



WATER SERVICES ASSOCIATION
of Australia

Aquality

Measuring the Implementation of Risk Management Plans

Peter Donlon
Technical Director - WSAA

The Water Services Association of Australia (WSAA)

WA MEMBER
Water Corporation

NT MEMBER
Power and Water

QLD MEMBERS
Brisbane Water
Gold Coast Water
Ipswich Water
Logan Water
Maroochy Water Services
NQ Water
SEQ Water

ASSOCIATE MEMBERS
CalAqua (Caloundra City Council)
Cairns City Council
Department of Natural Resources and Mines
Gladstone Area Water Board
Pine Rivers Shire Council
Queensland Water Directorate
Redland Shire Council

NEW ZEALAND MEMBERS
Metrowater Limited
Northshore City Council
Watercare Services Limited

ASSOCIATE MEMBER
New Zealand Water and Wastes Association

ACT MEMBER
ACTEW Corporation

SA MEMBER
SA Water

VIC MEMBERS
Barwon Region Water Authority
Central Highlands Water
Coliban Water
City West Water Limited
Gippsland Water
Goulburn Valley Water
Melbourne Water
South East Water Limited
Western Region Water Authority
Yarra Valley Water Limited

ASSOCIATE MEMBERS
Department of Human Services
Earth Tech Engineering Pty Ltd
East Gippsland Region Water Authority
Goulburn-Murray Water
Grampians Wimmera Mallee Water
Gutteridge Haskins and Davey Pty Ltd
Lower Murray Region Water Authority
Victorian Water Industry Association
Westernport Region Water Authority

TAS MEMBER
Hobart Water

ASSOCIATE MEMBERS
Cradle Coast Water
Esk Water Authority
Hobart City Council

NSW MEMBERS
Gosford City Council
Hunter Water Corporation
Sydney Water Corporation
Sydney Catchment Authority

ASSOCIATE MEMBERS
Country Energy
Department of Commerce
Hastings Council
Mid Coast Water
Ministry of Energy, Utilities and Sustainability
Shoalhaven Water (Shoalhaven City Council)
Water Directorate

Why should we analyse our risks?

Is this just more work imposed on us ?

Does it really matter ?



**It's not more work
IT IS THE WORK !**

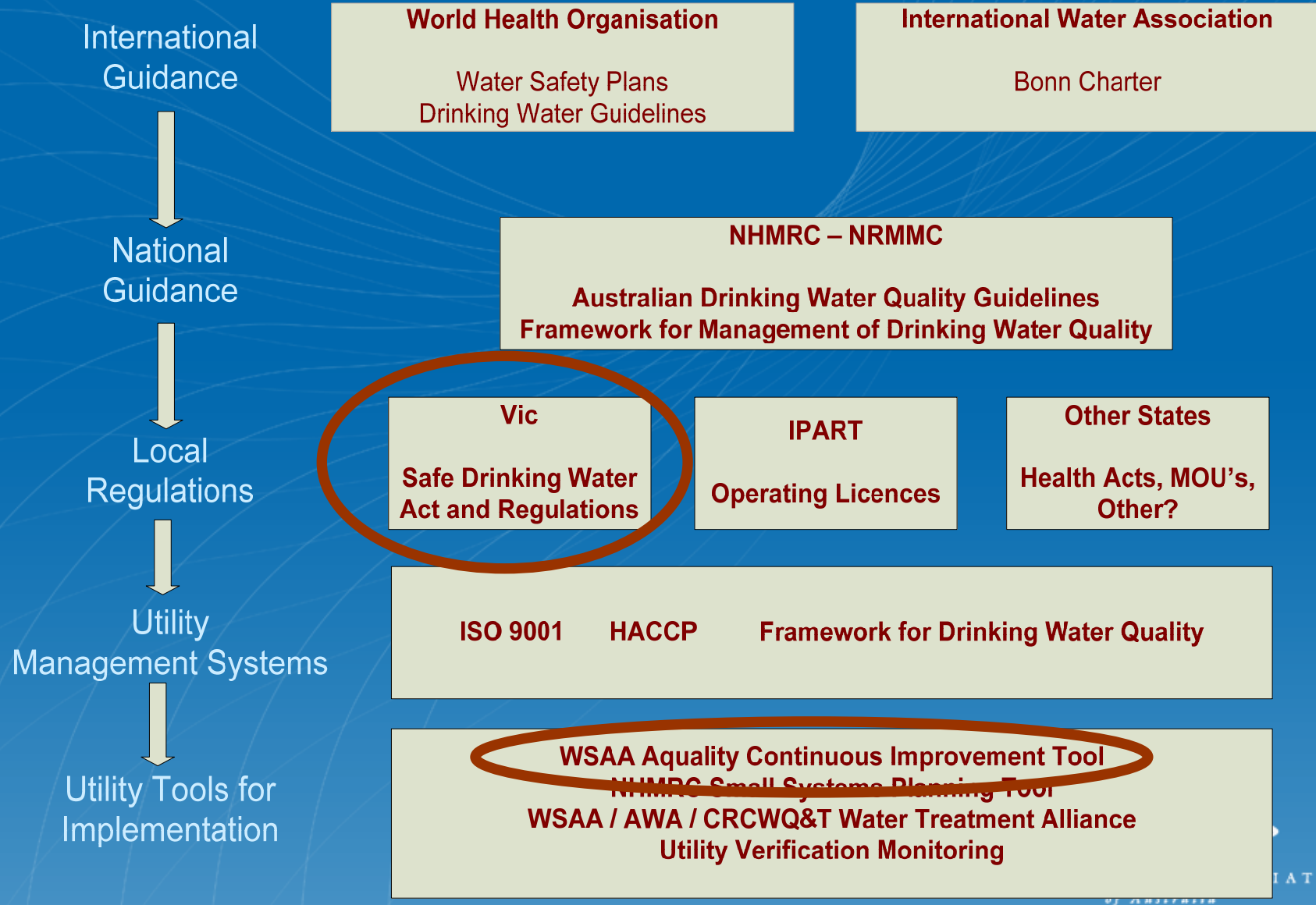
Professor Don Bursill
Chair of the NHMRC Water Quality Committee

