



Cooperative Research Centre for
IRRIGATION FUTURES

Technical Report No. 09/07

An Evaluation of the Corporate Governance Arrangements of Australian Irrigation Water Providers

Jennifer McKay

November 2007

BETTER IRRIGATION

BETTER ENVIRONMENT

BETTER FUTURE



An Evaluation of the Corporate Governance Arrangements of Australian Irrigation Water Providers

Jennifer McKay

University of South Australia

CRC for Irrigation Futures

CRC for Irrigation Futures Technical Report 09/07
November 2007

CRC IF Copyright Statement

© 2008 IF Technologies Pty Ltd. This work is copyright. It may be reproduced subject to the inclusion of an acknowledgement of the source.

978 0 9804985 6 1 (pdf)

978 0 9804985 7 8 (print)

Important Disclaimer

The Cooperative Research Centre for Irrigation Futures advises that the information contained in this publication comprises general statements based on scientific research. The reader is advised and needs to be aware that such information may be incomplete or unable to be used in any specific situation. No reliance or actions must therefore be made on that information without seeking prior expert professional, scientific and technical advice. To the extent permitted by law, the Cooperative Research Centre for Irrigation Futures (including its employees and consultants) excludes all liability to any person for any consequences, including but not limited to all losses, damages, costs, expenses and any other compensation, arising directly or indirectly from using this publication (in part or in whole) and any information or material contained in it.

Acknowledgements

This project has been a large and complex undertaking. As the Water Supply industry is a chaotic and rapidly changing environment, planning the course of this research and obtaining the necessary data would have been impossible without the generous counsel and assistance of many people and institutions.

Organisations & Institutions

Australian Water Association (AWA)
Australian Centre for International Agricultural Research (ACIAR)
Cooperative Research Centre for Irrigation Futures (CRC-IF)
Murray Irrigation Limited (MIL)
Queensland Department of Agriculture (QLD Dept. Agriculture)
University of South Australia (UniSA)
Victorian Department of Primary Industries (VIC Dept. Primary Industry)
Irrigation Association of Australia (IAA)
New South Wales Department of Agriculture (NSW Dept. Agriculture)
New South Wales Department of Planning & Infrastructure (NSW Dept. Plan & Inf)
Queensland Department of Natural Resources & Mines (QLD Dept. NR&M)

Individuals

Adam Gray (UniSA)
Anna Hurlimann (University of Melbourne)
Brianna Hastie (UniSA)
Chris Davis (AWA)
Eddie Parr (NSW Dept. Agriculture)
Fiona Partington (Flinders University)
Ganesh Keremane (UniSA)
Glen Starkey (NRM QLD)
John Williams (CRC-IF)
Jolyon Burnett (Irrigation Association of Australia)
Kirsty Willis (Marketing Science Centre)
Lindsay Evans (NSW Dept. Plan & Inf)
Matthew Durack (CRC-IF)
Megan Rogers (NSW Dept. Plan & Inf)
Michael Griffin (University of Adelaide)
Michelle Ramos (IAA)
Peter Cullen (CRC-IF)
Peter Smith (NSW Dept. Agriculture)
Professor Gus Geursen (UniSA)
Ruth Renschler (Deakin University)
Seamus Parker (QLD Dept. NR&M)
Wayne Meyer (CRC-IF)

Contents

1	EXECUTIVE SUMMARY	1
1.1	THE ROLE AND PRACTICES OF THE AUSTRALIAN WATER INDUSTRY	1
1.2	A HIGHLY FRAGMENTED WATER INDUSTRY	3
1.3	THE RESEARCH OBJECTIVE	3
2	AUSTRALIAN WATER SUPPLY BUSINESSES TYPOLOGY -ASSESSMENT AND DATA COLLECTION	4
2.1	IDENTIFYING WHAT TYPOLOGIES WERE EXTANT IN EACH STATE	6
2.1.1	<i>Australian Capital Territory (ACT)</i>	6
2.1.2	<i>New South Wales (NSW)</i>	6
2.1.3	<i>The Northern Territory (NT)</i>	7
2.1.4	<i>Queensland (QLD)</i>	8
2.1.5	<i>South Australia (SA)</i>	8
2.1.6	<i>Tasmania (TAS)</i>	8
2.1.7	<i>Victoria (VIC)</i>	9
2.1.8	<i>Western Australia (WA)</i>	9
2.2	CHARACTERISTICS OF EACH TYPOLOGY	10
2.2.1	<i>Key Differences in WSB Corporate Governance Types - Board structure: appointment or election</i>	11
3	CONTENT ANALYSIS – METHOD & RESULTS	14
3.1	CONTENT ANALYSIS - METHODOLOGY	16
3.2	CONTENT ANALYSIS RESULTS	20
4	SURVEY OF CEOS – METHOD & RESULTS	22
4.1	CEO SURVEY - METHOD	23
4.2	CEO SURVEY RESULTS	24
4.2.1	<i>CEO Attention and understanding of ESD</i>	25
4.2.2	<i>CEO Satisfaction, confidence with their Organisation</i>	27
4.2.3	<i>CEO Satisfaction and confidence with Organisation Board</i>	28
4.2.4	<i>Organisation’s relationship with State Government</i>	30
4.2.5	<i>CEO Impression of Water Policy Changes</i>	32
4.2.6	<i>CEO Impression of Stakeholder and Community role/perspective</i>	35
5	INSUBSTANTIAL TENUOUS AND VAGUE LAWS- THE IMPLEMENTATION OF ESD BY WATER SUPPLY BUSINESS CEO’S	37
5.1	ESD AND SUSTAINABLE DEVELOPMENT LAWS	37
5.1.1	<i>Sustainable Development Laws</i>	37
5.1.2	<i>Australian Water Supply Businesses as Bound to Achieve ESD</i>	41
5.1.3	<i>CEOs and Achieving ESD</i>	43
5.1.4	<i>Relationship between CEO Perceptions on Water Issues and Legal Structure</i>	45
6	PERCEPTIONS OF THE WATER SUPPLY BUSINESS CEOS ABOUT COHERENCE OF STATE GOVERNMENT WATER POLICIES	47
6.1	FACTOR ANALYSIS OF THE CEO PERCEPTIONS AND ATTITUDES TOWARDS ESD	47
6.1.1	<i>Criteria for model fit and inclusion of variables</i>	48
6.1.2	<i>Results of Factor Analysis (PAF)</i>	48
6.1.3	<i>Reliability analysis</i>	52
7	SUMMARY AND RECOMMENDATIONS	53
8	REFERENCES	55
9	APPENDICES	61

List of tables

Table 1: Australian Water Supply Businesses and Governance Typologies	4
Table 2: Corporate Governance Legal Types (Typologies) of WSBs by State (14 identified).....	11
Table 3: Number and Qualification of Directors in Australian Major Water Businesses.....	12
Table 4: Description of Basic Details Gathered	17
Table 5: Description of Content Analysis Categories and Subcategories	17
Table 6: Content Analysis Disaggregated Subcategories	21
Table 7: Major Groupings of Questions and Corresponding Question Numbers	25
Table 8: The Acts requiring WSB to achieve ESD	41
Table 9: Descriptives of the scale items used in the survey	43
Table 10: CEO perceptions on sustainable water management.....	45
Table 11: CEO satisfaction and confidence with the organisation of the Board	46
Table 12: List of scale items used in the first round of factor analysis	48
Table 13: Communalities of the items retained in factor analysis	50
Table 14: KMO and Bartlett's test for model's fit.....	51
Table 15: Factor loadings for CEOs perceptions and attitudes regarding water issues.....	51

List of figures

Figure 1: Number of Typologies per State	10
Figure 2: Content Analysis Categories and Sub Categories	15
Figure 3: Difference between the States in Water Reporting	20
Figure 4: National Content Analysis Summary	20
Figure 5: National Content Analysis Summary by Corporate Governance Types	21
Figure 6: CEO Survey Number of Respondents per State.....	22
Figure 7: Achieving ESD Principles – Effort and Difficulty	26
Figure 8: Question # 7 - I am able to achieve sustainable water management	27
Figure 9: Question # 8 - I am clear on what it means to this organisation to achieve sustainable water management.	27
Figure 10: Question # 6 - I am happy with the charter of the organisation	28
Figure 11: Question # 86 - Over the last 10 years change in this organisation has been incremental.	28
Figure 12: Question # 15 - The non executive members of the board understands their role.....	29
Figure 13: Question # 16 - The non executive members of the board understand ESD.	29
Figure 14: Question # 18 - All board members work together cohesively.	30
Figure 15: Question # 82 - There are well established intergovernmental processes that ensure co-ordination and the State government.	30
Figure 16: Question # 89 - The transaction costs in meeting external requirements of other Government are huge.....	31
Figure 17: Question # 91 - There is a huge amount of trust between this organisation and the State government.....	31
Figure 18: Question # 28 - Of all the regulators, the environmental regulator is the hardest to please.....	32
Figure 19: Question # 29 - Of all the regulators, the price control regulator is most difficult to please. ...	32

Figure 20: Question # 10 - The water planning process instigated by the State government is the 90's has worked well here.	33
Figure 21: Question # 12 - I am well informed by the state government about their water policy?	33
Figure 22: Question # 92 - We are always consulted and given time to respond to policy changes.	34
Figure 23: Question # 93 - This organisation is nested in a mutually supportive State government policy environment.	34
Figure 24: Question # 97 - State government policy making processes follow a predictable pattern.	35
Figure 25: Question # 14 - All sectors of the community of this water business understand the viewpoint of others in the area.	35
Figure 26: Question # 9 - All stakeholders are consulted in water planning.	36
Figure 27: Question # 13 - The community in this area works well together in water planning?	36
Figure 28: Question # 88 - This organisation needs to have fewer external stakeholders calling on us to provide information.	36
Figure 29: Degree of difficulty and effort put into by the CEOs in achieving ESD.....	44

List of Appendices

Appendix A: Content Analysis Pro Forma.....	61
Appendix B: Content Analysis Transparency	62
Appendix C: Survey Questions	63
Appendix D: Australian Water Supply Businesses.....	68
Appendix E: Extended Content Analysis Summary by State	74

List of Boxes

Box 1: Objectives and guiding principles of the National Strategy for ESD.....	39
--	----

1 Executive Summary

The aim of this research is to determine which Corporate Governance Typology best facilitates the Ecologically Sustainable Development (ESD) outcomes intended by the Council of Australian Governments (CoAG) and National Water Initiative (NWI) mandated institutional separation of water service providers from environmental resource managers.

Governance is the process of decision making in the community involving both formal and informal actors at all levels. Government is just one of the formal actors in governance. The institutions and organisations it creates by laws and regulations are the formal actors in the process of extracting, distributing and using water. There are of course many informal institutions as well, such as customs of the society with respect to water use and allocation and in relation to enforcement of the law.

After the Council of Australian Government reforms in 1994 there were many laws creating many types of organisations to extract, distribute and use water in each State. This paper reports on work to examine the formal legal processes. The work established that there are now 14 different types of corporate organisations supplying water in Australia. These formal organisations and the informal institutions have different responses to the formal water law and policy changes. The responses of the formal organisations and informal institutions are instrumental to the success of the new water law and policy reforms under the National Water Initiative.

The Project has three phases:

- Establishment of a typology of the Corporate Governance types of Australian Water Supply Businesses
- A content analysis of the Annual Reports of a sample of these businesses to determine the content of reporting, and
- Interviews with a sample of the CEOs of Australian Water Supply businesses to determine what are barriers to ESD implementation and if these are related to Corporate Governance type.

The results presented here look at their responses to Australia's changing water policies. In particular evaluating the effort put into ESD by the responding CEOs, the difficulty in pleasing regulators (environment and pricing), the amount of information they have about water policy and ESD, and their level of trust in their State government.

1.1 The role and practices of the Australian Water Industry

The last two decades has seen a heightened public focus on the role and practices of the Australian Water Industry. This increase in public awareness has led to a number of politically driven social, economic, and legislative developments that have markedly impacted upon how these organisations are structured and how they operate.

Chief amongst these developments are the national level reforms mandated by the CoAG in 1994, and the adoption in 2004 of the National Water Initiatives.

The Deputy Prime Minister in August 2003, stated in the introduction to the National Water Initiative that "Australians use 250,000 litres per year which is about 30% higher than the OECD average" (Anderson MP 29 August 2004).

He went on to say that when it is finished "...the NWI will affect every single Australian household... Our lives depend on a staggering amount of water, so it is crucially important to each Australian who eats steak which costs 50,000 litres per kilo or drinks fruit juice which costs 780 litres per litre of juice."

The central aims of the CoAG reforms are stated as:

- Improve the security of water access entitlements, including by clear assignment of risks of reductions in future water availability and by returning over allocated systems to sustainable allocation levels;
- Ensure ecosystem health by implementing regimes to protect environmental assets at a whole-of-basin, aquifer or catchment scale;
- Ensure water is put to best use by encouraging the expansion of water markets and trading across and between districts and States (where water systems are physically shared), involving clear rules for trading, robust water accounting arrangements and pricing based on full cost recovery principles; and
- Encourage water conservation in our cities, including better use of storm water and recycled water.

The key objectives of the NWI are stated as:

- Expansion of permanent trade in water bringing about more profitable use of water and more cost-effective and flexible recovery of water to achieve environmental outcomes
- More confidence for those investing in the water industry due to more secure water access entitlements, better and more compatible registry arrangements, better monitoring, reporting and accounting of water use, and improved public access to information
- More sophisticated, transparent and comprehensive water planning that deals with key issues such as the major interception of water, the interaction between surface and groundwater systems, and the provision of water to meet specific environmental outcomes
- A commitment to addressing over allocated systems as quickly as possible, in consultation with affected stakeholders, addressing significant adjustment issues where appropriate, and
- Better and more efficient management of water in urban environments, for example through the increased use of recycled water and storm water.

Each State and Territory is required to implement the CoAG and NWI reforms and this has resulted in massive changes in State laws and the operational structures of water supply organisations.

This has necessitated a considerable adjustment of their local policies and legislation.

The usual challenges faced in water resource management are somewhat exacerbated in Australia by three factors.

Firstly, as is commonly noted, that Australia is the driest populated continent in the world. Most of the country is arid or semi-arid. There simply is not a lot of water available.

Secondly, Australia's economy is currently - and has traditionally been - heavily geared towards primary industry. A significant percentage of Australia's annual export is in water consumptive agriculture products such as beef, wool, wheat, etc. In a very real sense, Australia is effectively exporting water.

Thirdly, when Australia federated in 1901, Section 100 of the Constitution vested all water resource management powers to the individual States and Territories. This has led to each State and Territory pursuing their own parochial agendas in terms of water legislation and policies. This in turn has resulted in a highly fragmented water industry.

1.2 A Highly Fragmented Water Industry

One of the primary obstacles in producing a national level approach to reforms within the Water Industry has been the large number and variety in type of industry participants.

Much of this variety is a Constitutional legacy from the days of Federation (Section 100. Australian Constitution) which ensured State autonomy in dealing with management of water resources. This has contributed to each State and Territory having markedly differing policies, legislation, standards of best practice, and even corporate governance models of Water Utilities and Water Businesses.

This localised autonomy led to a highly fragmented Water Industry that had little or no coordination within or across State borders.

A major component of the CoAG and NWI reforms can be simply expressed as seeking institutional separation of Water Service Providers and Water Resource Managers in order to achieve better Ecologically Sustainable Development (ESD) outcomes.

1.3 The Research Objective

The objective of this research is to examine the current Corporate Governance models of Australian Irrigation Water Providers and identify which current Corporate Governance Model has best facilitated adoption of the CoAG and NWI reforms.

By identifying the Governance Model that has been best suited to enable successful implementation of the CoAG and NWI reforms, policy advisors, legislators, industry members, and stakeholders alike will be better informed as they proceed with future development within the Water Industry.

It should be noted that this research does not purport to evaluate relative achievement of ESD, compliance with NWI, or any other State law.

2 Australian Water Supply Businesses typology - Assessment and Data Collection

When the CoAG 1994 Reforms were adopted, the water sector in Australia was highly fragmented with over 800 suppliers (Broughton 1999). It is still regarded as highly fragmented (Productivity Commission 2003) and diverse with in excess of 300 businesses.

This research has identified approximately 333 authorities or agencies that sell and distribute water in Australia as of December 2005 (See Table 1).

Table 1: Australian Water Supply Businesses and Governance Typologies

State	Area	Population (ABS, 2001)	WSBs Identified	Governance Types	CA'd	Surveyed	CA'd & Surveyed	Assessed	Mission Breadth	
Australia		7659789	19383424	333	14	192	183	105	273	
Australian Capital Territory		2358	314171	1	1	1	1	1	1	Dual Mission
New South Wales		800628	6532459	145	9	51	38	15	74	Multiple & Single Mission
Northern Territory		1335742	197590	1	1	1	1	1	1	Dual Mission
Queensland		1723936	3627816	133	7	88	86	59	115	Multiple & Single Mission
South Australia		978810	1502397	8	3	4	0	0	4	Single Mission
Tasmania		64519	470272	14	5	16	24	11	29	Multiple & Single Mission
Victoria		227010	4828968	24	2	24	13	13	24	Single Mission
Western Australia		2526786	1909751	8	5	7	20	5	22	Single Mission

Identifying and quantifying Water Supply Businesses (WSBs) and the attendant data necessary to complete this research has proven to be very challenging. The large number of participants, variety in scale of size and operation, variation in legal structure, and dramatically changing legislative and operational environment for the Water Supply Industry presents a number of obstacles.

The first task has been to identify the WSBs in each State and Territory. This has required the identification and merging of lists obtained from various sources.

Our first list was provided to us by the Australian Water Association. To this list we added information from the Irrigation Association of Australia and benchmarking data from ANCID. From there, details of further organisations were obtained from Local Government associations in each State and State Government hosted Water Service Providers listings.

We then identified key persons in each State and asked for their comments on the merged list. This identified several key bodies that were not included in other listings - especially among Local Government Authorities and smaller Irrigation Trusts.

This level of external consultation took many months of time while contacts were made, annual reports secured, and details and usage of water were determined. During this period, over 450 Organisations and Individuals were consulted.

After we had established the maximum total number of WSBs, it was decided that it was necessary to vet the WSBs and only consider the irrigation water supply businesses and relevant reticulators that also provide bulk or irrigation water.

There are a number of Water Supply Businesses that were not assessed or included within this research. The primary reason for this is a lack of data. WSBs that are particularly small – having less than 250 customers or very low water volume transactions – generally do not have the data necessary for this research being publicly available. Furthermore, there are agencies that are licensed Water Supply Businesses but that are not deemed to actually be WSBs for the purposes of this research as they either have highly specialised niche services or have outsourced all facets of their Water Supply and Water Resource Management roles.

