Total Coliforms (50), T Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zir (12)           Yes. Stage 3A water restrictions. 4 hours of garden watering per week (7.00am – 8.00am and 6.00pm – 7.00pm, 2 days per week); odd numbered houses Tuesday and Saturday; even numb houses Wednesday and Sunday; no lawn watering allowed; car washing with hand held hose w trigger nozzle allowed on lawn any time.           Unknown.         - 340km           - 340km         - Temperate           455mm (Source: BoM station number 69139, period 2004-2008)           YES / NO         NOTES / EXPLANATION	
WATER SECURITY	achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall	Total Coliforms         98           Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium ( Chloride (12), Chromium (12), Copper (12), E.Coli (50), Fluoride (12), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Total Coliforms (50), T Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zir (12)           Yes. Stage 3A water restrictions. 4 hours of garden watering per week (7.00am – 8.00am and 6.00pm – 7.00pm, 2 days per week); odd numbered houses Tuesday and Saturday; even numb houses Wednesday and Sunday; no lawn watering allowed; car washing with hand held hose w trigger nozzle allowed on lawn any time.           Unknown.         - 340km           - 340km         - 455mm (Source: BoM station number 69139, period 2004-2008)	
WATER SECURITY	achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR	Total Coliforms         98           Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium ( Chloride (12), Chromium (12), Copper (12), E.Coli (50), Fluoride (12), Iodine (12), Iron (12), Lead (12), Magnessium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Total Coliforms (50), T Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zir (12)           Yes. Stage 3A water restrictions. 4 hours of garden watering per week (7.00am – 8.00am and 6.00pm – 7.00pm, 2 days per week); odd numbered houses Tuesday and Saturday; even numb houses Wednesday and Sunday; no lawn watering allowed; car washing with hand held hose w trigger nozzle allowed on lawn any time.           Unknown.           ~ 340km           Temperate           455mm (Source: BoM station number 69139, period 2004-2008)           YES / NO         NOTES / EXPLANATION           Yes         Classified as 'in Drought' according to NSW DPI Drought Map October	
WATER SECURITY	achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought	Total Coliforms         98           Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium ( Chloride (12), Chromium (12), Copper (12), E.Coli (50), Fluoride (12), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Total Coliforms (50), T Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zir (12)           Yes. Stage 3A water restrictions. 4 hours of garden watering per week (7.00am – 8.00am and 6.00pm – 7.00pm, 2 days per week); odd numbered houses Tuesday and Saturday; even numb houses Wednesday and Sunday; no lawn watering allowed; car washing with hand held hose w trigger nozzle allowed on lawn any time.           Unknown.         -           ~ 340km           Temperate           455mm (Source: BoM station number 69139, period 2004-2008)           YES / NO         NOTES / EXPLANATION           Yes         Classified as 'In Drought' according to NSW DPI Drought Map October 2009.           Yes         Aluminium in supply, (NSW Health, 07-08 reporting period).	
WATER SECURITY	achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source	Total Coliforms         98           Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium ( Chloride (12), Chromium (12), Copper (12), E.Coli (50), Fluoride (12), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Total Coliforms (50), T Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zir (12)           Yes. Stage 3A water restrictions. 4 hours of garden watering per week (7.00am – 8.00am and 6.00pm – 7.00pm, 2 days per week); odd numbered houses Tuesday and Saturday; even numb houses Wednesday and Sunday; no lawn watering allowed; car washing with hand held hose w trigger nozzle allowed on lawn any time.           Unknown.         - 340km           - 340km         - Classified as 'In Drought' according to NSW DPI Drought Map October 2009.           Yes         Classified as 'In Drought' according to NSW DPI Drought Map October 2009.           Yes         Aluminium in supply, (NSW Health, 07-08 reporting period).           Yes         Aluminium in supply, (NSW Health, 07-08 reporting period).	
WATER SECURITY	achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source	Total Coliforms         98           Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium ( Chloride (12), Chromium (12), Copper (12), E.Coli (50), Fluoride (12), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Total Coliforms (50), T Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zir (12)           Yes. Stage 3A water restrictions. 4 hours of garden watering per week (7.00am – 8.00am and 6.00pm – 7.00pm, 2 days per week); odd numbered houses Tuesday and Saturday; even numb houses Wednesday and Sunday; no lawn watering allowed; car washing with hand held hose w trigger nozzle allowed on lawn any time.           Unknown.	
	achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding	Total Coliforms         98           Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium ( Chloride (12), Chromium (12), Copper (12), E.Coli (50), Fluoride (12), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Total Coliforms (50), T Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zir (12)           Yes. Stage 3A water restrictions. 4 hours of garden watering per week (7.00am – 8.00am and 6.00pm – 7.00pm, 2 days per week); odd numbered houses Tuesday and Saturday; even numb houses Wednesday and Sunday; no lawn watering allowed; car washing with hand held hose w trigger nozzle allowed on lawn any time.           Unknown.	
	achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source	Total Coliforms         98           Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium ( Chloride (12), Chromium (12), Copper (12), E.Coli (50), Fluoride (12), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Total Coliforms (50), T Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zir (12)           Yes. Stage 3A water restrictions. 4 hours of garden watering per week (7.00am – 8.00am and 6.00pm – 7.00pm, 2 days per week); odd numbered houses Tuesday and Saturday; even numb houses Wednesday and Sunday; no lawn watering allowed; car washing with hand held hose w trigger nozzle allowed on lawn any time.           Unknown.         -           ~ 340km           Temperate           455mm (Source: Bold station number 69139, period 2004-2008)           Yes         Classified as 'In Drought' according to NSW DPI Drought Map October 2009.           Yes         Aluminium in supply, (NSW Health, 07-08 reporting period).           Yes         Effluent discharges from the Mulwala Sewage Treatment Works that exceeded the environment protection license standards (Murray Region Organisation of Councils Annual Report, 07-08).	
	achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding	Total Coliforms         98           Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium ( Chloride (12), Chromium (12), Copper (12), E.Coli (50), Fluoride (12), Iodine (12), Iron (12), Lead (12), Magnessium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Total Coliforms (50), T Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zir (12)           Yes. Stage 3A water restrictions. 4 hours of garden watering per week (7.00am – 8.00am and 6.00pm – 7.00pm, 2 days per week); odd numbered houses Tuesday and Saturday; even numb houses Wednesday and Sunday; no lawn watering allowed; car washing with hand held hose w trigger nozzle allowed on lawn any time.           Unknown.         ~ 340km           ~ 340km         _ Classified as 'In Drought' according to NSW DPI Drought Map October 2009.           Yes         Aluminium in supply, (NSW Health, 07-08 reporting period).           Effluent discharges from the Mulwala Sewage Treatment Works that exceeded the environment protection license standards (Murray Regior Organisation of Councils Annual Report, 07-08).           No         _	
d Water Supply WATER SECURITY	achieving < 100%, 2007-2008 Parameter(s) tested and number of samples ( ) 2007-2008 Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply	Total Coliforms         98           Aluminium (12), Antimony (12), Arsenic (12), Barium (12), Boron (12), Cadmium (12), Calcium ( Chloride (12), Chromium (12), Copper (12), E.Coli (50), Fluoride (12), Iodine (12), Iron (12), Lead (12), Magnesium (12), Manganese (12), Mercury (12), Molybdenum (12), Nickel (12), Nitrate (12), Nitrite (12), pH (12), Selenium (12), Silver (12), Sodium (12), Sulfate (12), Total Coliforms (50), T Dissolved Solids (TDS) (12), Total Hardness as CaCO3 (12), True Colour (12), Turbidity (12), Zir (12)           Yes. Stage 3A water restrictions. 4 hours of garden watering per week (7.00am – 8.00am and 6.00pm – 7.00pm, 2 days per week); odd numbered houses Tuesday and Saturday; even numb houses Wednesday and Sunday; no lawn watering allowed; car washing with hand held hose w trigger nozzle allowed on lawn any time.           Unknown.         -           -340km         -           Temperate         455mm (Source: BoM station number 69139, period 2004-2008)           Yes         Classified as 'In Drought' according to NSW DPI Drought Map October 2009.           Yes         Aluminium in supply, (NSW Health, 07-08 reporting period).           Yes         Aluminium in supply, (NSW Health, 07-08).           No         -           Yes         Water supply is Murray River, which is likely to experience high wildlife activity.	

SE)	nt ar	Extensive agriculture	Yes	Sheep, cattle and pig meat industries. Piggery feedlot and abattoir in the area.
(CAU	Catchment	Low vegetation cover (dust, sediment runoff)	Yes	urou.
×	C G	Poor access to supply	No	
盟	-	Unsustainable water extraction	Yes	Stage 3A water restrictions.
RITY		Aquifer turning saline due to high extraction		Salinity is a reported issue.
5		Hard water	No	Hardness levels are historically compliant.
R SE(		Aging or inadequate pipe work and associated infrastructure	No	Water filtration plant in use.
		Significant water losses due to leaking pipes	No	No indication of water losses.
ALI		High per capita water consumption	No	Unknown per capita water consumption.
WATER QUALITY OR SECURITY RISK (CAUSE)	e	Inappropriate water quality standards / objectives	No	Council reports to NSW Health, who use ADWG.
μ	an	Lack of infrastructure maintenance	No	
.Υ A	Governance	Poor management or governance	No	
>	ò	Vandalism / sabotage / terrorism	No	
	G	Insufficient trained personnel	No	
		Inadequate funding for maintenance or upgrades	No	
	-	Mining / minerals	Yes	Sand and gravel extraction. Concrete production.
	í	Irrigation	Yes	Irrigation for meat industries.
	Industries	Chemicals / process	Yes	Munitions production - dangerous goods, explosives, general chemicals storage, non-thermal treatment of hazardous and other waste, thermal treatment of hazardous waste (Thales Australia Limited). Thales Australia issued with a cleanup notice under their environment protection license.
	Populatio n	Seasonal population loadings	No	Tourism is a growing industry.
	Popu	Rapid population growth	No	Population growth = 1.1% between 2001 and 2006 Census, which is less than NSW population growth of 1.6% (ABS, 2009).
N X		Bacteriological and / or viral contamination	Yes	Total coliforms.
WATER QUALITY OR SECURITY RISK		Algal blooms	Yes	Incidence of blue-green algae outbreak (lasting 6 months) reported for Corowa in the Murray Regional Organisation of Councils SoE Report, 07- 08.
្អ		Heavy metal contamination	Yes	
S É	Ę	Poor chlorine residuals	Yes	Free chlorine is not measured.
R		Pesticide contamination	No	No reports of pesticide contamination.
× Ľ		High suspended solids	No	
<u> </u>	Ľ,	Boil water notices	No	No reported boil water notices.
IAL		Deaths or illness due to water quality	No	
ğ		Water restrictions (current and historic)	Yes	Stage 3A water restrictions.
Ľ.		Taste and odour issues	No	
WATE		Other contamination that would affect health	Yes	Salinity and acid sulfate soils reported to affect the Corowa Shire as reported in the Murray Regional Organisation of Councils SoE Report, 07- 08.
		Notes		

z	40		
	State/Territory	NSW	
TOWN	Town Name	Jindabyne East	
6	Town Population	2095 (NSW Health)	
	Name of Water Utility	Snowy River Shire C	ouncil
rr ≻	Council Web-Link		sw.gov.au/content/Public/Homepage.aspx
WATER UTILITY			w.gov.au/content/Fublic/Homepage.aspx
E II	Rate (\$/kL)	\$1.61/kL	
$\leq \supset$	Per Capita Water Consumption (L/day)	Unknown	
	Number of Connections		er Shire Council system), DWE Annual Performance Report 07-08
무눈	Catchment	Southern Rivers	
₹ d	Sub-Catchment	-	
누음	Catchment Management Authority (CMA)	Southern Rivers	
E S	CMA Web-Link	www.southern.cma.nsw.g	<u>ov.au</u>
CATCHMENT AND WATER SUPPLY	Catchment Protection Status	None. Some of the ur	ostream area is the Snowy Mountains National Park.
ATC	Potable Water Source(s)	Lake Jindabyne (surf	
A N	Supply Capacity		ted to potable in 07-08.
	Treatment Plant(s)	No	
	Level of Treatment	-	lion
		Chlorination, fluoridat	
	Drinking Water Guidelines	ADWG (Council repo	
	NSW		cation: Supply System SR02
	% compliance for water quality parameters	E. coli	96
	achieving < 100%, 2003-2004	pН	50
	achieving < 100%, 2003-2004	Total Coliforms	61
	Parameter(s) tested and number of samples ( ) 2003-2004	(2), Chloride (2), Chr Fluoride (daily WSA) Magnesium (2), Man Nitrite (2), pH (2), Se	ony (2), Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium omium (2), Copper (2), Cyanide (2), E.Coli (49), Fluoride (12), (365), Fluoride (weekly WSA) (108), Iodine (2), Iron (2), Lead (2), ganese (2), Mercury (2), Molybdenum (2), Nickel (2), Nitrate (2), lenium (2), Silver (2), Sodium (2), Sulfate (2), Total Coliforms (49) s (TDS) (2), Total Hardness as CaCO3 (2), True Colour (1), 98
	% compliance for water quality parameters		92
	achieving < 100%, 2004-2005	Fluoride (weekly WS	84
		Total Coliforms	84 ony (1), Arsenic (1), Barium (1), Boron (1), Cadmium (1), Calcium
	Parameter(s) tested and number of samples ( ) 2004-2005	WSA) (365), Fluoride (1), Manganese (1), I (1), Selenium (1), Silv Dissolved Solids (TD	omium (1), Copper (1), E.Coli (50), Fluoride (0), Fluoride (daily e (weekly WSA) (108), Iodine (1), Iron (1), Lead (1), Magnesium Mercury (1), Molybdenum (1), Nickel (1), Nitrate (1), Nitrite (1), pH ver (1), Sodium (1), Sulfate (1), Total Coliforms (50), Total IS) (1), Total Hardness as CaCO3 (1), True Colour (1), Turbidity
		E. coli	98
		Fluoride (daily WSA)	62
	% compliance for water quality parameters	Fluoride (weekly WS	59
	achieving < 100%, 2005-2006	Fluoride Ratio	25
	achieving < 100%, 2005-2000	рH	50
		Total Coliforms	92
≥		Turbidity	50
WATER QUALITY	Parameter(s) tested and number of samples ( ) 2005-2006	(2), Chloride (2), Chr WSA) (223), Fluoride	ony (2), Arsenic (2), Barium (2), Boron (2), Cadmium (2), Calcium omium (2), Copper (2), E.Coli (51), Fluoride (12), Fluoride (daily a (field result WSA) (5), Fluoride (weekly WSA) (39), Fluoride ron (2), Lead (2), Magnesium (2), Manganese (2), Mercury (2),
		Sodium (2), Sulfate ( Hardness as CaCO3	kel (2), Nitrate (2), Nitrite (2), pH (2), Selenium (2), Silver (2), 2), Total Coliforms (51), Total Dissolved Solids (TDS) (2), Total (2), True Colour (2), Turbidity (2), Zinc (2)
		Sodium (2), Sulfate (2)	kel (2), Nitrate (2), Nitrite (2), pH (2), Selenium (2), Silver (2), 2), Total Coliforms (51), Total Dissolved Solids (TDS) (2), Total
		Sodium (2), Sulfate ( Hardness as CaCO3	kel (2), Nitrate (2), Nitrite (2), pH (2), Selenium (2), Silver (2), 2), Total Coliforms (51), Total Dissolved Solids (TDS) (2), Total (2), True Colour (2), Turbidity (2), Zinc (2)
	% compliance for water quality parameters	Sodium (2), Sulfate ( Hardness as CaCO3 E. coli Fluoride (daily WSA)	kel (2), Nitrate (2), Nitrite (2), pH (2), Selenium (2), Silver (2), 2), Total Coliforms (51), Total Dissolved Solids (TDS) (2), Total (2), True Colour (2), Turbidity (2), Zinc (2) <u>96</u> 69
	% compliance for water quality parameters achieving < 100%, 2006-2007	Sodium (2), Sulfate ( Hardness as CaCO3 E. coli Fluoride (daily WSA) Fluoride (weekly WS	kel (2), Nitrate (2), Nitrite (2), pH (2), Selenium (2), Silver (2), 2), Total Coliforms (51), Total Dissolved Solids (TDS) (2), Total (2), True Colour (2), Turbidity (2), Zinc (2) <u>96</u> 69
		Sodium (2), Sulfate ( Hardness as CaCO3 E. coli Fluoride (daily WSA) Fluoride (weekly WS Fluoride Ratio	kel (2), Nitrate (2), Nitrite (2), pH (2), Selenium (2), Silver (2), 2), Total Coliforms (51), Total Dissolved Solids (TDS) (2), Total (2), True Colour (2), Turbidity (2), Zinc (2) 96 69 64 73
		Sodium (2), Sulfate (: Hardness as CaCO3 E. coli Fluoride (daily WSA) Fluoride (weekly WS Fluoride Ratio pH	kel (2), Nitrate (2), Nitrite (2), pH (2), Selenium (2), Silver (2), 2), Total Coliforms (51), Total Dissolved Solids (TDS) (2), Total (2), True Colour (2), Turbidity (2), Zinc (2) 96 69 64 73 67
		Sodium (2), Sulfate (: Hardness as CaCO3 E. coli Fluoride (daily WSA) Fluoride Ratio pH Total Coliforms Aluminium (3), Antim (3), Chloride (3), Chr WSA) (359), Fluoride Ratio (11), Iodine (3), Molybdenum (3), Nifate (: Sodium (3), Sulfate (:	kel (2), Nitrate (2), Nitrite (2), pH (2), Selenium (2), Silver (2), 2), Total Coliforms (51), Total Dissolved Solids (TDS) (2), Total (2), True Colour (2), Turbidity (2), Zinc (2) 96 69 64 73
	achieving < 100%, 2006-2007 Parameter(s) tested and number of	Sodium (2), Sulfate (: Hardness as CaCO3 E. coli Fluoride (daily WSA) Fluoride Ratio pH Total Coliforms Aluminium (3), Antim (3), Chloride (3), Chr WSA) (359), Fluoride Ratio (11), Iodine (3), Molybdenum (3), Nifate (: Sodium (3), Sulfate (:	kel (2), Nitrate (2), Nitrite (2), pH (2), Selenium (2), Silver (2), 2), Total Coliforms (51), Total Dissolved Solids (TDS) (2), Total (2), True Colour (2), Turbidity (2), Zinc (2) 96 69 64 73 67 79 ony (3), Arsenic (3), Barium (3), Boron (3), Cadmium (3), Calcium omium (3), Copper (3), E.Coli (53), Fluoride (11), Fluoride (daily e (field result WSA) (11), Fluoride (weekly WSA) (47), Fluoride (3), Lead (3), Magnesium (3), Manganese (3), Mercury (3), kel (3), Nitrate (3), Nitrite (3), pH (3), Selenium (3), Silver (3), 3), Total Coliforms (53), Total Dissolved Solids (TDS) (3), Total
	achieving < 100%, 2006-2007 Parameter(s) tested and number of	Sodium (2), Sulfate (: Hardness as CaCO3 E. coli Fluoride (daily WSA) Fluoride (weekly WS Fluoride Ratio pH Total Coliforms Aluminium (3), Antim (3), Chloride (3), Chr WSA) (359), Fluoride Ratio (11), Iodine (3), Molybdenum (3), Nic Sodium (3), Sulfate (: Hardness as CaCO3 E. coli	kel (2), Nitrate (2), Nitrite (2), pH (2), Selenium (2), Silver (2), 2), Total Coliforms (51), Total Dissolved Solids (TDS) (2), Total (2), True Colour (2), Turbidity (2), Zinc (2) 96 64 64 73 67 79 ony (3), Arsenic (3), Barium (3), Boron (3), Cadmium (3), Calcium omium (3), Copper (3), E.Coli (53), Fluoride (11), Fluoride (daily e (field result WSA) (11), Fluoride (weekly WSA) (47), Fluoride Iron (3), Lead (3), Magnesium (3), Manganese (3), Mercury (3), kel (3), Nitrate (3), Nitrite (3), pH (3), Selenium (3), Silver (3), 3), Total Coliforms (53), Total Dissolved Solids (TDS) (3), Total (3), True Colour (3), Turbidity (3), Zinc (3)
	Achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007	Sodium (2), Sulfate (; Hardness as CaCO3 E. coli Fluoride (daily WSA) Fluoride (weekly WS Fluoride Ratio pH Total Coliforms Aluminium (3), Antim (3), Chloride (3), Chr WSA) (359), Fluoride Ratio (11), Iodine (3), Nic Sodium (3), Sulfate (; Hardness as CaCO3 E. coli Fluoride (daily WSA)	kel (2), Nitrate (2), Nitrite (2), pH (2), Selenium (2), Silver (2), 2), Total Coliforms (51), Total Dissolved Solids (TDS) (2), Total (2), True Colour (2), Turbidity (2), Zinc (2) 96 69 64 73 67 79 ony (3), Arsenic (3), Barium (3), Boron (3), Cadmium (3), Calcium omium (3), Copper (3), E.Coli (53), Fluoride (11), Fluoride (daily e (field result WSA) (11), Fluoride (weekly WSA) (47), Fluoride (ron (3), Lead (3), Magnesium (3), Manganese (3), Mercury (3), kel (3), Nitrate (3), Nitrite (3), pH (3), Selenium (3), Silver (3), 3), Total Coliforms (53), Total Dissolved Solids (TDS) (3), Total (3), True Colour (3), Turbidity (3), Zinc (3) 96
	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters	Sodium (2), Sulfate (; Hardness as CaCO3 E. coli Fluoride (daily WSA) Fluoride (weekly WS Fluoride Ratio pH Total Coliforms Aluminium (3), Antim (3), Chloride (3), Chr WSA) (359), Fluoride Ratio (11), Iodine (3), Molybdenum (3), Nic Sodium (3), Sulfate (; Hardness as CaCO3 E. coli Fluoride (daily WSA) Fluoride (field result	kel (2), Nitrate (2), Nitrite (2), pH (2), Selenium (2), Silver (2), 2), Total Coliforms (51), Total Dissolved Solids (TDS) (2), Total (2), True Colour (2), Turbidity (2), Zinc (2) 96 69 64 73 67 79 ony (3), Arsenic (3), Barium (3), Boron (3), Cadmium (3), Calcium omium (3), Copper (3), E.Coli (53), Fluoride (11), Fluoride (daily (field result WSA) (11), Fluoride (weekly WSA) (47), Fluoride Iron (3), Lead (3), Magnesium (3), Manganese (3), Mercury (3), kel (3), Nitrate (3), Nitrite (3), pH (3), Selenium (3), Silver (3), 3), Total Coliforms (53), Total Dissolved Solids (TDS) (3), Total (3), True Colour (3), Turbidity (3), Zinc (3) 96 75 91
	Achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007	Sodium (2), Sulfate (; Hardness as CaCO3 E. coli Fluoride (daily WSA) Fluoride (daily WSA) Fluoride Ratio pH Total Coliforms Aluminium (3), Antim (3), Chloride (3), Chr WSA) (359), Fluoride Ratio (11), Iodine (3), Molybdenum (3), Nic Sodium (3), Sulfate (; Hardness as CaCO3 E. coli Fluoride (daily WSA) Fluoride (field result Fluoride (field result	kel (2), Nitrate (2), Nitrite (2), pH (2), Selenium (2), Silver (2), 2), Total Coliforms (51), Total Dissolved Solids (TDS) (2), Total (2), True Colour (2), Turbidity (2), Zinc (2) 96 69 64 73 67 79 ony (3), Arsenic (3), Barium (3), Boron (3), Cadmium (3), Calciun omium (3), Copper (3), E.Coli (53), Fluoride (11), Fluoride (daily e (field result WSA) (11), Fluoride (weekly WSA) (47), Fluoride (10), Lead (3), Magnesium (3), Manganese (3), Mercury (3), kel (3), Nitrate (3), Nitrite (3), pH (3), Selenium (3), Silver (3), 3), Total Coliforms (53), Total Dissolved Solids (TDS) (3), Total (3), True Colour (3), Turbidity (3), Zinc (3) 96 91 63
	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters	Sodium (2), Sulfate (: Hardness as CaCO3 E. coli Fluoride (daily WSA) Fluoride (atily WSA) Fluoride Ratio pH Total Coliforms Aluminium (3), Antim (3), Chloride (3), Chr WSA) (359), Fluoride Ratio (11), Iodine (3), Molybdenum (3), Nic Sodium (3), Sulfate (: Hardness as CaCO3 E. coli Fluoride (daily WSA) Fluoride (ifield result Fluoride (weekly WS Fluoride Ratio	kel (2), Nitrate (2), Nitrite (2), pH (2), Selenium (2), Silver (2), 2), Total Coliforms (51), Total Dissolved Solids (TDS) (2), Total (2), True Colour (2), Turbidity (2), Zinc (2) 96 69 64 73 67 79 ony (3), Arsenic (3), Barium (3), Boron (3), Cadmium (3), Calciun omium (3), Copper (3), E.Coli (53), Fluoride (11), Fluoride (daily e (field result WSA) (11), Fluoride (weekly WSA) (47), Fluoride Iron (3), Lead (3), Magnesium (3), Manganese (3), Mercury (3), kel (3), Nitrate (3), Nitrite (3), pH (3), Selenium (3), Silver (3), 3), Total Coliforms (53), Total Dissolved Solids (TDS) (3), Total (3), True Colour (3), Turbidity (3), Zinc (3) 96 75 91 63 60
	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters	Sodium (2), Sulfate (: Hardness as CaCO3 E. coli Fluoride (daily WSA) Fluoride Ratio pH Total Coliforms Aluminium (3), Antim (3), Chloride (3), Chr WSA) (359), Fluoride Ratio (11), Iodine (3), Molybdenum (3), Niti Sodium (3), Sulfate (: Hardness as CaCO3 E. coli Fluoride (daily WSA) Fluoride (field result Fluoride (meekly WS Fluoride Ratio pH	kel (2), Nitrate (2), Nitrite (2), pH (2), Selenium (2), Silver (2), 2), Total Coliforms (51), Total Dissolved Solids (TDS) (2), Total (2), True Colour (2), Turbidity (2), Zinc (2) 96 64 63 64 73 67 79 ony (3), Arsenic (3), Barium (3), Boron (3), Cadmium (3), Calcium omium (3), Copper (3), E.Coli (53), Fluoride (11), Fluoride (daily e (field result WSA) (11), Fluoride (weekly WSA) (47), Fluoride Iron (3), Lead (3), Magnesium (3), Manganese (3), Mercury (3), kel (3), Nitrate (3), Nitrite (3), pH (3), Selenium (3), Silver (3), 3), Total Coliforms (53), Total Dissolved Solids (TDS) (3), Total (3), True Colour (3), Turbidity (3), Zinc (3) 96 75 91 63 60 67
	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples ( ) 2006-2007 % compliance for water quality parameters	Sodium (2), Sulfate (; Hardness as CaCO3 Fluoride (daily WSA) Fluoride (daily WSA) Fluoride Ratio pH Total Coliforms Aluminium (3), Antim (3), Chloride (3), Chr WSA) (359), Fluoride Ratio (11), Iodine (3), Molybdenum (3), Nic Sodium (3), Sulfate (; Hardness as CaCO3 E. coli Fluoride (daily WSA) Fluoride (ato (3), Notim (3), Chloride (3), Chr WSA) (283), Fluoride Ratio (10), Iodine (3), Molybdenum (3), Nic Sodium (3), Sulfate (;	kel (2), Nitrate (2), Nitrite (2), pH (2), Selenium (2), Silver (2), 2), Total Coliforms (51), Total Dissolved Solids (TDS) (2), Total (2), True Colour (2), Turbidity (2), Zinc (2) 96 69 64 73 67 79 ony (3), Arsenic (3), Barium (3), Boron (3), Cadmium (3), Calciun omium (3), Copper (3), E.Coli (53), Fluoride (11), Fluoride (daily (field result WSA) (11), Fluoride (weekly WSA) (47), Fluoride Iron (3), Lead (3), Magnesium (3), Manganese (3), Mercury (3), kel (3), Nitrate (3), Nitrite (3), pH (3), Selenium (3), Silver (3), 3), Total Coliforms (53), Total Dissolved Solids (TDS) (3), Total (3), True Colour (3), Turbidity (3), Zinc (3) 96 75 91 63 60 60 67 90 ony (3), Arsenic (3), Barium (3), Boron (3), Cadmium (3), Calciun omium (3), Copper (3), E.Coli (52), Fluoride (12), Fluoride (daily e (field result WSA) (11), Fluoride (weekly WSA) (43), Fluoride Iron (3), Lead (3), Magnesium (3), Manganese (3), Mercury (3), kel (3), Nitrate (3), Nitrite (3), pH (3), Selenium (3), Silver (3), 3), Total Coliforms (52), Total Dissolved Solids (TDS) (3), Total 60 60 67 90 60 67 90 60 67 90 60 67 90 61 63 60 63 60 64 67 90 63 64 60 67 90 63 64 64 67 90 64 67 90 63 64 64 67 90 63 64 64 67 90 64 67 90 75 91 75 91 75 91 75 91 75 91 75 91 75 91 75 91 75 91 75 91 75 75 91 75 75 91 75 75 75 75 75 75 75 75 75 75
	achieving < 100%, 2006-2007 Parameter(s) tested and number of samples () 2006-2007 % compliance for water quality parameters achieving < 100%, 2007-2008 Parameter(s) tested and number of	Sodium (2), Sulfate (; Hardness as CaCO3 Fluoride (daily WSA) Fluoride (daily WSA) Fluoride Ratio pH Total Coliforms Aluminium (3), Antim (3), Chloride (3), Chr WSA) (359), Fluoride Ratio (11), Iodine (3), Molybdenum (3), Nic Sodium (3), Sulfate (; Hardness as CaCO3 E. coli Fluoride (daily WSA) Fluoride (ato (3), Notim (3), Chloride (3), Chr WSA) (283), Fluoride Ratio (10), Iodine (3), Molybdenum (3), Nic Sodium (3), Sulfate (;	kel (2), Nitrate (2), Nitrite (2), pH (2), Selenium (2), Silver (2), 2), Total Coliforms (51), Total Dissolved Solids (TDS) (2), Total (2), True Colour (2), Turbidity (2), Zinc (2) 96 69 64 73 67 79 00ny (3), Arsenic (3), Barium (3), Boron (3), Cadmium (3), Calciun omium (3), Copper (3), E.Coli (53), Fluoride (11), Fluoride (daily e (field result WSA) (11), Fluoride (weekly WSA) (47), Fluoride Iron (3), Lead (3), Magnesium (3), Manganese (3), Mercury (3), kel (3), Nitrate (3), Nitrite (3), pH (3), Selenium (3), Silver (3), 3), Total Coliforms (53), Total Dissolved Solids (TDS) (3), Total (3), True Colour (3), Turbidity (3), Zinc (3) 96 75 91 63 60 60 67 90 ony (3), Arsenic (3), Barium (3), Boron (3), Cadmium (3), Calciun omium (3), Copper (3), E.Coli (52), Fluoride (12), Fluoride (daily e (field result WSA) (11), Fluoride (weekly WSA) (43), Fluoride (10), Arsenic (3), Barium (3), Boron (3), Cadmium (3), Calciun omium (3), Copper (3), E.Coli (52), Fluoride (12), Fluoride (daily e (field result WSA) (11), Fluoride (weekly WSA) (43), Fluoride (10), Lead (3), Magnesium (3), Manganese (3), Mercury (3), kel (3), Nitrate (3), Nitrite (3), pH (3), Selenium (3), Silver (3),

WATER	× 	Proportion of Potable Water Supplied to Households (%)	Unknown	
ATI A	<u>ב</u>	Distance from the Coast (km)	130km	
≥i	й И	Climate		rn Rivers CMA, 2009)
		Average Annual Rainfall		oM station number 071021 Jindabyne (Lynwood), period 2004-2008)
		FACTOR	YES / NO	NOTES / EXPLANATION
			Yes	Classified as 'In Drought' according to NSW DPI Drought Map
		Drought	res	October 2009.
		Single drinking water source	Yes	
		Poor quality water source	No	Alpine region, lake/surface water supply.
		Sewage overflow or disposal into water	Yes	Media reports to suggest sewer overflow into supply.
	Š	Flooding	No	
	ddn	Fauna defecating in supply	Yes	Surface water storage.
	Š	Fauna destroying water intake structures	No	
	Catchment and Water Supply	Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)	No	Compliance with natural mineral pollutants is good.
	pue	Un-lined landfills		
WATER QUALITY OR SECURITY RISK (CAUSE)	nt a	Extensive agriculture	No	
AL	me	Low vegetation cover (dust, sediment	No	
) X	tch	Poor access to supply	No	
Ň	Ca	Unsustainable water extraction	Yes	Visible draw down in the lake.
х К		Aquifer turning saline due to high		
ST.		Hard water		
IJ,		Aging or inadequate pipe work and	No	Last augmented/upgraded in 2007 (DWE, 07-08)
ы		associated infrastructure	NO	
2		Significant water losses due to leaking		
õ	Governance	High per capita water consumption		
Ę		Inappropriate water quality standards /	No	Council reports to NSW Health who use ADWG.
IAL		objectives		Council reports to NSW Treatth who use ADWG.
ğ		Lack of infrastructure maintenance	No	
ËR		Poor management or governance	No	
/AT	õ	Vandalism / sabotage / terrorism	No	
5	-	Insufficient trained personnel		
		Inadequate funding for maintenance or upgrades		
	es	Mining / minerals	No	
	Industries	Irrigation	No	
	pul	Chemicals / process	No	
	opulation	Seasonal population loadings	Yes	Alpine region. Highly seasonal- winter peak.
	Popul	Rapid population growth	No	1.1% (Regional SoE Report)
~		Bacteriological and / or viral contamination	Yes	Ecoli non-compliances.
WATER QUALITY OR SECURITY		Algal blooms	No	None recorded on the DWE website as of 16th November 2009.
SC		Heavy metal contamination	No	No record of heavy metals in water quality results.
US É	Ę	Poor chlorine residuals		Free chlorine not tested.
SR 01	ц	Pesticide contamination	Ne	Pesticides not tested.
Σľ	Ē.	High suspended solids Boil water notices	No	Compliant for these parameters.
	L L	boil water holices	Yes	2009 alert recorded on NSW Health database. Illnesses reported in the media due to contaminated drinking
∆U∧ NO10	KISK (EFFEUL)	Deaths or illness due to water quality	Yes	ilinesses reported in the media due to contaminated drinking water.
81	-	Water restrictions (current and historic)	No	No current water restrictions.
Ē		Taste and odour issues		
MA		Other contamination that would affect		1
-		health	No	
		Notes		



## Town Profiles – VIC



Appendices Volume 2

TOWN		State/Territory	VIC		
		Town Name	Daylesford		
		Town Population		6, Urban Centre/Locality)	
с	~	Name of Water Utility	Central Highlands V		
WATER	5	Rate (\$/kL)		2 \$1.57/kL, Tier 3 \$1.96/kL	
٨A	5	Per Capita Water Consumption (L/day)		nder Stage 2 restrictions, 598L/capita/day - current unrestricted demand	
>		Number of Connections	2,589		
>		Catchment		laimed Water Supply Catchment	
<u> </u>		Sub-Catchment	River Basin - Upper	Loddon	
đ		Catchment Management Authority (CMA)	North Central Catch	ment Management Authority	
SI		• • • •			
ER		CMA Web-Link	www.nccma.vic.gov.au/		
AT		Catchment Protection Status	Proclaimed Water Supply Catchment, good condition		
3			Wombat Reservoir - 568ML Bullarto Reservoir - 219ML		
g		Potable Water Source(s)			
∠ ∠			Hepburn Reservoir		
Ż		Wallaby Creek			
CATCHMENT AND WATER SUPPLY				Entitlement - up to 916 ML in any year	
팡		Supply Consoity		Entitlement - < 5 ML per day	
AT		Supply Capacity		intitlement - < 2 ML per day	
Û				Entitlement - < 0.5ML per day tlement - < 0.4ML per day	
		Treatment Plant(s)	Daylesford WTP	uement - > 0.4ML per day	
	~	Level of Treatment		ion and Filtration (DAFF) plant with disinfection by chlorine	
ER	-	Drinking Water Guidelines	Australian Drinking	Water Guidelines (2004) and Safe Drinking Water Regulations (2005)	
WATER	IAL		E. Coli	Complied (100%)	
Š	ช	Results (% compliance for the 07-08	E. Coll Heavy Metals	100%	
		reporting period)	pH	Complied (based on overall average)	
				Started 17/12/06	
		Current Water Restrictions		http://www.ourwater.vic.gov.au/saving/restrictions	
WATER	£	Proportion of Potable Water Supplied to			
Ë	¥.	Households (%)	Residential - 51%	Industrial - 22% Concessional - 6% Non Revenue - 21%	
٨N	U U	Distance from the Coast (km)	Approx 100km Sout	h	
_	S	Climate	Temperate	ai	
		Average Annual Rainfall	579.5mm		
		FACTOR	YES / NO	NOTES / EXPLANATION	
	1		1207110	Majority of Victoria experiencing drought (or Exceptional Circumstances, whereby	
		Drought	YES	farmers can apply for rebates)	
			-	http://www.daff.gov.au/agriculture-food/drought/ec/victoria	
		Single drinking water source	NO		
		Poor quality water source	NO		
		Sewage overflow or disposal into water	NO		
	yld	Flooding	-		
	dng	Fauna defecating in supply			
	5	Fauna destroying water intake structures			
	/ate	Natural mineral pollutants (e.g. uranium,	-		
Ω	5	nitrates, iron, fluoride)			
1SI	and	Un-lined landfills			
IA I	nt ;	Extensive agriculture			
0		Low vegetation cover (dust, sediment			
-	Ĕ				
ISK (	tchme	Poor access to supply			
RISK (	Catchment and Water Supply	Poor access to supply Unsustainable water extraction			
ITY RISK (	Catchme				
JHITY RISK (	Catchme	Unsustainable water extraction			
ECURITY RISK (	Catchme	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water			
	Catchme	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and			
r	Catchme	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure			
r	Catchme	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking	NO		
r	Catchme	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking	NO		
r		Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipoo High per capita water consumption Inappropriate water quality standards /	NO		
r		Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking rised High per capita water consumption Inappropriate water quality standards / objectives			
r		Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking high per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance			
r		Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance			
WATER QUALITY OR SECURITY RISK (CAUSE)	Governance	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism	NO		
r		Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking ninaperopriate water consumption Inappropriate water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel	NO ?		
с		Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking high per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or	NO		
с	Governance	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking ninaperopriate water consumption Inappropriate water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel	NO ?		
r	Governance	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking binac High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals	NO ? NO NO		
r	Governance	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking high per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation	NO ? NO NO NO		
r	Industrie Governance (	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking binac High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals	NO ? NO NO		
r	Industrie Governance (	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking high per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation	NO ? NO NO NO		
r	Industrie Governance (	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process	NO ? NO NO NO		
r	Industrie Governance (	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking nappropriate water consumption Inappropriate water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings	NO ? NO NO NO NO	Decline in Population between 2001 and 2006	
r	Governance	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process	NO ? NO NO NO	Decline in Population between 2001 and 2006	
r	Industrie Governance (	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking high per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth	NO ? NO NO NO NO		
	Population Industrie Governance	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking high per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Bacteriological and / or viral contamination	NO ? NO NO NO NO YES	Decline in Population between 2001 and 2006 Detection of E. coli in basin	
	Population Industrie Governance	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Significant water losses due to leaking associated infrastructure Significant water losses due to leaking associated infrastructure High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Insufficient rained personnel Insufficient rained personnel Insufficient rained set so Wining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Bacteriological and / or viral contamination Algal blooms	NO ? NO NO NO NO NO YES NO		
	Population Industrie Governance	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking nappopriate water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Bacteriological and / or viral contamination Algal blooms Heavy metal contamination	NO ? NO NO NO NO YES NO NO		
	Population Industrie Governance	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking nappropriate water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Bacteriological and / or viral contamination Algal blooms Heavy metal contamination Poor chlorine residuals	NO ? NO NO NO NO YES NO NO NO		
WATER QUALITY OR	Population Industrie Governance	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Significant water losses due to leaking associated infrastructure Significant water losses due to leaking associated infrastructure Name of the second second second High per capita water consumption Inappropriate water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Bacteriological and / or viral contamination Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination	NO ? NO NO NO NO YES NO NO NO NO NO NO NO NO NO NO		
	Population Industrie Governance	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking nappropriate water consumption Inappropriate water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Bacteriological and / or viral contamination Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination Boil water notices	NO ? NO NO NO NO NO YES NO NO NO NO NO NO		
r	Population Industrie Governance	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Significant water losses due to leaking associated infrastructure Significant water losses due to leaking associated infrastructure Name of the second second second High per capita water consumption Inappropriate water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Bacteriological and / or viral contamination Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination	NO ? NO NO NO NO YES NO NO NO NO NO NO NO NO NO NO		

<u><u> </u></u>	Other contamination that would affect health	YES	Sodium bisulfite entered water supply due to mislabelled chemical. Central Highlands Water advised that, in relation to the sodium bisulfite incident at the Daylesford treatment plant, the issue was due to mislabelled water treatment chemical being delivered to the treatment plant. The product was relabelled from the chemical manufacturer to the chemical distributor. Although a small amount of the product was dosed into the drinking water, no health risk was evident. The incident had prompted corrective action by the chemical distributor, to no longer rename and relabel the product.
Notes		system is approxima	orical inflow averages, the current likelihood of water restrictions in the Daylesford tely 1 in 7 years (86% reliability of supply). While using a continued low inflow ctions are likely to occur approximately 1 in every 4 years (74% reliability of supply).

Town	#	4

	42	State/Territory	VIC		
TOWN		Town Name	Maryborough		
1 D		Town Population	7,692 (Census 2006, Urban Centre	e/Locality)	
뜺	<u>-</u>	Name of Water Utility	Central Highlands Water		
WATER	2	Rate (\$/kL) Per Capita Water Consumption (L/day)	Tier 1 \$1.30/kL, Tier 2 \$1.57/kL, Ti 398L/day - under stage 2 restriction	er 3 \$1.96/kL ns, 586L/day - current unrestricted demand	
3 5	D	Number of Connections	5,400	· · ·	
LY		Catchment	Loddon River (Laanecoorie) - Proclaimed Water Supply Catchment		
CATCHMENT AND WATER SUPPLY		Sub-Catchment Catchment Management Authority (CMA)	River Basin - Upper Loddon North Central Catchment Management Authority		
Catchment Management Authonity (CMA) North Central Catch		www.nccma.vic.gov.au/			
Ë		Catchment Protection Status	Proclaimed Water Supply Catchme	ent, Poor to Moderate condition.	
Evansford - 1351ML					
2		Potable Water Source(s)	Talbot Reservoir - 846ML Tullaroop Reservoir - 1200ML		
Æ			Centenary Reservoir - 180ML Combined Annual Entitlement - Up to 300 ML in any year		
L L					
Ę			Evansford - < 6 ML per day		
10 L		Supply Capacity	Talbot Reservoir - < 2 ML per day Tullaroop Reservoir - 600 - 1200 ML/annum		
S			Centenary Reservoir - Holding bas		
		Treatment Plant(s)	Maryborough WTP	·	
≃∤	-	Level of Treatment		ration plant with disinfection by chlorine	
WATER	AL	Drinking Water Guidelines	ADWG, 2004 and SDWG, 2005 Suspended Solids	Did not comply	
≥ ₹	3	Results (% compliance for the 07-08	Faecal Coliforms	Did not comply 100%	
		reporting period)	THM's, TDS, Hardness and Iron	Did not comply	
	_	Current Water Restrictions	Yes, Stage 4 - started 30/04/09		
H E	F	Proportion of Potable Water Supplied to	Residential - 60% Industrial - 16%	6 Concessional - 4% Non Revenue - 20%	
ATE	į	Households (%) Distance from the Coast (km)	Approx 150km south-east		
WATER	П Л	Climate	Temperate		
		Average Annual Rainfall	524 mm		
		FACTOR	YES / NO	NOTES / EXPLANATION Severe drought conditions continued across Central Highland Water's area of operation dur	
		Drought	YES	2007–08. This created challenges to maintaining water quality with low reservoir levels, emergency supplies and limited resource for mains cleaning programs.	
		Single drinking water source	NO		
		Poor quality water source	YES		
	Supply	Sewage overflow or disposal into water	NO		
	Sup	Flooding Fauna defecating in supply			
	Catchment and Water	Fauna destroying water intake structures			
	Š	Natural mineral pollutants (e.g. uranium,	YES	Iron levels did not comply with standards.	
(;	and	nitrates, iron, fluoride) Un-lined landfills	NO		
JSE	ent	Extensive agriculture	NO		
CAI	Ĕ	Low vegetation cover (dust, sediment runoff)			
SK (	Cato	Poor access to supply			
R	Ŭ	Unsustainable water extraction			
ΥLIX		Aquifer turning saline due to high extraction Hard water	YES	Hardness testing did not meet standards.	
SUR		Aging or inadequate pipe work and	163		
SEC		associated infrastructure			
DR (		Significant water losses due to leaking pipes			
Σ		High per capita water consumption Inappropriate water quality standards /	NO		
		objectives	NO		
'nα	nce	Lack of infrastructure maintenance	Unknown	Issues associated with not having sufficient water for flushing	
ER 0	irna			mains	
WATER QUALITY OR SECURITY RISK (CAUSE)	Governance	Poor management or governance Vandalism / sabotage / terrorism	NO NO		
\$	U	Insufficient trained personnel	Unknown		
		Inadequate funding for maintenance or			
	10	upgrades			
	Industries	Mining / minerals	NO		
	dust	Irrigation	NO		
	ln	Chemicals / process	NO		
	Population	Seasonal population loadings			
	Popu	Rapid population growth	NO		
≿		Bacteriological and / or viral contamination	YES	Detection of E. coli at Talbot break tank, Tank dosed with sodium hypochlorite and then re-	
WATER QUALITY OR SECURITY		Algal blooms	YES	Centenary reservoir taken offline for a total of 13 days during the reporting period due to blu green algae break-outs. In each instance algaecide dosing used to correct problem.	
SE	5	Heavy metal contamination	NO		
NOF	Ξ.	Poor chlorine residuals Pesticide contamination	NO		
Σ	Ē.	Boil water notices	NO		
JAL.	Ś	Deaths or illness due to water quality	NO		
JO L	r	Water restrictions (current and historic)	YES	Stage 4 - started 30/04/09.	
ER		Taste and odour issues	NO	Unknown	
WAT		Other contamination that would affect health	YES	Elevated trihalomethanes - Issue lasted 112 days. Chloramination plant commissioned after reporting period (November 2008).	
		Notes		rators have been used at Tullaroop Reservoir to help improve water quality and prevent alg a permanent aeration system to help improve source water quality.	

Ę		State/Territory	VIC	
TOWN		Town Name	Warracknabeal	
Ĕ		Town Population	2,490 (Census 2006, Urba	an Centre/Locality)
$\sim$ >	-	Name of Water Utility	Grampians Wimmera Ma	llee Water
WATER		Rate (\$/kL)	\$1.30/kL - fully treated wa	
. ₹ Ħ	1	Per Capita Water Consumption (L/day)	Unknown	
≤ ⊃	)	Number of Connections	Unknown	
		Catchment	Wimmera	
Δ、		Sub-Catchment	Not within a designated c	atchment
∖	5	Catchment Management Authority (CMA)	Wimmera Catchment Mar	
ĒĔ	CMA Web-Link		http://wcma.vic.gov.au	
සු ස්	5	Catchment Protection Status	None.	
CATCHMENT AND WATER SUPPLY		Potable Water Source(s)		Mallee channel system - now supplied by the Wimmera Mallee Pipeline improvements).
		Supply Capacity	Unknown	
	_	Treatment Plant(s)	Warracknabeal WTP	
E E		Level of Treatment		dissolved air flotation, filtration, disinfection, pH correction.
AT		Drinking Water Guidelines		Guidelines (2004) and Safe Drinking Water Regulations (2005)
WATER	ý	Results (% compliance for the 07-08	E.Coli	100%
		reporting period)	Aluminium and THM's	Did not comply with standards
		Current Water Restrictions	Yes Stage 4 - Started	10/02/09
		Proportion of Potable Water Supplied to	Unknown	
E E		Households (%)	ONNIOWI	
NO.	Ś	Distance from the Coast (km)	Approx 230km South	
WATER	5	Climate	Temperate	
		Average Annual Rainfall	445.6 mm	
		FACTOR	YES / NO	NOTES / EXPLANATION
			YES	Majority of Victoria experiencing drought (or Exceptional Circumstand whereby farmers can apply for rebates)
		Drought	VE0	http://www.daff.gov.au/agriculture-food/drought/ec/victoria
		Single drinking water source	YES	Based on available information
		Poor quality water source	YES	Issues with previous open channel system
	≥	source	NO	
	Supply	Flooding	NO	
	Su	Fauna defecating in supply		
	ter	Fauna destroying water intake structures		
Э́Ш	Na	Natural mineral pollutants (e.g. uranium,		
Ĵ	_p	nitrates, iron, fluoride)		
0	Catchment and Water	Un-lined landfills	NO	
¥	eui	Extensive agriculture		
SIS	Ę	runoff)		
×	atc	Poor access to supply		
LIX SIT	0	Unsustainable water extraction		
5		Aquifer turning saline due to high		
Щ		Hard water	NO	
QUALITY OR SECURITY RISK (CAUSE)		Aging or inadequate pipe work and associated infrastructure		
5		pipes		
J U		High per capita water consumption		
ð		Inappropriate water quality standards /	NO	
Ë	0	objectives		
WAT	and	Lack of infrastructure maintenance	??	
\$	Governan	Poor management or governance	NO	
	ò	Vandalism / sabotage / terrorism	NO	
	0	Insufficient trained personnel	?	
		Inadequate funding for maintenance or	NO	
		upgrades		
	itri	Mining / minerals	NO	
	Industri es	Irrigation	NO	
	Ē	Chemicals / process	NO	
	Pop ulati	Seasonal population loadings		
	Щ	Rapid population growth	NO	
		Pathogenic contamination	NO	
È		Algal blooms	NO	
R		Heavy metal contamination	NO	
i i i		Poor chlorine residuals	?	
S (I		Pesticide contamination	NO	
QUALITY OR SE RISK (EFFECT)	í	Boil water notices	NO	
ΣЩ		Deaths or illness due to water quality	NO	
55		Water restrictions (current and historic)	YES	Stage 4 - Started 10/02/09
NAL AR	5			High Salinity. As of November 2008 improvement in salinity 3,500 EC
WATER QUALITY OR SECURITY RISK (EFFECT)	-	Taste and odour issues	YES	units to less than 500 EC due to change in water supply Aluminium - caused by changes in the raw water pH as part of
WAT		Other contamination that would affect health	YES	Aluminium - caused by changes in the raw water pH as part of operational changes made to the raw water storages. Elevated Trihalomethanes.
		Notes	GWM pipeline which show	place in May 2008 to improve water quality. Town now connected to uld improve quality along with the proposed construction of new raw was complaint with THM's during last reporting period.

CATCHMENT AND WATER TOWN		State/Territory Town Name Town Population	VIC		
WATER UTILITY			Seymour		
WATER UTILITY				6, Urban Centre/Locality)	
		Name of Water Utility	Goulburn Valley Wa		
		Rate (\$/kL)	Treated Water - \$0.75/kL Raw Water - \$0.38/kL		
		Per Capita Water Consumption (L/day)	Unknown		
IT AND		Number of Connections	Unknown		
IT AND		Catchment	Goulburn Broken		
HPP		Sub-Catchment	Not within a designation	ated Catchment	
		Catabrant Management Authority (CMA)		atchment Management Authority	
SC		Catchment Management Authority (CMA)	Goulburn Broken Ca	atchinent Management Autionty	
₹E		CMA Web-Link	http://www.gbcma.v		
ATC		Catchment Protection Status		ondition is Good to Excellent.	
SG		Potable Water Source(s)	Heywoods Hill Raw Water Storage - sourced from Goulburn River		
		Supply Capacity Treatment Plant(s)	Unknown Seymour WTP		
<u> </u>		Level of Treatment	· ·	ation, up flow clarification, filtration, chlorination.	
WATER QUALITY		Drinking Water Guidelines		Water Guidelines (2004) and Safe Drinking Water Regulations (2005)	
TAL VAL			Aluminium	Exceeded guidelines	
≥ 9		Results (% compliance for 2008 reporting	pH	Exceeded guidelines	
		period)	E. Coli	100%	
		Current Water Restrictions	Yes Stage 1 - St	tarted 20/10/07	
WATER SECURITY		Proportion of Potable Water Supplied to	Unknown		
Ē		Households (%)			
MA ECI		Distance from the Coast (km)	Approx 170km Sout	h	
S. S		Climate Average Annual Rainfall	Temperate		
		FACTOR	593.4mm YES / NO	NOTES / EXPLANATION	
			TLS/NU	Majority of Victoria experiencing drought (or Exceptional Circumstances,	
		Drought	YES	whereby farmers can apply for rebates)	
				http://www.daff.gov.au/agriculture-food/drought/ec/victoria	
		Single drinking water source	YES	Based on available information	
		Poor quality water source			
	~	Sewage overflow or disposal into water	NO		
	ldd	Flooding	NO		
	Sul	Fauna defecating in supply			
	Catchment and Water Supply	Fauna destroying water intake structures			
	Na	Natural mineral pollutants (e.g. uranium,			
ω	pue	nitrates, iron, fluoride) Un-lined landfills	NO		
UALITY OR SECURITY RISK (CAUSE)	ut e	Extensive agriculture	NO		
CA	me	Low vegetation cover (dust, sediment			
×.	atch	Poor access to supply			
RIG	ö	Unsustainable water extraction			
≽		Aquifer turning saline due to high			
R		Hard water	NO		
U U		Aging or inadequate pipe work and			
S		associated infrastructure			
Ъ		Significant water losses due to leaking			
È		High per capita water consumption			
IAL		Inappropriate water quality standards /	NO		
ð	JCe	objectives			
ER	nar	Lack of infrastructure maintenance Poor management or governance	Unknown NO		
WATER QI	Governance	Vandalism / sabotage / terrorism	NO		
5	Ö	Insufficient trained personnel	Unknown		
		Inadequate funding for maintenance or			
		upgrades	NO		
	les	Mining / minerals	NO		
•	Industries	Irrigation	NO		
	pul	Chemicals / process	NO		
-					
	Population	Seasonal population loadings			
·	pul				
1	Ъ	Rapid population growth	NO	Decline in Population between 2001 and 2006	
~		Pathogenic contamination	NO		
R		Algal blooms	YES	Algal Bloom in May 2008	
D.		Heavy metal contamination	NO	<u>.</u>	
Э S		Poor chlorine residuals	?		
Кü		Pesticide contamination	NO		
× 15		Boil water notices	NO		
E II K		Deaths or illness due to water quality	NO		
WATER QUALITY OR SECURITY RISK (EFFECT)		Water restrictions (current and historic)	YES	Stage 1 - Started 20/10/07	
R C R		Taste and odour issues	YES	Complaints received after algae outbreak in May 2008 Aluminium - the non-compliance was due to a short term process control	
Ë		Other contamination that would affect	YES	issue at the water treatment plants.	
WA		health		pH exceeded ADWG.	
		Notes		1p	

5		State/Territory	VIC			
TOWN		Town Name	Castlemaine	6 Lithan Centre/Locality)		
		Town Population Name of Water Utility	7,248 (Census 200 Coliban Water	6, Urban Centre/Locality)		
WATER		Rate (\$/kL)		Step 1 - \$1.34/kL, Step 2 - \$1.62/kL, Step 3 - \$2.66/kL		
E E	-	Per Capita Water Consumption (L/day)	338 L/capita/day			
< =	2	Number of Connections	6,924 (2004/2005 p			
		Catchment	Cairn Curran - Proc			
₽≻	-	Sub-Catchment Catchment Management Authority (CMA)	River Basin - Loddo	in River South Iment Management Authority		
A T T	-	CMA Web-Link	http://www.nccma.v			
CATCHMENT AND WATER SUPPLY	2	Catchment Protection Status		Moderate condition		
Σμ	÷	Potable Water Source(s)		oir - (via Coliban Main Channel) into McCay Reservoir, via the Poverty Gully Channe		
D F A	c .		McCay Reservoir (p	rimarily used as a service reservoir)		
⊲ ≥	\$	Supply Capacity	Bulk Entitlement of supply areas)	50,260ML/annum for the Coliban Supply System (includes several other towns and		
		Treatment Plant(s)	Castlemaine WTP			
WATER QUALITY				dour / algae toxin removal, pH Correction, Disinfection, Alum / alum chlorhydrate,		
N		Level of Treatment	Activated Carbon.			
ð		Drinking Water Guidelines	Australian Drinking	Water Guidelines (2004) and Safe Drinking Water Regulations (2005)		
Ë		Results (% compliance for 2008 reporting	E.Coli	Complied		
ΔĂ		period)	Aluminium	Complied		
	_		Turbidity	Complied		
TIR		Current Water Restrictions		tarted 01/09/06 http://www.ourwater.vic.gov.au/saving/restrictions		
WATER SECURITY		Proportion of Potable Water Supplied to Households (%)	39% to Residential,	25% Rural Consumption , 17.5% Non Residential		
ER		Distance from the Coast (km)	Approx 150km Sout	th		
/AT		Climate	Temperate			
5		Average Annual Rainfall	592.7mm			
	1	FACTOR	YES / NO	NOTES / EXPLANATION Majority of Victoria experiencing drought (or Exceptional Circumstances, whereby		
		Drought	YES	farmers can apply for rebates) http://www.daff.gov.au/agriculture-food/drought/ec/victoria		
		Single drinking water source	NO	nup.//www.dan.gov.ad/aghculture=lood/drough/ec/victona		
		Poor quality water source	YES	Due to low reservoir levels		
	≥	Sewage overflow or disposal into water	NO			
	Catchment and Water Supply	Flooding	NO			
	r Sl	Fauna defecating in supply				
	ate	Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium,				
_	≥ ₽	nitrates, iron, fluoride)				
ŝ	ano	Un-lined landfills	NO			
NAU	ent	Extensive agriculture				
0	щ	Low vegetation cover (dust, sediment				
Ś	Catc	Poor access to supply Unsustainable water extraction				
£ ≻	0	Aquifer turning saline due to high extraction				
RIT		Hard water	NO			
CC		Aging or inadequate pipe work and				
SE		associated infrastructure				
OR		Significant water losses due to leaking				
Ł		High per capita water consumption	NO			
ALITY OR SECURITY RISK (CAUSE)	d)	Inappropriate water quality standards / objectives	NO			
	ance	Lack of infrastructure maintenance	Unknown			
WATER QU	emé	Poor management or governance	NO			
ATI	Governance	Vandalism / sabotage / terrorism	NO			
3	0	Insufficient trained personnel Inadeguate funding for maintenance or	Unknown			
		upgrades	NO			
	ies	Mining / minerals	NO			
	Industries	Irrigation	NO			
	Ind	Chemicals / process	NO			
	-		-			
	Population	Seasonal population loadings				
	Popt	Rapid population growth	NO			
_	_	Pathogenic contamination	NO	E.coli detected in November 2007, although re-sample was clear.		
<u>م</u> ک	2	Algal blooms	YES	Tullaroop Reservoir had blue green algae problem - although it is unclear whether		
о Н	-		NO	not this impacted upon the Castlemaine water supply.		
Ē	j	Heavy metal contamination Poor chlorine residuals	Unknown			
JAL	2	Pesticide contamination	NO			
WATER QUALITY OR SECLIRITY RISK (FEFECT)	4	Boil water notices	NO			
E L	-	Deaths or illness due to water quality	NO			
LEA	Ş	Water restrictions (current and historic) Taste and odour issues	YES YES	Stage 4 - Started 01/09/06		
S C	Ļ	Other contamination that would affect		Refer below re: Coliban notice of change in aesthetic quality.		
		health	NO			

 June 2008 - Fluoride dosing of Castlemaine's water supply started after a directive from the Department of Human Services.

 Notes
 Castlemaine also has a water reclamation plant with water provided to the golf club.

 May 2009 - Media release from Coliban about change in water quality due to low reservoir levels (advised that there may be changes to taste/odour that customers are used to.

Ş		State/Territory	VIC			
TOWN		Town Name	Hamilton			
		Town Population		sus 2006, Urban Centre/Locality)		
照 논	_	Name of Water Utility	Wannon W			
AT A	2	Rate (\$/kL) Per Capita Water Consumption (L/day)		Step 1 - \$1.60/kL, Step 2 - \$1.92/kL, Step 3 - \$2.88/kL 298 L/capita/day		
WATER	5	Number of Connections	4,898	anay		
		Catchment		Grampians		
Ř		Sub-Catchment	River Basin			
E A		Catchment Management Authority (CMA)		Glenelg Hopkins Catchment Management Authority		
Ž		CMA Web-Link	http://www.	ghcma.vic.gov.au/		
₽×	-	Catchment Protection Status		to Moderate condition.		
CATCHMENT AND WATER SUPPLY	-			ervoir, Cruckoor Reservoir, Hartwichs Reservoir		
	2	Potable Water Source(s)		ervice Basins 1 & 2		
. ₩	,	. ,		ater from the Victoria Ranges catchment (extracted from numerous small streams er flow- numerous bores		
Ċ				ater Bulk Entitlement of 3,435 ML		
S		Supply Capacity		um capacity of the supply system is approximately 12.8 ML/d		
Ŭ				guifer - 120 ML/annum		
		Treatment Plant(s)	Hamilton W			
È		Level of Treatment		, Coagulation, Flocculation, Clarification, Filtration		
٩L		Drinking Water Guidelines		Drinking Water Guidelines (2004) and Safe Drinking Water Regulations (2005)		
WATER QUALITY			E Coli	100%		
R		Results (% compliance for 2008 reporting	Aluminium			
ATI		period)	pH	Did not comply		
Ň			Iron Ammonia	Did not comply		
~	_			Did not comply		
E L		Current Water Restrictions		age 3 - Started 03/11/07		
Ľ.			For details	refer to: http://www.ourwater.vic.gov.au/saving/restrictions		
WATER SECURITY		Proportion of Potable Water Supplied to	Unknown			
2		Households (%) Distance from the Coast (km)		m South West		
Ē		Climate		m South-West		
Ň		Average Annual Rainfall	Temperate 613.3mm			
		FACTOR	YES / NO	NOTES / EXPLANATION		
				Majority of Victoria experiencing drought (or Exceptional Circumstances, where		
		Drought	YES	farmers can apply for rebates)		
				http://www.daff.gov.au/agriculture-food/drought/ec/victoria		
		Single drinking water source	NO			
		Poor quality water source	YES	Groundwater quality issues, treatment plant unable to cope.		
	Ā	Sewage overflow or disposal into water	NO			
		Flooding	NO			
	Supply	Fauna defecating in supply				
	เงิ	Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium,	-			
	and Water	nitrates, iron, fluoride)	YES	Iron exceeded guidelines.		
	Š	Un-lined landfills	NO			
Ω.	and	Extensive agriculture				
S	ut 9	Low vegetation cover (dust, sediment				
ð.	Catchment	Poor access to supply				
ž	atch	Unsustainable water extraction				
R R	ő	Aquifer turning saline due to high	Unknown			
≿		Hard water	NO			
OR SECURITY RISK (CAUSE)		A sing as in adaptuate give work and		Treatment plant is inadequate for current feed water. Action to redesign and		
ວ		Aging or inadequate pipe work and associated infrastructure	YES	reconstruct existing stream off take structures in the southern Grampians to en compliance with passing flows from 2010 (Reference: Wannon Water - Water		
S				Supply Demand Strategy)		
R		Significant water losses due to leaking				
≻		nines				
F.		High per capita water consumption	NO			
n n		Inappropriate water quality standards / objectives	NO			
2	nce	Lack of infrastructure maintenance	??			
WATER QUALIT	Governance	Poor management or governance	NO			
M	ove	Vandalism / sabotage / terrorism	NO			
	ŭ	Insufficient trained personnel	Unknown			
		Inadequate funding for maintenance or	NO			
		upgrades				
	ŝ	Mining / minerals	NO			
	Industries	Iningtion	NO			
	snp	Irrigation	NO			
	Ē	Chemicals / process	NO			
	<b>_</b>					
	Population	Seasonal population loadings	1			
	sluc		<u></u>			
	Pop	Rapid population growth	NO			
Ē		Pathogenic contamination	NO			
WATER QUALITY OR SECURITY RISK (FEFECT)	) L	Algal blooms	NO			
		Heavy metal contamination	NO			
Ē	Ţ	Poor chlorine residuals	Unknown			
AL	5	Pesticide contamination	NO			
D B	2	Boil water notices	NO			
£ ⊢		Deaths or illness due to water quality	NO			
ATI	5	Water restrictions (current and historic)	YES	Stage 3 - Started 03/11/07		
≥ C	5	Taste and odour issues	YES	70 Complaints received relating to aesthetics (0.75 complaints per 100 custome		
U.	5	Other contamination that would affect	YES	High Aluminium levels.		
				of the raw water entering the water treatment plant has deteriorated to the point		
		Notes	where it is a	outside the design specifications of the water treatment plant. Changes have sind		