The Community has
their Trust in You !



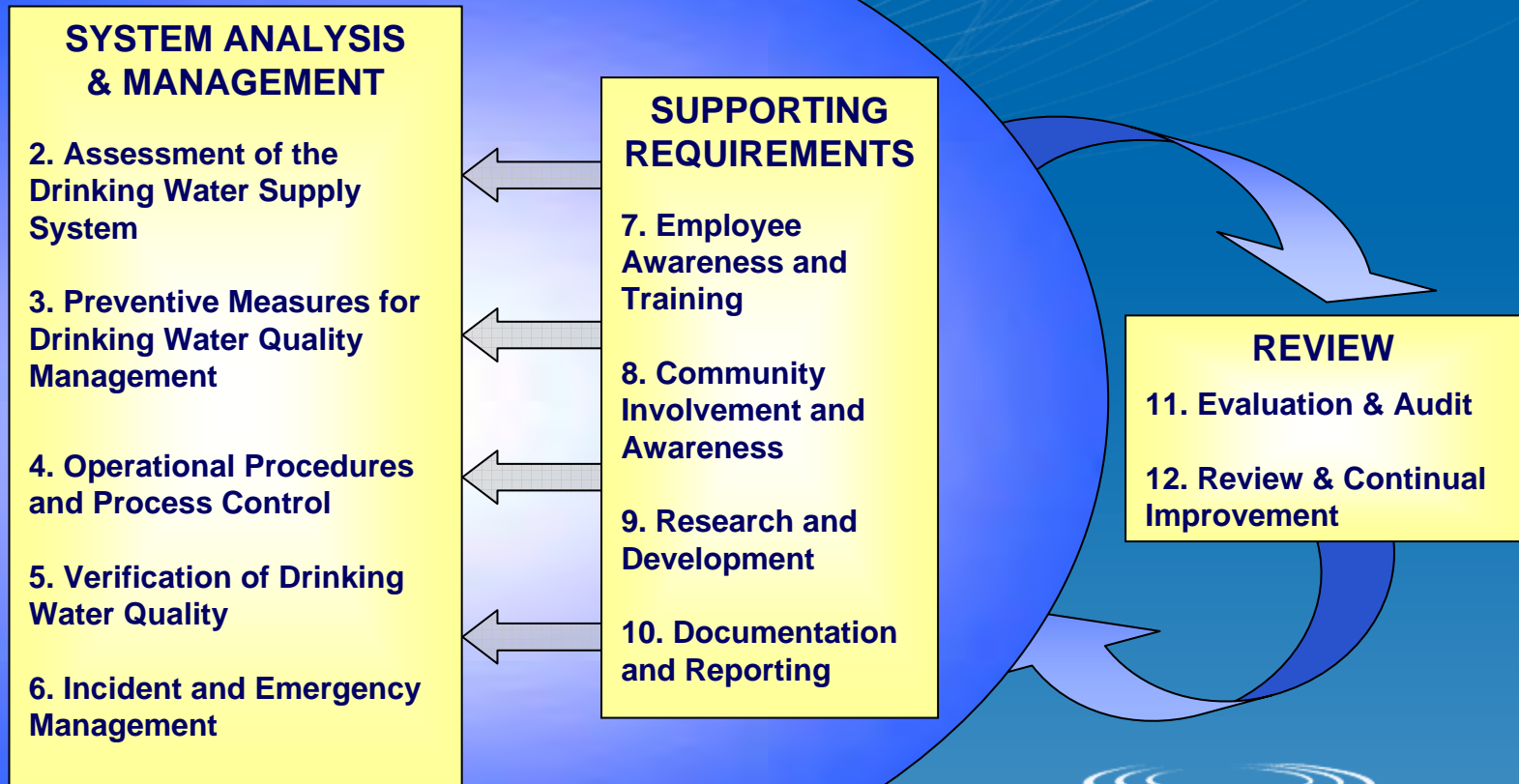
WATER SERVICES ASSOCIATION
of Australia

Safe Drinking Water - Guidance and Implementation



Framework for Management of Drinking Water Quality

1. COMMITMENT TO DRINKING WATER QUALITY MANAGEMENT



Australian Drinking Water Guidelines 2004

Framework for the Management of Drinking Water