The WSBs not included within this research were discounted for one (or more) of the following:

- **Size of Water Supply Businesses** – Due to the low volume of water involved, the scarcity of publicly available data and the inability to corroborate any data obtained, it was decided to not include WSBs that handled either very low volumes or who had less than 250 clients/customers. For example, this has precluded some small Irrigation Trusts in South Australia, a reticulator in Tasmania, and some regional water providers in Queensland.
- **Remote and/or Aboriginal Communities** – Provision of Water Supplies for Aboriginal Communities is clearly an issue of considerable importance. However, as the focus of this study is on Irrigation Water Supply, information from remote aboriginal communities is not relevant to this research due to their generally small size, low levels of water consumption, lack of agriculture, and externality from National Resource Management agendas. Furthermore, as a consequence of their size and possibly because of the frequently unclear roles of administering/consulting Federal and State Agencies, there appears to be little or no data available from these communities.
- **Plurality of Ownership** – In Several instances in several States, Organisations such as State Governments, Local Government Authorities, and Government Owned Corporations are ‘part owners’ of subsidiary Water Supply Businesses. For Example, a Local Government might wholly or partially own a small Water Supply Business which, in turn, is responsible for supplying reticulated and bulk water to the Local Government’s constituents. It – and the subsidiary Water Supply Business – may even both be licensed Water Supply Service Providers. However, unless the Local Government (or similar Owner Agency) is involved in multiple Water Supply Businesses or providing Water Supply Services separate from the subsidiary WSB, they are not included within the list of WSBs examined by this research.
- **Type of Water Supply Service Provided** – In a number of instances, Agencies are licensed as Water Supply Service Providers by their State’s relevant regulator – but the scale or type of Water Supply Service that they provide is not pertinent to this research. For example, a number of Local Government Authorities in Western Australia are licensed but in fact merely have ‘stand pipe’ facilities for filling water trucks. Likewise, remote mining operations with both a very limited population and infrastructure may still need licensing to provide water to their employees. As these situations invariably involve very small volumes of water - and almost certainly no appreciable irrigation component – it was decided to not include these organisations within this study.

With a final listing of WSBs relevant to this research, data collected from surveys, Content Analysis, and the data gathered from benchmarking reports and government regulators, and industry contacts, work commenced on identifying characteristics associated with a WSB’s Legal Governance Structure – or Typology.

When evaluating a WSB’s Governance Typology, the objective is to identify what its legal structure for existence is. For example, while a corner store may be owned by a single individual, it might also be owned by a family trust, a corporation, or any of a number of possible scenarios. A similar variance in governance structure can be found with Australian Water Supply Businesses.

Once typologies have been confirmed, patterns can be identified, and trends that are associated with being formed under a specific Governance Typology can be illuminated.

The next stage was to identify which Governance Typologies existed within Australia. This involved an examination of Annual Reports, State and Federal Legislation, a review of available benchmarking literature for Australia (WSAA, ANCID) Europe (IFNET, AccountAbility), and UN Global Reporting Initiative and UN Guidelines for Consumer Protection (UNEP, 2003).

Through this process, the following Corporate Governance Typologies were identified within the Australian Water Industry:

- Local Government Regional Council (LGRC),
- Shire Council (LGSC),
- City/Town Council (LGCC),
- Local Government Owned Corporations (LGOC),
- Joint Local Government Organisation (JLGG),
- Water Boards {Includes Rural Water & Drainage Boards} (WB),
- Government Departments Licenser (GD),
- Government Owned Corporation (GOC),
- Statutory Bodies (SB),
- Corporations Law Companies (CLC),
- Irrigation Trusts (IT),
- Hybrid – (SB/CLC),
- Hybrid – (IT/CLC), and
- Undetermined

Each of these Typologies is formed under different legislative frameworks. They have differing requirements in a number of areas including: public reporting, regulator regimes to answer to, obligations to shareholders, owners, and stakeholders, etc.

This process illustrated another key factor in the shaping of ESD priority, and that is whether the WSB has multiple missions or is largely a single mission business.

Three main categories of Mission breadth have been determined. They are:

Multi Mission – Indicates that the WSB has multiple areas of activity, such as provision of water, maintenance of roads, and rubbish removal, etc. Generally these WSBs are Local Government Authorities of one kind or another.

Dual Mission – Indicates that the WSB has two areas of activity. In most instances within the Australian Water Sector, this mission breadth occurs with Utilities that provide water and power services.

Single Mission – Indicates that the WSB has just one area of activity. For example, a rural water authority in Victoria has really only one business; water.

2.1 Identifying what typologies were extant in each State

Identifying the Water Supply Businesses around Australia was a complex undertaking. As the industry is in a considerable state of flux, there were considerable challenges in gathering basic data. Below is a brief discussion of the issues in each State and Territory.

2.1.1 Australian Capital Territory (ACT)

The Australian Capital Territory has one Water Supply Business. It is ACTEW. A Government owned Corporation. As is indicated in Chapter 5 - CEO Survey, the CEO was interviewed but the results cannot be shown as this would breach that CEO's confidentiality.

2.1.2 New South Wales (NSW)

New South Wales has arguably the most fragmented and overburdened Water Industry. It currently has 145 Water Utilities licensed by the Department of the Environment, Utilities and Sustainability (DEUS). The majority of these are Local Governments that distribute reticulated water to their constituents.

There are also several dedicated Bulk Water suppliers that deal primarily with Agriculture.

The reporting period of 2002 – 2003 was a notably bad year for NSW. They were faced with natural disasters, a problematic raft of State Government policies, an infrastructure that was increasingly in need of major overhaul and repair, an increasingly litigious constituency, and an abrupt escalation of insurance liabilities.

In 2002-2003 the drought was at its worst in NSW.

“Ninety two per cent of New South Wales is now in drought, a further six per cent is considered marginal.”¹

Some areas have been drought affected for several years, and the cumulative lack of water across the State led (not surprisingly) to NSW being responsible for 50.9% of the Diversions from the MDBC.

2002–2003 was also a particularly bad year for bushfires. By February of 2003, the Minister for Regional Services, Territories and Local Government, Wilson Tuckey MP had issued a press release proclaiming:

“NSW Declares Natural Disaster Status for Current Bushfire Crisis.”²

The extent of the bushfires was considerable. Several Catchment areas were affected by it, and at least one LGA lost not only their water infrastructure, but their Council Offices as well.³

The cumulative impact of the drought, hailstorms, and bushfires was in their number. Local Governments play a key role in coordinating and leading a community through the difficult and expensive process of rebuilding after a natural disaster. As LGAs in NSW had so many in such a short period of time, they were arguably particularly stretched.

Exacerbating matters were four issues that the LGAs were in conflict with the State Government over. The first was the increasing perception that the State Government was cost shifting services and responsibilities onto the LGAs without providing funding. This eventually resulted in a Cost Shifting Enquiry.⁴

The next issue was fairly dramatic increase in range and number of reporting regimens that the LGAs were required to answer to.

The third issue of contention was the disposition of grant money. A new ‘formula’ had been developed by the State Government, and several councils were not happy with the results.

The final and – for some – most unpalatable issue was the declaration by the new minister overseeing Local Government that there would be a dramatic shuffling of boundaries, and Local Government structure. Many of the Councils felt that the decisions were arbitrary and ill-conceived.

Initial impressions are that with the advent of DEUS and a slightly clarified LGA environment, there has been a marked improvement in availability in information concerning Water Resources and Water data.

2.1.3 The Northern Territory (NT)

The Territory has all of its water and electricity provided by a State Government owned Corporation called PowerWater. This Corporation provides Electricity, Sewerage, and Water to the vast majority of the population.

As is with the ACT, the CEO was interviewed but the results cannot be shown as this would breach that CEOs confidentiality.

¹ ABC Website Rural Online Radio National. <http://www.abc.net.au/rural/drought2002/gallery-westerntour.html>

² Wilson Tuckey, Minister for Regional Services, Territories and Local Government http://www.ministers.dotars.gov.au/wt/releases/2003/february/WT09_2003.htm

³ Tumbarumba Shire Council. 2002-2003 Annual Report

⁴ Rates and Taxes – A Fair Share for Responsible Local Government, 2004 House of Representatives Standing Committee on Economics, Finance, and Public Administration – “Cost Shifting Enquiry”.

There are a number of Aboriginal Communities that are provided power, sewerage, and water by PowerWater (Approximately 80 communities). It appears that most of these groups have their services provided by Indigenous Essential Services - a company wholly owned by PowerWater.

Searching for Websites for remote Aboriginal Communities has proven to be a fairly fruitless task. Most simply don't have a site, and those that do don't tend to have the kind of information that we are looking for.

The following excerpt is drawn from the NT Government web site. By searching for water supply information, one is led inexorably to a document that contains the following summary.

"Power and Water is the licensed provider of water to five major urban centres (Darwin, Katherine, Tennant Creek, Alice Springs and Yulara) and twelve minor urban centres throughout the Northern Territory. Power and Water supplies and treats water for domestic and industrial use throughout the Northern Territory. Apart from Darwin, Katherine and Pine Creek, most other centres rely almost exclusively on groundwater, particularly in the arid centre. In some cases the groundwater is 20 000 years old. Power and Water aims to provide a good quality, safe and reliable drinking water supply. A regular water quality monitoring program is undertaken by Power and Water throughout the Northern Territory. This program is based on the Australian Drinking Water Guidelines."

2.1.4 Queensland (QLD)

According to the Queensland Government's Department of Natural Resources and Mines Website, There were a total of 228 registered service providers as at 1st Jan 2005.

Many of these (59) include Aboriginal and Torres Strait Islander Councils, Private individuals, Drainage Boards, and the like. Once the organisations that do not supply either treated or untreated water are discounted, there are 169 WSBs.

Of these 36 are Water Boards or Water Supply Boards who primarily deal with licensing, catchment management and/or act as monitoring/regulators.

This leaves 133 WSBs. Of these, 20 have (at times complex) external entities that they are - at least in part - shareholders for. In short, it is difficult to say that there are "x" WSBs without clearly specifying what is meant by Water Supply Business.

A significant number of Local Governments operate Water Supply Businesses as separate entities. In some cases, it is effectively just an external division of the Council operations, in other instances, it is a mechanism for pooling resources and assets with other authorities.

2.1.5 South Australia (SA)

South Australia has an unusual Water Supply Industry environment. Overseeing it all and acting as the responsible regulator and monitoring authority is SA Water. However, it has 'outsourced' the provision of reticulated water to a International Corporation called United Water.

Irrigation and bulk water are largely handled by either direct take by riparian users or through irrigation supplies provided by a number of generally fairly small Irrigation Trusts (T Thompson pers comm).

It must be stressed that as many of the South Australian Irrigation trusts have fewer than 250 client/stakeholders, and as more than half of the total water used for irrigation is privately diverted, the data for water extraction and usage and TMRs suitable for Content Analysis are simply not available.

2.1.6 Tasmania (TAS)

Reticulated water is available from the 29 Local Governments (down from 46 in 1993).

In most instances, Local Councils receive reticulated water from one of three Bulk Water Sellers. Hobart Regional Water Authority (HRWA), the Esk Water Authority (Esk Water), and Cradle Coast Water. These Bulk suppliers are owned by their client Councils.

Irrigators are overwhelmingly 'Direct-Take' from Tasmania's various lakes, rivers and streams. Generally the water quality in Tasmanian Rivers and streams is of a very high quality.

Overseeing everything are the Department of Primary Industries, Water and Environment (DPIWE) and The Department of Health and Human Services (DHHS). The DPIWE looks after management issues and ESD requirements. The DHHS ensures that regular water testing occurs.

The Rivers and Water Supply Commission (part of DPIWE) administers the various irrigation schemes and local water access.

2.1.7 Victoria (VIC)

The Victorian water industry is serviced by 24 authorities classed as metropolitan, non-metropolitan urban and rural water authorities and one Irrigation Trust. All of these organisations are either Statutory Bodies or Government Owned Corporations.

Reform within the Victorian Water industry and in the institutional arrangements has been an ongoing process since the early 1980s. In 1980, there were two large water authorities and over 380 smaller water supply businesses.

The reformation that has occurred in Victoria is comprehensive and has resulted in a clear understanding of role and responsibility in service providers, regulators, and the general public.

2.1.8 Western Australia (WA)

The Water Corporation is by far the primary Water Supplier in Western Australia. It is a state owned corporation with a board of six appointed non-executive Directors and one executive director. Approximately 56% of their water supply goes towards irrigation and 44% to Domestic/Industrial (source: Water Corporation Annual Report, 2003-2004).

Western Australia is undergoing a fairly long term and in depth restructure of their water infrastructure and practices. The Department of Environment is responsible for ensuring that Western Australia's water needs are met through equitable water management.

The Department collects and analyses water resources information, prepares policies and management plans, issues licences, regulates water use and protects the quality of water and important water dependent ecosystems.

The mechanism for developing Irrigation Districts in WA is overseen by the Water Corporation. The Corporation develops an irrigation district with supplies and infrastructure, and then the local irrigators are given the infrastructure and the distribution business as shareholders. Basically the infrastructure is deemed as one entity, and the supply business is another. So each shareholder owns shares in two distinct bodies.

Gascoyne and Harvey are already owned by shareholders. Other irrigation projects will end up being developed in a similar fashion.

Figure 1 gives the picture of the number of Water Supply Businesses (WSBs) assessed and the type of WSBs per state.

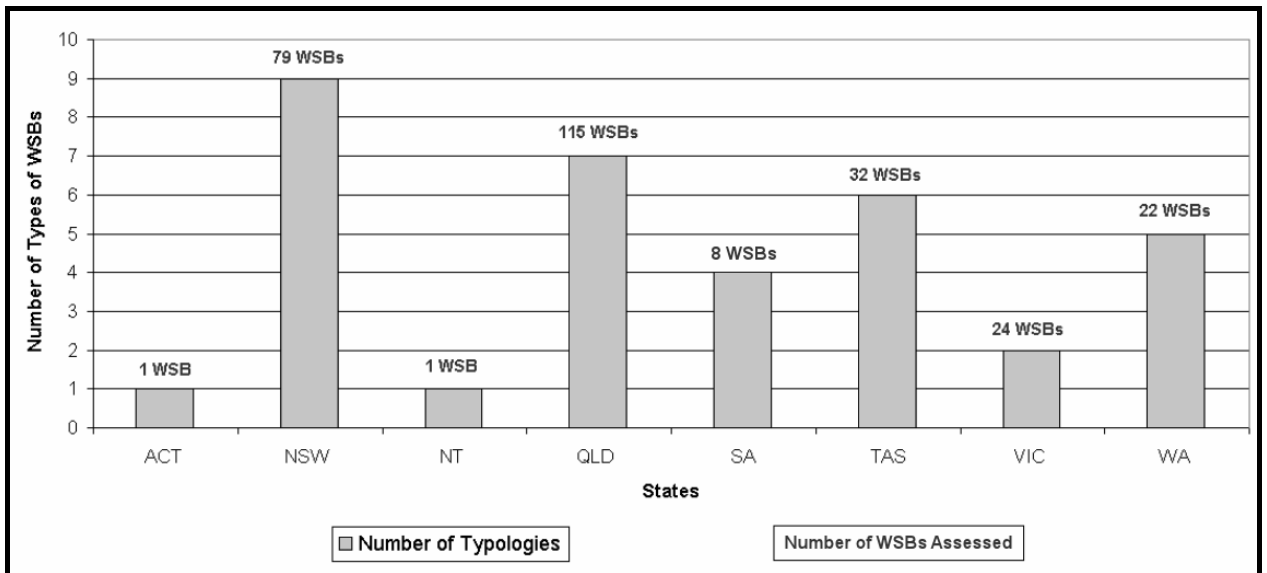


Figure 1: Number of Typologies per State

2.2 Characteristics of each Typology

The Legal Structure – or model of Corporate Governance Typology - has been identified using a grounded theory approach. That is, data on various performance and operational attributes was collected and the legal framework under which the Water Supply Business was established.

During the course of this study a number of typologies with a variety of characteristics were identified. This process required reviewing available benchmarking literature for Australia (WSAA, ANCID) and Europe IFNET, AccountAbility (Accountability 2004) UN Global Reporting Initiative and UN Guidelines for Consumer Protection (UNEP 2003).

The literature seeks to benchmark internal and external domains of company operations. The internal domains are strategic intent, governance and performance management and the external are stakeholder engagement, assurance and public disclosure.

The first task has been to identify the WSBs in each State and Territory and has required the identification and merging of lists obtained from various sources (see Appendix D).

In many instances, several different data sources may refer to an individual Bulk Water Supplier. These multiple sources of information were used together to corroborate the data and ensure data integrity.

We estimate that there are over 170 irrigation water suppliers. Many of these businesses also supply reticulated water to urban areas and/or remote communities.

Table 2 provides an overall picture of the typology of the water service businesses in Australia in August 2006.

Table 2: Corporate Governance Legal Types (Typologies) of WSBs by State (14 identified)

Type of WSB	ACT	NSW ⁵	NT	QLD	SA	TAS	VIC	WA	Total
Local Government Regional Council	0	2	0	0	0	0	0	0	2
Shire Council (LGSC)	0	46	0	92	0	17	0	14	169
City/Town Council (LGCC) ⁶	0	0	0	15	0	5	0	0	20
Local Government Owned Corporations	0	14	0	4	0	0	0	0	18
Joint Local Government Organisation	0	5	0	1	0	3	0	0	9
Water Boards <i>{Includes Rural Water & Government Departments Licensor (GD)}</i>	0	0	0	0	0	0	0	2	2
Government Owned Corporation (GOC)	1	5	1	1	1	0	6	1	16
Statutory Bodies (SB)	0	0	0	0	0	0	18	0	18
Corporations Law Companies (CLC)	0	3	0	1	2	0	0	1	7
Irrigation Trusts (IT)	0	2	0	0	4	0	0	0	6
Undetermined ⁸	0	0	0	0	0	2	0	4	6
Hybrid – (SB/CLC) ⁹	0	1	0	0	0	0	0	0	1
Hybrid – (IT/CLC) ¹⁰	0	1	0	0	0	0	0	0	1
Total	1	74 - 79¹¹	1	115	7	29	24	22	278

Source: CCWP&L Research CRC-IF Project 1.06

© McKay, 2006

2.2.1 Key Differences in WSB Corporate Governance Types - Board structure: appointment or election

As the different Governance Types are formed under different laws, this leads to key differences in how the Board is composed and the nature of the duties and obligations of the Directors and Board Members. Each State has a different State Owned Corporations Laws and different Water Acts. Most of these provide for the appointment of directors.

The duties of directors may be found in one or both Acts and the duties of directors are generally to avoid conflicts of interest and exercise due and reasonable care. These duties are similar to those specified in the Corporations Law which applies to all companies incorporated in Australia. The Corporations Law has the most developed and strictest set of rules and this applies to some WSBs. The shareholders in that case would elect the Directors.

The bulk of WSBs are formed under a number of State based Local Government Acts. The Board members are elected by the community and have a different set of drivers on their actions.