State Territory         VC           Text Provider         Thornton           State Territory			Town Name	Thornton		
Name of Water Water         Southom Valley         Southom Valley Water           Section 2000         Part Explain Matter Containington (Large)         Unitional           Section 2000         Part Explain Matter Containington (Large)         Unitional           Static Calcination         Static Calcination         Static Calcination           Static Calcination         Not attrain a designated Calcination         Static Calcination           Static Calcination         Not attrain a designated Calcination         Not attrain a designated Calcination           Static Calcination         Not attrain a designated Calcination         Not attrain a designated Calcination           Static Static Calcination         Not attrain a designated Calcination         Not attrain a designated Calcination           Static Static Static Calcination         Not attrain a designated Calcination         Not attrain a designated Calcination           Provide Calcination         Provide Calcination         Not attrain a designated Calcination         Not attrain a designated Calcination           Provide Calcination         Provide Calcination         Provide Calcination         Provide Calcination           Provide Calcination         Provide Calcination         Provide Calcination         Provide Calcination           Provide Calcination         Provide Calcination         Provide Calcinatin desin and calcination         Provide Calcina						
Name of Water Water         Southom Valley         Southom Valley Water           Section 2000         Part Explain Matter Containington (Large)         Unitional           Section 2000         Part Explain Matter Containington (Large)         Unitional           Static Calcination         Static Calcination         Static Calcination           Static Calcination         Not attrain a designated Calcination         Static Calcination           Static Calcination         Not attrain a designated Calcination         Not attrain a designated Calcination           Static Calcination         Not attrain a designated Calcination         Not attrain a designated Calcination           Static Static Calcination         Not attrain a designated Calcination         Not attrain a designated Calcination           Static Static Static Calcination         Not attrain a designated Calcination         Not attrain a designated Calcination           Provide Calcination         Provide Calcination         Not attrain a designated Calcination         Not attrain a designated Calcination           Provide Calcination         Provide Calcination         Provide Calcination         Provide Calcination           Provide Calcination         Provide Calcination         Provide Calcination         Provide Calcination           Provide Calcination         Provide Calcination         Provide Calcinatin desin and calcination         Provide Calcina			Town Population			
Base (Sk1)         Base (S	WATER UTILITY		rown'r opulation	164 (Census 2006, S	State Suburb)	
Cardiomet Counter Counter Cardiomet Cardiomet Allocation Research Allocation Research Cardiomet Management Allocation Cardiomet Cardiomet Cardiomet Cardiomet Cardiomet Cardiomet Cardiometer Cardio Cardiomete	WATE			Goulburn Valley Water		
Cardiomet Counter Counter Cardiomet Cardiomet Allocation Research Allocation Research Cardiomet Management Allocation Cardiomet Cardiomet Cardiomet Cardiomet Cardiomet Cardiomet Cardiometer Cardio Cardiomete	NA.				ater)	
Cardiomet Counter Counter Cardiomet Cardiomet Allocation Research Allocation Research Cardiomet Management Allocation Cardiomet Cardiomet Cardiomet Cardiomet Cardiomet Cardiomet Cardiometer Cardio Cardiomete	د <					
Sub_Catchment         Nod with a designated Catchment (Action)           Sub_Catchment Musagement (Author) (CMA)         Column Rokes Catchment Measurement (Author)           Construction         Catchment Musagement (Author) (CMA)         Column Rokes Catchment Measurement (Author)           Sub_Catchment Management (Author) (CMA)         Column Rokes Catchment Measurement (Author)         Column Rokes Catchment (CMA)           Sub_Phy Capacity (Small Water Source)         Column Rokes Catchment (CMA)         Column Rokes Catchment (CMA)           Sub_Phy Capacity (Small Water Source)         Column Rokes Catchment (CMA)         Column Rokes Catchment (CMA)           Corrent Water Restrictions         Column Rokes Catchment (CMA)         Column Rokes Catchment (CMA)           Corrent Water Restrictions         For details refer to ritig//rww carvariar vice gov autasing/restrictions           Results (% compliance for 2008 reporting Automagement (CMR)         Corrent Water Restrictions           Results (% compliance for 2008 reporting Automagement (CMR)         Corrent Water Restrictions           Results (% compliance for 2008 reporting Automagement (CMR)         Corrent Water Restrictions           Results (% compliance for 2008 reporting Automagement (CMR)         Corrent Water Restrictions           Results (% compliance for 2008 reporting Automagement (CMR)         Corrent Water Restrictions           Results (% compliance for 2008 reporting Automagement (CMR)         Corrent Water R			Number of Connections			
Supply Cases/y         Unknown           End of Treatment Brancis         Americano           Providence If Brancis         Americano           Providence If Brancis         Americano           Providence If Brancis         Americano           Providence If Brancis         Providence If Brancis           Providence If Brancis         Providence If			Catchment	Goulburn Broken		
Supply Cases/y         Unknown           End of Treatment Brancis         Americano           Providence If Brancis         Americano           Providence If Brancis         Americano           Providence If Brancis         Americano           Providence If Brancis         Providence If Brancis           Providence If Brancis         Providence If	Ϋ́		Sub-Catchment	Not within a designation	ted Catchment	
Supply Cases/y         Unknown           End of Treatment Brancis         Americano           Providence If Brancis         Americano           Providence If Brancis         Americano           Providence If Brancis         Americano           Providence If Brancis         Providence If Brancis           Providence If Brancis         Providence If	- 빌튼 :	2	Catchment Management Authority (CMA)	Goulburn Broken Ca	tchment Management Authority	
Supply Cases/y         Unknown           End of Treatment Brancis         Americano           Providence If Brancis         Americano           Providence If Brancis         Americano           Providence If Brancis         Americano           Providence If Brancis         Providence If Brancis           Providence If Brancis         Providence If	E ≤ 2	ł	CMA Web-Link	http://www.gbcma.vi	c.gov.au/	
Supply Cases/y         Unknown           End of Treatment Brancis         Americano           Providence If Brancis         Americano           Providence If Brancis         Americano           Providence If Brancis         Americano           Providence If Brancis         Providence If Brancis           Providence If Brancis         Providence If	E g a	D'S	Catchment Protection Status	Good to Excellent		
Supply Cases/y         Unknown           End of Treatment Brancis         Americano           Providence If Brancis         Americano           Providence If Brancis         Americano           Providence If Brancis         Americano           Providence If Brancis         Providence If Brancis           Providence If Brancis         Providence If	A C		Potable Water Source(s)	Rubicon River		
Level of Treatment         Choinination           Term 1         Choining Water Guidelines (2004) and Safe Drinking Water Regulations (2005)           Provide         Provide Safe Drinking Water Guidelines (2004) and Safe Drinking Water Regulations (2005)           Provide         Provide Safe Drinking Water Guidelines (2004) and Safe Drinking Water Regulations (2005)           Provide Safe Drinking Water Safe Drinking Water Regulations (2005)         Provide Safe Drinking Water Safe Drinking Water Regulations (2005)           Provide Safe Drinking Water Safe Drinking Water Regulations (2005)         Provide Safe Drinking Water Safe Drinking Water Regulations (2005)           Provide Safe Drinking Water Safe Drinking Water Regulations (2005)         Provide Safe Drinking Water Safe Drinking Water Regulations (2005)           Provide Safe Drinking Water Safe Drinking Water Regulations (2005)         Provide Safe Drinking Water Safe Drinking Water Safe Drinking Water Regulations (2005)           Provide Safe Drinking Water Safe Drinking Water Regulations (2005)         Provide Safe Drinking Water Safe Drinking Water Regulations (2005)           Provide Safe Drinking Water Safe Drinking Water Regulations (2005)         Provide Safe Drinking Water Regulations (2005)           Safe Drinking Water Regulations (2007)         Provide Regulations (2007)         Provide Regulations (2007)           Safe Drinking Water Regulations (2007)         Provide Regulations (2007)         Provide Regulations (2007)           Safe Drinking Water Regulations (2007) <t< td=""><td></td><td></td><td>Supply Capacity</td><td>Unknown</td><td></td></t<>			Supply Capacity	Unknown		
Current Water Restrictions     Current Water Restrictions     Current Water Restrictions     Ves Stage 1- 0/11007     For details refer to http://www.ourwater.wc.gov.au/saving/restrictions     Proportion of Potable Water Supplied     Muncovn     Proportion of Potable Water Supplied     Muncovn     FACTOR     VES     VES	~		Treatment Plant(s)	Thornton WTP		
Current Water Restrictions     Current Water Restrictions     Current Water Restrictions     Ves Stage 1- 0/11007     For details refer to http://www.ourwater.wc.gov.au/saving/restrictions     Proportion of Potable Water Supplied     Muncovn     Proportion of Potable Water Supplied     Muncovn     FACTOR     VES     VES	É		Level of Treatment	Chlorination		
Current Water Restrictions     Current Water Restrictions     Current Water Restrictions     Ves Stage 1- 0/11007     For details refer to http://www.ourwater.wc.gov.au/saving/restrictions     Proportion of Potable Water Supplied     Muncovn     Proportion of Potable Water Supplied     Muncovn     FACTOR     VES     VES	Ι		Drinking Water Guidelines	Australian Drinking V	Vater Guidelines (2004) and Safe Drinking Water Regulations (2005)	
Current Water Restrictions     Current Water Restrictions     Current Water Restrictions     Ves Stage 1- 0/11007     For details refer to http://www.ourwater.wc.gov.au/saving/restrictions     Proportion of Potable Water Supplied     Muncovn     Proportion of Potable Water Supplied     Muncovn     FACTOR     VES     VES	б			E Coli	100%	
Current Water Restrictions     Current Water Restrictions     Current Water Restrictions     Ves Stage 1- 0/11007     For details refer to http://www.ourwater.wc.gov.au/saving/restrictions     Proportion of Potable Water Supplied     Muncovn     Proportion of Potable Water Supplied     Muncovn     FACTOR     VES     VES	Ř		Results (% compliance for 2008 reporting	pН		
Current Water Restrictions     Current Water Restrictions     Current Water Restrictions     Ves Stage 1- 0/11007     For details refer to http://www.ourwater.wc.gov.au/saving/restrictions     Proportion of Potable Water Supplied     Muncovn     Proportion of Potable Water Supplied     Muncovn     FACTOR     VES     VES	Ë					
Current Water Restrictions     Current Water Restrictions     Current Water Restrictions     Ves Stage 1- 0/11007     For details refer to http://www.ourwater.wc.gov.au/saving/restrictions     Proportion of Potable Water Supplied     Muncovn     Proportion of Potable Water Supplied     Muncovn     FACTOR     VES     VES	Š		penda)	Other	Attributed to high organic content of raw water	
Process         FACTOR         Invession         NOTES / EPRATION           Drought         YES         Majority of Victoria experiencing drought (or Exceptional Circumstant whereby famers can apply for rebate);           Single drinking water source         YES         Robicon River           Poor quality water source         YES         Robicon River           Poor quality water source         YES         Robicon River           Sewage overflow or disposal into water source         YES         Robicon River           Sewage overflow or disposal into water source         NO         Form 1.u) to 5 July 60 July 2007 and 24 to 27 December 2007 drinking water source           Sewage overflow or disposal into water source         NO         Form 1.u) to 5 July 60 July 6					Benzo(a)pyrene detected in raw water supply	
Process         FACTOR         Invession         NOTES / EPRATION           Drought         YES         Majority of Victoria experiencing drought (or Exceptional Circumstant whereby famers can apply for rebate);           Single drinking water source         YES         Robicon River           Poor quality water source         YES         Robicon River           Poor quality water source         YES         Robicon River           Sewage overflow or disposal into water source         YES         Robicon River           Sewage overflow or disposal into water source         NO         Form 1.u) to 5 July 60 July 2007 and 24 to 27 December 2007 drinking water source           Sewage overflow or disposal into water source         NO         Form 1.u) to 5 July 60 July 6	≿		O mark Webs Development	Yes Stage 1 - 01	/10/07	
Process         FACTOR         Invession         NOTES / EPRATION           Drought         YES         Majority of Victoria experiencing drought (or Exceptional Circumstant whereby famers can apply for rebate);           Single drinking water source         YES         Robicon River           Poor quality water source         YES         Robicon River           Poor quality water source         YES         Robicon River           Sewage overflow or disposal into water source         YES         Robicon River           Sewage overflow or disposal into water source         NO         Form 1.u) to 5 July 60 July 2007 and 24 to 27 December 2007 drinking water source           Sewage overflow or disposal into water source         NO         Form 1.u) to 5 July 60 July 6			Current Water Restrictions			
Process         FACTOR         Invession         NOTES / EPRATION           Drought         YES         Majority of Victoria experiencing drought (or Exceptional Circumstant whereby famers can apply for rebate);           Single drinking water source         YES         Robicon River           Poor quality water source         YES         Robicon River           Poor quality water source         YES         Robicon River           Sewage overflow or disposal into water source         YES         Robicon River           Sewage overflow or disposal into water source         NO         Form 1.u) to 5 July 60 July 2007 and 24 to 27 December 2007 drinking water source           Sewage overflow or disposal into water source         NO         Form 1.u) to 5 July 60 July 6	S		Proportion of Potable Water Supplied to			
Process         FACTOR         Invession         NOTES / EPRATION           Drought         YES         Majority of Victoria experiencing drought (or Exceptional Circumstant whereby famers can apply for rebate);           Single drinking water source         YES         Robicon River           Poor quality water source         YES         Robicon River           Poor quality water source         YES         Robicon River           Sewage overflow or disposal into water source         YES         Robicon River           Sewage overflow or disposal into water source         NO         Form 1.u) to 5 July 60 July 2007 and 24 to 27 December 2007 drinking water source           Sewage overflow or disposal into water source         NO         Form 1.u) to 5 July 60 July 6	ů S			Unknown		
Process         FACTOR         Invession         NOTES / EPRATION           Drought         YES         Majority of Victoria experiencing drought (or Exceptional Circumstant whereby famers can apply for rebate);           Single drinking water source         YES         Robicon River           Poor quality water source         YES         Robicon River           Poor quality water source         YES         Robicon River           Sewage overflow or disposal into water source         YES         Robicon River           Sewage overflow or disposal into water source         NO         Form 1.u) to 5 July 60 July 2007 and 24 to 27 December 2007 drinking water source           Sewage overflow or disposal into water source         NO         Form 1.u) to 5 July 60 July 6	Ľ			Approx 160km South		
Process         FACTOR         Invession         NOTES / EPRATION           Drought         YES         Majority of Victoria experiencing drought (or Exceptional Circumstant whereby famers can apply for rebate);           Single drinking water source         YES         Robicon River           Poor quality water source         YES         Robicon River           Poor quality water source         YES         Robicon River           Sewage overflow or disposal into water source         YES         Robicon River           Sewage overflow or disposal into water source         NO         Form 1.u) to 5 July 60 July 2007 and 24 to 27 December 2007 drinking water source           Sewage overflow or disposal into water source         NO         Form 1.u) to 5 July 60 July 6	Ë					
Process         FACTOR         Invession         NOTES / EPRATION           Drought         YES         Majority of Victoria experiencing drought (or Exceptional Circumstant whereby famers can apply for rebate);           Single drinking water source         YES         Robicon River           Poor quality water source         YES         Robicon River           Poor quality water source         YES         Robicon River           Sewage overflow or disposal into water source         YES         Robicon River           Sewage overflow or disposal into water source         NO         Form 1.u) to 5 July 60 July 2007 and 24 to 27 December 2007 drinking water source           Sewage overflow or disposal into water source         NO         Form 1.u) to 5 July 60 July 6	A N					
Bond Part Part Part Part Part Part Part Part					ΝΟΤΕς / ΕΥΡΙ ΑΝΑΤΙΟΝ	
Understand         Drought         YES         whereby fammers can apply for interbeds)           Single drinking water source         YES         Rubicon River           Poor quality water source         YES         Rubicon River           Sewage overflow or disposal into water source         NO         -           Sewage overflow or disposal into water source         NO         -           Florent 1. July to 5. July 2007 and 24 to 27 December 2007 drinking water source         NO           Florent 1. July to 5. July 2007 and 24 to 27 December 2007 drinking water source         NO           Florent 1. July to 5. July 2007 and 24 to 27 December 2007 drinking water source         NO           Florent 1. July to 5. July 2007 and 24 to 27 December 2007 drinking water source         NO           Florent 1. July to 5. July 2007 and 24 to 27 December 2007 drinking water source         NO           Florent 1. July to 5. July 2007 and 24 to 27 December 2007 drinking water source         NO           Florent 1. July to 5. July 2007 and 24 to 27 December 2007 drinking water source         NO           Florent 1. July to 5. July 2007 and 24 to 27 December 2007 drinking water source         NO           Florent 1. July to 5. July 2007 and 24 to 27 December 2007 drinking water source         NO           Florent 1. July to 5. July 2007 and 24 to 27 December 2007 drinking water source         NO           Florent 2007 drinking water s			TACTOR	TL37NO		
United by the source         No           Several control of the source         YES         Rubbioon River           Several control of source         YES         From 1.July to 5.July 2007 and 24 to 27 December 2007 drinking we were source           Several control of source         YES         From 1.July to 5.July 2007 and 24 to 27 December 2007 drinking we were source           Several control of source         NO         From 1.July to 5.July 2007 and 24 to 27 December 2007 drinking we were source           Several control of source         NO         From 1.July to 5.July 2007 and 24 to 27 December 2007 drinking we were source           Several control of source         NO         From 1.July to 5.July 2007 and 24 to 27 December 2007 drinking we were source           Several control of source         NO         From 1.July to 5.July 2007 and 24 to 27 December 2007 drinking we were source           Fauna destroying water inkes structures         NO         From 1.July to 5.July 2007 and 24 to 27 December 2007 drinking we were source           Un-inect landfilis         NO         From 2000 drinking we were source         From 2000 drinking we were source           Un-inect landfilis         NO         From 2000 drinking we were source         From 2000 drinking we were source           Poor access to supply         NO         From 2000 drinking we were source         NO           Hard water         NO         From 2000 drinking we			Drought	YES		
Single drinking water source     YES     Rubbon River     From 1 July to 5 July 2007 and 24 to 27 December 2007 drinking w     was tankered from Alexandra to Thomton due to high turbidity in the     Rubbon River.     Sewage overflow or disposal into water     source     From 1 July to 5 July 2007 and 24 to 27 December 2007 drinking w     was tankered from Alexandra to Thomton due to high turbidity in the     Rubbon River.     Sewage overflow or disposal into water     source     From 1 July to 5 July 2007 and 24 to 27 December 2007 drinking w     was tankered from Alexandra to Thomton due to high turbidity in the     Rubbon River.     Sewage overflow or disposal into water     source     From 1 July to 5 July 2007     The set of the set overflow or disposal     rundfl     For access to supply     Unisstandbe water extraction     NA     Aging or indequate pipe work and     aging drink water losses due to leaking     pes     High per capita water consumption     Insufficient trained personnel     VA     High per capita water consumption     Insufficient trained per formal rundfl     Reproduces to complex     No     Insufficient trained personnel     Vincown     Insufficient trained personnel     Vincown     Insufficient trained personnel     Vincown     Insufficient trained personnel     Vincown     Rapid population growth     Unknown     Rapid population loadings     NO     Rapid population runding			Diougin	. 20		
Poor quality water source     NO     Poor quality source (tass source)     NO     Poor quality source (tass source)     NO     Poor quality source (tass source)     NO     Poor quality source     NO			Single drinking water source	VES		
Poor quality water source         YES         was tankered from Alexandra to Thomton due to high turbidity in the Rubicon River.           Sewage overflow or disposal into water source         NO         Intervention of the source         NO           Sewage overflow or disposal into water source         NO         Intervention of the source         NO           Sewage overflow or disposal into water source         NO         Intervention of the source         NO           Sewage overflow or disposal into water source         NO         Intervention of the source         NO           Sewage overflow or disposal into water source         NO         Intervention of the source         NO           Sewage overflow or disposal into water source         NO         Intervention of the source         NO           Sewage overflow or disposal into water source         NO         Intervention of the source         NO           The source over (dust, sediment unoff)         NO         Intervention of the source         NO           Significant water losses due to leaking pipes         NO         Intervention of the source         NO           Significant water losses due to leaking pipes         NO         Intervention of the source         NO           Ming / minerais         NO         Intervention of the source         NO         Intedequate funding for maintenance of undident source <t< td=""><td></td><td></td><td>Single drinking water source</td><td>120</td><td></td></t<>			Single drinking water source	120		
Genu         Rubicon River.           Image: Source of the stand description or disposal into water source of the stand description of disposal into water source of the stand description of disposal into water source of the stand description of disposal into water source of the stand description of the stand destription of the stand description of the stand des			Poor quality water source	VES		
Sewage overflow or disposal into water source         NO           Produing         NO           Production         NO           Unitates introl (build)         NO           Extensive agriculture         NO           Productors to supply         NO           Productors         NO           Significant water consumption         NO           Imappropriate water quality standards / opicative         NO           Vandalian / sabotage / terrorism         NO           Vandalian / sabotage / terrorism         NO           Vandalian / sabotage / terrorism         NO           Vanda			Poor quality water source	160		
Source         NO           Image: Source         NO           Pauna defectating in supply         NO           Pauna defectating in supply         NO           Pauna defectating in supply         NO           Image: Source         NO           Pauna defectating in supply         NO           Image: Source         NO           Image: Source<			Sowago overflow or diapopal into water			
Bit Ploating         NO           Image destroying value intake structures         Image destroying value intake structures           Image destroying value intake structures         Image destroying value intake structures           Image destroying value intake structures         Image destroying value intake structures           Image destroying value intake structures         Image destroying value intake structures           Image destroying value intake structures         Image destroying value intake structures           Image destroying value intake structures         Image destroying value intake structures           Image destroying value intake structures         Image destroying value intake structures           Image destroying value intake structures         Image destroying value intake structure           Image of inadequate pipe work and associated infrastructure         Image destroying value intake structure           Image of inadequate pipe work and associated infrastructure         Image destroying value intake structure           Image of inadequate pipe work and associated infrastructure maintenance         Image destroying value intake structure           Image of inadequate pipe work and associated infrastructure maintenance         Image destroying value intake structure           Image destroying value in intenance         Image destroying value intake structure           Image destroying value in intenance or value intake structure         NO				NO		
NO         Extensive agriculture         NA           Agrig or inadequate pipe work and associated infrastructure         NA           Agrig or inadequate pipe work and associated infrastructure         Significant water observed us to leaking pipes         NA           Big pipes         High per capita water observed us to leaking pipes         NO         Agrig or inadequate pipe work and associated infrastructure         Significant water observed us to leaking pipes           Big pipes         High per capita water consumption inappropriate water quality standards / objectives         NO           Big per capita water consumption insufficient water of operance         NO         NO           Big per capita water consumption insufficient water of operance         NO         NO           Big per capita water consumption insufficient water quality standards / objectives         NO         Interpreting           Big per capita water consumption insufficient water quality standards / objectives         NO         Interpreting           Big per capita water consumption insufficient water optoperance         NO         Interpreting         NO           Big per capita water consumption insufficient water quality standards / poc management or governance         NO         Interpreting         NO           Big per contamination Per contamination         NO         Interpreting         NO         Interpreting           Big per contami		Ъ		NO		
NO         Extensive agriculture         NA           Agrig or inadequate pipe work and associated infrastructure         NA           Agrig or inadequate pipe work and associated infrastructure         Significant water observed us to leaking pipes         NA           Big pipes         High per capita water observed us to leaking pipes         NO         Agrig or inadequate pipe work and associated infrastructure         Significant water observed us to leaking pipes           Big pipes         High per capita water consumption inappropriate water quality standards / objectives         NO           Big per capita water consumption insufficient water of operance         NO         NO           Big per capita water consumption insufficient water of operance         NO         NO           Big per capita water consumption insufficient water quality standards / objectives         NO         Interpreting           Big per capita water consumption insufficient water quality standards / objectives         NO         Interpreting           Big per capita water consumption insufficient water optoperance         NO         Interpreting         NO           Big per capita water consumption insufficient water quality standards / poc management or governance         NO         Interpreting         NO           Big per contamination Per contamination         NO         Interpreting         NO         Interpreting           Big per contami		d,		NU		
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NO       NO         Objectives       Lack of infrastructure maintenance       Unknown         Poor management or governance       NO         Vardalism / sabotage / terrorism       NO         Insufficient trained personnel       Unknown         Inadequate funding for maintenance or upgrades       NO         Irrigation       NO         Chemicals / process       NO         Rapid population loadings       NO         Rapid population growth       Unknown         Rapid population growth       Unknown         Poor chlorine residuals       Unknown         Poor chlorine residuals       Unknown         Poor chlorine residuals       Unknown         Pesticide contamination       NO         Poor chlorine residuals       Unknown <t< td=""><td>SU</td><td>ца</td><td></td><td>NU</td><td></td></t<>	SU	ца		NU		
NO       NO         Objectives       Lack of infrastructure maintenance       Unknown         Poor management or governance       NO         Vardalism / sabotage / terrorism       NO         Insufficient trained personnel       Unknown         Inadequate funding for maintenance or upgrades       NO         Irrigation       NO         Chemicals / process       NO         Rapid population loadings       NO         Rapid population growth       Unknown         Rapid population growth       Unknown         Poor chlorine residuals       Unknown         Poor chlorine residuals       Unknown         Poor chlorine residuals       Unknown         Pesticide contamination       NO         Poor chlorine residuals       Unknown <t< td=""><td>N.</td><td>inər</td><td></td><td></td><td></td></t<>	N.	inər				
NO       NO         Objectives       Lack of infrastructure maintenance       Unknown         Poor management or governance       NO         Vardalism / sabotage / terrorism       NO         Insufficient trained personnel       Unknown         Inadequate funding for maintenance or upgrades       NO         Irrigation       NO         Chemicals / process       NO         Rapid population loadings       NO         Rapid population growth       Unknown         Rapid population growth       Unknown         Poor chlorine residuals       Unknown         Poor chlorine residuals       Unknown         Poor chlorine residuals       Unknown         Pesticide contamination       NO         Poor chlorine residuals       Unknown <t< td=""><td><u> </u></td><td>Чų</td><td></td><td></td><td></td></t<>	<u> </u>	Чų				
NO       NO         Objectives       Lack of infrastructure maintenance       Unknown         Poor management or governance       NO         Vardalism / sabotage / terrorism       NO         Insufficient trained personnel       Unknown         Inadequate funding for maintenance or upgrades       NO         Irrigation       NO         Chemicals / process       NO         Rapid population loadings       NO         Rapid population growth       Unknown         Rapid population growth       Unknown         Poor chlorine residuals       Unknown         Poor chlorine residuals       Unknown         Poor chlorine residuals       Unknown         Pesticide contamination       NO         Poor chlorine residuals       Unknown <t< td=""><td>Ś</td><td>Sat</td><td></td><td></td><td></td></t<>	Ś	Sat				
NO       NO         Objectives       Lack of infrastructure maintenance       Unknown         Poor management or governance       NO         Vardalism / sabotage / terrorism       NO         Insufficient trained personnel       Unknown         Inadequate funding for maintenance or upgrades       NO         Irrigation       NO         Chemicals / process       NO         Rapid population loadings       NO         Rapid population growth       Unknown         Rapid population growth       Unknown         Poor chlorine residuals       Unknown         Poor chlorine residuals       Unknown         Poor chlorine residuals       Unknown         Pesticide contamination       NO         Poor chlorine residuals       Unknown <t< td=""><td>Ř</td><td>0</td><td></td><td>NI/A</td><td></td></t<>	Ř	0		NI/A		
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NO       NO         Objectives       Lack of infrastructure maintenance       Unknown         Poor management or governance       NO         Vardalism / sabotage / terrorism       NO         Insufficient trained personnel       Unknown         Inadequate funding for maintenance or upgrades       NO         Irrigation       NO         Chemicals / process       NO         Rapid population loadings       NO         Rapid population growth       Unknown         Rapid population growth       Unknown         Poor chlorine residuals       Unknown         Poor chlorine residuals       Unknown         Poor chlorine residuals       Unknown         Pesticide contamination       NO         Poor chlorine residuals       Unknown <t< td=""><td>i i i i</td><td></td><td></td><td>NO</td><td></td></t<>	i i i i			NO		
NO       NO         Objectives       Lack of infrastructure maintenance       Unknown         Poor management or governance       NO         Vardalism / sabotage / terrorism       NO         Insufficient trained personnel       Unknown         Inadequate funding for maintenance or upgrades       NO         Irrigation       NO         Chemicals / process       NO         Rapid population loadings       NO         Rapid population growth       Unknown         Rapid population growth       Unknown         Poor chlorine residuals       Unknown         Poor chlorine residuals       Unknown         Poor chlorine residuals       Unknown         Pesticide contamination       NO         Poor chlorine residuals       Unknown <t< td=""><td>SE</td><td></td><td></td><td>NO</td><td></td></t<>	SE			NO		
NO       NO         Objectives       Lack of infrastructure maintenance       Unknown         Poor management or governance       NO         Vardalism / sabotage / terrorism       NO         Insufficient trained personnel       Unknown         Inadequate funding for maintenance or upgrades       NO         Irrigation       NO         Chemicals / process       NO         Rapid population loadings       NO         Rapid population growth       Unknown         Rapid population growth       Unknown         Poor chlorine residuals       Unknown         Poor chlorine residuals       Unknown         Poor chlorine residuals       Unknown         Pesticide contamination       NO         Poor chlorine residuals       Unknown <t< td=""><td>R</td><td></td><td></td><td></td><td></td></t<>	R					
NO       NO         Objectives       Lack of infrastructure maintenance       Unknown         Poor management or governance       NO         Vardalism / sabotage / terrorism       NO         Insufficient trained personnel       Unknown         Inadequate funding for maintenance or upgrades       NO         Irrigation       NO         Chemicals / process       NO         Rapid population loadings       NO         Rapid population growth       Unknown         Rapid population growth       Unknown         Poor chlorine residuals       Unknown         Poor chlorine residuals       Unknown         Poor chlorine residuals       Unknown         Pesticide contamination       NO         Poor chlorine residuals       Unknown <t< td=""><td>ž</td><td></td><td></td><td></td><td></td></t<>	ž					
NO       NO         Objectives       Lack of infrastructure maintenance       Unknown         Poor management or governance       NO         Vardalism / sabotage / terrorism       NO         Insufficient trained personnel       Unknown         Inadequate funding for maintenance or upgrades       NO         Irrigation       NO         Chemicals / process       NO         Rapid population loadings       NO         Rapid population growth       Unknown         Rapid population growth       Unknown         Poor chlorine residuals       Unknown         Poor chlorine residuals       Unknown         Poor chlorine residuals       Unknown         Pesticide contamination       NO         Poor chlorine residuals       Unknown <t< td=""><td>5</td><td></td><td></td><td></td><td></td></t<>	5					
NO       NO         Objectives       Lack of infrastructure maintenance       Unknown         Poor management or governance       NO         Vardalism / sabotage / terrorism       NO         Insufficient trained personnel       Unknown         Inadequate funding for maintenance or upgrades       NO         Irrigation       NO         Chemicals / process       NO         Rapid population loadings       NO         Rapid population growth       Unknown         Rapid population growth       Unknown         Poor chlorine residuals       Unknown         Poor chlorine residuals       Unknown         Poor chlorine residuals       Unknown         Pesticide contamination       NO         Poor chlorine residuals       Unknown <t< td=""><td></td><td>_</td><td></td><td>ł</td><td>+</td></t<>		_		ł	+	
NO       NO         Objectives       Lack of infrastructure maintenance       Unknown         Poor management or governance       NO         Vardalism / sabotage / terrorism       NO         Insufficient trained personnel       Unknown         Inadequate funding for maintenance or upgrades       NO         Irrigation       NO         Chemicals / process       NO         Rapid population loadings       NO         Rapid population growth       Unknown         Rapid population growth       Unknown         Poor chlorine residuals       Unknown         Poor chlorine residuals       Unknown         Poor chlorine residuals       Unknown         Pesticide contamination       NO         Poor chlorine residuals       Unknown <t< td=""><td>ğ</td><td></td><td></td><td></td><td>1</td></t<>	ğ				1	
Image: Properties of governance       NO         Vandalizer / terrorism       NO         Insufficient trained personnel       Unknown         Insufficient trained personnel       Unknown         Inadequate funding for maintenance or upgrades       NO         Image:	К			NO		
Image: Properties of governance       NO         Vandalizer / terrorism       NO         Insufficient trained personnel       Unknown         Insufficient trained personnel       Unknown         Inadequate funding for maintenance or upgrades       NO         Image:	T	nce		Unknown	1	
Image: Properties of governance       NO         Vandalizer / terrorism       NO         Insufficient trained personnel       Unknown         Insufficient trained personnel       Unknown         Inadequate funding for maintenance or upgrades       NO         Image:	Ň	'na				
No         No           Inadequate funding for maintenance or upgrades         No           Inadequate funding for maintenance or upgrades         No           Image         Mining / minerals         NO           Irrigation         NO           Chemicals / process         NO           Egg         Seasonal population loadings         NO           Rapid population growth         Unknown         Census data unavailable for 2001           Pathogenic contamination         NO         NO           Heavy metal contamination         NO         NO           Posticide contamination         NO         NO           Boil water notices         NO         NO           Boil water notices         NO         NO           Water restrictions (current and historic)         YES         Stage 1 - 01/10/07           Taste and odour issues         NO         Benzo(a)pyrene detected in raw water during one sampling event, subsequent sample clear.           Planning and design for a pinging and design for a pinging to provide fully treated water to Thornton and Fildon for		ve		-		
No         No           Inadequate funding for maintenance or upgrades         No           Inadequate funding for maintenance or upgrades         No           Image         Mining / minerals         NO           Irrigation         NO           Chemicals / process         NO           Egg         Seasonal population loadings         NO           Rapid population growth         Unknown         Census data unavailable for 2001           Pathogenic contamination         NO         NO           Heavy metal contamination         NO         NO           Posticide contamination         NO         NO           Boil water notices         NO         NO           Boil water notices         NO         NO           Water restrictions (current and historic)         YES         Stage 1 - 01/10/07           Taste and odour issues         NO         Benzo(a)pyrene detected in raw water during one sampling event, subsequent sample clear.           Planning and design for a pinging and design for a pinging to provide fully treated water to Thornton and Fildon for		ß			1	
NO       age transmission     NO       age transmission     NO       Irrigation     NO       Chemicals / process     NO       Chemicals / process     NO       Chemicals / process     NO       Seasonal population loadings     NO       Rapid population growth     Unknown       Census data unavailable for 2001       Pathogenic contamination     NO       Algal blooms     NO       Heavy metal contamination     NO       Post cide contamination     NO       Post cide contamination     NO       Boil water notices     NO       Boil water notices     NO       Water restrictions (current and historic)     YES       Stage 1 - 01/10/07     Taste and odour issues       Other contamination that would affect health     YES       Benzo(a)pyrene detected in raw water during one sampling event, subsequent sample clear.					1	
Mining / minerals         NO           Irrigation         NO           Chemicals / process         NO           Chemicals / process         NO           Seasonal population loadings         NO           Rapid population growth         Unknown           Census data unavailable for 2001           Adgal blooms         NO           Heavy metal contamination         NO           Poor chlorine residuals         Unknown           Poor chlorine residuals         Unknown           Poor chlorine residuals         Unknown           Poor chlorine residuals         Unknown           Posticide contamination         NO           Boil water notices         NO           Water restrictions (current and historic)         YES           Water restrictions (current and historic)         YES           Benzo(a)pyrene detected in raw water during one sampling event, theatth           ubsequent sample clear         NO				NO		
Irrigation         NO           Chemicals / process         NO           Seasonal population loadings         NO           Rapid population growth         Unknown           Census data unavailable for 2001           Algal blooms         NO           Heavy metal contamination         NO           Poor chlorine residuals         Unknown           Poor chlorine residuals         Unknown           Poor chlorine residuals         Unknown           Pesticide contamination         NO           Boll water notices         NO           Water restrictions (current and historic)         YES           Water restrictions (current and historic)         YES           Benzo(a)pyrene detected in raw water during one sampling event, theatth           Public         YES           Benzo(a)pyrene detected in raw water to Thornton and Fildon from the theatth		(0		NO		
Seasonal population loadings         NO           Rapid population growth         Unknown         Census data unavailable for 2001           Pathogenic contamination         NO         Algal blooms           Heavy metal contamination         NO         Heavy metal contamination           Poor chlorine residuals         Unknown         Pesticide contamination           Poor chlorine residuals         Unknown         Pesticide contamination           Poor chlorine residuals         Unknown         Pesticide contamination           Post chlorine residuals         Unknown         Pesticide contamination           Post chlorine residuals         Unknown         Posticide contamination           Post chlorine residuals         Unknown         Posticide contamination           Post chlorine residuals         Unknown         Posticide contamination           Post chlorine residuals         NO         Posticide contamination           Utater restrictions (current and historic)         YES         Stage 1 - 01/10/07           Taste and doour issues         NO         Posticide fully treated water to Thornton and Fildon from the table of the contamination that would affect health		rie				
Seasonal population loadings         NO           Rapid population growth         Unknown         Census data unavailable for 2001           Pathogenic contamination         NO         Algal blooms           Heavy metal contamination         NO         Heavy metal contamination           Poor chlorine residuals         Unknown         Pesticide contamination           Poor chlorine residuals         Unknown         Pesticide contamination           Poor chlorine residuals         Unknown         Pesticide contamination           Post chlorine residuals         Unknown         Pesticide contamination           Post chlorine residuals         Unknown         Posticide contamination           Post chlorine residuals         Unknown         Posticide contamination           Post chlorine residuals         Unknown         Posticide contamination           Post chlorine residuals         NO         Posticide contamination           Utater restrictions (current and historic)         YES         Stage 1 - 01/10/07           Taste and doour issues         NO         Posticide fully treated water to Thornton and Fildon from the table of the contamination that would affect health	1	ust	Irrigation	NO		
Seasonal population loadings         NO           Rapid population growth         Unknown         Census data unavailable for 2001           Pathogenic contamination         NO         Algal blooms           Heavy metal contamination         NO         Heavy metal contamination           Poor chlorine residuals         Unknown         Pesticide contamination           Poor chlorine residuals         Unknown         Pesticide contamination           Poor chlorine residuals         Unknown         Pesticide contamination           Post chlorine residuals         Unknown         Pesticide contamination           Post chlorine residuals         Unknown         Posticide contamination           Post chlorine residuals         Unknown         Posticide contamination           Post chlorine residuals         Unknown         Posticide contamination           Post chlorine residuals         NO         Posticide contamination           Utater restrictions (current and historic)         YES         Stage 1 - 01/10/07           Taste and doour issues         NO         Posticide fully treated water to Thornton and Fildon from the table of the contamination that would affect health		<u>p</u>		NO	1	
Pathogenic contamination NO Algal blooms NO Heavy metal contamination NO Poor chlorine residuals Unknown Poor chlorine residuals Unknown Posticide contamination NO Boil water notices NO Deaths or illness due to water quality NO Water restrictions (current and historic) YES Stage 1 - 01/10/07 Taste and odour issues NO Other contamination that would affect health YES Benzo(a)pyrene detected in raw water during one sampling event, busequent sample clear.	i i i i i i i i i i i i i i i i i i i	_	onemicais / process			
Pathogenic contamination NO Algal blooms NO Heavy metal contamination NO Poor chlorine residuals Unknown Poor chlorine residuals Unknown Posticide contamination NO Boil water notices NO Deaths or illness due to water quality NO Water restrictions (current and historic) YES Stage 1 - 01/10/07 Taste and odour issues NO Other contamination that would affect health YES Benzo(a)pyrene detected in raw water during one sampling event, busequent sample clear.		E	Seasonal population loadings	NO		
Pathogenic contamination NO Algal blooms NO Heavy metal contamination NO Poor chlorine residuals Unknown Poor chlorine residuals Unknown Posticide contamination NO Boil water notices NO Deaths or illness due to water quality NO Water restrictions (current and historic) YES Stage 1 - 01/10/07 Taste and odour issues NO Other contamination that would affect health YES Benzo(a)pyrene detected in raw water during one sampling event, busequent sample clear.	-	atic	ocasonal population loadings			
Pathogenic contamination NO Algal blooms NO Heavy metal contamination NO Poor chlorine residuals Unknown Poor chlorine residuals Unknown Posticide contamination NO Boil water notices NO Deaths or illness due to water quality NO Water restrictions (current and historic) YES Stage 1 - 01/10/07 Taste and odour issues NO Other contamination that would affect health YES Benzo(a)pyrene detected in raw water during one sampling event, busequent sample clear.	-	ni,				
Pathogenic contamination NO Algal blooms NO Heavy metal contamination NO Poor chlorine residuals Unknown Poor chlorine residuals Unknown Posticide contamination NO Boil water notices NO Deaths or illness due to water quality NO Water restrictions (current and historic) YES Stage 1 - 01/10/07 Taste and odour issues NO Other contamination that would affect health YES Benzo(a)pyrene detected in raw water during one sampling event, busequent sample clear.		ð	Rapid population growth	Unknown	Census data unavailable for 2001	
Algal blooms     NO       Heavy metal contamination     NO       Poor chlorine residuals     Unknown       Poor chlorine residuals     Unknown       Boil water notices     NO       Boil water notices     NO       Deaths or illness due to water quality     NO       Water restrictions (current and historic)     YES       Stage 1 - 01/10/07     Taste and odour issues       Other contamination that would affect health     YES       Benzo(a)pyrene detected in raw water during one sampling event, subsequent sample clear.						
Planning and design for a pipeline to provide fully treated water to Thomton and Fildon from	Ê	•				
Planning and design for a pipeline to provide fully treated water to Thomton and Fildon from	к. С					
Planning and design for a pipeline to provide fully treated water to Thomton and Fildon from	C H					
Planning and design for a pipeline to provide fully treated water to Thornton and Fildon from	ΕÜ					
Planning and design for a pipeline to provide fully treated water to Thornton and Fildon from	Α×					
Planning and design for a pipeline to provide fully treated water to Thornton and Fildon from	$\neg \circ$					
Planning and design for a pipeline to provide fully treated water to Thornton and Fildon from	20					
Planning and design for a pipeline to provide fully treated water to Thornton and Fildon from	7 QI				Stage 1 - 01/10/07	
Planning and design for a pipeline to provide fully treated water to Thomton and Fildon from	TER QI RITY RI		Taste and odour issues	NO		
Planning and design for a pipeline to provide fully treated water to Thomton and Fildon from	VATER QI					
Planning and design for a pipeline to provide fully treated water to Thornton and Eildon fror	WATER QI		Other contamination that would affect	YES		
	WATER QI SECURITY RI		Other contamination that would affect	YES		

Ę		State/Territory	VIC	
TOWN		Town Name	Riddells Creek	
P		Town Population	2,625 (Census 2006, l	Jrban Centre/Locality)
R >	٢	Name of Water Utility	Western Water	
벁	5	Rate (\$/kL)	\$1.49/kL	
WATER	5	Per Capita Water Consumption (L/day)	Unknown	
		Number of Connections	Unknown	
Ë		Catchment		catchments and Yarra Valley tributaries and Jacksons Creek Catchme
۲¥		Sub-Catchment	Weribee River Basin	
> 0.		Catchment Management Authority (CMA)	Port Phillip and Weste	ernport Catchment Management Authority
ENT ANI	Ļ	CMA Web-Link	http://www.ppwcma.vi	
Ę	ţ	Catchment Protection Status	Varies from tributary to	
ة لِلَّا	ก		Surface water from ab	
CATCHMENT AND WATER SUPPLY		Potable Water Source(s)	Rosslynne Reservoir	
			Wright Reservoir and	Forster Reservoir used as back up
õ		Supply Capacity	Unknown	
		Treatment Plant(s)	Rosslynne Water Filtra	ation Plant (chloramination)
È				ary chlorination by Melbourne Water
<b>WATER QUALITY</b>		Level of Treatment	Secondary disinfection	
σ				emans Rd Pump Station
Ř				by booster chlorinators along reticulation system as required
ATI		Drinking Water Guidelines	Australian Drinking Wa	ater Guidelines (2004) and Safe Drinking Water Regulations (2005)
Š		Results (% compliance for 2008 reporting	E Coli	100%
		period)	- 001	
F		Current Water Destrictions	Yes Stage 3a - Sta	arted 01/04/07
WATER SECURITY		Current Water Restrictions		ttp://www.ourwater.vic.gov.au/saving/restrictions
in L		Proportion of Potable Water Supplied to		
SE		Households (%)	Unknown	
Ë		Distance from the Coast (km)	Approx 95km South-W	/est
AT (		Climate	Temperate	
3		Average Annual Rainfall	838.7mm	
	1	FACTOR	YES / NO	NOTES / EXPLANATION Majority of Victoria experiencing drought (or Exceptional Circumstance
		Drought	YES	whereby farmers can apply for rebates)
		biougin	120	http://www.daff.gov.au/agriculture-food/drought/ec/victoria
		Single drinking water source	NO	international agriculture research agric contection
		Poor quality water source	NO	
	~	Sewage overflow or disposal into water	NO	
	(Idc	Flooding	NO	
	Catchment and Water Supply	Fauna defecating in supply		
		Fauna destroying water intake structures		
	Š	Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)		
ŝ	p	Un-lined landfills	NO	
ISL	nt a	Extensive agriculture	110	
CAL	ner	Low vegetation cover (dust, sediment		
¥	ţç	Poor access to supply		
SIS	Ca	Unsustainable water extraction	N/A	
7		Aquifer turning saline due to high	N/A	
Ľ		Hard water	NO	
D C C		Aging or inadequate pipe work and associated infrastructure		
SE		Significant water losses due to leaking		
OR		nines		
ž		High per capita water consumption		
LL.		Inappropriate water quality standards /	NO	
2UZ	nce	objectives Lack of infrastructure maintenance	Unknown	
R	rna	Poor management or governance	NO	
WATER QUALITY OR SECURITY RISK (CAUSE)	Governance	Vandalism / sabotage / terrorism	NO	
MM	ŭ	Insufficient trained personnel	Unknown	
-		Inadequate funding for maintenance or	NO	
		upgrades	10	
	es	Mining / minerals	NO	
	Industries	Irrigation	NO	
	npu			+
	=	Chemicals / process	NO	
	E	Seasonal population loadings	NO	
	Population	esternar population loadingo		
	Inde	Deside and attended to the	V/50	
	Ъ	Rapid population growth	YES	Growth rate of 3.18% P.A between 2001 and 2006
_				
É	<u> </u>	Pathogenic contamination	NO	
К,	С Ц	Algal blooms	YES	Blue Green Algae Bloom - Alert Level 3 (August 2007 - October 2007)
7	L L	Heavy metal contamination	NO	Dies Creat / "gas Broom / Nort Level & (August 2007 - October 2007)
5	ц Ц	Poor chlorine residuals	Unknown	
NA	N.	Pesticide contamination	NO	
ğ	⊻ ≻	Boil water notices	NO	
ШÉ	-	Deaths or illness due to water quality	NO	
WATER QUALITY OR	Ź	Water restrictions (current and historic)	YES	Stage 3a - Started 01/04/07
50	ц Ц	Taste and odour issues Other contamination that would affect	NO	
0		health	NO	
		noutri	Water for the meet and	I
				rt is sourced from Melbourne. At times this can vary between Melbourne
		Notes	water and a Deceluppe	e Reservoir/ Melbourne water blend to ensure that the Rosslynne Wat

Town #	49				
z	-3	State/Territory	VIC		
TOWN		Town Name	Beulah		
1		Town Population	219 (Census 2006, Urt	ban Centre/Locality)	
rr >	-	Name of Water Utility	Grampians Wimmera Mallee Water		
μĒ	5	Rate (\$/kL)	\$1.19/kL - partially trea		
WATER	5	Per Capita Water Consumption (L/day)	Unknown		
> -		Number of Connections	Unknown		
<b>–</b> • •		Catchment	Wimmera River Basin		
E E	~	Sub-Catchment	Not within a designate		
AT	1	Catchment Management Authority (CMA)	Mallee Catchment Mar		
SG	5	CMA Web-Link	http://www.malleecma		
CATCHMENT AND WATER	S	Catchment Protection Status Potable Water Source(s)	None. Very Poor to Mo Unknown	derate condition.	
0 4		Supply Capacity	Unknown		
		Treatment Plant(s)	Beulah WTP ?		
~ >	⊢	Level of Treatment	Disinfection		
WATER	3	Drinking Water Guidelines		ater Guidelines (2004) and Safe Drinking Water Regulations (2005)	
E A	۲ ۵	Results (% compliance for 2008 reporting	E Coli	100%	
> 0	Э	period)	Turbidity	Did not comply with standards	
		. ,	THM's	Did not comply with standards	
,	_	Current Water Restrictions	Yes Stage 4 - Star	ted 10/02/09	
μÉ		Proportion of Potable Water Supplied to	Unknown		
WATER	5,	Households (%)			
	L L	Distance from the Coast (km) Climate	Approx 260km West Temperate		
U	0	Average Annual Rainfall	374.3 mm		
		FACTOR	YES / NO	NOTES / EXPLANATION	
			,	Majority of Victoria experiencing drought (or Exceptional Circumstances,	
		Drought	YES	whereby farmers can apply for rebates)	
				http://www.daff.gov.au/agriculture-food/drought/ec/victoria	
		Single drinking water source	YES?		
		Poor quality water source	YES		
		Sewage overflow or disposal into water	NO		
		source			
	(Id	Flooding Fauna defecating in supply	NO		
	Sup	Fauna destroying water intake structures			
	Catchment and Water Supply	Natural mineral pollutants (e.g. uranium,			
	Vat	nitrates, iron, fluoride)			
E)	_> pi	Un-lined landfills	NO		
SU S	tar	Extensive agriculture			
(C/	en	Low vegetation cover (dust, sediment			
X	hu	runoff)			
RIG	atc	Poor access to supply			
≽	0	Unsustainable water extraction			
.IRI		Aquifer turning saline due to high extraction			
in the second		Hard water	NO		
SE		Aging or inadequate pipe work and			
R		associated infrastructure			
È		Significant water losses due to leaking			
E I		pipes			
√∩¢		High per capita water consumption	NO		
2		Inappropriate water quality standards /	NO		
Ξ	nce	objectives Lack of infrastructure maintenance	Unknown		
WATER QUALITY OR SECURITY RISK (CAUSE)	rna	Poor management or governance	NO		
_	overnance	Vandalism / sabotage / terrorism	NO		
	ğ	Insufficient trained personnel	Unknown		
		Inadequate funding for maintenance or	NO		
		upgrades			
	ies	Mining / minerals	NO		
	Industries	Irrigation	NO		
	ndı	Chemicals / process	NO		
		onomicais / process			
	latic	Seasonal population loadings			
	Populatio n		 		
	Ро	Rapid population growth	YES	Growth rate of 1.58% P.A between 2001 and 2006.	
Ĺ	2	Pathogenic contamination	NO		
Ц Ц	ر ⊔	Algal blooms	NO		
		Heavy metal contamination	NO		
ΕU	<u> </u>	Poor chlorine residuals	Unknown		
IAL	2	Pesticide contamination Boil water notices	NO NO		
ğ	r	Deaths or illness due to water quality	NO		
Ë	-	Water restrictions (current and historic)	YES	Stage 4 - Started 10/02/09	
IAT (AT	5	Taste and odour issues	NO		
WATER QUALITY OR		Other contamination that would affect	YES	Elevated Trihalomethanes.	
0	0	health	120		
				o the Wimmera Mallee Pipeline and construct new raw water storages for	
		Notes	Beulah.		
		Notes		ng, Nullawil and Quambatook) within the GWM region are experiencing the	

2		0 State/Territory	VIC	
TOWN		Town Name	Avoca	
P		Town Population	951 (Census 2006, Urbar	n Centre/Locality)
щ	≻	Name of Water Utility	Central Highlands Water	
WATER	UTILITY	Rate (\$/kL)	Tier 1 \$1.30/kL, Tier 2 \$1	
Å.	5	Per Capita Water Consumption (L/day) Number of Connections	292 L/capita/day - Curren	t unrestricted demand
		Catchment	608 Avoca River	
Ř		Sub-Catchment	River Basin - Avoca	
TE		Catchment Management Authority (CMA)	North Central Catchment	Management Authority
CATCHMENT AND WATER		CMA Web-Link	www.nccma.vic.gov.au/	
	≻.	Catchment Protection Status	None. Very Poor conditio	
	d d		Sugarloaf Reservoir - 363	B ML
	j,	Potable Water Source(s)	Lead Dam - 118 ML	
			Bung Bong Bore	Annual Entitlement - up to 233 ML in any year
ģ				a rate not exceeding 0.84ML/day
'A		Supply Capacity	Lead Dam - no extraction	
Ũ			Groundwater Licence - 20	
Σ		Treatment Plant(s)	Avoca WTP	
AL I		Level of Treatment		ion and filtration plant with disinfection by chlorine.
nc		Drinking Water Guidelines		r Guidelines (2004) and Safe Drinking Water Regulations (2005)
2		Results (% compliance for 2008 reporting	Suspended Solids E Coli	Did not comply with standards 100%
TE		period)	THM's, TDS, Hardness	
AV.		,	and Iron	Did not comply with standards
≻			Yes Stage 2 - Started	12/11/07
WATER SECURITY WATER QUALITY		Current Water Restrictions		/www.ourwater.vic.gov.au/saving/restrictions
SEC		Proportion of Potable Water Supplied to	Residential - 60% Indus	strial - 14% Concessional - 6% Non Revenue - 20%
Ř		Households (%) Distance from the Coast (km)	Approx 160km South-Eas	st
ATE		Climate	Temperate	2
1M		Average Annual Rainfall	536.2 mm	
-		FACTOR	YES / NO	NOTES / EXPLANATION
		Drought	YES	Severe drought conditions continued across Central Highland Water's at of operation during 2007–08. This created challenges to maintaining wat quality with low reservoir levels, emergency supplies and limited resource for mains cleaning programs.
		Single drinking water source	NO	
		Poor quality water source	YES	Groundwater with high salinity was being blended with surface water to supplement supplies - this has caused a number of quality issues.
	Catchment and Water Supply	Sewage overflow or disposal into water source	NO	
		Flooding	NO	
	e	Fauna defecating in supply		
	Vat	Fauna destroying water intake structures		
ш	_ Þr	Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)	YES	Iron levels did not comply with standards.
N	tar	Un-lined landfills	NO	
CA	ner	Extensive agriculture	110	
ž	chn	Low vegetation cover (dust, sediment		
SIN SI	Cat	runoff)		
≿	Ŭ	Poor access to supply		
SECURITY RISK (CAUSE)		Unsustainable water extraction		
ы С		Aquifer turning saline due to high extraction Hard water	VES	Hardness testing did not meet standards
		Aging or inadequate pipe work and	YES	Hardness testing did not meet standards.
NOR NOR		associated infrastructure		
≿		Significant water losses due to leaking		
ALI		pipes		
Q		High per capita water consumption Inappropriate water quality standards /	NO	
ЦШ	Φ	objectives	NO	
WATER QUALITY OR	Governance	Lack of infrastructure maintenance	Unknown	
×.	erné	Poor management or governance	NO	
	OVe	Vandalism / sabotage / terrorism	NO	
	Ű	Insufficient trained personnel	Unknown	
		Inadequate funding for maintenance or upgrades	NO	
	ries	Mining / minerals	NO	
	Industries	Irrigation	NO	
	Inc	Chemicals / process	NO	
		Seasonal population loadings		
	Population	Rapid population growth	NO	Decline in Population between 2001 and 2006
1		Pathogenic contamination	NO	
с	0	Algal blooms	NO	
ō	Ľ	Heavy metal contamination	NO	
VATER QUALITY OR	Ū,	Poor chlorine residuals	NO	
JAL JAL	NX NX	Pesticide contamination	NO	
g	ř	Boil water notices Deaths or illness due to water quality	NO NO	
EH I	Ē	Water restrictions (current and historic)	YES	Stage 2 - Started 12/11/07
	r	Taste and odour issues	NO	Salinity Issues associated with the use of groundwater.

SEC	Other contamination that would affect health		Elevated trihalomethanes - Issue lasted 119 days. Chloramination plant commissioned after reporting period (November 2008).
	Notes	supply and Lead Dam. Th Reservoir. However since	vstems consists of Sugarloaf Reservoir, Bung Bong Bore groundwater e Avoca system has predominantly relied on water from Sugarloaf rainfall in the region has been less reliable this has resulted in a greater re. Whilst the groundwater supply is reliable, it is characterised by ity and hardness levels.

Town #	51			
	•.	State/Territory	VIC	
TOWN		Town Name	Woori Yallock	
6		Town Population		6, Urban Centre/Locality)
		Name of Water Utility	Yarra Valley Water	
WATER		Rate (\$/kL)		Block 2 - \$1.47/kL, Block 3 - \$ 2.17/kL
TAT IT	-	Per Capita Water Consumption (L/day)	Unknown	
≥ ⊃	)	Number of Connections	Unknown	
		Catchment		er Varra Catchments
느 때		Sub-Catchment	Thompson and Upper Yarra Catchments Not within a designated water supply catchment - River Basin is Yarra	
山田の	≻_	Catchment Management Authority (CMA)		sternport Catchment Management Authority
Z Z Z Z	료	CMA Web-Link	http://www.ppwcma	
25	Ĵ,	Catchment Protection Status		y to tributary (generally Poor to Moderate)
CATCHMENT AND WATER		Potable Water Source(s)	Unknown	
		Supply Capacity	Unknown	
		Treatment Plant(s)	Lusatia Park WTP	
WATER OUALITY		Level of Treatment	Unknown	
ALL	1	Drinking Water Guidelines		Water Guidelines (2004) and Safe Drinking Water Regulations (2005)
M NC	5	Results (% compliance for 2008 reporting	E Coli	100%
	·	period)	Other	High Iron and Turbidity Levels recorded although overall standards were
		Current Water Restrictions	No	
		Proportion of Potable Water Supplied to	Linknown	
LEF		Households (%)	Unknown	
WATER		Distance from the Coast (km)	Approx 85km South	-West
> III	)	Climate	Temperate	
		Average Annual Rainfall	693.6mm	
		FACTOR	YES / NO	NOTES / EXPLANATION
		Drawkt	VEO	Majority of Victoria experiencing drought (or Exceptional Circumstances,
		Drought	YES	whereby farmers can apply for rebates)
		Single drinking water source	Unknown	http://www.daff.gov.au/agriculture-food/drought/ec/victoria
		Poor quality water source	NO	
		Sewage overflow or disposal into water		
	≥	Flooding	NO YES	O superior and a superior of issues in the second sec
	Supply	Fauna defecating in supply	TES	Caused a number of issues in June/July 2007
	IS .	Fauna destroying water intake structures		
	ater	Natural mineral pollutants (e.g. uranium,		
	Š	nitrates, iron, fluoride)		
ÎÎÎ	pu	Un-lined landfills	NO	
ISL	ıt a	Extensive agriculture		
SAL	Jer	Low vegetation cover (dust, sediment		
<u> </u>	chr	Poor access to supply		
to I	Catchment and Water	Unsustainable water extraction	N/A	
ц Г		Aquifer turning saline due to high extraction		
E				
Ľ,		Hard water Aging or inadequate pipe work and	NO	
U U U		associated infrastructure		
or or		Significant water losses due to leaking		
ō		High per capita water consumption		
≥		Inappropriate water quality standards /		
ALI	a	objectives	NO	
л С	DO L	Lack of infrastructure maintenance	Unknown	
WATER QUALITY OR SECURITY RISK (CAUSE)		Poor management or governance	NO	
Ë	ove	Vandalism / sabotage / terrorism	NO	
M M	ğ	Insufficient trained personnel	Unknown	
		Inadequate funding for maintenance or	NO	
		upgrades		
	Ś	Mining / minerals	NO	
	trie			
	Industries	Irrigation	NO	
	lng	Chemicals / process	NO	
	tior	Seasonal population loadings	NO	
	Population			
	do	Rapid population growth	NO	
	а.			
~		Pathogenic contamination	NO	
٩Å		Algal blooms	NO	
ZIS.		Heavy metal contamination Poor chlorine residuals	NO Unknown	1
WATER QUALITY OR SECURITY RISK	CI	Pesticide contamination	NO	
ALT SUL	Ш	Boil water notices	YES	Elevated turbidity and iron levels during June/July 2007
SUF SUF	Ш	Deaths or illness due to water quality	NO	
ШШ	-	Water restrictions (current and historic)	NO	1
A S S		Taste and odour issues	NO	1
-		Other contamination that would affect	NO	
				avy rainfall around the Upper Yarra Reservoir, which caused high inflows of
				voir, in a very short period of time. This heavy
		Notes		naturally occurring sediments to flow into the Reservoir, which caused the
				Yarra Reservoir to be highly turbid.
				Yarra Reservoir to be highly turbid. arly 2008 to improve WQ.

State/Territory         VIC           Town Name         Myrtleford           Town Population         2,728 (Census 2006, Urban Centre/Locality)		State/Territory	VIC		
Ś		Town Name	Myrtleford		
1		Town Population		Urban Centre/Locality)	
Ц Ц	X	Name of Water Utility	North East Water		
WATER	⊒	Rate (\$/kL) Per Capita Water Consumption (L/day)	\$2.00/kL	and on water supply system - 633 ML/annum.	
2 S	5	Number of Connections	1,524	and on water supply system - 633 ML/annum.	
Δ.		Catchment	Ovens River (Wangar	ratta)	
CATCHMENT AND	2	Sub-Catchment	Buffalo Creek Catchr		
E Z		Catchment Management Authority (CMA)		nt Management Authority	
ШЩ	ທ ~	CMA Web-Link Catchment Protection Status	http://www.necma.vid		
	Ē	Potable Water Source(s)	None. Good to Excellent condition. Buffalo Creek		
CAT	A N	Supply Capacity		ement - 1212 ML/annum	
				e for 75ML - bore out of order	
Ę		Treatment Plant(s) Level of Treatment	Myrtleford UV plant	ne/Granular Activated Carbon disinfection system has been taken offline).	
NAI		Drinking Water Guidelines		Vater Guidelines (2004) and Safe Drinking Water Regulations (2005)	
ð			Suspended Solids	High Turbidity (may indicate high SS)	
WATER QUALITY		Results (% compliance for 2008 reporting	Faecal Coliforms	98.3% (E. coli)	
MA		period)	Colour Iron	Did not meet guidelines Did not meet guidelines	
		Current Water Restrictions	No	Dia normeer galdelinee	
сÈ	È	Proportion of Potable Water Supplied to	Residential - 40% Co	ommercial - 15%, Industrial - 22%, Non revenue - 23%	
E E	N N	Households (%)	-		
WATER	Ц Ц	Distance from the Coast (km) Climate	Approx 190km South Temperate	East	
C		Average Annual Rainfall	946.5 mm		
		FACTOR	YES / NO	NOTES / EXPLANATION	
		Draught	VED	Majority of Victoria experiencing drought (or Exceptional Circumstances,	
		Drought	YES	whereby farmers can apply for rebates) http://www.daff.gov.au/agriculture-food/drought/ec/victoria	
		Single drinking water source	YES		
		Poor quality water source	NO		
		Sewage overflow or disposal into water	NO		
	≥	source Flooding	NO		
	ddr	Fauna defecating in supply	NU		
	r Si	Fauna destroying water intake structures			
	/ate	Natural mineral pollutants (e.g. uranium,	NO		
	≤ P	nitrates, iron, fluoride) Un-lined landfills			
SE)	tan	Extensive agriculture			
WATER QUALITY OR SECURITY RISK (CAUSE)	Catchment and Water Supply	Low vegetation cover (dust, sediment			
<u>0</u>	chr	runoff)			
NA N	Cat	Poor access to supply Unsustainable water extraction			
Ϋ́		Aquifer turning saline due to high extraction	NO		
RIT		Hard water	NO		
CU		Aging or inadequate pipe work and	YES	36 mains failures over the past 3 years. Only single barrier treatment in	
S		associated infrastructure	123	place.	
ЧÖ		Significant water losses due to leaking pipes	YES	Assumed to be an issue as large number of failures.	
È		High per capita water consumption	NO		
IAL		Inappropriate water quality standards /	NO		
б	ance	objectives	-		
ĒR		Lack of infrastructure maintenance	Unknown NO		
VAT	Goverr	Poor management or governance Vandalism / sabotage / terrorism	NO		
2	ğ	Insufficient trained personnel			
		Inadequate funding for maintenance or			
	-	upgrades			
	ies	Mining / minerals	NO		
	Industries	Irrigation			
	Indi	Chemicals / process	NO		
		Chemicals / process	NO		
	tion	Seasonal population loadings	NO		
	Population				
	Pop	Rapid population growth	YES	Growth Rate of 1.69% P.A. (between 2001 and 2006)	
			V/50	E.coli detected on a number of occasions, although due to the large	
É	Ē	Pathogenic contamination	YES	number of samples, they were still compliant.	
R F	Ц Ц	Algal blooms	NO		
01	Ц Ц	Heavy metal contamination	NO		
γĽ	×	Poor chlorine residuals Pesticide contamination	Unknown NO		
	2	Boil water notices	YES	Boil Water Notice was in place from August 2007 to 1 May 2008.	
	N N	Doll water notices			
ER QUALITY C	IIY KISI	Deaths or illness due to water quality	NO		
ATER QUALITY C	נטאווץ אוא	Deaths or illness due to water quality Water restrictions (current and historic)	NO		
	SECURITY RISI	Deaths or illness due to water quality Water restrictions (current and historic) Taste and odour issues	NO NO		
WATER QUALITY OR	SECURITY RISI	Deaths or illness due to water quality Water restrictions (current and historic)	NO	Enterococcus detection in December 2007.	
WATER QUALITY C	SECURITY KIS	Deaths or illness due to water quality Water restrictions (current and historic) Taste and odour issues Other contamination that would affect	NO NO YES		
	SECURITY RIS	Deaths or illness due to water quality Water restrictions (current and historic) Taste and odour issues Other contamination that would affect	NO NO YES October 2009 - Work first stage of a \$5 mil	Enterococcus detection in December 2007. has begun on the construction of a treated water storage at Myrtleford, the lion project to upgrade the town's water supply. idual disinfectant is at the request of the local communities.	

Town #         53           z         State/Territory         VIC				
Š		State/Territory Town Name	VIC Beechworth	
TOWN		Town Population		6, Urban Centre/Locality)
	-	Name of Water Utility	North East Water	-,
WATER	5	Rate (\$/kL)	\$2.00/kL	
EN E		Per Capita Water Consumption (L/day)	Unknown. 313 kL/h	ousehold/year.
> -		Number of Connections	1396	
		Catchment	Ovens	
₽>	<b>-</b>	Sub-Catchment	Ovens River catchr	ient
CATCHMENT AND	Ļ	Catchment Management Authority (CMA)	North East Catchm	ent Management Authority
	Ď	CMA Web-Link	http://www.necma.v	ic gov au/
E E E	Ľ	Catchment Protection Status	None. Good to Exce	
는 분			Nine Mile Creek	
LAC		Potable Water Source(s)	Frenchman's Creek	
Ŭ			Lake Kerferd	
		Supply Capacity		tlement - 1,100 ML/annum
	_	Treatment Plant(s) Level of Treatment	Beechworth WTP	ulation, Floatation, Filtration, pH correction, Chloramination
Ë	-	Drinking Water Guidelines		Water Guidelines (2004) and Safe Drinking Water Regulations (2005)
AT 'AT	Ę		Suspended Solids	
WATER QUALITY		Results (% compliance for 2008 reporting period)	E Coli	100%
		period)	Aluminium	Did not meet guidelines
		Current Water Restrictions	Yes Stage 1 - Star	
	-		For details refer to:	http://www.ourwater.vic.gov.au/saving/restrictions
WATER	<u>r</u>	Proportion of Potable Water Supplied to	Residential - 54%	Commercial - 25%, Non revenue - 21%
E A	2	Households (%)		
<ul> <li>Ц</li> <li>0</li> </ul>	0	Distance from the Coast (km)	Approx 200km Sout	IN EASI
		Climate Average Annual Rainfall	Temperate 946.5mm	
		FACTOR	YES / NO	NOTES / EXPLANATION
				Majority of Victoria experiencing drought (or Exceptional Circumstances,
		Drought	YES	whereby farmers can apply for rebates)
				http://www.daff.gov.au/agriculture-food/drought/ec/victoria
		Single drinking water source	YES	All water from Lake.
		Poor quality water source	NO	
	≥	Sewage overflow or disposal into water Flooding	NO NO	
	Catchment and Water Supply	Fauna defecating in supply	NU	
		Fauna destroying water intake structures		
		Natural mineral pollutants (e.g. uranium,	NO	
		nitrates, iron, fluoride)	NU	
		Un-lined landfills		
SE		Extensive agriculture		
AU		Low vegetation cover (dust, sediment		
0		Poor access to supply		
NY IS	õ	Unsustainable water extraction		
х К		Aquifer turning saline due to high extraction	NO	
L L		Hard water	NO	
IJ.		Aging or inadequate pipe work and		
SEC		associated infrastructure		
R S		Significant water losses due to leaking		
ν Σ		High per capita water consumption	NO	Water use higher than other towns in the region (313kL/house with a
WATER QUALITY OR SECURITY RISK (CAUSE)		•••••	-	regional average of 305kL/house).
INI	e	Inappropriate water quality standards / objectives	NO	
ð	Jan	Lack of infrastructure maintenance	Unknown	
ШЦ	Governan	Poor management or governance	NO	
VAT	00	Vandalism / sabotage / terrorism		
>		Insufficient trained personnel		
		Inadequate funding for maintenance or		
		upgrades	<u> </u>	
	ies	Mining / minerals	NO	
	Industries	Irrigation		
	ndt	-	NO	
		Chemicals / process	NO	
	u	Seasonal population loadings	NO	
	Population	seasonal population loadings		
	ndo	Papid population growth	NO	Decline in population between 2001 and 2006
	ď.	Rapid population growth	NO	Decline in population between 2001 and 2006
Ĺ	-	Pathogenic contamination	NO	
Ц Ц	ر ⊔	Algal blooms	NO	
	L	Heavy metal contamination	NO	
Ē	<u> </u>	Poor chlorine residuals	Unknown	
	n n	Pesticide contamination Boil water notices	NO NO	
	r F	Deaths or illness due to water quality	NO	
O L	_		YES	Stage 1 - Started 21/11/08,
TER Q	7			
	R N	Water restrictions (current and historic)	1123	Currently on Stage 2 Restrictions (Water Authority Website)
WATER QUALITY OR SECLIDITY DISK (FEFECT)		Taste and odour issues Other contamination that would affect	YES	Currently on Stage 2 Restrictions (Water Authority Website) Elevated aluminium levels.

		State/Territory	VIC	
TOWN		Town Name	Bright 2.111 (Census 2006, Urban Centre/Locality)	
10		Town Population		Urban Centre/Locality)
~ >		Name of Water Utility	North East Water	**
μĘ		Rate (\$/kL)	\$2.00/kL	
WATER UTILITY		Per Capita Water Consumption (L/day)		nd on water supply system - 393ML/annum
ر <	·	Number of Connections	1,795	
		Catchment	North East / Ovens	
CATCHMENT AND WATER SUPPLY		Sub-Catchment	Bakers Gully and Over	ns River catchments (Ovens River - Proclaimed)
P PI		Catchment Management Authority (CMA)	North East Catchment	Management Authority
SCE	}	CMA Web-Link		
Ξü		Catchment Protection Status	http://www.necma.vic.g None. Good to Excelle	
ATIC			Ovens River	ni conditori.
SS		Potable Water Source(s)	Bakers Gully Creek	
		Supply Capacity	Surface water entitlem	ent - 704ML/annum
WATER QUALITY		Treatment Plant(s)		or and Ovens River chlorinator
		Level of Treatment	Chlorination	
		Drinking Water Guidelines		ater Guidelines (2004) and Safe Drinking Water Regulations (2005)
ц Ц		Results (% compliance for 2008 reporting	Suspended Solids	High Turbidity 98.10%
Ę		period)	E Coli Colour	Did not meet guidelines
Å		periody	Iron	Did not meet guidelines
		Current Water Restrictions	No	<u> </u>
WATER SECURITY		Proportion of Potable Water Supplied to		nmercial - 20%, Non revenue - 38%
TEI N		Households (%)		
A A		Distance from the Coast (km)	Approx 160km South E	last
- 8	)	Climate Average Annual Rainfall	Temperate 1127.2mm	
		FACTOR	YES / NO	NOTES / EXPLANATION
		THOTON .	1207110	Majority of Victoria experiencing drought (or Exceptional Circumstances,
		Drought	YES	whereby farmers can apply for rebates)
				http://www.daff.gov.au/agriculture-food/drought/ec/victoria
		Single drinking water source	YES	
		Poor quality water source	YES	
		Sewage overflow or disposal into water	NO	
	₹	source Flooding	YES	Storms after a bushire event caused water quality issues.
	dn	Fauna defecating in supply	120	Storms and a busine event caused water quality issues.
	Catchment and Water Supply	Fauna destroying water intake structures		
		Natural mineral pollutants (e.g. uranium,	YES	High Iron levels recorded.
		nitrates, iron, flouride)	120	nigh homevers recorded.
ω		Un-lined landfills		
N		Extensive agriculture		
CA		Low vegetation cover (dust, sediment runoff)		
Ж		Poor access to supply		
RIG		Unsustainable water extraction		
≿		Aquifer turning saline due to high extraction	NO	
R		Hard water	NO	
ICI .		Aging or inadequate pipework and	YES	Chlorinator was inadequate for incoming raw water.
s SI		associated infrastructure		18 failures in last 3 years in delivery pipework.
Р		Significant water losses due to leaking pipes	YES	Assumed to be an issues as large number of failures and significant
WATER QUALITY OR SECURITY RISK (CAUSE)		High per capita water consumption	NO	proportion of non-revenue water.
AL		Inappropriate water quality standards /		
g	e	objectives	NO	
Ř	anc	Lack of infrastructure maintenance	Unknown	
ATI	ern	Poor management or governance	NO	
3	Governance	Vandalism / sabotage / terrorism		
	9	Insufficient trained personnel		
		Inadequate funding for maintenance or upgrades		
-		Mining / minerals	NO	
	ries	winning / minerals	NO	
	Industries	Irrigation		
	lnd	Chemicals / process	NO	
-				
	Population	Seasonal population loadings	YES	Can increase to 10,000 in peak periods.
	ula			·
	do	Rapid population growth	NO	
	_			Postaria datastad in Ostabor 2007 - the allociation designed of the
Ł		Pathogenic contamination	YES	Bacteria detected in October 2007, extra chlorine dosing undertaken and test clear.
UR		Algal blooms	NO	
UC .		Heavy metal contamination	NO	
CT S		Poor chlorine residuals	Unknown	
Ы. С		Pesticide contamination	NO	
ΣĔ	į	Boil water notices	YES	A number of boil water notices issued due to chlorinator failures and
N A				bushfires.
JO RIS		Deaths or illness due to water quality	NO	
WATER QUALITY OR SECURITY RISK (EFFECT)		Water restrictions (current and historic) Taste and odour issues	NO	
ATI			1.50	
Š		Other contamination that would affect health	YES	Refer to water quality notices.
Notes		Notes	to the deterioration of t resulted in elevated tur the nfiltered supply at the	d Porepunkah experienced and extended period under a Boil Water Notice the raw water supply. Previous ushfires in the catchment area followed by rabidity levels, in the Ovens River, that compromised the disinfection system in hese localities. A Boil Water Notice was implemented while a temporary filtram Wangaratta, installed and ommissioned in Bright. On the July 16, water

Town #	55				
Z		State/Territory	VIC Trafalgar		
Town Population 2,301 (Census 2006, Urban Centre/Locality)		Irban Centre/Locality)			
		Name of Water Utility	2,301 (Census 2006, C Gippsland Water		
WATER	Ę	Rate (\$/kL)	\$1.56/kL		
VAT	Ē	Per Capita Water Consumption (L/day)	Unknown		
5	J	Number of Connections	Unknown		
0		Catchment	Latrobe		
CATCHMENT AND	Γ	Sub-Catchment	Not within a designated water supply catchment - Latrobe River Basin		
Ę	L D	Catchment Management Authority (CMA)	West Gippsland Catchment Management Authority		
UE .	S S	CMA Web-Link	http://www.wgcma.vic.	gov.au/	
E	Ξ.	Catchment Protection Status	None. Variable depending on location - likely to be moderate to poor.		
AT.	<b>∀</b> ≥	Potable Water Source(s)	Tanjil River		
0.		Supply Capacity	Narracan Creek Unknown		
		Treatment Plant(s)	Moe WTP		
WATER QUALITY		Level of Treatment		on, Primary Solids Separation - (Clarification), Secondary Solids ers & Dual Media Filters), Primary and Secondary disinfection, pH 1.	
ËR		Drinking Water Guidelines	Australian Drinking Wa	ter Guidelines (2004) and Safe Drinking Water Regulations (2005)	
/AT		Results (% compliance for 2008 reporting	E Coli	100%	
5	•	period)	pH	Maximum pH level was just outside guideline.	
	~	Current Water Restrictions	No		
WATER	Ê	Proportion of Potable Water Supplied to	Unknown		
ATE	Ľ.	Households (%) Distance from the Coast (km)	Approx 70km South		
ĺ Š L	SEC	Climate	Temperate		
		Average Annual Rainfall	1019.8mm		
		FACTOR	YES / NO	NOTES / EXPLANATION	
		Drought	YES	Majority of Victoria experiencing drought (or Exceptional Circumstances, whereby farmers can apply for rebates) http://www.daff.gov.au/agriculture-food/drought/ec/victoria	
		Single drinking water source	NO		
		Poor quality water source Sewage overflow or disposal into water			
		source			
	ylq	Flooding			
	Catchment and Water Supply	Fauna defecating in supply			
		Fauna destroying water intake structures			
		Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)	NO		
ω		Un-lined landfills			
ISI		Extensive agriculture			
OR SECURITY RISK (CAUSE)		Low vegetation cover (dust, sediment			
X		runoff) Poor access to supply			
R		Unsustainable water extraction			
È		Aquifer turning saline due to high extraction			
UR		Hard water	NO		
EC		Aging or inadequate pipe work and			
Å,		associated infrastructure Significant water losses due to leaking			
20		pipes			
QUALITY		High per capita water consumption			
UAL		Inappropriate water quality standards /	NO		
	nce	objectives			
Ē	ma	Lack of infrastructure maintenance Poor management or governance	NO NO		
WATER	Governance	Vandalism / sabotage / terrorism	NO		
-	ğ	Insufficient trained personnel	NO		
		Inadequate funding for maintenance or			
	(0)	upgrades	NO		
	Industries	Mining / minerals	NO		
	lust	Irrigation			
	un o	Chemicals / process	NO		
			<u> </u>		
	Population	Seasonal population loadings			
	Ъ	Rapid population growth	NO		
í	F	Pathogenic contamination	NO		
с (	с Ш	Algal blooms	NO		
>	11 11	Heavy metal contamination	NO		
L L	E Y	Poor chlorine residuals Pesticide contamination	NO NO		
N	SIS	Boil water notices	NO		
a c	⊬	Deaths or illness due to water quality	NO		
ШЦ Ц	L L	Water restrictions (current and historic)	YES	May have previously been on restrictions but these have now been lifted.	
WATER QUALITY OR	D D	Taste and odour issues	NO		
	ŝ	Other contamination that would affect health	YES	High turbidity and aluminium during a high rainfall event.	
				rbidity and aluminium in water supply due to heavy rainfall event. It plant caused by heavy rainfall event. Malfunction rectified and the water ed operation.	