Victorian Safe Drinking Water Act and Regulations

Managing Risk



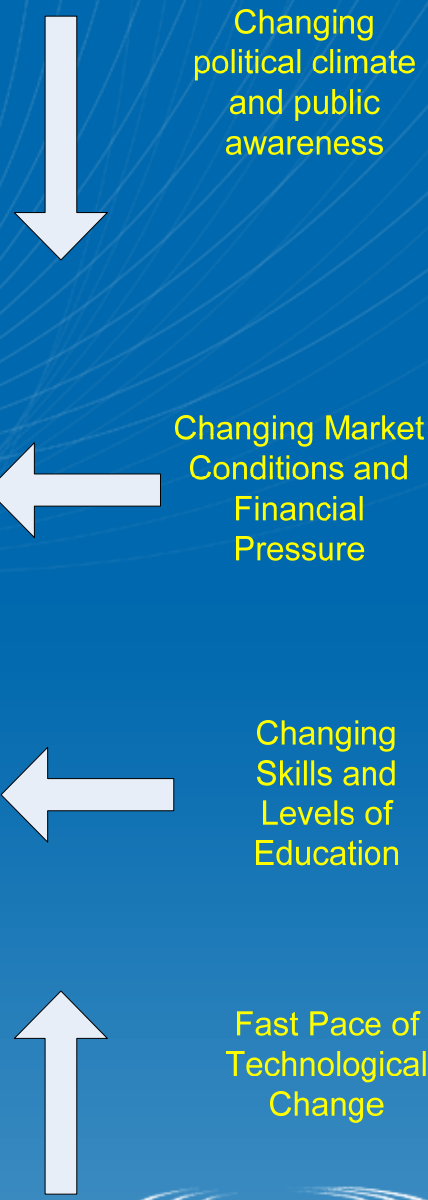
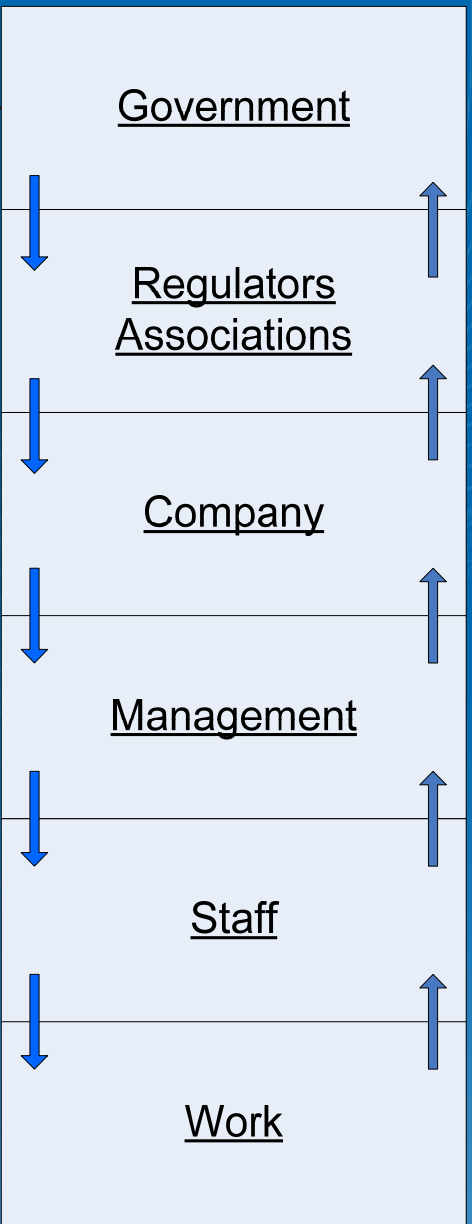
WATER SERVICES ASSOCIATION
of Australia

Public Opinion →

Sociotechnical Systems and Risk Management (Woo and Vicente)

If Balance is Incorrect Systems Will Fail – We must manage the Risks!