⁵ NSW councils that generate turnover of > \$2m are classified by the National Competition Policy and Local Government Act 1993 (NSW) as category 1 businesses. If < \$2m then category 2. Category 1 businesses are subject to more stringent reporting/auditing requirements and must be privatised corporations. In effect, category 1's are/may be semi autonomous subsidiaries or completely autonomous privatised corporations. Thus, the level of turnover is crucial to the character of the entity and its classification.

⁶ Includes Local Government Town Councils and Local Government City Councils.

⁷ Includes Organisations that are owned by a collective of LGAs and organizations owned by a collective of LGAs with State Government.

⁸ Typology has not been determined due to insufficient materials to make a definitive assessment.

⁹ West Corugan Irrigation apparently exists as both a Statutory Body and a Corporations Law Company.

¹⁰ Western Murray Irrigation Ltd is identified as an Irrigation Trust within legislation but is structured and operating as a Corporations Law Company.

¹¹ NSW had extensive council mergers and redrafting of Council boundaries during the period that this research examines. As such, the material collected reflects the rapidly shifting face of the NSW Water Industry. At the beginning of the researched period, there were 79 distinct WSBs, within the year; however, amalgamations had reduced this number to 74.

Table 3 provides an overall picture of the number of directors in Australian major water businesses and their qualification.

Table 3: Number and Qualification of Directors in Australian Major Water Businesses

Water Business	Number and Qualification
Sydney Water	SW - Chair appointed by voting shareholder (Government).9 others with expertise in business management, environmental protection and public health. Public advertisement. 4 a quorum in person or on the phone. Appointed for 5 years.
Melbourne Water	MW Wholesaler - Minister must ensure Directors have qualifications relevant to the operations of the Corporation.
Yarra Valley Water	YW - Yarra Valley Water is a corporative entity formed in January 1995. It is the largest of Melbourne's three retail water companies and is owned by the State Government of Victoria, Australia. It has 7 directors 6 non executives and 1 executive all appointed by the Shareholder the State Government of Victoria.
SA Water	SAW - Members who together have the abilities and experience required for effective discharge of business and management obligations
Power and Water	PWNT - 4 independent non executives and one executive MD appointed by the Administrator of the NT upon the recommendation of the Minister shareholder. Appointment may be terminated at any time.
WA Water Corporation	WAWA (Perth) - 6 non executives and 1 executive MD .All appointed by Governor On nomination of Minister of Government Enterprises of Western Australia after consultation with and recommendations of the Board. No skill base specified
Hobart Water	HW - Joint Authority owned by 8 Local Governments. Joint Authority Representatives 2 from Hobart LG 2 from Kingborough LG and 1 from each other LG. These people are directly elected by the community. There is also a Board of Management with 5 an Executive team of 7. There is no overlap between the Joint Authority and these people.
Brisbane Water	BW - Brisbane water is a commercialized wholly owned business unit of The Brisbane City Council incorporated under the Local Government Act QLD in 1996. The Brisbane Water Advisory Board reports to the Holding Entity Advisory Board which facilitated this and other business units. The divisional Manager reports to the Chief Executive Officer of Brisbane City Council, the Chairperson of the Customer and local Services Committee and the Chairman of the Board. Chairperson External four external appointees selected for their Commercial skills and experience and Brisbane Water's Divisional Manager.

Source: various Annual Reports and State laws.

© McKay, 2006

All acts require conflicts of interest to be declared on an ongoing basis (for example, section 610 of the Water Act, QLD). The general formulation is that Directors must act honestly. In the Corporation Law directors must absent themselves from Board deliberations where they have a material personal interest and this rule is applied as the Corporations Law is applied in the Northern Territory. The others use similar but not identical formulations and the context of each act would mean that it would not be possible to generalise the outcome. In SA, for example, the Public Corporations Act provides that a director of a public corporation incurs no civil liability for an honest act or omission in the performance or discharge, or purported performance or discharge of functions or duties as a director. The Local Government Act in each State also imposes director's duties and fiduciary duties on the elected officials. The formula differs between the two States of Tasmania and Queensland having persons elected under these Acts in the management of Water Supply Businesses.

The corporate form differs widely between the jurisdictions. Queensland has a format for the board structure in the Water Act - section 599 - which requires Stakeholder and Resource managers. For example, in the Gladstone Area Water Board in 2003 there were seven directors, three were appointed from the Department of Natural Resources to provide Resource Manager participation and two from each underlying Local Government to ensure stakeholder participation.

The Tasmanian scheme includes stakeholder representatives as well. The other schemes include Board appointees who would be stakeholders in a personal capacity, but there is no mention of the resource manager at Board level participating in decisions.

Hunter Water in New South Wales is a major State Owned Corporation under New South Wales law and it provides services to nearly half a million people in major urban centres in central coastal NSW. It has a board composed of a Managing Director and eight persons appointed by the Government shareholders. (Hunter Water Annual Report, 2003).

3 Content Analysis – Method & Results

The next stage of the research was to submit the top management reports of most identified WSB's to Content Analysis to identify agenda priorities.

Content Analysis is a technique for identifying the focus of a piece of text. In a sense, Content Analysis is much like a search engine on the internet. A word or term (or whole series of words and terms) is specified and then either the incidence of the specified words is tallied or the space dedicated to the word or term is measured. Content analysis is a research technique for making replicable and valid inferences from data according to its context. (Raar 2002)

This can be revealing. For example, Book A contains 150 incidences of the word "Jungle" and 0 incidences of the word "Martian", whereas Book B contains 0 incidences of the word "Jungle" and 248 incidences of the word 'Martian'. As "Martian" is a highly specific term with limited 'everyday' application, it is possible to speculate that Book B is either a work of Science Fiction or concerns Astronomy in some manner. With this very simple form of Content Analysis, it is evident which book is Rudyard Kipling's Jungle Book, and which is HG Wells' War of the Worlds.

The techniques applied in Content Analysis have been used in a wide range of Business and Management research disciplines ranging from Sociology, Psychology, History, Literature, and Political Science (Deegan and Rankin 1996).

The underlying assumption is that Senior Management will express what they perceive to be positive, compelling, and laudable in the reports that are written for their businesses' stakeholders and shareholders. As such, it is possible to determine what their priorities are in their management of their company.

After using Content Analysis, the researchers are able to present an assessment of the document in terms of the percentage of document pertaining to a specified topic. For example: "1.3% of this document concerned non-water related infrastructure maintenance".

It was initially planned that Contextual Content Analysis software called N6 (which is produced by QSR International) would be used for assessing the incidence of words and concepts within the WSB Top Management Reports (TMRs). As the research progressed, it was decided that the Project Team's needs would be better served with a simple spatial assessment.

This determination was made due to three main issues; the complexity of using N6, data format compatibility, and finally simply because there appeared to be little advantage in using it.

The complexities inherent in configuring N6 stem from the need to be able to comprehensively define what language to 'look for'. When a number of large, contextually similar documents need to be examined, N6 is very useful. The requirements of this project meant that documents to be assessed were comparatively short and from a wide range of organisations. Further, the information being categorised fell into 10 broad categories with over 60 subcategories (see Figure 2).

There was also considerable difficulty in obtaining TMRs in an electronic format fully compatible with the software. Most of the readily available documents were Adobe Acrobat (more commonly known as "pdf") files and while able to process Acrobat text, difficulties were encountered when documents were stored as Acrobat format graphics.

Researchers using Content Analysis generally follow Krippendorf's method (Krippendorf, 1980) which requires the systematic evaluative techniques of the written language. Content Analysis is a quantitatively oriented technique by which standardised measurements are applied to metrically defined units of text and these are used to characterise and compare documents (Manning P and B Cullum-swan, 1994).

Water Content & ESD	Non Water	Headings
Community/Stakeholder Consultation	Complaint – Govt. Policy (Non-Water)	Headings
Complaint – Govt. Policy (Water)	Conservation Projects (non Water)	
Conservation Projects (Water)	Impacting litigation – Not Water	Staff
Corporate Social Responsibility	Infrastructure – Maint. (Non-Water)	Internal workplace culture
Current water sources	Infrastructure – New (Non-Water)	Staff
Demand Management - Current	Local Events (Non-Water)	
Demand Management - Future	Non-Water related projects/initiatives	Governance
Environment Plan	Praise – Govt. Policy (Non-Water)	Board of Management or Committees
ESD	Property Development levels	Meetings of Board or Committees
Global water issues	Regional Development	Reports on other side of business
Impacting litigation - Water		Review of policies
Infrastructure – Maint. (Water)	Acknowledgements & Graphics	Structure of WSB
Infrastructure – New (Water)	Acknowledgements	
Internal or External audit process	Awards from or to WSB	Current Drought
Investigation of other water	Biographies	Current Drought
Praise – Govt. Policy (Water)	Decorative photos or graphics	
Reducing greenhouse gas	Introduction	Mission / Vision.
Sustainability & water cycle strategy	Signature or identifying photo	Total Mission and or Vision
Sustainable policy unit	This Document	
Water Allocation	Visiting Dignitaries	Elections / Profits
Water Conservation - Agricultural		Elections
Water Conservation - Other	Customers	Impact of litigation
Water reuse or Grey water	Aboriginal & Torres Strait Islanders	Other financial details
Water sales	Community Education	Plans for the future
Water Technology	Customer billing	Profit or Budget Surplus
	Customer satisfaction	
	Customers	

Figure 2: Content Analysis Categories and Sub Categories

The SustainAbility Reporter 2003 for the UK recommends that printed reports be assessed to determine if the type of information and quality of information is responsive to stakeholder needs. The Content Analysis of the disclosures of the WSBs in the CEO and MD reports is undertaken in order to see what the organisation is reporting to stakeholders (SustainAbility, 2003).

The judgment as to whether this is good or bad or sufficient is for the stakeholders themselves. The premise is that stakeholders need to be able to access information to inform their discussions with the organisation. The goal of sustainability reporting is akin to accounting to society (SustainAbility, 2003). Some people even describe this as assessing if a business has a social licence to operate.

SustainAbility defines a “Top Management Statement” as being a letter to the reader at the beginning of the Annual Report from the CEO or Chairman or both. SustainAbility suggests that these statements and any ‘highlights’ or ‘key indicators’ sections within the report should be evaluated.

The process was to use Spatial Content Analysis (Palmquist Carley and Dale, 1997) of the Top Management Reports (TMRs) of the CEOs and Chairpersons of all businesses providing irrigation water. The TMR was defined to include all of the narrative in the Chairman of the Board’s report, the CEOs report and the “Highlights of the Year”. Some literature suggests that many customers of businesses only read the TMR (Unerman, 2000) but others such as regulators will read it all.

The focus was on determining what material was presented in the TMR of the Annual Reports on the assumption that Senior Management will express what they perceive to be positive, compelling, and laudable in the reports that are written for their businesses’ stakeholders and shareholders (Unerman, 2000). The assumption is that the quantity of the disclosures within a given category signifies the Senior Management’s perception of the relative importance of the category and this is fundamental to all of these studies (Deegan and Rankin, 1996).

3.1 Content Analysis - Methodology

A total of 62 distinct subjects were defined with these falling into 10 main categories.

These Categories are used within the research to provide 'generalised' snapshots of a WSB's attitudes and focus. The 10 categories used are:

1. Water Content
2. Headings
3. Acknowledgments and photos of CEO,
4. Non Water,
5. Current Drought,
6. Staff,
7. Governance,
8. Customers,
9. Elections/Profits,
10. Mission/Vision

See Figure 2 for the sub-categories under each broad category.

To carry out Content Analysis on the selected WSBs, Annual Reports were obtained and the Introductions, Highlights, Mayoral Report, CEOs Report, and Managing Director's Reports from within the Annual Reports were examined.

All annual reports were printed on standard A4 paper which has a surface area of 623.7cm² per page.

Measurement of the content was carried out manually with a clear transparency that had a 5mm × 5mm grid overlay. This allowed for a fairly precise and operationally consistent means for determining 'space per topic' (see Appendix B).

All text and blank spaces were measured. Photos were only included within a subject category if they were captioned and referred to in the text. All other photos were defined as decorative and listed accordingly.

As the TMRs were assessed, the results were listed on standardised pro forma (see Appendix A).

After the assessment was completed, the total for each category was determined. The data was entered into a excel spreadsheet and percentages of TMR were calculated.

At various stages during the Content Analysis process, a number of TMRs were reassessed and the results compared to earlier assessments. The results of these reassessments was that a high level of consistency was maintained in spite of the volume of TMRs being examined.

In the course of conducting the Content Analysis of 191 of the 333 estimated Water Supply Businesses in Australia, information about the individual WSBs was collected. The focus of this data was to facilitate the illustration of the differing operational characteristics of WSBs associated with their specific Corporate Governance Typology.

As WSBs are held to widely differing public reporting requirements depending on their locale, size and corporate structure, some of the data sought is either not publicly available or - in many instances – not even recorded by the individual WSB in question. Table 4 and Table 5 describe the methodology of the Content Analysis.

Table 4 gives the description of the details gathered and Table 5 describes the actual process of the Content analysis.

Table 4: Description of Basic Details Gathered

Item	Description
WSB	This is the name of the Water Supply Business
Number of pages in TMR	This is the number of pages of Top Management Reports That were content analysed.
State	This is the State where the WSB is situated
IrrigationUsers	This is the number of Customers that the WSB has listed as using their water for Irrigation
DomesticUsers	This is the number of Customers that the WSB has listed as using their water for domestic or residential purposes
IndustryUsers	This is the number of Customers that the WSB has listed as using their water for Industrial purposes
OtherUsers	This is the number of Customers that the WSB has listed as using their water for purposes other than Irrigation, Domestic or Industry
Total Users	This is the total number of account holders identified by the WSB
Irrigation Volume	This is the amount of water used for Irrigation purposes
Domestic Volume	This is the amount of water used for Domestic purposes
Industry Volume	This is the amount of water used for Industrial purposes
Other Volume	This is the amount of water used for purposes other than Irrigation, Domestic or Industry
Total Volume	This is the total amount of water supplied by the WSB
Employees	This is the number of people employed by the WSB on a Full Time Equivalence (FTE) basis
Gov. Model	This is the identified Governance Model
MDBC	This is whether the WSB is within, partially within, or not within the Murray Darling Basin region
Class of Utility	This category was deemed redundant with Governance Typology and hence not assessed

Table 5: Description of Content Analysis Categories and Subcategories

Categories and Subcategories	Description
1. Headings	Space dedicated to Headings
2. Current Drought	Details or description of drought or drought related matters
3. Mission / Vision	Mission or vision. Corporate 'ideology'
4. Water Content	
Community / Stakeholder Consultation	Pertaining to stakeholder or public consultation
Complaint – Govt. Policy (Water)	Complaints or criticisms of Local, State, or Federal water policy
Conservation Projects (Water)	Conservation Projects aimed at improving water ecology
Corporate Social responsibility	Pertaining to Corporate Social Responsibility
Current water sources	Pertaining to current sources of water supply
Demand Management - Current	Pertaining to procedures or events involving managing water demand/supply
Demand Management - Future	Pertaining to plans for managing water demand/supply
Environment Plan	Pertaining to either published Environment Plan or stated environmental policy
ESD	Pertaining to Environmentally Sustainable Development or paraphrasing of the underlying paradigms inherent in ESD

Categories and Subcategories	Description
Global water issues	Pertaining to global scale Water issues
Impacting litigation - Water	Reference to Local, State or Federal Government legislation that pertains to water
Infrastructure – Maint. (Water)	Includes refurbishment, maintenance, and upgrades of water assets
Infrastructure – New (Water)	Includes replacement, expansion, and development of water assets
Internal or External audit process	Refers to formal audit process
Investigation of other water	Examination of alternative sources, supplies or processes of water procurement
Praise – Govt. Policy (Water)	Praise or endorsement of Local, State, or Federal water policy
Reducing greenhouse gas	Pertaining to Greenhouse gases, emissions, air pollution
Sustainability & water cycle strategy	Pertaining to the natural water cycle and water reclamation strategy
Sustainable policy unit	Reference to specific internal officers or unit that is responsible for overseeing implementation of sustainability paradigms and practices
Water Allocation	Water allocations, entitlements, licensing, etc.
Water Conservation - Agricultural	Reduction of water consumption by the Agricultural sector
Water Conservation - Other	Reduction of water consumption by non-agricultural sectors
Water reuse or Grey water	Recycled, reclaimed, or grey water
Water sales	Sale of water
Water Technology	New technology or discussion of merit of water infrastructure technology
5. Acknowledgements & Photos of CEO	
Acknowledgements	Acknowledgement of individuals or organisations
Awards from or to WSB	Awards to or from WSB or WSB personnel
Biographies	Biographical information about WSB associated personnel
Decorative photos or graphics	Photos or graphics
Introduction/Rhetoric	Clichés, useless rhetoric, introductory passages. Basically sentences with verbiage
Signature or identifying photo	Signatures or photos about the officers who have contributed to the TMR (ie. The author)
This Document	Information about the document that the TMR is contained within
Visiting Dignitaries	Reference to a visit or collaboration with a dignitary or famous individual not normally associated with the WSB
6. Non Water	
Complaint – Govt. Policy (Non-Water)	Complaints or criticisms of Local, State, or Federal policy that is not related to water
Conservation Projects (non Water)	Conservation Projects aimed at improving the local non-water based ecology
Impacting litigation – Not Water	Reference to Local, State or Federal Government legislation that does not pertain to water
Infrastructure – Maint. (Non-Water)	Includes refurbishment, maintenance, and upgrades of non water assets
Infrastructure – New (Non-Water)	Includes replacement, expansion, and development of non water assets
Local Events (Non-Water)	Events that do not pertain to water
Non-Water related projects/initiatives	Projects and initiatives that do not pertain to water
Praise – Govt. Policy (Non-Water)	Praise or endorsement of Local, State, or Federal policy that is not related to water
Property Development levels	References to Property Developments, expansions, reductions, etc.

Categories and Subcategories	Description
Regional Development	Initiatives or events that relate to regional development or growth
7. Staff	
Internal workplace culture	Description of work environment related events, culture, or determinations
Staff	Reference to specific or general Staff, includes events, policies, and individuals
8. Governance	
Board of Management or Committees	Structure, duties or composition of Board or Committees
Meetings of Board or Committees	Activities or events by Board or Committees
Reports on other side of business	Reference to non-water related business activities of WSB
Review of policies	Review or monitoring of internal policies
Structure of WSB	Corporate or operational structure of the WSB
9. Customers	
Aboriginal & Torres Strait Islanders	Reference to Aboriginal & Torres Strait Islanders community or activities
Community Education	Public or community education or awareness initiatives or activities
Customer billing	Reference to billing processes, policy, or specific events
Customer satisfaction	Reference to customer satisfaction
Customers	General comments about customers
10. Elections / Profits	
Elections	Pertains to Local, State, or Federal Government or internal elections
Impact of Legislation	References to Legislation that impacts operations or events discussed within the TMR
Other financial details	Discussion of financial matters other than profits or budget
Plans for the future	Outlined details concerning plans for the future that is not covered in other categories
Profit or Budget Surplus	Financial details pertaining to profits of budget surpluses

3.2 Content Analysis Results

The Content Analysis method detailed in Section 3.1 was applied and yielded the results summarised in the charts that follow. Where appropriate, the results are presented by State and by Governance Type in figures 3, 4 and 5.