Town # 56

State Technology         Vic Segment           Participation         Non-Segment         Non-Segment           Participation         Non-Segment         Non-Segment           Participation         Scate Colors         Non-Segment           Participation         Non-Segment         Non-Segment	Town #	56		1.40	
Lame of Water (Maily         South Clippan Water         Image of Water (Data)           Base of Water (Data)         South Clippan Water (Data)         South Clippan Water (Data)           Base of Water (Data)         Water (Data)         Water (Data)         Water (Data)           Base of Water (Data)         Water (Data)         Water (Data)         Water (Data)           Base Of Water (Data)         Water (Data)         Water (Data)         Water (Data)           Base Of Water (Data)         Water (Data)         Water (Data)         Water (Data)           Base Of Water (Data)         Water (Data)         Water (Data)         Water (Data)           Base Of Water (Data)         Water (Data)         Water (Data)         Water (Data)           Base Of Water (Data)         Water (Data)         Water (Data)         Water (Data)           Base Of Water (Data)         Water (Data)         Water (Data)         Water (Data)           Base Of Water (Data)         Water (Data)         Water (Data)         Water (Data)           Base Of Water (Data)         Water (Data)         Water (Data)         Water (Data)           Base Of Water (Data)         Water (Data)         Water (Data)         Water (Data)           Base Of Water (Data)         Water (Data)         Water (Data)         Water (Data)	Ę				
Lame of Water (Maily         South Clippan Water         Image of Water (Data)           Base of Water (Data)         South Clippan Water (Data)         South Clippan Water (Data)           Base of Water (Data)         Water (Data)         Water (Data)         Water (Data)           Base of Water (Data)         Water (Data)         Water (Data)         Water (Data)           Base Of Water (Data)         Water (Data)         Water (Data)         Water (Data)           Base Of Water (Data)         Water (Data)         Water (Data)         Water (Data)           Base Of Water (Data)         Water (Data)         Water (Data)         Water (Data)           Base Of Water (Data)         Water (Data)         Water (Data)         Water (Data)           Base Of Water (Data)         Water (Data)         Water (Data)         Water (Data)           Base Of Water (Data)         Water (Data)         Water (Data)         Water (Data)           Base Of Water (Data)         Water (Data)         Water (Data)         Water (Data)           Base Of Water (Data)         Water (Data)         Water (Data)         Water (Data)           Base Of Water (Data)         Water (Data)         Water (Data)         Water (Data)           Base Of Water (Data)         Water (Data)         Water (Data)         Water (Data)	Ś		Town Name	Wonthaggi	
Base of Water diffusion         South Regulated Water           Base of Water diffusion         South Regulated Water           Base of Water diffusion         Water South Controlling           Base of Water diffusion         Mater diffusion           Base of Water diff	μ		Town Population	6.529 (Census 2006.	Urban Centre/Locality)
Bit State         Frage (SAL)         Bit ZPAL           Performance         Unknown         Unknown         Unknown           Diamond Consumption (Liday)         Unknown         Unknown         Unknown           Diamond Consumption (Liday)         Unknown         Unknown         Unknown           Diamond Consumption (Liday)         Unknown         Unknown         Unknown           Catchines Management Authority (CMA)         West Oppisation Event Management Authority         Editions           Catchines Management Authority (CMA)         West Oppisation All appr authority         Editions           Catchines Management Authority (CMA)         Point Management Authority         Editions           Catchines Management Authority (CMA)         Point Management Authority         Editions           Diaman Paratico         Perevise Devisitional Authority         Editional Authority           Teamann Paratico         Perevise Devisitional Authority         Editional Authority           Unrealing         West Oppisational Authority         Editional Authority           Unrealing         Perevise Devisitional Authority         Editional Authority           Unrealing         West Oppisational Authority         Editional Authority           Unrealing         Authority With Authority         Editional Authority	'ER ITY				
Open control         West Sorth Graphand River Basin           Current Water Real Calculations         Calculations           Current Water Real Calculations         Pack Mode Link           Packatie Water Source(s)         Pack Mode Link           Packatie Water Source(s)         Packatie Water Source(s)           Packatie Water Real Calculations         Packatie Water Real Calculations           Packatie Source(s)         Packatie Mater Source(s)           Pacor Source(s)	E A	E			
Open control         West Sorth Graphand River Basin           Current Water Real Calculations         Calculations           Current Water Real Calculations         Pack Mode Link           Packatie Water Source(s)         Pack Mode Link           Packatie Water Source(s)         Packatie Water Source(s)           Packatie Water Real Calculations         Packatie Water Real Calculations           Packatie Source(s)         Packatie Mater Source(s)           Pacor Source(s)	L L	<u> </u>			
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Supply Capacity         Unknown           Taskmen Plant(s)         Lance Circk VTP           Taskmen Plant(s)         Reservor Destratification Tasks and Odeur pH Correction Plantation           Level of Treatment         Proceedings           Proceeding         Proceedings           Proceedings         Proceedings <td>S S</td> <td>3</td> <td>Potable vvater Source(s)</td> <td></td> <td></td>	S S	3	Potable vvater Source(s)		
Treatment Plant(s)     Treatment Plant(s	-		Supply Capacity		
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Under Status         PH Correction Procession Chicknatuon/Re-chicknatuon Chicknatuon Chichicknatuon Chicknatuon Chichichicknatuon Chicknatu				Reservoir Destratifica	ation
United         Address         Address <th< td=""><td>≻</td><td></td><td></td><td>Taste and Odour</td><td></td></th<>	≻			Taste and Odour	
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United         Address         Address         Address           Prinking Water Guidelines         Address         100%.         100%.           Durrent Water Guidelines         No.         100%.         100%.           Durrent Water Guidelines         No.         100%.         100%.           Providio of Probability Water Supplied In Households (%).         Majority of Victorie experiencing drought (of Exceptional Circumstances, whereby farmers can apply for rebates)         NOTES / EXPLANATION           Face Statistic Water Supplied In Households (%).         YES / NO         NOTES / EXPLANATION           Face Statistic Water Supres         NO         100%.           Generation Statistic Water Supres         NO         100%.           Face Statistic Water Supres	AL AL		Level of Treetmant		n
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Comparison         TH-Ms         Bid not comply with standards           Without Standards         No         Heroportion of Potable Water Supplied to Heroportion (Potable Stress Face Potable Comparison of Potable Water Supplied Torumstances, Water Supplied Torumstances, Water Supplied Torumstances, Water Supplied Torumstances, No           Potable Torum Standards (Potable Stress Face Potable Comparison (Potable Compariso			Results (% compliance for 2008 reporting		
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BALE     Proportion of Potable Water Supplied to     Unknown     Unknown     Distance from the Coast (km)     Approx Sxn South-West     Climate     Temperate     FACTOR     FACTOR     VES     Majority of Victoria experimenting drough (of Exceptional Circumstances,     whereby famers can applied     FACTOR     VES     Majority of Victoria experimenting drough (of Exceptional Circumstances,     whereby famers can applied     FACTOR     VES     Majority of victoria experiment drough Victoria     Single difficing water source     NO     Ford guality water source     NO     Fama destroying water induces includes     Fama destroying water induces     Fama destroyi					
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FACTOR     YES / NO     NOTES / SPL ANATION     NOTES / SPL ANATION     VES     Whereby famers can apply for rebates)     http://www.daff.gov.au/agriculture-food/drought/ecivictoria     Single drinking water source     NO     Poor guality water source     NO     Found affecting in supply     Fauna descroning water intake structures     Source     Teauna descroning water intake structures     NO     Vortex structure     V					
Use of the second sec	-	-			
Prought Minking water source NO     Production as apply for rebates     Mitp://www.daff.gov.au/agroutiure-food/drought/ec/victoria     Single drinking water source     NO     Prought Single drinking water source     NO     Provide Single drinking     NO     Provide Single drinking source     NO     Provide Single drinking Single drinking     NO     Provide Single drinking source     NO     Provide Single drinking source     NO     Provide Single Single drinking source     NO     Provide Single Single drinking source     NO     Provide Single S			FACTOR	TES/NU	
Brought     B					
Brought     B				YES	whereby farmers can apply for rebates)
Single drinking water source NO Source NO Fauna defecting in supply Eauna defecting and set source NO Natural mineral poliutants (e.g. uranium, Intrates, iron, floode) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment unoff) Poor access to supply Unsustanable water extraction Aquifer turning aline due to high NO Hard water Aquifer turning aline due to high NO Hard water consumption Inappropriate water quality standards / NO NO NO NO NO NO NO NO NO NO			Drought		
Porcyality water source         NO           Porcyality water source         NO           Floating				NO	
Source         Source           Floading					
Process     Provide Prevalence     Provide Prevalence     Provide Prevalence				UNI	
Image: state of the state state o			source		
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Portion       Lack of infrastructure mantenance       NO         Poor management or governance       NO         Vandalism / sabotage / terrorism       NO         Insufficient trained personnel       NO         Inadequate funding for maintenance or upgrades       NO         Mining / minerals       NO         Irrigation       Irrigation         Chemicals / process       NO         Rapid population loadings       Insufficient traination         Rapid population growth       NO         Pathogenic contamination       NO         Agai blooms       YES         Heavy metal contamination       NO         Poor chlorine residuals       Poor the Lance Creek Reservoir.         Pesticide contamination       NO         Boil water notices       NO         Water restrictions (current and historic)       NO         Water restrictions (current and historic)       NO         Water restrictions (current and historic)       NO         Taste and odour issues       NO	Ř	U			
Portion       Lack of infrastructure mantenance       NO         Poor management or governance       NO         Vandalism / sabotage / terrorism       NO         Insufficient trained personnel       NO         Inadequate funding for maintenance or upgrades       NO         Mining / minerals       NO         Irrigation       Irrigation         Chemicals / process       NO         Rapid population loadings       Insufficient traination         Rapid population growth       NO         Pathogenic contamination       NO         Agai blooms       YES         Heavy metal contamination       NO         Poor chlorine residuals       Poor the Lance Creek Reservoir.         Pesticide contamination       NO         Boil water notices       NO         Water restrictions (current and historic)       NO         Water restrictions (current and historic)       NO         Water restrictions (current and historic)       NO         Taste and odour issues       NO	L ∠				
Portion       Lack of infrastructure mantenance       NO         Poor management or governance       NO         Vandalism / sabotage / terrorism       NO         Insufficient trained personnel       NO         Inadequate funding for maintenance or upgrades       NO         Mining / minerals       NO         Irrigation       Irrigation         Chemicals / process       NO         Rapid population loadings       Insufficient traination         Rapid population growth       NO         Pathogenic contamination       NO         Agai blooms       YES         Heavy metal contamination       NO         Poor chlorine residuals       Poor the Lance Creek Reservoir.         Pesticide contamination       NO         Boil water notices       NO         Water restrictions (current and historic)       NO         Water restrictions (current and historic)       NO         Water restrictions (current and historic)       NO         Taste and odour issues       NO	Ř		Hard water	NO	
Portion       Lack of infrastructure mantenance       NO         Poor management or governance       NO         Vandalism / sabotage / terrorism       NO         Insufficient trained personnel       NO         Inadequate funding for maintenance or upgrades       NO         Mining / minerals       NO         Irrigation       Irrigation         Chemicals / process       NO         Rapid population loadings       Insufficient traination         Rapid population growth       NO         Pathogenic contamination       NO         Agai blooms       YES         Heavy metal contamination       NO         Poor chlorine residuals       Poor the Lance Creek Reservoir.         Pesticide contamination       NO         Boil water notices       NO         Water restrictions (current and historic)       NO         Water restrictions (current and historic)       NO         Water restrictions (current and historic)       NO         Taste and odour issues       NO	D.		Aging or inadequate pipe work and		
Portion       Lack of infrastructure mantenance       NO         Poor management or governance       NO         Vandalism / sabotage / terrorism       NO         Insufficient trained personnel       NO         Inadequate funding for maintenance or upgrades       NO         Mining / minerals       NO         Irrigation       Irrigation         Chemicals / process       NO         Rapid population loadings       Insufficient traination         Rapid population growth       NO         Pathogenic contamination       NO         Agai blooms       YES         Heavy metal contamination       NO         Poor chlorine residuals       Poor the Lance Creek Reservoir.         Pesticide contamination       NO         Boil water notices       NO         Water restrictions (current and historic)       NO         Water restrictions (current and historic)       NO         Water restrictions (current and historic)       NO         Taste and odour issues       NO	Ш Ш				
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Portion       Lack of infrastructure mantenance       NO         Poor management or governance       NO         Vandalism / sabotage / terrorism       NO         Insufficient trained personnel       NO         Inadequate funding for maintenance or upgrades       NO         Mining / minerals       NO         Irrigation       Irrigation         Chemicals / process       NO         Rapid population loadings       Insufficient traination         Rapid population growth       NO         Pathogenic contamination       NO         Agai blooms       YES         Heavy metal contamination       NO         Poor chlorine residuals       Poor the Lance Creek Reservoir.         Pesticide contamination       NO         Boil water notices       NO         Water restrictions (current and historic)       NO         Water restrictions (current and historic)       NO         Water restrictions (current and historic)       NO         Taste and odour issues       NO	R				
Portion       Lack of infrastructure mantenance       NO         Poor management or governance       NO         Vandalism / sabotage / terrorism       NO         Insufficient trained personnel       NO         Inadequate funding for maintenance or upgrades       NO         Mining / minerals       NO         Irrigation       Irrigation         Chemicals / process       NO         Rapid population loadings       Insufficient traination         Rapid population growth       NO         Pathogenic contamination       NO         Agai blooms       YES         Heavy metal contamination       NO         Poor chlorine residuals       Poor the Lance Creek Reservoir.         Pesticide contamination       NO         Boil water notices       NO         Water restrictions (current and historic)       NO         Water restrictions (current and historic)       NO         Water restrictions (current and historic)       NO         Taste and odour issues       NO	ů,				
Portion       Lack of infrastructure mantenance       NO         Poor management or governance       NO         Vandalism / sabotage / terrorism       NO         Insufficient trained personnel       NO         Inadequate funding for maintenance or upgrades       NO         Mining / minerals       NO         Irrigation       Irrigation         Chemicals / process       NO         Rapid population loadings       Insufficient traination         Rapid population growth       NO         Pathogenic contamination       NO         Agai blooms       YES         Heavy metal contamination       NO         Poor chlorine residuals       Poor the Lance Creek Reservoir.         Pesticide contamination       NO         Boil water notices       NO         Water restrictions (current and historic)       NO         Water restrictions (current and historic)       NO         Water restrictions (current and historic)       NO         Taste and odour issues       NO	L ⊢		High per capita water consumption		
Portion       Lack of infrastructure mantenance       NO         Poor management or governance       NO         Vandalism / sabotage / terrorism       NO         Insufficient trained personnel       NO         Inadequate funding for maintenance or upgrades       NO         Mining / minerals       NO         Irrigation       Irrigation         Chemicals / process       NO         Rapid population loadings       Insufficient traination         Rapid population growth       NO         Pathogenic contamination       NO         Agai blooms       YES         Heavy metal contamination       NO         Poor chlorine residuals       Poor the Lance Creek Reservoir.         Pesticide contamination       NO         Boil water notices       NO         Water restrictions (current and historic)       NO         Water restrictions (current and historic)       NO         Water restrictions (current and historic)       NO         Taste and odour issues       NO	Ę				
Portion       Lack of infrastructure mantenance       NO         Poor management or governance       NO         Vandalism / sabotage / terrorism       NO         Insufficient trained personnel       NO         Inadequate funding for maintenance or upgrades       NO         Mining / minerals       NO         Irrigation       Irrigation         Chemicals / process       NO         Rapid population loadings       Insufficient traination         Rapid population growth       NO         Pathogenic contamination       NO         Agai blooms       YES         Heavy metal contamination       NO         Poor chlorine residuals       Poor the Lance Creek Reservoir.         Pesticide contamination       NO         Boil water notices       NO         Water restrictions (current and historic)       NO         Water restrictions (current and historic)       NO         Water restrictions (current and historic)       NO         Taste and odour issues       NO	N	0		NO	
Build         Poor management or governance         NO           Vandalism / sabotage / terrorism         NO           Insufficient trained personnel         NO           Image trained personnel         NO           Seasonal population loadings         NO           Rapid population growth         NO           Pathogenic contamination         NO           Algal blooms         YES           Heavy metal contamination         NO           Pesticide contamination         NO           Boil water notices         NO           Deaths or illnes					
Working of a status personal persona persona personal personal personal personal persona	Ř	Jai		10	
Working of a status personal persona persona personal personal personal personal persona	μ	err			
Working of a status personal persona persona personal personal personal personal persona	AN I	Š		NO	
Inadequate funding for maintenance or upgrades       NO         Inadequate funding for maintenance or upgrades       NO         Iming / minerals       NO         Irrigation       Irrigation         Iming / minerals       NO         Seasonal population loadings       Iming / minerals         Rapid population growth       NO         Rapid population growth       NO         Algal blooms       YES         Heavy metal contamination       NO         Poor chlorine residuals       Pesticide contamination         Posticide contamination       NO         Boil water notices       NO         Boil water notices       NO         Water restrictions (current and historic)       NO         Water restrictions (current and historic)       NO         Taste and odour issues       NO	5	U	Insufficient trained personnel	NO	
upgrades         upgrades           Mining / minerals         NO           Irrigation         Irrigation           Organ         Seasonal population loadings           Seasonal population growth         NO           Rapid population growth         NO           Pathogenic contamination         NO           Algal blooms         YES           Heavy metal contamination         NO           Poor chlorine residuals         Pesticide contamination           Poor chlorine residuals         NO           Boil water notices         NO           Weater restrictions (current and historic)         NO           Water restrictions (current and historic)         NO				i i i i i i i i i i i i i i i i i i i	
NO       Iming / minerals     NO       Chemicals / process     NO       Seasonal population loadings     Iming / minerals       Rapid population growth     NO       Algal blooms     YES       Heavy metal contamination     NO       Heavy metal contamination     NO       Post clicide contamination     NO       Boil water notices     NO       Boil water notices     NO       Water restrictions (current and historic)     NO       Water rastrictions (current and historic)     NO       Taste and odour issues     NO					
Set State       No         Image manage manage       Image manage         Image manage       No         Chemicals / process       NO         Chemicals / process       NO         Rapid population loadings       NO         Rapid population growth       NO         Pathogenic contamination       NO         Algal blooms       YES         Heavy metal contamination       NO         Poor chlorine residuals       Pesticide contamination         Post chlorine residuals       NO         Boil water notices       NO         Water restrictions (current and historic)       NO         Water restrictions (current and historic)       NO         Taste and odour issues       NO		-			
Bigged       Irrigation       NO         Irrigation       NO         Chemicals / process       NO         Bigged       Seasonal population loadings         Rapid population growth       NO         Pathogenic contamination       NO         Algal blooms       YES         Heavy metal contamination       NO         Poor chlorine residuals       Pesticide contamination         Poor chlorine residuals       Pesticide contamination         Boil water notices       NO         Water restrictions (current and historic)       NO         Water rastrictions (current and historic)       NO         Taste and odour issues       NO			Mining / minerals	NO	
Image: Chemicals / process       NO         Image: Chemicals / process       NO         Image: Chemicals / process       NO         Rapid population loadings       NO         Rapid population growth       NO         Pathogenic contamination       NO         Algal blooms       YES         Algal blooms       YES         Heavy metal contamination       NO         Poor chlorine residuals       Pesticide contamination         Poor chlorine residuals       Pesticide contamination         Deaths or illness due to water quality       NO         Water restrictions (current and historic)       NO         Taste and odour issues       NO		es		i i i i i i i i i i i i i i i i i i i	
Image: Chemicals / process       NO         Image: Chemicals / process       NO         Image: Chemicals / process       NO         Rapid population loadings       NO         Rapid population growth       NO         Pathogenic contamination       NO         Algal blooms       YES         Algal blooms       YES         Heavy metal contamination       NO         Poor chlorine residuals       Pesticide contamination         Poor chlorine residuals       Pesticide contamination         Deaths or illness due to water quality       NO         Water restrictions (current and historic)       NO         Taste and odour issues       NO		stri	Interation		
Image: Chemicals / process       NO         Image: Chemicals / process       NO         Image: Chemicals / process       NO         Rapid population loadings       NO         Rapid population growth       NO         Pathogenic contamination       NO         Algal blooms       YES         Algal blooms       YES         Heavy metal contamination       NO         Poor chlorine residuals       Pesticide contamination         Poor chlorine residuals       Pesticide contamination         Deaths or illness due to water quality       NO         Water restrictions (current and historic)       NO         Taste and odour issues       NO		Π	Ingation		
Image: Chemicals / process       NO         Image: Chemicals / process       NO         Image: Chemicals / process       NO         Rapid population loadings       NO         Rapid population growth       NO         Pathogenic contamination       NO         Algal blooms       YES         Algal blooms       YES         Heavy metal contamination       NO         Poor chlorine residuals       Pesticide contamination         Poor chlorine residuals       Pesticide contamination         Deaths or illness due to water quality       NO         Water restrictions (current and historic)       NO         Taste and odour issues       NO		Ē		NO	
Opened         Seasonal population loadings         NO           Rapid population growth         NO         NO           Rapid population growth         NO         Algal bloom event was reported on the 30th August 2007 for the Lance Creek Reservoir.           Heavy metal contamination         NO         Post cicle contamination         NO           Heavy metal contamination         NO         Post cicle contamination         NO           Boil water notices         NO         Pesticide contamination         NO           Boil water notices         NO         Pesticide contamination         NO           Water restrictions (current and historic)         NO         Image: Current and historic)         NO           Taste and odour issues         NO         Image: Current and historic)         NO         Image: Current and historic)			Chemicals / process	110	
Pathogenic contamination       NO         Algal blooms       YES         Algal blooms       YES         Heavy metal contamination       NO         Poor chlorine residuals       Pesticide contamination         Pesticide contamination       NO         Boil water notices       NO         Deaths or illness due to water quality       NO         Water restrictions (current and historic)       NO         Taste and odour issues       NO		0			
Pathogenic contamination       NO         Algal blooms       YES         Algal blooms       YES         Heavy metal contamination       NO         Poor chlorine residuals       Pesticide contamination         Pesticide contamination       NO         Boil water notices       NO         Deaths or illness due to water quality       NO         Water restrictions (current and historic)       NO         Taste and odour issues       NO		atic	Seasonal population loadings		
Pathogenic contamination       NO         Algal blooms       YES         Algal blooms       YES         Heavy metal contamination       NO         Poor chlorine residuals       Pesticide contamination         Pesticide contamination       NO         Boil water notices       NO         Deaths or illness due to water quality       NO         Water restrictions (current and historic)       NO         Taste and odour issues       NO		n c			
Pathogenic contamination       NO         Algal blooms       YES         Algal blooms       YES         Heavy metal contamination       NO         Poor chlorine residuals       Pesticide contamination         Pesticide contamination       NO         Boil water notices       NO         Deaths or illness due to water quality       NO         Water restrictions (current and historic)       NO         Taste and odour issues       NO		do		NO	
Pathogenic contamination       NO         Algal blooms       YES       A blue-green algal bloom event was reported on the 30th August 2007 for the Lance Creek Reservoir.         Heavy metal contamination       NO         Poor chlorine residuals       Pesticide contamination         Pesticide contamination       NO         Boil water notices       NO         Water restrictions (current and historic)       NO         Taste and odour issues       NO		۵.	Rapid population growth		
YES     A blue-green algal bloom event was reported on the 30th August 2007 for the Lance Creek Reservoir.       Heavy metal contamination     NO       Poor chlorine residuals		~		NO	
Algal blooms     YES     A blue-green algal bloom event was reported on the 30th Adgust 2007 for the Lance Creek Reservoir.       Poor chlorine residuals     NO       Pesticide contamination     NO       Boil water notices     NO       Deaths or illness due to water quality     NO       Water restrictions (current and historic)     NO       Taste and odour issues     NO       Other contamination that would affect     YES       Elevated THM's.	Ē.	5			A blue green algal bloom event was reported on the 20th Avgust 2007
Havy metal contamination     NO       Poor chlorine residuals     Pesticide contamination       Boil water notices     NO       Boil water notices     NO       Water restrictions (current and historic)     NO       Taste and odour issues     NO       Other contamination that would affect     YES	R	й Ц		YES	
Heavy metal contamination NO Poor chlorine residuals Post cicle contamination NO Boil water notices NO Deaths or illness due to water quality NO Water restrictions (current and historic) NO Taste and odour issues NO Other contamination that would affect YES Elevated THM's.		1			tor the Lance Creek Reservoir.
Poor chlorine residuals     NO       Pesticide contamination     NO       Boil water notices     NO       Deaths or illness due to water quality     NO       Water restrictions (current and historic)     NO       Taste and odour issues     NO       Other contamination that would affect     YES	_ <u>}</u>	Ξ.	Heavy metal contamination	NO	
NO     Pesticide contamination     NO       Boil water notices     NO       Boil water notices     NO       Water restrictions (current and historic)     NO       Taste and odour issues     NO       Other contamination that would affect     YES	J.	¥			
Boil water notices     NO       Deaths or illness due to water quality     NO       Water restrictions (current and historic)     NO       Taste and odour issues     NO       Other contamination that would affect     YES	N N	<u>v</u>		NO	
Dol water notices         NO           Deaths or illness due to water quality         NO           Water restrictions (current and historic)         NO           Taste and odour issues         NO           Other contamination that would affect         YES	ğ	r			
Homogeneous         Deaths or illness due to water quality         NO           Water restrictions (current and historic)         NO           Taste and odour issues         NO           Other contamination that would affect         YES           Elevated THM's.	<u>د ک</u>	≻			
Water restrictions (current and historic)       NO         Taste and odour issues       NO         Other contamination that would affect       YES         Elevated THM's.	ШE	F			
Taste and odour issues         NO           Other contamination that would affect         YES         Elevated THM's.	\$	5		NO	
Other contamination that would affect YES Elevated THM's.	S	U U			
		S			Elevated THM's
	0				

 Notes
 Introduction of chloramination system to replace present chlorination disinfection and thereby reduce trihalomethane formation - Due for completion in April 2009. Inverloch is another town with the same issues as its water supply comes from the same system.

Town #     57       Z     State/Territory			VIC	
Town Name Kerang				
6		Town Population		Jrban Centre/Locality)
<u>د</u> ک	≻	Name of Water Utility	Lower Murray Water	
WATER	3	Rate (\$/kL)		\$0.59/kL, Tier 3 \$0.76/kL
₹.	5	Per Capita Water Consumption (L/day)	Unknown	
		Number of Connections	Unknown	
		Catchment Sub-Catchment	North Loddon River Basin Not within a designated water supply catchment	
CATCHMENT AND	7			
Ā	T T	Catchment Management Authority (CMA)	North Central Catchme	ent Management Authority
	n S	CMA Web-Link	http://www.nccma.vic.g	gov.au/
Ę	ř	Catchment Protection Status	None. Moderate condit	tion.
D E			Murray River (directly)	
-A	Ì	Potable Water Source(s)		er Irrigation Channel (water originates from the Murray River)
			Loddon River	
		Supply Capacity Treatment Plant(s)	Murray River (approx 5 Kerang WTP	UL/sec)
≃ }	≻	Level of Treatment		on, Disinfection, pH correction, Taste & odour removal
E E	ļ	Drinking Water Guidelines		ater Guidelines (2004) and Safe Drinking Water Regulations (2005)
WATER	Ž	Results (% compliance for 2008 reporting	Aluminium	92% - Did not comply with standards
,	0	period)	E Coli	100%
≿			Yes Stage 3 - Started	I 17/01/08
Ĩ		Current Water Restrictions		p://www.ourwater.vic.gov.au/saving/restrictions
i C L		Proportion of Potable Water Supplied to		
WATER SECURITY		Households (%)	Unknown	
ЦЦ		Distance from the Coast (km)	Approx 290km South	
AT		Climate	Temperate	
5		Average Annual Rainfall	371.9 mm	1
_		FACTOR	YES / NO	NOTES / EXPLANATION
		Drought	YES	Majority of Victoria experiencing drought (or Exceptional Circumstances, whereby farmers can apply for rebates)
		Drought	TES	http://www.daff.gov.au/agriculture-food/drought/ec/victoria
		Single drinking water source		
		Poor quality water source		
		Sewage overflow or disposal into water		
		source		
	Catchment and Water Supply	Flooding		
		Fauna defecating in supply		
		Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium,		
		nitrates, iron, fluoride)		
		Un-lined landfills		
SE		Extensive agriculture		
AU		Low vegetation cover (dust, sediment		
RISK (CAUSE	hn	runoff)		
NY IN	Cato	Poor access to supply Unsustainable water extraction		
	Ŭ			
L L		Aquifer turning saline due to high extraction		
SECURITY		Hard water		
SEC		Aging or inadequate pipe work and		
Ř		associated infrastructure		
JALITY OR		Significant water losses due to leaking		
É		pipes High per capita water consumption		
		Inappropriate water quality standards /		
WATER QI	e	objectives		
ШЦ	anc	Lack of infrastructure maintenance		
LAV	ern	Poor management or governance		
>	Governance	Vandalism / sabotage / terrorism		
		Insufficient trained personnel Inadequate funding for maintenance or		
		upgrades		
	ries	Mining / minerals		
	Industries	Irrigation		
	pri			
		Chemicals / process		
	tion	Seasonal population loadings		
	ulat			
	Population	Rapid population growth	NO	
	ш	Pathogenic contamination		
	Ê	Pathogenic contamination Algal blooms		
ŕ	Ц Ц	Heavy metal contamination	1	
R	L	Poor chlorine residuals		
Y OR	<u>+</u>	Pesticide contamination		
	L L L	resticide contamination		
	risk (ef	Boil water notices	NO	
	Y RISK (EF	Boil water notices Deaths or illness due to water quality	NO	
TER QUALITY OR	kii y kisk (ef	Boil water notices Deaths or illness due to water quality Water restrictions (current and historic)	NO YES	Stage 3 currently in place
ATER QUALITY OR	JURILY RISK (EF	Boil water notices Deaths or illness due to water quality	NO	
WATER QUALITY OR	SECURITY RISK (EF	Boil water notices Deaths or illness due to water quality Water restrictions (current and historic) Taste and odour issues Other contamination that would affect	NO YES NO	Elevated levels of aluminium.
	SECURITY RISK (EF	Boil water notices Deaths or illness due to water quality Water restrictions (current and historic) Taste and odour issues	NO YES	

NMC	58		140	
TOWN		State/Territory	VIC	
9		Town Name	Ararat	
		Town Population	7,169 (Census 2006, L	
뜺	≿	Name of Water Utility	Grampians Wimmera	
WATER	⊒	Rate (\$/kL) Per Capita Water Consumption (L/day)	\$1.30/kL - fully treated Unknown	water
2 S	5	Number of Connections	Unknown	
		Catchment	Hopkins River Basin	
	~	Sub-Catchment	Not within a designate	d Catchment
AN	<u>_</u>	Catchment Management Authority (CMA)		ment Management Authority
Ļ ₽	L L	CMA Web-Link	http://www.ghcma.vic.g	
CATCHMENT AND	ທີ	Catchment Protection Status	None. Very Poor to Po	
E L	ц		Lake Fyans	
	Ā	Potable Water Source(s)	Mt Cole Reservoir	
S S	3		Langi Ghiran Reservoir	•
		Supply Capacity	Unknown	
	~	Treatment Plant(s)	Ararat WTP	
WATER	=	Level of Treatment		on, dissolved air flotation, filtration, disinfection, pH correction
AT AT	Ā	Drinking Water Guidelines		ater Guidelines (2004) and Safe Drinking Water Regulations (2005)
≥ ₹	ð	Results (% compliance for 2008 reporting	E Coli	100%
		period)	THM's	Did not comply with standards
>	≻	Current Water Restrictions	Yes Recently revise	ed from Stage 4 to Stage 1
딾브	F	Proportion of Potable Water Supplied to	Unknown	
WATER	5	Households (%) Distance from the Coast (km)	Approx 130km South-V	Vest
≥ µ	Ц Ц	Climate	Temperate	1001
0	.,	Average Annual Rainfall	587.1 mm	
		FACTOR	YES / NO	NOTES / EXPLANATION
			0,	Majority of Victoria experiencing drought (or Exceptional Circumstances,
		Drought	YES	whereby farmers can apply for rebates)
				http://www.daff.gov.au/agriculture-food/drought/ec/victoria
		Single drinking water source	NO	
		Poor quality water source	NO	
		Sewage overflow or disposal into water	NO	
	~	source		
	ldd	Flooding	NO	
	Su	Fauna defecating in supply		
	ē	Fauna destroying water intake structures		
	Catchment and Water Supply	Natural mineral pollutants (e.g. uranium,		
ш		nitrates, iron, fluoride)	NO	
ISI		Un-lined landfills	NO	
CA CA		Extensive agriculture Low vegetation cover (dust, sediment		
ž Y	Ę	runoff)		
SISI	atc	Poor access to supply		
×	ő	Unsustainable water extraction		
Τ		Aquifer turning saline due to high extraction		
Ľ.		Hard water	NO	
U U		Aging or inadequate pipe work and		
с С		associated infrastructure		
ō		Significant water losses due to leaking		
È		pipes		
WATER QUALITY OR SECURITY RISK (CAUSE)		High per capita water consumption		
л.		Inappropriate water quality standards /	NO	
н С	Ge	objectives		
Ë	vernance	Lack of infrastructure maintenance	??	
MA	/err	Poor management or governance	NO	
_	Gov	Vandalism / sabotage / terrorism	NO	
		Insufficient trained personnel	?	
		Inadequate funding for maintenance or upgrades	NO	
	s	Mining / minerals	NO	
	Industries			
	ust	Irrigation	NO	
	pul	Chemicals / process	NO	
	E.			
	Population	Seasonal population loadings		
	ouls			
	6	Rapid population growth	NO	
	Ч Ч	Dath a namia a sub-usin sticu	NO	
~ 		Pathogenic contamination	NO	
OR		Algal blooms	NO NO	
TY OR		Algal blooms Heavy metal contamination	NO NO ?	
ILITY OR		Algal blooms Heavy metal contamination Poor chlorine residuals	NO	
UALITY OR		Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination	NO ?	
R QUALITY OR		Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination Boil water notices	NO ? NO	
TER QUALITY OR		Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination Boil water notices Deaths or illness due to water quality	NO ? NO NO	Stage 4 - Started 10/02/09 recently revised to Stage 1.
ATER QUALITY OR		Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination Boil water notices	NO ? NO NO NO	Stage 4 - Started 10/02/09 recently revised to Stage 1.
		Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination Boil water notices Deaths or illness due to water quality Water restrictions (current and historic)	NO ? NO NO NO YES NO	
		Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination Boil water notices Deaths or illness due to water quality Water restrictions (current and historic) Taste and odour issues	NO ? NO NO YES	Stage 4 - Started 10/02/09 recently revised to Stage 1. Elevated trihalomethanes.

## AECOM

## Town Profiles – SA



Appendices Volume 2

		State/Territory	SA			
Ö		Town Name	Port Augusta			
		Town Population		suburbs Pt Augusta, Pt Augusta West and Stirling North)		
∺ ≿		Name of Water Utility	SA Water			
WATER UTILITY		Rate (\$/kL) Per Capita Water Consumption (ML/day)	Quarterly supply charge of \$34.40 360 L/person/day (based on reside			
≥5		Number of Connections	5,860			
		Catchment	Murray River Basin Catchment			
Ř		Sub-Catchment	Lower Murray			
ATE						
Ň		Catchment Management Authority (CMA)	South Australia Murray Darling Ba	sin (SAMDB), Natural Resources Management Board (NRMB)		
₽≻.		CMA Web-Link	http://www.mdba.gov.au/ http://	www.nrm.sa.gov.au/		
PL		Catchment Protection Status	Prescribed			
N N		Potable Water Source(s)	Murray River			
CATCHMENT AND WATER SUPPLY			Water is delivered via the Morgan	<ul> <li>Whyalla pipeline from SA Water's existing Country</li> </ul>		
Ó		Supply Capacity		Inrestricted, this allocation is 50 GL/a. However, recent		
.AO		Supply Supulity		allocations drop to 31 GL/a in 2007-08. Supply capacity to particular to		
Ũ			is unknown.			
		Treatment Plant(s)	Morgan Filtration Plant, Morgan (I	Morgan-Whyalla pipeline)		
				nt (Coagulation, Flocculation, Sedimentation, Filtration, Disinfection		
		Level of Treatment	(NHCl2), Fluoridation, Storage and			
		Drinking Water Guidelines	ADWG 2004	···· ,		
		Drinking Water Ouldennes	Source:	SA Water (email)		
≻			Faecal Coliforms/100 mL	100%		
E -			E.Coli/100mL	100%		
NAI			Chlorine Residual-Free [mg/L]	N/A		
WATER QUALITY			Chlorine Residual- Total [mg/L]	100%		
ËR			TDS [by EC] [mg/L]	100%		
IA1		Results (% compliance for 2008 reporting		100%		
3		period)	Turbidity [NTU]	100%		
			pH Units Trialomethanes Total [ug/L]	1% 100%		
			Trialomethanes-Total [ug/L] Fluoride [mg/L]	100%		
			Iron-Total [mg/L]	100%		
			Total Hardness as CaCO3 [mg/L]	100%		
			Manganese	100%		
~				Dripper systems and hand-held hoses fitted with a trigger nozzle can be used		
E C		Current Water Restrictions	maximum of 3 hours 2 days a week between 6 am - 9 am or 6pm - 9 pm. Watering cans and buckets can be used on ar			
Ľ.			day/time. Sprinklers and other wateri	ng systems remain banned.		
SEC.		Proportion of Potable Water Supplied to	72% residential, 28% non-resident	ial (incl. commercial, industrial, mining, public institution, public utilities		
E E		Households (%)	recreation)			
WATER SECURITY		Distance from the Coast (km)	0			
A M		Climate	Temperate			
-		Average Annual Rainfall FACTOR	242.8mm YES / NO NOTES / EXPLANATION			
		Drought	YES	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps		
		Single drinking water source	YES	From the Morgan-Whyalla Pipeline		
		Poor quality water source	NO			
		Sewage overflow or disposal into water	NO			
		source				
		Flooding	NO	No historical record for Pt Augusta		
		Fauna defecating in supply	Yes	Not an issue due to treatment plant		
	рl	Fauna destroying water intake structures	NO			
	Supply	Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)	Unknown			
	er O	Un-lined landfills	NO			
	Water	Extensive agriculture	YES	Extensive grazing and cropping. Dryland and irrigated agriculture.		
	_	Low vegetation cover (dust, sediment				
	an	runoff)	YES	Cleared and modified native vegetation, cropping and grasslands.		
<u>î</u>	Catchment and	Poor access to supply	NO			
0	Ë	Unsustainable water extraction	YES	Low flows causing several issues for Murray River Region.		
	atc	Aquifer turning saline due to high	NO			
5	0	extraction		Motor quality report above M/TD water to be of second available		
	Ũ	Hard water	NO	Water quality report shows WTP water to be of good quality. SA Water undertakes integrated asset management covering all of it		
				TOA MALE UNCLARES INCLARED ASSEL HANDLENE LOVEND AND AND AND AND AND AND AND AND AND A		
		Aging or inadequate pipe work and	NO			
		Aging or inadequate pipe work and associated infrastructure	NO	water infrastructure across South Australia, that ensures ongoing		
		associated infrastructure	NO	water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers		
		associated infrastructure Significant water losses due to leaking	NO	water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers		
		associated infrastructure Significant water losses due to leaking pipes	NO	water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers		
ו סא שבטמאו דו אושא (כאר		associated infrastructure Significant water losses due to leaking pipes High per capita water consumption		water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing		
		associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards /	NO	water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers		
		associated infrastructure Significant water losses due to leaking pipes High per capita water consumption	NO	water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers According to SA WATER		
		associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives	NO NO NO	water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers According to SA WATER SA Water undertakes integrated asset management covering all of it		
		associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards /	NO	water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers According to SA WATER SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing		
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		associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance	NO NO NO	water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers According to SA WATER SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it SA water undertakes integrated asset management covering all of it		
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	rnance	associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance	NO NO NO	water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers According to SA WATER SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing		
		associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance	NO NO NO NO	water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers According to SA WATER SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing		
		associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel	NO NO NO NO NO NO	water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers According to SA WATER SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it SA Water undertakes integrated asset management covering all of it SA Water undertakes integrated asset management covering all of it		
		associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or	NO NO NO NO NO	water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers According to SA WATER SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers		
	Governance	associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades	NO NO NO NO NO NO NO	water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers According to SA WATER SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers		
	Governance	associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals	NO NO NO NO NO NO NO	water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers According to SA WATER SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers		
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Populatic	Rapid population growth	NO	extended period of population decline, however from 2001 to 2006 this changed with the region experiencing growth of approximately 0.75 % per annum.
	Pathogenic contamination	NO	100% of all tests are above AWDG guidelines this year
EFFECT)	Algal blooms	YES	A total of 53 blooms were recorded in SA Water Reservoirs between 2002 and 2007, while a further 100 blooms were detected along the Murray River.
	Heavy metal contamination	Unknown	
ISI I	Poor chlorine residuals	NO	
URITY F	Pesticide contamination	YES	The recent rains may have washed stormwater pollution (such as fertilisers, manure and detergent) into our creeks and rivers. Due to high agriculture it seems likely, although could not find dat.
Ö	Boil water notices	NO	
5	Deaths or illness due to water quality	NO	
КO	Water restrictions (current and historic)	YES	Since 2003.
	Taste and odour issues	YES	
WATER QUALITY OR SECURITY RISK (EFFECT)	Other contamination that would affect health	YES	Increasing salinity -(critical issue for the quality of our drinking water in the Murray. Long-term below average rainfall over the past 10 years has reduced river flows and salt has accumulated in the floodplains and disconnected wetlands. While the water quality meets drinking water guidelines at the moment, when river flows are increased, this accumulated salt may reduce water quality). <u>Elevated phosphorus and nitrate</u> readings (fertilisers, manure and detergent washed in from rainfall).
	Notes		·

	State/Territory	SA		
Ş	Town Name	Port Pirie		
TOWN	Town Population	13,752 (SA Water Data, based on Risdon Park, Risdon Park, Risdon Park South,	suburbs of Port Pirie, Port Pirie West, Port Pirie South Solomontown)	
α≻	Name of Water Utility	SA Water		
WATER UTILITY	Rate (\$/kL)	13,752		
A FU	Per Capita Water Consumption (L/day)	290 L/person/day (based on resid	ential use only)	
	Number of Connections	6,538		
Ë	Catchment Sub-Catchment	Murray River Basin Catchment Southern Basin		
WA	Catchment Management Authority (CMA)	South Australia Murray Darling Ba	asin (SAMDB) , Natural Resources Management Board	
		(INRIVID)		
1 H	CMA Web-Link Catchment Protection Status	http://www.mdba.gov.au/ http:// Prescribed	/www.nrm.sa.qov.au/	
SC III	Potable Water Source(s)	Murray River		
CATCHMENT AND WATER SUPPLY	Supply Capacity	Water delivered via the Morgan – Allocation from the River Murray.	Whyalla pipeline is from SA Water's existing Country Unrestricted, this allocation is 50 GL/a. However, recer allocations drop to 31 GL/a in 2007-08. Supply capacit	
	Treatment Plant(s)	Morgan Filtration Plant, Morgan		
	Level of Treatment	Disinfection (NHCl2), Fluoridation	ant (Coagulation, Flocculation, Sedimentation, Filtration, Storage and distribution)	
	Drinking Water Guidelines	ADWG 2004		
		Source	SA Water (email).	
≽		Faecal Coliforms/100 mL E.Coli/100mL	100% 100%	
ALL		Chlorine Residual-Free [mg/L]	N/A	
WATER QUALITY		Chlorine Residual- Total [mg/L]	100%	
Ř		TDS [by EC] [mg/L]	100%	
ATE	Results (% compliance for 2008 reporting	Colour-True [HU]	100%	
Š	period)	Turbidity [NTU]	100%	
		pH Units Trialomethanes-Total [ug/L]	1% 100%	
		Fluoride [mg/L]	100%	
		Iron-Total [mg/L]	100%	
			100%	
		Total Hardness as CaCO3 [mg/L]		
		Manganese	100% tions-Dripper systems and hand-held hoses fitted with a	
WATER SECURITY	Current Water Restrictions	trigger nozzle can be used for a maximum of 3 hours 2 days a week between 6 am - 9 am or 6p 9 pm. Watering cans and buckets can be used on any day/time. Sprinklers and other watering 28% residential, 72% non-residential (incl. commercial, industrial, mining, public institution		
ER SI	Proportion of Potable Water Supplied to Households (%)	public utilities & recreation).		
/AT	Distance from the Coast (km) Climate	0 Temperate		
5	Average Annual Rainfall	344.6mm		
	FACTOR	YES / NO	NOTES / EXPLANATION	
	Drought	YES	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps.	
	Single drinking water source	YES	From the Morgan-Whyalla Pipeline	
	Poor quality water source	NO		
	Sewage overflow or disposal into water source	NO		
	Flooding	NO	No historical record for Pt Augusta	
	Fauna defecating in supply	Yes	Not an issue due to treatment plant	
	Fauna destroying water intake structures	NO		
	Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)	Unknown		
No	Un-lined landfills	NO		
	Extensive agriculture	YES	Extensive grazing and cropping. Dryland and irrigate agriculture	
Catchment and Water Sumly	Low vegetation cover (dust, sediment runoff)	YES	Cleared and modified native vegetation, cropping ar grasslands	
- - 	Poor access to supply	NO		
uemu	Unsustainable water extraction	YES	Low flows causing several issues for Murray River Region	
	Aquifer turning saline due to high extraction	NO		
(ISE)	Hard water	NO	Water quality report shows WTP water to be of good quality	
OR SECURITY RISK (CAUSE)	Aging or inadequate pipe work and associated infrastructure	NO	SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation the assets and reliable service to customers.	
E	Significant water losses due to leaking		SA Water undertakes integrated asset management covering all of its water infrastructure across South	

ALITY	0	Inappropriate water quality standards / objectives	NO	
WATER QUALITY		Lack of infrastructure maintenance	NO	SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
>	Governance	Poor management or governance	NO	SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
		Vandalism / sabotage / terrorism	NO	
		Insufficient trained personnel	NO	
		Inadequate funding for maintenance or upgrades	NO	SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
	sa	Mining / minerals	NO	
	ndustries	Irrigation	YES	Irrigated cropping occurs in this catchment.
	Ľ.	Chemicals / process	NO	
		Seasonal population loadings	NO	
	Population	Rapid population growth	NO	During the period leading up to 2001 the region was enduring an extended period of population decline, however from 2001 to 2006 this changed with the region experiencing growth of approximately 0.75 % per annum.
		Pathogenic contamination	NO	100% of all tests are above AWDG guidelines this year.
Ê		Algal blooms	YES	A total of 53 blooms were recorded in SA Water Reservoirs between 2002 and 2007, while a further 100 blooms were detected along the Murray River.
Ш		Heavy metal contamination	Unknown	
Ë		Poor chlorine residuals	NO	
RITY RISK (I		Pesticide contamination	YES	The recent rains may have washed stormwater pollution (such as fertilisers, manure and detergent) into our creeks and rivers. Due to high agriculture it seems likely, although could not find data
, S		Boil water notices	NO	
ы Ш		Deaths or illness due to water quality	NO	
0) 2		Water restrictions (current and historic)	YES	Since 2003.
Ō		Taste and odour issues	YES	
WATER QUALITY OR SECURITY RISK (EFFECT)		Other contamination that would affect health	YES	Increasing salinity -(critical issue for the quality of our drinking water in the Murray. Long-term below average rainfall over the past 10 years has reduced river flows and salt has accumulated in the floodplains and disconnected wetlands. While the water quality meets drinking water guidelines at the moment, when river flows are increased, this accumulated salt may reduce water quality). Elevated phosphorus and nitrate readings (fertilisers, manure and detergent washed in from rainfall).
		Notes		

TOWN		State/Territory	SA			
õ		Town Name	Port Lincoln			
Ĕ		Town Population	13,044 (Census 2006, Urban Centre/Locality)			
ш	≿	Name of Water Utility	SA Water			
Ë	2	Rate (\$/kL)	Quarterly supply charge of \$34.40			
WATER	5	Per Capita Water Consumption (L/day) Number of Connections	240 L/person/day (based on residential use only) 6137			
		Catchment	Lincoln Basin/ Uley South/Uley Wanilla			
		Sub-Catchment	Lincoln Basin/ Uley South/Uley Wanilla			
SUPPLY		Catchment Management Authority (CMA)	<ul> <li>Department of Water, Land and Biodiversity Conservation (DWLBC)</li> <li>Eyre Peninsula Natural Resources Management Board (EPNRMB)</li> <li>EPNRMB Water Resources Advisory Committee (WRAC)</li> </ul>			
ER		CMA Web-Link	www.epnrmb.sa.gov.au			
AT		Catchment Protection Status	Prescribed			
2		Potable Water Source(s)	Lincoln Basin/ Uley South/Uley Wanilla	3		
CATCHMENT AND WATER SUPPLY		Supply Capacity	for each lens. 60% of this annual recha available for allocation (a percentage of	essed 'catchment' area of each lens to generate an annual recharge volume arge is set aside to maintain the integrity of the resource, leaving ~40% f which is set aside for stock and domestic users). Recharge rates are a set the allocation for the following financial year.		
		Treatment Plant(s)	N/A			
		Level of Treatment	Cl2 Disinfection Only			
		Drinking Water Guidelines	ADWG 2004	Lincoln Lillov Couth Lillov Monille Doni-		
			Source:	Lincoln Uley South Uley Wanilla Basin SA Water Drinking Water Quality Report 07-08		
			Source: Faecal Coliforms/100 mL	SA Water Drinking Water Quality Report 07-08 100%		
≽			E.Coli/100mL	100%		
WATER QUALITY			Chlorine Residual-Free [mg/L]	100%		
n ng			Chlorine Residual- Total [mg/L]	N/A		
R		Booulta (% compliance for 2008 reporting	TDS [by EC] [mg/L]	0%		
Ë		Results (% compliance for 2008 reporting period)	Colour-True [HU]	100%		
AN AN		period)	Turbidity [NTU]	100%		
-			pH Units	100%		
			Trialomethanes-Total [ug/L]	100%		
			Fluoride [mg/L]	100%		
			Iron-Total [mg/L] Total Hardness as CaCO3 [mg/L]	100% 0%		
			Manganese	100%		
SECL		Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate	buckets and watering cans any time, permits required for swimming pools). Commercial-4.5%, Industrial 8.3%, Primary Production, 0.5 %, Public Institution, 4.7 %, Public Utilities 0.9 %, Recreation, 4.3 %, Residential 67.4%, Unclassified 5.6%, Vacant Land 3.8% 0 Tagenore			
ATER		Average Annual Rainfall	Temperate 490.9mm			
WATER SECURITY			YES / NO	NOTES / EXPLANATION		
WATER		FAULUR	YES	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps		
WATER		FACTOR Drought				
WATER		Single drinking water source	YES	Uley and Lincoln Bores. Tod Reservoir is an integral part of the overall contingency plan for the region and presents a future option to ensure the the water quality in Tod Reservoir is suitable for use as an emergency supply.		
WATER		Drought		contingency plan for the region and presents a future option to ensure the the water quality in Tod Reservoir is suitable for use as an emergency		
WATER		Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water	YES	contingency plan for the region and presents a future option to ensure the the water quality in Tod Reservoir is suitable for use as an emergency supply. The groundwater is classified as moderate for drinking water due to elevated salinity in some areas. This is largely due to excess irrigation water leaching salts through the soil to the shallow (quaternary aquifer) system. The salinity was between 494mg/L and 1312 mg/L across the region, while the NH&MRC guideline (for taste) has a low value of		
WATER		Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source	YES NO	contingency plan for the region and presents a future option to ensure the the water quality in Tod Reservoir is suitable for use as an emergency supply. The groundwater is classified as moderate for drinking water due to elevated salinity in some areas. This is largely due to excess irrigation water leaching salts through the soil to the shallow (quaternary aquifer) system. The salinity was between 494mg/L and 1312 mg/L across the region, while the NH&MRC guideline (for taste) has a low value of 500mg/L and an upper value of 1000mg/L.		
WATER		Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding	YES NO NO YES	contingency plan for the region and presents a future option to ensure the the water quality in Tod Reservoir is suitable for use as an emergency supply. The groundwater is classified as moderate for drinking water due to elevated salinity in some areas. This is largely due to excess irrigation water leaching salts through the soil to the shallow (quaternary aquifer) system. The salinity was between 494mg/L and 1312 mg/L across the region, while the NH&MRC guideline (for taste) has a low value of		
WATER	Aldc	Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply	YES NO NO YES NO	contingency plan for the region and presents a future option to ensure the the water quality in Tod Reservoir is suitable for use as an emergency supply. The groundwater is classified as moderate for drinking water due to elevated salinity in some areas. This is largely due to excess irrigation water leaching salts through the soil to the shallow (quaternary aquifer) system. The salinity was between 494mg/L and 1312 mg/L across the region, while the NH&MRC guideline (for taste) has a low value of 500mg/L and an upper value of 1000mg/L.		
WATER	Supply	Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures	YES NO NO YES NO NO	contingency plan for the region and presents a future option to ensure the water quality in Tod Reservoir is suitable for use as an emergency supply. The groundwater is classified as moderate for drinking water due to elevated salinity in some areas. This is largely due to excess irrigation water leaching salts through the soil to the shallow (quaternary aquifer) system. The salinity was between 494mg/L and 1312 mg/L across the region, while the NH&MRC guideline (for taste) has a low value of 500mg/L and an upper value of 1000mg/L.		
WATER	ter Supply	Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium,	YES NO NO YES NO	contingency plan for the region and presents a future option to ensure the water quality in Tod Reservoir is suitable for use as an emergency supply. The groundwater is classified as moderate for drinking water due to elevated salinity in some areas. This is largely due to excess irrigation water leaching salts through the soil to the shallow (quaternary aquifer) system. The salinity was between 494mg/L and 1312 mg/L across the region, while the NH&MRC guideline (for taste) has a low value of 500mg/L and an upper value of 1000mg/L.		
WATER	Nater Supply	Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures	YES NO NO YES NO NO	contingency plan for the region and presents a future option to ensure the the water quality in Tod Reservoir is suitable for use as an emergency supply. The groundwater is classified as moderate for drinking water due to elevated salinity in some areas. This is largely due to excess irrigation water leaching salts through the soil to the shallow (quaternary aquifer) system. The salinity was between 494mg/L and 1312 mg/L across the region, while the NH&MRC guideline (for taste) has a low value of 500mg/L and an upper value of 1000mg/L.		
WATER	nd Water Supply	Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, ino, fluoride) Un-lined landfills Extensive agriculture	YES NO NO YES NO NO Unknown	contingency plan for the region and presents a future option to ensure the the water quality in Tod Reservoir is suitable for use as an emergency supply. The groundwater is classified as moderate for drinking water due to elevated salinity in some areas. This is largely due to excess irrigation water leaching salts through the soil to the shallow (quaternary aquifer) system. The salinity was between 494mg/L and 1312 mg/L across the region, while the NH&MRC guideline (for taste) has a low value of 500mg/L and an upper value of 1000mg/L.		
WATER	t and Water Supply	Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment	YES NO YES NO Unknown NO YES	contingency plan for the region and presents a future option to ensure the water quality in Tod Reservoir is suitable for use as an emergency supply. The groundwater is classified as moderate for drinking water due to elevated salinity in some areas. This is largely due to excess irrigation water leaching salts through the soil to the shallow (quaternary aquifer) system. The salinity was between 494mg/L and 1312 mg/L across the region, while the NH&MRC guideline (for taste) has a low value of 500mg/L and an upper value of 1000mg/L.		
WATER	nent and Water Supply	Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna defecating vater intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff)	YES NO NO YES NO Unknown NO YES NO NO	contingency plan for the region and presents a future option to ensure the water quality in Tod Reservoir is suitable for use as an emergency supply. The groundwater is classified as moderate for drinking water due to elevated salinity in some areas. This is largely due to excess irrigation water leaching salts through the soil to the shallow (quaternary aquifer) system. The salinity was between 494mg/L and 1312 mg/L across the region, while the NH&MRC guideline (for taste) has a low value of 500mg/L and an upper value of 1000mg/L.		
	Catchment and Water Supply	Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment	YES NO YES NO Unknown NO YES	contingency plan for the region and presents a future option to ensure the the water quality in Tod Reservoir is suitable for use as an emergency supply. The groundwater is classified as moderate for drinking water due to elevated salinity in some areas. This is largely due to excess irrigation water leaching salts through the soil to the shallow (quaternary aquifer) system. The salinity was between 494mg/L and 1312 mg/L across the region, while the NH&MRC guideline (for taste) has a low value of 500mg/L and an upper value of 1000mg/L. Due to high tides.		
	Catchment and Water Supply	Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply	YES NO NO YES NO Unknown NO YES NO NO YES	contingency plan for the region and presents a future option to ensure the the water quality in Tod Reservoir is suitable for use as an emergency supply.         The groundwater is classified as moderate for drinking water due to elevated salinity in some areas. This is largely due to excess irrigation water leaching salts through the soil to the shallow (quaternary aquifer) system. The salinity was between 494mg/L and 1312 mg/L across the region, while the NH&MRC guideline (for taste) has a low value of 500mg/L and an upper value of 1000mg/L.         Due to high tides.         Extensive cropping, although the bore fields are in national parks.         Water levels in Eyre Peninsula groundwater basins have dropped by up five metres since 1970 due to below average rainfall and unsustainable extraction.         A lack of recent rainfall and increasing demand on some of the region's smaller groundwater resources has lessened the amount of fresh water within these lenses and increased salinity. Potential for seawater incursi		
ALITY OR SECURITY RISK (CAUSE)	Catchment and Water Supply	Drought         Single drinking water source         Poor quality water source         Sewage overflow or disposal into water source         Flooding         Fauna defecating in supply         Fauna destroying water intake structures         Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)         Un-lined landfills         Extensive agriculture         Low vegetation cover (dust, sediment runoff)         Poor access to supply         Unsustainable water extraction	YES NO NO YES NO Unknown NO YES NO NO YES	contingency plan for the region and presents a future option to ensure the the water quality in Tod Reservoir is suitable for use as an emergency supply.         The groundwater is classified as moderate for drinking water due to elevated salinity in some areas. This is largely due to excess irrigation water leaching salts through the soil to the shallow (quaternary aquifer) system. The salinity was between 494 mg/L and 1312 mg/L across the region, while the NH&MRC guideline (for taste) has a low value of 500mg/L and an upper value of 1000mg/L.         Due to high tides.         Extensive cropping, although the bore fields are in national parks.         Water levels in Eyre Peninsula groundwater basins have dropped by up five metres since 1970 due to below average rainfall and unsustainable extraction.         A lack of recent rainfall and increasing demand on some of the region's smaller groundwater resources has lessened the amount of fresh water		

WATER QU,		Significant water losses due to leaking pipes	NO	SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
AT		High per capita water consumption	NO	According to SA Water
\$		Inappropriate water quality standards / objectives	NO	
	nce	Lack of infrastructure maintenance	NO	SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
	Governance	Poor management or governance	NO	SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
	Ŭ	Vandalism / sabotage / terrorism	NO	
		Insufficient trained personnel	NO	
		Inadequate funding for maintenance or upgrades	NO	SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
	Industries	Mining / minerals	NO	
		Irrigation	YES	Agriculture
		Chemicals / process	YES	Fishing industry/potential mine industry
	Population	Seasonal population loadings	YES	Moderate population changes due to fishing industry.
		Rapid population growth	NO	Population increase = 0.51%/annum based on 2006/2001 census (Urban Centre/Locality), which is below the state average (0.76%/annum) for the same period.
Ĥ	Ê	Pathogenic contamination	NO	
сí	ر	Algal blooms	NO	
	Ē.	Heavy metal contamination	Unknown	
E	Ū	Poor chlorine residuals	NO	
5 F	Ś	Pesticide contamination	Unknown	
25	ř	Boil water notices	NO	
й Ш	-	Deaths or illness due to water quality	NO	
Ë	r	Water restrictions (current and historic)	NO	Yes has been level 3 in the past and now is enhanced level 3.
	3	Taste and odour issues	NO	
Ĺ	0	Other contamination that would affect health	YES	High salts and hardness.
		Notes	Morgan-Whyalla pipeline w pressure in the groundwate	ill be connected to other rural towns using the groundwater this year. This will reduce the r.