From Sociotechnical systems, risk management, and public health: comparing the Nth Battleford and Walkerton Outbreaks (Woo and Vicente; Reliability Engineering and System Safety 80 (2003) P 253-269)





Demonstrating the Robustness of ADWG

Element 9
Research and Development

- Research preceding the incident:
 - pathogen types in Melbourne's protected catchments
 - pathogen concentrations during runoff events
- Low concentrations of micro-organisms detected:
 - non-human infectious Cryptosporidium
 - Giardia
 - bacterial indicators

Element 5
Verification Monitoring

Lessons learnt

- The importance of:

Element 8
Community Involvement

- Strong relationships and open communication with stakeholders (regulator, Government, retail water companies, Councils, schools and customers)
- Knowing the catchment risks and treatment plant limits (HACCP)
- Contingency planning for alternate sources and preparedness (of Yarra Valley Water) to administer a boil water notice
- Support from the broader water industry expertise

Element 6 Incident Management

Element 2 Assess of Risks

Element 3 Preventative Measures

Algae in Lake Burragorang - Warragamba Dam - 28 August 2007 to date



Photo: 30 August 2007



Photo: 31 August 2007



**Algae in Lake Burragorang - Warragamba Dam
- 28 August 2007 to date**

**Unprecedented !
Plan for key risks!**



Photo: 31 August 2007







Best Practice Incident Management

System Problems – Saturday Morning

- ▶ **70 wastewater pumping stations without power**
- ▶ **4000 properties out of water due to water pumping station problems**
 - Water supplies to both sides of Lake Macquarie and Eastern Newcastle affected
- ▶ **Over 500 of customer calls due to sewer overflows, many others due to stormwater problems and loss of water supply over the long weekend**
- ▶ **1200 SCADA alarms**

Traditional *E. coli* Indicator alone
is insufficient

We must proactively manage the
“Risk!”

What do you report to your Board?



Pathogens are the greatest risk



Salmonella Sepsis

E.coli 0157
death



Studied water-borne outbreaks in the developed world

- ◆ Over the past 30 years
- ◆ In 15 affluent countries
- ◆ 98 outbreaks reviewed
- ◆ 73 case studies analysed
- ◆ Focused on what failed & why
- ◆ Book has now sold in 25 countries since July 2004 and is into second printing