The results clearly illustrate that there is a marked variation in the level of reporting of ESD issues in the TMR of the WSB. Figure 3 gives the overall breakdown by State of the content of the TMR'S

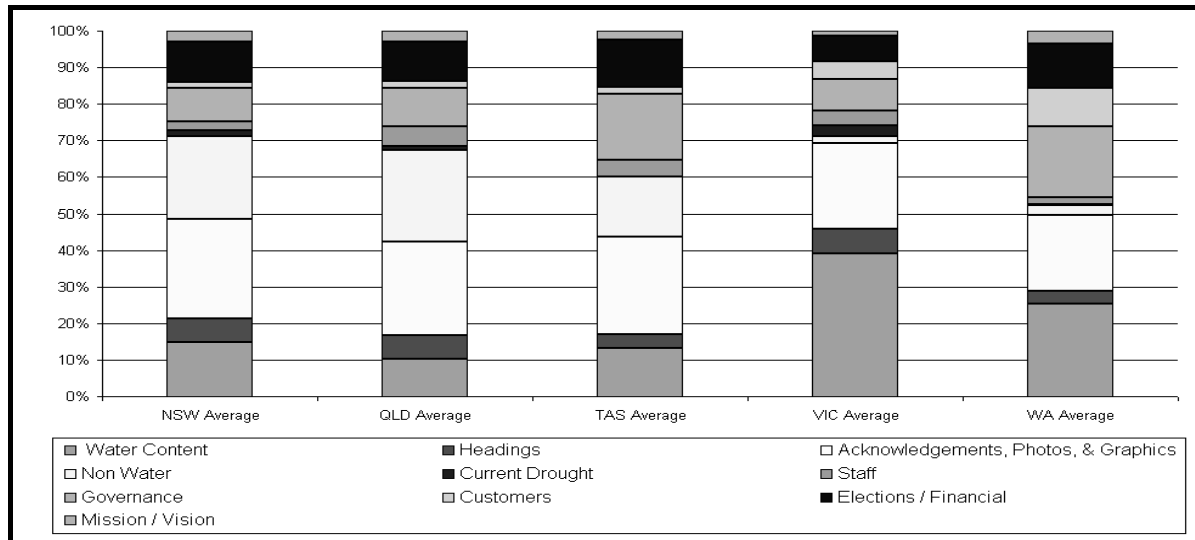


Figure 3: Difference between the States in Water Reporting

The influencing factors that result in this variation can be seen in both regionality and in the nature of a WSB's Corporate Governance structure.

The Victorian utilities – overall – provided the most reporting of ESD activities and all 24 Victorian WSBs are consistently high reporters of activities. This may be because of the small number of such bodies per capita, the high level of coordination between them, and/or the fact that they are all single purpose bodies.

National Content Analysis Summary breaks this down by number of missions and reveals the single mission bodies (water supply only) are the best reporters of Water content (Fig. 4).

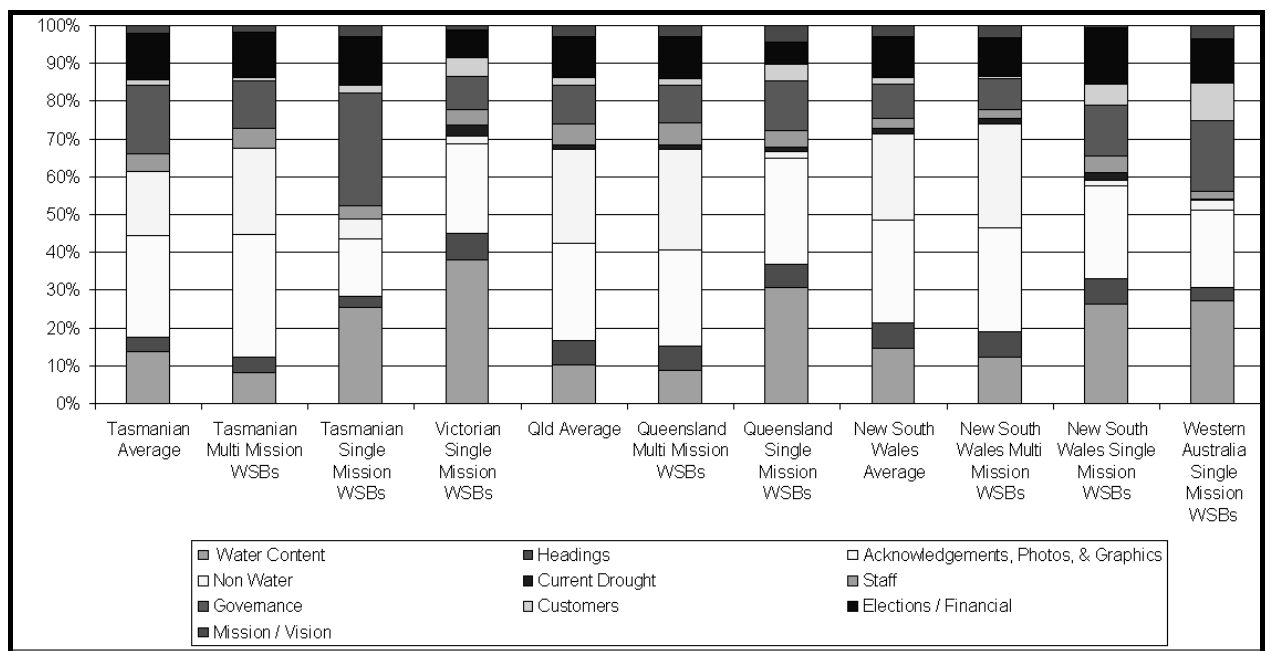


Figure 4: National Content Analysis Summary

National Content Analysis Summary by Corporate Governance Types breaks down the content analysis by Corporate governance type (Fig. 5).

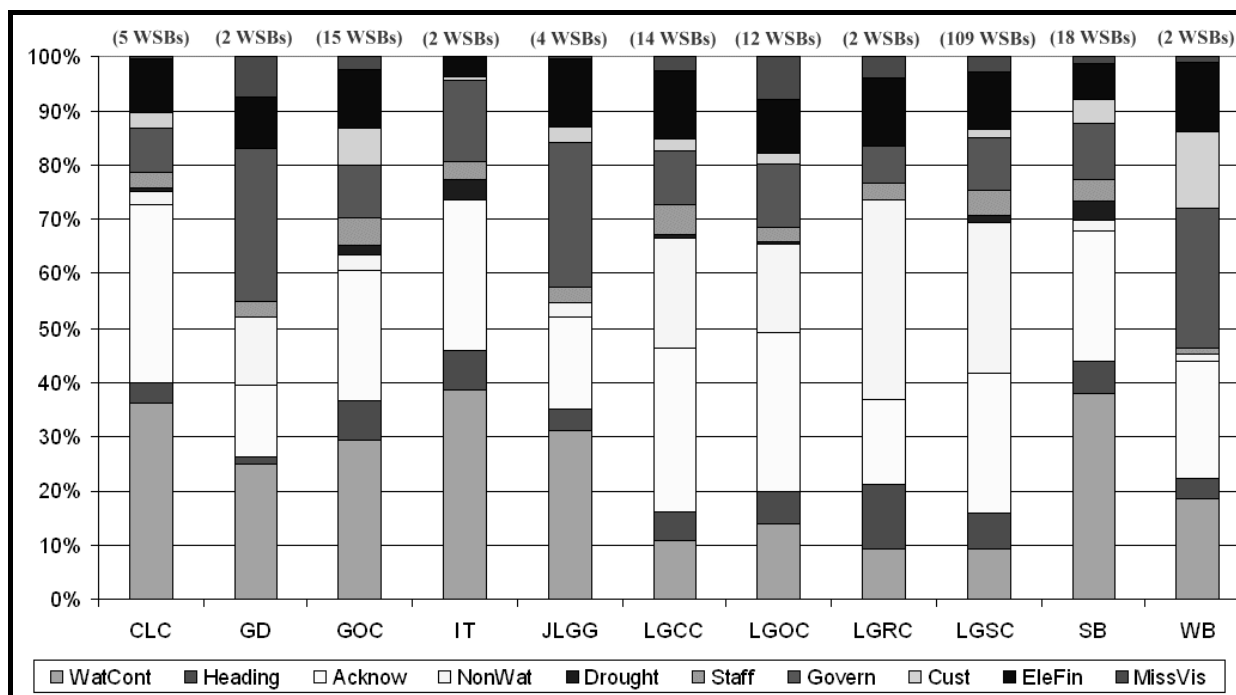


Figure 5: National Content Analysis Summary by Corporate Governance Types

The breakdown by corporate governance types is very revealing. It shows that local governments were reporting the least activities around water in the TMRs.

As shown in Figure 2 above there are 25 subcategories of the water content heading. Of these 18 were the most important.

Content Analysis Disaggregated Subcategories below shows the distribution over the sub categories of content in the TMRs (Table 6). In this table it is possible for TMRs to report more than once on a category hence the numbers differ. This shows that there were few complaints about water policy and few comments praising the water policy. ESD was most often mentioned in Queensland and Victoria. New water infrastructure was mentioned 75 times mainly in Queensland and Victoria. Demand management current and future was a key issue in all States.

Table 6: Content Analysis Disaggregated Subcategories

Sub-Categories	National	NSW	QLD	SA	TAS	VIC	WA
CA Categories	<i>N/Y</i>	<i>N/Y</i>	<i>N/Y</i>	<i>N/Y</i>	<i>N/Y</i>	<i>N/Y</i>	<i>N/Y</i>
Community / Stakeholder Consultation	107/85	24/27	55/33	1/3	10/6	8/16	7/0
Complaint – Govt. Policy (Water)	186/6	47/4	86/2	4/0	16/0	24/0	7/0
Corporate Social responsibility	161/31	45/6	71/17	4/0	16/0	16/8	7/0
Current water sources	156/36	47/4	73/15	1/3	11/5	17/7	5/2
Demand Management - Current	163/29	43/8	81/7	2/2	15/1	14/10	6/1
Demand Management - Future	134/58	39/12	67/21	2/2	13/3	7/17	5/2
Environment Plan	167/25	43/8	82/6	4/0	16/0	14/10	6/1
ESD	130/62	40/11	62/26	2/2	13/3	6/18	5/2
Infrastructure – Maint. (Water)	143/49	41/10	74/14	1/3	11/5	11/13	5/2
Infrastructure – New (Water)	117/75	40/11	53/35	3/1	11/5	5/19	4/3
Internal or External audit process	156/36	46/5	69/19	3/1	12/4	18/6	6/1
Praise – Govt. Policy (Water)	185/7	47/4	88/0	4/0	16/0	23/1	5/2
Sustainability & water cycle strategy	161/31	42/9	77/11	2/2	15/1	17/7	6/1
Water reuse or Grey water	160/32	48/3	76/12	4/0	14/2	9/15	7/0
Water sales	159/33	48/3	79/9	2/2	14/2	9/15	6/1
Complaint – Govt. Policy (Non-Water)	170/22	43/8	75/13	4/0	15/1	24/0	7/0
Praise – Govt. Policy (Non-Water)	183/9	46/5	84/4	4/0	16/0	24/0	7/0
Current drought	124/68	32/19	61/27	2/2	16/0	6/18	6/1

N = No entry Y = Entry recorded

Source: McKay, 2006. CRC-IF Project 1.06

4 Survey of CEOs – Method & Results

This section reports on the second major data collection method used in the project. The CEO survey was a long instrument with a variety of question formats. There were 107 questions in the survey. The individual questions and answer structures were designed in consultation with CRC for Irrigation Futures members and University of South Australia staff.

A critical element of this research was to seek input from the senior management of the examined WSBs. While the Database Analysis, Literature Review, Content Analysis, and general consultation can provide some insight into the direct impact of the CoAG and NWI reforms, the only way to find out what the affected businesses 'think' is to ask (see Appendix C).

For these reasons, Surveys were essential. The Survey concentrated on the following areas:

- Personal details such as previous experience
- Attitude questions likert scales on Board structure, ESD, the new water policies, ETC.
- Personal understanding of ESD
- Personal understanding of ESD policy administration in their State
- Personal views on the admin of the policy
- Personal views of problems, way to improve ESD policy uptake
- Internal governance of their organisation
- Present other organisational arrangements for them to evaluate

The survey was tailored to be non-confrontational, ensure anonymity, and provide the respondents with the opportunity to speak freely. Figure 6 shows the number of respondents (CEOs) per State.

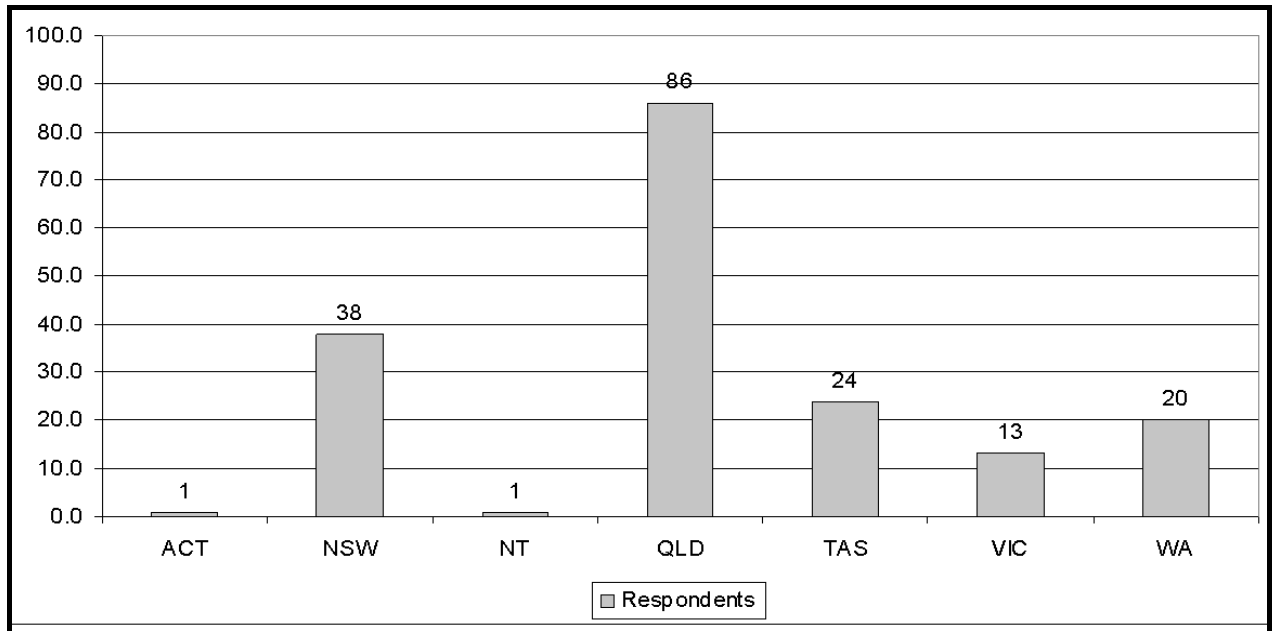


Figure 6: CEO Survey Number of Respondents per State

4.1 CEO Survey - Method

The sampling method was to use the list generated from the typology work described in section 2.0.

Over all there are approximately 333 water supply businesses (which includes a number of small or highly specialised businesses). For the purposes of this Survey, we endeavoured to select the major reticulated water and Irrigation Water Supply Businesses that – collectively – handle most of Australia's water consumption.

The Surveys were conducted by the Marketing Science Centre facilities located at the University of South Australia 'City West' Campus. This unit has IQCA accreditation. Four Marketing Science Centre employees were employed on this job and they reported any issues to us on a daily basis.

A testimony to both the skill of the Survey Staff and the willingness of CEOs within the Water Supply Industry to discuss the issues covered within the Survey was the extremely low incidence of "No response" to the questions.

The fieldwork was conducted over a longer than usual time frame, mainly due to the seniority of the participants, and their busy schedules. Interviewing began on the 28th September 2005 and concluded on the 24th January 2006.

In total 183 interviews were completed. The Key Actors were given formal pre-notification of the study, which helped to accommodate the lengthy telephone interview of approximately 27 minutes. The participants were contacted to arrange a suitable time to conduct the interview and were also faxed/emailed a two-page brochure on water policy to view and later comment on.

There were 107 questions in total (refer to Appendix C) – it should be noted that due to the nature of the Marketing Centre's report, there appears to have been 110 questions. However, in three instances, instructions or background information has been cited as a 'question' and numbered accordingly. As no answer is registered from the respondent, no data is collected from those three 'questions'.

The Survey had five different types of questions that pertained to seven broad categories. These categories were intuitive in that they were designed from the field work and preliminary discussions and as well as from literature. The most literature exists on the Board structure but none of the studies reviewed related to water utilities. The literature did refer to the impact of the type of Board appointment process (election or appointment) and then the interpersonal relationships between Board members as having an acute impact on Board performance and value to a company.

The first type of question format used a Likert scale response. The respondents gave their answers on an 11 point scale of *Strongly Agree* to *Strongly Disagree* with 11 as *Don't Know*. There were 68 of these questions.

The second form of question was a 'free response' format. A question or statement was put to the respondent who then gave a short, specific response. There were 32 of these questions.

The third format for questions was a simple choice between: *Yes*, *No*, or *Don't Know*. There were two of these questions.

The fourth type of question asked respondents to define and discuss their Key Performance Indicators. This generally included an associated opportunity for the respondent to use a 'free response' question to expand or clarify their answer. There were three of these questions.

The fifth type of question structure was a set answer format where either a set answer was nominated or the answers were reordered by the respondent to reflect their views. The arrangement of order was particularly used in ascertaining the respondents' views on ESD priority and difficulty. There were two of these questions.

The seven categories that the questions broadly fit into were:

- The Organisation or Organisation's Charter (21 Questions)
- The Organisations ability to achieve Sustainable Water Management (30 Questions)
- The State Water Planning Process (16 Questions)
- The Organisation's client Community (11 Questions)
- The Organisation's Board (10 Questions)
- The ESD Process (10 Questions)
- The CEO (nine Questions)

After the completion of the Survey, 30 of the surveyed CEOs were contacted to obtain feedback and follow up. Most expressed interest in receiving the report. Many reported that they liked the survey as it gave them an opportunity to discuss many issues. See below the Executive Summary Extract from the Survey Report.

This report presents the results of a research project designed to outline the attitudes and opinions about Water Supply and the Governance Issues facing Water Businesses in Australia, importantly the obstacles and issues facing businesses that supply water. This research was federally funded and conducted by the Centre for Comparative Water Policies and Laws at the University of South Australia.