TOWN		State/Territory	SA	
õ		Town Name	Mt Barker	(humb of Mount Dorl(on)
-	_	Town Population Name of Water Utility	10,272 (SA Water Data, based on the su Riverland Water	IDUID OF MOUNT BARKER)
WATER UTILITY		Rate (\$/kL)	Quarterly supply charge of \$34.40 Quarterly water use charges based mete For the first 0.3288 kL used per day \$0.9 For use above 0.3288 kL per day \$1.88 p For use above 1.4247kL per day for hom \$2.26 per kL.	per kL es, home units, maisonettes, townhouses, row houses and some shack
>		Per Capita Water Consumption (L/day)	180 L/person/day (based on residential u	ise only)
		Number of Connections Catchment	3,873 Murray River	
CATCHMENT AND WATER SUPPLY		Sub-Catchment	Lower Murray	
필문스	Catchment Management Authority (CMA) South Australia Murray Darling Basin (SAMDB), Na		AMDB), Natural Resources Management Board (NRMB)	
H ≥ H		CMA Web-Link	http://www.mdba.gov.au/ http://www.n	nm.sa.gov.au/
SPAT		Catchment Protection Status	Prescribed	
S ⊲		Potable Water Source(s)	Murray River River - allowable extraction	
		Supply Capacity Treatment Plant(s)	Summit WTP, Balhannah	
				agulation, Flocculation, Sedimentation, Filtration, Disinfection (UV and
		Level of Treatment	NHCl2), Fluoridation, Storage and distrib	
		Drinking Water Guidelines	ADWG 2004	
			Source	SA Water Drinking Water Quality Report 07-08
≻			Faecal Coliforms/100 mL	100%
E_			E.Coli/100mL	100%
N			Chlorine Residual-Free [mg/L]	N/A
WATER QUALITY			Chlorine Residual- Total [mg/L]	100%
Ē		Results (% compliance for 2008 reporting	TDS [by EC] [mg/L] Colour-True [HU]	86% 100%
٨A		period)	Turbidity [NTU]	100%
-		policity)	pH Units	30%
			Trialomethanes-Total [ug/L]	100%
			Fluoride [mg/L]	100%
			Iron-Total [mg/L]	100%
			Total Hardness as CaCO3 [mg/L] Manganese as CaCo3 [mg/L]	100%
URITY	Current Water Restrictions Proportion of Potable Water Supplied to		cans any time, permits required for swim	ns (Dripper and trigger nozzle hoses 3 hours a week, buckets and wate nming pools). Level 3 water restrictions apply to all properties under a S ty or indirectly to any of the following trunk mains: Mannum Adelaide.
R SECI		Proportion of Potable Water Supplied to Households (%)	70% residential, 30% non-residential.	
TER SECI		Households (%) Distance from the Coast (km)	30	
WATER SECURITY		Households (%) Distance from the Coast (km) Climate	30 Temperate	
WATER SEC		Households (%) Distance from the Coast (km) Climate Average Annual Rainfall	30 Temperate 764mm	
WATER SECI		Households (%) Distance from the Coast (km) Climate	30 Temperate	NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps
WATER SECI		Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source	30 Temperate 764mm YES / NO YES YES	NOTES / EXPLANATION
WATER SECI		Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source	30 Temperate 764mm YES / NO YES	NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps
WATER SECI		Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water	30 Temperate 764mm YES / NO YES YES	NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps
WATER SEC		Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source	30 Temperate 764mm YES / NO YES YES NO NO	NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps Mannum-Adelaide Pipeline
WATER SEC		Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water	30 Temperate 764mm YES / NO YES YES NO	NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps
	Supply	Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium,	30 Temperate 764mm YES / NO YES NO NO YES	NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps Mannum-Adelaide Pipeline Historical floods in Mt Barker and Murray River
	er Supply	Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna defecating in supply	30 Temperate 764mm YES / NO YES NO NO YES YES YES NO Unknown NO	NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps Mannum-Adelaide Pipeline Historical floods in Mt Barker and Murray River Not a problem due to WTP
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	Catchment and Water Supply	Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and	30 Temperate 764mm YES / NO YES YES NO NO YES YES NO Unknown NO YES YES YES YES NO NO YES YES NO NO NO NO NO NO NO NO NO NO	NOTES / EXPLANATION           Yes, Based on the PIRSA EC maps and BOM 3 year rain maps           Mannum-Adelaide Pipeline           Historical floods in Mt Barker and Murray River           Not a problem due to WTP           Extensive grazing and cropping. Dryland and irrigated agriculture.           Cleared and modified native vegetation, cropping and grasslands.           Low flows causing several issues for Murray River Region.           Water quality report shows WTP water to be of good quality           SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets management covering all of its water infrastructure across South Australia, that ensures ongoing low for the asset management covering all of its water infrastructure across South Australia, that ensures ongoing low for the asset management covering all of its water infrastructure across South Australia, that ensures ongoing low for the asset management covering all of its water infrastructure across South Australia, that ensures ongoing low for the asset management covering all of its water infrastructure across South Australia, that ensures ongoing low for the asset management covering all of its mater infrastructure across South Australia, that ensures ongoing low for the asset management covering all of its mater infrastructure across South Australia, that ensures ongoing low for the asset management covering all of its mater infrastructure across South Australia, that ensures ongoing low for the asset management covering all of its mater infrastructure across South Australia, that ensures ongoing low for the asset management covering all of its mater infrastructure across South Aust
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Indi		NO	
Population	Seasonal population loadings	NO	
Popu	Rapid population growth	YES	Above state average (.76%/annum) - 5.28%/annum;. (population increase based on 2006/2001 census (Urban Centre/Locality))
E	Pathogenic contamination	NO	100% of all tests meet AWDG guidelines this year
RISK (EFFECT	Algal blooms	YES	A total of 53 blooms were recorded in SA Water Reservoirs between 2002 and 2007, while a further 100 blooms were detected along the Murray River.
Š	Heavy metal contamination	Unknown	
	Poor chlorine residuals	NO	
SECURITY	Pesticide contamination	Unknown	
R	Boil water notices	NO	
с С	Deaths or illness due to water quality	NO	
Ш	Water restrictions (current and historic)	YES	Since 2003
Ω,	Taste and odour issues	YES	
WATER QUALITY O	Other contamination that would affect health	YES	Increasing salinity -(critical issue for the quality of our drinking water in the Murray. Long-term below average rainfall over the past 10 years has reduced river flows and salt has accumulated in the floodplains and disconnected wetlands. While the water quality meets drinking water guidelines at the moment, when river flows are increased, this accumulated salt may reduce water quality). Elevated phosphorus and nitrate readings (fertilisers, manure and detergent worked).
	Notes		

TOWN		State/Territory	SA		
Ĕ		Town Name	Victor Harbor		
		Town Population	10,794 (SA Water Data, based on th	ne suburbs of Encounter Bay, Victor Harbor, McCracken, Hayborough)	
cr≻		Name of Water Utility	SA Water -United Group Infrastructu	re/United water	
WATER UTILITY		Rate (\$/kL)	Quarterly supply charge of \$34.40		
₹ E		Per Capita Water Consumption (ML/day)	270 L/person/day (based on residential use only)		
~ ~		Number of Connections	6412		
		Catchment	River Murray and Myponga River Catchment		
₽≻		Sub-Catchment	Lower Murray		
CATCHMENT AND WATER SUPPLY		Catchment Management Authority (CMA)		n (SAMDB)/Adelaide and Mount Lofty Ranges Natural Resources	
μĒ			Management Board		
ਹਿ ਸ਼ੁੱ		CMA Web-Link		vw.nrm.sa.gov.au/	
Ξü		Catchment Protection Status	Prescribed		
ATC		Potable Water Source(s)	River Murray		
≷ ≷		,	Myponga reservoir		
		Supply Capacity	Murray River - allowable extraction	00.000	
				res per year average, 26 800 megalitres maximum	
		Treatment Plant(s)	Myponga WTP		
		Level of Treatment		t (Coagulation, Flocculation, Sedimentation, Filtration, Disinfection (UV and istribution) for the Reservoir, Membrane plant with CL2 Disinfection for the Reservoir, Membrane plant with CL2 Disinfection for the Reservoir.	
		Drinking Water Guidelines	ADWG 2004		
≥			Faecal Coliforms/100 mL	100%	
5			E.Coli/100mL	100%	
٩N			Chlorine Residual-Free [mg/L]	100%	
ğ			Chlorine Residual- Total [mg/L]	N/A	
Ш			TDS [by EC] [mg/L]	100%	
WATER QUALITY		Results (% compliance for 2008 reporting	Colour-True [HU]	100%	
3		period)	Turbidity [NTU]	100%	
			pH Units	100%	
			Trialomethanes-Total [ug/L]	66%	
			Fluoride [mg/L]	100%	
			Iron-Total [mg/L]	100%	
			Total Hardness as CaCO3 [mg/L]	100%	
			Manganese	100%	
WATER SECURITY		Current Water Restrictions		ripper systems and hand-held hoses fitted with a trigger nozzle can be used for a ween 6 am - 9 am or 6pm - 9 pm. Watering cans and buckets can be used on any systems remain banned.	
TER SE		Proportion of Potable Water Supplied to Households (%)	75% residential, 25% non-residentia	1	
Ň		Distance from the Coast (km) Climate	-		
-		Average Annual Rainfall	Temperate 535mm Victor Harbor/750mm Mypo	nga Catahmant	
		FACTOR	YES / NO	NOTES / EXPLANATION	
		Drought	YES	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps	
		Single drinking water source	NO		
		onge unning witer obaroc		Reservoir and river Murray water. The Myponga River catchment is used intensively for grazing dairy cattl Water quality is frequently poor in terms of nutrient concentrations, orga	
		Poor quality water source	YES	The Myponga River catchment is used intensively for grazing dairy cattle	
			YES	The Myponga River catchment is used intensively for grazing dairy catt Water quality is frequently poor in terms of nutrient concentrations, org carbon levels and protozoan contamination. Oxidised Nitrogen Good Total Nitrogen Good Soluble Phosphorus Poor Total Phosphorus Moderate Turbidity Good Sewer overflows to the environment have been reduced from 20.7 per	
		Poor quality water source	YES	The Myponga River catchment is used intensively for grazing dairy cattl Water quality is frequently poor in terms of nutrient concentrations, org- carbon levels and protozoan contamination. Oxidised Nitrogen Good Total Nitrogen Good Soluble Phosphorus Poor Total Phosphorus Moderate Turbidity Good Sewer overflows to the environment have been reduced from 20.7 per 100km of main in 2005-2006 to 0 in 2006-2007.	
		Poor quality water source Sewage overflow or disposal into water	YES	The Myponga River catchment is used intensively for grazing dairy catt Water quality is frequently poor in terms of nutrient concentrations, org carbon levels and protozoan contamination. Oxidised Nitrogen Good Total Nitrogen Good Soluble Phosphorus Poor Total Phosphorus Moderate Turbidity Good Sewer overflows to the environment have been reduced from 20.7 per 100km of main in 2005-2006 to 0 in 2006-2007. Improvements to flood due to high tide have been made recently.	
		Poor quality water source Sewage overflow or disposal into water source Flooding	YES NO NO	The Myponga River catchment is used intensively for grazing dairy catt Water quality is frequently poor in terms of nutrient concentrations, org carbon levels and protozoan contamination. Oxidised Nitrogen Good Total Nitrogen Good Soluble Phosphorus Poor Total Phosphorus Moderate Turbidity Good Sewer overflows to the environment have been reduced from 20.7 per 100km of main in 2005-2006 to 0 in 2006-2007. Improvements to flood due to high tide have been made recently. Myponga catchments has intensive livestock land use, but this should	
	Vide	Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply	YES NO NO YES	The Myponga River catchment is used intensively for grazing dairy catt Water quality is frequently poor in terms of nutrient concentrations, org carbon levels and protozoan contamination. Oxidised Nitrogen Good Total Nitrogen Good Soluble Phosphorus Poor Total Phosphorus Moderate Turbidity Good Sewer overflows to the environment have been reduced from 20.7 per 100km of main in 2005-2006 to 0 in 2006-2007. Improvements to flood due to high tide have been made recently.	
	Supply	Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures	YES NO NO	The Myponga River catchment is used intensively for grazing dairy catt Water quality is frequently poor in terms of nutrient concentrations, org carbon levels and protozoan contamination. Oxidised Nitrogen Good Total Nitrogen Good Soluble Phosphorus Poor Total Phosphorus Moderate Turbidity Good Sewer overflows to the environment have been reduced from 20.7 per 100km of main in 2005-2006 to 0 in 2006-2007. Improvements to flood due to high tide have been made recently. Myponga catchments has intensive livestock land use, but this should	
	Water Supply	Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply	YES NO NO YES	The Myponga River catchment is used intensively for grazing dairy catt Water quality is frequently poor in terms of nutrient concentrations, org carbon levels and protozoan contamination. Oxidised Nitrogen Good Total Nitrogen Good Soluble Phosphorus Poor Total Phosphorus Moderate Turbidity Good Sewer overflows to the environment have been reduced from 20.7 per 100km of main in 2005-2006 to 0 in 2006-2007. Improvements to flood due to high tide have been made recently. Myponga catchments has intensive livestock land use, but this should be an issue due to WTP.	
SE)	ent and Water Supply	Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills	YES NO NO YES NO Unknown NO	The Myponga River catchment is used intensively for grazing dairy cattl Water quality is frequently poor in terms of nutrient concentrations, org- carbon levels and protozoan contamination. Oxidised Nitrogen Good Total Nitrogen Good Soluble Phosphorus Poor Total Phosphorus Moderate Turbidity Good Sewer overflows to the environment have been reduced from 20.7 per 100km of main in 2005-2006 to 0 in 2006-2007. Improvements to flood due to high tide have been made recently. Myponga catchments has intensive livestock land use, but this should in be an issue due to WTP.	
AUSE)	iment and Water Supply	Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture	YES NO YES NO Unknown NO YES	The Myponga River catchment is used intensively for grazing dairy cattl Water quality is frequently poor in terms of nutrient concentrations, orge carbon levels and protozoan contamination. Oxidised Nitrogen Good Total Nitrogen Good Soluble Phosphorus Poor Total Phosphorus Moderate Turbidity Good Sewer overflows to the environment have been reduced from 20.7 per 100km of main in 2005-2006 to 0 in 2006-2007. Improvements to flood due to high tide have been made recently. Myponga catchments has intensive livestock land use, but this should r be an issue due to WTP.	
(CAUSE)	ttchment and Water Supply	Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment	YES NO NO YES NO Unknown NO	The Myponga River catchment is used intensively for grazing dairy cattl Water quality is frequently poor in terms of nutrient concentrations, org- carbon levels and protozoan contamination. Oxidised Nitrogen Good Total Nitrogen Good Soluble Phosphorus Poor Total Phosphorus Moderate Turbidity Good Sewer overflows to the environment have been reduced from 20.7 per 100km of main in 2005-2006 to 0 in 2006-2007. Improvements to flood due to high tide have been made recently. Myponga catchments has intensive livestock land use, but this should in be an issue due to WTP.	
SK (CAUSE)	Catchment and Water Supply	Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff)	YES NO VES NO Unknown NO YES NO	The Myponga River catchment is used intensively for grazing dairy catt Water quality is frequently poor in terms of nutrient concentrations, org carbon levels and protozoan contamination. Oxidised Nitrogen Good Total Nitrogen Good Soluble Phosphorus Poor Total Phosphorus Moderate Turbidity Good Sewer overflows to the environment have been reduced from 20.7 per 100km of main in 2005-2006 to 0 in 2006-2007. Improvements to flood due to high tide have been made recently. Myponga catchments has intensive livestock land use, but this should be an issue due to WTP. There is an unlined landfill in the region. This is no longer in use and ca not be located via the intermet. It is not mentioned in river health/water quality documents has intensive livestock land use.	
RITY RISK (CAUSE)	Catchment and Water Supply	Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment	YES NO YES NO Unknown NO YES	The Myponga River catchment is used intensively for grazing dairy cattl Water quality is frequently poor in terms of nutrient concentrations, org: carbon levels and protozoan contamination. Oxidised Nitrogen Good Total Nitrogen Good Soluble Phosphorus Poor Total Phosphorus Moderate Turbidity Good Sewer overflows to the environment have been reduced from 20.7 per 100km of main in 2005-2006 to 0 in 2006-2007. Improvements to flood due to high tide have been made recently. Myponga catchments has intensive livestock land use, but this should be an issue due to WTP. There is an unlined landfill in the region. This is no longer in use and ca not be located via the intermet. It is not mentioned in river health/water quality documents so is unlikely to be an issue. Farming with some remnant forest and woodlands. Available information suggests that the current flow conditions are providing adequate environmental flows to maintain health in the Mypo	
OR SECURITY RISK (CAUSE)	Catchment and Water Supply	Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply	YES NO VES NO Unknown NO YES NO NO YES	The Myponga River catchment is used intensively for grazing dairy cattl Water quality is frequently poor in terms of nutrient concentrations, org: carbon levels and protozoan contamination. Oxidised Nitrogen Good Total Nitrogen Good Total Nitrogen Good Soluble Phosphorus Poor Total Phosphorus Moderate Turbidity Good Sewer overflows to the environment have been reduced from 20.7 per 100km of main in 2005-2006 to 0 in 2006-2007. Improvements to flood due to high tide have been made recently. Myponga catchments has intensive livestock land use, but this should the an issue due to WTP. There is an unlined landfill in the region. This is no longer in use and ca not be located via the internet. It is not mentioned in river health/water quality documents has intensive livestock land use. Farming with some remnant forest and woodlands. Available information suggests that the current flow conditions are providing adequate environmental flows to maintain health in the Mypo River. This is not the case with the Murray River. Documents suggest allocation greater than sustainable yield. Full use a allocation will increase water level decline and potentially increase sali	
ITY OR SECURITY RISK (CAUSE)	Catchment and Water Supply	Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction	YES NO YES NO Unknown NO YES NO YES YES	The Myponga River catchment is used intensively for grazing dairy cattl Water quality is frequently poor in terms of nutrient concentrations, org- carbon levels and protozoan contamination. Oxidised Nitrogen Good Total Nitrogen Good Total Nitrogen Good Soluble Phosphorus Poor Total Phosphorus Moderate Turbidity Good Sewer overflows to the environment have been reduced from 20.7 per 100km of main in 2005-2006 to 0 in 2006-2007. Improvements to flood due to high tide have been made recently. Myponga catchments has intensive livestock land use, but this should i be an issue due to WTP. There is an unlined landfill in the region. This is no longer in use and ca not be located via the intermet. It is not mentioned in river health/water quality documents has intensive livestock land use. Farming with some remnant forest and woodlands. Available information suggests that the current flow conditions are providing adequate environmental flows to maintain health in the Mypo River. This is not the case with the Murray River. Documents suggest allocation greater than sustainable yield. Full use a lalocation will increase water level decline and potentially increase sali	
ALITY OR SECURITY RISK (CAUSE)	Catchment and Water Supply	Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water	YES NO VES NO Unknown NO YES NO NO YES	The Myponga River catchment is used intensively for grazing dairy cattl Water quality is frequently poor in terms of nutrient concentrations, org: carbon levels and protozoan contamination. Oxidised Nitrogen Good Total Nitrogen Good Total Nitrogen Good Soluble Phosphorus Poor Total Phosphorus Moderate Turbidity Good Sewer overflows to the environment have been reduced from 20.7 per 100km of main in 2005-2006 to 0 in 2006-2007. Improvements to flood due to high tide have been made recently. Myponga catchments has intensive livestock land use, but this should be an issue due to WTP. There is an unlined landfill in the region. This is no longer in use and ca not be located via the internet. It is not mentioned in river health/water quality documents so is unlikely to be an issue. Myponga catchments has intensive livestock land use. Farming with some remnant forest and woodlands. Available information suggests that the current flow conditions are providing adequate environmental flows to maintain health in the Mypo River. This is not the case with the Murray River. Documents suggest allocation greater than sustainable yield. Full use a allocation will increase water level decline and potential for leakage and contamination between aquifers and loss to stream flow.	
WATER QUALITY OR SECURITY RISK (CAUSE)	Catchment and Water Supply	Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction	YES NO YES NO Unknown NO YES NO YES YES	The Myponga River catchment is used intensively for grazing dairy cattl Water quality is frequently poor in terms of nutrient concentrations, org: carbon levels and protozoan contamination. Oxidised Nitrogen Good Total Nitrogen Good Total Nitrogen Good Soluble Phosphorus Poor Total Phosphorus Moderate Turbidity Good Sewer overflows to the environment have been reduced from 20.7 per 100km of main in 2005-2006 to 0 in 2006-2007. Improvements to flood due to high tide have been made recently. Myponga catchments has intensive livestock land use, but this should the an issue due to WTP. There is an unlined landfill in the region. This is no longer in use and ca not be located via the internet. It is not mentioned in river health/water quality documents has intensive livestock land use. Farming with some remnant forest and woodlands. Available information suggests that the current flow conditions are providing adequate environmental flows to maintain health in the Mypo River. This is not the case with the Murray River. Documents suggest allocation greater than sustainable yield. Full use a allocation will increase water level decline and potentially increase sali	

		Inappropriate water quality standards /	NO	
		objectives		
			110	SA Water undertakes integrated asset management covering all of its
	g	Lack of infrastructure maintenance	NO	water infrastructure across South Australia, that ensures ongoing
	anc			satisfactory operation of the assets and reliable service to customers.
	E	Boor management or governance	NO	SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing
	Governance	Poor management or governance	NO	satisfactory operation of the assets and reliable service to customers.
	G	Vandalism / sabotage / terrorism	NO	
		Insufficient trained personnel	NO	
			110	SA Water undertakes integrated asset management covering all of its
		Inadequate funding for maintenance or	NO	water infrastructure across South Australia, that ensures ongoing
		upgrades		satisfactory operation of the assets and reliable service to customers.
	itri	Mining / minerals	NO	
	Industri es	Irrigation	NO	
		Chemicals / process	Yes	Dairy farms
	a c	Seasonal population loadings	YES	Holiday Destination
	Popula tion	Rapid population growth	YES	Above state average (.76%/annum) - 3.27%/annum;. (population increase
	ď			based on 2006/2001 census (Urban Centre/Locality))
Ж		Pathogenic contamination	YES	Myponga catchments has intensive livestock land use
Ř		Algal blooms	YES	SA Water has identified continuation of cyanobacterial bloom
≥				management at Myponga reservoir
R		Heavy metal contamination	YES	Moderate amounts of total copper and soluble aluminium, poor levels of
ರ				total iron
IJ S ⊂	2	Poor chlorine residuals	NO	
ITY OR SE	2	Pesticide contamination	Unknown	
	-	Boil water notices	NO NO	
Еч	ī	Deaths or illness due to water quality	YES	0:=== 0000
IAL		Water restrictions (current and historic) Taste and odour issues	Unknown	Since 2003
ы			Unknown	The nutrient levels in the Myponga River are often elevated in the winter
WATER QUALITY OR SECURITY RISK (FEFECT)		Other contamination that would affect		months, coinciding with higher rainfall flushing animal wastes into the
ATE		health	YES	river. Nutrient levels in the Myponga catchment are being addressed by
Ŵ		licalui		the EPA through a Myponga Watercourse Restoration Project.
		Notes		The Er A through a wyponga watercourse restoration Project.
		10100		

Ň	State/Territory	SA		
TOWN	Town Name	Goolwa		
	Town Population	6,055 (Census 2006, Urban Centre/		
WATER UTILITY	Name of Water Utility Rate (\$/kL)	SA Water -United Group Infrastructu	ire/United water	
ATE	Per Capita Water Consumption (ML/day)	Quarterly supply charge of \$34.40 280 L/person/day (based on residential use only)		
≩5	Number of Connections	3923		
	Catchment	River Murray and Myponga River Ca	tchment	
0	Sub-Catchment	Lower Murray		
CATCHMENT AND WATER SUPPLY			n (SAMDB)/Adelaide and Mount Lofty Ranges Natural Resources	
∠ d	Catchment Management Authority (CMA)	Management Board	····(	
N N	CMA Web-Link		ww.nrm.sa.gov.au/	
Σĸ	Catchment Protection Status	Prescribed		
흐쁜		River Murray		
TA: MA	Potable Water Source(s)	Myponga reservoir		
0-	Supply Capacity	Murray River - allowable extraction		
	Supply Capacity	Myponga Reservoir - 15 000 megali	tres per year average, 26 800 megalitres maximum	
	Treatment Plant(s)	Myponga WTP		
	Level of Treatment		t (Coagulation, Flocculation, Sedimentation, Filtration, Disinfection (UV a istribution) for the Reservoir, Membrane plant with CL2 Disinfection for th	
	Drinking Water Guidelines	ADWG 2004		
≥		Faecal Coliforms/100 mL	100%	
WATER QUALITY		E.Coli/100mL	100%	
<b>∀</b> ∩		Chlorine Residual-Free [mg/L]	100%	
ð		Chlorine Residual- Total [mg/L]	N/A	
Ш		TDS [by EC] [mg/L]	100%	
AT	Results (% compliance for 2008 reporting	Colour-True [HU]	100%	
3	period)	Turbidity [NTU]	59%	
	(	pH Units	81%	
		Trialomethanes-Total [ug/L]	96%	
		Fluoride [mg/L]	100%	
		Iron-Total [mg/L]	92%	
		Total Hardness as CaCO3 [mg/L]	100%	
		Manganese	100%	
≻			ripper systems and hand-held hoses fitted with a trigger nozzle can be used for	
LL S	Current Water Restrictions		ween 6 am - 9 am or 6pm - 9 pm. Watering cans and buckets can be used on an	
5		day/time. Sprinklers and other watering	j systems remain banned.	
ũ	Proportion of Potable Water Supplied to			
n n	Households (%)	85% residential, 15% non-residentia		
Ē	Distance from the Coast (km)	0		
		te men e mete		
۸	Climate	temperate		
WATER SECURITY		535mm Victor Harbor/750mm Mypo	nga Catchment	
MM.	Climate Average Annual Rainfall FACTOR		nga Catchment NOTES / EXPLANATION	
M	Average Annual Rainfall	535mm Victor Harbor/750mm Mypo		
WA	Average Annual Rainfall FACTOR	535mm Victor Harbor/750mm Mypo YES / NO	NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps reservoir and river Murray water	
	Average Annual Rainfall FACTOR Drought	535mm Victor Harbor/750mm Mypo YES / NO YES	NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps reservoir and river Murray water The Myponga River catchment is used intensively for grazing dairy catt Water quality is frequently poor in terms of nutrient concentrations, org carbon levels and protozoan contamination. Oxidised Nitrogen Good Total Nitrogen Good Soluble Phosphorus Poor Total Phosphorus Moderate	
	Average Annual Rainfall FACTOR Drought Single drinking water source	535mm Victor Harbor/750mm Mypo YES / NO YES NO	NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps reservoir and river Murray water The Myponga River catchment is used intensively for grazing dairy catt Water quality is frequently poor in terms of nutrient concentrations, org carbon levels and protozoan contamination. Oxidised Nitrogen Good Total Nitrogen Good Soluble Phosphorus Poor Total Phosphorus Moderate Turbidity Good	
	Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water	535mm Victor Harbor/750mm Mypo YES / NO YES NO	NOTES / EXPLANATION           Yes, Based on the PIRSA EC maps and BOM 3 year rain maps           reservoir and river Murray water           The Myponga River catchment is used intensively for grazing dairy catt           Water quality is frequently poor in terms of nutrient concentrations, org           carbon levels and protozoan contamination.           Oxidised Nitrogen Good           Soluble Phosphorus Poor           Total Phosphorus Moderate           Turbidity Good           Sewer overflows to the environment have been reduced form 20.7 per	
MA	Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source	535mm Victor Harbor/750mm Mypo YES / NO NO YES	NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps reservoir and river Murray water The Myponga River catchment is used intensively for grazing dairy catt Water quality is frequently poor in terms of nutrient concentrations, org carbon levels and protozoan contamination. Oxidised Nitrogen Good Total Nitrogen Good Soluble Phosphorus Poor Total Phosphorus Moderate Turbidity Good Sewer overflows to the environment have been reduced form 20.7 per 100km of main in 2005-2006 to 0 in 2006-2007.	
MA	Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water	535mm Victor Harbor/750mm Mypo YES / NO NO YES	NOTES / EXPLANATION           Yes, Based on the PIRSA EC maps and BOM 3 year rain maps           reservoir and river Murray water           The Myponga River catchment is used intensively for grazing dairy catt           Water quality is frequently poor in terms of nutrient concentrations, org           carbon levels and protozoan contamination.           Oxidised Nitrogen Good           Soluble Phosphorus Poor           Total Nitrogen Good           Soluble Phosphorus Moderate           Turbidity Good           Sewer overflows to the environment have been reduced form 20.7 per           100km of main in 2005-2006 to 0 in 2006-2007.           Improvements to flood due to high tide have been made recently	
	Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source	535mm Victor Harbor/750mm Mypo YES / NO NO YES	NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps reservoir and river Murray water The Myponga River catchment is used intensively for grazing dairy catt Water quality is frequently poor in terms of nutrient concentrations, org carbon levels and protozoan contamination. Oxidised Nitrogen Good Total Nitrogen Good Soluble Phosphorus Poor Total Phosphorus Moderate Turbidity Good Sewer overflows to the environment have been reduced form 20.7 per 100km of main in 2005-2006 to 0 in 2006-2007. Improvements to flood due to high tide have been made recently Myponga catchments has intensive livestock land use, but this should	
	Average Annual Rainfall         FACTOR         Drought         Single drinking water source         Poor quality water source         Sewage overflow or disposal into water source         Flooding         Fauna defecating in supply	535mm Victor Harbor/750mm Mypo YES / NO YES NO YES	NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps reservoir and river Murray water The Myponga River catchment is used intensively for grazing dairy catt Water quality is frequently poor in terms of nutrient concentrations, org carbon levels and protozoan contamination. Oxidised Nitrogen Good Total Nitrogen Good Soluble Phosphorus Poor Total Phosphorus Moderate Turbidity Good Sewer overflows to the environment have been reduced form 20.7 per 100km of main in 2005-2006 to 0 in 2006-2007. Improvements to flood due to high tide have been made recently	
	Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures	535mm Victor Harbor/750mm Mypo YES / NO YES NO YES NO NO	NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps reservoir and river Murray water The Myponga River catchment is used intensively for grazing dairy catt Water quality is frequently poor in terms of nutrient concentrations, org carbon levels and protozoan contamination. Oxidised Nitrogen Good Total Nitrogen Good Soluble Phosphorus Poor Total Phosphorus Moderate Turbidity Good Sewer overflows to the environment have been reduced form 20.7 per 100km of main in 2005-2006 to 0 in 2006-2007. Improvements to flood due to high tide have been made recently Myponga catchments has intensive livestock land use, but this should	
	Average Annual Rainfall         FACTOR         Drought         Single drinking water source         Poor quality water source         Sewage overflow or disposal into water source         Flooding         Fauna defecating in supply         Fauna destroying water intake structures         Natural mineral pollutants (e.g. uranium,	535mm Victor Harbor/750mm Mypo YES / NO YES NO YES	NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps reservoir and river Murray water The Myponga River catchment is used intensively for grazing dairy catt Water quality is frequently poor in terms of nutrient concentrations, org carbon levels and protozoan contamination. Oxidised Nitrogen Good Total Nitrogen Good Soluble Phosphorus Poor Total Phosphorus Moderate Turbidity Good Sewer overflows to the environment have been reduced form 20.7 per 100km of main in 2005-2006 to 0 in 2006-2007. Improvements to flood due to high tide have been made recently Myponga catchments has intensive livestock land use, but this should	
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	nce	Lack of infrastructure maintenance	NO	SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
	Governance	Poor management or governance	NO	SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
	Ŭ	Vandalism / sabotage / terrorism	NO	
		Insufficient trained personnel	NO	
		Inadequate funding for maintenance or upgrades	NO	SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
	ŝ	Mining / minerals	NO	
	Industries	Irrigation	NO	
	Indu	Chemicals / process	Yes	Dairy farms
	ulati	Seasonal population loadings	YES	Holiday Destination
	Populati on	Rapid population growth	YES	Above state average (.76%/annum) - 7.18%/annum;. (population increase based on 2006/2001 census (Urban Centre/Locality))
X		Pathogenic contamination	YES	Myponga catchments has intensive livestock land use
Y RIS		Algal blooms	YES	SA Water has identified continuation of cyanobacterial bloom management at Myponga reservoir
CURIT		Heavy metal contamination	YES	Moderate amounts of total copper and soluble aluminium, poor levels of total iron.
Щ <sub>с</sub>	~	Poor chlorine residuals	NO	
2 C	5	Pesticide contamination	Unknown	
ITY OR SE	-	Boil water notices	NO	
Ľ Ľ	j –	Deaths or illness due to water quality	NO	
ALI		Water restrictions (current and historic)	YES	Since 2003
n ng		Taste and odour issues	Unknown	
WATER QUALITY OR SECURITY RISK		Other contamination that would affect health	YES	The nutrient levels in the Myponga River are often elevated in the winter months, coinciding with higher rainfall flushing animal wastes into the river. Nutrient levels in the Myponga catchment are being addressed by the EPA through a Myponga Watercourse Restoration Project.
		Notes		

Ň		State/Territory	SA			
TOWN		Town Name	Naracoorte			
		Town Population	4,888 (Census 2006, Urban Centre/	Locality)		
WATER UTILITY		Name of Water Utility Rate (\$/kL)	SA Water Quarterly supply charge of \$34.40			
ATI TLI		Per Capita Water Consumption (ML/day)	260 L/person/day (based on resider	ntial use only)		
≥⊃		Number of Connections	2,227			
Δ、		Catchment	Limestone Aquifer			
CATCHMENT AND WATER SUPPLY		Sub-Catchment	Naracoorte Ranges Unconfined Aquifer			
1 H H H		Catchment Management Authority (CMA)		atural Resources Management Board. The EPA focuses its water quality		
S SI			monitoring on the unconfined aquife	er in the area		
苦臣		CMA Web-Link Catchment Protection Status	nttp://www.senrm.sa.gov.au/ None			
VA <sup>-</sup>		Potable Water Source(s)	Limestone Aquifer			
< ن		Supply Capacity		ction/sustainable yield is 4,500 ML/yr		
		Treatment Plant(s)	N/A			
		Level of Treatment	CI2 Disinfection Only			
		Drinking Water Guidelines	ADWG 2004 Faecal Coliforms/100 mL	100%		
			E.Coli/100mL	100%		
≿			Chlorine Residual-Free [mg/L]	100%		
ALI			Chlorine Residual- Total [mg/L]	N/A		
Ŋ			TDS [by EC] [mg/L]	0%		
water quality		Results (% compliance for 2008 reporting	Colour-True [HU]	100%		
ATE		period)	Turbidity [NTU]	100%		
Š			pH Units Trialomethanes Total [ug/L]	100%		
			Trialomethanes-Total [ug/L] Fluoride [mg/L]	100%		
			Iron-Total [mg/L]	67%		
			Total Hardness as CaCO3 [mg/L]	0%		
			Manganese	100%		
				res-1. Watering gardens, grounds and nurseries		
				areas, sports grounds or nurseries can be watered:		
				system , through a sprinkler - after 5pm and before 10am on any day (including		
≻			public or private gardens, recreation ar	. 1 5		
RIT		Current Water Restrictions		at unless the water is applied from a bucket, high-pressure low volume water cle		
S			trigger nozzle hose or a commercial ca			
SE				e used to control dust or other pollutants resulting from building works unless t fitted with a trigger nozzle, or directly from a motor vehicle designed to carry a		
Ř			deposit water.	entied with a trigger nozzie, or directly norm a motor vehicle designed to carry a		
ATE						
WATER SECURITY		Proportion of Potable Water Supplied to	83% residential, 17% non-residentia	ai		
WATE		Households (%)	83% residential, 17% non-residentia	al		
WATE		Households (%) Distance from the Coast (km)	83% residential, 17% non-residentia	al		
WATE		Households (%) Distance from the Coast (km) Climate	83% residential, 17% non-residentia	al		
WATE		Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR	83% residential, 17% non-residentia 80 Temperate 577.9mm YES / NO	NOTES / EXPLANATION		
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	5	Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna defecating in supply Fauna defecating in supply Fauna defecating in supply Fauna defecating in supply Initrates, iron, fluoride) Un-lined landfills Extensive agriculture	83% residential, 17% non-residential           80           Temperate           577.9mm           YES / NO           YES           YES           YES           NO           NO           NO           NO           NO           YES           YES	NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps Bore field. In terms of drinking water quality, the groundwater in the South East is No records found		
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	Catchment and Water	Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna defecation (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism	83% residential, 17% non-residential           80           Temperate           577.9mm           YES           YES           YES           NO           NO           NO           NO           YES           NO           NO           NO           NO           NO           YES           NO           YES           NO	NOTES / EXPLANATION           Yes, Based on the PIRSA EC maps and BOM 3 year rain maps           Bore field.           In terms of drinking water quality, the groundwater in the South East is           No records found           testing of WQ in the south east region shows high levels of nitrates           Australian Intensive Agriculture Zone           Low level of extraction (0-29%).           Turning saline due to land practices.           Refer to WQ compliance stats.           SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.           SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.           SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.           SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.           SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.		
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Ind	Chemicals / process	NO	
Population	Seasonal population loadings	NO	
Popu	Rapid population growth	NO	Below state average (.76%/annum) - 0.5%/annum;. (population increase based on 2006/2001 census (Urban Centre/Locality)))
Ē	Pathogenic contamination	Unknown	
ы К. М.	Algal blooms	NO	
: QUALITY OR	Heavy metal contamination	Unknown	
ていて	Poor chlorine residuals	Unknown	
₹ F	Pesticide contamination	Unknown	
12 82	Boil water notices	NO	
а <u>х</u> х	Deaths or illness due to water quality	NO	
ΞE	Water restrictions (current and historic)	YES	Permanent water conservation measures since 2002.
N N	Taste and odour issues	Unknown	
WATER ( SECURITY	Other contamination that would affect health	Unknown	High nitrates
	Notes		

Z		State/Territory SA Millicent			
TOWN		Town Name	Millicent		
		Town Population	4,771 (Census 2006, Urban Centre/L	ocality)	
WATER UTILITY		Name of Water Utility Rate (\$/kL)	SA Water Quarterly supply charge of \$34.40		
I I I		Per Capita Water Consumption (ML/day)	160 L/person/day (based on resident	ial use only)	
≥5		Number of Connections	2000		
0		Catchment	Limestone Aquifer		
CATCHMENT AND WATER SUPPLY	Sub-Catchment		There are two aquifers in the area - an upper unconfined aquifer and a lower confined aquifer.		
4 H H			EPA-South Australia, South East Natural Resources Management Board. The EPA focuses its water quality		
SCE		Catchment Management Authority (CMA)	monitoring on the unconfined aquifer	in the area	
₽ĸ		CMA Web-Link	http://www.senrm.sa.gov.au/		
ATCI		Catchment Protection Status	Prescribed		
S ≥		Potable Water Source(s)	Limestone Aquifer		
		Supply Capacity	Groundwater bore - allowable extract	lion	
		Treatment Plant(s) Level of Treatment	N/A Cl2 Disinfection Only		
		Drinking Water Guidelines	2004 AWDG		
			Faecal Coliforms/100 mL	99%	
			E.Coli/100mL	100%	
È			Chlorine Residual-Free [mg/L]	100%	
AL			Chlorine Residual- Total [mg/L]	N/A	
DQ			TDS [by EC] [mg/L]	0%	
WATER QUALITY		Results (% compliance for 2008 reporting	Colour-True [HU]	100%	
ATE		period)	Turbidity [NTU]	83%	
Ň			pH Units	100%	
			Trialomethanes-Total [ug/L]	100%	
			Fluoride [mg/L] Iron-Total [mg/L]	100%	
			Total Hardness as CaCO3 [mg/L]	0%	
			Manganese	100%	
_	-			es- 1. Watering gardens, grounds and nurseries	
				reas, sports grounds or nurseries can be watered:	
				system, through a sprinkler - after 5pm and before 10am on any day (including	
			public or private gardens, recreation are		
Ê		Current Water Restrictions	used to clean a motor vehicle or boat un	less the water is applied from a bucket, high-pressure low volume water cleaner	
UR			trigger nozzle hose or a commercial car	wash.	
Ö			3. Construction sites: Water must not be	used to control dust or other pollutants resulting from building works unless th	
SI			water is applied from a hand-held hose f	fitted with a trigger nozzle, or directly from a motor vehicle designed to carry an	
Щ			deposit water.		
WATER SECURITY		Descention of Detable Water Overslind to			
5		Proportion of Potable Water Supplied to Households (%)	78% residential, 22% non-residential		
		Distance from the Coast (km)	15		
		Climate	Temperate		
		Average Annual Rainfall	786.5mm		
		FACTOR	YES / NO	NOTES / EXPLANATION	
		FACTOR Drought	YES / NO No	Not in a declared area of EC	
		FACTOR	YES / NO	Not in a declared area of EC Bores	
		FACTOR Drought	YES / NO No	Not in a declared area of EC Bores In terms of drinking water quality, the groundwater in the South East is	
		FACTOR Drought Single drinking water source	YES / NO No YES	Not in a declared area of EC Bores In terms of drinking water quality, the groundwater in the South East is poor because of elevated nitrate agricultural practices. Elevated salinity	
		FACTOR Drought	YES / NO No	Not in a declared area of EC Bores In terms of drinking water quality, the groundwater in the South East is poor because of elevated nitrate agricultural practices. Elevated salinity	
		FACTOR Drought Single drinking water source	YES / NO No YES	Not in a declared area of EC Bores In terms of drinking water quality, the groundwater in the South East is poor because of elevated nitrate agricultural practices. Elevated salinity groundwater across the South East means that drinking water quality is poor because of the effect on taste. Drinking water quality is also	
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		FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source	YES / NO No YES	Not in a declared area of EC Bores In terms of drinking water quality, the groundwater in the South East is poor because of elevated nitrate agricultural practices. Elevated salinity groundwater across the South East means that drinking water quality is poor because of the effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is most	
		FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding	YES / NO YES YES NO	Not in a declared area of EC Bores In terms of drinking water quality, the groundwater in the South East is poor because of elevated nitrate agricultural practices. Elevated salinity groundwater across the South East means that drinking water quality is poor because of the effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is most	
	Alddr	FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply	YES / NO YES YES NO NO	Not in a declared area of EC Bores In terms of drinking water quality, the groundwater in the South East is poor because of elevated nitrate agricultural practices. Elevated salinity groundwater across the South East means that drinking water quality is poor because of the effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is most due to iron.	
	- Supply	FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna defecting in supply	YES / NO           No           YES           YES           NO           NO           NO           NO           NO           NO           NO	Not in a declared area of EC Bores In terms of drinking water quality, the groundwater in the South East is poor because of elevated nitrate agricultural practices. Elevated salinity groundwater across the South East means that drinking water quality is poor because of the effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is most due to iron.	
	ater Supply	FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium,	YES / NO YES YES NO NO	Not in a declared area of EC Bores In terms of drinking water quality, the groundwater in the South East is poor because of elevated nitrate agricultural practices. Elevated salinity groundwater across the South East means that drinking water quality is poor because of the effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is most due to iron.	
	Water Supply	FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)	YES / NO           YES           YES           YES           NO           NO           NO           NO           NO           YES	Not in a declared area of EC Bores In terms of drinking water quality, the groundwater in the South East is poor because of elevated nitrate agricultural practices. Elevated salinity groundwater across the South East means that drinking water quality is poor because of the effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is most due to iron.	
	ind Water Supply	FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills	YES / NO           No           YES           YES           NO           NO           NO           NO           YES	Not in a declared area of EC Bores In terms of drinking water quality, the groundwater in the South East is poor because of elevated nitrate agricultural practices. Elevated salinity groundwater across the South East means that drinking water quality is poor because of the effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is most due to iron. No records found Drinking water shows poor levels of nitrates and metals	
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	Catchment and Water Supply	FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply	YES / NO           YES           YES           YES           NO           NO           NO           NO           YES           NO           NO           YES           NO           YES           NO           YES           NO           YES           NO           YES           NO           YES           NO           NO           NO	Not in a declared area of EC         Bores         In terms of drinking water quality, the groundwater in the South East is poor because of elevated nitrate agricultural practices. Elevated salinity groundwater across the South East means that drinking water quality is also considered poor because of elevated metal concentrations. This is most due to iron.         No records found         Drinking water shows poor levels of nitrates and metals         Intensive cropping-cereals/grain legumes/oil seeds         Low level of extraction (0-29% of total aquifer water is extracted for	
	Catchment and Water Supply	FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff)	YES / NO           YES           YES           YES           NO           NO           NO           NO           YES           NO	Not in a declared area of EC         Bores         In terms of drinking water quality, the groundwater in the South East is poor because of elevated nitrate agricultural practices. Elevated salinity groundwater across the South East means that drinking water quality is also considered poor because of elevated metal concentrations. This is most due to iron.         No records found         Drinking water shows poor levels of nitrates and metals         Intensive cropping-cereals/grain legumes/oil seeds         Low level of extraction (0-29% of total aquifer water is extracted for stock/human/irrigation use)	
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	Catchment and Water Supply	FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defcating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction	YES / NO           No           YES           YES           NO           NO           NO           YES           NO           YES           NO           YES           NO           YES           NO           YES           NO	Not in a declared area of EC         Bores         In terms of drinking water quality, the groundwater in the South East is poor because of elevated nitrate agricultural practices. Elevated salinity groundwater across the South East means that drinking water quality is also considered poor because of elevated metal concentrations. This is more due to iron.         No records found         Drinking water shows poor levels of nitrates and metals         Intensive cropping-cereals/grain legumes/oil seeds         Low level of extraction (0-29% of total aquifer water is extracted for stock/human/irrigation use)         Turning Saline due to land use practices (i.e Removal of native trees planting high rotation crops. Extraction levels are not contributing to salinity)	
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	Catchment and Water Supply	FACTOR Drought Single drinking water source Poor quality water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and	YES / NO           No           YES           YES           NO           NO           NO           NO           YES           NO           NO           YES           NO           YES           NO           YES           NO           YES           NO           YES           NO           YES           NO           NO           NO           NO           NO           NO           YES	Not in a declared area of EC           Bores           In terms of drinking water quality, the groundwater in the South East is poor because of elevated nitrate agricultural practices. Elevated salinity groundwater across the South East means that drinking water quality is also considered poor because of elevated metal concentrations. This is more due to iron.           No records found           No records found           Drinking water shows poor levels of nitrates and metals           Intensive cropping-cereals/grain legumes/oil seeds           Low level of extraction (0-29% of total aquifer water is extracted for stock/human/irrigation use)           Turning Saline due to land use practices (i.e Removal of native trees planting high rotation crops. Extraction levels are not contributing to salinity)           0% tests passed           SA Water undertakes integrated asset management covering all of its	
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WATER QUALITY OR SECURITY RISK (CAUSE)	Catchment and Water	FACTOR         Drought         Single drinking water source         Poor quality water source         Sewage overflow or disposal into water source         Flooding         Fauna defecating in supply         Fauna destroying water intake structures         Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)         Un-lined landfills         Extensive agriculture         Low vegetation cover (dust, sediment runoff)         Poor access to supply         Unsustainable water extraction         Hard water         Aguifer turning saline due to high extraction         Hard water         Significant water losses due to leaking pipes         High per capita water consumption         Inappropriate water quality standards / objectives	YES / NO           No           YES           YES           NO           NO           NO           NO           YES           NO           YES           NO           YES           NO           YES           NO           NO	Not in a declared area of EC           Bores           In terms of drinking water quality, the groundwater in the South East is poor because of elevated nitrate agricultural practices. Elevated salinity groundwater across the South East means that drinking water quality is also considered poor because of elevated metal concentrations. This is most due to iron.           No records found           No records found           Drinking water shows poor levels of nitrates and metals           Intensive cropping-cereals/grain legumes/oil seeds           Intensive cropping-cereals/grain legumes/oil seeds           Uruning Saline due to land use practices (i.e Removal of native trees planting high rotation crops. Extraction levels are not contributing to salinity)           0% tests passed           SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.           SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.           SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.	
WATER QUALITY OR SECURITY RISK (CAUSE)	Catchment and Water	FACTOR         Drought         Single drinking water source         Poor quality water source         Poor quality water source         Sewage overflow or disposal into water source         Flooding         Fauna defecating in supply         Tauna defecating in supply         Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)         Un-lined landfills         Extensive agriculture         Low vegetation cover (dust, sediment runoff)         Poor access to supply         Unsustainable water extraction         Aquifer turning saline due to high extraction         Hard water         Aging or inadequate pipe work and associated infrastructure         Significant water losses due to leaking pipes         High per capita water consumption         Inappropriate water quality standards / objectives         Lack of infrastructure maintenance	YES / NO           No           YES           YES           YES           NO           NO           NO           NO           YES           NO           NO           YES           NO           YES           NO           NO	Not in a declared area of EC           Bores           In terms of drinking water quality, the groundwater in the South East is poor because of elevated nitrate agricultural practices. Elevated salinity groundwater across the South East means that drinking water quality is also considered poor because of elevated metal concentrations. This is more due to iron.           No records found	
WATER QUALITY OR SECURITY RISK (CAUSE)	Governance Catchment and Water Supply	FACTOR         Drought         Single drinking water source         Poor quality water source         Sewage overflow or disposal into water source         Flooding         Fauna defecating in supply         Fauna destroying water intake structures         Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)         Un-lined landfills         Extensive agriculture         Low vegetation cover (dust, sediment runoff)         Poor access to supply         Unsustainable water extraction         Hard water         Aguifer turning saline due to high extraction         Hard water         Significant water losses due to leaking pipes         High per capita water consumption         Inappropriate water quality standards / objectives	YES / NO           No           YES           YES           NO           NO           NO           NO           YES           NO           YES           NO           YES           NO           YES           NO           NO	Not in a declared area of EC           Bores           In terms of drinking water quality, the groundwater in the South East is poor because of elevated nitrate agricultural practices. Elevated salinity groundwater across the South East means that drinking water quality is poor because of the effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is module to iron.           No records found	

	Insufficient trained personnel	NO	
	Inadequate funding for maintenance or upgrades	NO	SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
ries	Mining / minerals	NO	
Industries	Irrigation	YES	Cropping
드	Chemicals / process	NO	
Population	Seasonal population loadings	NO	
Popu	Rapid population growth	YES	Above state average (.76%/annum) - 1.5%/annum;. (population increase based on 2006/2001 census (Urban Centre/Locality))
¥	Pathogenic contamination	YES	There was not 100% tests above AWDG
ISI	Algal blooms	NO	
SECURITY RISK T)	Heavy metal contamination	YES	Water quality classification has labelled it poor for drinking water quality. Drinking water quality is also considered poor because of elevated metal concentrations. This is mostly due to iron, which can discolour water.
З E	Poor chlorine residuals	NO	
ITY OR SE (EFFECT)	Pesticide contamination	NO	No results of pesticide contamination in the Millicent area form 1998-200
QUALITY (EF	Boil water notices	NO	
IAU	Deaths or illness due to water quality	NO	
ಠ	Water restrictions (current and historic)	YES	
R.	Taste and odour issues	NO	
WATER	Other contamination that would affect health	YES	Nitrites - concerns regarding the extensive grazing and dairying on the Limestone aquifers in the south-east of South Australia. A groundwater quality management plan is being implemented.
	Notes		The All of the strength the second se

wn# Z		State/Territory	SA	
TOWN		Town Name	Nuriootpa	
Ţ		Town Population	5,114 (SA Water Data, based on subur	b of Nuriootpa)
<u>⊮</u> ≻		Name of Water Utility	SA Water -Riverland Water	
WATER UTILITY		Rate (\$/kL)	Quarterly supply charge of \$34.40 240 L/person/day (based on residential	
₹ L		Per Capita Water Consumption (ML/day) Number of Connections	240 L/person/day (based on residential	use only)
		Catchment	Murray River Catchment	
μĸ		Sub-Catchment	Lower Murray	
御田区	5	Catchment Management Authority (CMA)		SAMDB), Natural Resources Management Board (NRMB)
£₿₽	-	CMA Web-Link		nrm.sa.gov.au/
CATCHMENT AND WATER SUPPLY	2	Catchment Protection Status	Prescribed	
δA		Potable Water Source(s)	Murray River	
		Supply Capacity Treatment Plant(s)	Murray River - allowable extraction unkr Swan Reach WTP	lown
		Level of Treatment	Conventional Water Treatment Plant (C	oagulation, Flocculation, Sedimentation, Filtration, Disinfection (UV and
		Drinking Water Guidelines	NHCl2), Fluoridation, Storage and distri ADWG 2004	bution)
			Overall	
≿			Faecal Coliforms/100 mL	100%
ALI			E.Coli/100mL	100%
water quality			Chlorine Residual-Free [mg/L] Chlorine Residual- Total [mg/L]	N/A 100%
Ľ.			TDS [by EC] [mg/L]	100%
ATE		Results (% compliance for 2008 reporting	Colour-True [HU]	100%
×,		period)	Turbidity [NTU]	100%
			pH Units	0%
			Trialomethanes-Total [ug/L]	100%
			Fluoride [mg/L]	100%
			Iron-Total [mg/L] Total Hardness as CaCO3 [mg/L]	100%
			Manganese	100%
				er systems and hand-held hoses fitted with a trigger nozzle can be used for a
WATER SECURITY		Current Water Restrictions		n 6 am - 9 am or 6pm - 9 pm. Watering cans and buckets can be used on any
IER SE		Proportion of Potable Water Supplied to Households (%)	52% residential, 48% non-residential	
LAV		Distance from the Coast (km)	50	
>		Climate	Temperate	
		Average Appuel Beinfell	500 F	
		Average Annual Rainfall	500.5 YES / NO	ΝΩΤΕς / ΕΧΡΙ ΔΝΔΤΙΩΝ
		FACTOR	YES / NO	NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps
				NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline
		FACTOR Drought Single drinking water source Poor quality water source	YES / NO YES	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps
		FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water	YES / NO YES YES NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps
		FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source	YES / NO YES YES NO NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline
		FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding	YES / NO YES YES NO NO NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta
		FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply	YES / NO YES NO NO NO YES	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline
	pply	FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna defecting water intake structures	YES / NO YES NO NO NO YES NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta
	Supply	FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply	YES / NO YES NO NO NO YES	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta
	ater Supply	FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills	YES / NO YES NO NO NO YES NO Unknown NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta Not a problem due to WTP
	Water Supply	FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna defecating in supply Fauna defecating water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture	YES / NO YES NO NO NO YES NO Unknown	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta
	ind Water Supply	FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment	YES / NO YES NO NO NO YES NO Unknown NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta Not a problem due to WTP
		FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff)	YES / NO YES NO NO NO YES NO Unknown NO YES YES YES	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta Not a problem due to WTP fruit industry/vineyards and cropping
	-	FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply	YES / NO YES NO NO NO YES NO Unknown NO YES YES NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta Not a problem due to WTP fruit industry/vineyards and cropping cleared and modified native vegetation, cropping and grasslands
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	Catchment and Water Supply	FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction	YES / NO YES NO NO NO YES NO Unknown NO YES YES NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta Not a problem due to WTP fruit industry/vineyards and cropping cleared and modified native vegetation, cropping and grasslands
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	-	FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction	YES / NO           YES           NO           NO           NO           YES           NO           Unknown           NO           YES           YES           YES           YES           YES           YES           NO           YES           NO           YES           NO           YES           NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta Not a problem due to WTP fruit industry/vineyards and cropping cleared and modified native vegetation, cropping and grasslands low flows causing several issues for Murray River Region from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers
	-	FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and	YES / NO           YES           NO           NO           NO           YES           NO           Unknown           NO           YES           YES           YES           YES           YES           NO           YES           NO           YES           NO           YES           NO           YES           NO           YES	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta Not a problem due to WTP fruit industry/vineyards and cropping cleared and modified native vegetation, cropping and grasslands low flows causing several issues for Murray River Region from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets management covering all of it water infrastructure across South Australia, that ensures ongoing stifactory operation of the assets management covering all of it water infrastructure across South Australia, that ensures ongoing stifactory operation of the assets management covering all of it water infrastructure across South Australia, that ensures ongoing stifactory operation of the asset management covering all of it water infrastructure across South Australia, that ensures ongoing stifactory operation of the asset management covering all of it water infrastructure across South Australia, that ensures ongoing
	-	FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking	YES / NO           YES           NO           NO           NO           YES           NO           Unknown           NO           YES           YES           YES           YES           YES           NO           YES           NO           YES           NO           YES           NO           NO           NO           NO           NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta Not a problem due to WTP fruit industry/vineyards and cropping cleared and modified native vegetation, cropping and grasslands low flows causing several issues for Murray River Region from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets management covering all of it water infrastructure across South Australia, that ensures ongoing stifactory operation of the assets management covering all of it water infrastructure across South Australia, that ensures ongoing stifactory operation of the assets management covering all of it water infrastructure across South Australia, that ensures ongoing stifactory operation of the asset management covering all of it water infrastructure across South Australia, that ensures ongoing stifactory operation of the asset management covering all of it water infrastructure across South Australia, that ensures ongoing
	-	FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards /	YES / NO           YES           NO           NO           NO           NO           YES           NO           Unknown           NO           YES           YES           YES           YES           YES           NO           YES           NO           YES           NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta Not a problem due to WTP fruit industry/vineyards and cropping cleared and modified native vegetation, cropping and grasslands low flows causing several issues for Murray River Region from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers
	-	FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption	YES / NO           YES           NO           NO           NO           YES           NO           Unknown           NO           YES           YES           YES           YES           YES           YES           NO           YES           NO           YES           NO           YES           NO           NO           NO           NO           NO           NO           NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta Not a problem due to WTP fruit industry/vineyards and cropping cleared and modified native vegetation, cropping and grasslands low flows causing several issues for Murray River Region from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers SA Water undertakes integrated asset management covering all of it water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers According to SA Water
( QUALITY OR SECURITY RISK (CAUSE)	Catchment	FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards /	YES / NO           YES           NO           NO           NO           NO           YES           NO           Unknown           NO           YES           YES           YES           YES           YES           NO           YES           NO           YES           NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps         From the Morgan-Whyalla Pipeline         No historical record for Pt Augusta         Not a problem due to WTP         fruit industry/vineyards and cropping         cleared and modified native vegetation, cropping and grasslands         low flows causing several issues for Murray River Region         from high river extraction         Water quality report shows WTP water to be of good quality         SA Water undertakes integrated asset management covering all of its         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers.         According to SA Water         SA Water undertakes integrated asset management covering all of its         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers.         According to SA Water         SA Water undertakes integrated asset management covering all of its         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers.         According to SA Water
	Catchment	FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives	YES / NO           YES           NO           NO           NO           NO           YES           NO           Unknown           NO           YES           YES           YES           YES           NO           YES           NO           YES           NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps         From the Morgan-Whyalla Pipeline         No historical record for Pt Augusta         Not a problem due to WTP         fruit industry/vineyards and cropping         cleared and modified native vegetation, cropping and grasslands         low flows causing several issues for Murray River Region         from high river extraction         Water quality report shows WTP water to be of good quality         SA Water undertakes integrated asset management covering all of it         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers         SA Water undertakes integrated asset management covering all of it         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers         SA Water undertakes integrated asset management covering all of it         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers         According to SA Water         SA Water undertakes integrated asset management covering all of it         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers         According to SA Water </td
	-	FACTOR           Drought         Single drinking water source           Single drinking water source         Peor quality water source           Sewage overflow or disposal into water source         Flooding           Flooding         Fauna defecating in supply           Fauna defecating in supply         Fauna destroying water intake structures           Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)         Un-lined landfills           Extensive agriculture         Low vegetation cover (dust, sediment runoff)           Poor access to supply         Unsustainable water extraction           Aquifer turning saline due to high extraction         Had water           Aging or inadequate pipe work and associated infrastructure         Significant water losses due to leaking pipes           High per capita water quality standards / objectives         Lack of infrastructure maintenance           Poor management or governance         Poor management or governance	YES / NO           YES           NO           NO           NO           YES           NO           YES           NO           Unknown           NO           YES           YES           YES           NO           YES           NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps         From the Morgan-Whyalla Pipeline         No historical record for Pt Augusta         Not a problem due to WTP         fruit industry/vineyards and cropping         cleared and modified native vegetation, cropping and grasslands         low flows causing several issues for Murray River Region         from high river extraction         Water quality report shows WTP water to be of good quality         SA Water undertakes integrated asset management covering all of it         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers         SA Water undertakes integrated asset management covering all of it         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers         SA Water undertakes integrated asset management covering all of it         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers         According to SA Water         SA Water undertakes integrated asset management covering all of it         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers         According to SA Water </td
	Catchment	FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism	YES / NO           YES           NO           NO           NO           NO           YES           NO           YES           NO           YES           NO           YES           YES           YES           YES           NO           YES           NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps         From the Morgan-Whyalla Pipeline         No historical record for Pt Augusta         Not a problem due to WTP         fruit industry/vineyards and cropping         cleared and modified native vegetation, cropping and grasslands         low flows causing several issues for Murray River Region         from high river extraction         Water quality report shows WTP water to be of good quality         SA Water undertakes integrated asset management covering all of it:         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers         SA Water undertakes integrated asset management covering all of it:         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers         SA Water undertakes integrated asset management covering all of it:         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers         According to SA Water         SA Water undertakes integrated asset management covering all of it:         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers         According to SA Water
	Catchment	FACTOR         Drought         Single drinking water source         Poor quality water source         Sewage overflow or disposal into water source         Flooding         Fauna defecating in supply         Fauna destroying water intake structures         Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)         Un-lined landfills         Extensive agriculture         Low vegetation cover (dust, sediment runoff)         Poor access to supply         Unsustainable water extraction         Aquifer turning saline due to high extraction         Hard water         Aging or inadequate pipe work and associated infrastructure         Significant water losses due to leaking pipes         High per capita water consumption Inappropriate water quality standards / objectives         Lack of infrastructure maintenance         Poor management or governance         Vandalism / sabotage / terrorism Insufficient trained personnel	YES / NO           YES           NO           NO           NO           YES           NO           YES           NO           Unknown           NO           YES           YES           YES           NO           YES           NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps         From the Morgan-Whyalla Pipeline         No historical record for Pt Augusta         Not a problem due to WTP         fruit industry/vineyards and cropping         cleared and modified native vegetation, cropping and grasslands         low flows causing several issues for Murray River Region         from high river extraction         Water quality report shows WTP water to be of good quality         SA Water undertakes integrated asset management covering all of it         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers         According to SA Water         SA Water undertakes integrated asset management covering all of it         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers         According to SA Water         SA Water undertakes integrated asset management covering all of it         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers         According to SA Water         SA Water undertakes integrated asset management covering all of it         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of
WATEK GUALLIY OK SECURITY KISK (CAUSE)	Governance Catchment	FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades	YES / NO           YES           NO           NO           NO           NO           NO           VES           NO           VES           NO           YES           NO           YES           YES           YES           NO           YES           NO           NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps         From the Morgan-Whyalla Pipeline         No historical record for Pt Augusta         Not a problem due to WTP         fruit industry/vineyards and cropping         cleared and modified native vegetation, cropping and grasslands         low flows causing several issues for Murray River Region         from high river extraction         Water quality report shows WTP water to be of good quality         SA Water undertakes integrated asset management covering all of it:         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers         According to SA Water         SA Water undertakes integrated asset management covering all of it:         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers         According to SA Water         SA Water undertakes integrated asset management covering all of it:         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers         SA Water undertakes integrated asset management covering all of it:         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers
	Governance Catchment	FACTOR           Drought           Single drinking water source           Poor quality water source           Sewage overflow or disposal into water source           Flooding           Fauna defecating in supply           Fauna destroying water intake structures           Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)           Un-lined landfills           Extensive agriculture           Low vegetation cover (dust, sediment runoff)           Poor access to supply           Unsustainable water extraction           Aquifer turning saline due to high extraction           Hard water           Aging or inadequate pipe work and associated infrastructure           Significant water losses due to leaking pipes           High per capita water consumption Inappropriate water quality standards / objectives           Lack of infrastructure maintenance           Poor management or governance           Vandalism / sabotage / terrorism Insufficient trained personnel           Inadequate funding for maintenance or upgrades	YES / NO           YES           NO           NO           NO           NO           NO           NO           NO           NO           YES           NO           YES           YES           YES           NO           YES           NO           NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps         From the Morgan-Whyalla Pipeline         No historical record for Pt Augusta         Not a problem due to WTP         fruit industry/vineyards and cropping         cleared and modified native vegetation, cropping and grasslands         low flows causing several issues for Murray River Region         from high river extraction         Water quality report shows WTP water to be of good quality         SA Water undertakes integrated asset management covering all of its         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers.         SA Water undertakes integrated asset management covering all of its         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers.         According to SA Water         SA Water undertakes integrated asset management covering all of its         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers.         SA Water undertakes integrated asset management covering all of its         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers.         SA Water undertakes integ
	Governance Catchment	FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades	YES / NO           YES           NO           NO           NO           NO           NO           VES           NO           VES           NO           YES           NO           YES           YES           YES           NO           YES           NO           NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps         From the Morgan-Whyalla Pipeline         No historical record for Pt Augusta         Not a problem due to WTP         fruit industry/vineyards and cropping         cleared and modified native vegetation, cropping and grasslands         low flows causing several issues for Murray River Region         from high river extraction         Water quality report shows WTP water to be of good quality         SA Water undertakes integrated asset management covering all of its         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers.         According to SA Water         SA Water undertakes integrated asset management covering all of its         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers.         According to SA Water         SA Water undertakes integrated asset management covering all of its         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers:         SA Water undertakes integrated asset management covering all of its         water infrastructure across South Australia, that ensures ongoing         satisfactory operation of the assets and reliable service to customers:

Populatio	Rapid population growth	YES	Above state average (.76%/annum) - 2.9 %/annum;. (population increase based on 2006/2001 census (Urban Centre/Locality )). Barossa is identified in the SA Government 30 year growth plan as an area to experience growth.
Ê	Pathogenic contamination	NO	100% of all tests are above AWDG guidelines this year
RISK (EFFECT)	Algal blooms	YES	A total of 53 blooms were recorded in SA Water Reservoirs between 2002 and 2007, while a further 100 blooms were detected along the Murray River.
×	Heavy metal contamination	Unknown	
RIS	Poor chlorine residuals	NO	
≥	Pesticide contamination	Unknown	
OR SECURITY	Boil water notices	NO	
5	Deaths or illness due to water quality	NO	
Ŭ O	Water restrictions (current and historic)	YES	since 2003
Ř	Taste and odour issues	YES	
WATER QUALITY O	Other contamination that would affect health	YES	Increasing salinity -(critical issue for the quality of our drinking water in the Murray. Long-term below average rainfall over the past 10 years has reduced river flows and salt has accumulated in the floodplains and disconnected wetlands. While the water quality meets drinking water guidelines at the moment, when river flows are increased, this accumulated salt may reduce water quality). Elevated phosphorus and nitrate readings ( fertilisers, manure and detergent washed in from rainfall).
	Notes		

Z		State/Territory	SA		
TOWN	,	Town Name	Renmark	л. 19.X	
		Town Population	4,339 (Census 2006, Urban Centre	/Locality)	
WATER	È	Name of Water Utility Rate (\$/kL)	SA Water -River Water Quarterly supply charge of \$34.40		
ATE	2	Per Capita Water Consumption (ML/day)	410 L/person/day (based on residential use only)		
Š	5	Number of Connections	1983		
		Catchment	Murray River		
CATCHMENT AND WATER	i.	Sub-Catchment	Lower Murray		
<b>W</b> F	5	Catchment Management Authority (CMA)		in (SAMDB), Natural Resources Management Board (NRMB)	
₽≥	Ē	CMA Web-Link		/ww.nrm.sa.gov.au/	
AD	ິທ	Catchment Protection Status	Prescribed		
0 4		Potable Water Source(s) Supply Capacity	Murray River River - allowable extraction unknow	in the second	
		Treatment Plant(s)	Renmark WTP, Renmark		
			Conventional Water Treatment Play	nt (Coagulation, Flocculation, Sedimentation, Filtration, Disinfection (UV a	
		Level of Treatment	Cl2), Fluoridation, Storage and dist		
		Drinking Water Guidelines	ADWG 2004	·	
		Diriking Water Guidennes	Faecal Coliforms/100 mL	100%	
⊢			E.Coli/100mL	100%	
ALI	l		Chlorine Residual-Free [mg/L]	100%	
no	5		Chlorine Residual- Total [mg/L]	N/A	
Ř			TDS [by EC] [mg/L]	100%	
WATER QUALITY		Results (% compliance for 2008 reporting	Colour-True [HU]	100%	
M/		period)	Turbidity [NTU]	100%	
			pH Units Trialomethanes-Total [ug/L]	100%	
			Fluoride [mg/L]	100%	
			Iron-Total [mg/L]	100%	
			Total Hardness as CaCO3 [mg/L]	100%	
			Manganese	100%	
~				stems and hand-held hoses fitted with a trigger nozzle can be used for a maximur	
É	;	Current Water Restrictions		9 am or 6pm - 9 pm. Watering cans and buckets can be used on any day/time.	
Ľ.	5		Sprinklers and other watering systems	remain banned.	
U U U	1	Proportion of Potable Water Supplied to			
WATER SECURITY		Households (%)	81% residential, 19% non-residenti	al	
Ë		Distance from the Coast (km)	218		
AM		Climate	Temperate		
-		Average Annual Rainfall	260.5mm		
		FACTOR	YES / NO	NOTES / EXPLANATION	
		Drought	YES	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps	
		Single drinking water source	YES	From the Morgan-Whyalla Pipeline	
		Poor quality water source Sewage overflow or disposal into water	NO		
		source	NO		
		Flooding	NO	No historical record for Pt Augusta	
		Fauna defecating in supply	YES	Not an issue due to WTP	
	<u></u>	Fauna destroying water intake structures	NO		
	dn	Natural mineral pollutants (e.g. uranium,	Unknown		
	S S	nitrates, iron, fluoride)	NO		
	ate	Un-lined landfills Extensive agriculture	NO YES	fruiting utralian and arouning	
	5	Low vegetation cover (dust, sediment		fruit industry/vineyards and cropping	
Э	iment and Water Supply	runoff)	YES	cleared and modified native vegetation, cropping and grasslands	
CAUSE	ent	Poor access to supply	NO		
5	ũ	Unsustainable water extraction	YES	low flows causing several issues for Murray River Region	
Y.	Catch	Aquifer turning saline due to high extraction	N/A	from high river extraction	
ř	Ö			•	
≻		Hard water	NO	Water quality report shows WTP water to be of good quality	
Y		Aging or inadequate pipe work and	NO	SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing	
WATER QUALITY OR SECURITY RISK		associated infrastructure		satisfactory operation of the assets and reliable service to customers.	
S		Cignificant water because the state of		SA Water undertakes integrated asset management covering all of its	
Ъ С		Significant water losses due to leaking	NO	water infrastructure across South Australia, that ensures ongoing	
≻		pipes		satisfactory operation of the assets and reliable service to customers.	
		High per capita water consumption	NO		
2 T		Inappropriate water quality standards /	NO		
r		objectives		SA Water undertakes integrated asset management covering all of its	
Ц		Lack of infrastructure maintenance	NO	water infrastructure across South Australia, that ensures ongoing	
**	JCe			satisfactory operation of the assets and reliable service to customers.	
	Governance			SA Water undertakes integrated asset management covering all of its	
	ver	Poor management or governance	NO	water infrastructure across South Australia, that ensures ongoing	
	ß			satisfactory operation of the assets and reliable service to customers.	
		Vandalism / sabotage / terrorism	NO		
		Insufficient trained personnel	NO	CA Water undertaken integrated asset man-set asset as the City	
		Inadequate funding for maintenance or	NO	SA Water undertakes integrated asset management covering all of its	
		upgrades	NO	water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.	
	Ξ	Mining / minerals	NO	satisfactory operation of the assets and reliable service to customers.	
	Industri es	Irrigation	YES	irrigated cropping occurs in this catchment	
	pu	Chemicals / process	NO		
	5				
	ati I	Seasonal population loadings	NO		
	Pop I ulati	Seasonal population loadings Rapid population growth	NO NO	population decreasing	

RISK (EFFEC	Algal blooms	YES	A total of 53 blooms were recorded in SA Water Reservoirs between 2002 and 2007, while a further 100 blooms were detected along the Murray River.
×	Heavy metal contamination	YES	
RIG	Poor chlorine residuals	NO	
$\overline{\succ}$	Pesticide contamination	Unknown	
SECURITY	Boil water notices	NO	
I.C.	Deaths or illness due to water quality	NO	
Ŭ	Water restrictions (current and historic)	YES	Since 2002
OR S	Taste and odour issues	YES	
WATER QUALITY OF	Other contamination that would affect health	YES	Increasing salinity -(critical issue for the quality of our drinking water in the Murray. Long-term below average rainfall over the past 10 years has reduced river flows and salt has accumulated in the floodplains and disconnected wetlands. While the water quality meets drinking water guidelines at the moment, when river flows are increased, this accumulated salt may reduce water quality).Elevated phosphorus and nitrate readings (fertilisers, manure and detergent washed in from rainfall).
	Notes		

2		State/Territory	SA		
TOWN		Town Name	Tanunda		
		Town Population	4,500 (SA Water Data, based on	suburb of Tanunda)	
	-	Name of Water Utility	SA Water -Riverland Water	<u>^</u>	
WATER UTILITY	2	Rate (\$/kL) Per Capita Water Consumption (ML/day)	Quarterly supply charge of \$34.4		
N I	5	Number of Connections	280 L/person/day (based on residential use only) 1956		
		Catchment	Murray River		
μĸ		Sub-Catchment	Lower Murray		
CATCHMENT AND WATER	Ž	Catchment Management Authority (CMA)	South Australia Murray Darling Basin (SAMDB), Natural Resources Management Board (NRMB)		
ΞŠ	Ę	CMA Web-Link		//www.nrm.sa.gov.au/	
ADA	SL	Catchment Protection Status	Prescribed		
v∢		Potable Water Source(s) Supply Capacity	Murray River River - allowable extraction unkr		
		Treatment Plant(s)	Swan Reach WTP	lowin	
				last (Coordination Flooridation Codimentation Filtration Disinfection (	
		Level of Treatment	and NHCl2), Fluoridation, Storag	lant (Coagulation, Flocculation, Sedimentation, Filtration, Disinfection (U e and distribution)	
		Drinking Water Guidelines	ADWG 2004	1	
			Overall	100%	
≥			Faecal Coliforms/100 mL E.Coli/100mL	100%	
Ē			Chlorine Residual-Free [mg/L]	100%	
∩			Chlorine Residual- Total [mg/L]	N/A	
WATER QUALITY			TDS [by EC] [mg/L]	100%	
Ē		Regulto (% compliance for 2000 reporting	Colour-True [HU]	100%	
٨A		Results (% compliance for 2008 reporting period)	Turbidity [NTU]	100%	
2		poliou)	pH Units	100%	
			Trialomethanes-Total [ug/L]	100%	
			Fluoride [mg/L]	100%	
			Iron-Total [mg/L]	100%	
			Total Hardness as CaCO3 [mg/L]	100%	
			[mg/L] Manganese	100%	
				5- Dripper systems and hand-held hoses fitted with a trigger nozzle can be used	
Ē		Current Water Restrictions		k between 6 am - 9 am or 6pm - 9 pm. Watering cans and buckets can be used	
Ч			any day/time. Sprinklers and other v		
Ш		Proportion of Potable Water Supplied to			
WATER SECURITY		Households (%)	59% residential, 41% non-reside	ntial	
Ē		Distance from the Coast (km)	46		
NA		Climate	mperate		
		Average Annual Rainfall	3.4mm		
	1	FACTOR	YES / NO	NOTES / EXPLANATION	
		Drought Single drinking water source	YES YES	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Swan Reach-Stockwell Pipeline	
		Poor quality water source	NO		
		Sewage overflow or disposal into water			
		source	NO		
		Flooding	NO		
		Fauna defecating in supply	YES	Not an issue due to WTP	
	ply	Fauna destroying water intake structures	NO		
	Sup	Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)	Unknown		
	e	Un-lined landfills	NO		
	Vat	Extensive agriculture	YES	fruit industry/vineyards and cropping	
	and Water Supply	Low vegetation cover (dust, sediment	YES		
	nt an	runoff)		cleared and modified native vegetation, cropping and grasslands	
		Poor access to supply	NO		
	Catchme	Unsustainable water extraction	YES	low flows causing several issues for Murray River Region	
Li Li	Cato	Aquifer turning saline due to high extraction	YES	from high river extraction	
AUSE		Hard water	NO	Water quality report shows WTP water to be of good quality	
(CAUSE					
SK (CAUSE				SA Water undertakes integrated asset management covering all of its	
Y RISK (CAUSE		Aging or inadequate pipe work and associated infrastructure	NO	water infrastructure across South Australia, that ensures ongoing	
CURITY RISK (CAUSE		Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking			
SECURITY RISK (CAUSE		Aging or inadequate pipe work and associated infrastructure	NO	water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its	
dr security risk (cause		Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption	NO	water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing	
LITY OR SECURITY RISK (CAUSE		Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes	NO	water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water	
R QUALITY OR SECURITY RISK (CAUSE	Ice	Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards /		water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.	
WATER QUALITY OR SECURITY RISK (CAUSE)	overnance	Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives	NO NO NO	water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing	
WATER QUALITY OR SECURITY RISK (CAUSE	Governance	Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance	NO NO NO NO	water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its	
WATER QUALITY OR SECURITY RISK (CAUSE	Governance	Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism	NO NO NO NO NO	water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing	
WATER QUALITY OR SECURITY RISK (CAUSE	Governance	Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or	NO NO NO NO	water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing	
WATER QUALITY OR SECURITY RISK (CAUSE	Governance	Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades	NO NO NO NO NO NO NO NO	water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its SA Water undertakes integrated asset management covering all of its	
WATER QUALITY OR SECURITY RISK (CAUSE		Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or	NO NO NO NO NO NO NO	water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing	
WATER QUALITY OR SECURITY RISK (GAUSE	Industries Governance	Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades	NO NO NO NO NO NO NO NO	water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing	

Population	Seasonal population loadings	NO	
Popu	Rapid population growth	YES	Above state average (.76%/annum) - 1.65%/annum;. (population increase based on 2006/2001 census (Urban Centre/Locality))
F	Pathogenic contamination	NO	100% of all tests are above AWDG guidelines this year
(EFFEC	Algal blooms	YES	A total of 53 blooms were recorded in SA Water Reservoirs between 2002 and 2007, while a further 100 blooms were detected along the Murray River.
×	Heavy metal contamination	Unknown	
E C	Poor chlorine residuals	Unknown	
~	Pesticide contamination	Unknown	
E	Boil water notices	NO	
I.	Deaths or illness due to water quality	NO	
Ŭ,	Water restrictions (current and historic)	YES	Since 2002
0) (*	Taste and odour issues	YES	
WATER QUALITY OR SECURITY RISK (EFFECT)	Other contamination that would affect health	YES	Increasing salinity -(critical issue for the quality of our drinking water in the Murray. Long-term below average rainfall over the past 10 years has reduced river flows and salt has accumulated in the floodplains and disconnected wetlands. While the water quality meets drinking water guidelines at the moment, when river flows are increased, this accumulated salt may reduce water quality). Elevated phosphorus and nitrate readings (fertilisers, manure and detergent washed in from rainfall).
	Notes		