Safe Drinking Water

Lessons from Recent Outbreaks in Affluent Nations

Steve E. Hruddy and Elizabeth J. Hruddy



IWA
Publishing

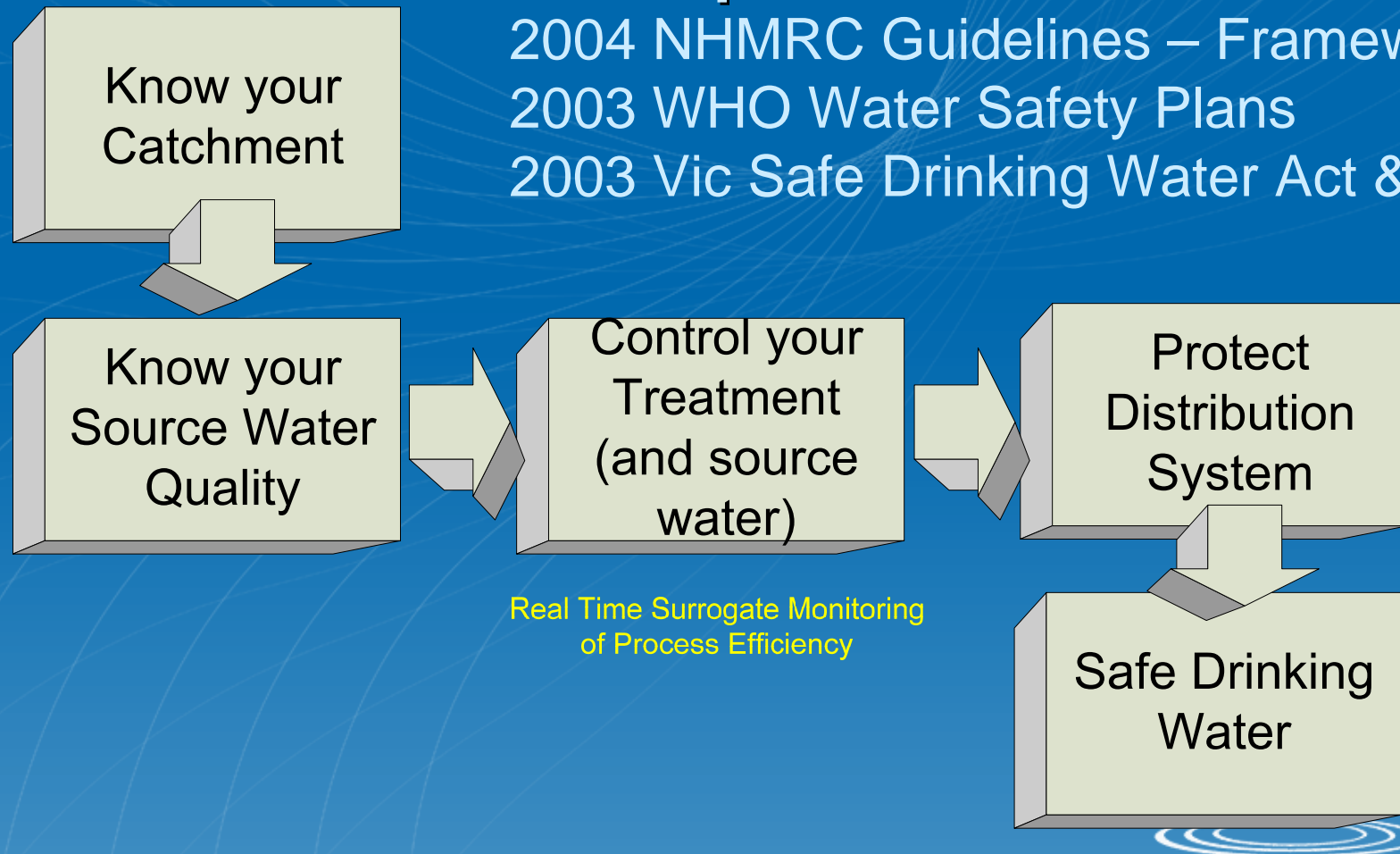
Catchment to Consumer Risk Management

Concept Imbedded In:

2004 NHMRC Guidelines – Framework

2003 WHO Water Safety Plans

2003 Vic Safe Drinking Water Act & Regs



Aquality

- System Process Metric that scores water quality management practices (not quality) based on ADWG Framework
- Measures developed by experienced Water Quality Managers across the Country. International peer review
- **Victorian Safe Drinking Water Act Subset**
- Hierarchical Reporting System
 - Board Reports (shows Board, Exec strengths and weaknesses)
 - Detailed Systematic Improvement Approach (individual measures can be worked on to improve over time)



Australian Drinking Water Quality Guidelines (2004)
Framework for the Management of Drinking Water Quality