For this research, Water Businesses on the east coast of Australia were contacted. Participants in the study were strictly restricted to Key Actors only including CEO's and MD's.

The fieldwork was conducted over a longer than usual time frame, mainly due to the seniority of the participants, and their busy schedules. Interviewing began on the 28th September 2005 and concluded on the 24th January 2006. In total 183 interviews were completed.

The Key Actors were given formal pre-notification of the study, which helped to accommodate the lengthy telephone interview of approximately 27 minutes. The participants were contacted to arrange a suitable time to conduct the interview and were also faxed/emailed a two-page brochure on water policy to view and later comment on.

Our IQCA accredited field team that is located at our 'City West' facilities undertook all interviews.

*Executive Summary extract from
"Report on Water Supply with Key Actors"
Kirsty Willis, Ehrenberg Bass Institute
University of South Australia
Date of Issue: 24 March 2006*

4.2 CEO Survey Results

The key results from the Survey of 183 WSB Chief Executive Officers are presented in this section. Included are charted results from 29 central Likert format questions and two 'rank set answer' questions.

The results for all Likert questions are reported by State (excluding ACT and NT for confidentiality reasons) and corporate governance type.

For the purposes of examining the presented survey results, the nature of the questions have been loosely grouped into the following six categories. This paper will present results under these headings in the most useful question. This chapter will present the raw frequencies for these questions by State and organisational type. There are limitations on the use of non parametric statistics because of the sample structure with a few organisations representing many types. Indeed the population of many types was too small to engage in statistical analysis.

- CEO Attention and understanding of ESD
- CEO Satisfaction and confidence with their Organisation
- CEO Satisfaction and confidence with Organisation Board
- Organisation's relationship with State Government
- CEOs Impression of Water Policy Changes
- CEOs Impression of Stakeholder and Community role/perspective

Table 7 provides the six major groupings of the survey questions.

Table 7: Major Groupings of Questions and Corresponding Question Numbers

CEO Attention and understanding of ESD
Effort of Difficulty
Amount of Effort expended
Question # 7 - I am able to achieve sustainable water management
Question # 8 - I am clear on what it means to this organisation to achieve sustainable water management.
Question # 26 - The ESD process is transparent.
Question # 101 - It is important to act in relation to global environmental change. *
CEO Satisfaction and confidence with their Organisation
Question # 6 - I am happy with the charter of the organisation
Question # 86 - Over the last 10 years change in this organisation has been incremental.
CEO Satisfaction and confidence with Organisation Board
Question # 15 - The non executive members of the board understand their role.
Question # 16 - The non executive members of the board understand ESD.
Question # 17 - The non executive Board members see themselves as guardians over the executive behaviour. *
Question # 18 - All board members work together cohesively.
Question # 19 - The board understands that is governs not manages? *
Question # 20 - Some members of the Board compete with each other. *
Question # 22 - The water customers see non executive directors as a source of probity (goodness). *
Question # 23 - Some board members show little interest in the organisation.
Question # 24 - The relationship of the Chair of the board and the CEO is competitive.
Question # 25 - The board controls and plans its own agenda.
Organisation's relationship with State Government
Question # 82 - There are well established intergovernmental processes that ensure co-ordination and the State government.
Question # 89 - The transaction costs in meeting external requirements of other Government are huge. *
Question # 91 - There is a huge amount of trust between this organisation and the State government.
Question # 28 - Of all the regulators, the environmental regulator is the hardest to please.
Question # 29 - Of all the regulators, the price control regulator is most difficult to please.
Question # 10 - The water planning process instigated by the State government in the 90's have worked well here.
Question # 12 - I am well informed by the state government about their water policy?
Question # 92 - We are always consulted and given time to respond to policy changes.
Question # 93 - This organisation is nested in a mutually supportive State government policy environment.
Question # 97 - State government policy making processes follow a predictable pattern.
CEOs Impression of Stakeholder and Community role/perspective
Question # 9 - All stakeholders are consulted in water planning.
Question # 13 - The community in this area works well together in water planning?
Question # 14 - All sectors of the community of this water business understand the viewpoint of others in the area.
Question # 88 - This organisation needs to have fewer external stakeholders calling on us to provide information.

Source: CCWP&L Research CRC-IF Project 1.06 (Survey questions in Appendices)

* not charted here.

In the Likert questions the CEO in each organisation type showed a wide range of responses to all the Likert scaled questions with some strongly agreeing and some at the other end. The range of responses is shown in the following bar charts. In each of the figures below the mean is shown as a diamond (◆) and it enables some distinctions to be made between the groups of organisations types or States. The Likert scaled questions seem to have been good questions in that respondents used the entire range of answers and did not all answer neutral or strongly agree. Many respondents indeed were receptive to being able to express their views in this way on the basis that their individual responses could never be identified. Again due to the small sample size in some organisation types it was impossible to do even within sample non parametric statistics.

4.2.1 CEO attention and understanding of ESD

The first two questions reported here were emailed to the respondents so they could see the full text and they were asked to rate each one from *1 not at all difficult* to *10 extremely difficult*. In the second question, they were asked to rate them according to the effort they have put in from *1 least effort* to *10 most effort*. In all the questions 11 was *don't know* and *refused* but there were very few of these. The votes were then tallied as shown in the figures below.

Responses to the first question indicate that the CEOs thought that it was most difficult to achieve global dimensions and least difficult to achieve broad community involvement.

As can be seen below in Figure 7, 'Broad Community Involvement', 'Cost Effective Policies', and 'Integrated Decision Making Processes' were consistently the principles that received the most effort and attention by the respondents organisations. This reflects the generally high level of priority that these specific principles enjoy.

In relation to the transparency of the ESD process, the Survey results indicate that most organisations have a neutral view. All had heard of the process. Hence they are neutral as to whether the process in their State is transparent. The Water Boards perceive the process as transparent. Local government are clearly of the neutral view. The local governments occur in three States, Queensland, NSW and Tasmania.

In relation to ability to achieve ESD, the local governments were most likely to be neutral on this. Water Boards and Government Owned Corporations were more likely to be optimistic that they can achieve it.

This finding is corroborated by research carried out by the Australian Local Government Association (ALGA) where it was reported that most councils were not active in Regional NRM Plan development because of a lack of resources with 56 per cent of councils highlighting a lack of human or financial resources to effectively participate. The ALGA report also cited that only 31 per cent of councils believe that they have a good or comprehensive capacity to develop and implement the regional plans (Australian Local Government Association 2005).

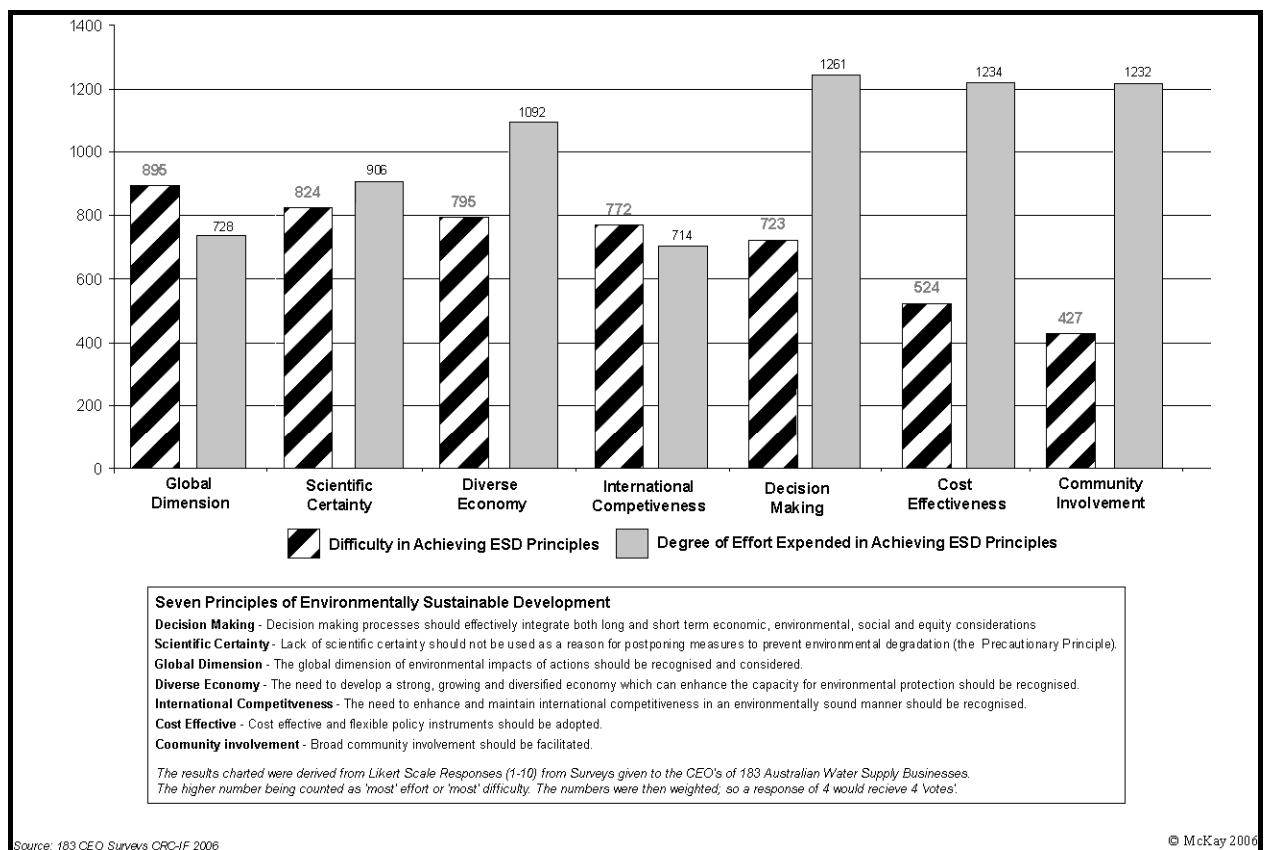


Figure 7: Achieving ESD Principles – Effort and Difficulty

In terms of seeing themselves as a piece of a larger whole, while the general response was that it was important to act in awareness of Global developments, this principle was viewed as the most difficult to achieve and yet attracted a low level of effort.

The ability of the CEO to achieve ESD was clearly the focus of this research. As seen in figure 8 below the range of answers were enormous but the means hover around neutral 5 and peak at 8 which is on the agree side but short of strongly agree. Hence, we can

conclude that the CEOs are not confident in their ability to achieve ESD. The reasons for this relate to funding and external factors.

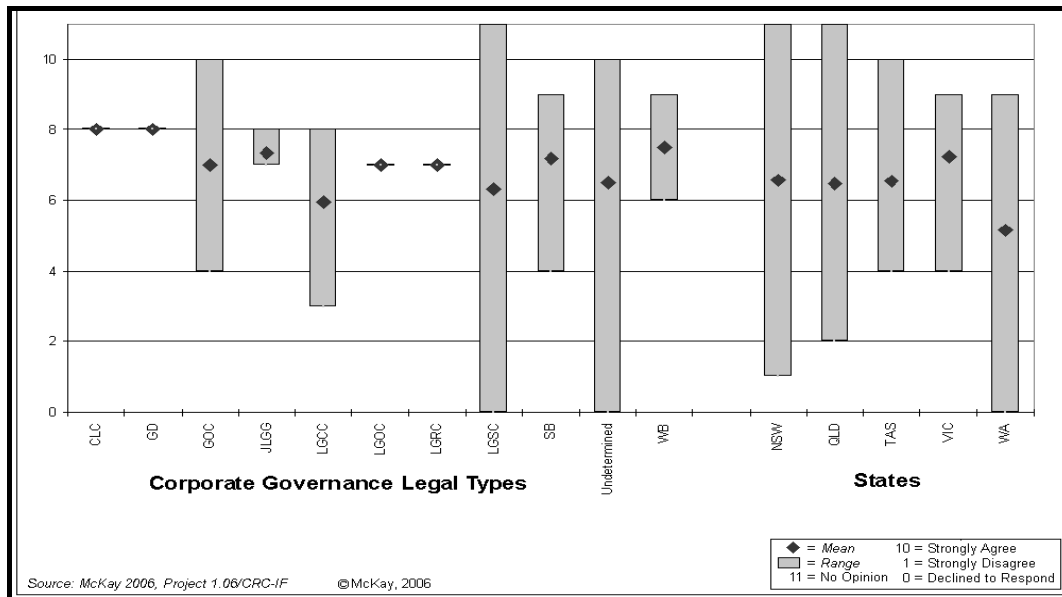


Figure 8: Question # 7 - I am able to achieve sustainable water management

The CEOs clearly had different attitudes to the transparency of the ESD process in their State. Local governments thought it least transparent in general terms. The lack of transparency is one factor impinging on ability to achieve ESD and willingness to try. The CEOs were personally clear on what it meant to their organisation to achieve ESD so we can conclude that the lack of ability to achieve it is not related to knowledge of the issue but to some other factors.

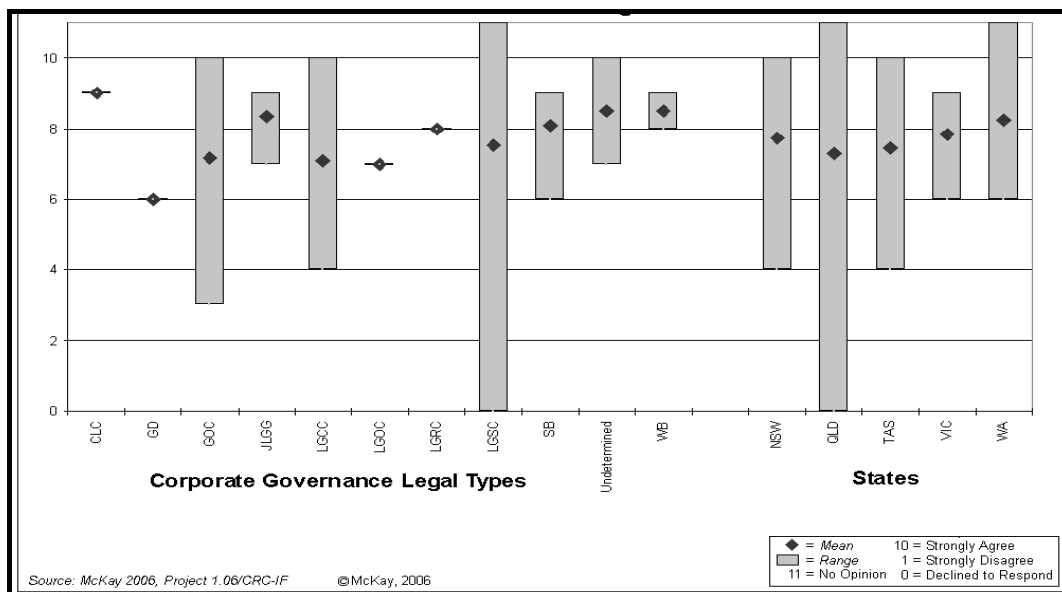


Figure 9: Question # 8 - I am clear on what it means to this organisation to achieve sustainable water management.

4.2.2 CEO satisfaction, confidence with their Organisation

There is generally a high level of satisfaction with the median response in all states and in all governance types. However, it should be noted that Local Government Authorities in QLD and TAS both had wide ranging responses, including a number who were dissatisfied.

In all States and in all forms of governance types there has been a wide range of responses to the level of change that their organisation has undergone during the period of the CoAG and NWI reformations. On the whole, the attitude can best be characterised as neutral.

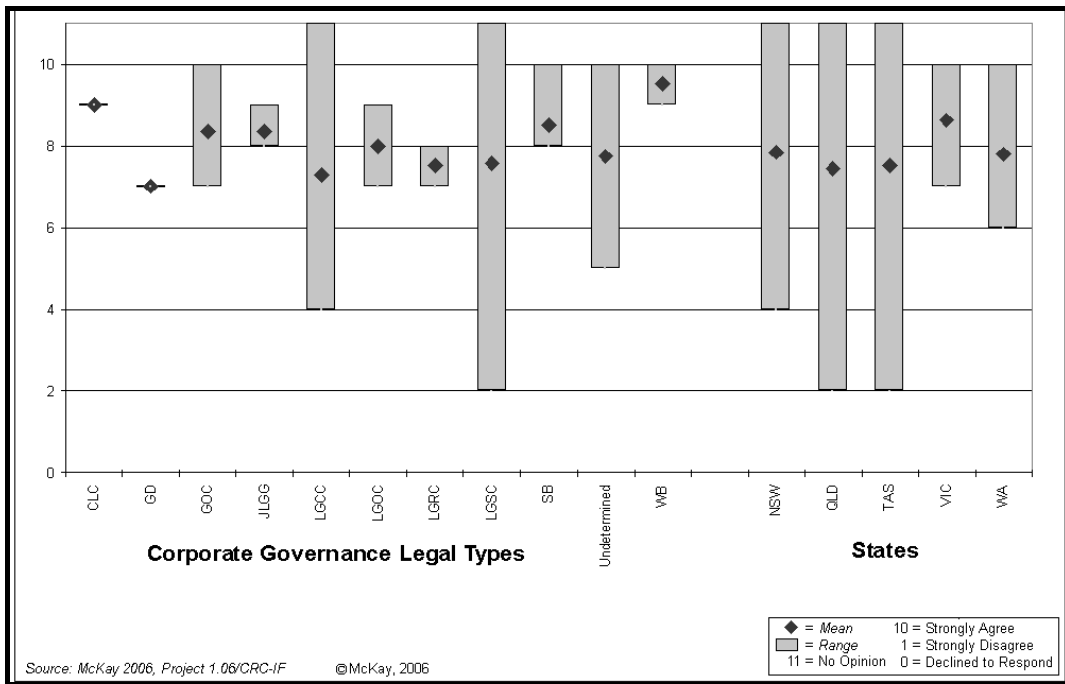


Figure 10: Question # 6 - I am happy with the charter of the organisation

The respondents all clearly think that change in their organisation has not been incremental and hence all have in common a sense of fatigue.