Z		State/Territory	SA		
TOWN		Town Name Town Population	Berri 4 008 (Census 2006, Urban Centre	/l ocality)	
		Name of Water Utility	4,008 (Census 2006, Urban Centre/Locality) SA Water (Riverland Water)		
WATER	<u>-</u>	Rate (\$/kL)	Quarterly supply charge of \$34.40		
A I	Ⅎ	Per Capita Water Consumption (ML/day)	360 L/person/day (based on reside	ntial use only)	
3	5	Number of Connections	1756		
		Catchment	Murray River		
CATCHMENT AND WATER		Sub-Catchment	Lower Murray		
ΨĘ	7	Catchment Management Authority (CMA)		sin (SAMDB), Natural Resources Management Board (NRMB)	
ĔŞ	4	CMA Web-Link	http://www.mdba.gov.au/ http://w	vww.nrm.sa.gov.au/	
Ĕ₽	SU	Catchment Protection Status	Prescribed		
Q 4		Potable Water Source(s)	River Murray		
		Supply Capacity	River - allowable extraction unknow	vn	
		Treatment Plant(s)	Berri WTP, Berri		
		Level of Treatment	Conventional Water Treatment Pla Cl2), Fluoridation, Storage and dist	nt (Coagulation, Flocculation, Sedimentation, Filtration, Disinfection (UV ribution)	
		Drinking Water Guidelines	ADWG 2004		
			Overall	100%	
≿			Faecal Coliforms/100 mL	100%	
Ę			E.Coli/100mL	100%	
۲,			Chlorine Residual-Free [mg/L]	100%	
WATER QUALITY			Chlorine Residual- Total [mg/L]	N/A	
Ë			TDS [by EC] [mg/L]	100%	
A		Results (% compliance for 2008 reporting	Colour-True [HU]	100%	
>		period)	Turbidity [NTU] pH Units	100% 100%	
			pH Units Trialomethanes-Total [ug/L]	100%	
			Fluoride [mg/L]	100%	
			Iron-Total [mg/L]	100%	
			Total Hardness as CaCO3 [mg/L]	100%	
			Manganese	100%	
				Dripper systems and hand-held hoses fitted with a trigger nozzle can be used for	
URITY		Current Water Restrictions		etween 6 am - 9 am or 6pm - 9 pm. Watering cans and buckets can be used on a	
WATER SECURITY		Proportion of Potable Water Supplied to Households (%)	73% residential, 27% non-resident	al	
Ë		Distance from the Coast (km)	202		
_ ∧		Climate	Temperate		
-		Average Annual Rainfall	261.3mm		
		FACTOR	YES / NO	NOTES / EXPLANATION	
		Drought	YES	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps	
		Single drinking water source	YES	From the Morgan-Whyalla Pipeline	
		Poor quality water source	NO		
		Sewage overflow or disposal into water	NO		
		Source	NO	No historian record for Dt Augusta	
		Flooding Fauna defecating in supply	YES	No historical record for Pt Augusta Not an issue due to the WTP	
	~	Fauna destroying water intake structures	NO		
	and Water Supply	Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)	Unknown		
	Iter	Un-lined landfills	NO		
	Ň	Extensive agriculture	YES	fruit industry/vineyards and cropping	
	nt and	Low vegetation cover (dust, sediment runoff)	YES	cleared and modified native vegetation, cropping and grasslands	
Э		Poor access to supply Unsustainable water extraction	NO YES	low flows causing several issues for Murray River Region	
S	Catchme				
5	Cat	Aquifer turning saline due to high extraction	YES	from high river extraction	
<		Hard water	NO	Water quality report shows WTP water to be of good quality	
		Aging or inadequate pipe work and associated infrastructure	NO	SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.	
WATER QUARTY OR SECURITY RISK (CAUSE)		Significant water losses due to leaking pipes	NO	SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing	
n Y				satisfactory operation of the assets and reliable service to customers.	
Ś		High per capita water consumption	NO	According to Sa Water	
-		Inappropriate water quality standards / objectives	NO		
K QUAL	e	Lack of infrastructure maintenance	NO	SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing actignation apporting of the acoust and reliable conting to automorphic the action of the acoust and reliable conting to automorphic actignation of the acoust and reliable conting to automorphic the action of the acoust and the action of the	
WAIE	Governance	Poor management or governance	NO	satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing	
	ŭ	Vendeliem / eeksteres / terresitere	NO	satisfactory operation of the assets and reliable service to customers.	
		Vandalism / sabotage / terrorism	NO		
		Insufficient trained personnel Inadequate funding for maintenance or	NO NO	SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing	
		upgrades		satisfactory operation of the assets and reliable service to customers.	
	se	Mining / minerals	NO		
	stries	Mining / minerals			
	Idustries	Mining / minerals Irrigation	NO YES	irrigated cropping occurs in this catchment	
	lation Industries			irrigated cropping occurs in this catchment	

Popu	Rapid population growth	NO	Population is decreasing
Ê	Pathogenic contamination	NO	100% of all tests are above AWDG guidelines this year
RISK (EFFECT)	Algal blooms	YES	A total of 53 blooms were recorded in SA Water Reservoirs between 2002 and 2007, while a further 100 blooms were detected along the Murray River.
X	Heavy metal contamination	YES	
Ř	Poor chlorine residuals	NO	
≥	Pesticide contamination	YES	
Ē	Boil water notices	NO	
SECURITY	Deaths or illness due to water quality	NO	
ы Ш	Water restrictions (current and historic)	YES	Since 2002
OR (	Taste and odour issues	YES	
WATER QUALITY O	Other contamination that would affect health	YES	Increasing salinity -(critical issue for the quality of our drinking water in the Murray. Long-term below average rainfall over the past 10 years has reduced river flows and salt has accumulated in the floodplains and disconnected wetlands. While the water quality meets drinking water guidelines at the moment, when river flows are increased, this accumulated salt may reduce water quality). Elevated phosphorus and nitrate readings ( fertilisers, manure and detergent washed in from rainfall).
	Notes		

z	State/Territory	SA	
TOWN	Town Name	Strathalbyn	
2	Town Population	4,861 (SA Water Data, based on sul	burb of Strathalbyn)
~≻	Name of Water Utility	SA Water	······································
WATER UTILITY	Rate (\$/kL)	Quarterly supply charge of \$34.40	
ξĒ	Per Capita Water Consumption (ML/day)	240 L/person/day (based on residen	tial use only)
$\leq \supset$	Number of Connections	1889	
	Catchment	River Murray	
0.	Sub-Catchment	Lower Murray	
ΞŻ		South Australia Murray Darling Basin	n (SAMDB)/Adelaide and Mount Lofty Ranges Natural Resources
μ d d	Catchment Management Authority (CMA)	Management Board	
N N	CMA Web-Link	http://www.mdba.gov.au/ http://ww	vw.nrm.sa.gov.au/
Ξü	Catchment Protection Status	Prescribed	
CATCHMENT AND WATER SUPPLY	Potable Water Source(s)	River Murray	
AN MA	Folable Water Source(s)	Myponga reservoir	
0-	Supply Capacity	Murray River - allowable extraction u	nknown
	Supply Supacity	Myponga Reservoir - 15 000 megalit	res per year average, 26 800 megalitres maximum
	Treatment Plant(s)	Summit WTP, Balhanna	
	Level of Treatment		t (Coagulation, Flocculation, Sedimention, Filtration, Disinfection (UV an
	Drinking Water Guidelines	2004 ADWG	
		Overall	
		Faecal Coliforms/100 mL	100%
≽		E.Coli/100mL	100%
WATER QUALITY		Chlorine Residual-Free [mg/L]	N/A
J.		Chlorine Residual- Total [mg/L]	100%
ð		TDS [by EC] [mg/L]	100%
Щ	Results (% compliance for 2008 reporting	Colour-True [HU]	100%
AT	period)	Turbidity [NTU]	86%
3		pH Units	30%
		Trialomethanes-Total [ug/L]	100%
		Flouride [mg/L]	100%
		Iron-Total [mg/L]	91%
		Total Hardness as CaCO3 [mg/L]	100%
		Manganese as CaCo3 [mg/L]	100%
			ripper systems and hand-held hoses fitted with a trigger nozzle can be used for
WATER SECURITY	Current Water Restrictions		ween 6 am - 9 am or 6pm - 9 pm. Watering cans and buckets can be used on a
Ч		day/time. Sprinklers and other watering	systems remain banned.
0			
SE	Proportion of Potable Water Supplied to	77% residential 22% per residentia	
К.	Households (%)	77% residential, 23% non- residentia	
II A	Distance from the Coast (km)	0	
Š	Climate	Temperate	
	Average Annual Rainfall	535mm Victor Harbor/750mm Mypo	nga Catchment
	FACTOR	YES / NO	NOTES / EXPLANATION
	Drought	YES	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps
	Single drinking water source	YES	Mannum-Adelaide Pipeline
	Poor quality water source	NO	
	Sewage overflow or disposal into water	NO	
	source		
	Flooding	YES	Historical floods in Mt Barker and Murrya River
	Fauna defecating in supply	YES	Not a problem due to WTP
<u>∼</u>	Fauna destroying water intake structures	NO	
Supply	Natural mineral pollutants (e.g. uranium,	Unknown	
้ง	nitrates, iron, flouride)	OIKIOWI	
	Un-lined landfills	luo -	
te	on-inted landing	NO	
Nater	Extensive agriculture	YES	extensive grazing and cropping. Dryland and irrigated agriculture
nd Water		YES	
p	Extensive agriculture		extensive grazing and cropping. Dryland and irrigated agriculture cleared and modifed native vegetation, cropping and grasslands
p	Extensive agriculture Low vegetation cover (dust, sediment	YES	
p	Extensive agriculture Low vegetation cover (dust, sediment runoff)	YES YES	
p	Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction	YES YES NO YES	cleared and modifed native vegetation, cropping and grasslands low flows causing several issues for Murray River Region
p	Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction	YES YES NO	cleared and modifed native vegetation, cropping and grasslands
p	Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction	YES YES NO YES	cleared and modifed native vegetation, cropping and grasslands low flows causing several issues for Murray River Region
p	Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water	YES YES NO YES NO	cleared and modifed native vegetation, cropping and grasslands low flows causing several issues for Murray River Region from high river extraction Water quality report shows WTP water to be of good quality
p	Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipework and	YES YES NO YES NO	cleared and modifed native vegetation, cropping and grasslands low flows causing several issues for Murray River Region from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing
p	Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water	YES YES NO YES NO NO	cleared and modifed native vegetation, cropping and grasslands low flows causing several issues for Murray River Region from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
p	Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipework and associated infrastructure	YES YES NO YES NO NO	cleared and modifed native vegetation, cropping and grasslands low flows causing several issues for Murray River Region from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
p	Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipework and associated infrastructure Significant water losses due to leaking	YES YES NO YES NO NO	cleared and modifed native vegetation, cropping and grasslands low flows causing several issues for Murray River Region from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
p	Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipework and associated infrastructure	YES YES NO YES NO NO	cleared and modifed native vegetation, cropping and grasslands low flows causing several issues for Murray River Region from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its
p	Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipework and associated infrastructure Significant water losses due to leaking	YES YES NO YES NO NO	cleared and modifed native vegetation, cropping and grasslands low flows causing several issues for Murray River Region from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
p	Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipework and associated infrastructure Significant water losses due to leaking pipes	YES YES NO YES NO NO NO NO	cleared and modifed native vegetation, cropping and grasslands low flows causing several issues for Murray River Region from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
p	Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipework and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption	YES YES NO YES NO NO NO	cleared and modifed native vegetation, cropping and grasslands low flows causing several issues for Murray River Region from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
p	Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipework and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards /	YES YES NO YES NO NO NO NO	cleared and modifed native vegetation, cropping and grasslands low flows causing several issues for Murray River Region from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water
Catchment and	Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipework and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards /	YES YES NO YES NO NO NO NO	cleared and modifed native vegetation, cropping and grasslands low flows causing several issues for Murray River Region from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water
Catchment and	Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipework and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives	YES YES NO YES NO NO NO NO NO	cleared and modifed native vegetation, cropping and grasslands low flows causing several issues for Murray River Region from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water
Catchment and	Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipework and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives	YES YES NO YES NO NO NO NO NO	cleared and modifed native vegetation, cropping and grasslands low flows causing several issues for Murray River Region from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
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n P	Rupiu population growth	YES	
	Pathogenic contamination	NO	100% of all tests are above AWDG guidlelines this year
WATER QUALITY OR SECURITY RISK (EFFECT)	Algal blooms	YES	At the beginning of 2007, the predictions for low Murray River flows into South Australia were a cause for concern. The potential water quality issues from these low flows included elevated cyanobacterial blooms and buildup of cyanobacteria in connected wetlands. SA Water, with support from MDBC, undertook a pilot project to investigate the use of high- definition aerial photography for the early detection of potential water quality issues. This monitoring has proven to be invaluable. Algal blooms were detected early in the river channel and water treatment was enhanced at the local treatment plant. Blooms in connected wetlands were detected, as well as numerous issues in both the main channel of the Murray and in backwaters and wetlands. The aerial imagery enabled improved management of these issues and has established a benchmark for Murray River flootplain management. Cyanobacteria or blue-green algae are naturally occurring organisms that can increase in numbers to produce a freshwater algal bloom, under certain conditions. Some human activities, such as farming with lots of fertilisers, produce high levels of nutrients in water, which can lead to algal blooms. These occur when
D.	Heavy metal contamination	Unknown	
ŭ	Poor chlorine residuals	NO	
05 67	Pesticide contamination	Unknown	
ö	Boil water notices	NO	
≥	Deaths or illness due to water quality	NO	
, i	Water restrictions (current and historic)	YES	Since 2003
⊃	Taste and odour issues	YES	
WATER Q	Other contamination that would affect health	YES	Increasing salinity in the Murray River is a critical issue for the quality of our drinking water. Long-term below average rainfall over the past 10 years has reduced river. was a number of elevated phosphorus and nitrate readings. The recent rains may have washed stormwater pollution (such as fertilisers, manure and detergent) into our creeks and rivers. Ten sites recorded phosphorous levels higher than 0.1mgL. 0.4mgL of phosphorous were taken at Angas River (ANG300), Wellington (MUR410) and Byethorne Park (BYE010) which could lead to algal blooms flows and salt has accumulated in the floodplains and disconnected wetlands. While the water quality meets drinking water guidelines at the moment, when river flows are increased, this accumulated salt may reduce water quality.
			increased, this accumulated sait hidy feduce water quality.

7	72			
=		State/Territory	SA	
TOWN		Town Name	Roxby Downs	
Ĕ		Town Population	5,160 (Census 2006	, Urban Centre/Locality)
<u> </u>	F	Name of Water Utility	Roxby Water	
Ξ	5	Rate (\$/kL)	\$2.83	
WATER	5	Per Capita Water Consumption (ML/day)	2.0	
> -	<u> </u>	Number of Connections	10800	
Δ.	_	Catchment	Great Artesian Basin	
CATCHMENT AND	Ę.	Sub-Catchment	Eromanga Basin nea	ar the southern and eastern areas of lake Eyre
	Ľ,	Catchment Management Authority (CMA)	Arid Areas Catchme	nt Water Management Board
ਹ ਸ਼ੂੰ ਹ	ดี			-
i Z Ω	Ľ Ц	CMA Web-Link		sa.gov.au/About Us/What we do.aspx
	Ē.	Catchment Protection Status		ct 1997 on 27 March 2003
S≥	>	Potable Water Source(s)	Eromanga Basin	
		Supply Capacity		40ML/d (this includes water to Olympic dam)
		Treatment Plant(s)	BHP desal and WTP	
≃≧	-	Level of Treatment		and "treatment" by The Western Mining Corporation, Chlorine injection by
WATER	ļ		Roxby Council	
A V V	Ĵ,	Drinking Water Guidelines	Guidelines created b	based on AWDG 2004
- (	و	Results (% compliance for 2008 reporting	Overall	Statement found indicates that Water quality is above or on par with that of
		period)	Overall	SA WATER results.
		Current Water Restrictions	No- not to any federa	al or state requirements
WATER	=	Proportion of Potable Water Supplied to	Unknown	
빌	5	Households (%)		
N N	ر ⊔	Distance from the Coast (km)	210	
2 4	0	Climate	Temperate	
		Average Annual Rainfall	211mm	
		FACTOR	YES / NO	NOTES / EXPLANATION
		Drought	YES	EC and BOM
		Single drinking water source	YES	Total water is sourced from surface water
			l I	Water is very soft, of high quality, has a small amount of natural fluoride and is low in dissolved solids. Water has
		Poor quality water source	YES	been tested and compared against a range of other urban
			1	water supplies and bottled water with favourable results.
		Sewage overflow or disposal into water	·	
		source	NO	
	Supply	Flooding	NO	No historical data
	dn	Fauna defecating in supply	NO	
	S S	Fauna destroying water intake structures	NO	
	Catchment and Water	Natural mineral pollutants (e.g. uranium,		
		nitrates, iron, fluoride)	YES	Seems likely due to proximity of Olympic dam
ш		Un-lined landfills	NO	
SU		Extensive agriculture	NO	
S		Low vegetation cover (dust, sediment	YES	Native grasslands and minimally modified pastures
¥		runoff)		
SIS		Poor access to supply	NO	
Ϋ́		Unsustainable water extraction	Unknown	
L S		Aquifer turning saline due to high extraction	Unknown	
j,		Hard water	NO	Council report states that Water is very soft
Ĕ		Aging or inadequate pipe work and		
с С		associated infrastructure	NO	
ō		Significant water losses due to leaking		
		Significant water losses due to leaking pipes	NO	
ΑΓΙΤΥ ΟΙ		Significant water losses due to leaking pipes High per capita water consumption	NO Unknown	
QUALITY OI		pipes	Unknown	Council Deport indicatos the standards on any with AMDO 2004
R QUALITY OR SECURITY RISK (CAUSE)		pipes High per capita water consumption	-	Council Report indicates the standards on par with AWDG 2004
n		pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance	Unknown NO NO	
Ŷ		pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance	Unknown NO NO NO	Council Report indicates the standards on par with AWDG 2004 Run by BHP
		pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism	Unknown NO NO NO NO	
Ŷ	Governance	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel	Unknown NO NO NO	
Ŷ		pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or	Unknown NO NO NO NO	
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n	Governano	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or	Unknown NO NO NO NO NO	
۲r	Governano	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals	Unknown NO NO NO NO NO YES	Run by BHP
Ŷ	Governano	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation	Unknown NO NO NO NO NO YES NO	Run by BHP Olympic Dam
Ŷ		pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals	Unknown NO NO NO NO NO YES	Run by BHP
WATER	Industries Governand	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process	Unknown NO NO NO NO NO YES NO YES	Run by BHP Olympic Dam
WATER	Industries Governand	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation	Unknown NO NO NO NO NO YES NO	Run by BHP Olympic Dam
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WATER	Industries Governand	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Indequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process	Unknown NO NO NO NO NO YES NO YES	Run by BHP Olympic Dam Olympic Dam Above state average (.76%/annum) - 1.3%/annum;. (population increase
WATER	Population Industries Governant	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth	Unknown NO NO NO NO NO YES NO YES NO	Run by BHP Olympic Dam Olympic Dam
WATER	Population Industries Governant	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination	Unknown NO NO NO NO NO YES NO YES NO	Run by BHP Olympic Dam Olympic Dam Above state average (.76%/annum) - 1.3%/annum;. (population increase
WATER	Population Industries Governant	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms	Unknown NO NO NO NO NO YES NO YES NO	Run by BHP Olympic Dam Olympic Dam Above state average (.76%/annum) - 1.3%/annum;. (population increase
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WATER	Population Industries Governant	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination	Unknown NO NO NO NO NO YES NO YES NO	Run by BHP Olympic Dam Olympic Dam Above state average (.76%/annum) - 1.3%/annum;. (population increase
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WATER	Population Industries Governant	pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination Boil water notices Deaths or illness due to water quality Water restrictions (current and historic) Taste and odour issues Other contamination that would affect	Unknown NO NO NO NO NO YES NO YES	Run by BHP Olympic Dam Olympic Dam Above state average (.76%/annum) - 1.3%/annum;. (population increase
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	73	State/Territory	SA	
TOWN		Town Name	Loxton	
		Town Population	4,419 (SA Water Data, based on su	burb of Loxton)
۲. F	<u>}</u>	Name of Water Utility Rate (\$/kL)	SA Water -Riverland Water	
WATER	2	Per Capita Water Consumption (ML/day)	Quarterly supply charge of \$34.40 350 L/person/day (based on resider	ntial use only)
3 :	D	Number of Connections	1644	
		Catchment	Murray Darling Basin	
CATCHMENT AND WATER	~	Sub-Catchment	Southern Basin	
MEA	5	Catchment Management Authority (CMA)		n (SAMDB), Natural Resources Management Board (NRMB)
₽≥	IL	CMA Web-Link	http://www.mdba.gov.au/ http://w	ww.nrm.sa.gov.au/
N AT	S	Catchment Protection Status Potable Water Source(s)	prescribed River Murray	
0 4		Supply Capacity	Unknown	
		Treatment Plant(s)	Loxton WTP, Loxton	
		Level of Treatment	Conventional Water Treatment Plar NHCl2), Fluoridation, Storage and c	t (Coagulation, Flocculation, Sedimentation, Filtration, Disinfection (UV a istribution)
		Drinking Water Cuidelines	<i>,</i> , , , , , , , , , , , , , , , , , , ,	
		Drinking Water Guidelines	ADWG 2004 Faecal Coliforms/100 mL	100%
≿			E.Coli/100mL	100%
ALI			Chlorine Residual-Free [mg/L]	N/A
WATER QUALITY			Chlorine Residual- Total [mg/L]	100%
Ľ			TDS [by EC] [mg/L]	100%
ATE		Results (% compliance for 2008 reporting	Colour-True [HU]	100%
Š		period)	Turbidity [NTU] pH Units	100% 4%
			Trialomethanes-Total [ug/L]	100%
			Fluoride [mg/L]	100%
			Iron-Total [mg/L]	100%
			Total Hardness as CaCO3 [mg/L]	100%
			Manganese	100%
≽				ripper systems and hand-held hoses fitted with a trigger nozzle can be used for
R		Current Water Restrictions	day/time. Sprinklers and other waterin	ween 6 am - 9 am or 6pm - 9 pm. Watering cans and buckets can be used on an
WATER SECURITY		Proportion of Potable Water Supplied to Households (%)	84% residential, 16% non-residentia	
ER		Distance from the Coast (km)	117	
AT		Climate	Temperate	
<		Average Annual Rainfall	272.3mm	
		FACTOR	YES / NO	NOTES / EXPLANATION
		Drought	YES	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps
		Single drinking water source Poor quality water source	YES NO	From the Morgan-Whyalla Pipeline
		Sewage overflow or disposal into water		
		source	NO	
		Flooding	NO	No historical record for Pt Augusta
	~	Fauna defecating in supply	YES	Not an issue due to WTP
	ply.	Fauna destroying water intake structures	NO	
	Sup	Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)	Unknown	
	e	Un-lined landfills	NO	
	Vat	Extensive agriculture	YES	extensive grazing and cropping. Dryland and irrigated agriculture
	/ pc	Low vegetation cover (dust, sediment	YES	cleared and modified native vegetation, cropping and grasslands
ì	chment and Water Supply	runoff)		ocaroa ana mounica native vegetation, cropping ana grassidilas
10000	nen	Poor access to supply	NO	leur fleure equeire equerel isques for Murroy Diver Denier
5	chn	Unsustainable water extraction	YES	low flows causing several issues for Murray River Region
	Cato	Aquifer turning saline due to high extraction	YES	from high river extraction
ź		Hard water	NO	Water quality report shows WTP water to be of good quality
		Aging or inadequate pipe work and		SA Water undertakes integrated asset management covering all of its
5		associated infrastructure	NO	water infrastructure across South Australia, that ensures ongoing
Ś				satisfactory operation of the assets and reliable service to customers.
5		Significant water losses due to leaking	NO	SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing
5		pipes		satisfactory operation of the assets and reliable service to customers.
		High per capita water consumption	NO	According to SA Water
-		Inappropriate water quality standards /	NO	
		objectives		
			1	SA Water undertakes integrated asset management covering all of its
	e	Lack of infrastructure maintenance	NO	water infrastructure across South Australia, that ensures ongoing
	ance	Lack of infrastructure maintenance	NO	satisfactory operation of the assets and reliable service to customers.
	ernance			satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its
	sovernance	Lack of infrastructure maintenance Poor management or governance	NO	satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing
	Governance			satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its
	Governance	Poor management or governance	NO	satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
	Governance	Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel	NO NO NO	satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
	Governance	Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or	NO	satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing
		Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personne! Inadequate funding for maintenance or upgrades	NO NO NO	satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its
		Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals	NO NO NO NO	satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
		Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation	NO NO NO NO YES	satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing
		Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process	NO NO NO YES NO	satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
	Popula Industri tion es Governance	Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation	NO NO NO NO YES	satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.

RISK	Algal blooms	YES	A total of 53 blooms were recorded in SA Water Reservoirs between 2002 and 2007, while a further 100 blooms were detected along the Murray River.
È	Heavy metal contamination	Unknown	
Ч	Poor chlorine residuals	NO	
LITY OR SECU (EFFECT)	Pesticide contamination	Unknown	
S E	Boil water notices	NO	
ж Ы	Deaths or illness due to water quality	NO	
2 H	Water restrictions (current and historic)	YES	
느픈	Taste and odour issues	YES	
WATER QUAL	Other contamination that would affect health	YES	Increasing salinity -(critical issue for the quality of our drinking water in the Murray. Long-term below average rainfall over the past 10 years has reduced river flows and salt has accumulated in the floodplains and disconnected wetlands. While the water quality meets drinking water guidelines at the moment, when river flows are increased, this accumulated salt may reduce water quality. Elevated phosphorus and nitrate readings (fertilisers, manure and detergent washed in from rainfall).
	Notes		

	State/Territory	SA	
TOWN	Town Name	Moonta	
10	Town Population	3,404 (SA Water Data, based on suburb moonta, north yelta, port hughes)	is cross roads, kooroona, moonta, moonta bay, moonta mines, north
	Name of Water Utility	SA Water	
WATER UTILITY	Rate (\$/kL)	For the first 0.3288 kL used per day \$0.9 For use above 0.3288 kL per day \$1.88	
	Per Capita Water Consumption (ML/day)	340 L/person/day (based on residential	use only)
	Number of Connections	2419	••
⊢ ~	Catchment	Murray Darling Basin	
CATCHMENT AND WATER SUPPLY	Sub-Catchment	Southern Basin	
ਙਙਰ	Catchment Management Authority (CMA) CMA Web-Link	Murray-Darling Basin Authority http://www.mdba.gov.au/	
	Catchment Protection Status	Prescribed	
	Potable Water Source(s)	River Murray	
<u> </u>	Supply Capacity	River - allowable extraction unknown	
	Treatment Plant(s)	Morgan-Swan Reach WTP	
	Level of Treatment	Conventional Water Treatment Plant (Co NHCl2), Fluoridation, Storage and distrib	pagulation, Flocculation, Sedimentation, Filtration, Disinfection (UV and pution)
	Drinking Water Guidelines	ADWG 2004	
≻		Overall	Source: SA Water Drinking Water Quality Report 07-08
Ę		Faecal Coliforms/100 mL	100%
WATER QUALITY		E.Coli/100mL	100%
ð		Chlorine Residual-Free [mg/L] Chlorine Residual- Total [mg/L]	N/A 100%
Ë		TDS [by EC] [mg/L]	100%
IAT (	Results (% compliance for 2008 reporting	Colour-True [HU]	100%
5	period)	Turbidity [NTU]	100%
		pH Units	1%
		Trialomethanes-Total [ug/L]	100%
		Fluoride [mg/L]	100%
		Iron-Total [mg/L] Total Hardness as CaCO3 [mg/L]	100%
		Level 3 Enhanced Water Restrictions, Dring	er systems and hand-held hoses fitted with a trigger nozzle can be used for a
ECUF	Current Water Restrictions	day/time. Sprinklers and other watering syst	ens rendir bannea.
ERS	Proportion of Potable Water Supplied to Households (%)	82% residential, 18% non-residential	
VATER S	Households (%) Distance from the Coast (km)	0	
WATER SECURITY	Households (%) Distance from the Coast (km) Climate	0 Temperate	
WATER S	Households (%) Distance from the Coast (km) Climate Average Annual Rainfall	0 Temperate 388.6mm	
WATER S	Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR	0 Temperate 388.6mm YES / NO	NOTES / EXPLANATION Yes. Based on the PIRSA EC maps and BOM 3 year rain maps
WATER S	Households (%) Distance from the Coast (km) Climate Average Annual Rainfall	0 Temperate 388.6mm	NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline
WATERS	Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source	0 Temperate 388.6mm YES / NO YES	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps
WATERS	Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water	0 Temperate 388.6mm YES / NO YES YES NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps
WATERS	Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source	0 Temperate 388.6mm YES / NO YES YES NO NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline
WATERS	Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding	0 Temperate 388.6mm YES / NO YES YES NO NO NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta
	Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply	0 Temperate 388.6mm YES / NO YES YES NO NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline
	Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply	0 Temperate 388.6mm YES / NO YES YES NO NO NO YES NO NO YES NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta
	Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply	0 Temperate 388.6mm YES / NO YES YES NO NO NO YES NO Unknown	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta
	Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply	0 Temperate 388.6mm YES / NO YES NO NO NO YES NO Unknown NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta Not an issue because of WTP
	Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply	0 Temperate 388.6mm YES / NO YES NO NO NO YES NO Unknown NO YES	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta Not an issue because of WTP extensive grazing and cropping. Dryland and irrigated agriculture
and Water Supply	Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply	0 Temperate 388.6mm YES / NO YES NO NO NO YES NO Unknown NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta Not an issue because of WTP
and Water Supply	Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply	0 Temperate 388.6mm YES / NO YES YES NO NO YES NO Unknown NO YES YES YES NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta Not an issue because of WTP extensive grazing and cropping. Dryland and irrigated agriculture cleared and modified native vegetation, cropping and grasslands
and Water Supply	Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply	0 Temperate 388.6mm YES / NO YES YES NO NO NO YES NO Unknown NO YES YES YES YES	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta Not an issue because of WTP extensive grazing and cropping. Dryland and irrigated agriculture
and Water Supply	Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply	0 Temperate 388.6mm YES / NO YES YES NO NO YES NO Unknown NO YES YES YES NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta Not an issue because of WTP extensive grazing and cropping. Dryland and irrigated agriculture cleared and modified native vegetation, cropping and grasslands
and Water Supply	Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply	0 Temperate 388.6mm YES / NO YES YES NO NO NO YES NO Unknown NO YES YES YES NO YES YES	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta Not an issue because of WTP extensive grazing and cropping. Dryland and irrigated agriculture cleared and modified native vegetation, cropping and grasslands low flows causing several issues for Murray River Region
and Water Supply	Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water	0 Temperate 388.6mm YES / NO YES YES NO NO NO NO VO Unknown NO YES YES YES YES NO YES NO YES NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta Not an issue because of WTP extensive grazing and cropping. Dryland and irrigated agriculture cleared and modified native vegetation, cropping and grasslands low flows causing several issues for Murray River Region from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its
and Water Supply	Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna defecating in supply Fauna defecating in supply Launa destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure	0 Temperate 388.6mm YES / NO YES YES NO NO NO NO NO VO YES NO Unknown NO YES YES NO YES YES NO YES YES YES YES YES YES	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta Not an issue because of WTP extensive grazing and cropping. Dryland and irrigated agriculture cleared and modified native vegetation, cropping and grasslands low flows causing several issues for Murray River Region from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
and Water Supply	Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Flooding Fauna defecating in supply Fauna defecating in supply Fauna defecating in supply Fauna defecating in supply Lun-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and	0 Temperate 388.6mm YES / NO YES YES NO NO NO NO VO Unknown NO YES YES YES YES NO YES NO YES NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta Not an issue because of WTP extensive grazing and cropping. Dryland and irrigated agriculture cleared and modified native vegetation, cropping and grasslands low flows causing several issues for Murray River Region from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
and Water Supply	Households (%)         Distance from the Coast (km)         Climate         Average Annual Rainfall         FACTOR         Drought         Single drinking water source         Poor quality water source         Sewage overflow or disposal into water source         Flooding         Fauna defecating in supply         Fauna destroying water intake structures         Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)         Un-lined landfills         Extensive agriculture         Low vegetation cover (dust, sediment runoff)         Poor access to supply         Unsustainable water extraction         Hard water         Aging or inadequate pipe work and associated infrastructure         Significant water losses due to leaking pipes         High per capita water consumption	0 Temperate 388.6mm YES / NO YES YES NO NO NO NO VO Unknown NO YES YES YES NO YES NO YES NO YES NO YES NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta Not an issue because of WTP extensive grazing and cropping. Dryland and irrigated agriculture cleared and modified native vegetation, cropping and grasslands low flows causing several issues for Murray River Region from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its
and Water Supply	Households (%)         Distance from the Coast (km)         Climate         Average Annual Rainfall         FACTOR         Drought         Single drinking water source         Poor quality water source         Sewage overflow or disposal into water source         Flooding         Fauna defecating in supply         Fauna destroying water intake structures         Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)         Un-lined landfills         Extensive agriculture         Low vegetation cover (dust, sediment runoff)         Poor access to supply         Unsustainable water extraction         Hard water         Aging or inadequate pipe work and associated infrastructure         Significant water losses due to leaking pipes         High per capita water consumption linappropriate water quality standards / objectives	0 Temperate 388.6mm YES YES NO NO NO NO VES YES NO Unknown NO YES YES NO YES YES NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta Not an issue because of WTP extensive grazing and cropping. Dryland and irrigated agriculture cleared and modified native vegetation, cropping and grasslands low flows causing several issues for Murray River Region from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water
ER QUALITY OR SECURITY RISK (CAUSE) Catchment and Water Supply	Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives	0 Temperate 388.6mm YES / NO YES YES NO NO NO NO VO Unknown NO YES YES YES NO YES NO YES NO YES NO YES NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta Not an issue because of WTP extensive grazing and cropping. Dryland and irrigated agriculture cleared and modified native vegetation, cropping and grasslands low flows causing several issues for Murray River Region from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water
EK QUALITY OK SECUKITY KISN (CAUSE) Catchment and Water Supply	Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives	0 Temperate 388.6mm YES YES NO NO NO NO VES YES NO Unknown NO YES YES NO YES YES NO	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta Not an issue because of WTP extensive grazing and cropping. Dryland and irrigated agriculture cleared and modified native vegetation, cropping and grasslands low flows causing several issues for Murray River Region from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water
and Water Supply	Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives	0  Temperate  388.6mm  YES / NO  YES  YES  NO  NO  NO  VO  Unknown  NO  YES  YES  NO  YES  NO  YES  NO  NO  NO  NO  NO  NO  NO  NO  NO  N	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps From the Morgan-Whyalla Pipeline No historical record for Pt Augusta Not an issue because of WTP extensive grazing and cropping. Dryland and irrigated agriculture cleared and modified native vegetation, cropping and grasslands low flows causing several issues for Murray River Region from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water

	Inadequate funding for maintenance or upgrades	NO	SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
itri	Mining / minerals	NO	
Industri es	Irrigation	YES	irrigated cropping occurs in this catchment
<u>L</u>	Chemicals / process	NO	
<u>a</u>	Seasonal population loadings	Yes	According to SA Water Data
Popula tion	Rapid population growth	Yes	Above state average (.76%/annum) - 1.8%/annum;. (population increase based on 2006/2001 census (Urban Centre/Locality))
Ê.	Pathogenic contamination	NO	100% of all tests are above AWDG guidelines this year
SECURITY RISK (EFFECT)	Algal blooms	YES	A total of 53 blooms were recorded in SA Water Reservoirs between 2002 and 2007, while a further 100 blooms were detected along the Murray River.
ž	Heavy metal contamination	Unknown	
Ř	Poor chlorine residuals	Unknown	
≥	Pesticide contamination	Unknown	
<u> </u>	Boil water notices	NO	
2	Deaths or illness due to water quality	NO	
ŭ	Water restrictions (current and historic)	YES	
OR	Taste and odour issues	YES	
WATER QUALITY O	Other contamination that would affect health	YES	Increasing salinity -(critical issue for the quality of our drinking water in the Murray. Long-term below average rainfall over the past 10 years has reduced river flows and salt has accumulated in the floodplains and disconnected wetlands. While the water quality meets drinking water guidelines at the moment, when river flows are increased, this accumulated salt may reduce water quality). Elevated phosphorus and nitrate readings ( fertilisers, manure and detergent washed in from rainfall,
	Notes		

<		State/Territory	SA	
ñ		Town Name	Clare	
TOWN		Town Population	3,063 (Census 2006, Urban Centre	/Locality)
<u>د ک</u>	-	Name of Water Utility	SA Water	
WATER	3	Rate (\$/kL)	Quarterly supply charge of \$34.40	
₹ F	5	Per Capita Water Consumption (ML/day)	320 L/person/day (based on reside	ntial use only)
		Number of Connections	1457	
		Catchment	Murray Darling Basin	
₽>	~	Sub-Catchment	Southern Basin	
A D	7	Catchment Management Authority (CMA) CMA Web-Link	- http://www.mdba.gov.au/	
E E	5	Catchment Protection Status	Prescribed	
E C	n N	Potable Water Source(s)	Murray River	
E L	Ξ́.			Vhyalla pipeline is from SA Water's existing Country
CATCHMENT AND	IAW	Supply Capacity	Allocation from the River Murray. U	Inrestricted, this allocation is 50 GL/a. However, recent Illocations drop to 31 GL/a in 2007-08. Supply capacity to particular town is
		Treatment Plant(s)	Morgan Filtration Plant, Morgan	
		Level of Treatment		nt (Coagulation, Flocculation, Sedimentation, Filtration, Disinfection (NHC
		Drinking Water Guidelines	ADWG 2004	
			Faecal Coliforms/100 mL	100%
≥			E.Coli/100mL	100%
water quality			Chlorine Residual-Free [mg/L]	N/A
A			Chlorine Residual- Total [mg/L]	100%
ð			TDS [by EC] [mg/L]	96%
E		Results (% compliance for 2008 reporting	Colour-True [HU]	100%
AT		period)	Turbidity [NTU]	99%
≥			pH Units	52%
			Trialomethanes-Total [ug/L]	96%
			Fluoride [mg/L]	100%
			Iron-Total [mg/L]	100%
			Total Hardness as CaCO3 [mg/L]	100%
~				ns- Dripper systems and hand-held hoses fitted with a trigger nozzle can b
WATER SECURITY		Current Water Restrictions	used for a maximum of 3 hours 2 d	lays a week between 6 am - 9 am or 6pm - 9 pm. Watering cans and buck Iklers and other watering systems remain banned.
SE		Proportion of Potable Water Supplied to	75% residential, 25% non-residenti	al
Ř		Households (%)		6
Ë		Distance from the Coast (km)	37	
Š		Climate	Temperate	
-		Average Annual Rainfall	530.5	
		FACTOR	YES / NO	NOTES / EXPLANATION
		Drought	YES	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps
		Single drinking water source	YES	From the Morgan-Whyalla Pipeline
		Poor quality water source Sewage overflow or disposal into water	NO NO	
		source		
		Flooding	NO	No historical record for Pt Augusta
		Fauna defecating in supply	YES	Not an issue due to WTP
	Supply	Fauna destroying water intake structures	NO	
	dŋ	Natural mineral pollutants (e.g. uranium,	Unknown	
	5	nitrates, iron, fluoride)		
	ate	Un-lined landfills	NO	
	Š	Extensive agriculture	YES	extensive grazing and cropping. Dryland and irrigated agriculture
_	ment and Water	Low vegetation cover (dust, sediment runoff)	YES	cleared and modified native vegetation, cropping and grasslands
	±	Poor access to supply		
L L	E D		NO	
	men	Unsustainable water extraction	NO YES	low flows causing several issues for Murray River Region
	tchmen	Unsustainable water extraction	YES	
	Catchmen		YES	low flows causing several issues for Murray River Region from high river extraction
	Catchmen	Unsustainable water extraction	YES	
	Catchmen	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water	YES YES	from high river extraction
	Catchmen	Unsustainable water extraction Aquifer turning saline due to high extraction	YES YES	from high river extraction Water quality report shows WTP water to be of good quality
UR SECURITY RISK (CAUSE	Catchmen	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and	YES YES NO	from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing
ו ז טה אברטמון ז הואה (האטאב	Catchmen	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes	YES YES NO NO	from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
UALITY OR SECURITY RISK (CAUSE	Catchmen	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards /	YES YES NO NO	from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing
עאובה גיטאנויז טה אבטטגויז הואת (האטאב	Catch	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption	YES YES NO NO NO	from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water Data SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
WATER QUALITY OR SECURITY RISK (CAUSE)	Catch	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives	YES YES NO NO NO NO	from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water Data SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing
	Governance Catchmen	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance	YES YES NO NO NO NO	from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water Data SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water Data SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
	Catch	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance	YES YES NO NO NO NO NO	from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water Data SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water Data SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
WATER GUARTY OR SECURITY RISK (CAUSE	Catch	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism	YES YES NO NO NO NO NO NO	from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water Data SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
	Governance	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades	YES YES NO NO NO NO NO NO NO NO	from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water Data SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
	Governance	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals	YES YES NO NO NO NO NO NO NO NO	from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water Data SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
	Industri es Catch	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation	YES YES NO NO NO NO NO NO NO NO NO YES	from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water Data SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
	Industri es Catch	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process	YES YES NO NO NO NO NO NO NO NO NO NO YES NO	from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water Data SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
WATEK GUALLT OK SECURIT KISK (CAUSE	Governance	Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation	YES YES NO NO NO NO NO NO NO NO NO YES	from high river extraction Water quality report shows WTP water to be of good quality SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. According to SA Water Data SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.

RISK (EFFEC	Algal blooms	YES	A total of 53 blooms were recorded in SA Water Reservoirs between 2002 and 2007, while a further 100 blooms were detected along the Murray River.
¥	Heavy metal contamination	Unknown	
SIS	Poor chlorine residuals	NO	
<u>ل</u>	Pesticide contamination	Unknown	
L R	Boil water notices	NO	
L L	Deaths or illness due to water quality	NO	
SECURIT	Water restrictions (current and historic)	YES	
	Taste and odour issues	YES	
a	Other contamination that would affect health	YES	Increasing salinity -(critical issue for the quality of our drinking water in the Murray. Long-term below average rainfall over the past 10 years has reduced river flows and salt has accumulated in the floodplains and disconnected wetlands. While the water quality meets drinking water guidelines at the moment, when river flows are increased, this accumulated salt may reduce water quality). Elevated phosphorus and nitrate readings ( fertilisers, manure and detergent washed in from rainfall).
	Notes		

Z		State/Territory	SA	
TOWN		Town Name	Wallaroo	
		Town Population	3,144 (SA Water Data, based on su	iburbs North Beach and Wallaroo)
WATER	≿	Name of Water Utility Rate (\$/kL)	SA Water Quarterly supply charge of \$34.40	
ATI	2	Per Capita Water Consumption (ML/day)	280 L/person/day (based on reside	ntial use only)
N S	5	Number of Connections	2132	
		Catchment	Murray River	
μü		Sub-Catchment	Lower Murray	
CATCHMENT AND WATER	Ľ,	Catchment Management Authority (CMA)	Murray-Darling Basin Authority	
포홍	4	CMA Web-Link	http://www.mdba.gov.au/	
₽₽	รา	Catchment Protection Status	Prescribed	
S ≤		Potable Water Source(s)	Murray River	
		Supply Capacity Treatment Plant(s)	River - allowable extraction Swan Reach WTP	
		Level of Treatment		nt (Coagulation, Flocculation, Sedimentation, Filtration, Disinfection (NH
		Drinking Water Guidelines	ADWG 2004	
			Faecal Coliforms/100 mL	100%
≻			E.Coli/100mL	100%
É			Chlorine Residual-Free [mg/L]	100%
A			Chlorine Residual- Total [mg/L]	N/A
WATER QUALITY			TDS [by EC] [mg/L] Colour-True [HU]	100%
E H		Results (% compliance for 2008 reporting	Turbidity [NTU]	100%
/AT		period)	pH Units	0%
5			Trialomethanes-Total [ug/L]	100%
			Fluoride [mg/L]	100%
			Iron-Total [mg/L]	100%
			Total Hardness as CaCO3 [mg/L]	100%
_			Manganese	100%
WATER SECURITY		Current Water Restrictions	used for a maximum of 3 hours 2 d	<u>ns-</u> Dripper systems and hand-held hoses fitted with a trigger nozzle can ays a week between 6 am - 9 am or 6pm - 9 pm. Watering cans and ne. Sprinklers and other watering systems remain banned.
SECL		Proportion of Potable Water Supplied to Households (%)	70% residential, 30% non-residentia	
ER		Distance from the Coast (km)	0	
AT		Climate	Temperate	
3		Average Annual Rainfall	388.6	
		FACTOR	YES / NO	NOTES / EXPLANATION
		Drought	YES	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps
		Single drinking water source	YES	From the Morgan-Whyalla Pipeline
		Poor quality water source Sewage overflow or disposal into water	NO	
		source	NO	
		Flooding	NO	No historical record for Pt Augusta
		Fauna defecating in supply	YES	······································
	<u>S</u>	Fauna destroying water intake structures	NO	
	r Sup	Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)	Unknown	
	ate	Un-lined landfills	NO	
	Š	Extensive agriculture	YES	extensive grazing and cropping. Dryland and irrigated agriculture
Ú	Catchment and Water Supply	Low vegetation cover (dust, sediment runoff)	YES	cleared and modified native vegetation, cropping and grasslands
KISK (CAUSE)	ner	Poor access to supply Unsustainable water extraction	NO YES	low flows causing several issues for Murray River Region
ځ	chr			
Ś	Cat	Aquifer turning saline due to high extraction	YES	from high river extraction
		Hard water	NO	Water quality report shows WTP water to be of good quality
-				SA Water undertakes integrated asset management covering all of its
200		Aging or inadequate pipe work and associated infrastructure	NO	water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
		Significant water losses due to leaking	NO	SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing
-		pipes High per capita water consumption	NO	satisfactory operation of the assets and reliable service to customers. According to SA Water
GUAL		Inappropriate water quality standards / objectives	NO	
WATER QUALITY UR SECURITY	e	Lack of infrastructure maintenance	NO	SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
3	Governance	Poor management or governance	NO	SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing
	ů			satisfactory operation of the assets and reliable service to customers.
		Vandalism / sabotage / terrorism	NO	
		Insufficient trained personnel	NO	SA Water undertakes integrated asset management as arises - " - f :
		Inadequate funding for maintenance or upgrades	NO	SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
	Ξ	Mining / minerals	NO	service to customers.
	Industri es	Irrigation	YES	irrigated cropping occurs in this catchment
	lnc	Chemicals / process	NO	
	a c	Seasonal population loadings	YES	Holiday retirement destination
	Popula tion	Rapid population growth	YES	Above state average (.76%/annum) - 2.5%/annum;. (population increase
				based on 2006/2001 census (Urban Centre/Locality))
	7	Pathogenic contamination	NO	100% of all tests are above AWDG guidelines this year A total of 53 blooms were recorded in SA Water Reservoirs between 2
SK (EFFECT)				TA TOTAL OF 53 DIOOMS WARE RECORDED IN SA Water Reservoirs between 2

Ř	Poor chlorine residuals	NO	
≥	Pesticide contamination	Unknown	
L L	Boil water notices	NO	
2	Deaths or illness due to water quality	NO	
SECI	Water restrictions (current and historic)	YES	since 2002 and level 3 enhanced currently
с, С	Taste and odour issues	YES	
a	Other contamination that would affect health	YES	Increasing salinity -(critical issue for the quality of our drinking water in the Murray. Long-term below average rainfall over the past 10 years has reduced river flows and salt has accumulated in the floodplains and disconnected wetlands. While the water quality meets drinking water guidelines at the moment, when river flows are increased, this accumulated salt may reduce water quality). Elevated phosphorus and nitrate readings ( fertilisers, manure and detergent washed in from rainfall).
	Notes		

Ž		State/Territory	SA	
TOWN	5	Town Name	Bordertown	
		Town Population	2,581 (Census 2006, Urban Centre/Lo	cality)
ц	≿	Name of Water Utility	SA Water	
WATER	1	Rate (\$/kL)	Quarterly supply charge of \$34.40	
AN I	Ē	Per Capita Water Consumption (ML/day)	310 L/person/day (based on residentia	l use only)
_		Number of Connections	1330	
	~	Catchment	Limestone Aquifer	
CATCHMENT AND	2	Sub-Catchment	unconfined aquifer in the Keith-Willald	
Ę	Ĕ,	Catchment Management Authority (CMA)		ral Resources Management Board. The EPA focuses its water quality
Ξ	ร	• • • •	monitoring on the unconfined aquifer i	n the area
₽	К.	CMA Web-Link	http://www.senrm.sa.gov.au/	
Ξi	Ë,	Catchment Protection Status	prescribed	
X	×	Potable Water Source(s)	unconfined aquifer in the Keith-Willald	
0		Supply Capacity	Groundwater bore - allowable extraction	n
		Treatment Plant(s)	N/A	
		Level of Treatment	Cl2 Disinfection Only	
		Drinking Water Guidelines	ADWG 2004	
			Overall	
			Faecal Coliforms/100 mL	98%
≽			E.Coli/100mL	100%
WATER QUALITY	ļ		Chlorine Residual-Free [mg/L]	100%
JU Z	ò		Chlorine Residual- Total [mg/L]	N/A
0			TDS [by EC] [mg/L]	25%
μ		Results (% compliance for 2008 reporting	Colour-True [HU]	100%
۲A'		period)	Turbidity [NTU]	100%
3	•		pH Units	100%
			Trialomethanes-Total [ug/L]	100%
			Fluoride [mg/L]	100%
			Iron-Total [mg/L]	100%
			Total Hardness as CaCO3 [mg/L]	0%
			Manganese	100%
			Permanent Water Conservation Meas recreational areas, sports grounds or r	ires- 1. Watering gardens, grounds and nurseries Public or private gardens
WATER SECURITY		Current Water Restrictions	(including public or private gardens, re clean a motor vehicle or boat unless the trigger nozzle hose or a commercial ca	system , through a sprinkler - after 5pm and before 10am on any day creation areas, sports grounds and nurseries. 2. Water must not be used t e water is applied from a bucket, high-pressure low volume water cleaner, ir wash. 3. Construction sites: Water must not be used to control dust or of s unless the water is applied from a hand-held hose fitted with a trigger no: ed to carry and deposit water.
WATER		Proportion of Potable Water Supplied to Households (%)	75% residential, 25% non-residential	
		Distance from the Coast (km)	56	
		Climate	Temperate	
		Average Annual Rainfall	462.4mm	
		FACTOR	YES / NO	NOTES / EXPLANATION
		Drought	YES	Yes, Based on the PIRSA EC maps and BOM 3 year rain maps
		Single drinking water source	YES	Bores
				In terms of drinking water quality, the groundwater in the South East is poor because of elevated nitrate agricultural practices. Elevated salinity
		Poor quality water source	YES	groundwater across the South East means that drinking water quality is poor because of its effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is most due to iron, which can discolour water.
				poor because of its effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is most
		Sewage overflow or disposal into water	YES	poor because of its effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is most
		Sewage overflow or disposal into water source	NO	poor because of its effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is most due to iron, which can discolour water.
		Sewage overflow or disposal into water source Flooding	NO	poor because of its effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is most
	ply	Sewage overflow or disposal into water source Flooding Fauna defecating in supply	NO NO NO	poor because of its effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is most due to iron, which can discolour water.
	Aldan	Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures	NO NO NO	poor because of its effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is most due to iron, which can discolour water.
	r Supply	Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium,	NO NO NO	poor because of its effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is most due to iron, which can discolour water.
	ater Supply	Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)	NO NO NO YES	poor because of its effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is most due to iron, which can discolour water.
	Water Supply	Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills	NO NO NO YES NO	poor because of its effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is most due to iron, which can discolour water.
	nd Water Supply	Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture	NO NO NO YES NO YES	poor because of its effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is most due to iron, which can discolour water.
	t and Water Supply	Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment	NO NO NO YES NO	poor because of its effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is more due to iron, which can discolour water.
	ent and Water Supply	Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff)	NO NO NO YES NO YES NO	poor because of its effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is more due to iron, which can discolour water.
	Catchment and Water Supply	Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment	NO NO NO YES NO YES	poor because of its effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is most due to iron, which can discolour water. No historical flooding South east area has high nitrate levels Intensive Cropping-Cereals/Grain Legumes/Oil Seeds (Black Soils) High level of extraction (70-100%). The groundwater extractions have b
	Catchment and Water Supply	Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction	NO NO NO YES NO YES NO YES	poor because of its effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is more due to iron, which can discolour water.         No historical flooding         South east area has high nitrate levels         Intensive Cropping-Cereals/Grain Legumes/Oil Seeds (Black Soils)         High level of extraction (70-100%). The groundwater extractions have be compared to the sustainable yield and categorised in each groundwater management unit by percentage. The volumes of extraction and sustainable         yield are for 2004/05. In many areas, management actions since 2005 have led to reduced levels of extraction.
	Catchment and Water Supply	Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply	NO NO NO YES NO YES NO YES	poor because of its effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is most due to iron, which can discolour water.         No historical flooding         South east area has high nitrate levels         Intensive Cropping-Cereals/Grain Legumes/Oil Seeds (Black Soils)         High level of extraction (70-100%). The groundwater extractions have b compared to the sustainable yield and categorised in each groundwate management unit by percentage. The volumes of extraction and sustainable yields.
	Catchment and Water Supply	Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction	NO NO NO YES NO YES NO YES	poor because of its effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is more due to iron, which can discolour water.         No historical flooding         South east area has high nitrate levels         Intensive Cropping-Cereals/Grain Legumes/Oil Seeds (Black Soils)         High level of extraction (70-100%). The groundwater extractions have be compared to the sustainable yield and categorised in each groundwater management unit by percentage. The volumes of extraction and sustainable         yield are for 2004/05. In many areas, management actions since 2005 have led to reduced levels of extraction.
	Catchment and Water Supply	Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction	NO NO NO YES NO YES NO YES NO NO	poor because of its effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is most due to iron, which can discolour water.         No historical flooding         South east area has high nitrate levels         Intensive Cropping-Cereals/Grain Legumes/Oil Seeds (Black Soils)         High level of extraction (70-100%). The groundwater extractions have b compared to the sustainable yield and categorised in each groundwate management unit by percentage. The volumes of extraction and sustainable yield to reduced levels of extraction.         turning saline due to land use         Does not meet AWDG guidelines         SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
	Catchment and Water Supply	Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes	NO NO NO NO YES NO YES NO YES NO YES NO YES NO	poor because of its effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is more due to iron, which can discolour water.         No historical flooding         South east area has high nitrate levels         Intensive Cropping-Cereals/Grain Legumes/Oil Seeds (Black Soils)         High level of extraction (70-100%). The groundwater extractions have b compared to the sustainable yield and categorised in each groundwate management unit by percentage. The volumes of extraction and sustainable yield are for 2004/05. In many areas, management actions since 2005 have led to reduced levels of extraction.         turning saline due to land use         Does not meet AWDG guidelines         SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.         SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
	Catchment and Water Supply	Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption	NO NO NO NO YES NO YES NO YES NO YES NO YES	poor because of its effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is more due to iron, which can discolour water.         No historical flooding         South east area has high nitrate levels         Intensive Cropping-Cereals/Grain Legumes/Oil Seeds (Black Soils)         High level of extraction (70-100%). The groundwater extractions have b compared to the sustainable yield and categorised in each groundwater management unit by percentage. The volumes of extraction and sustainable yield are for 2004/05. In many areas, management actions since 2005 have led to reduced levels of extraction.         turning saline due to land use         Does not meet AWDG guidelines         SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
	Catchment and Water Supply	Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards /	NO NO NO NO YES NO YES NO YES NO YES NO NO NO	poor because of its effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is more due to iron, which can discolour water.         No historical flooding         South east area has high nitrate levels         Intensive Cropping-Cereals/Grain Legumes/Oil Seeds (Black Soils)         High level of extraction (70-100%). The groundwater extractions have b compared to the sustainable yield and categorised in each groundwate management unit by percentage. The volumes of extraction and sustainable yield are for 2004/05. In many areas, management actions since 2005 have led to reduced levels of extraction.         turning saline due to land use         Does not meet AWDG guidelines         SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.         SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
	Catchment and Water Supply	Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption	NO NO NO NO YES NO YES NO YES NO YES NO YES NO	poor because of its effect on taste. Drinking water quality is also considered poor because of elevated metal concentrations. This is more due to iron, which can discolour water.         No historical flooding         South east area has high nitrate levels         Intensive Cropping-Cereals/Grain Legumes/Oil Seeds (Black Soils)         High level of extraction (70-100%). The groundwater extractions have b compared to the sustainable yield and categorised in each groundwate management unit by percentage. The volumes of extraction and sustainable yield are for 2004/05. In many areas, management actions since 2005 have led to reduced levels of extraction.         turning saline due to land use         Does not meet AWDG guidelines         SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.         SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.

	Govern	Poor management or governance	NO	SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
		Vandalism / sabotage / terrorism	NO	
		Insufficient trained personnel	NO	
		Inadequate funding for maintenance or upgrades	NO	
	ies	Mining / minerals	NO	
	ndustries	Irrigation	YES	
	<u> </u>	Chemicals / process	NO	
	Population	Seasonal population loadings	NO	
	Popu	Rapid population growth	NO	Above state average (.76%/annum) - 1.2%/annum;. (population increase based on 2006/2001 census (Urban Centre/Locality))
í	(1	Pathogenic contamination	Yes	At test site has not had 100% compliance.
Ľ Å	ပ္ပ	Algal blooms	NO	
0	Ŧ.	Heavy metal contamination	Unknown	
Εį	Ē	Poor chlorine residuals	NO	
A P	ž	Pesticide contamination	Unknown	
25	ř	Boil water notices	NO	
E E	≻	Deaths or illness due to water quality	NO	
Щ Щ <u>н</u>	Ŷ	Water restrictions (current and historic)	Yes	
¥.	2	Taste and odour issues	NO	
WATER QUALITY OR	SEC	Other contamination that would affect health	Unknown	
		Notes		

## Town # 78

own #	78			
TOWN		State/Territory	SA	
8		Town Name	Ceduna	
Ĕ		Town Population	2,304 (Census 2006, Urban Centre/Lo	ocality)
₩ 2	-	Name of Water Utility	SA Water	
巴	3	Rate (\$/kL)	Quarterly supply charge of \$34.40	
WATER	=	Per Capita Water Consumption (ML/day)	200 L/person/day (based on residenti	ial use only)
> -	ر	Number of Connections	852	
		Catchment	Uley Basin/Lincoln Basin	
		Sub-Catchment	N/A	
Ž			- Department of Water, Land and Bio	adiversity Conservation (DWLBC)
님		Catchment Management Authority (CMA)		Management Board (EPNRMB) – EPNRMB Water Resources Advisory
S		Caterine in Management Autionty (CMA)	Committee (WRAC)	
Ř			, ,	
Ë		CMA Web-Link	www.epnrm.sa.gov.au	
.A		Catchment Protection Status	Prescribed	
>		Potable Water Source(s)	Uley Basin South/Uley Wanilla/Lincol	In Basin
CATCHMENT AND WATER SUPPLY		Supply Capacity	generate an annual recharge volume of the resource, leaving ~40% available	charge rates are applied to the assessed 'catchment' area of each lens to for each lens. 60% of this annual recharge is set aside to maintain the integri ble for allocation (a percentage of which is set aside for stock and domestic n November each year, which set the allocation for the following financial yea
		Treatment Plant(s)	N/A	
		Level of Treatment	Cl2 Disinfection Only	
		Drinking Water Guidelines	ADWG 2004	
			Faecal Coliforms/100 mL	100%
≻			E.Coli/100mL	100%
<b>WATER QUALITY</b>			Chlorine Residual-Free [mg/L]	100%
AL			Chlorine Residual-Total [mg/L]	N/A
DC DC				
ц		Booulto (9/ compliance for 0000	TDS [by EC] [mg/L]	0%
μ		Results (% compliance for 2008 reporting	Colour-True [HU]	100%
<pre>A</pre>		period)	Turbidity [NTU]	100%
5			pH Units	100%
			Trialomethanes-Total [ug/L]	100%
			Fluoride [mg/L]	100%
			Iron-Total [mg/L]	100%
			Total Hardness as CaCO3 [mg/L]	0%
È		Current Water Restrictions		
ER SECURITY		Proportion of Potable Water Supplied to	cans and buckets can be used on any commercial 6.5%, Industrial 0.3%, Pr	mum of 3 hours 2 days a week between 6 am - 9 am or 6pm - 9 pm. Watering y day/time. Sprinklers and other watering systems remain banned.
ATER SECURITY		Proportion of Potable Water Supplied to Households (%)	cans and buckets can be used on any	y day/time. Sprinklers and other watering systems remain banned. imary Production 0.0%, Public Institution 7.5%, Public Utilities 0.2%, Recreati
WATER SECURITY		Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km)	cans and buckets can be used on an commercial 6.5%, Industrial 0.3%, Pr 7.4%, Residential 63.9%, Unclassifier 0	y day/time. Sprinklers and other watering systems remain banned. imary Production 0.0%, Public Institution 7.5%, Public Utilities 0.2%, Recreati
WATER SECURITY		Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate	cans and buckets can be used on an commercial 6.5%, Industrial 0.3%, Pr 7.4%, Residential 63.9%, Unclassifier 0 Temperate	y day/time. Sprinklers and other watering systems remain banned. imary Production 0.0%, Public Institution 7.5%, Public Utilities 0.2%, Recreati
WATER SECURITY		Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall	cans and buckets can be used on an commercial 6.5%, Industrial 0.3%, Pr 7.4%, Residential 63.9%, Unclassifier 0 Temperate 297.2mm	y day/time. Sprinklers and other watering systems remain banned. imary Production 0.0%, Public Institution 7.5%, Public Utilities 0.2%, Recreati d 7.4%, Vacant Land 6.8%
WATER SECURITY		Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR	cans and buckets can be used on an commercial 6.5%, Industrial 0.3%, Pr 7.4%, Residential 63.9%, Unclassifier 0 Temperate 297.2mm YES / NO	y day/time. Sprinklers and other watering systems remain banned. imary Production 0.0%, Public Institution 7.5%, Public Utilities 0.2%, Recreati d 7.4%, Vacant Land 6.8% NOTES / EXPLANATION
WATER SECURITY		Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought	cans and buckets can be used on an commercial 6.5%, Industrial 0.3%, Pr 7.4%, Residential 63.9%, Unclassifier 0 Temperate 297.2mm YES / NO YES	y day/time. Sprinklers and other watering systems remain banned. imary Production 0.0%, Public Institution 7.5%, Public Utilities 0.2%, Recreati d 7.4%, Vacant Land 6.8% NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps
WATER SECURITY		Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source	cans and buckets can be used on an commercial 6.5%, Industrial 0.3%, Pr 7.4%, Residential 63.9%, Unclassifier 0 Temperate 297.2mm YES / NO YES NO	y day/time. Sprinklers and other watering systems remain banned. imary Production 0.0%, Public Institution 7.5%, Public Utilities 0.2%, Recreati d 7.4%, Vacant Land 6.8% NOTES / EXPLANATION
WATER SECURITY		Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source	cans and buckets can be used on an commercial 6.5%, Industrial 0.3%, Pr 7.4%, Residential 63.9%, Unclassifier 0 Temperate 297.2mm YES / NO YES NO NO	y day/time. Sprinklers and other watering systems remain banned. imary Production 0.0%, Public Institution 7.5%, Public Utilities 0.2%, Recreati d 7.4%, Vacant Land 6.8% NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps
WATER SECURITY		Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water	cans and buckets can be used on an commercial 6.5%, Industrial 0.3%, Pr 7.4%, Residential 63.9%, Unclassifier 0 Temperate 297.2mm YES / NO YES NO	y day/time. Sprinklers and other watering systems remain banned. imary Production 0.0%, Public Institution 7.5%, Public Utilities 0.2%, Recreati d 7.4%, Vacant Land 6.8% NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps
WATER SECURITY		Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source	cars and buckets can be used on an commercial 6.5%, Industrial 0.3%, Pr 7.4%, Residential 63.9%, Unclassifie 0 Temperate 297.2mm YES / NO YES NO NO NO	y day/time. Sprinklers and other watering systems remain banned. imary Production 0.0%, Public Institution 7.5%, Public Utilities 0.2%, Recreati d 7.4%, Vacant Land 6.8% NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps
WATER SECURITY		Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding	cans and buckets can be used on an commercial 6.5%, Industrial 0.3%, Pr 7.4%, Residential 63.9%, Unclassifie 0 Temperate 297.2mm YES / NO YES / NO YES NO NO NO	y day/time. Sprinklers and other watering systems remain banned. imary Production 0.0%, Public Institution 7.5%, Public Utilities 0.2%, Recreati d 7.4%, Vacant Land 6.8% NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps
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WATER SECURITY		Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures	cans and buckets can be used on an commercial 6.5%, Industrial 0.3%, Pr 7.4%, Residential 63.9%, Unclassifie 0 Temperate 297.2mm YES / NO YES / NO YES NO NO NO	y day/time. Sprinklers and other watering systems remain banned. imary Production 0.0%, Public Institution 7.5%, Public Utilities 0.2%, Recreati d 7.4%, Vacant Land 6.8% NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps
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WATER SECURITY		Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna defecating in supply Fauna defecating in supply Fauna defecating in supply Ataural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)	cans and buckets can be used on an commercial 6.5%, Industrial 0.3%, Pr 7.4%, Residential 63.9%, Unclassifie 0 Temperate 297.2mm YES / NO YES / NO YES / NO NO NO NO NO NO NO NO Unknown	y day/time. Sprinklers and other watering systems remain banned. imary Production 0.0%, Public Institution 7.5%, Public Utilities 0.2%, Recreati d 7.4%, Vacant Land 6.8% NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps
WATER SECURITY		Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna defecating in sup	cans and buckets can be used on an commercial 6.5%, Industrial 0.3%, Pr 7.4%, Residential 63.9%, Unclassifie 0 Temperate 297.2mm YES / NO YES / NO YES / NO NO NO NO NO NO NO NO NO NO	y day/time. Sprinklers and other watering systems remain banned. imary Production 0.0%, Public Institution 7.5%, Public Utilities 0.2%, Recreated d 7.4%, Vacant Land 6.8% NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps Uley and Lincoln groundwater
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WATER SECURITY	Supply	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna defecating in supply Fauna defecating in supply Fauna defecating in supply Fauna defecating in supply In a destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment	cars and buckets can be used on an commercial 6.5%, Industrial 0.3%, Pr 7.4%, Residential 63.9%, Unclassifie 0 Temperate 297.2mm YES / NO YES / NO YES / NO NO NO NO NO NO NO NO NO NO NO NO NO N	y day/time. Sprinklers and other watering systems remain banned. imary Production 0.0%, Public Institution 7.5%, Public Utilities 0.2%, Recreat d 7.4%, Vacant Land 6.8% NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps Uley and Lincoln groundwater
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	Supply	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna defecating in supp	cars and buckets can be used on an commercial 6.5%, Industrial 0.3%, Pr 7.4%, Residential 63.9%, Unclassifie 0 Temperate 297.2mm YES / NO YES / NO YES / NO NO NO NO NO NO NO NO NO NO NO NO NO N	y day/time. Sprinklers and other watering systems remain banned. imary Production 0.0%, Public Institution 7.5%, Public Utilities 0.2%, Recreated 7.4%, Vacant Land 6.8%  NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps Uley and Lincoln groundwater Uley and Lincoln groundwater Yes surrounding the Pt Lincoln Area, bores are in national park WATER levels in Eyre Peninsula groundwater basins have dropped by u to five metres since 1970 due to below average rainfall and unsustainabl
		Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply	cars and buckets can be used on an commercial 6.5%, Industrial 0.3%, Pr 7.4%, Residential 63.9%, Unclassifier 0 Temperate 297.2mm YES / NO YES NO NO NO NO NO NO NO NO NO NO	y day/time. Sprinklers and other watering systems remain banned. imary Production 0.0%, Public Institution 7.5%, Public Utilities 0.2%, Recreated d 7.4%, Vacant Land 6.8%  NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps Uley and Lincoln groundwater Uley and Lincoln groundwater Yes surrounding the Pt Lincoln Area, bores are in national park Yes surrounding the Pt Lincoln Area, bores are in national park WATER levels in Eyre Peninsula groundwater basins have dropped by u to five metres since 1970 due to below average rainfall and unsustainabl extraction due to low levels. Potential for seawater incursion is also becoming a concern
	Supply	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna defecating in supply Fauna defecating in supply Fauna defecating in supply Fauna defecating in supply Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction	cars and buckets can be used on an commercial 6.5%, Industrial 0.3%, Pr 7.4%, Residential 63.9%, Unclassifier 0 Temperate 297.2mm YES / NO YES NO NO NO NO NO NO NO NO NO NO	y day/time. Sprinklers and other watering systems remain banned. imary Production 0.0%, Public Institution 7.5%, Public Utilities 0.2%, Recreated d 7.4%, Vacant Land 6.8% NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps Uley and Lincoln groundwater Uley and Lincoln groundwater Yes surrounding the Pt Lincoln Area, bores are in national park Yes surrounding the Pt Lincoln Area, bores are in national park WATER levels in Eyre Peninsula groundwater basins have dropped by u to five metres since 1970 due to below average rainfall and unsustainable extraction due to low levels. Potential for seawater incursion is also becoming a concern Lincoln basin averages 360 mg/L, Uley South averages 270, Uley Wanill averages 280 CaCO3 for 2004 to 2007 (200-500 mg/L causes increasing
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	Catchment and Water Supply	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water quality standards /	cans and buckets can be used on an commercial 6.5%, Industrial 0.3%, Pr 7.4%, Residential 63.9%, Unclassifie 0 Temperate 297.2mm YES / NO YES NO NO NO NO NO NO NO NO NO NO	y day/time. Sprinklers and other watering systems remain banned. imary Production 0.0%, Public Institution 7.5%, Public Utilities 0.2%, Recreat d 7.4%, Vacant Land 6.8% NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps Uley and Lincoln groundwater Uley and Lincoln groundwater Yes surrounding the Pt Lincoln Area, bores are in national park Yes surrounding the Pt Lincoln Area, bores are in national park WATER levels in Eyre Peninsula groundwater basins have dropped by u to five metres since 1970 due to below average rainfall and unsustainab extraction due to low levels. Potential for seawater incursion is also becoming a concern Lincoln basin averages 360 mg/L, Uley South averages 270, Uley Wanil averages 280 CaCO3 for 2004 to 2007 (200-500 mg/L causes increasing scaling problems) SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
WATER QUALITY OR SECURITY RISK (CAUSE)	Catchment and Water Supply	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride) Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives	cans and buckets can be used on an commercial 6.5%, Industrial 0.3%, Pr 7.4%, Residential 63.9%, Unclassifie 0 Temperate 297.2mm YES / NO YES NO NO NO NO NO NO Unknown NO YES NO NO YES YES YES YES YES NO NO NO NO NO NO NO NO NO NO	y day/time. Sprinklers and other watering systems remain banned. imary Production 0.0%, Public Institution 7.5%, Public Utilities 0.2%, Recreat d 7.4%, Vacant Land 6.8% NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps Uley and Lincoln groundwater Ves, Based on the PIRSA EC maps and BOM 3 year rain maps Uley and Lincoln groundwater Yes surrounding the Pt Lincoln Area, bores are in national park WATER levels in Eyre Peninsula groundwater basins have dropped by u to five metres since 1970 due to below average rainfall and unsustainab extraction due to low levels. Potential for seawater incursion is also becoming a concern Lincoln basin averages 360 mg/L, Uley South averages 270, Uley Wanili averages 280 CaCO3 for 2004 to 2007 (200-500 mg/L causes increasing scaling problems) SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets
	Supply	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna defecating in supply Un-lined landfills Extensive agriculture Low vegetation cover (dust, sediment runoff) Poor access to supply Unsustainable water extraction Aquifer turning saline due to high extraction Hard water Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance	cans and buckets can be used on an commercial 6.5%, Industrial 0.3%, Pr 7.4%, Residential 63.9%, Unclassifie 0 Temperate 297.2mm YES NO NO NO NO NO NO NO NO NO NO	y day/time. Sprinklers and other watering systems remain banned. imary Production 0.0%, Public Institution 7.5%, Public Utilities 0.2%, Recrea d 7.4%, Vacant Land 6.8% NOTES / EXPLANATION Yes, Based on the PIRSA EC maps and BOM 3 year rain maps Uley and Lincoln groundwater Ves surrounding the PIRSA EC maps and BOM 3 year rain maps Uley and Lincoln groundwater Yes surrounding the Pt Lincoln Area, bores are in national park WATER levels in Eyre Peninsula groundwater basins have dropped by to to five metres since 1970 due to below average rainfall and unsustainat extraction due to low levels. Potential for seawater incursion is also becoming a concern Lincoln basin averages 360 mg/L, Uley South averages 270, Uley Wani averages 280 CaCO3 for 2004 to 2007 (200-500 mg/L causes increasin scaling problems) SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers. SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets a