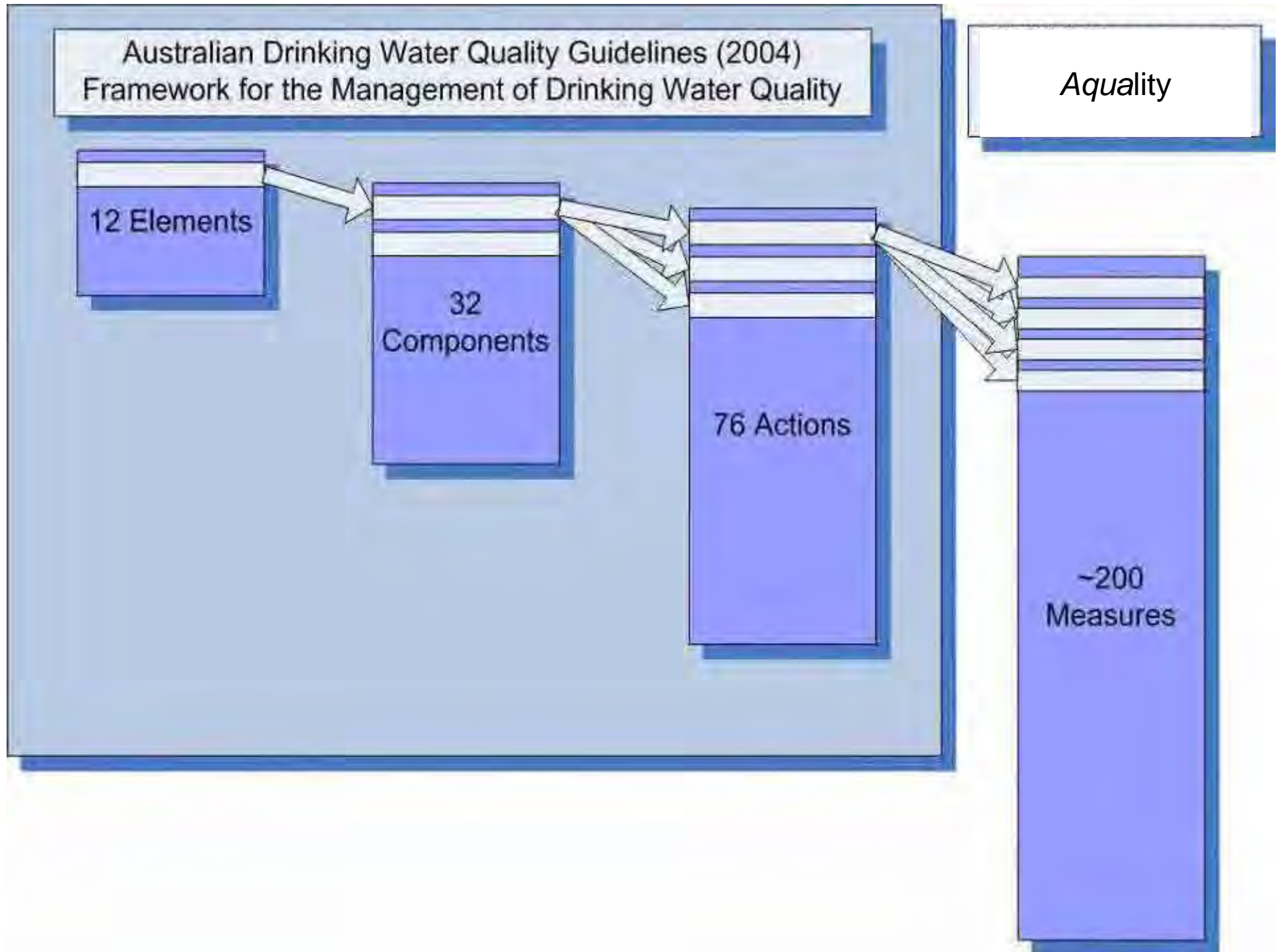
12 Elements

32
Components

76 Actions

~200
Measures

Aquality



Aquality Project - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Home Search Favorites

Address http://localhost/aquality/project.aspx Go Links

aquality WATER SERVICES ASSOCIATION of Australia

Project [TEST]: Another test 2006-11-07 Log Off

- 1 Commitment to Drinking Water Quality Management
 - 1.1 Drinking water quality policy
 - 1.2 Regulatory and formal requirements
 - 1.3 Engaging stakeholders
 - 1.3.1 **Measure 1.3.1.1**

Score: 0 %

DESCRIPTION

The agency has a process for determining the identity and role of stakeholders in relation to drinking water quality.
 - 1.3.2
 - 1.3.3
- 2 Assessment of the Drinking Water Supply System
- 3 Preventive Measures for Drinking Water Quality Management
- 4 Operational Procedures and Process Control
- 5 Verification of drinking water quality
- 6 Management of incidents and emergencies
- 7 Employee awareness and training
- 8 Community involvement and awareness
- 9 Research and development
- 10 Documentation and record keeping
- 11 Evaluation and audit
- 12 Review and continual improvement

Recalc. Scores Measure Close

Done Local intranet

Supporting information for each measure

Measure	Possible Records	Intent of Measure	Scenario	Possible Questions
<i>Specific Measure against which Framework implementation is assessed</i>	<i>Information that may be useful to support assessment</i>	<i>Description of the objectives of the Measure</i>	<i>Example(s) of current good practice in implementing the Measure</i>	<i>Questions that could be asked to assess the level of implementation of the Measure</i>



Aquality Measure - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites

Address http://localhost/aquality/measure.aspx Go

aquality WATER SERVICE ASSOCIATION
WSA Water Quality Process

THINKING WINDOWS

Measure [TEST] Log Off

Element 1 Commitment to Drinking Water Quality Management

Not Undertaken

Component 1.3 Engaging stakeholders

Measure 1.3.1.1 The agency has a process for determining the identity and role of stakeholders in relation to drinking water quality.

INPUTS
 Communiqués and internal policy position statements identifying the agency's role as the lead agency in drinking water quality management.

INTENT
 Water quality management requires multiple stakeholders to play a role, particularly for catchments. A lead agency(ies) for drinking water quality management needs to coordinate and support the activity of these other stakeholders.

SCENARIO
 The agency has combined with another agency to identify themselves as jointly being responsible for coordinating implementation of the framework.

QUESTIONS
 Describe how the agency has identified all stakeholders who could affect or be affected by the drinking water supplier.
 Has an agency(ies) been identified as the lead for coordinating the multi-agency task of managing drinking water quality?

Comments

Process Development
 Advanced
 Process development is substantially complete and is yet to be tested and verified.

Process Documentation
 Minimal
 Documentation is structured but is not comprehensive.