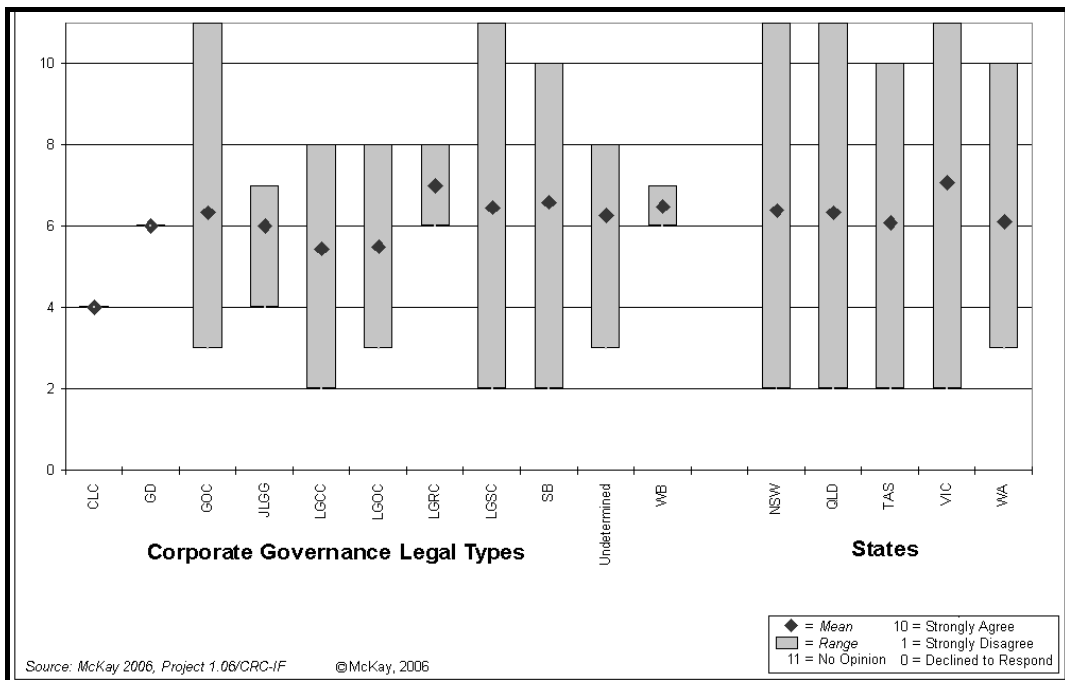


Figure 11: Question # 86 - Over the last 10 years change in this organisation has been incremental.

4.2.3 CEO satisfaction and confidence with Organisation Board

Only some questions are reported here. The means suggest that irrespective of organisation type there is a general understanding by Board members of their role. However, when it comes to ESD there are vast differences between the organisation types in understanding of ESD. This of course may be one reason why the CEOs have difficulty in achieving ESD.

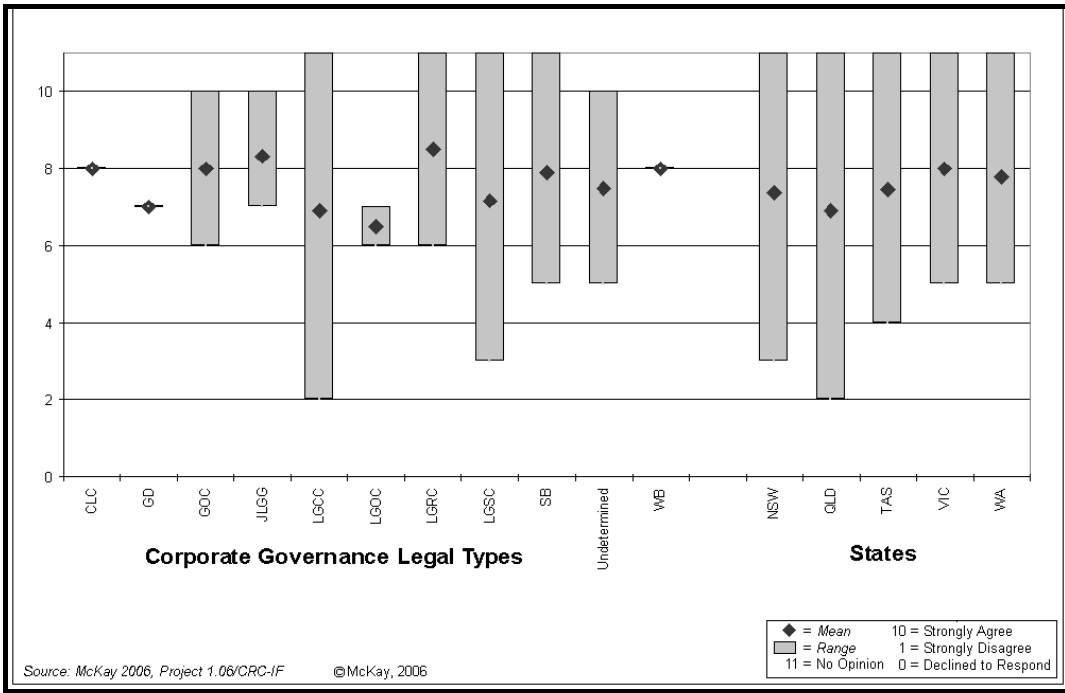


Figure 12: Question # 15 - The non executive members of the board understands their role.

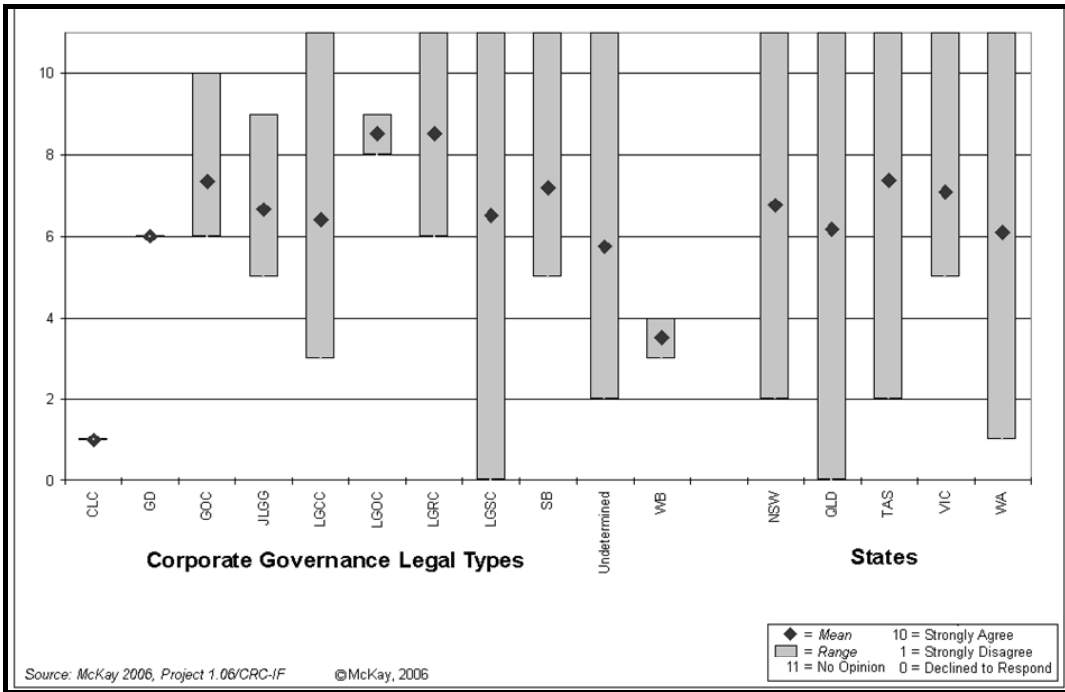


Figure 13: Question # 16 - The non executive members of the board understand ESD.

The cohesiveness of the Board differs between the corporate governance types as well and this is a factor in CEO achievements of ESD. The least cohesive were Local Governments.

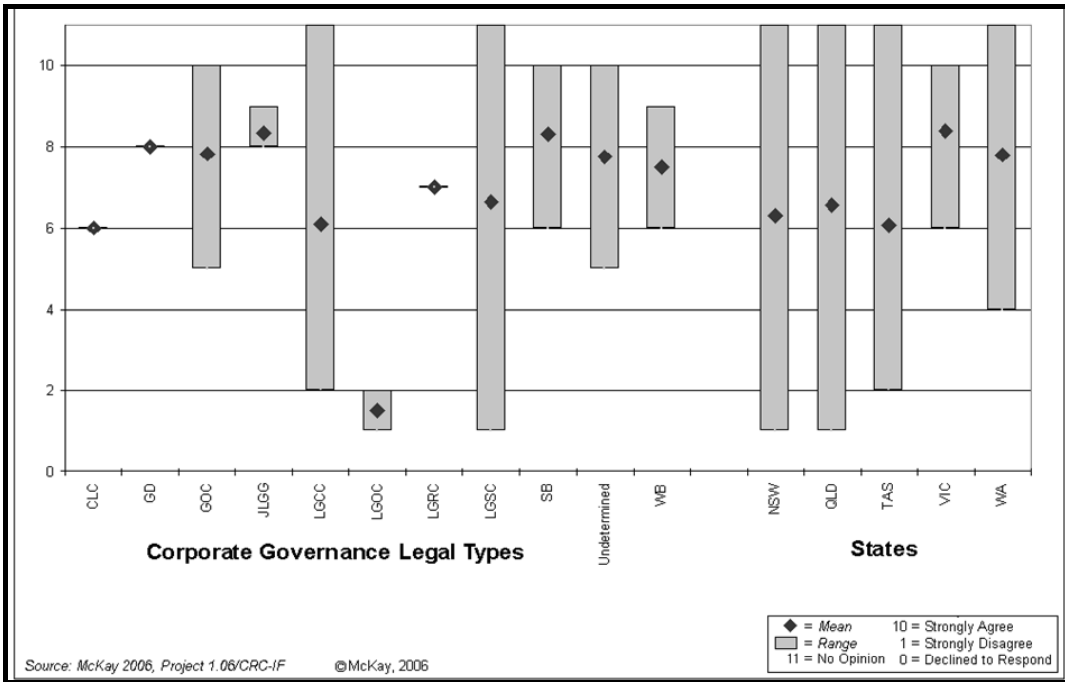


Figure 14: Question # 18 - All board members work together cohesively.

4.2.4 Organisation’s relationship with State Government

These questions were the crux of the research as the external water policy environment and how the CEOs perceive it is crucial to ESD performance.

The CEOs were not convinced that there are well established intergovernmental processes to ensure coordination. This reinforces the responses to the questions regarding ability to achieve ESD. Most responses were neutral.

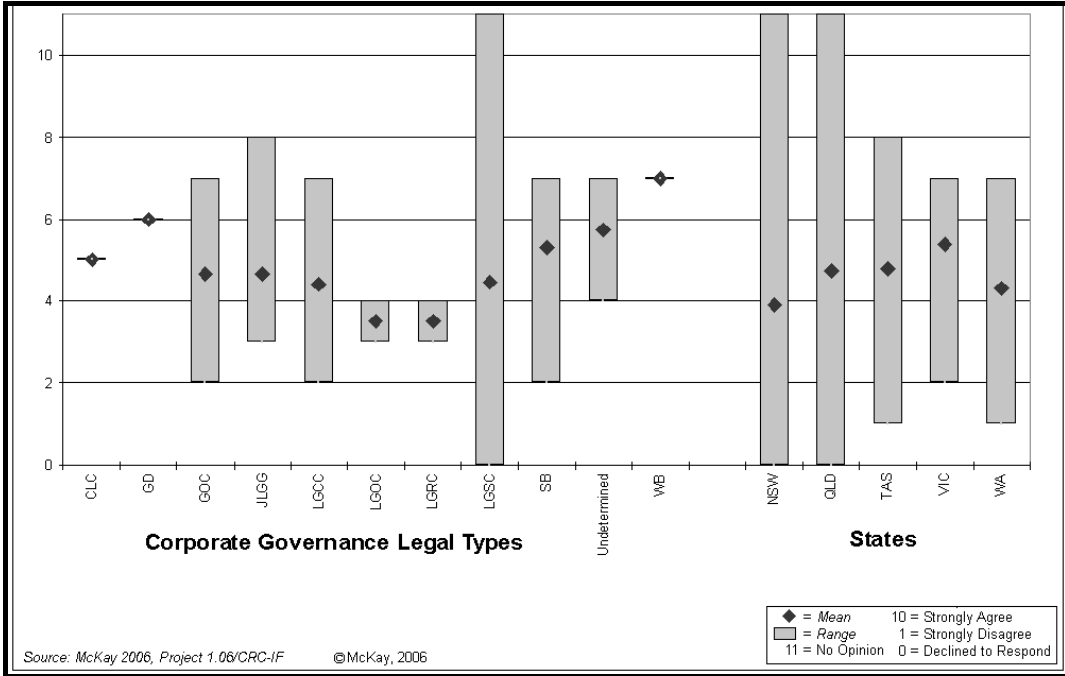


Figure 15: Question # 82 - There are well established intergovernmental processes that ensure co-ordination and the State government.

All agreed that the transaction costs in meeting State government requirements in reporting to other arms of government were huge. The Government owned Corporations were neutral on this and this may reflect their great connection with governments and hence familiarity with the processes.

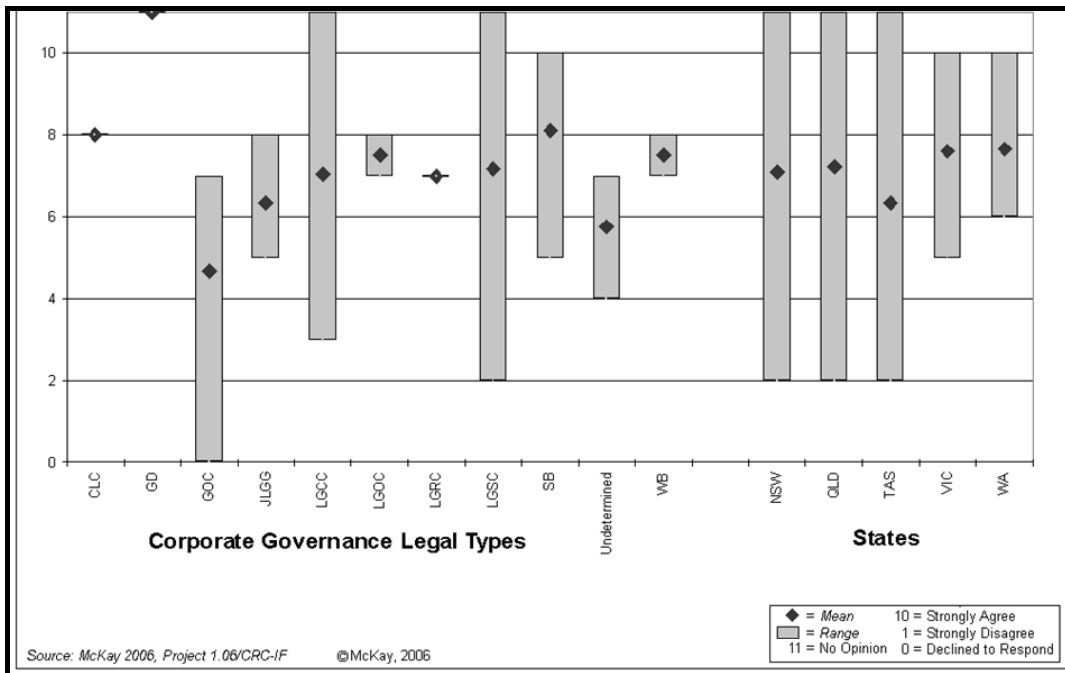


Figure 16: Question # 89 - The transaction costs in meeting external requirements of other Government are huge.

There was also considerable variation between Corporate Governance Types as well with Statutory Boards and Government Owned Corporations consistently having a greater level of trust and Local Government Authorities having the least.

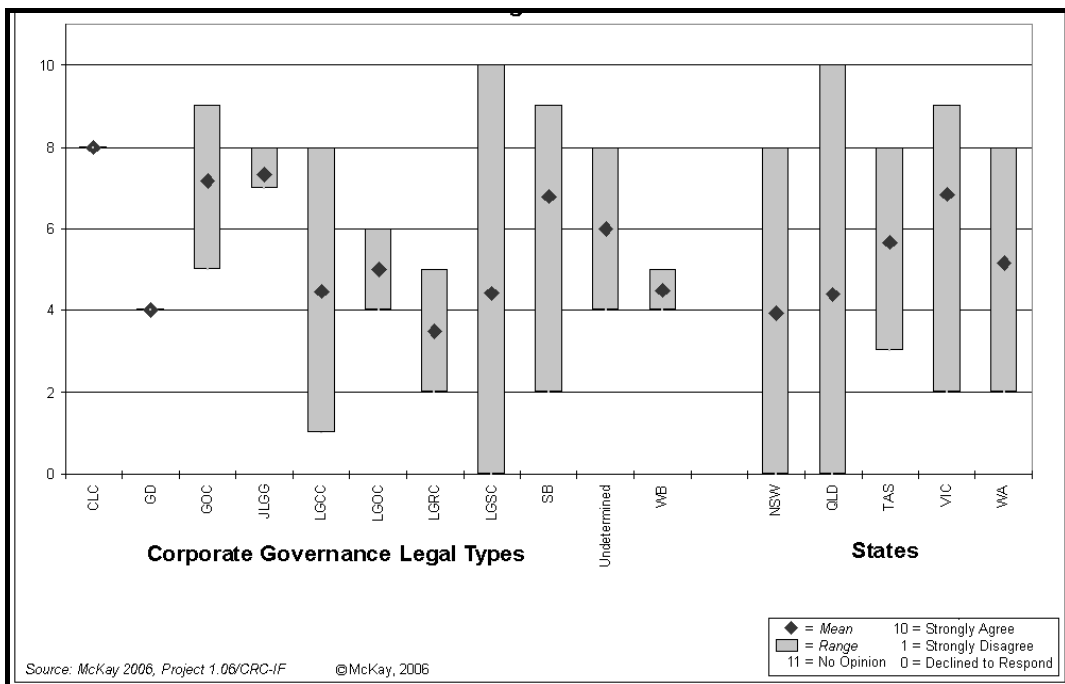


Figure 17: Question # 91 - There is a huge amount of trust between this organisation and the State government.

With regard to pleasing the environmental and price regulators (who are two separate bodies in each State) there were notable variations in responses when Corporate governance type was considered. There were also differences between states.

The environment regulator was considered most difficult to please by some local governments which spilled over the showing that for NSW and Queensland. In Victoria the price regulator was clearly the most difficult to please and Statutory Board also reported this. Local government generally found the environment regulator most difficult.