	Insufficient trained personnel	NO	
	Inadequate funding for maintenance or upgrades	NO	SA Water undertakes integrated asset management covering all of its water infrastructure across South Australia, that ensures ongoing satisfactory operation of the assets and reliable service to customers.
Industries	Mining / minerals	YES	Iluka Resources Limited plans to begin mining and shipping heavy minera concentrate mine by the end of the first quarter in 2010
inp	Irrigation	NO	
드	Chemicals / process	YES	Fishing/aquaculture
Population	Seasonal population loadings	NO	
	Rapid population growth	NO	Population is deceasing however it is expected to increase in the near future due to mining
QUALITY OR RISK (EFFECT)	Pathogenic contamination	NO	
чÜ	Algal blooms	NO	
0 H	Heavy metal contamination	Unknown	
ΕĒ	Poor chlorine residuals	NO	
₹×	Pesticide contamination	Unknown	
QUALITY RISK (EF	Boil water notices	NO	
∡ ≻	Deaths or illness due to water quality	NO	
ΞH	Water restrictions (current and historic)	YES	it has been level 2 since 2003 and now is level 3 enhanced
.A IU	Taste and odour issues	NO	
WATER O SECURITY I	Other contamination that would affect health	NO	
	Notes	Ceduna will be connected to the Morga resources	n-Whyalla pipeline this year to reduce the pressure on the groundwater