Process Coverage
 Requirement
 Process is in use in most areas/functions. Generally this would be greater than 75% of the areas/functions as determined by the process.

Process Frequency

- Never
- Rarely
- Occasionally
- Often
- Usually
- Always

Reset Cancel


Done Local Intranet

Adobe Reader - [Project Detail Report[1].pdf]


File Edit View Document Tools Window Help

74%


Adobe Reader 7.0



Zoran Water Authority
 Project: Test Blah
 Status: WSAA Approved



Project Detail Report



Printed: 13-Nov-2008

		Score	
		Actual	Maximum
Element: 1 Commitment to Drinking Water Quality Management		12 %	
Component: 1.1 Drinking water quality policy		42 %	50
Action:	1.1.1 Formulate a drinking water quality policy, endorsed by senior executives, to be implemented throughout the organisation.	70 %	30
	1.1.1.1 The agency has an executive-endorsed drinking water quality policy.	60 %	30
Process Development: <i>Advanced</i> Process Documentation: <i>Moderate</i> Process Coverage: <i>Total</i> Process Frequency: <i>Often</i>			
<u>Current Status:</u>			
<u>Action Required:</u>			
<u>By Whom:</u>	<u>By When:</u>		
Action:	1.1.2 Ensure that the policy is visible and is communicated, understood and implemented by employees.	0 %	20
	1.1.2.1 The agency has a systematic process for communicating its water quality commitment to employees.	0 %	20
Component: 1.2 Regulatory and formal requirements		0 %	40
Action:	1.2.1 Identify and document all relevant regulatory and formal requirements.	0 %	10
	1.2.1.1 The agency has a process for identifying and documenting any regulatory and formal requirements relevant to drinking water quality	0 %	10
Action:	1.2.2 Ensure responsibilities are understood and communicated to employees.	0 %	20
	1.2.2.1 The agency has a process for ensuring that all employees involved in water quality management understand their role in implementing relevant formal responsibilities.	0 %	20
Action:	1.2.3 Review requirements periodically to reflect any changes.	0 %	10
	1.2.3.1 The agency has a process for identifying and communicating changes in regulatory and formal requirements.	0 %	10
Component: 1.3 Engaging stakeholders		0 %	80

Page 1 of 21

*NU - Not Undertaken

Aquality Score Analysis - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address: http://localhost/aquality/score_comparison.aspx

aquality
Water Quality Performance

WATER TREATMENT FACILITY

THINKING WINDOWS

Score Analysis [TEST] [Log Off](#)

Scores

Element	Blue Bar (Approx. %)	Pink Bar (Approx. %)
Commitment to Drinking Water Quality Management	15	55
Assessment of the Drinking Water Supply System	25	55
Preventive Measures for Drinking Water Quality Management	45	25
Operational Procedures and Process Control	15	45
Verification of Drinking Water Quality	5	65
Management of Drinking Water Quality	5	65
Employee Awareness and Training	5	60
Community Involvement and Awareness	5	80
Research and development	40	65
Documentation and record keeping	5	95
Evaluation and audit	30	60
Review and continual improvement	15	80

Best in element "Commitment to Drinking Water Quality Management" (Accredited/Non-Accredited/Self-Assessed)

Element Selected: Commitment to Drinking Water Quality Management

Element Comments:

Comparison Criteria:

Measure Subset: Any

Region: Any

No. of Properties: Any

Scope: Any

Type:

Accredited

Non-Accredited

Self-Assessed

Download as: Word Document PDF Document Components No Comparison Close

Done Local intranet

Aquality Users

- 19 Utility Users
 - 16 Utilities
 - 3 Councils

- 11 “larger companies”
- 10 “smaller companies”

- These Utilities/Councils service approximately 15 Million Australian and New Zealanders