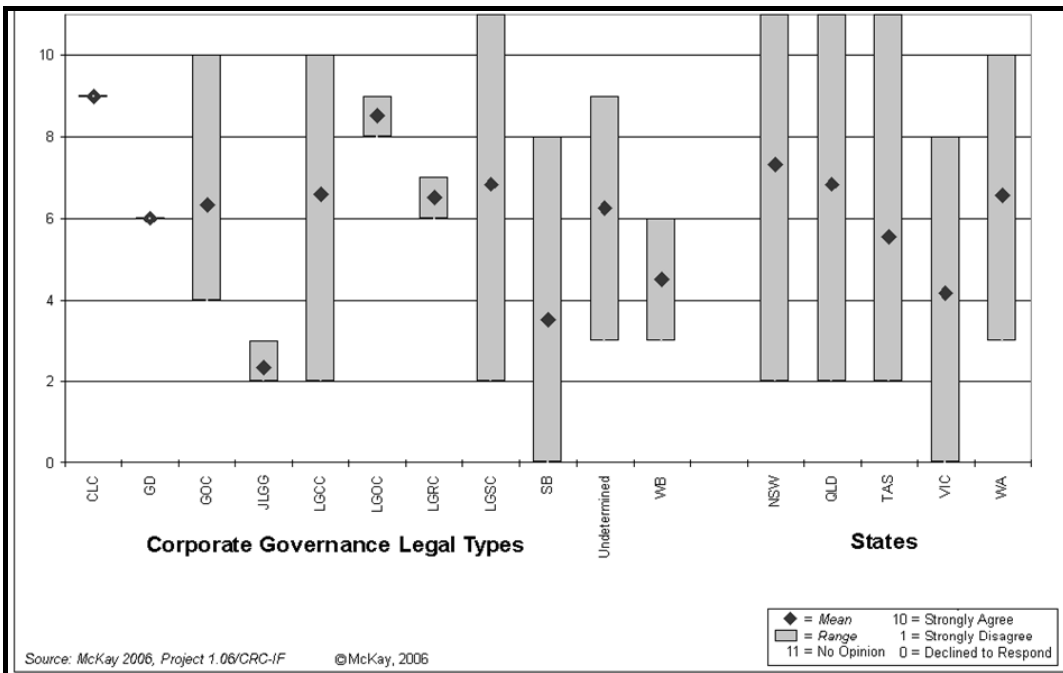


Figure 18: Question # 28 - Of all the regulators, the environmental regulator is the hardest to please.

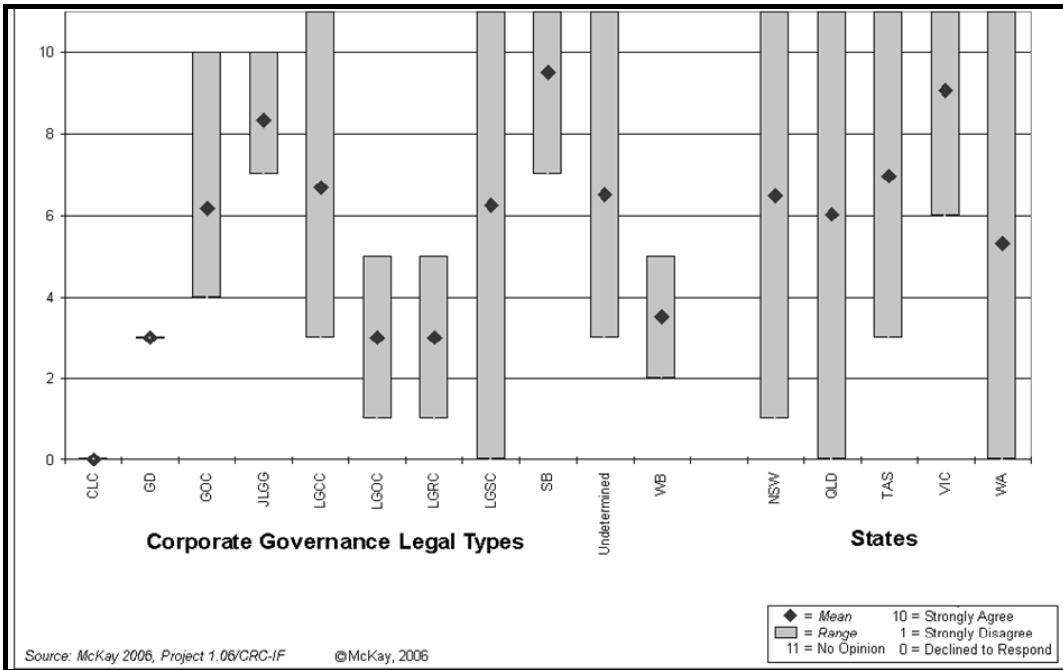


Figure 19: Question # 29 - Of all the regulators, the price control regulator is most difficult to please.

4.2.5 CEO Impression of Water Policy Changes

The CEOs generally despite their organisation type, are not convinced that the water planning process instigated by their particular State government has worked well for them. Statutory Board are more positive around 7 and Government owned Corporations.

The next question deals with perception by the CEOs to their level of information provided by the State government about Water policy. Some feel much uninformed and some well informed. This would have an impact on their ability to achieve ESD and also on other attitudes to the State government particularly trust. The CEOs don't feel that they are consulted and given time to respond to water policy changes. There are differences between the CEOs organisational type in their perception of being nested in a mutually supportive government policy environment. The Statutory Boards, Water businesses and Government

Owned Corporations feel they are, the local governments less so. Finally, the different types of bodies have different views on the predictability of State government policy. In general they mildly agree it is predicabile but local government tends to disagree, except the local government owned corporation who as big bodies have closer contact with State government.

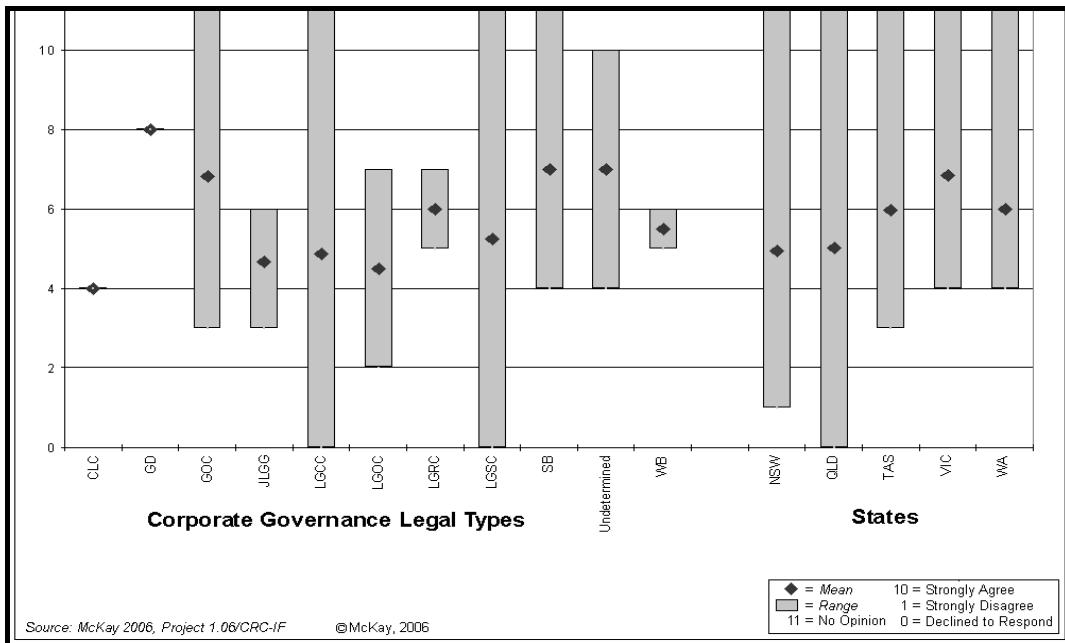


Figure 20: Question # 10 - The water planning process instigated by the State government is the 90's has worked well here.

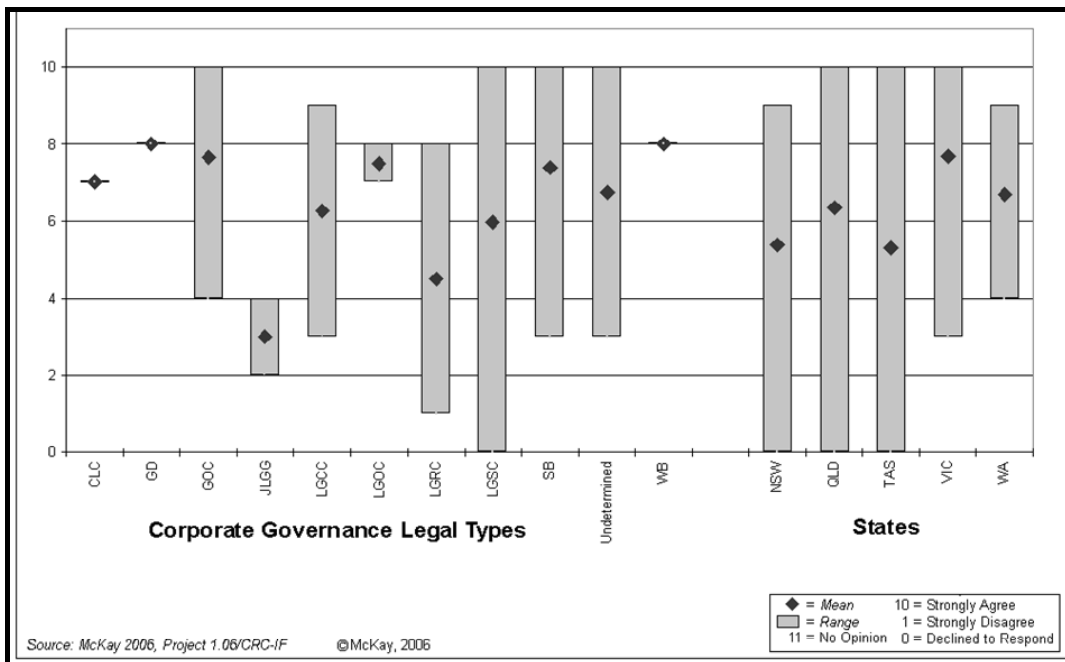


Figure 21: Question # 12 - I am well informed by the state government about their water policy?

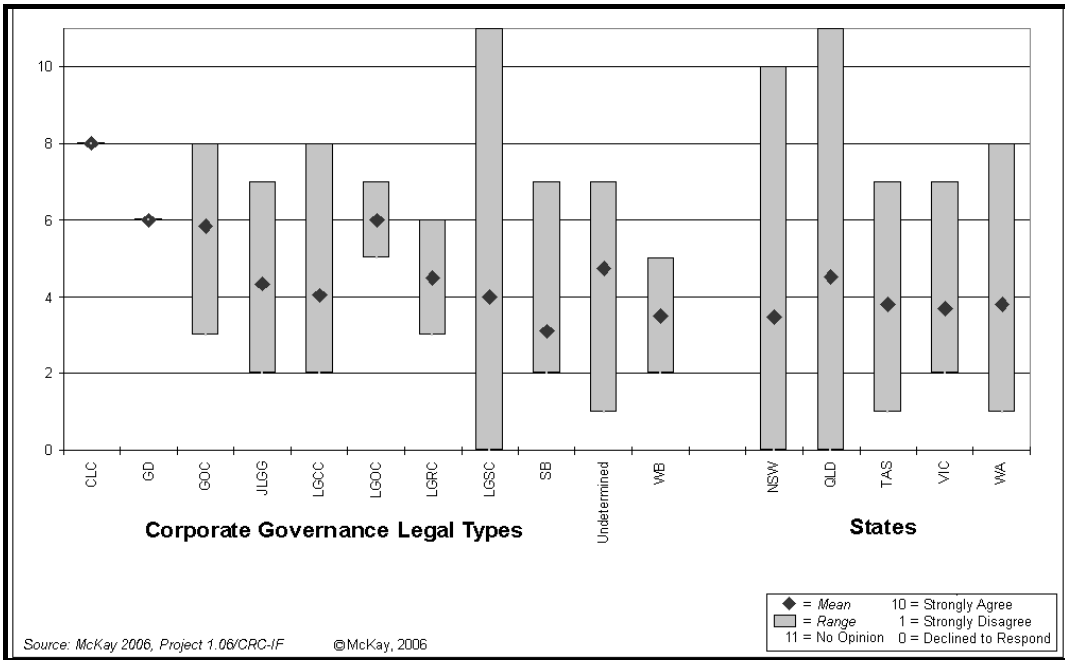


Figure 22: Question # 92 - We are always consulted and given time to respond to policy changes.

The CEOs also don't generally feel nested in a mutually supportive policy environment except in Victoria, and this related directly to the corporate governance types of Government Owned Corporations and Statutory Bodies.

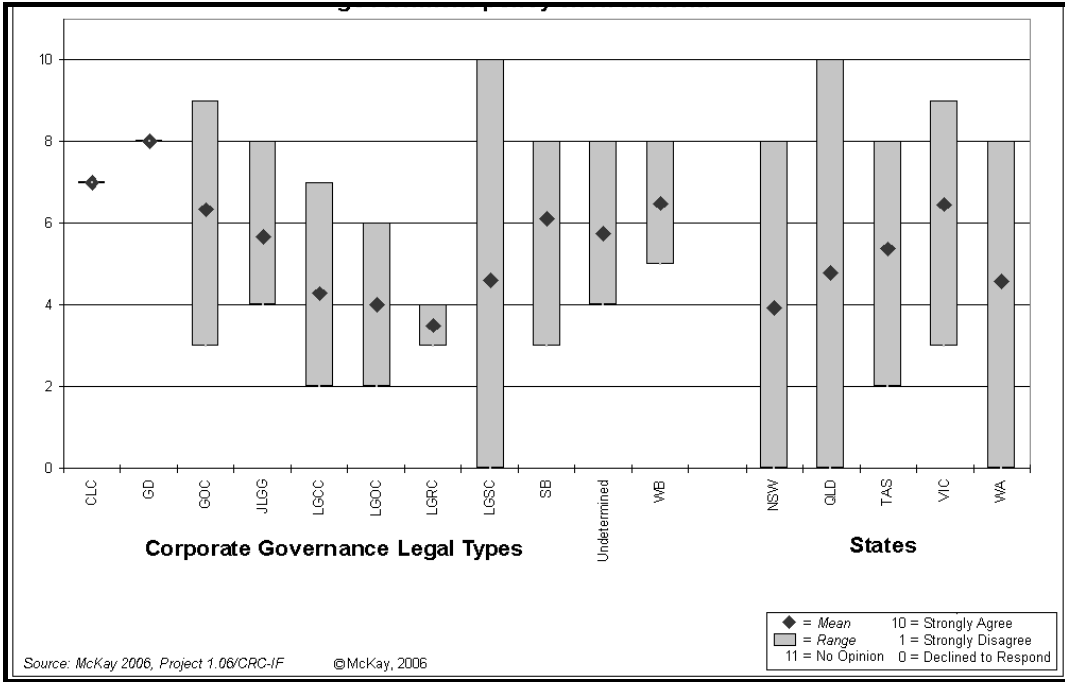


Figure 23: Question # 93 - This organisation is nested in a mutually supportive State government policy environment.

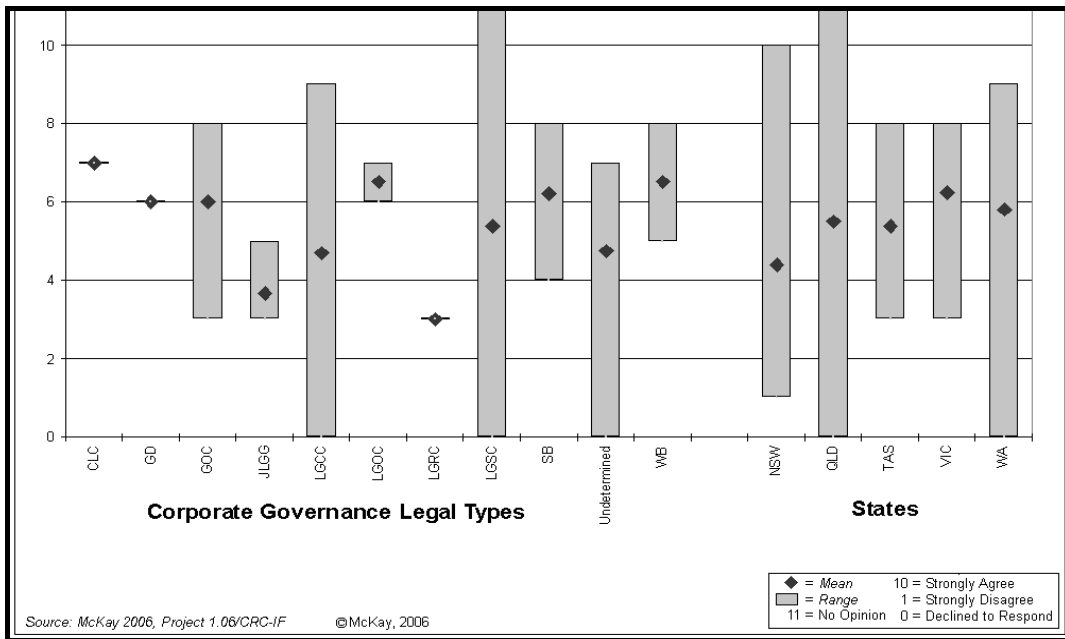


Figure 24: Question # 97 - State government policy making processes follow a predictable pattern.

4.2.6 CEO Impression of Stakeholder and Community role/perspective

In relation to whether the CEOs feel that all sectors of their community understand the viewpoints of others, the results – across all governance types and in each state - suggest that they are neutral on this.

This indicates that the CEOs surveyed are not confident in the success of efforts to achieve 'broad community involvement'. So, despite the priority and effort reported in the charts 'Degree of effort put into ESD Guiding Principles' and 'Difficulty in achieving ESD Principles', the results are not compelling.

Further, while the respondents all report a high level of Stakeholder Consultation, they also report a similarly high level of feeling that their organisation needs to have fewer external stakeholder demands for information.

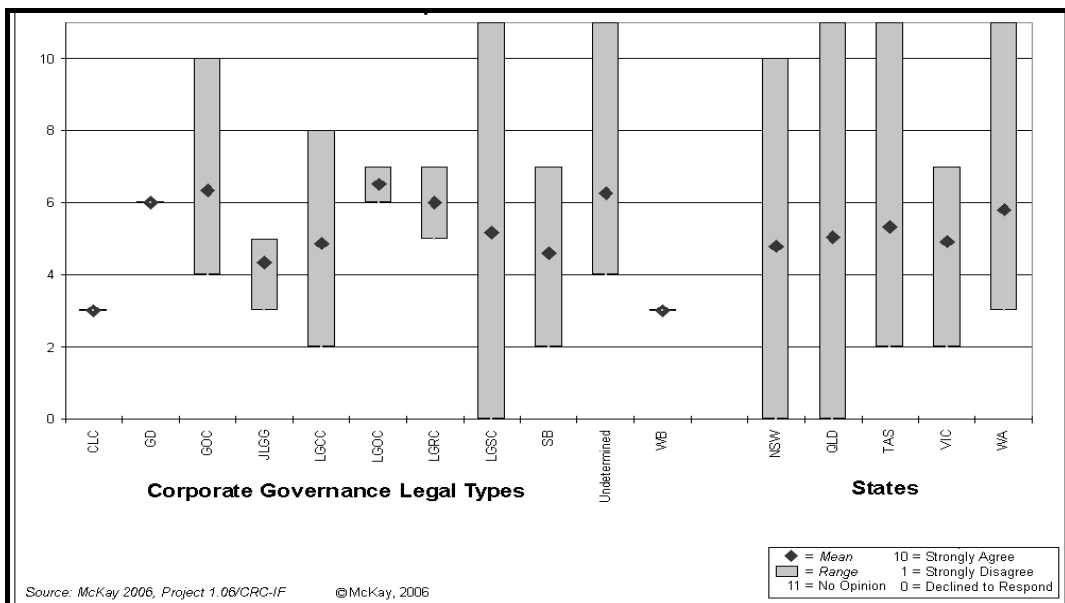


Figure 25: Question # 14 - All sectors of the community of this water business understand the viewpoint of others in the area.