## AECOM

## Town Profiles – WA



Appendices Volume 2 Town # 79

TOWN				
2		State/Territory	WA	
U.		Town Name	Bridgetown	
		Town Population	2,322 (Census 2006, Urban Ce	entre/Locality)
照거	-	Name of Water Utility Rate (\$/kL)	Water Corporation of WA \$0.72 to \$7.69 per kL	
WATER	2	Per Capita Water Consumption (ML/day)	Unknown	
N E	5	Number of Connections	Unknown	
z		Catchment	South West Region	
CATCHMEN T AND WATFR	Ϋ́	Sub-Catchment	Boyup Brook	
E A A	24	Catchment Protection Status	Unknown	
AT A	s ∪ S	Potable Water Source(s)	Boyup Brook	
Ũ		Supply Capacity	Unknown	
		Treatment Plant(s)	Yes	
		Level of Treatment	Unknown	
~		Drinking Water Guidelines	ADWG 1987	
WATER QUALITY			Overall Thermotolerant Coliforms	100% compliance Samples taken 51; 100% compliance
IAL			Thermophilic Naegleria	Samples taken 26; 100% compliance
g			Fluoride (mean)	Samples taken 2 (<0.10mg/L);
ER		Results (% compliance for 2008 reporting	Hydrocarbons	Samples taken 0
AT		period)	Metals	Samples taken 2; 100% compliance
>			Nitrate (mean)	Samples taken 4 (<0.05mg/L); 100% compliance
			Pesticides	Samples taken 2; 100% compliance
			Radiological	Samples taken 0;
			Trihalomethanes (mean)	Samples taken 2 (0.098mg/L); 100% compliance
~	-	Current Water Restrictions	Yes	
H H	F	Proportion of Potable Water Supplied to	Unknown	
ATE	Ş	Households (%) Distance from the Coast (km)	100km	
WATER	ц И	Climate		ature 22.3; Min mean temperature 8.4
0.	.,	Average Annual Rainfall	829.9 mm	
		FACTOR	YES / NO	NOTES / EXPLANATION
				Unconfirmed Local Knowledge: based on Water Corporation advice that
		Drought	Yes	there are no issues
		Single drinking water source	Yes	Unconfirmed Local Knowledge: based on Water Corporation advice that
		Single drinking water source	163	there are no issues
		Poor quality water source	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
				there are no issues
		Sewage overflow or disposal into water	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
		source		there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that
		Flooding	Yes	there are no issues
				Unconfirmed Local Knowledge: based on Water Corporation advice that
		Fauna defecating in supply	No	there are no issues
	Pl A	Fauna dostroving water intake structures	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
	dng	Fauna destroying water intake structures	140	there are no issues
	Catchment and Water Supply	Natural mineral pollutants (e.g. uranium,	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
	/ate	nitrates, iron, fluoride)	110	there are no issues
	> p	Un-lined landfills		Unconfirmed Local Knowledge: based on Water Corporation advice that
	an			there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that
	ent	Extensive agriculture	Yes	there are no issues
	m Hi	Low vegetation cover (dust, sediment		Unconfirmed Local Knowledge: based on Water Corporation advice that
ISE	ato	runoff)	No	there are no issues
SAL	0	Poor access to supply	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
0)		Foor access to supply	140	there are no issues
N N		Unsustainable water extraction	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
μ Σ				there are no issues
É		Aquifer turning saline due to high	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
ECURITY RISK (CAUSE)		extraction		there are no issues
Ш		1		there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that
~~~		Hard water	No	there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
R S		Hard water Aging or inadequate pipe work and		Unconfirmed Local Knowledge: based on Water Corporation advice that
Y OR S			No No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
ITY OR S		Aging or inadequate pipe work and	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that
JALITY OR S		Aging or inadequate pipe work and associated infrastructure		Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
QUALITY OR S		Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that
ER QUALITY OR S		Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
ATER QUALITY OR S		Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards /	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that
WATER QUALITY OR S		Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption	No No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
WATER QUALITY OR S	8	Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards /	No No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that Unconfirmed Local Knowledge: based on Water Corporation advice that
WATER QUALITY OR S	lance	Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance	No No No No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
WATER QUALITY OR S	ernance	Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives	No No No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that Unconfirmed Local Knowledge: based on Water Corporation advice that
WATER QUALITY OR S	Sovernance	Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance	No No No No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
WATER QUALITY OR S	Governance	Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance	No No No No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
WATER QUALITY OR S	Governance	Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism	No No No No No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that
WATER QUALITY OR S	Governance	Aging or inadequate pipe work and associated infrastructure Significant water losses due to leaking pipes High per capita water consumption Inappropriate water quality standards / objectives Lack of infrastructure maintenance Poor management or governance Vandalism / sabotage / terrorism Insufficient trained personnel	No No No No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
WATER QUALITY OR S	Governance	Aging or inadequate pipe work and associated infrastructure         Significant water losses due to leaking pipes         High per capita water consumption         Inappropriate water quality standards / objectives         Lack of infrastructure maintenance         Poor management or governance         Vandalism / sabotage / terrorism         Insufficient trained personnel         Inadequate funding for maintenance or	No No No No No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
WATER QUALITY OR S	Governance	Aging or inadequate pipe work and associated infrastructure         Significant water losses due to leaking pipes         High per capita water consumption         Inappropriate water quality standards / objectives         Lack of infrastructure maintenance         Poor management or governance         Vandalism / sabotage / terrorism         Insufficient trained personnel         Inadequate funding for maintenance or upgrades	No N	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
WATER QUALITY OR S		Aging or inadequate pipe work and associated infrastructure         Significant water losses due to leaking pipes         High per capita water consumption         Inappropriate water quality standards / objectives         Lack of infrastructure maintenance         Poor management or governance         Vandalism / sabotage / terrorism         Insufficient trained personnel         Inadequate funding for maintenance or	No N	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
WATER QUALITY OR S		Aging or inadequate pipe work and associated infrastructure         Significant water losses due to leaking pipes         High per capita water consumption         Inappropriate water quality standards / objectives         Lack of infrastructure maintenance         Poor management or governance         Vandalism / sabotage / terrorism         Insufficient trained personnel         Inadequate funding for maintenance or upgrades         Mining / minerals	No N	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
WATER QUALITY OR S		Aging or inadequate pipe work and associated infrastructure         Significant water losses due to leaking pipes         High per capita water consumption         Inappropriate water quality standards / objectives         Lack of infrastructure maintenance         Poor management or governance         Vandalism / sabotage / terrorism         Insufficient trained personnel         Inadequate funding for maintenance or upgrades	No N	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
WATER QUALITY OR S	Industries Governance	Aging or inadequate pipe work and associated infrastructure         Significant water losses due to leaking pipes         High per capita water consumption         Inappropriate water quality standards / objectives         Lack of infrastructure maintenance         Poor management or governance         Vandalism / sabotage / terrorism         Insufficient trained personnel         Inadequate funding for maintenance or upgrades         Mining / minerals	No N	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
WATER QUALITY OR S		Aging or inadequate pipe work and associated infrastructure         Significant water losses due to leaking pipes         High per capita water consumption         Inappropriate water quality standards / objectives         Lack of infrastructure maintenance         Poor management or governance         Vandalism / sabotage / terrorism         Insufficient trained personnel         Insufficient trained personnel         Indequate funding for maintenance or upgrades         Mining / minerals         Irrigation	No N	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge. Unconfirmed Local Knowledge.
WATER QUALITY OR S	Industries	Aging or inadequate pipe work and associated infrastructure         Significant water losses due to leaking pipes         High per capita water consumption         Inappropriate water quality standards / objectives         Lack of infrastructure maintenance         Poor management or governance         Vandalism / sabotage / terrorism         Insufficient trained personnel         Inadequate funding for maintenance or upgrades         Mining / minerals         Irrigation         Chemicals / process	No N	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge. Unconfirmed Local Knowledge.
WATER QUALITY OR S	Industries	Aging or inadequate pipe work and associated infrastructure         Significant water losses due to leaking pipes         High per capita water consumption         Inappropriate water quality standards / objectives         Lack of infrastructure maintenance         Poor management or governance         Vandalism / sabotage / terrorism         Insufficient trained personnel         Insufficient trained personnel         Indequate funding for maintenance or upgrades         Mining / minerals         Irrigation	No N	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge. Unconfirmed Local Knowledge.
WATER QUALITY OR S	Industries	Aging or inadequate pipe work and associated infrastructure         Significant water losses due to leaking pipes         High per capita water consumption         Inappropriate water quality standards / objectives         Lack of infrastructure maintenance         Poor management or governance         Vandalism / sabotage / terrorism         Insufficient trained personnel         Inadequate funding for maintenance or upgrades         Mining / minerals         Irrigation         Chemicals / process	No N	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge. Unconfirmed Local Knowledge.
WATER QUALITY OR S		Aging or inadequate pipe work and associated infrastructure         Significant water losses due to leaking pipes         High per capita water consumption         Inappropriate water quality standards / objectives         Lack of infrastructure maintenance         Poor management or governance         Vandalism / sabotage / terrorism         Insufficient trained personnel         Inadequate funding for maintenance or upgrades         Mining / minerals         Irrigation         Chemicals / process	No N	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues Unconfirmed Local Knowledge. Unconfirmed Local Knowledge.

Ĥ	Pathogenic contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
С Ш	Patriogenic contamination	140	there are no issues
Ē	Algal blooms	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
Ш	Algai bioonis	110	there are no issues
RISK (EFFECT	Heavy metal contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
Ř	neavy metal contamination	146	there are no issues
≥	Poor chlorine residuals	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
R		INO	there are no issues
SECURITY	Pesticide contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
ŭ	Boil water notices	No	there are no issues
OR (			Unconfirmed Local Knowledge: based on Water Corporation advice that
	Boli water fronces		there are no issues
È	Deaths or illness due to water quality		Unconfirmed Local Knowledge: based on Water Corporation advice that
ALI	Deaths of inness due to water quality	No	there are no issues
n ng	Water restrictions (current and historic)	Yes	Unconfirmed Local Knowledge.
e r	Taste and odour issues	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
Ē	Taste and oddur issues	140	there are no issues
WATER QUALITY	Other contamination that would affect	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
5	health	NO	there are no issues
	Notes		

Ę		State/Territory	WA		
TOWN		Town Name	Broome		
		Town Population	11,548 (Census 2006, Urban Centre/Locality) Water Corporation of WA		
ШĚ	<u>-</u>	Name of Water Utility Rate (\$/kL)	\$0.72 to \$2.76 per kL		
WATER UTILITY		Per Capita Water Consumption (ML/day)	\$0.72 to \$2.76 per kL Unknown		
3 :	D	Number of Connections	Unknown		
		Catchment	NorthWest Region		
g	12	Sub-Catchment	Unknown		
T AND T AND WATER SUPPLY		Catchment Protection Status Potable Water Source(s)	Unknown Ground Water		
; ;	> v	Supply Capacity	Unknown		
		Treatment Plant(s)	Yes		
		Level of Treatment	Unknown		
		Drinking Water Guidelines	ADWG 1987		
WATER QUALITY			Overall Thermotolerant Coliforms	100% compliance Samples taken 72; 100% compliance	
٦٩٢			Thermophilic Naegleria	Samples taken 72, 100% compliance	
ğ			Fluoride (mean)	Samples taken 52 (0.61mg/L);	
Ш		Results (% compliance for 2008 reporting	Hydrocarbons	Samples taken 0	
VAT V		period)	Metals	Samples taken 4; 100% compliance	
>			Nitrate (mean) Pesticides	Samples taken 4 (4.4mg/L); 100% compliance Samples taken 2; 100% compliance	
			Radiological	Samples taken 2, 100% compliance	
			Trihalomethanes (mean)	Samples taken 4 (<0.004mg/L); 100% compliance	
		Current Water Restrictions	Yes		
WATER SECURITY		Proportion of Potable Water Supplied to	Unknown		
E E	Ľ,	Households (%)			
Ň	л Ц	Distance from the Coast (km) Climate	0 km Grassland: Max mean tempe	erature 32.1; Min mean temperature 21.1	
C	n	Average Annual Rainfall	574.9 mm		
		FACTOR	YES / NO	NOTES / EXPLANATION	
		Drought	Yes	Unconfirmed Local Knowledge: based on Water Corporation advice th	
			100	there are no issues	
		Single drinking water source	Yes	Unconfirmed Local Knowledge: based on Water Corporation advice th there are no issues	
				Unconfirmed Local Knowledge: based on Water Corporation advice th	
		Poor quality water source	No	there are no issues	
		Sewage overflow or disposal into water	No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
		source	110	there are no issues	
		Flooding	No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
				there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th	
	≥	Fauna defecating in supply	No	there are no issues	
	Catchment and Water Supply	Fauna destroying water intake structures	No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
	S		110	there are no issues	
	/ate	Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)	No	Unconfirmed Local Knowledge: based on Water Corporation advice th there are no issues	
	≤ P			Unconfirmed Local Knowledge: based on Water Corporation advice th	
	an	Un-lined landfills	No	there are no issues	
	lent	Extensive agriculture	No	Unconfirmed Local Knowledge.	
Ĵ)	hm	Low vegetation cover (dust, sediment	Yes	Unconfirmed Local Knowledge: based on Water Corporation advice th	
	Cato	runoff)		there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th	
5	0	Poor access to supply	No	there are no issues	
Ś		Unsustainable water extraction	NI-	Unconfirmed Local Knowledge: based on Water Corporation advice th	
Ē			No	there are no issues	
-		Aquifer turning saline due to high extraction	No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
				there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th	
		Hard water	No	there are no issues	
n r		Aging or inadequate pipe work and	No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
5		associated infrastructure	No	there are no issues	
		Significant water losses due to leaking	No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
ξ.		pipes		there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th	
ž		High per capita water consumption	No	there are no issues	
Ľ		Inappropriate water quality standards /	No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
Ş		objectives		there are no issues	
>	e	Lack of infrastructure maintenance	No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
	Governance			there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th	
	ern,	Poor management or governance	No	there are no issues	
	20	Vandalism / sabotage / terrorism	No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
		- anadion / babblage / tentholion		there are no issues	
		Insufficient trained personnel	No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
		Inadequate funding for maintenance or		there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th	
		upgrades	No	there are no issues	
		Mining / minerals	No	Unconfirmed Local Knowledge.	
	ries				
	Industries	Irrigation	No	Unconfirmed Local Knowledge.	
	Ind	Chemicals / process	Not known	Unconfirmed Local Knowledge	
		Chemicals / process	Not known	Unconfirmed Local Knowledge.	
	uo	Seasonal population loadings	Yes	Holiday town	
	Population	Seasonal population loadings	100		
	ula				

(LC	Pathogenic contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
EFEC			there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that
(EFI	Algal blooms	No	there are no issues
RISK	Heavy metal contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
교		110	there are no issues
≥	Poor chlorine residuals	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
R		110	there are no issues
SECURIT	Pesticide contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
Ū.	r cateloc contamination	146	there are no issues
OR (	Boil water notices	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
0	Boll water holices	140	there are no issues
È	Deaths or illness due to water quality		Unconfirmed Local Knowledge: based on Water Corporation advice that
۲L	Deaths of inness due to water quality	No	there are no issues
QUALL	Water restrictions (current and historic)	Yes	Unconfirmed Local Knowledge.
	Taste and odour issues	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
μ	Taste and odour issues	INO	there are no issues
WATER	Other contamination that would affect	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
3	health	INO	there are no issues
	Notes		

Ś		State/Territory	WA		
TOWN		Town Name	Carnarvon	2 antro () a a a litu)	
		Town Population Name of Water Utility	5,284 (Census 2006, Urban C Water Corporation of WA	Centre/Locality)	
WATER	=	Rate (\$/kL)	\$0.72 to \$6.54 per kL		
AT I	=	Per Capita Water Consumption (L/day)	Unknown		
< :	2	Number of Connections	Unknown		
Z L	~ ~	Catchment	Mid West Region		
	μĹ	Sub-Catchment	Not known		
CATCHMEN T AND WATER SUPPLY		Catchment Protection Status Potable Water Source(s)	Not known Not known		
5 -	- 0)	Supply Capacity	Not known		
		Treatment Plant(s)	Yes		
		Level of Treatment	Not known		
≻		Drinking Water Guidelines	ADWG 1987 Overall	100% compliance	
WATER QUALITY			Thermotolerant Coliforms	Samples taken 65; 100% compliance	
N			Thermophilic Naegleria	Samples taken 40; 100% compliance	
ğ			Fluoride (mean)	Samples taken 4 (0.49mg/L);	
Ë		Results (% compliance for 2008 reporting	Hydrocarbons	Samples taken 0	
NA		period)	Metals Nitrate (mean)	Samples taken 8; 100% compliance Samples taken 2 (0.8mg/L); 100% compliance	
-			Pesticides	Samples taken 4; 100% compliance	
			Radiological	Samples taken 1; 100% compliance	
			Trihalomethanes (mean)	Samples taken 2 (0.006mg/L); 100% compliance	
5	-	Current Water Restrictions	Yes		
КÉ	F	Proportion of Potable Water Supplied to Households (%)	Unknown		
ATI	5	Distance from the Coast (km)	0 km		
WATER	Ú O	Climate		re 27.2; Min mean temperature 16.6	
	·	Average Annual Rainfall	230.8 mm	· ·	
		FACTOR	YES / NO	NOTES / EXPLANATION	
		Drought	Yes	Unconfirmed Local Knowledge: based on Water Corporation advice th there are no issues	
		Single drinking water source	Yes	Unconfirmed Local Knowledge.	
				Unconfirmed Local Knowledge: based on Water Corporation advice th	
		Poor quality water source	No	there are no issues	
		Sewage overflow or disposal into water	No	Unconfirmed Local Knowledge: based on Water Corporation advice the	
		source		there are no issues	
		Flooding	Yes	Unconfirmed Local Knowledge: Gascoyne River basin Unconfirmed Local Knowledge: based on Water Corporation advice th	
		Fauna defecating in supply	No	there are no issues	
	>	Fauna destroying water intake structures	No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
	Supply		INU	there are no issues	
	Su	Natural mineral pollutants (e.g. uranium,	No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
	Water	nitrates, iron, fluoride)		there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th	
	Ň	Un-lined landfills	No	there are no issues	
	Catchment and		No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
	nt a	Extensive agriculture	No	there are no issues	
Э	me	Low vegetation cover (dust, sediment	No	Unconfirmed Local Knowledge: based on Water Corporation advice the	
2	atch	runoff)		there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice the	
S	ő	Poor access to supply	No	there are no issues	
<u> </u>		Lineueteineble water extraction	No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
ř		Unsustainable water extraction	No	there are no issues	
_		Aquifer turning saline due to high extraction	No	Unconfirmed Local Knowledge: based on Water Corporation advice the	
YD				there are no issues	
ز لا		Hard water	No	Unconfirmed Local Knowledge: based on Water Corporation advice th there are no issues	
n Y		Aging or inadequate pipe work and	No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
Ō		associated infrastructure	No	there are no issues	
WATER QUARTY OR SECURITY RISK (CAUSE)		Significant water losses due to leaking	No	Unconfirmed Local Knowledge: based on Water Corporation advice the	
TAL	-	pipes		there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th	
วี		High per capita water consumption	No	there are no issues	
Ľ		Inappropriate water quality standards /	No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
E E		objectives	No	there are no issues	
>	e	Lack of infrastructure maintenance	No	Unconfirmed Local Knowledge: based on Water Corporation advice the	
	Governance			there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th	
	em	Poor management or governance	No	there are no issues	
	201	Vendeliem (eeksterre (terre	No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
		Vandalism / sabotage / terrorism	No	there are no issues	
		Insufficient trained personnel	No	Unconfirmed Local Knowledge: based on Water Corporation advice the	
				there are no issues	
		Inadequate funding for maintenance or upgrades	No	Unconfirmed Local Knowledge: based on Water Corporation advice th there are no issues	
	s	Mining / minerals	No		
	trie			Unconfirmed Local Knowledge.	
	Industries	Irrigation	No	Unconfirmed Local Knowledge.	
	Ĕ	Chemicals / process	No	Unconfirmed Local Knowledge.	
	E				
	Population	Seasonal population loadings	No		
	Inde	Denid a seulation ti	NI-		
	Ро	Rapid population growth	No	Unconfirmed Local Knowledge.	
			i	Unconfirmed Local Knowledge: based on Water Corporation advice th	

(EFF	Algal blooms	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
RISK (EFF	Heavy metal contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
$\overline{\succ}$	Poor chlorine residuals	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
SECURIT	Pesticide contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
OR S	Boil water notices	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
	Deaths or illness due to water quality	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
QUAI	Water restrictions (current and historic)	Yes	Unconfirmed Local Knowledge.
	Taste and odour issues	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
WATER	Other contamination that would affect health	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
	Notes		

Ę		State/Territory	WA	
TOWN		Town Name	Collie	
		Town Population	7,083 (Census 2006, Urban	Centre/Locality)
R.	<u>}</u>	Name of Water Utility	Water Corporation of WA	
WATER		Rate (\$/kL) Per Capita Water Consumption (ML/day)	\$0.72 to \$4.42 per kL Unknown	
Š.	5	Number of Connections	Unknown Unknown	
		Catchment	South West Region	
T AND T AND WATER SUPPLY		Sub-Catchment	-	
		Catchment Protection Status	Good	
Η.	ž IS	Potable Water Source(s)	Harris Dam	
i	•,	Supply Capacity	Unknown	
		Treatment Plant(s)	Yes	
		Level of Treatment	Not known	
		Drinking Water Guidelines	ADWG 1987	
Ē			Overall Thermotolerant Coliforms	100% compliance Samples taken 69; 100% compliance
٦			Thermophilic Naegleria	Samples taken 33; 100% compliance
g			Fluoride (mean)	Samples taken 52 (0.74mg/L);
WATER QUALITY		Results (% compliance for 2008 reporting	Hydrocarbons	Samples taken 0
Ę		period)	Metals	Samples taken 4, 100% compliance
≥			Nitrate (mean)	Samples taken 8 (<0.05mg/L); 100% compliance
			Pesticides	Samples taken 2; 100% compliance
			Radiological	Samples taken 0;
			Trihalomethanes (mean)	Samples taken 6 (0.076mg/L); 100% compliance
	~	Current Water Restrictions	Yes	
WATER	Ŧ	Proportion of Potable Water Supplied to	Unknown	
E H	5	Households (%) Distance from the Coast (km)	60km	
λ	ц Ц	Climate		erature 22.5; Min mean temperature 8.4
(	n	Average Annual Rainfall	938.8 mm	
		FACTOR	YES / NO	NOTES / EXPLANATION
				Unconfirmed Local Knowledge: based on Water Corporation advice th
		Drought	Yes	there are no issues
		Single drinking water source	Yes	Unconfirmed Local Knowledge.
		Poor quality water source	No	Wellington Dam source has Salinity Issues. Harris Dam Option is use
		Sewage overflow or disposal into water	No	Unconfirmed Local Knowledge: based on Water Corporation advice the
		source		there are no issues
		Flooding	No	Unconfirmed Local Knowledge
		Fauna defecating in supply	No	Unconfirmed Local Knowledge: based on Water Corporation advice the
				there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th
	β	Fauna destroying water intake structures	No	there are no issues
	dn	Natural mineral pollutants (e.g. uranium,		Unconfirmed Local Knowledge: based on Water Corporation advice the
	5	nitrates, iron, fluoride)	No	there are no issues
	ate	Un-lined landfills	Yes	Plans for lining in future - Source Shire Engineer
	Catchment and Water Supply	Extensive agriculture	Yes	Unconfirmed Local Knowledge: based on Water Corporation advice the
			163	there are no issues
	ent	Low vegetation cover (dust, sediment	No	Unconfirmed Local Knowledge: based on Water Corporation advice the
Ĵ	Ĕ	runoff)	-	there are no issues
<u>j</u>	atch	Poor access to supply	No	Unconfirmed Local Knowledge: based on Water Corporation advice th there are no issues
5	ő			Unconfirmed Local Knowledge: based on Water Corporation advice th
		Unsustainable water extraction	No	there are no issues
2				Unconfirmed Local Knowledge: based on Water Corporation advice the
		Aquifer turning saline due to high extraction	NO	there are no issues
2		Hordwater	No	Unconfirmed Local Knowledge: based on Water Corporation advice th
Ś		Hard water	No	there are no issues
2		Aging or inadequate pipe work and	No	Unconfirmed Local Knowledge: based on Water Corporation advice the
ś		associated infrastructure		there are no issues
		Significant water losses due to leaking	No	Unconfirmed Local Knowledge: based on Water Corporation advice the
	-	pipes		there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th
ò		High per capita water consumption	No	there are no issues
		Inappropriate water quality standards /		Unconfirmed Local Knowledge: based on Water Corporation advice th
]		objectives	No	there are no issues
			No	Unconfirmed Local Knowledge: based on Water Corporation advice th
	nce	Lack of infrastructure maintenance	No	there are no issues
	Governance	Poor management or governance	No	Unconfirmed Local Knowledge: based on Water Corporation advice the
	ve		····	there are no issues
	Ö	Vandalism / sabotage / terrorism	No	Unconfirmed Local Knowledge: based on Water Corporation advice the
				there are no issues
		Insufficient trained personnel	No	Unconfirmed Local Knowledge: based on Water Corporation advice the
		Inadequate funding for maintenance or		there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice the
		upgrades	No	there are no issues
	ŝ	Mining / minerals	Yes	Coal Mining Operations in the area
	strie	Irrigation	Yes	Unconfirmed Local Knowledge.
	Industries	-		
		Chemicals / process	No	Unconfirmed Local Knowledge.
	ation	Seasonal population loadings	No	
	Population	Rapid population growth	No	Unconfirmed Local Knowledge.
(EFFECT)		Pathogenic contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice the
Ш				there are no issues
		Algal blooms	No	Unconfirmed Local Knowledge: based on Water Corporation advice the there are no issues

RISK	Heavy metal contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
RITY	Poor chlorine residuals	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
SECU	Pesticide contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
OR S	Boil water notices	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
ALITY	Deaths or illness due to water quality	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
ĺ ĺ	Water restrictions (current and historic)	Yes	Unconfirmed Local Knowledge. Drought related.
ATER Q	Taste and odour issues	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
LAW	Other contamination that would affect health	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
	Notes		

WATER QUALITY OR SECURITY RISK (CAUSE) WATER QUALITY OR SECURITY RISK (CAUSE) WATER UTILITY TAND	Town Name         Town Population         Name of Water Utility         Rate (\$/kL)         Per Capita Water Consumption (ML/day)         Number of Connections         Catchment         Sub-Catchment         Catchment Protection Status         Potable Water Source(s)         Supply Capacity         Treatment Plant(s)         Level of Treatment         Drinking Water Guidelines         Results (% compliance for 2008 reporting period)	Esperance 9.535 (Census 2006, Urban · Water Corporation of WA §0.72 to §4.42 per kL Not known Gold Fields and Agricultural Not known Not known Ground and Surface Not known Yes None ADWG 1987 Overall Thermotolerant Coliforms Thermophilic Naegleria Fluoride (mean) Hydrocarbons	Region  100% compliance Samples taken 91; 100% compliance
WATER QUALITY OR SECURITY RISK (CAUSE) WATER QUALITY OR SECURITY RISK (CAUSE) WATER QUALITY CATCHMEN WATER QUALITY CATCHMEN WATER QUALITY SECURITY CATCHMEN WATER QUALITY WATER QUALIT	Name of Water Utility Rate (\$/kL) Per Capita Water Consumption (ML/day) Number of Connections Catchment Sub-Catchment Catchment Protection Status Potable Water Source(s) Supply Capacity Treatment Plant(s) Level of Treatment Drinking Water Guidelines Results (% compliance for 2008 reporting	Water Corporation of WA \$0.72 to \$4.42 per kL Not known Gold Fields and Agricultural Not known Not known Ground and Surface Not known Yes None ADWG 1987 Overall Thermophilic Naegleria Fluoride (mean)	Region  100% compliance Samples taken 91; 100% compliance
WATER QUALITY OR SECURITY RISK (CAUSE) WATER QUALITY OR SECURITY OR SECURITY OR SECURITY WATER QUALITY T AND WATER CATCHMEN AMATER CATCHMEN AMATER CATCHMEN AMATER CATCHMEN AMATER AMATE	Rate (\$/kL)         Per Capita Water Consumption (ML/day)         Number of Connections         Catchment         Sub-Catchment         Catchment Protection Status         Potable Water Source(s)         Supply Capacity         Treatment Plant(s)         Level of Treatment         Drinking Water Guidelines         Results (% compliance for 2008 reporting	\$0.72 to \$4.42 per kL Not known Not known Gold Fields and Agricultural Not known Ot known Ground and Surface Not known Yes None ADWG 1987 Overall Thermotolerant Coliforms Thermophilic Naegleria Fluoride (mean)	100% compliance Samples taken 91; 100% compliance
WATER QUALITY OR SECURITY RISK (CAUSE) WATER QUALITY OR SECURITY OR SECURITY OR SECURITY TAND CATCHMEN Governance Catchment and Water Supply Control of the	Per Capita Water Consumption (ML/day) Number of Connections Catchment Sub-Catchment Catchment Protection Status Potable Water Source(s) Supply Capacity Treatment Plant(s) Level of Treatment Drinking Water Guidelines Results (% compliance for 2008 reporting	Not known Not known Gold Fields and Agricultural Not known Ground and Surface Not known Yes None ADWG 1987 Overall Thermotolerant Coliforms Thermophilic Naegleria Fluoride (mean)	100% compliance Samples taken 91; 100% compliance
WATER QUALITY OR SECURITY RISK (CAUSE) WATER QUALITY OR SECURITY OR SECURITY OR SECURITY TAND CATCHMEN Governance Catchment and Water Supply Control of the	Number of Connections         Catchment         Sub-Catchment Protection Status         Potable Water Source(s)         Supply Capacity         Treatment Plant(s)         Level of Treatment         Drinking Water Guidelines         Results (% compliance for 2008 reporting	Not known Gold Fields and Agricultural Not known Ground and Surface Not known Yes None ADWG 1987 Overall Thermotolerant Coliforms Thermophilic Naegleria Fluoride (mean)	100% compliance Samples taken 91; 100% compliance
WATER QUALITY OR SECURITY RISK (CAUSE) WATER QUALITY OR SECURITY OR SECURITY WATER QUALITY CATCHMEN  CATCH	Catchment Sub-Catchment Catchment Protection Status Potable Water Source(s) Supply Capacity Treatment Plant(s) Level of Treatment Drinking Water Guidelines Results (% compliance for 2008 reporting	Gold Fields and Agricultural Not known Ground and Surface Not known Yes None ADWG 1987 Overall Thermotolerant Coliforms Thermophilic Naegleria Fluoride (mean)	100% compliance Samples taken 91; 100% compliance
WATER QUALITY OR SECURITY RISK (CAUSE) WATER QUALITY Governance Catchment and Water Supply Covernance Catchment and Water Supply Covernance Catchment and Water Supply Covernance Catchment and Water Supply Catch	Catchment Protection Status Potable Water Source(s) Supply Capacity Treatment Plant(s) Level of Treatment Drinking Water Guidelines Results (% compliance for 2008 reporting	Not known Ground and Surface Not known Yes None ADWG 1987 Overall Thermotolerant Coliforms Thermophilic Naegleria Fluoride (mean)	Samples taken 91; 100% compliance
WATER QUALITY OR SECURITY RISK (CAUSE) WATER QUALITY Governance Catchment and Water Supply Covernance Catchment and Water Supply Covernance Catchment and Water Supply Covernance Catchment and Water Supply Catch	Potable Water Source(s) Supply Capacity Treatment Plant(s) Level of Treatment Drinking Water Guidelines Results (% compliance for 2008 reporting	Ground and Surface Not known Yes None ADWG 1987 Overall Thermotolerant Coliforms Thermophilic Naegleria Fluoride (mean)	Samples taken 91; 100% compliance
WATER QUALITY OR SECURITY RISK (CAUSE) WATER QUALITY Governance Catchment and Water Supply Covernance Catchment and Water Supply Covernance Catchment and Water Supply Covernance Catchment and Water Supply Catch	Supply Capacity Treatment Plant(s) Level of Treatment Drinking Water Guidelines Results (% compliance for 2008 reporting	Not known Yes None ADWG 1987 Overall Thermotolerant Coliforms Thermophilic Naegleria Fluoride (mean)	Samples taken 91; 100% compliance
WATER QUALITY OR SECURITY RISK (CAUSE) WATER QUALITY Governance Catchment and Water Supply Covernance Catchment and Water Supply Covernance Catchment and Water Supply Covernance Catchment and Water Supply Catch	Treatment Plant(s) Level of Treatment Drinking Water Guidelines Results (% compliance for 2008 reporting	Yes None ADWG 1987 Overall Thermotolerant Coliforms Thermophilic Naegleria Fluoride (mean)	Samples taken 91; 100% compliance
WATER QUALITY OR SECURITY RISK (CAUSE) WATER QUALITY OR SECURITY RISK (CAUSE) Catchment and Water Supply Covernance Catchment and Water Supply Cov	Level of Treatment Drinking Water Guidelines Results (% compliance for 2008 reporting	None ADW G 1987 Overall Thermotolerant Coliforms Thermophilic Naegleria Fluoride (mean)	Samples taken 91; 100% compliance
WATER QUALITY OR SECURITY RISK (CAUSE) WATER QUALITY Covemance Catchment and Water Supply Covemance Catchment and Water Su	Drinking Water Guidelines Results (% compliance for 2008 reporting	ADWG 1987 Overall Thermotolerant Coliforms Thermophilic Naegleria Fluoride (mean)	Samples taken 91; 100% compliance
WATER QUALITY OR SECURITY RISK (CAUSE) WATER QUALITY Governance Catchment and Water Supply Control = 1 = 1 = 1 = 1 = 1 = 1 = 1 = 1 = 1 =	Results (% compliance for 2008 reporting	Thermotolerant Coliforms Thermophilic Naegleria Fluoride (mean)	Samples taken 91; 100% compliance
WATER QUALITY OR SECURITY RISK (CAUSE) WATER QUALITY OR SECURITY RISK (CAUSE)		Thermophilic Naegleria Fluoride (mean)	
WATER QUALITY OR SECURITY RISK (CAUSE) WATER QUALITY OR SECURITY RISK (CAUSE)		Fluoride (mean)	
WATER QUALITY OR SECURITY RISK (CAUSE) WATER QUALITY OR SECURITY RISK (CAUSE)			Samples taken 61; 100% compliance
WATER QUALITY OR SECURITY RISK (CAUSE) WATER QUALITY OR SECURITY RISK (CAUSE)			Samples taken 54 (0.83mg/L); Samples taken 0
WATER QUALITY OR SECURITY RISK (CAUSE) WATER QUALITY OR SECURITY RISK (CAUSE)		Metals	Samples taken 0 Samples taken 2; 100% compliance
WATER QUALITY OR SECURITY RISK (CAUSE) WATER QUALITY OR SECURITY RISK (CAUSE) WATER CONTRACTOR CAUSE)		Nitrate (mean)	Samples taken 5 (4.2mg/L); 100% compliance
WATER QUALITY OR SECURITY RISK (CAUSE) WATER QUALITY OR SECURITY RISK (CAUSE) WATER CONTRACTOR CONT		Pesticides	Samples taken 5; 100% compliance
WATER QUALITY OR SECURITY RISK (CAUSE) WATER QUALITY OR SECURITY RISK (CAUSE) WATER CONTRACTOR CONT		Radiological	Samples taken 0;
WATER QUALITY OR SECURITY RISK (CAUSE) WATER QUALITY OR SECURITY RISK (CAUSE) WATER CONTRACTOR CONT		Trihalomethanes (mean)	Samples taken 2 (0.044mg/L); 100% compliance
WATER QUALITY OR SECURITY RISK (CAUSE) Governance Catchment and Water Supply Catchment and Water Supply	Current Water Restrictions	Yes	
WATER QUALITY OR SECURITY RISK (CAUSE) Governance Catchment and Water Supply Catchment and Water Supply	Proportion of Potable Water Supplied to Households (%)	Unknown	
WATER QUALITY OR SECURITY RISK (CAUSE) Governance Catchment and Water Supply Catchment and Water Supply	Distance from the Coast (km)	0 km	
WATER QUALITY OR SECURITY RISK (CAUSE) Governance Catchment and Water Supply Catchment and Water Supply	Climate		erature 21.8; Min mean temperature 12.0
WATER QUALITY OR SECURITY RISK (CAUSE) Governance Catchment and Water Supply	Average Annual Rainfall	623.2 mm	· · ·
WATER QUALITY OR SECURITY RISK (CAUSE) Governance Catchment and Water Supply	FACTOR	YES / NO	NOTES / EXPLANATION
WATER QUALITY OR SECURITY RISK (CAUSE) Governance Catchment and Water Supply	Drought	Yes	Unconfirmed Local Knowledge: based on Water Corporation advice the
WATER QUALITY OR SECURITY RISK (CAUSE) Governance Catchment and Water Supply	-		there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice the
WATER QUALITY OR SECURITY RISK (CAUSE) Governance Catchment and Water Supply	Single drinking water source	Yes	there are no issues
WATER QUALITY OR SECURITY RISK (CAUSE) Governance Catchment and Water Supply			Unconfirmed Local Knowledge: based on Water Corporation advice the
WATER QUALITY OR SECURITY RISK (CAUSE) Governance Catchment and Water Supply	Poor quality water source	No	there are no issues
WATER QUALITY OR SECURITY RISK (CAUSE) Governance Catchment and Water Supply	Sewage overflow or disposal into water	No	Unconfirmed Local Knowledge: based on Water Corporation advice the
WATER QUALITY OR SECURITY RISK (CAUSE) Governance Catchment and Water Supply	source		there are no issues
WATER QUALITY OR SECURITY RISK (CAUSE) Governance Catchment and Water Supp	Flooding	No	Unconfirmed Local Knowledge: based on Water Corporation advice th
WATER QUALITY OR SECURITY RISK (CAUSE) Governance Catchment and Water Supp			there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th
WATER QUALITY OR SECURITY RISK (C Governance	Fauna defecating in supply	No	there are no issues
WATER QUALITY OR SECURITY RISK (C Governance	Former de star in sur ten intelles starstanses	NI-	Unconfirmed Local Knowledge: based on Water Corporation advice th
WATER QUALITY OR SECURITY RISK (C Governance	Fauna destroying water intake structures	No	there are no issues
WATER QUALITY OR SECURITY RISK (C Governance	Natural mineral pollutants (e.g. uranium,	No	Unconfirmed Local Knowledge: based on Water Corporation advice the
WATER QUALITY OR SECURITY RISK (C Governance	nitrates, iron, fluoride)		there are no issues
WATER QUALITY OR SECURITY RISK (C Governance	Un-lined landfills Extensive agriculture	Yes No	Shire Engineer Unconfirmed Local Knowledge.
WATER QUALITY OR SECURITY RISK (C Governance	Low vegetation cover (dust, sediment		Unconfirmed Local Knowledge: based on Water Corporation advice th
WATER QUALITY OR SECURITY RISK (C Governance	runoff)	Yes	there are no issues
WATER QUALITY OR SECURITY RISK (C Governance	Poor access to supply	No	Unconfirmed Local Knowledge: based on Water Corporation advice th
WATER QUALITY OR Governance		110	there are no issues
WATER QUALITY OR Governance	Unsustainable water extraction	No	Unconfirmed Local Knowledge: based on Water Corporation advice th
WATER QUALITY OR Governance			there are no issues
WATER QUALITY OR Governance	Aquifer turning saline due to high extraction	Yes	Coastal town
WATER QUALITY OR Governance	Hard water	No	Unconfirmed Local Knowledge: based on Water Corporation advice th
WATER QUALITY OR Governance	Hard water	No	there are no issues
Governance	Aging or inadequate pipe work and	No	Unconfirmed Local Knowledge: based on Water Corporation advice th
Governance	associated infrastructure Significant water losses due to leaking		there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th
Governance	pipes	No	there are no issues
Governance		Na	Unconfirmed Local Knowledge: based on Water Corporation advice th
Governance	High per capita water consumption	No	there are no issues
Governance	Inappropriate water quality standards /	No	Unconfirmed Local Knowledge: based on Water Corporation advice th
Governance	objectives		there are no issues
	Lack of infrastructure maintenance	No	Unconfirmed Local Knowledge: based on Water Corporation advice th
			there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th
	Poor management or governance	No	there are no issues
		No	Unconfirmed Local Knowledge: based on Water Corporation advice th
Ī	Ivangalism / sabotage / terrorism	ino	there are no issues
Ī	Vandalism / sabotage / terrorism	No	Unconfirmed Local Knowledge: based on Water Corporation advice the
	Vandalism / sabotage / terrorism		there are no issues
	Insufficient trained personnel	No	Unconfirmed Local Knowledge: based on Water Corporation advice th there are no issues
	Insufficient trained personnel Inadequate funding for maintenance or	Na	
ries	Insufficient trained personnel Inadequate funding for maintenance or upgrades	No	Unconfirmed Local Knowledge.
Industries	Insufficient trained personnel Inadequate funding for maintenance or		
pul	Insufficient trained personnel Inadequate funding for maintenance or upgrades	No	Unconfirmed Local Knowledge.
	Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals Irrigation		· ·
Population	Insufficient trained personnel Inadequate funding for maintenance or upgrades Mining / minerals	No No Yes	Unconfirmed Local Knowledge. Unconfirmed Local Knowledge. Holiday town

			Unconfirmed Local Knowledge: based on Water Corporation advice that
5	Pathogenic contamination	No	
щ			there are no issues
臣	Algal blooms	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
Ē	/ igai bioonio	110	there are no issues
RISK	Heavy metal contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
Ť	Heavy metal containination	NO	there are no issues
≻	Deer oblering regiduals	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
F	Poor chlorine residuals	No	there are no issues
SECUR			Unconfirmed Local Knowledge: based on Water Corporation advice that
U U	Pesticide contamination	No	there are no issues
00			Unconfirmed Local Knowledge: based on Water Corporation advice that
b b	Boil water notices	No	there are no issues
≥			Unconfirmed Local Knowledge: based on Water Corporation advice that
L_	Deaths or illness due to water quality	No	there are no issues
QUAL	Water restrictions (current and historic)	Yes	Unconfirmed Local Knowledge.
-	<b>—</b>		Unconfirmed Local Knowledge: based on Water Corporation advice that
Ë	Taste and odour issues	No	there are no issues
WATER	Other contamination that would affect		Unconfirmed Local Knowledge: based on Water Corporation advice that
×	health	No	there are no issues
	Notes		

		State/Territory	WA	
Š		Town Name	Exmouth	
Ĕ		Town Population	1,843 (Census 2006, Urban	Centre/Locality)
₩ 2	-	Name of Water Utility	Water Corporation of WA	
	2	Rate (\$/kL)	\$0.72 to \$5.33 per kL	
WATER	5	Per Capita Water Consumption (ML/day) Number of Connections	Not known	
		Catchment	Not known Mid West Region	
	<u>د</u> ۲.	Sub-Catchment	Not known	
CATCHMEN T AND WATER SUPPLY		Catchment Protection Status	Not known	
		Potable Water Source(s)	Ground	
5	0,	Supply Capacity	Not known	
		Treatment Plant(s)	Yes	
		Level of Treatment	None	
~		Drinking Water Guidelines	ADWG 1987 Overall	1000/ compliance
WATER QUALITY			Thermotolerant Coliforms	100% compliance Samples taken 65; 100% compliance
			Thermophilic Naegleria	Samples taken 40; 100% compliance
ğ			Fluoride (mean)	Samples taken 53 (0.68mg/L);
ER		Results (% compliance for 2008 reporting	Hydrocarbons	Samples taken 0
ΑT		period)	Metals	Samples taken 2; 100% compliance
3			Nitrate (mean)	Samples taken 3 (1.9mg/L); 100% compliance
			Pesticides	Samples taken 1; 100% compliance
			Radiological	Samples taken 1; 100% compliance
		Ourset Mater Destrictions	Trihalomethanes (mean)	Samples taken 2 (0.003mg/L); 100% compliance
	-	Current Water Restrictions Proportion of Potable Water Supplied to	Yes	
WATER	Ē	Households (%)	Unknown	
AT C	3	Distance from the Coast (km)	0 km	
≥ u		Climate	Grassland; Max mean tempe	erature 28.8; Min mean temperature 19.1 (Vlamingh Head)
		Average Annual Rainfall	296.1 mm (Vlamingh Head)	
		FACTOR	YES / NO	NOTES / EXPLANATION
		Drought	Yes	Unconfirmed Local Knowledge: based on Water Corporation advice the
				there are no issues
		Single drinking water source	Yes	Unconfirmed Local Knowledge: based on Water Corporation advice th there are no issues
				Unconfirmed Local Knowledge: based on Water Corporation advice th
		Poor quality water source	No	there are no issues
		Sewage overflow or disposal into water	NI-	Unconfirmed Local Knowledge: based on Water Corporation advice th
	r Supply	source	No	there are no issues
		Flooding	No	Unconfirmed Local Knowledge: based on Water Corporation advice the
				there are no issues
		Fauna defecating in supply	No	Unconfirmed Local Knowledge: based on Water Corporation advice th
				there are no issues
		Fauna destroying water intake structures	No	Unconfirmed Local Knowledge: based on Water Corporation advice the
	ater	Natural mineral pollutants (e.g. uranium,		there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice the
	Ň	nitrates, iron, fluoride)	No	there are no issues
	pu	Un-lined landfills	Yes	Shire Engineering section
	ut	Extensive agriculture	No	Unconfirmed Local Knowledge.
	me	Low vegetation cover (dust, sediment	Yes	Unconfirmed Local Knowledge: based on Water Corporation advice th
ž	Catchment and Water	runoff)	100	there are no issues
N.	Ca	Poor access to supply	No	Unconfirmed Local Knowledge: based on Water Corporation advice the
2				there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice the
<u>n</u>		Unsustainable water extraction	No	there are no issues
WALER QUALITY OR SECURITY RISK (CAUSE)				
Ŧ		Aquifer turning saline due to high extraction	Yes	Coastal town
Ę		Hard water	No	Unconfirmed Local Knowledge: based on Water Corporation advice th
ц И				there are no issues
r		Aging or inadequate pipe work and	No	Unconfirmed Local Knowledge: based on Water Corporation advice the
ر		associated infrastructure		there are no issues
5		Significant water losses due to leaking pipes	No	Unconfirmed Local Knowledge: based on Water Corporation advice th there are no issues
<b>E</b>				Unconfirmed Local Knowledge: based on Water Corporation advice th
ğ		High per capita water consumption	No	there are no issues
Ľ		Inappropriate water quality standards /	No	Unconfirmed Local Knowledge: based on Water Corporation advice the
Ā		objectives	INU	there are no issues
\$	e	Lack of infrastructure maintenance	No	Unconfirmed Local Knowledge: based on Water Corporation advice the
	Janc			there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th
	Governance	Poor management or governance	No	there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice the
	Ō	Vandalism / sabotage / terrorism	No	there are no issues
		Insufficient trained personnel	No	Unconfirmed Local Knowledge: based on Water Corporation advice th there are no issues
		Inadequate funding for maintenance or upgrades	No	Unconfirmed Local Knowledge: based on Water Corporation advice th there are no issues
	Ś	Mining / minerals	No	Unconfirmed Local Knowledge.
	trie			
	Industries	Irrigation	No	Unconfirmed Local Knowledge.
	lnd	Chemicals / process	No	Unconfirmed Local Knowledge.
		Seasonal population loadings	Yes	Holiday town
	Population			
	br		No	Unconfirmed Local Knowledge.

(LC	Pathogenic contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
EFEC			there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that
(EFI	Algal blooms	No	there are no issues
RISK	Heavy metal contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
교		110	there are no issues
≥	Poor chlorine residuals	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
R		110	there are no issues
SECURIT	Pesticide contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
Ū.	r cateloc contamination	146	there are no issues
OR (	Boil water notices	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
0	Boll water holices	140	there are no issues
È	Deaths or illness due to water quality		Unconfirmed Local Knowledge: based on Water Corporation advice that
۲L	Deaths of inness due to water quality	No	there are no issues
QUALL	Water restrictions (current and historic)	Yes	Unconfirmed Local Knowledge.
	Taste and odour issues	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
μ	Taste and odour issues	INO	there are no issues
WATER	Other contamination that would affect	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
3	health	INO	there are no issues
	Notes		

~	_	State/Territory	WA	
TOWN		Town Name	Kalbarri	
Ē		Town Population	1,328 (Census 2006, Urban	Centre/Locality)
2	-	Name of Water Utility	Water Corporation of WA	
WATER	2	Rate (\$/kL)	\$0.72 to \$2.76 per kL	
₹ ₹	5	Per Capita Water Consumption (L/day) Number of Connections	Not known Not known	
_		Catchment	Mid West Region	
	د ≻ <sub>ا</sub>	Sub-Catchment	Not known	
CATCHMEN T AND WATER SUPPLY		Catchment Protection Status	Not known	
=	ž j	Potable Water Source(s)	Ground Water	
5	•••	Supply Capacity	Not known	
		Treatment Plant(s)	Yes	
		Level of Treatment	Not known	
		Drinking Water Guidelines	ADWG 1987	
WATER QUALITY			Overall Thermotolerant Coliforms	100% compliance Samples taken 52; 100% compliance
٦۲			Thermophilic Naegleria	Samples taken 27; 100% compliance
g			Fluoride (mean)	Samples taken 2 (<0.10mg/L);
ER		Results (% compliance for 2008 reporting	Hydrocarbons	Samples taken 0
AT		period)	Metals	Samples taken 2; 100% compliance
≥			Nitrate (mean)	Samples taken 2 (0.7mg/L); 100% compliance
			Pesticides	Samples taken 1; 100% compliance
			Radiological	Samples taken 0
			Trihalomethanes (mean)	Samples taken 2 (0.004mg/L); 100% compliance
>	-	Current Water Restrictions	Yes	
WATER	Ē	Proportion of Potable Water Supplied to Households (%)	Unknown	
EA I	5	Distance from the Coast (km)	0 km	
≥ ŭ	Ú.	Climate		erature 27.5; Min mean temperature 14.5
Ŭ	, , , , , , , , , , , , , , , , , , ,	Average Annual Rainfall	353.8 mm	
		FACTOR	YES / NO	NOTES / EXPLANATION
		Drought	Yes	Unconfirmed Local Knowledge: based on Water Corporation advice the
		brought	100	there are no issues
		Single drinking water source	Yes	Unconfirmed Local Knowledge: based on Water Corporation advice the
				there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice the
		Poor quality water source	No	there are no issues
		Sewage overflow or disposal into water		Unconfirmed Local Knowledge: based on Water Corporation advice the
		source	No	there are no issues
		Flooding	No	Unconfirmed Local Knowledge: based on Water Corporation advice the
		Flooding	110	there are no issues
		Fauna defecating in supply	No	Unconfirmed Local Knowledge: based on Water Corporation advice th
	ply	·		there are no issues
	er Supply	Fauna destroying water intake structures	No	Unconfirmed Local Knowledge: based on Water Corporation advice the
		Natural mineral pollutants (e.g. uranium,		there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th
	Vati	nitrates, iron, fluoride)	No	there are no issues
	and Water			Unconfirmed Local Knowledge: based on Water Corporation advice the
	an	Un-lined landfills	No	there are no issues
~	ent	Extensive agriculture	No	Unconfirmed Local Knowledge.
	E H	Low vegetation cover (dust, sediment	Yes	Unconfirmed Local Knowledge: based on Water Corporation advice th
2	Catchment	runoff)		there are no issues
2	O	Poor access to supply	No	Unconfirmed Local Knowledge: based on Water Corporation advice th
5				there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th
		Unsustainable water extraction	No	there are no issues
=				
5		Aquifer turning saline due to high extraction	Yes	Coastal town
		Hard water	No	Unconfirmed Local Knowledge: based on Water Corporation advice the
2			110	there are no issues
5		Aging or inadequate pipe work and	No	Unconfirmed Local Knowledge: based on Water Corporation advice th
		associated infrastructure Significant water losses due to leaking		there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th
Ę		pipes	No	there are no issues
3				Unconfirmed Local Knowledge: based on Water Corporation advice th
÷		High per capita water consumption	No	there are no issues
r i		Inappropriate water quality standards /	No	Unconfirmed Local Knowledge: based on Water Corporation advice th
2		objectives	110	there are no issues
	e	Lack of infrastructure maintenance	No	Unconfirmed Local Knowledge: based on Water Corporation advice th
	Governance			there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th
	ern	Poor management or governance	No	there are no issues
	NO.			Unconfirmed Local Knowledge: based on Water Corporation advice th
	U	Vandalism / sabotage / terrorism	No	there are no issues
		Insufficient trained accessed	No	Unconfirmed Local Knowledge: based on Water Corporation advice th
		Insufficient trained personnel	No	there are no issues
		Inadequate funding for maintenance or	No	Unconfirmed Local Knowledge: based on Water Corporation advice the
		upgrades	110	there are no issues
	es	Mining / minerals	No	Unconfirmed Local Knowledge.
	Industries	Irrigation	No	Unconfirmed Local Knowledge.
	Ä			
	<u> </u>	Chemicals / process	No	Unconfirmed Local Knowledge.
	Inc	· · · · · · · · · · · · · · · · · · ·		
		· · · ·	Ves	Holiday town
		Seasonal population loadings	Yes	Holiday town
	Population Inc	· · · ·	Yes	Holiday town Unconfirmed Local Knowledge.

ECT)	Pathogenic contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
Ë		Na	Unconfirmed Local Knowledge: based on Water Corporation advice that
Ē	Algal blooms	No	there are no issues
AISK	Heavy metal contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
Ë	Heavy metal containination	110	there are no issues
≥	Poor chlorine residuals	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
L'A	Foor chionne residuais	140	there are no issues
2	Pesticide contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
SECI	Festicide containination	110	there are no issues
Ω,	Boil water notices	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
ō	Boli water notices	110	there are no issues
≥	Deaths or illness due to water quality		Unconfirmed Local Knowledge: based on Water Corporation advice that
٦L	Deaths of inness due to water quality	No	there are no issues
í,	Water restrictions (current and historic)	Yes	Unconfirmed Local Knowledge.
6	Taste and odour issues	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
芭	Taste and odour issues	110	there are no issues
WATER	Other contamination that would affect	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
\$	health	INU	there are no issues
	Notes		

ź		State/Territory	WA			
TOWN		Town Name	Karratha			
		Town Population Name of Water Utility	11,727 (Census 2006, Urban Centre/Locality) Water Corporation of WA			
WATER	È	Rate (\$/kL)	\$0.76 to \$5.33 per kL			
AT AT	=	Per Capita Water Consumption (ML/day)	Not known			
< :	$\supset$	Number of Connections	Not known			
	~ >	Catchment	North West Region			
CATCHMEN T AND WATER SUPPLY		Sub-Catchment Catchment Protection Status	Not known Not known			
א כ ו ⊢ :	₹J	Potable Water Source(s)	Ground and Surface Water			
5.	- 05	Supply Capacity	Not known			
		Treatment Plant(s)	Yes			
		Level of Treatment	Not known			
≻		Drinking Water Guidelines	ADWG 1987 Overall	100% compliance		
Ē			Thermotolerant Coliforms	Samples taken 72; 100% compliance		
A D			Thermophilic Naegleria	Samples taken 72; 100% compliance		
WATER QUALITY			Fluoride (mean)	Samples taken 54 (0.66mg/L);		
Ē		Results (% compliance for 2008 reporting period)	Hydrocarbons Metals	Samples taken 0 Samples taken 1; 100% compliance		
_ ∧		penod)	Nitrate (mean)	Samples taken 4 (<0.05mg/L); 100% compliance		
			Pesticides	Samples taken 1; 100% compliance		
			Radiological	Samples taken 0		
			Trihalomethanes (mean)	Samples taken 4 (0.158mg/L); 100% compliance		
;	~	Current Water Restrictions Proportion of Potable Water Supplied to	Yes			
WATER	Y	Households (%)	Unknown			
VAT	2	Distance from the Coast (km)	0 km			
S L	SE	Climate		ure 32.3; Min mean temperature 20.7		
_		Average Annual Rainfall FACTOR	281.6 mm YES / NO			
		1		NOTES / EXPLANATION Unconfirmed Local Knowledge: based on Water Corporation advice that		
		Drought	Yes	there are no issues		
		Single drinking water source	Yes	Unconfirmed Local Knowledge: based on Water Corporation advice the		
			103	there are no issues		
		Poor quality water source	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues		
		Sewage overflow or disposal into water		Unconfirmed Local Knowledge: based on Water Corporation advice that		
		source	No	there are no issues		
		Flooding	No	Unconfirmed Local Knowledge: based on Water Corporation advice that		
	and Water Supply			there are no issues		
		Fauna defecating in supply	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues		
				Unconfirmed Local Knowledge: based on Water Corporation advice that		
	rSL	Fauna destroying water intake structures	No	there are no issues		
	/ate	Natural mineral pollutants (e.g. uranium,	No	Unconfirmed Local Knowledge: based on Water Corporation advice the		
	3	nitrates, iron, fluoride)		there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that		
	anc	Un-lined landfills	No	there are no issues		
<u></u>	Catchment	Extensive agriculture	No	Unconfirmed Local Knowledge.		
3 S	L L L	Low vegetation cover (dust, sediment	Yes	Unconfirmed Local Knowledge: based on Water Corporation advice the		
KITY KISK (CAUSE	Catc	runoff)		there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that		
¥	0	Poor access to supply	No	there are no issues		
2				Unconfirmed Local Knowledge: based on Water Corporation advice that		
2		Unsustainable water extraction	No	there are no issues		
R		Aquifer turning saline due to high extraction	Yes	Coastal town		
SECU				Unconfirmed Local Knowledge: based on Water Corporation advice that		
n Y		Hard water	No	there are no issues		
Ś		Aging or inadequate pipe work and	No	Unconfirmed Local Knowledge: based on Water Corporation advice that		
WAIEK QUALITY OK		associated infrastructure		there are no issues		
JAL		Significant water losses due to leaking pipes	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues		
ž			N1-	Unconfirmed Local Knowledge: based on Water Corporation advice that		
ц Ц		High per capita water consumption	No	there are no issues		
A A		Inappropriate water quality standards /	No	Unconfirmed Local Knowledge: based on Water Corporation advice the		
>		objectives		there are no issues		
	e	Lack of infrastructure maintenance	No	Unconfirmed Local Knowledge: based on Water Corporation advice the there are no issues		
	Governance	Poor management or government	No	Unconfirmed Local Knowledge: based on Water Corporation advice the		
	ver	Poor management or governance	No	there are no issues		
	G	Vandalism / sabotage / terrorism	No	Unconfirmed Local Knowledge: based on Water Corporation advice the		
		-		there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice the		
		Insufficient trained personnel	No	there are no issues		
		Inadequate funding for maintenance or	No	Unconfirmed Local Knowledge: based on Water Corporation advice the		
		upgrades		there are no issues		
	Industries	Mining / minerals	Yes	Mineral Export Port Facility		
	usti	Irrigation	No	Unconfirmed Local Knowledge.		
	Ind	Chemicals / process	No	Unconfirmed Local Knowledge.		
			No			
	Populatio n	Seasonal population loadings	No	Large proportion of non resident (FIFO) workforce		
	ldo	Rapid population growth	Yes	"Karratha Vision 2020" - Shire of Karratha		
			100			
ECT)		Pathogenic contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice the there are no issues		

(EFF	Algal blooms	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
RISK	Heavy metal contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
AITY F	Poor chlorine residuals	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
SECUE	Pesticide contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
OR S	Boil water notices	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
ALITY	Deaths or illness due to water quality	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
ĺ ĺ	Water restrictions (current and historic)	Yes	Unconfirmed Local Knowledge.
'ER Q	Taste and odour issues	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
WAT	Other contamination that would affect health	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
	Notes		

<		State/Territory	WA		
TOWN		Town Name	Manjimup		
Ĕ		Town Population	4,239 (Census 2006, Urban Centre/Locality)		
щ	≻	Name of Water Utility	Water Corporation of WA		
WATER	UIILIIY	Rate (\$/kL)	\$0.76 to \$6.54 per kL		
_ ₹ !	5	Per Capita Water Consumption (ML/day)	Not known		
		Number of Connections	Not known		
TAND	r≻.	Catchment Sub-Catchment	South West Region		
z	WA IEK SUPPLY	Catchment Protection Status	Not known Not known		
-⊢	₹₽	Potable Water Source(s)	Not known		
5 : :	> v	Supply Capacity	Not known		
-		Treatment Plant(s)	Yes		
		Level of Treatment	Not known		
		Drinking Water Guidelines	ADWG 1987		
≥			Overall	100% compliance	
WATER QUALITY			Thermotolerant Coliforms	Samples taken 65; 100% compliance	
٦ ا			Thermophilic Naegleria	Samples taken 32; 100% compliance	
0			Fluoride (mean)	Samples taken 56 (0.73mg/L);	
Щ		Results (% compliance for 2008 reporting	Hydrocarbons	Samples taken 0	
Į		period)	Metals	Samples taken 2; 100% compliance	
<			Nitrate (mean)	Samples taken 4 (<0.05mg/L); 100% compliance	
			Pesticides	Samples taken 4; 100% compliance	
			Radiological	Samples taken 0	
			Trihalomethanes (mean)	Samples taken 2 (0.045mg/L); 100% compliance	
	~	Current Water Restrictions	Yes		
R I	Ŧ	Proportion of Potable Water Supplied to	Not known		
E S	,	Households (%) Distance from the Coast (km)	100km		
WATER	Ц Ц	Climate		perature 20.3; Min mean temperature 9.6	
(	0	Average Annual Rainfall	1013.7mm	belature 20.0, with mean temperature 0.0	
		FACTOR	YES / NO	NOTES / EXPLANATION	
				Unconfirmed Local Knowledge: based on Water Corporation advice th	
		Drought	Yes	there are no issues	
		Single drinking water source	Yes	Unconfirmed Local Knowledge: based on Water Corporation advice th	
		Single uninking water source	Tes	there are no issues	
		Poor quality water source	No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
				there are no issues	
		Sewage overflow or disposal into water	No	Unconfirmed Local Knowledge: based on Water Corporation advice the	
		source		there are no issues	
	Catchment and Water Supply	Flooding	Yes	Unconfirmed Local Knowledge: based on Water Corporation advice th	
				there are no issues	
		Fauna defecating in supply	No	Unconfirmed Local Knowledge: based on Water Corporation advice th there are no issues	
				Unconfirmed Local Knowledge: based on Water Corporation advice th	
		Fauna destroying water intake structures	No	there are no issues	
	e	Natural mineral pollutants (e.g. uranium,		Unconfirmed Local Knowledge: based on Water Corporation advice th	
	Vat	nitrates, iron, fluoride)	No	there are no issues	
	> p	Un-lined landfills	Yes		
	an			Unconfirmed Local Knowledge: based on Water Corporation advice th	
	ent	Extensive agriculture	Yes	there are no issues	
Ľ	E	Low vegetation cover (dust, sediment	No	Unconfirmed Local Knowledge: based on Water Corporation advice the	
ź	atcl	runoff)	110	there are no issues	
5	Ö	Poor access to supply	No	Unconfirmed Local Knowledge: based on Water Corporation advice the	
í.				there are no issues	
ź		Unsustainable water extraction	No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
				there are no issues	
2		Aquifer turning saline due to high extraction	No	Unconfirmed Local Knowledge: based on Water Corporation advice the	
				there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th	
L L		Hard water	No	there are no issues	
÷		Aging or inadequate pipe work and	•••	Unconfirmed Local Knowledge: based on Water Corporation advice th	
		associated infrastructure	No	there are no issues	
5		Significant water losses due to leaking	No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
5		pipes	No	there are no issues	
5			No	Unconfirmed Local Knowledge: based on Water Corporation advice the	
í		High per capita water consumption	00	there are no issues	
-		Inappropriate water quality standards /	No	Unconfirmed Local Knowledge: based on Water Corporation advice the	
:		objectives	-	there are no issues	
	e	Lack of infrastructure maintenance	No	Unconfirmed Local Knowledge: based on Water Corporation advice the	
	Governance			there are no issues	
	arn	Poor management or governance	No	Unconfirmed Local Knowledge: based on Water Corporation advice th there are no issues	
	Ň			Unconfirmed Local Knowledge: based on Water Corporation advice th	
	O	Vandalism / sabotage / terrorism	No	there are no issues	
		here the instance is a first second sec	NI -	Unconfirmed Local Knowledge: based on Water Corporation advice th	
		Insufficient trained personnel	No	there are no issues	
		Inadequate funding for maintenance or	Ne	Unconfirmed Local Knowledge: based on Water Corporation advice th	
		upgrades	No	there are no issues	
	S	Mining / minerals	No	Unconfirmed Local Knowledge.	
	trie			• •	
	Industries	Irrigation	No	Unconfirmed Local Knowledge.	
	lnc	Chemicals / process	No	Unconfirmed Local Knowledge.	
	Population	Seasonal population loadings	Yes	Holiday town	
	0				
	n				

ECT)	Pathogenic contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
(EFFE	Algal blooms	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
RISK	Heavy metal contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
RITY	Poor chlorine residuals	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
SECUR	Pesticide contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
OR	Boil water notices	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
ALITY	Deaths or illness due to water quality	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
QUAL	Water restrictions (current and historic)	Yes	Unconfirmed Local Knowledge.
-	Taste and odour issues	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
WATER	Other contamination that would affect health	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
	Notes		

TOWN						
Ē		Town Name	Margaret River			
		Town Population	4,414 (Census 2006, Urban Centre/Locality)			
WATER	=	Name of Water Utility Rate (\$/kL)	Water Corporation of WA \$0.76 to \$2.76 per kL			
AT I		Per Capita Water Consumption (ML/day)	Not known			
CATCHMEN T AND W WATER U SUPPLY		Number of Connections	Not known			
		Catchment	South West Region			
		Sub-Catchment Catchment Protection Status	Not known			
5 < -	ξ d	Potable Water Source(s)	Not known Not known			
5 -	- 0)	Supply Capacity	Not known			
		Treatment Plant(s)	Yes			
		Level of Treatment	Not known			
≻		Drinking Water Guidelines	ADWG 1987 Overall	100% compliance		
É			Thermotolerant Coliforms	Samples taken 65; 100% compliance		
WATER QUALITY			Thermophilic Naegleria	Samples taken 32; 100% compliance		
ğ			Fluoride (mean)	Samples taken 2 (<0.10mg/L);		
Ē		Results (% compliance for 2008 reporting	Hydrocarbons	Samples taken 0		
NA		period)	Metals Nitrate (mean)	Samples taken 5; 100% compliance Samples taken 5 (0.1mg/L); 100% compliance		
-			Pesticides	Samples taken 4; 100% compliance		
			Radiological	Samples taken 0		
			Trihalomethanes (mean)	Samples taken 4 (0.096mg/L); 100% compliance		
7	~	Current Water Restrictions	Yes			
Щ	Ŧ	Proportion of Potable Water Supplied to Households (%)	Not known			
WATER	3	Distance from the Coast (km)	20km			
≥ u	D D	Climate		erature 20.3; Min mean temperature 9.6		
		Average Annual Rainfall	1013.7mm			
		FACTOR	YES / NO	NOTES / EXPLANATION		
		Drought	Yes	Unconfirmed Local Knowledge: based on Water Corporation advice th there are no issues		
				Unconfirmed Local Knowledge: based on Water Corporation advice th		
		Single drinking water source	Yes	there are no issues		
l		Poor quality water source	No	Unconfirmed Local Knowledge: based on Water Corporation advice th		
				there are no issues		
		Sewage overflow or disposal into water source	No	Unconfirmed Local Knowledge: based on Water Corporation advice th there are no issues		
ļ			Vee	Unconfirmed Local Knowledge: based on Water Corporation advice th		
ļ		Flooding	Yes	there are no issues		
	Catchment and Water Supply	Fauna defecating in supply	No	Unconfirmed Local Knowledge: based on Water Corporation advice th		
ļ				there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice the		
		Fauna destroying water intake structures	No	there are no issues		
		Natural mineral pollutants (e.g. uranium,	No	Unconfirmed Local Knowledge: based on Water Corporation advice th		
		nitrates, iron, fluoride)	INU	there are no issues		
	> pi	Un-lined landfills	Yes	Unconfirmed Local Knowledge: based on Water Corporation advice th		
	tar			there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th		
_	nen	Extensive agriculture	Yes	there are no issues		
	chr	Low vegetation cover (dust, sediment	No	Unconfirmed Local Knowledge: based on Water Corporation advice th		
Ę	Cat	runoff)	110	there are no issues		
		Poor access to supply	No	Unconfirmed Local Knowledge: based on Water Corporation advice th there are no issues		
				Unconfirmed Local Knowledge: based on Water Corporation advice th		
-		Unsustainable water extraction	No	there are no issues		
WATER QUART & UR SECURIT		Aquifer turning saline due to high extraction	Νο	Unconfirmed Local Knowledge: based on Water Corporation advice th		
3				there are no issues		
0		Hard water	No	Unconfirmed Local Knowledge: based on Water Corporation advice th there are no issues		
5		Aging or inadequate pipe work and	No	Unconfirmed Local Knowledge: based on Water Corporation advice th		
-		associated infrastructure	No	there are no issues		
ł		Significant water losses due to leaking	No	Unconfirmed Local Knowledge: based on Water Corporation advice th		
3		pipes		there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice the		
		High per capita water consumption	No	there are no issues		
ζ		Inappropriate water quality standards /	No	Unconfirmed Local Knowledge: based on Water Corporation advice the		
\$		objectives	No	there are no issues		
	e	Lack of infrastructure maintenance	No	Unconfirmed Local Knowledge: based on Water Corporation advice the		
	Governance			there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice the		
	/ern	Poor management or governance	No	there are no issues		
	00	Vandalism / sabotage / terrorism	No	Unconfirmed Local Knowledge: based on Water Corporation advice the		
	-	Vandalism / sabotage / terrorism		there are no issues		
		Insufficient trained personnel	No	Unconfirmed Local Knowledge: based on Water Corporation advice th		
		Inadequate funding for maintenance or		there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice the		
		upgrades	No	there are no issues		
	í	Mining / minerals	No	Unconfirmed Local Knowledge.		
	trie					
	Industries	Irrigation	No	Unconfirmed Local Knowledge.		
	Ĕ	Chemicals / process	No	Unconfirmed Local Knowledge.		
	ç			ř.		
		Seasonal population loadings	Yes	Holiday town		
	Population	ocasonal population loadiligo				

CT)	Pathogenic contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
(EFFE	Algal blooms	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
RISK	Heavy metal contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
RITY	Poor chlorine residuals	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
SECURI	Pesticide contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
OR (	Boil water notices	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
ALITY	Deaths or illness due to water quality	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
QUAL	Water restrictions (current and historic)	Yes	Unconfirmed Local Knowledge.
-	Taste and odour issues	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
WATER	Other contamination that would affect health	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
	Notes		

Fown # 89 <		State/Territory	WA			
TOWN		Town Name	Narrogin			
Ĕ		Town Population	4,238 (Census 2006, Urban Centre/Locality)			
R R	≻	Name of Water Utility	Water Corporation of WA			
	3	Rate (\$/kL)	\$0.76 to \$6.54 per kL			
WATER		Per Capita Water Consumption (ML/day)	Not known			
		Number of Connections	Not known			
CATCHMENT AND WATER	≻	Catchment	Harris Dam Supply			
N A	SUPPLY	Sub-Catchment	Harris dam			
D D	SUF	Catchment Protection Status	Good			
A C A	•,	Potable Water Source(s)	Not known			
		Supply Capacity Treatment Plant(s)	Not known Yes, at Harris Dam and re-chlorination on site			
		Level of Treatment	Not known			
		Drinking Water Guidelines	ADWG 1987			
≻			Overall	100% compliance		
WATER QUALITY			Thermotolerant Coliforms	Samples taken 60; 100% compliance		
ີລ			Thermophilic Naegleria	Samples taken 60; 100% compliance		
2			Fluoride (mean)	Samples taken 50 (0.73mg/L);		
Ë		Results (% compliance for 2008 reporting	Hydrocarbons	Samples taken 0		
M⊳		period)	Metals Nitrate (mean)	Samples taken 2; 100% compliance Samples taken 2 (0.1mg/L); 100% compliance		
			Pesticides	Samples taken 1; 100% compliance		
			Radiological	Samples taken 1; 100% compliance		
			Trihalomethanes (mean)	Samples taken 2 (0.136mg/L); 100% compliance		
		Current Water Restrictions	Yes			
сÌ	≿	Proportion of Potable Water Supplied to	Unknown			
WATER	SECURITY	Households (%)				
A N	С Ц	Distance from the Coast (km)	100km	· · · · · · · · · · · · · · · · · · ·		
- 0	5	Climate		ature 22.3; Min mean temperature 9.3		
		Average Annual Rainfall FACTOR	495.9 mm YES / NO	NOTES / EXPLANATION		
		Drought	Yes	Unconfirmed Local Knowledge: based on Water Corporation advice th		
		Single drinking water source	Yes	there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th		
		Poor quality water source	No	there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th		
		Sewage overflow or disposal into water	No	there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th		
		Flooding	Yes	there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th		
				there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice the		
	ply	Fauna defecating in supply	No	there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice the		
	hment and Water Supply	Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium,	No	there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th		
	Nate	nitrates, iron, fluoride)	No	there are no issues		
	_br	Un-lined landfills	Yes			
ŝ	enta	Extensive agriculture	Yes	Unconfirmed Local Knowledge: based on Water Corporation advice the		
AUSE	chme	Low vegetation cover (dust, sediment	No	there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th		
Č Ú	Catc	runoff)		there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th		
r RIS		Poor access to supply	No	there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th		
JRIT		Unsustainable water extraction	No	there are no issues		
SECI		Aquifer turning saline due to high extraction	No	Unconfirmed Local Knowledge: based on Water Corporation advice the there are no issues		
Y OR		Hard water	No	Unconfirmed Local Knowledge: based on Water Corporation advice th there are no issues		
IALIT		Aging or inadequate pipe work and associated infrastructure	No	Unconfirmed Local Knowledge: based on Water Corporation advice th there are no issues		
IR QL		Significant water losses due to leaking pipes	No	Unconfirmed Local Knowledge: based on Water Corporation advice th there are no issues		
WATER QUALITY OR SECURITY RISK (CAUSE)		High per capita water consumption	No	Unconfirmed Local Knowledge: based on Water Corporation advice th there are no issues		
		Inappropriate water quality standards / objectives	No	Unconfirmed Local Knowledge: based on Water Corporation advice the there are no issues		
	e	Lack of infrastructure maintenance	No	Unconfirmed Local Knowledge: based on Water Corporation advice th there are no issues		
	Governance	Poor management or governance	No	Unconfirmed Local Knowledge: based on Water Corporation advice the there are no issues		
	Gov	Vandalism / sabotage / terrorism	No	Unconfirmed Local Knowledge: based on Water Corporation advice the there are no issues		
		Insufficient trained personnel	No	Unconfirmed Local Knowledge: based on Water Corporation advice the there are no issues		
		Inadequate funding for maintenance or		Unconfirmed Local Knowledge: based on Water Corporation advice th		
	_	upgrades	No	there are no issues		

4	3 Irrigation	No	Linconfirmed Level Knowledge
Indus			Unconfirmed Local Knowledge.
	Chemicals / process	No	Unconfirmed Local Knowledge.
llat	Seasonal population loadings	No	
Populat	Rapid population growth	No	Unconfirmed Local Knowledge: based on Water Corporation advice tha
P		140	there are no issues
-	Dether enis contention tion	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
E	Pathogenic contamination	No	there are no issues
Ш			Unconfirmed Local Knowledge: based on Water Corporation advice that
Ë	Algal blooms	No	there are no issues
RISK (EFFECT)			Unconfirmed Local Knowledge: based on Water Corporation advice that
ISI ISI	Heavy metal contamination	No	there are no issues
_	Poor chlorine residuals	No	Unconfirmed Local Knowledge: based on Water Corporation advice tha
Ē			there are no issues
Ц	Pesticide contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
SECURITY			there are no issues
N N			Unconfirmed Local Knowledge: based on Water Corporation advice that
OR	Boil water notices	No	there are no issues
≽			Unconfirmed Local Knowledge: based on Water Corporation advice that
QUALIT	Deaths or illness due to water quality	No	there are no issues
<b>⊿</b>	Water restrictions (current and historic)	Yes	Unconfirmed Local Knowledge.
		Tes	· · · · · · · · · · · · · · · · · · ·
WATER	Taste and odour issues	No	Unconfirmed Local Knowledge: based on Water Corporation advice tha
<b>T</b> ≜			there are no issues
Ś	Other contamination that would affect	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
	health		there are no issues
	Notes		

z	90	State/Territory	WA		
TOWN		Town Name	Newman		
Ĕ		Town Population	4,248 (Census 2006, Urban Centre/Locality)		
R >	٢	Name of Water Utility	Water Corporation of WA		
ЩЦ	5	Rate (\$/kL)	\$0.76 to \$2.76 per kL		
WATER UTILITY		Per Capita Water Consumption (ML/day)	Not known		
	<u> </u>	Number of Connections	Not known		
	r >-	Catchment	North West Region		
	SUPPLY	Sub-Catchment	Not known		
5 ≤ 5	ξG	Catchment Protection Status Potable Water Source(s)	Not known		
۲' <sup>۲</sup>	s o	Supply Capacity	Ground water Not known		
		Treatment Plant(s)	Ves		
		Level of Treatment	Not known		
		Drinking Water Guidelines	ADWG 1987		
≻			Overall	100% compliance	
Ę			Thermotolerant Coliforms	Samples taken 62; 100% compliance	
_ ∩			Thermophilic Naegleria	Samples taken 48; 100% compliance	
WATER QUALITY			Fluoride (mean)	Samples taken 1 (0.55mg/L);	
岜		Results (% compliance for 2008 reporting	Hydrocarbons	Samples taken 0	
Ę		period)	Metals	Samples taken 2; 100% compliance	
5			Nitrate (mean)	Samples taken 2 (1.2mg/L); 100% compliance	
			Pesticides	Samples taken 1; 100% compliance	
			Radiological	Samples taken 1; 100% compliance	
		Current Water Restrictions	Trihalomethanes (mean) Yes	Samples taken 2 (0.009mg/L); 100% compliance	
>	-	Proportion of Potable Water Supplied to			
E	r	Households (%)	Not known		
WATER	3	Distance from the Coast (km)	350km		
ΣĽ	Ú O	Climate		ure 31.4; Min mean temperature 17.3	
, v	.,	Average Annual Rainfall	310.2 mm		
		FACTOR	YES / NO	NOTES / EXPLANATION	
		Drought	Yes	Unconfirmed Local Knowledge: based on Water Corporation advice th	
		Diought	Tes	there are no issues	
		Single drinking water source	Yes	Unconfirmed Local Knowledge: based on Water Corporation advice th	
			103	there are no issues	
		Poor quality water source	No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
				there are no issues	
		Sewage overflow or disposal into water	No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
		source		there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th	
		Flooding	No	there are no issues	
				Unconfirmed Local Knowledge: based on Water Corporation advice th	
		Fauna defecating in supply	No	there are no issues	
	-lq	Former de standing angle intelles atmost and	N1-	Unconfirmed Local Knowledge: based on Water Corporation advice th	
	Catchment and Water Supply	Fauna destroying water intake structures	No	there are no issues	
		Natural mineral pollutants (e.g. uranium,	No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
	Vat	nitrates, iron, fluoride)		there are no issues	
	> p	Un-lined landfills	No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
	an			there are no issues	
	ent	Extensive agriculture	No	Unconfirmed Local Knowledge: based on Water Corporation advice the	
Э	Ę	Low vegetation cover (dust, sediment		there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th	
KISK (CAUSE	atc	runoff)	No	there are no issues	
5	Ó			Unconfirmed Local Knowledge: based on Water Corporation advice th	
¥		Poor access to supply	No	there are no issues	
N N		Lineusteineble weter extraction	No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
-		Unsustainable water extraction	No	there are no issues	
r		Aquifer turning saline due to high extraction	No	Unconfirmed Local Knowledge: based on Water Corporation advice the	
WAIER WUALIIY UR SECURII				there are no issues	
П О		Hard water	No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
Ę				there are no issues	
		Aging or inadequate pipe work and	No	Unconfirmed Local Knowledge: based on Water Corporation advice the	
Ę		associated infrastructure Significant water losses due to leaking		there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th	
Į		pipes	No	there are no issues	
3				Unconfirmed Local Knowledge: based on Water Corporation advice th	
Ľ		High per capita water consumption	No	there are no issues	
= ∡		Inappropriate water quality standards /		Unconfirmed Local Knowledge: based on Water Corporation advice th	
Ś		objectives	No	there are no issues	
	a	Lack of infrastructure maintenance	No	Unconfirmed Local Knowledge: based on Water Corporation advice the	
	Governance			there are no issues	
	ma	Poor management or governance	No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
	ove			there are no issues	
	Ğ	Vandalism / sabotage / terrorism	No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
				there are no issues	
		Insufficient trained personnel	No	Unconfirmed Local Knowledge: based on Water Corporation advice th	
		Inadequate funding for maintenance or		there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice th	
		upgrades	No	there are no issues	
			Vee		
	Industries	Mining / minerals	Yes	Iron Ore mining Town	
	usti	Irrigation	No	Unconfirmed Local Knowledge.	
	pu			-	
		Chemicals / process	No	Unconfirmed Local Knowledge.	
	ulation	Occurrent and a first to the	N1-		
		Seasonal population loadings	No		

Popt	Rapid population growth	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
CT)	Pathogenic contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
RISK (EFFECT)	Algal blooms	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
SK (B	Heavy metal contamination	No	there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that
			there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that
SECURITY	Poor chlorine residuals	No	there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that
SEC	Pesticide contamination	No	there are no issues
SOR	Boil water notices	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
LTTY ITTY	Deaths or illness due to water quality	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
NA N	Water restrictions (current and historic)	Yes	Unconfirmed Local Knowledge.
WATER QUALITY	Taste and odour issues	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
LAW	Other contamination that would affect health	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
	Notes		•

Ş		State/Territory	WA			
TOWN		Town Name	Northam			
		Town Population	6,006 (Census 2006, Urban Centre/Locality)			
₩ }	-	Name of Water Utility	Water Corporation of WA			
WATER	2	Rate (\$/kL)	\$0.76 to \$5.33 per kL			
N I	5	Per Capita Water Consumption (ML/day) Number of Connections	Not known Not known			
		Catchment	Gold Fields and Agricultural	Pegion		
i	د ≻ <sub>ا</sub>	Sub-Catchment	Not known	Region		
Į Į ŀ		Catchment Protection Status	Not known			
	ξ.	Potable Water Source(s)	Not known			
5	0,	Supply Capacity	Not known			
		Treatment Plant(s)	Not known			
		Level of Treatment	Not known			
		Drinking Water Guidelines	ADWG 1987			
Ē			Overall Thermotolerant Coliforms	100% compliance Samples taken 66; 100% compliance		
IAL			Thermophilic Naegleria	Samples taken 66; 100% compliance		
WATER QUALITY			Fluoride (mean)	Samples taken 53 (0.84mg/L);		
		Results (% compliance for 2008 reporting	Hydrocarbons	Samples taken 0		
ΑT		period)	Metals	Samples taken 2; 100% compliance		
Š		. ,	Nitrate (mean)	Samples taken 2 (0.6mg/L); 100% compliance		
			Pesticides	Samples taken 1; 100% compliance		
			Radiological	Samples taken 0		
_			Trihalomethanes (mean)	Samples taken 2 (0.033mg/L); 100% compliance		
		Current Water Restrictions	Yes			
WATER	F	Proportion of Potable Water Supplied to	Not known			
ATE	5	Households (%) Distance from the Coast (km)	100km			
≥ î	Ú	Climate		perature 25.3; Min mean temperature 10.9		
C		Average Annual Rainfall	429.5 mm			
		FACTOR	YES / NO	NOTES / EXPLANATION		
		Drought	Yes	Unconfirmed Local Knowledge: based on Water Corporation advice the		
		Diougin	Tes	there are no issues		
		Single drinking water source	Yes	Unconfirmed Local Knowledge: based on Water Corporation advice th		
			100	there are no issues		
		Poor quality water source	No	Unconfirmed Local Knowledge: based on Water Corporation advice the		
				there are no issues		
		Sewage overflow or disposal into water source	No	Unconfirmed Local Knowledge: based on Water Corporation advice th there are no issues		
				Unconfirmed Local Knowledge: based on Water Corporation advice the		
	Catchment and Water Supply	Flooding	No	there are no issues		
		Found defending in supply	No	Unconfirmed Local Knowledge: based on Water Corporation advice th		
		Fauna defecating in supply	No	there are no issues		
		Fauna destroying water intake structures	No	Unconfirmed Local Knowledge: based on Water Corporation advice th		
				there are no issues		
		Natural mineral pollutants (e.g. uranium,	No	Unconfirmed Local Knowledge: based on Water Corporation advice th		
	ŝ	nitrates, iron, fluoride) Un-lined landfills	Not known	there are no issues		
	pue			Unconfirmed Local Knowledge: based on Water Corporation advice th		
	ut	Extensive agriculture	No	there are no issues		
Ū.	me	Low vegetation cover (dust, sediment	No	Unconfirmed Local Knowledge: based on Water Corporation advice the		
2	tch	runoff)		there are no issues		
5	Ca	Poor access to supply	No	Unconfirmed Local Knowledge: based on Water Corporation advice th		
Ś		· · · · · · · · · · · · · · · · · · ·		there are no issues		
		Unsustainable water extraction	No	Unconfirmed Local Knowledge: based on Water Corporation advice th there are no issues		
-				Unconfirmed Local Knowledge: based on Water Corporation advice th		
2		Aquifer turning saline due to high extraction	No	there are no issues		
5		Llord water	No	Unconfirmed Local Knowledge: based on Water Corporation advice th		
5		Hard water	No	there are no issues		
		Aging or inadequate pipe work and	No	Unconfirmed Local Knowledge: based on Water Corporation advice th		
-		associated infrastructure	No	there are no issues		
Į		Significant water losses due to leaking	No	Unconfirmed Local Knowledge: based on Water Corporation advice th		
ģ		pipes	No	there are no issues		
2		High per capita water consumption	No	Unconfirmed Local Knowledge: based on Water Corporation advice th		
1				there are no issues		
Ş		Inappropriate water quality standards /	No	Unconfirmed Local Knowledge: based on Water Corporation advice th		
		objectives		there are no issues		
	e	Lack of infrastructure maintenance	No	Unconfirmed Local Knowledge: based on Water Corporation advice th there are no issues		
	Governance			Unconfirmed Local Knowledge: based on Water Corporation advice th		
	/err	Poor management or governance	No	there are no issues		
	30	Vandalism / sabatago / torrariam	No	Unconfirmed Local Knowledge: based on Water Corporation advice th		
		Vandalism / sabotage / terrorism	No	there are no issues		
		Insufficient trained personnel	No	Unconfirmed Local Knowledge: based on Water Corporation advice th		
				there are no issues		
		Inadequate funding for maintenance or	No	Unconfirmed Local Knowledge: based on Water Corporation advice th		
		upgrades		there are no issues		
	ies	Mining / minerals	Yes	Iron Ore mining Town		
	Industries	Irrigation	No	Unconfirmed Local Knowledge.		
	npu	Chamicala / process	No	Linconfirmed Local Knowledge		
		Chemicals / process	No	Unconfirmed Local Knowledge.		
	<u></u>	Seasonal population loadings	No			
	ō					
	Population					

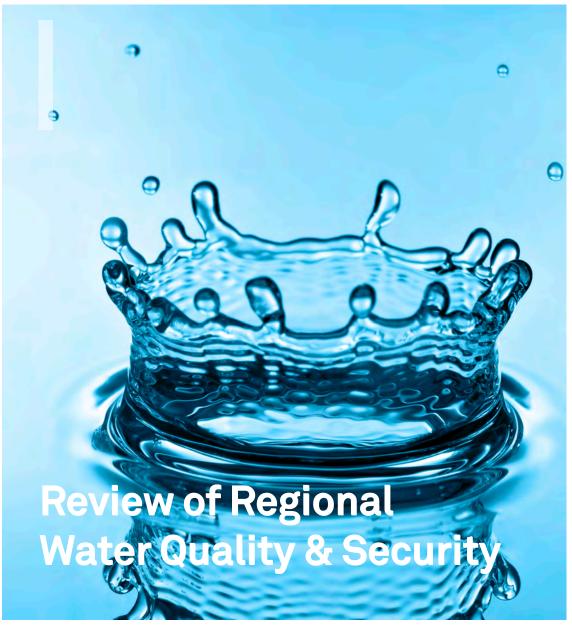
CT)	Pathogenic contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
(EFFE	Algal blooms	No	there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that
I) XSIF	Heavy metal contamination	No	there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that
lTY R	Poor chlorine residuals	No	there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
ECUR	Pesticide contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
OR SI	Boil water notices	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
νΓΙΤΥ	Deaths or illness due to water quality	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
N	Water restrictions (current and historic)	Yes	Unconfirmed Local Knowledge.
ERQ	Taste and odour issues	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
WATER	Other contamination that would affect health	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
	Notes		

Town #	92				
TOWN		State/Territory Town Name	WA Port Hedland		
TO TO		Town Name Town Population	11,557 (Census 2006, Urban Centre/Locality) Water Corporation of WA \$0.76 to \$4.42 per kL		
<u>د ب</u>	~	Name of Water Utility			
WATER	3	Rate (\$/kL)			
1	5	Per Capita Water Consumption (ML/day) Number of Connections	Not known Not known		
Z		Catchment	North West Region		
CATCHMEN T AND	WAI EK SUPPLY	Sub-Catchment	Not known		
		Catchment Protection Status Potable Water Source(s)	Not known Ground Water		
CA	> 0	Supply Capacity	Not known		
		Treatment Plant(s)	Yes		
		Level of Treatment Drinking Water Guidelines	Not known ADWG 1987		
~		Difficing Water Guidelines	Overall	100% compliance	
WATER QUALITY			Thermotolerant Coliforms	Samples taken 72; 100% compliance	
n n			Thermophilic Naegleria	Samples taken 72; 100% compliance	
Ř		Results (% compliance for 2008 reporting	Fluoride (mean) Hydrocarbons	Samples taken 52 (0.43mg/L); Samples taken 2; 100% compliance	
'ATI		period)	Metals	Samples taken 10; 100% compliance	
3			Nitrate (mean)	Samples taken 8 (0.9mg/L); 100% compliance	
			Pesticides Radiological	Samples taken 2; 100% compliance Samples taken 2; 100% compliance	
			Trihalomethanes (mean)	Samples taken 4 (<0.004mg/L); 100% compliance	
		Current Water Restrictions	Yes		
WATER	Ŧ	Proportion of Potable Water Supplied to Households (%)	Not known		
I AT	5	Distance from the Coast (km)	0 km		
≤ L (	Ж	Climate		ure 31.8; Min mean temperature 20.4	
		Average Annual Rainfall FACTOR	329.5 mm YES / NO	NOTES / EXPLANATION	
	1			Unconfirmed Local Knowledge: based on Water Corporation advice that	
		Drought	Yes	there are no issues	
		Single drinking water source	Yes	Unconfirmed Local Knowledge: based on Water Corporation advice that	
				there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that	
		Poor quality water source	No	there are no issues	
		Sewage overflow or disposal into water	No	Unconfirmed Local Knowledge: based on Water Corporation advice that	
		source		there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that	
		Flooding	No	there are no issues	
	Vic	Fauna defecating in supply	No	Unconfirmed Local Knowledge: based on Water Corporation advice that	
				there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that	
	Idne	Fauna destroying water intake structures	No	there are no issues	
	ter S	Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)	No	Unconfirmed Local Knowledge: based on Water Corporation advice that	
	Wa			there are no issues Unconfirmed Local Knowledge: based on Water Corporation advice that	
	Catchment and Water Supply	Un-lined landfills	No	there are no issues	
		Extensive agriculture	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues	
Э́Ц	ů h	Low vegetation cover (dust, sediment			
AUS	Cato	runoff)	yes	Unconfirmed Local Knowledge.	
Û	-	Poor access to supply	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues	
SECURITY RISK (CAUSE)			N	Unconfirmed Local Knowledge: based on Water Corporation advice that	
۳ ۲		Unsustainable water extraction	No	there are no issues	
IIII		Aquifer turning saline due to high extraction	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues	
ECL			N.	Unconfirmed Local Knowledge: based on Water Corporation advice that	
R SI		Hard water	No	there are no issues	
WATER QUALITY OR		Aging or inadequate pipe work and associated infrastructure	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues	
L I		Significant water losses due to leaking	No	Unconfirmed Local Knowledge: based on Water Corporation advice that	
AUG		pipes	NO	there are no issues	
IR (		High per capita water consumption	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues	
ATE		Inappropriate water quality standards /	No	Unconfirmed Local Knowledge: based on Water Corporation advice that	
≥		objectives		there are no issues	
	8	Lack of infrastructure maintenance	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues	
	Governance	Deer management or governance	No	Unconfirmed Local Knowledge: based on Water Corporation advice that	
	over	Poor management or governance	INU	there are no issues	
	ğ	Vandalism / sabotage / terrorism	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues	
		Insufficient trained personnel	No	Unconfirmed Local Knowledge: based on Water Corporation advice that	
		Insufficient trained personnel		there are no issues	
		Inadequate funding for maintenance or upgrades	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues	
	6	Mining / minerals	Yes	Minerals Export - Port Facility	
	tries	Irrigation	No	Unconfirmed Local Knowledge.	
	Industries				
	2	Chemicals / process	No	Unconfirmed Local Knowledge.	
	<b></b>	Seasonal population loadings	No		
	5	ocasonal population lodulitys	110		
	lation				
	opulation		Yes	Growth in Minerals Industry	
ECT)	Population	Rapid population growth	Yes	Growth in Minerals Industry Unconfirmed Local Knowledge: based on Water Corporation advice that	

(EFFI	Algal blooms	No	Unconfirmed Local Knowledge: based on Water Corporation advice that there are no issues
RISK	Heavy metal contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
RIG			there are no issues
≿	Poor chlorine residuals	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
E	F oor chionne residuais	INO	there are no issues
SECURI	Pesticide contamination	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
ŭ			there are no issues
OR (	Boil water notices	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
0			there are no issues
E	Deaths or illness due to water quality		Unconfirmed Local Knowledge: based on Water Corporation advice that
AL	Deaths of infields due to water quality	No	there are no issues
QUAL	Water restrictions (current and historic)	Yes	Unconfirmed Local Knowledge.
	Taste and odour issues	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
Ē	Taste and odour issues		there are no issues
NATER	Other contamination that would affect	No	Unconfirmed Local Knowledge: based on Water Corporation advice that
>	health	140	there are no issues
	Notes		

## AECOM

## Town Profiles – NT



z	State/Territory	NT		
TOWN	Town Name	Alice Springs		
6	Town Population		A for 2008 Reference 3218.0)	
	Name of Water Utility	Power and Water Co	,	
WATER UTILITY	Rate (\$/kL)		mestic and commercial; 95.36 cents/kL for government	
I A	Per Capita Water Consumption (ML/day)	1212kL/connection/a		
35	Number of Connections	7,612	indin	
	Catchment	Amadeus Basin (Gro	undwater)	
CATCHMENT AND WATER SUPPLY				
r ⊢ H	Sub-Catchment	Mereenie Rock Aquif		
SC E	Catchment Management Authority (CMA)		burces, Environment, The Arts and Sport	
Ęü	CMA Web-Link	www.nt.gov.au/nreta	water	
5 번	Catchment Protection Status	None		
AT V	Potable Water Source(s)	Roe Creek Borefield		
0-	Supply Capacity		2006-2015 water allocation plan)	
	Level of Treatment	Disinfection		
	Treatment Plant(s)	Temple Bar		
	Drinking Water Guidelines	ADWG 2004, TDS g	uideline value set by the Department of Environmental Health.	
			Health Parameters - 95th Percentile Values (mg/L)	
		Antimony	<0.0002	
		Arsenic	0.0010	
		Barium	0.10	
		Boron	0.14	
		Cadmium	<0.0002	
		Chlorine (free)	DNA	
		Chromium	<0.005	
		Copper	0.22	
		Fluoride	0.5	
		lodide	0.15	
		Lead	0.006	
		Manganese	0.023	
		Mercury	<0.0001	
		Molybdenum	<0.005	
		Nickel	0.006	
		Nitrate	7	
		Radiological mSv/yr	DNA	
		Selenium	0.004	
		Silver	<0.01	
		Sulfate	68	
		THM's	<0.004	
		Uranium	0.00956	
≿			Aesthetic Parameters - Mean Values (mg/L)	
		Aluminium	<0.02	
NALITY		Chloride	<0.02 73	
R QUALITY		Chloride Chlorine (free)	<0.02 73 DNA	
rer quality	Results (% compliance for 2008 reporting	Chloride Chlorine (free) Copper	<0.02 73	
ATER QUALITY	Results (% compliance for 2008 reporting period)	Chloride Chlorine (free) Copper Hardness (mg/L)	<0.02 73 DNA 0.10	
WATER QUALITY		Chloride Chlorine (free) Copper	<0.02 73 DNA 0.10 219	
WATER QUALITY		Chloride Chlorine (free) Copper Hardness (mg/L)	<0.02 73 DNA 0.10 219 0.03	
WATER QUALITY		Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese	<0.02 73 DNA 0.10 219 0.03 0.007	
WATER QUALITY		Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH	<0.02 73 DNA 0.10 219 0.03 0.007 7.7	
WATER QUALITY		Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Sodium	<0.02 73 DNA 0.10 <b>219</b> 0.03 0.007 7.7 77	
WATER QUALITY		Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH	<0.02 73 DNA 0.10 219 0.03 0.007 7.7	
WATER QUALITY		Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Sodium	<0.02 73 DNA 0.10 <b>219</b> 0.03 0.007 7.7 77	
WATER QUALITY		Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Sodium Sulfate	<0.02 73 DNA 0.10 219 0.03 0.007 7.7 77 60	
WATER QUALITY		Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Sodium Sodium Sulfate TDS	<0.02 73 DNA 0.10 219 0.03 0.007 7.7 77 60 463	
WATER QUALITY		Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Sodium Sodium Sulfate TDS	<0.02 73 DNA 0.10 219 0.03 0.007 7.7 77 60 463	
WATER QUALITY		Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Sodium Sodium Sulfate TDS	<0.02 73 DNA 0.10 219 0.03 0.007 7.7 77 60 463 0.05	
WATER QUALITY		Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Sodium Sulfate TDS Zinc Alkalinity	<0.02 73 DNA 0.10 <b>219</b> 0.03 0.007 7.7 77 60 463 0.05 Other Parameters - Mean Values (mg/L)	
WATER QUALITY		Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Sodium Sulfate TDS Zinc Alkalinity Beryllium	<0.02 73 DNA 0.10 219 0.03 0.007 7.7 77 60 463 0.05 Other Parameters - Mean Values (mg/L) 256 <0.001	
WATER QUALITY		Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Sodium Sulfate TDS Zinc Alkalinity Beryllium Bromide	<0.02 73 DNA 0.10 219 0.03 0.007 7.7 77 60 463 0.05 Other Parameters - Mean Values (mg/L) 256	
WATER QUALITY		Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Sodium Sulfate TDS Zinc Alkalinity Beryllium Bromide Calcium	<0.02 73 DNA 0.10 219 0.03 0.007 7.7 77 60 463 0.05 Other Parameters - Mean Values (mg/L) 256 <0.001 0.42 47	
WATER QUALITY		Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Sodium Sulfate TDS Zinc Alkalinity Beryllium Bromide Calcium (µS/cm)	<0.02 73 DNA 0.10 219 0.03 0.007 7.7 77 60 463 0.05 Other Parameters - Mean Values (mg/L) 256 <0.001 0.42 47 816	
WATER QUALITY		Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Sodium Sulfate TDS Zinc Alkalinity Beryllium Bromide Ccalcium (µS/cm) Magnesium	<0.02 73 DNA 0.10 <b>219</b> 0.03 0.007 7.7 77 60 463 0.05 <i>Other Parameters - Mean Values (mg/L)</i> 256 <0.001 0.42 47 816 25	
WATER QUALITY		Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Sodium Sulfate TDS Zinc Zinc Alkalinity Beryllium Bromide Calcium (µS/cm) Magnesium Potassium	<0.02 73 DNA 0.10 219 0.03 0.007 7.7 77 60 463 0.05 Other Parameters - Mean Values (mg/L) 256 <0.001 0.42 47 816 25 6.6	
WATER QUALITY		Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Sodium Sulfate TDS Zinc Alkalinity Beryllium Bromide Calcium (µS/cm) Magnesium Silica	<0.02 73 DNA 0.10 219 0.03 0.007 7.7 77 60 463 0.05 Other Parameters - Mean Values (mg/L) 256 <0.001 0.42 47 816 25 6.6 18	
WATER QUALITY		Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Sodium Sulfate TDS Zinc Zinc Alkalinity Beryllium Bromide Calcium (µS/cm) Magnesium Potassium	<0.02 73 DNA 0.10 219 0.03 0.007 7.7 77 60 463 0.05 Other Parameters - Mean Values (mg/L) 256 <0.001 0.42 47 816 25 6.6	