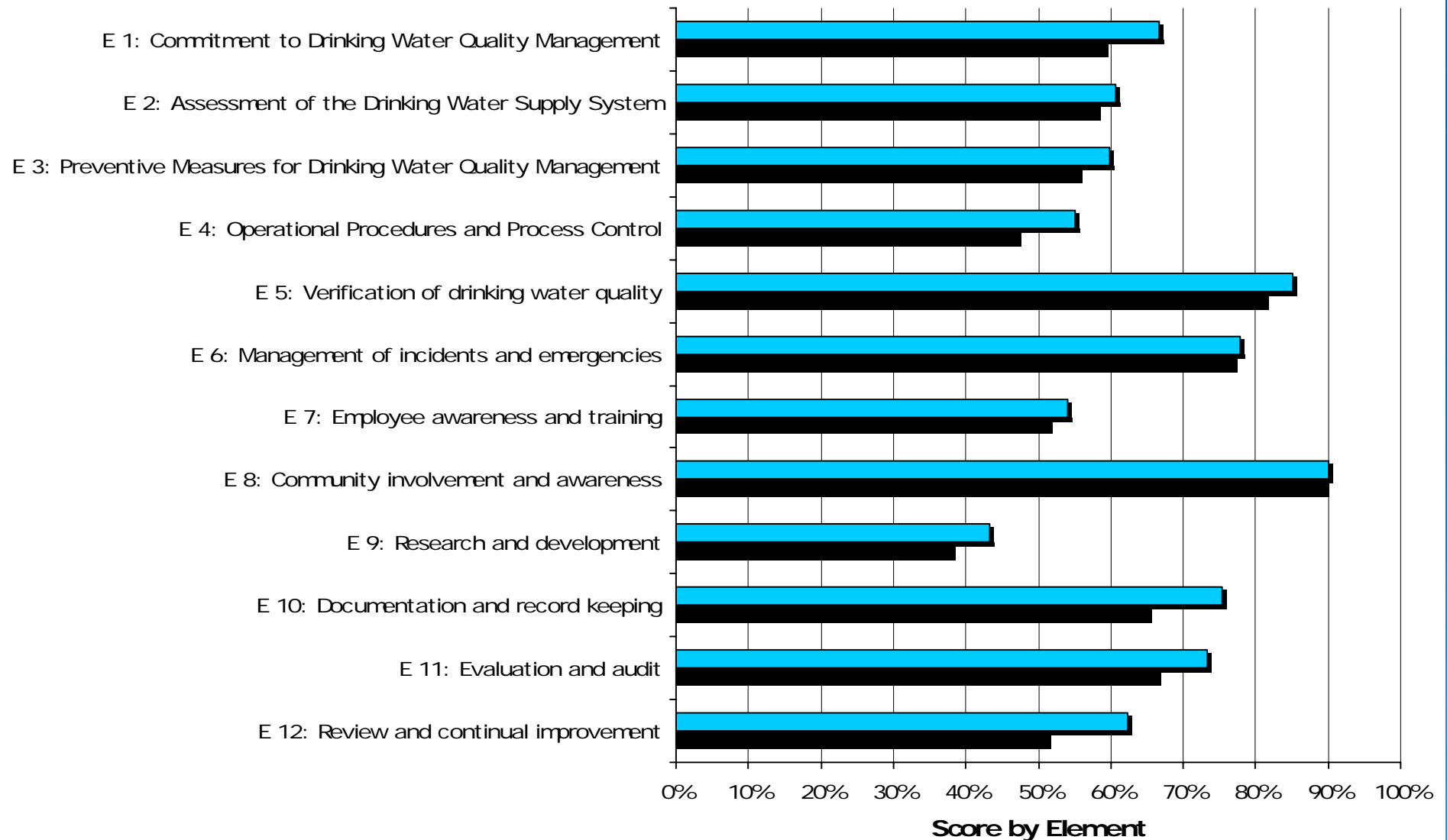
Advantages

Internal Assessment Versus External Audit

- Internal assessment using Aquality is objective (as is possible) in assessing management practices
- External audit should match this internal assessment
- Reduces fear of the unknown!
- Major differences between two
 - Poor rigour in internal assessment
 - Auditors that don't know what they are doing



Internal Versus External Assessment



IMPLEMENTING THE FRAMEWORK

***(Richard Walker – Manager Water Quality
Perth plus 255 small systems)***

- ◆ Compliance by numbers is easy.
- ◆ Compliance assessment with the framework is difficult
- ◆ My only concern is safe water –

- ◆ MY CONCERN IS NOT PASSING AUDITS
- ◆ The framework is my Bible BUT
- ◆ I want:
 - ◆ To self assess how I am going
 - ◆ Others (who know water quality) to help me improve
 - ◆ To be at “best practice” (best bits from all States)

- ◆ I need some CONSISTENT means of measuring achievement at
 - ◆ Utility level:
 - ◆ Region
 - ◆ Scheme
- ◆ Consistent over time.

USE FOR AQUALITY

- ◆ How am I going ?
 - ◆ Utility level
 - ◆ Region
 - ◆ Scheme
- ◆ Where are my weaknesses?
 - ◆ Immediate risks
 - ◆ Long term
- ◆ Prioritisation
 - ◆ Best risk reduction (tactical)
 - ◆ Initiate long term measures (strategic)
- ◆ Resources
 - ◆ Justify more
 - ◆ Raw scores and comparative scores
- ◆ Expertise
 - ◆ Is there another utility that can help me
- ◆ Communicate
 - ◆ Risk and risk management
 - ◆ Particularly upwards

And knowing how you are likely
to go in a Vic Regulatory Audit



WATER SERVICES ASSOCIATION
of Australia

Thank You