WATER QUALITY		Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Sodium Sulfate TDS Zinc Alkalinity Beryllium Bromide Calcium (µS/cm) Magnesium Potassium Silica Tin	<0.02 73 DNA 0.10 219 0.03 0.007 7.7 77 60 463 0.05 Other Parameters - Mean Values (mg/L) 256 <0.001 0.42 47 816 25 6.6 18 <0.01	
WATER QUALITY		Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Sodium Sulfate TDS Zinc Alkalinity Beryllium Bromide Calcium (µS/cm) Magnesium Potassium Silica Tin * Radiological value	<0.02 73 DNA 0.10 219 0.03 0.007 7.7 77 60 463 0.05 Other Parameters - Mean Values (mg/L) 256 <0.001 0.42 47 816 25 6.6 18 <25 6.6 18 <code display="block"></code>	
WATER QUALITY		Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Sodium Sulfate TDS Zinc Alkalinity Beryllium Bromide Calcium (µS/cm) Magnesium Potassium Silica Tin * Radiological value e * Values in bold exce	<0.02	
WATER QUALITY		Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Sodium Sulfate TDS Zinc Alkalinity Beryllium Bromide Calcium (µS/cm) Magnesium Potassium Silica Tin * Radiological value	<0.02	
WATER QUALITY		Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Sodium Sulfate TDS Zinc Alkalinity Beryllium Bromide Calcium (µS/cm) Magnesium Potassium Silica Tin * Radiological value e * Values in bold exce	<0.02	
WATER QUALITY		Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Sodium Sulfate TDS Zinc Alkalinity Beryllium Bromide Ccalcium (µS/cm) Magnesium Potassium Silica Tin * Radiological value * DNA - Data Not Avi	<0.02	
WATER QUALITY		Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Sodium Sulfate TDS Zinc Alkalinity Beryllium Bromide Calcium (µS/cm) Magnesium Potassium Silica Tin * Radiological value * DNA - Data Not Ava E. coli	<0.02	
WATER QUALITY		Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Sodium Sulfate TDS Zinc Alkalinity Beryllium Bromide Ccalcium (µS/cm) Magnesium Potassium Silica Tin * Radiological value * DNA - Data Not Avi	<0.02	
WATER QUALITY	period)	Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Sodium Sulfate TDS Zinc Alkalinity Beryllium Bromide Calcium (µS/cm) Magnesium Potassium Silica Tin * Radiological value * Values in bold exce * DNA - Data Not Avi E. coli Total Coliforms	<0.02	
	period)	Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Sodium Sulfate TDS Zinc Alkalinity Beryllium Bromide Calcium (µS/cm) Magnesium Potassium Silica Tin * Radiological value * DNA - Data Not Ava E. coli	<0.02	
	period)           Current Water Restrictions           Proportion of Potable Water Supplied to	Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Sodium Sulfate TDS Zinc Alkalinity Beryllium Bromide Calcum (µS/cm) Magnesium Potassium Silica Tin * Radiological value : * Values in bold exce * DNA - Data Not Avi E. coli Total Coliforms No	<0.02	
	period)  Eurrent Water Restrictions  Proportion of Potable Water Supplied to Households (%)	Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Solfate TDS Zinc Alkalinity Beryllium Bromide Calcium (µS/cm) Magnesium Potassium Silica Tin * Radiological value i * Values in bold exce * DNA - Data Not Ava E. coli Total Coliforms No	<0.02	
	Current Water Restrictions Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km)	Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Sodium Sulfate TDS Zinc Alkalinity Beryllium Bromide Calcum (µS/cm) Magnesium Potassium Silica Tin * Radiological value * Values in bold exce * DNA - Data Not Ava E. coli Total Coliforms S9% Approximately 1500	<0.02	
WATER BECURITY	period)  Eurrent Water Restrictions  Proportion of Potable Water Supplied to Households (%)	Chloride Chlorine (free) Copper Hardness (mg/L) CaCO3 Iron Manganese pH Solfate TDS Zinc Alkalinity Beryllium Bromide Calcium (µS/cm) Magnesium Potassium Silica Tin * Radiological value i * Values in bold exce * DNA - Data Not Ava E. coli Total Coliforms No	<0.02	

		FACTOR	YES / NO	NOTES / EXPLANATION
		Drought	No	
		Single drinking water source	Yes	
		Poor quality water source	No	
		Sewage overflow or disposal into water		
		source	No	
		Flooding	Yes	
	Catchment and Water Supply	Fauna defecating in supply	No	
		Fauna destroying water intake structures	No	
		Natural mineral pollutants (e.g. uranium,	No.	
	ter	nitrates, iron, fluoride)	Yes	lodide.
	Na	Un-lined landfills	No	
	pr /	Extensive agriculture	No	
Э.	tar	Low vegetation cover (dust, sediment	No	
SU	len	runoff)	NO	
C	hr	Poor access to supply	Yes?	Bores to 500m deep.
¥	Cato	Unsustainable water extraction	Yes	Non-renewable supply.
WATER QUALITY OR SECURITY RISK (CAUSE)		Aquifer turning saline due to high	No	
7		extraction	110	
E		Hard water	Yes	219mg/L CaCO3.
C		Aging or inadequate pipe work and	No	
SE		associated infrastructure		
R		Significant water losses due to leaking	No	
~		pipes	-	
5	Governance	High per capita water consumption	Yes	
٩N		Inappropriate water quality standards /	N/A	
ð		objectives	N	
Ë		Lack of infrastructure maintenance	No No	
IAT		Poor management or governance Vandalism / sabotage / terrorism	No	
5	Ö	Insufficient trained personnel	No	
		Inadequate funding for maintenance or	INU	
		upgrades	No	
			NI-	
	Industries	Mining / minerals	No	
	ustr	Irrigation	No	
	ndt			
		Chemicals / process	No	
	Б	Seasonal population loadings	Yes	Popular tourist destination, particularly during winter.
	latio	Seasonal population loadings	Tes	Popular tourist destination, particularly during winter.
	Population			
	д	Rapid population growth	No	
	~	Pathogenic contamination	No	No E. coli detected or Naegleria fowleri detected in 2007-08.
Í	SECURII Y KISK (EFFECT)	Algal blooms	No	
WATER QUALITY OR	Ц	Heavy metal contamination	No	
≿ ł	Щ.	Poor chlorine residuals	No	
ALI'	¥	Pesticide contamination	No	
	N Y	Boil water notices	No	None in 2007-08 but may potentially be issued during flooding.
R	~	Deaths or illness due to water quality	No reported deaths	Risk of potential illness if boil water alert instructions not adhered to.
μË	r	Water restrictions (current and historic)	No	
AN N	D	Taste and odour issues	No	
	С Ц	Other contamination that would affect	No	Current ADWG value for iodide exceeded but ADWG 2010 value
		health		expected to be raised to 0.4 mg/L.
		Notes		

Town # 94	4			
Z,	State/Territory	NT		
TOWN	Town Name	Katherine		
F	Town Population		r 2008 Reference 3218.0)	
≃≻	Name of Water Utility	Power and Water Corpor		
WATER UTILITY	Rate (\$/kL)		stic and commercial; 95.36 cents/kL for government	
M⊻U	Per Capita Water Consumption (L/day)	1565kL/connection/annu	n	
-	Number of Connections	2031		
Δ.	Catchment	Daly Kathoring Diver		
CATCHMENT AND WATER SUPPLY	Sub-Catchment Catchment Management Authority (CMA)	Katherine River Regulator - NT Dept of Na	atural Resources, Environment, The Arts and Sport	
μ Ε Ε Ε	CMA Web-Link	www.nt.gov.au/nreta/wat		
s su	Catchment Protection Status		atchment zoned Water Management under NT Planning Scheme	
토법	Potable Water Source(s)	Surface Water - Katherin	e River	
ATC		Groundwater - Tindal Aqu		
2 >	Supply Capacity	Surface Water - 4500 ML		
			rr at Total Security (plus an additional 2200 ML/yr subject to allocations)	
	Level of Treatment	Groundwater:-Disinfectio	/flocculation, filtration, disinfection and fluoridation	
	Treates and Direct(a)			
	Treatment Plant(s) Drinking Water Guidelines		ent Plant, Morris Road Katherine NT 0850 ine value set by the Department of Environmental Health.	
	Diliking water Guidennes		Health Parameters - 95th Percentile Values (mg/L)	
		Antimony		
		Arsenic	<0.0005	
		Barium	<0.05	
		Boron	<0.02	
		Cadmium	<0.0002	
		Chlorine (free)	0.81	
		Chromium	<0.005	
		Copper Fluoride	0.03	
		lodide	<	
		Lead	<0.01	
		Manganese	0.005	
		Mercury	<0.0001	
		Molybdenum	<0.005	
		Nickel	<0.002	
		Nitrate		
		Radiological mSv/yr Selenium	DNA <0.001	
		Silver	<0.01	
		Sulfate	15	
		THM's	0.040	
		Uranium	0.00017	
7				
WATER QUALITY	Results (% compliance for 2008 reporting		Aesthetic Parameters - Mean Values (mg/L)	
νΩ		Aluminium	0.03 5	
2		Chloride Chlorine (free)	0.58	
Ē		Copper	0.01	
NA.	period)		0.01	
-	, ,	Hardness (mg/L) CaCO3	109	
		Iron	0.02	
		Manganese	<0.005	
		pH	7.7	
		Sodium	6	
		Sulfate TDS	5 129	
		Zinc		
			U. 1Z	
			0.12	
			Other Parameters - Mean Values (mg/L)	
		Alkalinity	Other Parameters - Mean Values (mg/L) 107	
		Beryllium	Other Parameters - Mean Values (mg/L) 107 <0.001	
		Beryllium Bromide	Other Parameters - Mean Values (mg/L) 107 <0.001 0.02	
		Beryllium Bromide Calcium	Other Parameters - Mean Values (mg/L) 107 <0.001	
		Beryllium Bromide Calcium Electrical conductivity	Other Parameters - Mean Values (mg/L) 107 <0.001 0.02 25	
		Beryllium Bromide Calcium Electrical conductivity (µS/cm)	Other Parameters - Mean Values (mg/L) 107 <0.001 0.02 25 222	
		Beryllium Bromide Calcium Electrical conductivity (µS/cm) Magnesium	Other Parameters - Mean Values (mg/L) 107 <0.001 0.02 222 11	
		Beryllium Bromide Calcium Electrical conductivity (µS/cm)	Other Parameters - Mean Values (mg/L) 107 <0.001 0.02 25 222	
		Beryllium Bromide Calcium Electrical conductivity (µS/cm) Magnesium Potassium	Other Parameters - Mean Values (mg/L) 107 <0.001 0.02 25 222 11 1.0	
		Beryllium Bromide Calcium Electrical conductivity (µS/cm) Magnesium Potassium Silica Tin	Other Parameters - Mean Values (mg/L) 107 <0.001 0.02 25 222 11 1.0 10 <0.01 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
		Beryllium Bromide Calcium Electrical conductivity (µS/cm) Magnesium Potassium Silica Tin * Radiological value repo	Other Parameters - Mean Values (mg/L)           107           <0.001	
		Beryllium Bromide Calcium Electrical conductivity (μS/cm) Magnesium Potassium Silica Tin * Radiological value repo * Values in bold exceed A	Other Parameters - Mean Values (mg/L)           107           <0.001	
		Beryllium Bromide Calcium Electrical conductivity (µS/cm) Magnesium Potassium Silica Tin * Radiological value repo * Values in bold exceed <i>I</i> * DNA - Data not availabl	Other Parameters - Mean Values (mg/L)           107           <0.001	
		Beryllium Bromide Calcium Electrical conductivity (µS/cm) Magnesium Potassium Silica Tin * Radiological value repo * Values in bold exceed <i>I</i> * DNA - Data not availabl	Other Parameters - Mean Values (mg/L)           107           <0.001	
		Beryllium Bromide Calcium Electrical conductivity (μS/cm) Magnesium Potassium Silica Tin * Radiological value repo * Values in bold exceed <i>I</i> * DNA - Data not availabl	Other Parameters - Mean Values (mg/L) 107 <0.001 0.02 25 222 11 1. 1.0 10 <0.01 10 <0.01 25 222 222 222 222 222 222 222 222 222	
		Beryllium Bromide Calcium Electrical conductivity (μS/cm) Magnesium Potassium Silica Tin * Radiological value repo * Values in bold exceed A * DNA - Data not availabl E. coli	Other Parameters - Mean Values (mg/L)           107           <0.001	
	Current Water Restrictions	Beryllium Bromide Calcium Electrical conductivity (μS/cm) Magnesium Potassium Silica Tin * Radiological value repo * Values in bold exceed A * DNA - Data not availabl E. coli	Other Parameters - Mean Values (mg/L)           107           <0.001	
ER VITY	Proportion of Potable Water Supplied to	Beryllium Bromide Calcium Electrical conductivity (μS/cm) Magnesium Potassium Silica Tin * Radiological value repo * Values in bold exceed A * DNA - Data not availabl E. coli Total Coliforms	Other Parameters - Mean Values (mg/L)           107           <0.001	
URITY URITY	Proportion of Potable Water Supplied to Households (%)	Beryllium Bromide Calcium Electrical conductivity (µS/cm) Magnesium Potassium Silica Tin * Radiological value repo * Values in bold exceed A * DNA - Data not availabl E. coli Total Coliforms No 41%	Other Parameters - Mean Values (mg/L)           107           <0.001	
WATER ECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km)	Beryllium Bromide Calcium Electrical conductivity (µS/cm) Magnesium Potassium Silica Tin * Radiological value repo * Values in bold exceed A * DNA - Data not availabl E. coli Total Coliforms No 41% Approximately 270 km	Other Parameters - Mean Values (mg/L)           107           <0.001	
WATER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate	Beryllium Bromide Calcium Electrical conductivity (µS/cm) Magnesium Potassium Silica Tin * Radiological value repo * Values in bold exceed A * DNA - Data not availabl E. coli Total Coliforms No 41% Approximately 270 km	Other Parameters - Mean Values (mg/L)         107         <0.001	
WATER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km)	Beryllium Bromide Calcium Electrical conductivity (µS/cm) Magnesium Potassium Silica Tin * Radiological value repo * Values in bold exceed A * DNA - Data not availabl E. coli Total Coliforms No 41% Approximately 270 km	Other Parameters - Mean Values (mg/L)         107         <0.001	
WATER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall	Beryllium           Bromide           Calcium           Electrical conductivity           (μS/cm)           Magnesium           Potassium           Silica           Tin           * Radiological value repo           * Values in bold exceed A           * DNA - Data not availabl           E. coli           Total Coliforms           No           41%           Approximately 270 km           Wet/Dry Tropics           989.8mm (Katherine Cou	Other Parameters - Mean Values (mg/L)           107           <0.001	

		De ser sue l'iteration e ser se	¥	Conventional treatment of surface water required. Groundwater has high
		Poor quality water source	Yes	hardness and aquifer at risk of contamination.
		Sewage overflow or disposal into water		Rural residential properties with septic tanks located along Katherine
		source	Yes	River. On-site sewage treatment plant at Katherine Gorge park and tourist
				boats operating on Katherine River.
	>	Flooding	Yes	Large portion of town is located on flood plain.
	dd	Fauna defecating in supply	Yes	
	Catchment and Water Supply	Fauna destroying water intake structures	No	
		Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)	No	
		Un-lined landfills	No	
ÎÌÌ	ри	Extensive agriculture	Yes	Small-scale horticulture plus pastoral in catchments.
ISL	nta	Low vegetation cover (dust, sediment		
CAL	ner	runoff)	Yes	Sediment runoff is a consideration during first flush wet season events.
U V	-L-	Poor access to supply	No	
ts:	Cat	Unsustainable water extraction	No	
WATER QUALITY OR SECURITY RISK (CAUSE)	Ŭ	Aquifer turning saline due to high extraction	No	
URI		Hard water	Yes	Ground water source hardness approx 400 mg/L CaCo3. Blended supply
U U U				can reach 150+mg/L CaCo3.
s		Aging or inadequate pipe work and	No	
Ч		associated infrastructure		
È		Significant water losses due to leaking pipes	No	
AL	е	High per capita water consumption	Yes	
g		Inappropriate water quality standards /	N/A	
Ř		objectives	N/A	
AT B	lan	Lack of infrastructure maintenance	No	
ŝ	Governance	Poor management or governance	No	
		Vandalism / sabotage / terrorism	Yes	Previous vandalism and intrusions to service storage tanks detected.
		Insufficient trained personnel	No	
		Inadequate funding for maintenance or upgrades	No	
	Industries	Mining / minerals	Yes	Proposed significant mine within catchment.
		Irrigation	Yes	Groundwater component shared with irrigators.
		Chemicals / process	No	
	-			
	Population	Seasonal population loadings	Yes	Popular tourist destination.
	oula			
	Pol	Rapid population growth	No	
	Ê	Pathogenic contamination	No	No E. coli detected or Naegleria fowleri detected in 2007-08.
ц	с Ш	Algal blooms	No	
WATER QUALITY OR	SECURITY RISK (EFFECT)	Heavy metal contamination	No	
Ę	Ū	Poor chlorine residuals	No	
IAL	х Х	Pesticide contamination	No	
В	R	Boil water notices	No	None in 2007-08 but may potentially be issued during flooding.
Ľ.	≿	Deaths or illness due to water quality	No reported deaths	Risk of potential illness if boil water alert instructions not adhered to.
TE	R	Water restrictions (current and historic)	No	
M⊳	5	Taste and odour issues	No	
	SE	Other contamination that would affect health	No	
		Notes		
		110100		

TOWIT# 30		NT		
TOWN	State/Territory	NT		
NO NO	Town Name	Maningrida		
Ĕ	Town Population	2,746 (Census 2006, Urb	pan Centre/Locality)	
	Name of Water Utility	Power and Water Corpo		
≃≻				
L L S	Rate (\$/kL)	89.90 cents/kL for domes	stic and commercial; 95.36 cents/kL for government	
WATER UTILITY	Per Capita Water Consumption (L/day)	500L/day		
$\leq \supset$	Number of Connections	Could not be obtained		
-				
	Catchment	Marchinbar Sandstone		
₽≻	Sub-Catchment	Upper Section		
, A , A	Catchment Management Authority (CMA)	Regulator - NT Dept of N	latural Resources, Entertainment, the Arts and Sports	
~ 문				
N N	CMA Web-Link	www.nt.gov.au/nreta/wat	ler	
Ξñ	Catchment Protection Status	State wide Policy		
CATCHMENT AND WATER SUPPLY	Potable Water Source(s)	Groundwater - Upper se	ction of the Marchinbar Sandstone	
ĔĔ				
A ≥	Supply Capacity		Marchinbar Sandstone is 15000 ML/year, however the sustainable yield of	
Ŭ	Supply Supulity	the lower aquifer used for	or current extraction is 1497 ML/year	
	Level of Treatment	Groundwater:-Disinfection	n	
	Treatment Plant(s)	In-line Sodium Hypochlo	rite dosing	
	Drinking Water Guidelines		line value set by the Department of Environmental Health.	
			Health Parameters - 95th Percentile Values (mg/L)	
		Antimony	0.0001	
		Arsenic	0.00025	
		Barium	0.025	
		Boron	0.04	
		Cadmium	0.0001	
		Chromium	0.0025	
		Fluoride	0.05	
		Lead	0.001925	
		Mercury	0.00005	
		Molybdenum	0.0025	
		Nickel	0.001	
		Nitrate	0.5	
		Nitrite	DNA	
		Radiological (mSv/yr)	Gross α,β < 0.5 Bq/L	
		Selenium	0.0005	
		Silver	0.005	
		Uranium	0.00003	
			Aesthetic Parameters - Mean Values (mg/L)	
		Aluminium	0.01	
		Chloride	8.35	
~		Copper	0.025	
E		Hardness	7.9	
AL				
D D		lodine	0.01	
0		Iron Fe_T	0.01	
Li Li	Results (% compliance for 2008 reporting	Manganese	0.035	
E	period)	pH (pH Units)	6.65	
WATER QUALITY	penday			
-		Sodium	4.65	
		Sulfate	0.645	
		Total Dissolved Solids	49.5	
		True Colour (CU)	1.55	
		Turbidity (NTU)	0.165	
		Zinc	0.02	
			Other Parameters - Mean Values (mg/L)	
		Alkelipity		
		Alkalinity	8.55	
		Beryllium	0.0005	
		Bromide	0.141	
		Calcium	1.98	
		Electrical conductivity		
			10	
		(µS/cm)	46	
		Magnesium	0.785	
		Potassium	0.82	
		Silica	14	
		Tin	0.005	
		* Radiological value repo	orted is an average annual dose	
		* Values in bold exceed		
		* DNA - Data not availab		
		E	Bacteriological Parameters (% compliance 2008-09)	
		E. coli	100%	
		Total Coliforms	100%	
	Current Water Restrictions	A cap has been placed of	on the abstraction of groundwater	
WATER SECURITY	Proportion of Potable Water Supplied to			
SH ER		Could not be obtained		
ΕS	Households (%)	0		
S S	Distance from the Coast (km)	On the coast line (<500 r	n)	
SE /	Climate	Wet/Dry Tropics		
	Average Annual Rainfall	1284.4 mm (45 years his	torical data - BOM)	
	FACTOR	YES / NO	NOTES / EXPLANATION	
	Drought	120/110		

н

Drought

No

		Single drinking water source	Yes	
		Poor quality water source	No	
		Sewage overflow or disposal into water		
		source	No	Arafura Sea 180m North Pond
		Flooding	Yes	
	>	Fauna defecating in supply	No	
	ldd	Fauna destroying water intake structures	No	
	Sul	Natural mineral pollutants (e.g. uranium,	No	
	ter	nitrates, iron, fluoride)	NO	
	Va	Un-lined landfills		
	pu	Extensive agriculture	No	
JSE)	Catchment and Water Supply	Low vegetation cover (dust, sediment runoff)	No	
CAL	hm	Poor access to supply	No	
) Y	atc	Unsustainable water extraction	No	
r RISI	0	Aquifer turning saline due to high extraction	No	
É		Hard water	No	
ECUF		Aging or inadequate pipe work and associated infrastructure	No	
WATER QUALITY OR SECURITY RISK (CAUSE)		Significant water losses due to leaking pipes	No	
≽		High per capita water consumption	Yes	
DALI	e	Inappropriate water quality standards / objectives	No	
6	anci	Lack of infrastructure maintenance	No	
Ē	Governance	Poor management or governance	No	
NA.		Vandalism / sabotage / terrorism	No	
_		Insufficient trained personnel	No	
		Inadequate funding for maintenance or upgrades	No	
	ies	Mining / minerals	No	
	Industries	Irrigation	No	
	_	Chemicals / process	No	
	ation	Seasonal population loadings	No	
	Population	Rapid population growth	No	2%pa (from ABS Census 2001-2006)
	~	Pathogenic contamination	No	
r	CT	Algal blooms	No	
O D	Щ	Heavy metal contamination	No	
È	Ш	Poor chlorine residuals	No	
ALI	X	Pesticide contamination	No	4
α	Ř	Boil water notices	No	4
Ľ.	≽	Deaths or illness due to water quality	No	
WATER QUALITY OR	R	Water restrictions (current and historic)	No	
Ň	SECURITY RISK (EFFECT)	Taste and odour issues	No	
	SE	Other contamination that would affect health	No	
		Notes	L	

Ň	State/Territory	NT	
	Town Name	Tennant Creek	
TOWN	Town Population		2008 Reference 3218.0)
	Name of Water Utility	Power and Water Corporation 89.90 cents/kL for domestic and commercial; 95.36 cents/kL for government	
ΈĻ	Rate (\$/kL)		
WATER UTILITY	Per Capita Water Consumption (ML/day)	1346kL/connection/annum	
5 0	Number of Connections	1138	
Δ.	Catchment	Western Plateau	
CATCHMENT AND WATER SUPPLY	Sub-Catchment	Wiso Basin	
2 dd	Catchment Management Authority (CMA)	Dept of Natural Resource	s, Environment, The Arts and Sport
	CMA Web-Link	www.nt.gov.au/nreta/wat	
Ęĸ	Catchment Protection Status	None	
승 변	Potable Water Source(s)	Kelly Well and Cabbage	Gum bore fields
A N N	Supply Consoity	Kelly Well Bore field - 20	
0-	Supply Capacity	Cabbage Gum Bore field	- 200 ML/yr
	Level of Treatment	None	
	Treatment Plant(s)	N/A	
	Drinking Water Guidelines		ine value set by the Department of Environmental Health.
			Health Parameters - 95th Percentile Values (mg/L)
		Antimony	<0.0002
		Arsenic	0.0030
		Barium	<0.05
		Boron	0.52
		Cadmium	0.0008
		Chlorine (free)	DNA
		Chromium	<0.005
		Copper	0.10
		Fluoride	1.7
		lodide	0.39
		Lead	<0.001
		Manganese	0.005
		Mercury	<0.0001
		Molybdenum	<0.005
		Nickel	<0.002
		Nitrate	44
		Radiological mSv/yr	DNA
		Selenium	0.006
		Silver	<0.01
		Sulfate	88
		THM's	<0.004
		Uranium	0.00916
≻			Aesthetic Parameters - Mean Values (mg/L)
5		Aluminium	<0.02
IAL		Chloride	90
WATER QUALITY		Chlorine (free)	DNA
Ř	Results (% compliance for 2008 reporting	Copper	0.02
Ë	period)		
Ň	P /	Hardness (mg/L) CaCO3	
		Iron	0.07
		Manganese	<0.005
		pН	7.8
		Sodium	111
		Sulfate	50
		TDS	608
		Zinc	0.01
			Other Devendence Many Matter (and)
		Allealinite	Other Parameters - Mean Values (mg/L)
		Alkalinity	271
		Beryllium	<0.001
		Bromide	0.77
		Calcium	27
		Electrical conductivity	044
		(µS/cm)	944
		Magnesium	25
		Potassium	29.4
		Silica Tin	42
			<0.01
		<u></u>	
		* Radiological value repo	rted is an average annual dose
		* Radiological value repo * Values in bold exceed A	ADWG values
		* Radiological value repo	ADWG values
		* Radiological value repo * Values in bold exceed A * DNA - Data Not Availab	NWG values
		* Radiological value repo * Values in bold exceed A * DNA - Data Not Availab	NDWG values le Bacteriological Parameters (% compliance 2007-08)
		* Radiological value repo * Values in bold exceed A * DNA - Data Not Availab E. coli	ADWG values le Bacteriological Parameters (% compliance 2007-08) 99%
		* Radiological value repo * Values in bold exceed A * DNA - Data Not Availab	NDWG values le Bacteriological Parameters (% compliance 2007-08)
		* Radiological value repo * Values in bold exceed A * DNA - Data Not Availab E. coli Total Coliforms	NDWG values le Bacteriological Parameters (% compliance 2007-08) 99%
	Current Water Restrictions	* Radiological value repo * Values in bold exceed A * DNA - Data Not Availab E. coli	NDWG values le Bacteriological Parameters (% compliance 2007-08) 99%
л	Proportion of Potable Water Supplied to	* Radiological value repo * Values in bold exceed A * DNA - Data Not Availab E. coli Total Coliforms No	NDWG values le Bacteriological Parameters (% compliance 2007-08) 99%
JRITY	Proportion of Potable Water Supplied to Households (%)	* Radiological value repo * Values in bold exceed A * DNA - Data Not Availab E E. coli Total Coliforms No 39%	NDWG values le Bacteriological Parameters (% compliance 2007-08) 99%
VATER	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km)	* Radiological value repo * Values in bold exceed A * DNA - Data Not Availab E. coli Total Coliforms No 39% Approximately 1000 km	ADWG values le Bacteriological Parameters (% compliance 2007-08) 99%
WATER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate	* Radiological value repo * Values in bold exceed A * DNA - Data Not Availab E. coli Total Coliforms No 39% Approximately 1000 km Desert/Arid	ADWG values le Bacteriological Parameters (% compliance 2007-08) 99% 85%
WATER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall	* Radiological value repo * Values in bold exceed A * DNA - Data Not Availab E. coli Total Coliforms No 39% Approximately 1000 km Desert/Arid 452.1mm (Tennant Creel	ADWG values Bacteriological Parameters (% compliance 2007-08) 99% 85% ( Airport)
WATER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR	* Radiological value repo * Values in bold exceed A * DNA - Data Not Availab E. coli Total Coliforms No 39% Approximately 1000 km Desert/Arid 452.1mm (Tennant Creek YES / NO	ADWG values le Bacteriological Parameters (% compliance 2007-08) 99% 85%
WATER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall	* Radiological value repo * Values in bold exceed A * DNA - Data Not Availab E. coli Total Coliforms No 39% Approximately 1000 km Desert/Arid 452.1mm (Tennant Creel	ADWG values Bacteriological Parameters (% compliance 2007-08) 99% 85% ( Airport)
WATER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source	* Radiological value repo * Values in bold exceed A * DNA - Data Not Availab E. coli Total Coliforms No 39% Approximately 1000 km Desert/Arid 452.1mm (Tennant Creek YES / NO	ADWG values Bacteriological Parameters (% compliance 2007-08) 99% 85% ( Airport)
WATER	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source	* Radiological value repo * Values in bold exceed A * DNA - Data Not Availab E. coli Total Coliforms No 39% Approximately 1000 km Desert/Arid 452.1mm (Tennant Creek YES / NO No	ADWG values Bacteriological Parameters (% compliance 2007-08) 99% 85% ( Airport)
WATER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source	Radiological value repo     Values in bold exceed A     Values in bold exceed A     DNA - Data Not Availab     E. coli     Total Coliforms     No     39%     Approximately 1000 km     Desert/Arid     452.1mm (Tennant Creel         YES / NO     No     Yes	ADWG values Bacteriological Parameters (% compliance 2007-08) 99% 85% (Airport)

	1	Flooding	No	
	~	Fauna defecating in supply	No	
	ld	Fauna destroying water intake structures	No	
	er Sup	Natural mineral pollutants (e.g. uranium, nitrates, iron, fluoride)	Yes	Fluoride, iodide and nitrate.
	/ate	Un-lined landfills	No	
	5	Extensive agriculture	No	
ISE)	Catchment and Water Supply	Low vegetation cover (dust, sediment runoff)	No	
SAL S		Poor access to supply	No	
WATER QUALITY OR SECURITY RISK (CAUSE)	Catchr	Unsustainable water extraction	No*	Extraction considered to be within sustainable limits, but may require reassessment due to climate change.
T≺RI		Aquifer turning saline due to high extraction		
R		Hard water	Yes	172 mg/L vs. ADWG value of 200 mg/L.
SECL		Aging or inadequate pipe work and associated infrastructure	No	
Y OR		Significant water losses due to leaking pipes	No	
É		High per capita water consumption	Yes	
DUAL	e	Inappropriate water quality standards / objectives	N/A	
Ř	an	Lack of infrastructure maintenance	No	
Ë	Governance	Poor management or governance	No	
₹ N		Vandalism / sabotage / terrorism	Yes	Previous vandalism and intrusions to service storages detected.
-		Insufficient trained personnel	No	
		Inadequate funding for maintenance or upgrades	No	
	s	Mining / minerals	No	
	Industries	Irrigation	No	
		Chemicals / process	No	
	Population	Seasonal population loadings	Yes	Popular tourist gateway.
	Popu	Rapid population growth	No	
>		Pathogenic contamination	Yes	E. coli detected throughout system in May 2009.
É		Algal blooms	N/A	
UR		Heavy metal contamination	No	
U U	~	Poor chlorine residuals	Yes	No disinfection barrier so no chlorine residual maintained.
UN L	5	Pesticide contamination	No	
B B	Ш L	Boil water notices	Yes	One issued in May 2009.
WATER QUALITY OR SECURITY		Deaths or illness due to water quality	No reported deaths	Elevated risk of contamination as no disinfection barrier and hence heightened risk of illness in community. Risk of potential illness if boil water alert instructions not adhered to.
	ř	Water restrictions (current and historic)	No	
R.		Taste and odour issues	No	
WATE		Other contamination that would affect health	Elevated fluoride and iodide	Elevated fluoride level is naturally occurring. lodide level in ADWG 2010 expected to be raised to 0.4 mg/L.
		Notes		· · · · ·
		NULES		

2	97 State/Territory	NT	
≥	State/Territory Town Name	N I Yulara	
TOWN	Town Population		r 2008 Reference 3218.0)
	Name of Water Utility	Power and Water Corpor	
WATER UTILITY	Rate (\$/kL)		stic and commercial; 95.36 cents/kL for government
E II	Per Capita Water Consumption (ML/day)	2260kL/connection/annu	
	Number of Connections	247	
	Catchment	Western Plateau	
CATCHMENT AND WATER SUPPLY	Sub-Catchment	-	
AT AT	Catchment Management Authority (CMA)		urces, Environment, The Arts and Sport
ਲੁ≶ਬੁੱ	CMA Web-Link	www.nt.gov.au/nreta/wat	er
SUPAT	Catchment Protection Status	None	
0 <b>∢</b>	Potable Water Source(s)	Dune Plains Aquifer - gro	
	Supply Capacity	1600 ML/yr total borefield	
	Level of Treatment Treatment Plant(s)	Yulara Water Treatment	sinfection (for potable component)
	Drinking Water Guidelines		ine value set by the Department of Environmental Health.
	Drinking water Ouldennes		Health Parameters - 95th Percentile Values (mg/L)
		Antimony	<0.0002
		Arsenic	<0.0005
		Barium	<0.05
		Boron	0.68
		Cadmium	0.0012
		Chlorine (free)	0.65
		Chromium	<0.005
		Copper	0.15
		Fluoride	0.1
		lodide	0.06
		Lead	<0.001
		Manganese	0.005
		Mercury	<0.0001
		Molybdenum	<0.005
		Nickel	0.004
		Nitrate	37
		Radiological mSv/yr	DNA
		Selenium	<0.001
		Silver	<0.01
		Sulfate	328
		THM's	<0.004
		Uranium	0.00008
			Aesthetic Parameters - Mean Values (mg/L)
≿		Aluminium	<sufetic (mg="" -="" l)<="" p="" parameters="" values="" wean=""></sufetic>
Ĺ,		Chloride	44
WATER QUALITY		Chlorine (free)	0.48
۲ ۲		Copper	0.08
Ë	Results (% compliance for 2008 reporting		0.00
-A	period)	Hardness (mg/L) CaCO3	26
>		Iron	0.02
		Manganese	<0.005
		pН	7.0
		Sodium	38
		Sulfate	59
		TDS	158
		Zinc	0.05
			Other Beremeters Mean Values (mar/l)
		Alkalinity	Other Parameters - Mean Values (mg/L) 15
		Beryllium	<0.001
		Bromide	0.27
			7
		Calcium Electrical conductivity	
		Calcium	
		Calcium Electrical conductivity	7
		Calcium Electrical conductivity (µS/cm)	7 266
		Calcium Electrical conductivity (µS/cm) Magnesium	7 266 2 4.3 5
		Calcium Electrical conductivity (µS/cm) Magnesium Potassium	7 266 2 4.3
		Calcium Electrical conductivity (µS/cm) Magnesium Potassium Silica Tin	7 266 2 4.3 5 <0.01
		Calcium Electrical conductivity (µS/cm) Magnesium Potassium Silica Tin * Radiological value repo	7 266 2 4.3 5
		Calcium Electrical conductivity (µS/cm) Magnesium Potassium Silica Tin * Radiological value repo * Values in bold exceed	7 266 2 4.3 5 <0.01
		Calcium Electrical conductivity (µS/cm) Magnesium Potassium Silica Tin * Radiological value repo * Values in bold exceed ADWG values	7 266 2 4.3 5 <0.01 rted is an average annual dose
		Calcium Electrical conductivity (µS/cm) Magnesium Potassium Silica Tin * Radiological value repo * Values in bold exceed ADWG values * DNA - Data Not Availab	7 266 2 4.3 5 <0.01 rted is an average annual dose le
		Calcium Electrical conductivity (µS/cm) Potassium Silica Tin * Radiological value repo * Values in bold exceed ADWG values * DNA - Data Not Availab	7 266 2 4.3 5 <0.01 rted is an average annual dose le Bacteriological Parameters (% compliance 2007-08)
		Calcium Electrical conductivity (µS/cm) Magnesium Potassium Silica Tin * Radiological value repo * Values in bold exceed ADWG values * DNA - Data Not Availab E. coli	7 266 2 4.3 5 <<0.01 rted is an average annual dose le ascteriological Parameters (% compliance 2007-08) 100%
		Calcium Electrical conductivity (µS/cm) Potassium Silica Tin * Radiological value repo * Values in bold exceed ADWG values * DNA - Data Not Availab	7 266 2 4.3 5 <0.01 rted is an average annual dose le Bacteriological Parameters (% compliance 2007-08)
	Current Water Restrictions	Calcium Electrical conductivity (µS/cm) Magnesium Potassium Silica Tin * Radiological value repo * Values in bold exceed ADWG values * DNA - Data Not Availab E. coli	7 266 2 4.3 5 <<0.01 rted is an average annual dose le ascteriological Parameters (% compliance 2007-08) 100%
ž	Current Water Restrictions Proportion of Potable Water Supplied to	Calcium Electrical conductivity (µS/cm) Magnesium Potassium Silica Tin * Radiological value repo * Values in bold exceed ADWG values * DNA - Data Not Availab E. coli Total Coliforms No	7 266 2 4.3 5 <<0.01 rted is an average annual dose le acteriological Parameters (% compliance 2007-08) 100% 100%
JRITY	Proportion of Potable Water Supplied to Households (%)	Calcium Electrical conductivity (µS/cm) Magnesium Potassium Silica Tin * Radiological value repo * Values in bold exceed ADWG values * DNA - Data Not Availab E. coli Total Coliforms No Yulara is predominantly a	7 266 2 4.3 5 <<0.01 rted is an average annual dose le ascteriological Parameters (% compliance 2007-08) 100%
INTER CURITY	Proportion of Potable Water Supplied to	Calcium Electrical conductivity (µS/cm) Magnesium Potassium Silica Tin * Radiological value repo * Values in bold exceed ADWG values * DNA - Data Not Availab E. coli Total Coliforms No Yulara is predominantly a Approximately 1850 km	7 266 2 4.3 5 <<0.01 rted is an average annual dose le acteriological Parameters (% compliance 2007-08) 100% 100%
WATER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate	Calcium Electrical conductivity (juS/cm) Magnesium Potassium Silica Tin * Radiological value repo * Values in bold exceed ADWG values * DNA - Data Not Availab E. coli Total Coliforms No Yulara is predominantly a Approximately 1850 km Desert/Arid	7 266 2 4.3 5 <<0.01 rted is an average annual dose le Bacteriological Parameters (% compliance 2007-08) 100% 100% a tourist resort (household residential consumption is between 2-3%)
WATER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall	Calcium Electrical conductivity (µS/cm) Magnesium Potassium Silica Tin * Radiological value repo * Values in bold exceed ADWG values * DNA - Data Not Availab E.coli Total Coliforms No Yulara is predominantly a Approximately 1850 km Desert/Arid 266.3mm (Yulara Airport	7 266 2 4.3 5 <0.01 rted is an average annual dose le acteriological Parameters (% compliance 2007-08) 100% 100% a tourist resort (household residential consumption is between 2-3%)
WATER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR	Calcium Electrical conductivity (µS/cm) Magnesium Potassium Silica Tin * Radiological value repo * Values in bold exceed ADWG values * DNA - Data Not Availab E. coli Total Coliforms No Yulara is predominantly a Approximately 1850 km Desert/Arid 266.3mm (Yulara Airport YES / NO	7 266 2 4.3 5 <<0.01 rted is an average annual dose le Bacteriological Parameters (% compliance 2007-08) 100% 100% a tourist resort (household residential consumption is between 2-3%)
water security	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought	Calcium Electrical conductivity (µS/cm) Magnesium Potassium Silica Tin * Radiological value repo * Values in bold exceed ADWG values * DNA - Data Not Availab E. coli Total Coliforms No Yulara is predominantly a Approximately 1850 km Desert/Arid 266.3mm (Yulara Airport YES / NO No	7 266 2 4.3 5 <0.01 rted is an average annual dose le acteriological Parameters (% compliance 2007-08) 100% 100% a tourist resort (household residential consumption is between 2-3%)
WATER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source	Calcium Electrical conductivity (juS/cm) Magnesium Potassium Silica Tin * Radiological value repo * Values in bold exceed ADWG values * DNA - Data Not Availab E. coli Total Coliforms Valuara is predominantly a Approximately 1850 km Desert/Arid 266.3mm (Yulara Airport YES / NO No Yes	7 266 2 4.3 5 <0.01 rted is an average annual dose le Bacteriological Parameters (% compliance 2007-08) 100% 100% 100% 100% 100% 100% 100% 100
SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source	Calcium Electrical conductivity (µS/cm) Magnesium Potassium Silica Tin * Radiological value repo * Values in bold exceed ADWG values * DNA - Data Not Availab E. coli Total Coliforms No Yulara is predominantly a Approximately 1850 km Desert/Arid 266.3mm (Yulara Airport YES / NO No	7 266 2 4.3 5 <0.01 rted is an average annual dose le acteriological Parameters (% compliance 2007-08) 100% 100% 2007-08) 2009 2009 2009 2009 2009 2009 2009 200
WATER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source	Calcium Electrical conductivity (juS/cm) Magnesium Potassium Silica Tin * Radiological value repo * Values in bold exceed ADWG values * DNA - Data Not Availab E. coli Total Coliforms Valuara is predominantly a Approximately 1850 km Desert/Arid 266.3mm (Yulara Airport YES / NO No Yes	7 266 2 4.3 5 <0.01 rted is an average annual dose le Bacteriological Parameters (% compliance 2007-08) 100% 100% 100% 100% 100% 100% 100% 100

	>	Fauna defecating in supply	No	
	ldd		No	
	Su	Natural minoral pollutanta (o a uranium		
	fer	nitrates, iron, fluoride)	Yes	Nitrate.
	۲a.	Un-lined landfills	Yes	Not overlying aquifer.
	- p	Extensive agriculture	No	
ω	Catchment and Water Supply	Low vegetation cover (dust, sediment	Yes	Not a significant issue.
SU	ent	runoff)	Tes	Not a significant issue.
UAI CAI	Ē	Poor access to supply	No	
U U U U U U U U U U U U U U U U U U U	atcl	Unsustainable water extraction	No	Considered to be approximately at the aquifer sustainable yield.
RISI	Ö	Aquifer turning saline due to high extraction	No	
≥			No	
WATER QUALITY OR SECURITY RISK (CAUSE)		Aging or inadequate pipe work and associated infrastructure	No	
SE		Significant water losses due to leaking	No	
R		pipes	-	
×		High per capita water consumption	Yes	
IALIT	e	Inappropriate water quality standards / objectives	N/A	
au	aŭ	Lack of infrastructure maintenance	No	
Ř	Governance	Poor management or governance	No	
Ë		Vandalism / sabotage / terrorism	No	
× ∧		Insufficient trained personnel	No	
		upgrades	No	
	Industries	Mining / minerals	No	
		Irrigation	No	
		Chemicals / process	No	
	Population	Seasonal population loadings	Yes	Popular tourist destination.
	Popu	Rapid population growth	No	
É	÷	Pathogenic contamination	No	No E. coli detected or Naegleria fowleri detected in 2007-08.
ц Ц	С Ц	Algal blooms	N/A	
	£	Heavy metal contamination	No	
Ē	<u> </u>	Poor chlorine residuals	No	
JAL	¥∩ N	Pesticide contamination	No	None in 0007.00
5	r	Boil water notices	No No reported deaths	None in 2007-08.
뜺	≻ =	Deaths or illness due to water quality Water restrictions (current and historic)	No reported deaths No	
WATER QUALITY OR	¥	Taste and odour issues	NO	
Â,	រុ	Other contamination that would affect		
L C	2	health	No	
		Notes		·

TOWN	98 State/Territory	NT			
TO	State/Territory	N I Galiwinku			
	Town Name	2,156 (Census 2006, Urban Centre/Locality)			
	Town Population				
∺ ≿	Name of Water Utility Rate (\$/kL)	Power and Water Co			
WATER UTILITY			mestic and commercial; 95.36 cents/kL for government		
2 F	Per Capita Water Consumption (L/day)	562L/day			
	Number of Connections	Unknown			
œ	Catchment	Arafura Basin			
CATCHMENT AND WATER SUPPLY	Sub-Catchment	Elcho Island Formatio			
MP	Catchment Management Authority (CMA)		of Natural Resources, Entertainment, the Arts and Sports		
₽≻	CMA Web-Link	www.nt.gov.au/nreta/	/water		
IENT AND SUPPLY	Catchment Protection Status	State wide Policy			
IN: SUI		Bore RN8474			
Σ	Potable Water Source(s)	Bore RN20921			
ė.		Bore RN20922			
CAT		Bore RN20927			
-	Supply Capacity	3000 ML/year (sustai	nable yield)		
	Level of Treatment	Groundwater:-Disinfe	ction		
	Treatment Plant(s)	In-line Sodium Hypod	chlorite dosing		
	Drinking Water Guidelines	ADWG 2004, TDS gu	ideline value set by the Department of Environmental Health.		
			Health Parameters - 95th Percentile Values (mg/L)		
		Antimony	0.0001		
		Arsenic	0.0003		
		Barium	0.03		
		Boron	0.00		
		Cadmium	0.001		
			0.003		
		Chromium	0.05		
		Fluoride	0.008		
		Lead			
		Mercury	0.00005		
		Molybdenum	0.003		
		Nickel	0.001		
		Nitrate	1		
		Nitrite	DNA		
		Radiological (mSv/yr)	Gross α,β < 0.5 Bq/L		
		Selenium	0.0005		
		Silver	0.005		
		Uranium	0.00002		
		oraniani	0.00002		
			Aesthetic Parameters - Mean Values (mg/L)		
		Aluminium	0.01		
		Chloride	9		
		Copper	0.01		
≥		Hardness	6		
WATER QUALITY		lodine	0.005		
ng .			0.4		
R.	Results (% compliance for 2008 reporting	Iron Fe_T			
ATE		Manganese	0.003		
Š	period)	pH (pH Units)	5.6		
		Sodium	6		
		Sulfate	1		
		Total Dissolved Solids	40		
		True Colour (CU)	DNA		
		Turbidity (NTU)	DNA		
		Zinc	0.008		
			Other Parameters - Mean Values (mg/L)		
		Alkalinity	5		
		Alkalinity Beryllium			
			5		
		Beryllium	5 0.0005		
		Beryllium Bromide	5 0.0005 0.03		
		Beryllium Bromide Calcium Electrical conductivity	5 0.0005 0.03 1		
		Beryllium Bromide Calcium Electrical conductivity (µS/cm)	5 0.0005 0.03		
		Beryllium Bromide Calcium Electrical conductivity (µS/cm) Magnesium	5 0.0005 0.03 1 50		
		Beryllium Bromide Calcium Electrical conductivity (µS/cm) Magnesium Potassium	5 0.0005 0.03 1 50 0.9 1		
		Beryllium Bromide Calcium Electrical conductivity (µS/cm) Magnesium Potassium Silica	5 0.0005 0.03 1 50 0.9 1 12		
		Beryllium Bromide Calcium Electrical conductivity (µS/cm) Magnesium Potassium	5 0.0005 0.03 1 50 0.9 1		
		Beryllium Bromide Calcium Electrical conductivity (μS/cm) Magnesium Potassium Silica Tin	5 0.0005 0.03 1 50 0.9 1 12 0.005		
		Beryllium Bromide Calcium Electrical conductivity (μ5/cm) Magnesium Potassium Silica Tin * Radiological value rep	5 0.0005 0.03 1 50 0.9 1 12 0.005 ported is an average annual dose		
		Beryllium Bromide Calcium Electrical conductivity (µS/cm) Magnesium Potassium Silica Tin * Radiological value rep * Values in bold exceed	5 0.0005 0.03 1 50 0.9 1 12 0.005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005 2005		
		Beryllium Bromide Calcium Electrical conductivity (μ5/cm) Magnesium Potassium Silica Tin * Radiological value rep	5 0.0005 0.03 1 50 0.9 1 12 0.005 borted is an average annual dose ADWG values ble		
		Beryllium Bromide Calcium Electrical conductivity (μS/cm) Magnesium Potassium Silica Tin * Radiological value rep * Values in bold exceed * DNA - Data not availa	5 0.0005 0.03 1 50 0.9 1 1 12 0.005 borted is an average annual dose I ADWG values ble Bacteriological Parameters (% compliance 2008-09)		
		Beryllium Bromide Calcium Electrical conductivity (µS/cm) Magnesium Potassium Silica Tin * Radiological value reg * Values in bold exceed * DNA - Data not availa E. coli	5 0.0005 0.03 1 50 0.9 1 12 0.005 borted is an average annual dose IADWG values ble Bacteriological Parameters (% compliance 2008-09) 100%		
		Beryllium Bromide Calcium Electrical conductivity (μS/cm) Magnesium Potassium Silica Tin * Radiological value rep * Values in bold exceed * DNA - Data not availa	5 0.0005 0.03 1 50 0.9 1 1 12 0.005 borted is an average annual dose I ADWG values ble Bacteriological Parameters (% compliance 2008-09)		
×	Current Water Pastrictions	Beryllium Bromide Calcium Electrical conductivity (µS/cm) Magnesium Potassium Sillica Tin * Radiological value reg * Values in bold exceed * DNA - Data not availa E. coli Total Coliforms	5 0.0005 0.03 1 50 0.9 1 12 0.005 borted is an average annual dose IADWG values ble Bacteriological Parameters (% compliance 2008-09) 100%		
RITY	Current Water Restrictions	Beryllium Bromide Calcium Electrical conductivity (µS/cm) Magnesium Potassium Silica Tin * Radiological value reg * Values in bold exceed * DNA - Data not availa E. coli Total Coliforms No water restrictions	5 0.0005 0.03 1 50 0.9 1 12 0.005 borted is an average annual dose IADWG values ble Bacteriological Parameters (% compliance 2008-09) 100%		
CURITY	Proportion of Potable Water Supplied to	Beryllium Bromide Calcium Electrical conductivity (µS/cm) Magnesium Potassium Sillica Tin * Radiological value reg * Values in bold exceed * DNA - Data not availa E. coli Total Coliforms	5 0.0005 0.03 1 50 0.9 1 12 0.005 borted is an average annual dose IADWG values ble Bacteriological Parameters (% compliance 2008-09) 100%		
SECURITY	Proportion of Potable Water Supplied to Households (%)	Beryllium Bromide Calcium Electrical conductivity (µS/cm) Magnesium Potassium Sillica Tin * Radiological value rep * Values in bold exceed * DNA - Data not availa E. coli Total Coliforms No water restrictions DNA	5 0.0005 0.03 1 50 0.9 1 12 0.005 borted is an average annual dose IADWG values ble Bacteriological Parameters (% compliance 2008-09) 100%		
ER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km)	Beryllium Bromide Calcium Electrical conductivity (µS/cm) Magnesium Potassium Silica Tin * Radiological value reg * Values in bold exceed * DNA - Data not availa E. coli Total Coliforms No water restrictions DNA 0.1 km	5 0.0005 0.03 1 50 0.9 1 12 0.005 borted is an average annual dose IADWG values ble Bacteriological Parameters (% compliance 2008-09) 100%		
ATER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate	Beryllium Bromide Calcium Electrical conductivity (μS/cm) Magnesium Potassium Silica Tin * Radiological value reg * Values in bold exceed * DNA - Data not availa E. coli Total Coliforms No water restrictions DNA 0.1 km Wet/Dry Tropics	5         0.0005         0.03         1         50         0.9         1         12         0.005         borted is an average annual dose         IADWG values         ble         Bacteriological Parameters (% compliance 2008-09)         100%         100%		
WATER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall	Beryllium Bromide Calcium Electrical conductivity (µS/cm) Magnesium Silica Tin * Radiological value reg * Values in bold exceed * DNA - Data not availa E. coli Total Coliforms No water restrictions DNA 0.1 km Wet/Dry Tropics 1430.6 mm (BOM da	5 0.0005 0.03 1 50 0.9 1 12 0.005 borted is an average annual dose IADWG values ble Bacteriological Parameters (% compliance 2008-09) 100% 100% 100%		
WATER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR	Beryllium Bromide Calcium Electrical conductivity (µS/cm) Magnesium Potassium Sillica Tin * Radiological value reg * Values in bold exceed * DNA - Data not availa E. coli Total Coliforms No water restrictions DNA 0.1 km Wet/Dry Tropics 1430.6 mm (BOM da YES / NO	5 0.0005 0.03 1 50 0.9 1 12 0.005 borted is an average annual dose IADWG values ble Bacteriological Parameters (% compliance 2008-09) 100%		
WATER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought	Beryllium Bromide Calcium Electrical conductivity (μS/cm) Magnesium Potassium Sillica Tin * Radiological value reg * Values in bold exceed * DNA - Data not availa E. coli Total Coliforms No water restrictions DNA 0.1 km Wet/Dry Tropics 1430.6 mm (BOM da YES / NO No	5 0.0005 0.03 1 50 0.9 1 12 0.005 borted is an average annual dose IADWG values ble Bacteriological Parameters (% compliance 2008-09) 100% 100% 100%		
WATER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source	Beryllium         Bromide         Calcium         Calcium         Electrical conductivity         (μS/cm)         Magnesium         Potassium         Silica         Tin         * Radiological value reg         * Values in bold exceed         * DNA - Data not availa         E. coli         Total Coliforms         No water restrictions         DNA         0.1 km         Wet/Dry Tropics         1430.6 mm (BOM da         YES / NO         No	5 0.0005 0.03 1 50 0.9 1 12 0.005 borted is an average annual dose IADWG values ble Bacteriological Parameters (% compliance 2008-09) 100% 100% 100%		
WATER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source	Beryllium Bromide Calcium Electrical conductivity (μS/cm) Magnesium Potassium Sillica Tin * Radiological value reg * Values in bold exceed * DNA - Data not availa E. coli Total Coliforms No water restrictions DNA 0.1 km Wet/Dry Tropics 1430.6 mm (BOM da YES / NO No	5 0.0005 0.03 1 50 0.9 1 12 0.005 borted is an average annual dose IADWG values ble Bacteriological Parameters (% compliance 2008-09) 100% 100% 100%		
WATER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water	Beryllium Bromide Calcium Electrical conductivity (μS/cm) Magnesium Potassium Silica Tin * Radiological value reg * Values in bold exceed * DNA - Data not availa E. coli Total Coliforms No water restrictions DNA 0.1 km Wet/Dry Tropics 1430.6 mm (BOM da YES / NO No	5       0.0005         0.03       1         1       50         0.9       1         12       0.005         borted is an average annual dose         IADWG values         ble         Bacteriological Parameters (% compliance 2008-09)         100%         100%         100%         100%         1         1         1         1         1         100%         100%         100%         100%		
WATER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source	Beryllium         Bromide         Calcium         Calcium         Electrical conductivity         (μS/cm)         Magnesium         Potassium         Silica         Tin         * Radiological value reg         * Values in bold exceed         * DNA - Data not availa         E. coli         Total Coliforms         No water restrictions         DNA         0.1 km         Wet/Dry Tropics         1430.6 mm (BOM da         YES / NO         No	5 0.0005 0.03 1 50 0.9 1 12 0.005 borted is an average annual dose IADWG values ble Bacteriological Parameters (% compliance 2008-09) 100% 100% 100%		

	Supply	Fauna defecating in supply	No	
			No	
		Natural minoral pollutanta (o a uranium		
	fer	nitrates, iron, fluoride)	Yes	Total Iron values above ADW Guidelines
	Vai	Un-lined landfills		
	> p		No	
Ш Ш	an	Low vegetation cover (dust sediment		
n o	ant	runoff)	No	
CA	ŭ	Poor access to supply	No	
¥	Catchment and Water	Unsustainable water extraction	No	
WATER QUALITY OR SECURITY RISK (CAUSE)		Aquifer turning saline due to high extraction	No	
É		Hard water	No	
Ч		Aging or inadequate nine work and		
U U		associated infrastructure	No	
S		Significant water losses due to leaking		
Ю		pipes	No	
≥		High per capita water consumption	Yes	
Ę		Inappropriate water quality standards /	No	
٩N	8	objectives	NU	
Ø	an	Lack of infrastructure maintenance	No	
Ш	Governance		No	
AT		Vandalism / sabotage / terrorism	No	
>		Insufficient trained personnel	No	
		Inadequate funding for maintenance or upgrades	No	
	Industries	Mining / minerals	No	
		Irrigation	No	
		Chemicals / process	No	
	ion	Seasonal population loadings	No	
	llat	j.,	-	
	Population	Rapid population growth	Yes	14.2% - projected (ABS census 2001-2006)
-		Pathogenic contamination	No	
WATER QUALITY OR	5	Algal blooms	No	
WATER QUALITY OR	L		No	
'∠'	L		No	
, LL	ź		No	
	<u>n</u>	Boil water notices	No	
	£ ⊨		No	
ШÉ	Ē	Water restrictions (current and historic)	No	
E S	5	Taste and odour issues	No	
\$ C	ر ⊔	Other contamination that would affect		
ū	n	health	No	
		Notes		

	State/Territory	NT	
>	Town Name	Wadeye	
TOWN	Town Name Town Population		an Centre/Locality)
	Name of Water Utility	2,675 (Census 2006, Urban Centre/Locality) Power and Water Corporation	
£ ⊢	Rate (\$/kL)		stic and commercial; 95.36 cents/kL for government
WATER UTILITY	Per Capita Water Consumption (L/day)		
≥5	1	397L/day	
	Number of Connections	Unknown Bonanarte Gulf Basin	
$\vdash \sim$	Catchment	Bonaparte Gulf Basin	
Ш Ш Ш Г	Sub-Catchment	Hyland Bay Formation	
E A B	Catchment Management Authority (CMA)	none	
문동료	CMA Web-Link	none	
CATCHMENT AND WATER SUPPLY	Catchment Protection Status	none	
S <	Potable Water Source(s)	Groundwater	
	Supply Capacity	912ML/year (Aquifer Sus	
	Level of Treatment	Groundwater:-Disinfectio	
	Treatment Plant(s)	In-line Sodium Hypochlor	
	Drinking Water Guidelines		line value set by the Department of Environmental Health.
			Health Parameters - 95th Percentile Values (mg/L)
		Antimony	0.0001
		Arsenic	0.0005
		Barium	0.025
		Boron	0.54 0.0001
		Cadmium	
		Chromium	0.0025
		Fluoride	0.05
		Lead	0.002
		Mercury	0.0005
		Molybdenum	0.0025
		Nickel	0.001
		Nitrate	0.005
		Nitrite	DNA
		Radiological (mSv/yr)	0.007
		Selenium	0.004
		Silver	0.005
		Uranium	0.0199
		Alternationity	Aesthetic Parameters - Mean Values (mg/L)
		Aluminium	0.01
		Chloride	6.5
WATER QUALITY		Copper	0.01
		Hardness	16
Ω Ω		lodine	0.34
Ř	Results (% compliance for 2008 reporting	Iron Fe_T	0.18
Ë		Manganese	0.0025
-¥	period)	pH (pH Units)	5.8
>		Sodium	4.4
		Sulfate	0.59
		Total Dissolved Solids	31
		True Colour (CU)	1
		Turbidity (NTU)	0.1
		Zinc	0.08
		A.B. 19 19	Other Parameters - Mean Values (mg/L)
		Alkalinity	5.2
		Beryllium	0.0005
		Bromide	2.04
		Calcium	5.6
		Electrical conductivity	24
		(µS/cm)	34
		Magnesium	0.6
		Potassium	0.68
		Cilian	
		Silica	19
		Silica Tin	0.005
		Tin	0.005
		Tin * Radiological value repo	0.005 rted is an average annual dose
		Tin * Radiological value repo * Values in bold exceed /	0.005 rted is an average annual dose ADWG values
		Tin * Radiological value repo * Values in bold exceed A * DNA - Data not availabl	0.005 rted is an average annual dose ADWG values e
		Tin * Radiological value repo * Values in bold exceed <i>I</i> * DNA - Data not availabl	0.005 rted is an average annual dose ADWG values e Bacteriological Parameters (% compliance 2008-09)
		Tin * Radiological value repo * Values in bold exceed / * DNA - Data not availabl E. coli	0.005 rted is an average annual dose ADWG values e ascteriological Parameters (% compliance 2008-09) 98.4%
		Tin * Radiological value repo * Values in bold exceed <i>I</i> * DNA - Data not availabl	0.005 rted is an average annual dose ADWG values e Bacteriological Parameters (% compliance 2008-09)
	Current Water Destrictions	Tin * Radiological value repo * Values in bold exceed / * DNA - Data not availabl E. coli Total Coliforms	0.005 rted is an average annual dose ADWG values e ascteriological Parameters (% compliance 2008-09) 98.4%
	Current Water Restrictions	Tin * Radiological value repo * Values in bold exceed / * DNA - Data not availabl E. coli Total Coliforms Nil	0.005 rted is an average annual dose ADWG values e ascteriological Parameters (% compliance 2008-09) 98.4%
RITY	Proportion of Potable Water Supplied to	Tin * Radiological value repo * Values in bold exceed / * DNA - Data not availabl E. coli Total Coliforms	0.005 rted is an average annual dose ADWG values e ascteriological Parameters (% compliance 2008-09) 98.4%
ATER SURITY	Proportion of Potable Water Supplied to Households (%)	Tin * Radiological value repo * Values in bold exceed / * DNA - Data not availabl E. coli Total Coliforms Nii Unknown	0.005 rted is an average annual dose ADWG values e ascteriological Parameters (% compliance 2008-09) 98.4%
WATER	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km)	Tin * Radiological value repo * Values in bold exceed / * DNA - Data not availabl E. coli Total Coliforms Nil Unknown 6km	0.005 rted is an average annual dose ADWG values e ascteriological Parameters (% compliance 2008-09) 98.4%
WATER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate	Tin * Radiological value repo * Values in bold exceed / * DNA - Data not availabl E. coli Total Coliforms Nil Unknown 6km Dry Tropics	0.005 rted is an average annual dose ADWG values e ascteriological Parameters (% compliance 2008-09) 98.4%
WATER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall	Tin * Radiological value repo * Values in bold exceed / * DNA - Data not availabl E. coli Total Coliforms Nii Unknown 6km Dry Tropics 1300mm	0.005 rted is an average annual dose ADWG values e Bacteriological Parameters (% compliance 2008-09) 98.4% 97.3%
WATER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR	Tin * Radiological value repo * Values in bold exceed / * DNA - Data not availabl E Coli Total Coliforms Nil Unknown 6km Dry Tropics 1300mm YES / NO	0.005 rted is an average annual dose ADWG values e ascteriological Parameters (% compliance 2008-09) 98.4%
WATER	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought	Tin  * Radiological value repo * Values in bold exceed / * DNA - Data not availabl E. coli Total Coliforms Nil Unknown 6km Dry Tropics 1300mm YES / NO No	0.005 rted is an average annual dose ADWG values e Bacteriological Parameters (% compliance 2008-09) 98.4% 97.3%
WATER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source	Tin * Radiological value repo * Values in bold exceed // * DNA - Data not availabl E. coli Total Coliforms Nil Unknown 6km Dpy Tropics 1300mm YES / NO No Yes	0.005 rted is an average annual dose ADWG values e Bacteriological Parameters (% compliance 2008-09) 98.4% 97.3%
WATER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source	Tin * Radiological value repo * Values in bold exceed // * DNA - Data not availabl f. coli Total Coliforms Nii Unknown 6km Dry Tropics 1300mm YES / NO No Yes No	0.005  rted is an average annual dose  ADWG values e Bacteriological Parameters (% compliance 2008-09) 98.4% 97.3%  NOTES / EXPLANATION
WATER SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water	Tin * Radiological value repo * Values in bold exceed // * DNA - Data not availabl E. coli Total Coliforms Nil Unknown 6km Dpy Tropics 1300mm YES / NO No Yes	0.005 rted is an average annual dose ADWG values e Bacteriological Parameters (% compliance 2008-09) 98.4% 97.3%
WATER	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source	Tin  * Radiological value repo * Values in bold exceed / * DNA - Data not availabl E. coli Total Coliforms Nil Unknown 6km Dry Tropics 1300mm YES / NO No Yes No No No	0.005 rted is an average annual dose DOWG values e Bacteriological Parameters (% compliance 2008-09) 98.4% 97.3% NOTES / EXPLANATION Sewer overflow during wet season - not into water source
	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding	Tin * Radiological value repo * Values in bold exceed // * DNA - Data not availabl E. coli Total Coliforms Nil Unknown 6km Dry Tropics 1300mm YES / NO No Yes No No Yes No	0.005  rted is an average annual dose  ADWG values e Bacteriological Parameters (% compliance 2008-09) 98.4% 97.3%  NOTES / EXPLANATION
	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply	Tin * Radiological value repo * Values in bold exceed / * DNA - Data not availabl E. coli Total Coliforms Nii Unknown 6km Dry Tropics 1300mm YES / NO No Yes No Yes No	0.005 rted is an average annual dose DOWG values e Bacteriological Parameters (% compliance 2008-09) 98.4% 97.3% NOTES / EXPLANATION Sewer overflow during wet season - not into water source
	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply Fauna destroying water intake structures	Tin * Radiological value repo * Values in bold exceed // * DNA - Data not availabl E. coli Total Coliforms Nil Unknown 6km Dry Tropics 1300mm YES / NO No Yes No No Yes No	0.005 rted is an average annual dose DOWG values e Bacteriological Parameters (% compliance 2008-09) 98.4% 97.3% NOTES / EXPLANATION Sewer overflow during wet season - not into water source
Water Supply SECURITY	Proportion of Potable Water Supplied to Households (%) Distance from the Coast (km) Climate Average Annual Rainfall FACTOR Drought Single drinking water source Poor quality water source Sewage overflow or disposal into water source Flooding Fauna defecating in supply	Tin * Radiological value repo * Values in bold exceed / * DNA - Data not availabl E. coli Total Coliforms Nii Unknown 6km Dry Tropics 1300mm YES / NO No Yes No Yes No	0.005 rted is an average annual dose DOWG values e Bacteriological Parameters (% compliance 2008-09) 98.4% 97.3% NOTES / EXPLANATION Sewer overflow during wet season - not into water source

AECOM

	σ	Extensive agriculture	No	
ш	an	Low vegetation cover (dust sediment		
ns	ent	runoff)	No	
S	Ē		No	
¥	Catchment and	Unsustainable water extraction	No	
SISI	ö		No	
<u>ل</u>		Aquifer turning saline due to high extraction		
H H		Hard water	No	
10		Aging or inadequate pipe work and	Yes	Concrete cancer developing in sewer network
Ĕ		associated infrastructure		
200		Significant water losses due to leaking pipes	No	
0		High per capita water consumption	Yes	
É		Inconcrete water quality standards /		
WATER QUALITY OR SECURITY RISK (CAUSE)	e,	objectives	No	
σn	Governance		No	
Ľ.	Ĕ	Poor management or governance	No	
ATE	ð	Vandalism / sabotage / terrorism	No	
Ń	G		No	
		Inadequate funding for maintenance or	No	
		upgrades		
	n Industries	Mining / minerals	No	
			No	
		Irrigation		
		Chemicals / process	No	
	Population		No	
	ula	Seasonal population loadings		
	do		Yes	
	ш	Rapid population growth		
É	Ē	Pathogenic contamination	Yes	E.coli Non-conformances: 3
R C	С Ш	Algal blooms	No	
	÷	Heavy metal contamination	No	
는 특 등	Щ.	Poor chlorine residuals Pesticide contamination	No No	
E E	<u>ð</u>	Boil water notices	Yes	Issued 18/12/2008 Lifted 20/12/2008
WATER QUALITY OR	SECURITY RISK (EFFECT)	Deaths or illness due to water quality	No	1550C0 10/12/2000 Lilleu 20/12/2000
E E	E		No	
TAT TAT	Н	Taste and odour issues	No	
≥ 0	С Ц	Other contamination that would affect		
č	S	health	No	
		Notes		

## AECOM

## Town Profiles – TAS



Town #	100			
	100	State/Territory	TAS	
TOWN		Town Name	Ulverstone	
P		Town Population	9,514	
∠ ۲	-	Name of Water Utility	Cradle Mountain Water	
WATER		Rate (\$/kL)	0.72/kL	
₹ F	5	Per Capita Water Consumption (L/day)	133L/day	
		Number of Connections	28,558	
		Catchment Sub-Catchment	-	
CATCHMENT AND WATER SUPPLY		Catchment Management Authority (CMA)	- Council - Central Coast	Council
je je	-	CMA Web-Link	http://www.centralcoast.tas	
	į	Catchment Protection Status		ly catchments in southern Tasmania protected).
N N N			Deep Creek System	
U H C	1	Detable Water Course(a)	Cam River	
AT AT		Potable Water Source(s)	Leven River	
0-			Gawler River, Forth River, Lake Paloona, Lake Barrington, Dowling Creek	
		Supply Capacity	Unknown	
		Treatment Plant(s)		er, Lake Paloona, Lake Barrington, Dowling Creek, Leven River, Cam River,
WATER OUALITY		.,	Deep Creek System (137 ML/d each)	
ALI		Level of Treatment		% treated, 10% Chlorinated and 13% Non - Chlorinated water
× no	) M	Drinking Water Guidelines	ADWG, 2004 Physical & chemical	100%
Ŭ		Results	E-coli	100%
		Current Water Restrictions	n/a	100 /0
~ >		Proportion of Potable Water Supplied to		demostic users 200/ to long :- II
WATER SECURITY		Households (%)	Approximately 70% to c	domestic users; 30% to 'special' customers.
CU CU	5	Distance from the Coast (km)	1km	
<ul> <li>В</li> /ul>	1	Climate	Temperate (no dry season)	
		Average Annual Rainfall	768mm	
		FACTOR	YES / NO	NOTES / EXPLANATION
		Drought	no	Lake leandule and the Courter Diver
		Single drinking water source Poor quality water source	no no	Lake Isandula and the Gawler River
		Sewage overflow or disposal into water	no	
	~	Flooding	no	
	, Id	Fauna defecating in supply	yes	birds breached a service reservoir's vermin proofing early 2008
	Sup	Fauna destroying water intake structures	yes	as above
	e	Natural mineral pollutants (e.g. uranium,	2	
	Vat	nitrates, iron, fluoride)		
ŝ	Catchment and Water Supply	Un-lined landfills	no	
JSE		Extensive agriculture	no	although do supply to irrigators
SAL		Low vegetation cover (dust, sediment		
U U U		Poor access to supply		
ts I	ato	Unsustainable water extraction Aquifer turning saline due to high extraction	no	
×	0	Hard water	no	although some areas untreated
L R		Aging or inadequate pipe work and		Paloona System untreated - extra pipeline built to treat water and supply to
Ľ,		associated infrastructure	yes	customers
ы Э́с		Significant water losses due to leaking	no	
2		High per capita water consumption	-	
0 N		Inappropriate water quality standards /		
Ę		objectives		
WATER QUALITY OR SECURITY RISK (CAUSE)	ce	Lack of infrastructure maintenance	no	
g	Governance	Poor management or governance	no	Central Coast Council (in collaboration with Cradle Coast Water) prepared
Ц	em	· · ·	-	a Drinking Water Quality Management Plan
ATI	200	Vandalism / sabotage / terrorism	no	Original Origin Coursell Dublic Lingth Day 10007-00
>	0	Insufficient trained personnel	yes	Central Coast Council Public Health Report 2007-08 notes there were
		Inadequate funding for maintenance or	*	'resource shortages throughout the sampling period'.
		upgrades	no	
	Ē	Mining / minerals		
	Industri es	Irrigation	yes	
	Ĕ	Chemicals / process		
	tio	Seasonal population loadings	yes	Can increase to 16,000 over summer
	n at		,	
	Populatio n	Rapid population growth		
				Low level of E.coli contamination in the drinking water in January 2008.
È		Pathogenic contamination	yes	Caused by birds.
Ъ		Algal blooms	no	
C		Heavy metal contamination	no	
S SE	5	Poor chlorine residuals	yes	Customer complaints received by Cradle Coast Water re chlorine taste
OR FEC	1	Pesticide contamination	no	
≥ H	i.	Boil water notices	yes	A temporary boil water alert was issued in January 2008
K C		Deaths or illness due to water quality	no	
WATER QUALITY OR SECURITY RISK (EFFECT)	2	Water restrictions (current and historic)	no	Cradle Mountain Water (formerly Cradle Coast Water) received 17
		Taste and odour issues	yes	complaints in 2007-08. These incl: chlorine taste, dirty water, supplies
Ë			<b>y</b>	from the Paloona System (untreated)
WA		Other contamination that would affect		
		health		
		Notes		

Ş	101		TAS	
5		State/Territory Town Name	TAS Circular Head	
TOWN		Town Population	4,400	
		Name of Water Utility	Cradle Mountain Wate	•
ШÉ	Ę	Rate (\$/kL)	\$0.72/kL	
WATER	ŧ.	Per Capita Water Consumption (L/day)	681kL/property	
<	>	Number of Connections	28,558	
Δ,		Catchment	-	
CATCHMENT AND	Ş	Sub-Catchment	-	
, ≓	5	Catchment Management Authority (CMA)	Council - Central Coas	t Council
E E	N.		http://www.controlog.cot.to	a any autoite leage afm
동법	т Ц	CMA Web-Link Catchment Protection Status	http://www.centralcoast.tas.gov.au/site/page.cfm Likely not protected (only catchments in southern Tasmania protected).	
DTA	₹	Potable Water Source(s)	Unknown	
05	5	Supply Capacity	Unknown	
		Treatment Plant(s)	Gawler River, Forth River, Lake Paloona, Lake Barrington, Dowling Creek, Leven River, Cam Riv Deep Creek System (137 ML/d each)	
WATER QUALITY		Level of Treatment	The water supply is 77% treated, 10% Chlorinated and 13% Non - Chlorinated water	
E E		Drinking Water Guidelines	ADWG, 2004	
MA		Results (% compliance for 2008 reporting	Physical & chemical	100%
		period) Current Water Restrictions	E-coli	100%
WATER	, NII Y	Proportion of Potable Water Supplied to Households (%)	n/a Approximately 70% to o	domestic users; 30% to 'special' customers.
AN N	2	Distance from the Coast (km)	6km	
> [	ที่	Climate	temperate (no dry seas	on)
	_	Average Annual Rainfall	932mm	
		FACTOR Drought	YES / NO no	NOTES / EXPLANATION
		Single drinking water source	yes	Deep Creek bulk water supply system
		Poor quality water source	no	
		Sewage overflow or disposal into water	no	
	≥	Flooding	yes	Forth Valley flood event after heavy rainfall
	Supply	Fauna defecating in supply	no	
	เริ	Fauna destroying water intake structures Natural mineral pollutants (e.g. uranium,	no	accurred to local storm water and poarby areak after runtured pipe at
	atei	nitrates, iron, fluoride)	yes	occurred to local storm water and nearby creek after ruptured pipe at Burnie treatment plant
	Catchment and Water	Un-lined landfills	no	
SE)		Extensive agriculture	no	although water is supplied to irrigators, farmers etc.
¶ A		Low vegetation cover (dust, sediment	no	
<u>í</u>		Poor access to supply	no	
SK	atch	Unsustainable water extraction	no	
R	ů	Aquifer turning saline due to high extraction	no	
È		Hard water	no	
UR		Aging or inadequate pipe work and	yes	Council investigated infrastructure and found number of risks within
ЦС		associated infrastructure Significant water losses due to leaking	no	system (unknown what they are, however Council is addressing them).
s s		High per capita water consumption	no	
ō		Inappropriate water quality standards /	110	
È		objectives	no	
IAL	e			Council investigated infrastructure and found number of risks within
б	ano	Lack of infrastructure maintenance	yes	system (unknown what they are, however Council is addressing them).
~	ern	Poor management or governance	yes	Council investigated infrastructure and found number of risks within
Ш	Governance		·	system (unknown what they are, however Council is addressing them).
ATEF	G	Vandalism / sabotage / terrorism	no no	
WATER QUALITY OR SECURITY RISK (CAUSE)				
WATEF		Insufficient trained personnel Inadequate funding for maintenance or		
WATEF		Inadequate funding for maintenance or upgrades	no	
WATEF	stri	Inadequate funding for maintenance or upgrades Mining / minerals		
WATEF	ndustri es	Inadequate funding for maintenance or upgrades Mining / minerals Irrigation		
WATEF	<u> </u>	Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process		
WATER	atio Industri es	Inadequate funding for maintenance or upgrades Mining / minerals Irrigation		
WATEF	pulatio Industri n es	Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings		
WATEF	atio	Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process		
	Populatio Industri n es	Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth	no	Low level E.coli contamination detected in May 2007. Precautionary boil
	Populatio Industri n es	Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination	no yes	Low level E.coli contamination detected in May 2007. Precautionary boil water notice issued and lifted after 5 days.
	Populatio Industri n es	Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms	no yes no	
	Populatio n	Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms Heavy metal contamination	no yes no no	
	Populatio n	Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms Heavy metal contamination Poor chlorine residuals	no yes no no no	
	Populatio n	Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination	no yes no no no no	water notice issued and lifted after 5 days.
	Populatio n	Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms Heavy metal contamination Poor chlorine residuals	no yes no no no	
	Populatio n	Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination	no yes no no no no	water notice issued and lifted after 5 days.
	KISK (EFFECI) Populatio Industri n es	Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination Boil water notices	no yes no no no no yes	water notice issued and lifted after 5 days.
	Populatio n	Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination Boil water notices Deaths or illness due to water quality Water restrictions (current and historic)	no yes no no no no yes no no no no	water notice issued and lifted after 5 days.
	Populatio n	Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination Boil water notices Deaths or illness due to water quality	no yes no no no yes no	water notice issued and lifted after 5 days. Low level E.coli contamination detected in May 2007. Precautionary boil water notice issued and lifted after 5 days.
CURITY	Populatio n	Inadequate funding for maintenance or upgrades Mining / minerals Irrigation Chemicals / process Seasonal population loadings Rapid population growth Pathogenic contamination Algal blooms Heavy metal contamination Poor chlorine residuals Pesticide contamination Boil water notices Deaths or illness due to water quality Water restrictions (current and historic)	no yes no no no no yes no no no no	water notice issued and lifted after 5 days. Low level E.coli contamination detected in May 2007. Precautionary boil water notice issued and lifted after 5 days. complaints received by Cradle Mountain Water re chlorine taste in water



## **Case Studies**



# Appendix K Case Studies THE WATER INDUSTRY OPERATOR FFICIAL JOURNAL OF SSOCIATION December 2008

HOW GOOD IS YOUR TREATED WATER STORAGE???

Risks to public health through poor maintenance and management of treated water reservoirs - corrosion of reservoir roof guttering allowing roof runoff to enter reservoir; poor reservoir hatch design that does not achieve a proper seal; severe corrosion on access ladders; dead animals in the bottom of treated water reservoirs, (WIOA Waterworks Journal, December 2008)

#### Case Study 1 – Jindabyne/Smiggin Holes, NSW, Australia, E.Coli contamination 2009

In August this year, the **drinking water supply** of Jindabyne and surrounds was affected by a **sewage overflow**. The leak occurred at a sewer pump station behind the Lake Jindabyne Bowling Club. The Snowy River Shire Council telemetry records indicate that the sewage spill began around midday on the 7<sup>th</sup> August and **went undetected for three days**. An alarm system should have alerted Council workers to the leak, but it did not go off due a technical fault. Between 0.5 and 0.8 mega litres (1ML = 1000,000 L) of sewage spilled into Lake Jindabyne during the event (Summit Sun 13<sup>th</sup> August 2009). A boil water alert was issued to all customers as a precaution until three consecutive water quality tests revealed no *E.coli* in the reticulation system (Summit Sun 13<sup>th</sup> August 2009).

In a separate incident in the same region, around **120 guests became ill with gastroenteritis** at the Smiggin Holes ski resort. **One child required medical assistance** while on a bus trip home from the ski resort (Summit Sun 20<sup>th</sup> August 2009). None of the drinking water samples showed any signs of contamination, but Stuart Cohen of the NSW National Parks and Wildlife Service stated that given the number of people who fell ill and the timing of the gastro outbreak, the event was directly related to the drinking water (NSW NPWS, 2009).

#### Case Study 2 - Cairns/Port Douglas, Qld, Australia, E.coli contamination 2008

In September 2008 *E.coli* was found in seven of the thirteen Port Douglas and Mossman **reservoirs**, prompting Queensland Health to advise that residents in Port Douglas, Craiglee, Mowbray, Rock Point and Daintree Village to boil drinking water until further notice (Dickson, 2008).

Following discovery of the contamination, **seventeen people** presented at Mosman Hospital with **gastroenteritis** symptoms, with **six admitted for overnight observation** (Dickson, 2008).

Open areas and damaged roofs on the reservoirs were highlighted as the possible point of contamination. Prior to the detection of this contamination event, only the water treatment plant and the pipe work were being tested for water quality compliance (Dickson, 2008).

A one-off dose of chlorine was added to the contaminated reservoirs as local residents had an intense objection to the addition of chlorine to the water supply:

"Chlorination of our water supply tears at our social fabric" (Friends of the Douglas Shire 7<sup>th</sup> September 2009)

"There doesn't appear to be any comprehension regarding just how passionately the residents of the old Douglas Shire feel about a chemical free water supply, perhaps the Cairns Regional Council think that we will simply fall into line with their dictates like the rest of the Cairns metropolis appears to do. We will need to demonstrate to them that we are indeed not a herd of sheep to be pushed into whatever convenient pen they see fit. **Chemical free water is our right**..." (Friends of the Douglas Shire 7<sup>th</sup> September 2009)

Chlorination of the entire Douglas water system went ahead in October 2009 because of the repeated instances of *E.coli* contamination in the region (Pashley, 2009); between April and September 2009, there were reportedly 40 positive tests for E.coli (ABC News 28 September 2009). Queensland Health indicated that permanent chlorination will not go ahead if the source of contamination could be isolated (Pashley, 2009).

#### Case Study 3 – Sydney, NSW, cryptosporidium and giardia contamination

In August 1998 Sydney's drinking water supply was affected by cryptosporidium and giardia. Contamination was first detected in the system on the 21<sup>st</sup> July. A series of tests were conducted across the city to determine the extent and the severity of the contamination. The first boil water alert was issued on the 27<sup>th</sup> July to some parts of the Eastern CBD. The alert was extended to other parts of the city on the 29<sup>th</sup> of July and again on the 30<sup>th</sup> of July. The alerts were progressively lifted between the 2<sup>nd</sup> and the 4<sup>th</sup> July.

An Inquiry into the incident cited five possible causes of the contamination event:

- A localised contamination event in the eastern CBD
- Contamination at Potts Hill Reservoir
- Catchment area impacts on the inflow to the Prospect Plant (raw water turbidity events, septic systems draining in to Warragamba Dam, contamination in the upper canal or extraction from low levels in the

#### dam)

- Contamination at the Prospect Plant (release of sediment deposits from the inlet chamber during flow surges; loss of dilution water; reduced effectiveness of the coagulation process; problems in the backwash procedure; cleaning of the clear water tanks and the use of a bypass channel)
- Potential impacts downstream from the prospect plant

Source: (Smith, 1998)

#### Case Study 4 - Walkerton, Southern Ontario, Canada, E.Coli and Campylobacter jejuni contamination

In May 2000, the Walkerton drinking water system became contaminated with *E.coli* and *Campylobacter jejuni*. **Seven people died and over 2,300 people became ill with bloody diarrhoea, stomach pain and nausea.** Some victims, particularly children may experience lasting health effects from the contamination event.

The government of Ontario held an inquiry following the contamination event to determine the cause, who was responsible, how it could have been prevented and how to stop it from happening again. The inquiry heard from 114 witnesses, including residents of the town, local officials, senior civil servants, two former ministers of the environment and the Ontario Premier.

The inquiry found that the primary source of the contamination was from manure that had been spread on a farm near a drinking water well. The main findings of the inquiry were:

- The farmer was following proper practices and should not be faulted
- The contamination event could have been prevented if continuous chlorine residual monitors and turbidity monitors were in place
- Staff at the Walkerton Public Utilities Commission did not have sufficient skills to identify the vulnerability of the well to contamination and the requirement for continuous chlorine residual and turbidity monitors
- The failure to use monitors at the well resulted from short-comings in the approvals and inspections program of the Ministry of the Environment
- The provincial government's budget reductions made it less likely that the Ministry of the Environment would identify poor practices
- For a long period of time (years), the operators had been engaging in improper operating practices including failing to use adequate doses of chlorine, failing to monitor residuals daily, making false entries about residuals and reporting monitoring information at the wrong locations
- Following detection of the contamination event, the boil water alert that was issued should have been more widely disseminated; had this been done, hundreds of illnesses could have been avoided
- When the provincial government ceased government laboratory testing, they should have mandated that non-government testing laboratories notify the regulatory authorities immediately and directly of adverse results so that boil water alerts could have been issued sooner, preventing hundreds of illnesses

Source: (O'Conner, 2002)

Reconstructing the community's water supply is reported to have cost around \$11 million, while the estimated total cost of the contamination event was \$155 million by 2001 (Meinhardt, 2002, cited in Meinhardt, 2005).

#### Case Study 5 - Milwaukee, Wisconsin, USA, cryptosporidium

In 1993, Milwaukee in the USA experienced a large outbreak of waterborne cryptosporidiosis. The event was attributed as the underlying or contributing **cause of death in 54 residents** (Meinhardt, 2005). William et. al. (1994) report that an estimated **403,000 residents (or 52% of the population) developed diarrhoea** as a result of the outbreak. **Over 4,000 residents required hospitalisation** (Meinhardt, 2005). Susceptible members of the community were most severely affected (Meinhardt, 2005).

The following factors are highlighted in the literature:

- Cryptosporidium oocysts passed through the filtration system of one of the city's water treatment plants from Lake Michigan (William et. al., 1994)
- The outbreak went undetected for the period between the 23<sup>rd</sup> March 23 and the 9<sup>th</sup> April because the water quality standards and testing of patients for cryptosporidium were not adequate to detect the outbreak
- No specific source of the cryptosporidium was ever identified but runoff from abnormally heavy spring rains

- most likely carried the cryptosporidium to the lake from a variety of sources (Wisconsin DNR, 2008)
- There are reports to suggest that 725,000 productive days were lost due to the event, costing almost \$54 million lost work time and additional expenses to residents and local government (Meinhardt, 2005)
- As a result of the outbreak, more restrictive federal requirements were implemented for turbidity, including more frequent testing and more stringent standards (Wisconsin DNR, 2008)

Case Study 6 - North Thames, United Kingdom, cryptosporidium contamination in groundwater

In 1997, **345 people** were confirmed to be suffering **cryptosporidiosis** due to a large waterborne outbreak in North Thames. Studies carried out by Willocks et. al. (1998) indicate that the outbreak was attributed to one groundwater borehole. Cryptosporidium contamination was detected in the raw water, the filtered water, and in the distribution system (Willocks et. al., 1998). A boil water alert was in place for a period of sixteen days.

This is a unique case because at that time, it may have been the **first published case of cryptosporidium in a groundwater supply** (Willocks et. al., 1998). The cause of the contamination was unclear following investigations into the outbreak, however potential sources of contamination were infiltration from the nearby river through the aquifer and into the well, ingress through the well access system or cracks in the well lining (Willocks et. al., 1998).

Case Study 7 - North Pine, Qld, Australia, fluoride over-dosing/operator error

During April 2009, a series of events lead to **over-dosing of fluoride** at the North Pine water treatment plant in Queensland.

The North Pine treated water pumps were shut down just prior to midnight on the 27<sup>th</sup> April to allow scheduled maintenance to go ahead. At this time, the delivery flow meter should have displayed a zero flow, corresponding to zero fluoride dosing.

Approximately 19 hours after the pumps were shut down, a **false flow signal from the main delivery flow meter initiated fluoride dosing**. Normally, if the flow meter and flow switch show different signals, dosing will not occur. At this time, the flow switch had been repaired and had not been re-calibrated, so was showing a false signal of 'on'. Therefore the combination of the incorrect (positive) flow signal and the false flow signal of 'on' allowed dosing to go ahead.

There are two separate automated safety alarms that sound when the concentration of fluoride exceeds 1mg/L. Seqwater staff had disabled the function of one alarm due to it being faulty, so dosing occurred intermittently for several hours until the second online analyser initiating a "high high" fluoride alarm. This resulted in an automated shut down of the fluoride dosing facility, which occurred at 12:35am on the 29<sup>th</sup> April 2009. A total of **13,000 litres** of concentrated fluoride solution had been dosed before it was detected at the online analyser sample point (Queensland Health, 2009). Some of the water was potentially supplied to customers.

The Queensland Health report (2009) cited inappropriate operational responses, **lack of understanding** and **lack of reporting** on the operator's behalf as **contributing factors** to the event.

#### Case Study 8 - Gideon, Missouri, USA, salmonella contamination in an undisinfected supply

In November 1993, seven cases of *Salmonella typhimurium* gastroenteritis were detected amongst residents of the Anderson Township. The local health department found no common food exposures but all patients had drank water in the township of Gideon, which was an unchlorinated supply. When the water was tested, it was confirmed to contain faecal coliforms. A boil water alert was issued.

By the end of December, more than 650 people were ill, 15 residents had been hospitalised, 28 nursing home residents were ill with diarrhoea, 7 of whom would later die as a result.

The contamination entered the water system at the water storage tower/reservoir. The roof had an improper roof vent that allowed free access to wild birds.

Source: (Angulo et. al., 1997)



## Water Quality Media Monitoring



Indox #	Madia Depart
Index #	Media Report
1	'Swansea water clean by summer', <i>Hobart Mercury</i> , 15 September 2009.
	Swansea, TAS
	The construction of a new dam and water treatment plant will enable residents of Swansea to drink their
•	tap water without having to boil it. The project is expected to be complete by the summer of 2009-2010.
2	Ker, P, 'Drinking-water fears raised over cattle in rivers', <i>The Age</i> , 7 September 2009.
	VIC
	There are concerns over the protection of drinking water supplies as the Brumby Government prepares
	to re-issue licences that allow farmers to let their stock roam on river frontages that are part of Crown
	land. The managing director of North East Water said there were no doubts cattle created water quality
	challenges.
3	'Sewage spill threatens Jindabyne water supply', Canberra Times, 12 August 2009.
	Jindabyne, NSW
	A sewage spill in Lake Jindabyne contaminated the area's water supply. People reliant on the water
	source should boil their drinking water to avoid E.Coli bacteria, which causes diarrhoea, pneumonia and
	other illnesses.
4	'Not weak on water', Hobart Mercury, 4 August 2009.
	Hobart, TAS
	A pilot study monitoring bore water across Tasmania has found evidence of pesticides and herbicides
	commonly used in the farming and forestry sectors. This is not the first time chemicals have been found
	in Tasmania's water sources.
5	Hopkin, M, 'Recycled sewage trial on track to start in January', The West Australian, 10 July 2009.
	Perth, WA
	Perth's groundwater supplies are to be injected with treated sewage as part of the WA Government's
	plan to boost aquifers. Before injection, the sewage will be subject to an intensive purification process.
	The Health Department is to issue new quality guidelines for the treated water.
6	Williams, M, 'Salt threat to city water', The Advertiser, 7 July 2009.
	Adelaide, SA
	The salinity levels of River Murray water being pumped to the homes of 1.2 million people across
	Adelaide have more than doubled in the past three years. A fact sheet produced by SA Health warns
	there could be impacts for those people who need to limit their daily salt intake.
7	'Sydney's water safe', Daily Telegraph, 19 June 2009.
	Sydney, NSW
	A Sydney Catchment Authority spokeswoman has said that Sydney's water supply is safe despite high
	levels of metals and salts in a river feeding it. High levels of arsenic, copper and boron have been found
	in the Coxs River near Wallerawang power station west of Lithgow.
8	Cubby, B, Jenson, E, 'Government knew about toxic threat', The Sydney Morning Herald, 19 June
-	2009.
	Sydney, NSW
	High levels of toxic metals and poisons, including arsenic, have been found in the Coxs River, which
	feeds Sydney's water supply. It is thought that the pollution is caused by industries within the catchment,
	including collieries and power stations.
9	Cubby, B, 'Toxic metals threat', <i>The Sydney Morning Herald</i> , 18 June 2009.
-	Sydney, NSW
	A University of Western Sydney researcher has identified heavy metals and poisons such as arsenic,
	copper and boron in the Coxs River, which feeds Sydney's water supply. The source of the pollution is
	believed to be the Wallerawang power station.
10	Johnstone, C, 'Still none the wiser – water quality reports delayed', <i>The Courier-Mail</i> , 27 May
	2009.
	QLD
	The Bligh Government has delayed reports detailing water quality results for southeast Queensland's new water grid. The quarterly reports are to detail the monitoring results for fluoride, E.coli and
	pathogens such as Giardia.

## Appendix L Water Quality Media Monitoring

Index #	Media Report
11	Ker, P, 'Fight looms over whether to lead cattle to rivers', The Age, 26 May 2009.
	VIC
	Thousands of licences allowing farmers to graze cattle on river banks in Victoria are up for renewal.
	There is increased pressure by environmental groups to have cattle barred from river banks. Cattle
	hooves increase the erosion of river banks and grazing strips the banks of riparian vegetation which is
	important for controlling water quality. Cows also create problems by defecating, or even dying, in the
	rivers, increasing the risk of algal blooms and eroding water quality.
12	'HOPELESS – REVEALED: Even more blunders foul our water', The Courier-Mail, 23 May 2009.
	QLD
	Inadequately treated drinking water has been distributed around southeast Queensland's troubled water
	grid. This includes one case where E.coli contaminated a reservoir in Brisbane.
13	'Open tap on vital water information', <i>The Courier-Mail</i> , 23 May 2009.
-	QLD
	Evidence indicates that there are teething problems with the new southeast Queensland's water system.
	These problems include a lack of communication between water agencies and government departments,
	and the reliability of water quality information made available to the public.
14	'Claims drinking water contaminated by farm chemical', ABC Rural, 21 April 2009.
	QLD
	Scientists believe the drinking water in several Queensland communities is being contaminated by the
	commonly used farm herbicide atrazine. The herbicide is suspected to be disruptive to the human
	endocrine system and it is thought to cause cancer and infertility.
15	'Algae adds to river urgency', The Advertiser, 30 January, 2009; 'Murray toxic algae alert', The
	Advertiser, 30 January, 2009
	Murray River/Waikerie, VIC
	Detection of toxic blue-green algae blooms in the River Murray.
16	Guerrera, O, 'Locals hot under the collar about boiling 'unsafe' water', <i>The Age</i> , 28 July 2007.
	Mt Beauty, Tawonga, Tawonga South and Myrtleford, VIC
	Boil water notice issued, with a plan to remain in place indefinitely.
17	'Radiation blunder', <i>Herald Sun</i> , 24 July, 2007.
	Beverley Mine, SA
	A worker mistakenly added uranium solution rather than hydrochloric acid to a water desalination unit at
	the mine. Approximately 100 workers were exposed. An EPA spokesman said it was unlikely anyone
	would be affected as it was a weak solution, but an investigation would be carried out.
18	'Businesses blamed for WA's contaminated groundwater', The West Australian, 2 July 2007.
	WA
	The State of the Environment Report 2007 identified water contamination as one of the key issues facing
	WA. WA businesses are contributing by dumping pesticides and other pollutants into drains. In the Wheat
	belt, high levels of lead, iron and aluminium had been found in deep drains.
	Conservation Council president Philip Jennings said that the number of household bores which had been
	contaminated over recent years was alarming.
19	Brown, T, 'Waiting at hell's gate', <i>Herald Sun</i> , 9 December 2006.
	Tolmie and surrounds, VIC
	Township under boil water notice due to ash from bush fires fouling supplies.
20	'Sigh of relief amid devastation', <i>Herald Sun</i> , 22 March, 2006.
	Innisfail, Qld
	Residents issued with a boil water notice due to the impacts of Cyclone Larry.
21	Crawford, W, 'More than surface water', Hobart Mercury, 2 October 2004.
	TAS
	Opinion piece on the negative media attention on the state of drinking water in Tasmania. Includes info
	on the contamination of drinking water with atrazine; a potentially carcinogenic herbicide that was being
	used to spray timber plantations adjacent to drinking water source.
22	DiGirolamo, R, 'PVC drinking water review in pipeline', <i>The Australian</i> , 24 January 2001.
	Indulkana, SA
	PVC pipes contaminated drinking water. Lead levels four times the above the guidelines.
	Cause was human error and confusion over the correct standards to be used for drinking water pipes.

Index #	Media Report			
23	James, C, 'Block on herbicide use', Adelaide Advertiser, 24 January 2001.			
	South Para & Warren Reservoirs, SA			
	Forestry SA forced by the EPA to stop using potentially carcinogenic herbicides after its operations			
	contaminated drinking water supplies. The herbicide was found in the Warren Reservoir "continuously			
	since September 1997". The herbicide was traced to new pine plantations near the Barossa Valley.			
24	'Blooming invaders in our waters', Canberra Times, 30 November 2000.			
	Armidale NSW; Palm Island, QLD			
	Studies of blood samples from residents who had consumed water from an algal bloom in Armidale sho mild liver damage.			
	Following an algal bloom in the Solomon Dam, Palm Island Qld (in 1979), some children showed signs			
	gastrointestinal, liver and kidney damage.			
25	Flint, J, 'Water leaves bad taste in union mouth', The West Australian, 26 June 1999.			
	Worsley, WA			
	Workers went on strike after their drinking water was contaminated at the Worsley Alumina mine. Heavy			
	rain and construction activity had caused extra soil to wash into the company's fresh water dam,			
	increasing bacteria levels. Unions wanted bottled water be trucked in for workers, rather than drinking			
	water from Collie while an upgrade of the onsite water filtration plant was completed.			
26	Overington, C, 'Polluted water crisis', The Age, 31 July 1998.			
	Sydney, NSW			
	Drinking water contamination by cryptosporidium and giardia. Boil water alerts issued.			



## Water Security Media Monitoring



Index #	Media Report			
27	Caldwell, A, O'Loan, J, 'Towns near last dregs in drought', <i>Courier Mail</i> , 2 December 2009.			
21	Maleny and Dalby, QLD			
	Maleny, a town of population 5,000 located in the Queensland Sunshine Coast hinterland may required			
water to be trucked in within weeks. The town received only 39.2mm of rain in November,				
	100mm short of the average. The town has been participating in a water conservation program since			
	September, but are not on track with the program's targets.			
	Dalby, a town of population 12,000 reportedly had only a few hours supply remaining on the 2 <sup>nd</sup> of			
	December. The town was consuming 6.5ML/day when the available supply was only 4.5ML/day, partly			
	due to high temperatures. Councillors are planning on increasing water restrictions to Level 6.			
	The towns of Chinchilla, Miles and Tara are also running short on water, while Toowoomba's dams are			
	only at 8.2% capacity.			
28	Cubby, B, Wilkinson, M, 'People v power station as water levels plunge', Sydney Morning Herald,			
20	19 November 2009.			
	Oberon, NSW			
	The record low level of Oberon Dam (currently at 12.5%) has caused friction between two of the dam's			
	priority users; Oberon Council and Wallerawang power station. The township of Oberon, which is under			
	tight water restrictions, uses less than 2 million litres a day against the power station's allocation of 9			
	million. A spokesman for Water Minister Phil Costa has clearly stated, however, that water for critical			
	human needs comes first.			
29	Tovey, J, 'Rivers, dams fail Lachlan Valley towns', Sydney Morning Herald, 26 November 2009			
20	Lachlan Valley, NSW			
	Due to prolonged drought, many towns on the Lachlan River are from next month to receive their water			
	rations by truck. Wyangala Dam, at the top of the Lachlan River, is only at 4.9 percent capacity, and if			
	flows from the dam are not reduced and the drought continues there will be no flows left by Autumn.			
30	Gaynore, M, 'Toowoomba runs dry', <i>The Sunday Mail</i> , 20 September 2009.			
	Toowoomba, QLD			
	Toowoomba has been forced to tap into an emergency allocation of bore water, while a pipeline			
connecting the Wivenhoe Dam to the region's water supply is complete. The region is with				
	long drought, with dam levels falling to below 9.8%. Three years ago the town rejected a recycled water			
	referendum when dam levels were over 23%.			
31	Kretowicz, E, 'Cotter dam expansion may start next month', Canberra Times, 17 September 2009.			
•	Canberra, ACT			
	The ACT Government has approved the expansion of Cotter Dam. The dam will increase Canberra's			
	water supply by 35 percent.			
32	Jenkin, C, 'Stormwater plan will ease drain on Murray', The Advertiser, 14 September 2009.			
	Adelaide, SA			
	A key element of one of South Australia's largest stormwater recycling projects has been approved,			
	helping save 3.8 GL of water each year from the River Murray. The project will help improve the			
	sustainability of the city's water supply.			
33	'Water bans an election risk', The Advertiser, 10 September 2009.			
	Adelaide, SA			
	The management and security of Adelaide's water supply is expected to significantly influence the next			
state government election in March next year.				
34	Ker, P, 'Water plan a 'threat to river'', <i>The Age</i> , 9 September 2009.			
	Thomson River, VIC			
	To boost Melbourne's water supply the State Government plans to extract an extra 10 billion litres			
	annually from the Thomson River. This is equivalent to 15% of the river's flow after allocations to			
	farmers. Scientific advice has found that extra extractions from the river would deteriorate water quality			
	and reduce the potential for fish to move up the river.			
35	'Water costs still value for money', <i>Canberra Times</i> , 4 September 2009.			
	Canberra, ACT			
Cotter Dam is to be enlarged and the cost will ultimately be borne by consumers, with annua expected to rise by \$100 on average. It has been suggested that paying an extra \$2 a week				

## Appendix M Water Security Media Monitoring

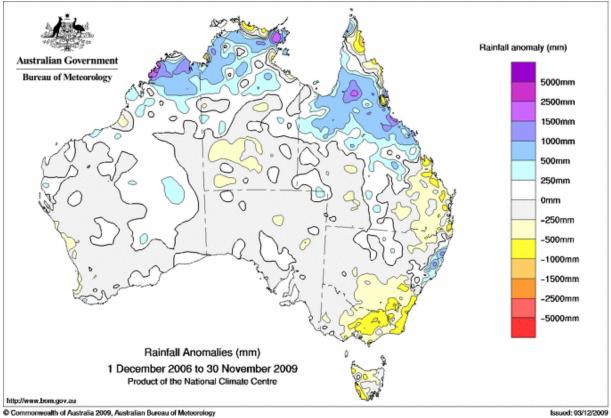
Index #	Media Report				
	security of supply now and well into the future is money well spent. The increase in water bills reflects				
	the growing scarcity of water supply.				
36	Ker, P, Morton, A, 'Clean-coal technologies may imperil water supply', The Age, 7 August 2009.				
	Melbourne, VIC				
	A report by the National Water Commission has warned that water consumption would significantly				
	increase if carbon capture and storage methods were built into coal-fired power stations. Power si				
	consume large amounts of fresh water, and the report estimated that incorporating carbon capture and				
	storage could be one-quarter to one-third more water intensive.				
37	Owen M, 'Upgrade to ease Murray's burden', The Australian, 29 July 2009.				
	Adelaide, SA				
	The SA government will spend \$400 million on improving the connectivity between Adelaide's southern				
	and northern water supply systems. This will allow the delivery of water at full capacity from Adelaide's				
desalination plant, which will come online in 2012 and reduce the city's reliance on the N					
38	Cubby, B, 'New mine could crack dam floor', The Sydney Morning Herald, 23 July 2009.				
	Woronora Catchment, Sydney				
	A new longwall coalmine directly beneath Woronora Reservoir has the potential to crack the dam floor				
	and cause serious leaks from southern Sydney's main drinking water supply.				
39	Cubby, B, Dart, J, 'Toxic waste in town's drinking water', The Sydney Morning Herald, 15 July 2009.				
	Lithgow, NSW				
	Doctors in Lithgow are protesting against Council's plans to increase the amount of recycled industrial				
	water in the town's drinking water supply. No research has been done on possible links between heavy				
	metals in the water and health effects.				
40	Downie, G, 'Cotter Dam EIS gets approval', Canberra Times, 21 June 2009.				
	Canberra, ACT				
	The Environmental Impact Statement assessment report for Canberra's Cotter Dam project has been				
	approved, allowing for development applications to be lodged. The project will increase the capacity of				
	Cotter Dam from 4GL to 78GL and will help to secure Canberra's water supply against drought.				
41	Jenkin, C, 'TECHNOLOGY Industries world leaders in purification making most of the little water				
	we have', The Advertiser, 6 June 2009.				
	Adelaide, SA				
	The water problems facing South Australian have been a key impetus for the growth of the state as a				
	global player in water-related technology and intelligence. Researchers and businesses are developing				
	new and improved methods for dealing with water shortages, with many local businesses now exporting technology and services around the world.				
42					
42	Johnstone, C, 'Supply cut as main floods suburb – giant pipeline given the all-clear recently', The Courier-Mail, 20 May 2009.				
	Brisbane, QLD				
	A giant water distribution main in Brisbane burst, flooding neighbouring properties and nearby creeks.				
	Many properties in Brisbane's west and south were without water supply or with reduced pressure for				
	several hours following the failure.				



## Water Quality and Security Risks



### Appendix N Water Quality and Security Risks



		Water Quality or Security Risk	No. of Selected Towns With Risk Factor	% of Selected Towns With Risk Factor
WATER QUALITY OR SECURITY RISK (CAUSE)		Drought	75	74
		Single drinking water source	66	65
		Poor quality water source	26	26
		Sewage overflow or disposal into water source	10	10
	<u>&gt;</u>	Flooding	35	35
	ddr	Fauna defecating in supply	44	44
	ŝ	Fauna destroying water intake structures	7	7
	Catchment and Water Supply	Natural mineral pollutants (e.g. uranium, nitrates, iron, flouride)	25	25
	p	Un-lined landfills	14	14
	t aı	Extensive agriculture	54	53
	nen	Low vegetation cover (dust, sediment runoff)	46	46
х Х	hr	Poor access to supply	1	1
R	ato	Unsustainable water extraction	30	30
μ	0	Aquifer turning saline due to high extraction	18	18
IRI		Hard water	9	9
SECL		Aging or inadequate pipework and associated infrastructure	22	22
Ř		Significant water losses due to leaking pipes	7	7
	Governance	High per capita water consumption	11	11
É		Inappropriate water quality standards / objectives	0	0
IAL		Lack of infrastructure maintenance	6	6
g		Poor management or governance	5	5
Ř		Vandalism / sabotage / terrorism	3	3
ATE		Insufficient trained personnel	4	4
Ň		Inadequate funding for maintenance or upgrades	5	5
	Industries	Mining / minerals	16	16
		Irrigation	45	45
		Chemicals / process	16	16
	Population	Seasonal population loadings	26	26
	Popu	Rapid population growth	25	25
	~	Bacteriological and / or viral contamination	24	24
	Ú.	Algal blooms	22	22
OR OR	Щ	Heavy metal contamination	17	17
Σ	Ē	Poor chlorine residuals	14	14
5	E X	Pesticide contamination	4	4
₽	SISI	High suspended solids	8	8
ğ	ш ≻	Boil water notices	7	7
WATER QUALITY OR SECURITY RISK (EFFECT)		Deaths or illness due to water quality	1	1
		Water restrictions (current and historic)	68	67
		Taste and odour issues	20	20
	S	Other contamination that may affect health	35	35

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