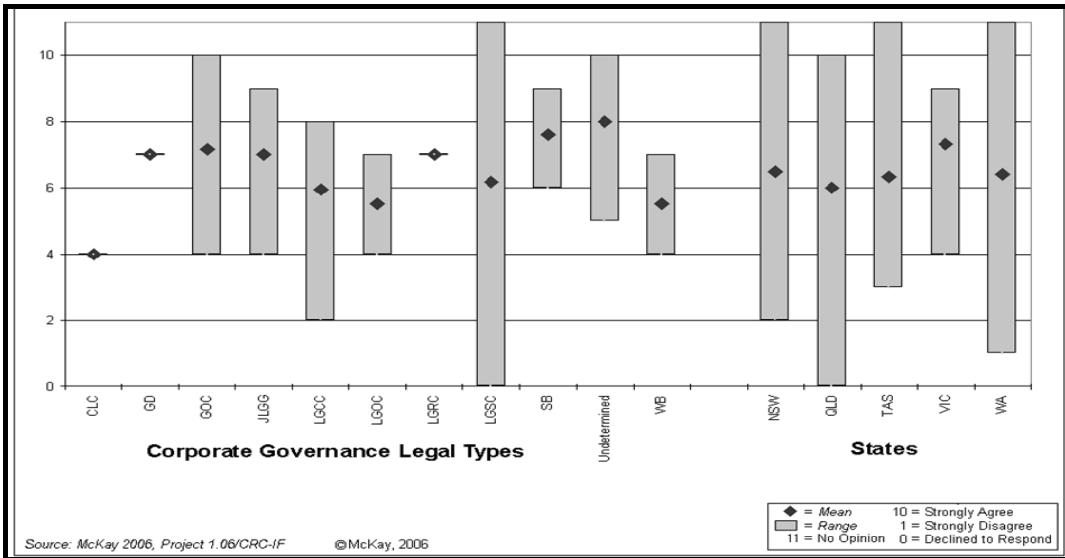


Figure 26: Question # 9 - All stakeholders are consulted in water planning.

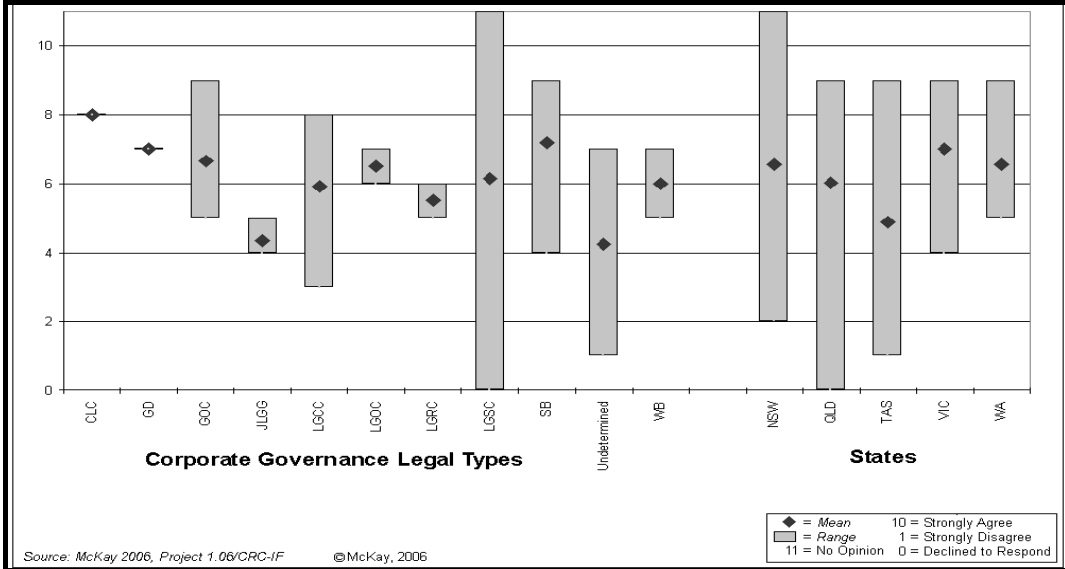


Figure 27: Question # 13 - The community in this area works well together in water planning?

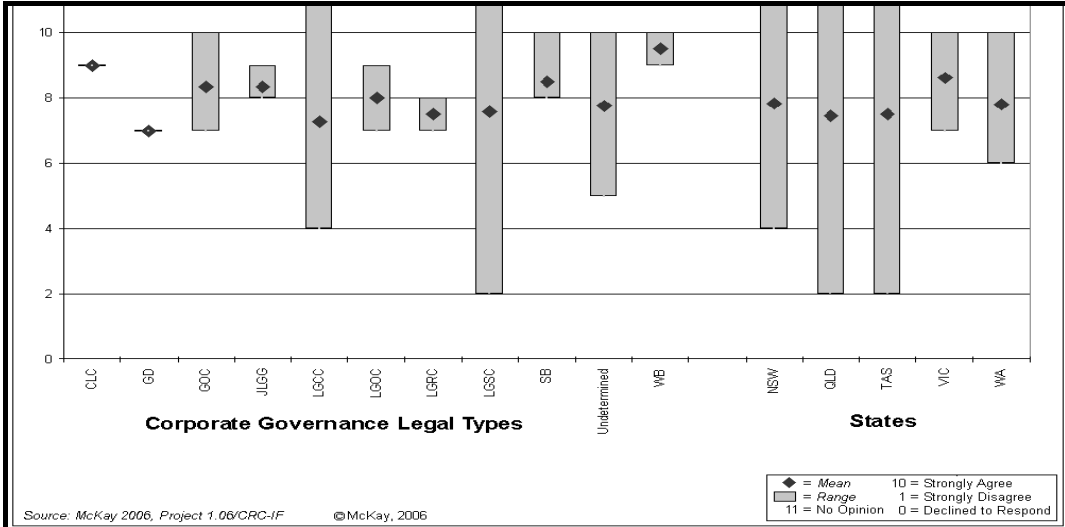


Figure 28: Question # 88 - This organisation needs to have fewer external stakeholders calling on us to provide information.

5 Insubstantial Tenuous and Vague Laws- The Implementation of ESD by Water Supply Business CEOs

Laws requiring water supply businesses to achieve environmentally sustainable development have existed in all States since 1994. The Federal government provided a definition based on international sources and each State has adopted this or a variant of it in its laws governing water supply businesses. There have been calls to expand this requirement as a duty of directors of all corporations in the Corporations law. This study interviewed 183 CEOs of water supply businesses and asked them about their ability to achieve ESD, to rank the effort they have put in to achieve it and to identify the barriers to achievement. The analysis of the results of the 80 questions also was tested against the legal form of the WSB to determine if the form has an impact and what other responses were related to the form. The results indicate a pessimistic outlook in relation to ability to achieve ESD related to lack of community cohesion and lack of coordination between Government agencies. In most cases, the CEO perceptions were independent of the legal structure but in relation to achieving sustainable water resource management the CEO perceptions were dependent on the legal structure of the water supply business.

5.1 ESD and Sustainable Development Laws

Ecologically Sustainable Development (ESD) represents one of the challenges facing Australia's governments, industry, business and community. The Federal and the State Governments recognise that there is no identifiable point where we can say we have achieved ESD. However, some changes in the way we think, act and make decisions, can ensure Australia's economic development is ecologically sustainable and sustainable development laws aim to achieve this objective.

The sustainable development concept, and hence the laws, came from many sources. In Australia, the key document was the development of the National Strategy for Ecologically Sustainable Development (ESD) in 1992. Since that time, the Commonwealth and the States have passed many laws with sustainable development concepts embedded in them. The Federal government provided a definition based on international sources and each State has adopted this or a variant of it in its laws governing water supply businesses. This paper discusses the sustainable development laws as they apply to the natural resources sector and the water sector in particular. The paper provides data with respect to the CEOs of Water Supply Businesses in Australia in 2005 and the implementation by them of ESD.

5.1.1 Sustainable Development Laws

Greater than the tread of mighty armies is an idea whose time has come - Victor Hugo

Sustainable development laws are laws having broad aspirational objects to achieve economic, environmental and social sustainability and came in to being in Australia in 1994. While there is no universally accepted definition of Ecologically Sustainable Development the most used definition is the one in the Brundtland report which states that sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.¹² This implies that sustainable development is any development that meets environmental, economic and social objectives simultaneously. Sustainable development law aims to achieve this objective and is an emerging and evolving era of law.¹³ The concept is broader than environmental law as it is

¹² Brundtland G, (1987) World Commission on Environment and Development, *Our Common Future*, 1987 at p. 44 (Oxford University Press, 1987)

¹³ Lee, Meg, "Sustainable development law and mining sector", (2007) ABLR 35 121 at 121-139

not about mitigating damage caused by industry but it is about maximizing harmony between the ecological systems and human use.¹⁴

The sustainable development concept and hence the laws came from many sources and as Kingdon said about health and transportation policy in the US:

“Ideas can come from anywhere and there is an infinite regress in trying to trace the origin of the ideas... this is not like a river there is no point of origin...”¹⁵

Hence to try and trace the origin of the concepts and laws is pointless¹⁶ but key events in the development of sustainability laws in Australia were: International sources such as Brundtland 1987, Rio earth summit 1992¹⁷, and World Summit on Sustainable Development (WSSD) in 2002¹⁸. At the National level the events were: Tasmanian Dams case¹⁹, and recently the Telstra case²⁰, The National Strategy for Ecologically Sustainable Development developed in 1992²¹ including the Precautionary principle, Water quality crises in the Darling river, blue green algae, and the generalised drought from 2000.

Internationally, the principle has been refined in 2002 to add social development to economic development and environmental protection. The Plan of Implementation of the World Summit on Sustainable Development held in Johannesburg, 2002, notes that efforts need to be taken to:

“promote the integration of the three components of sustainable development – economic development, social development and environmental protection – as interdependent and mutually reinforcing pillars. Poverty eradication, changing unsustainable patterns of production and consumption and protecting and managing the natural resource base of economic and social development are overarching objectives of, and essential requirements for, sustainable development” (at paragraph 2).

This is indeed a paradigm shift²² to make production *environmentally defensive*²³. Production of goods and services by all corporations will be guided by acting to promote sustainable resource use, with recycling of goods and being carbon neutral. The key document in Australia was the 1992 National Strategy for Ecologically Sustainable Development (ESD) and the broad seven ESD principles appear in Box 1. In Australia, the Commonwealth Government in 1990 suggested the following definition for ESD:

“using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased”

¹⁴ Boyd D 2005 Sustainability Law respecting the laws of nature Magill international review. P57 ff

¹⁵ Kingdon J (2003) Agenda, alternatives and Public policies 2nd edition. Kingdon does a case study of Health and transportation policy in the US and how the processes of government law achieved the reform process at pages 71,73

¹⁶ Kingdon J (2003) Agenda, alternatives and Public policies 2nd edition. Kingdon does a case study of Health and transportation policy in the US and how the processes of government law achieved the reform process.

¹⁷ Agenda 21 United Nations Program of action for sustainable development Rio declaration on environment and development 13th June 1992 31 ILM 874

¹⁸ WSSD PLAN OF IMPLEMENTATION AND Johannesburg Declaration on Sustainable Development. www.johannesburgsummit.org/html/documents.summit_docs/1009wssd_pol_declaration

¹⁹ See [http://www.austlii.edu.au/cgi-bin/sinodisp/au/cases/cth/high_ct/158clr1.html?query="gordon%20below%20franklin"](http://www.austlii.edu.au/cgi-bin/sinodisp/au/cases/cth/high_ct/158clr1.html?query=)

²⁰ Telstra Corporation limited v Homsby Shire Council [2006] NSWLEC 133

²¹ National Strategy for Ecologically Sustainable Development (1992). Prepared by the Ecologically Sustainable Development Steering Committee Endorsed by the Council of Australian Governments

²² B Boer, “The Globalisation of Environmental Law” (1995) 20 *Melbourne University Law Review* 101 at 111.

²³ Dryzek JS 1997 *The Political of the earth Environmental discourses* New York oxford Univeristy Press . p145

Box 1: Objectives and guiding principles of the National Strategy for ESD

Core objectives

- to enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations
- to provide for equity within and between generations
- to protect biological diversity and maintain essential ecological processes and life-support systems

The Guiding Principles

- decision making processes should effectively integrate both long and short-term economic, environmental, social and equity considerations
- where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation
- the global dimension of environmental impacts of actions and policies should be recognised and considered
- the need to develop a strong, growing and diversified economy which can enhance the capacity for environmental protection should be recognised
- the need to maintain and enhance international competitiveness in an environmentally sound manner should be recognised
- cost effective and flexible policy instruments should be adopted, such as improved valuation, pricing and incentive mechanisms
- decisions and actions should provide for broad community involvement on issues which affect them

Since that time, the Commonwealth and the States have passed many laws with sustainability law concepts embedded, some in the exact terms of Box 1, others with variants of language. The commonwealth has also encouraged the States to pass laws to promote regional NRM management committees. These laws often interact with the other laws creating the Water Supply Businesses (WSB) in each place and the boundaries a WSB can cross - more than one WSB can be in one NRM area. Indeed we have a mosaic of laws and Table 1 provides some details of some of these laws. These laws cover the legal forms of WSBs in Australia.

There has been a call to impose a duty on all directors of all corporations under the Corporation Law 2001, specifically 180A, to ensure that the company interacts with the environment in a sustainable manner.²⁴ This is a moral obligation part of the social licence to operate.²⁵ This follows on from Baxt's suggestion²⁶ in 2002 that the judicial expansion of Director's duties to encompass environmental consideration has happened in that Director's duties have been cast as acting in the interests of the community as a whole. This he considered an uncharted road.

Judicial notice has been taken of the principle in the Telstra case.²⁷ The concepts around sustainability law have been given recognition and are now being championed in at least one Australian State court. In Anvil Hill Coal Mine case in NSW Judge Preston CJ said:

"if individual members of the judiciary each work towards the common goal of achieving an environmentally sustainable future, the law on sustainable development will gain strength and through collective effort the goal will be reached.... it is clear the time for sustainable development has come, and it is essential that individual judges and national judiciaries seize the opportunity..."

The *Rowe v Lindner and Ors [2007] SASC 189* case concerned sustainability of a proposal to establish a feedlot for 1,500 cattle and the impact of extracting 25ML per annum of

²⁴ MConvill and M. Joy 2003 The interaction of Directors' duties and sustainable Development in Australia: setting off on the uncharted Road. MULR 4

²⁵ ²⁵ Fisher DE 2001 Sustainability- the Principle its implementation and its enforcement 18 Environmental and Planning Law Journal 361, 363-5 quoted in MConvill and M. Joy at

²⁶ Baxt R 2002 Just to whom do Directors Owe their fiduciary Duties? Will this conundrum Ever be Satisfactorily Resolved 30 Australian Business Law Review 445

²⁷ Telstra Corporation limited v Hornsby Shire Council [2006] NSWLEC 133

groundwater on the local surface and groundwater systems. The resource was not prescribed under the NRM Act of the previous Water Resources Act hence no licence was needed. The case used the Development Act and a plan under this which has an objective to protect all water resources from pollution or excessive usage which would threaten the long term reliability of existing resources. The case also gave judicial guidance on the Natural Resources Management Act 2004 and the Precautionary principle. The outcome in the end was to say that the proposed development complied with many of the provisions of the Development Act but failed due to unsustainable use of water resources and was refused. The Development Act filled in where the NRM Act did not apply as not prescribed. The outcome was that the case required that planning approval authorities should seek advice from appropriate State agencies or experts to assist in the determination of impacted water courses even though this is not a specific requirement of the NRM Act. When planning bodies are faced with a lack of data then the Precautionary principle should be applied (See SECTION 124 3 b).

The evidence was insufficient to support a conclusion of unsustainable water use. It was sufficient to support a conclusion of significant risk of serious harm due to water overuse coupled with current scientific uncertainty about the extent of environmental harm attracting the Precautionary principle (see *Telstra Corporation limited v Hornsby Shire Council* [2006] NSWLEC 133). This case reviewed the concept of ecologically sustainable development.

Ecologically sustainable development involves the internalisation of environmental costs into decision-making for economic and other development plans, programs and projects likely to affect the environment. This is the principle of the internalisation of environmental costs. The principle requires accounting for both the short-term and the long-term external environmental costs. This can be undertaken in a number of ways including:

- a. environmental factors being included in the valuation of assets and services;
- b. adopting the polluter pays (or user pays) principle, that is to say, those who generate pollution and waste should bear the costs of containment, avoidance or abatement;
- c. the users of goods and services paying prices based on the full life cycle of the costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste; and
- d. environmental goals, having been established, being pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems: see s 6(2) (d) of the *Protection of the Environment Administration Act* 1991 and section 3.5.4 of the *Intergovernmental Agreement on the Environment* 1992.

In summary, the aspiration of ESD is embedded in many laws and has the defining characteristics set out in Box 1. These aspirations are becoming less insubstantial, tenuous and vague with application in decisions. These aspirational laws are still experimental and there is uncertainty about the best laws, policies and programs to achieve ESD and hence there is experimentation in the US with approaches i.e. taxes, fines or carrots such as incentives²⁸. This is called *adaptive* and learning by doing requires monitoring of those charged with implementing ESD to make public the types of barriers to achievement of ESD. The monitoring and listening to the difficulties at the grass roots levels is an important aspect of law and policy revisions in all spheres of law reform. This paper provides data with respect to the CEOs of Water Supply Businesses in Australia in 2005 and the implementation by them of ESD.

²⁸ Fiore D (1999) Rethinking Environmental regulation Perspectives from Law and Governance Harvard Environmental Law Review 23 at 441

5.1.2 Australian Water Supply Businesses as Bound to Achieve ESD

In relation to WBS the broader ecologically sustainable development paradigm as set out in Box 1 is incorporated in the Acts which govern their operations. These are set out in Table 8. So, the WSBs have imposed on them the ESD obligations as above. This research then reports on the responses of the CEOs of the WSBs to this concept.

Table 8: The Acts requiring WSB to achieve ESD

Jurisdiction	Formulation of The ESD Duty as per 1992	Comments
Commonwealth Law	Water Act 2007 (No. 137, 2007) - Sect 21 Trade Practices Regulations (Amendment) 1997 No. 86 Explanatory Statement Statutory Rules 1997 No The list of public interest requirements in clause 1(3) of the Agreement have been included in the Principal Regulations pursuant to subsection 172(1) of the Principal Act for the purposes of paragraph 44ZZAA(3)(e) Environment Protection And Biodiversity Conservation Act 1999 - Sect 3a Fisheries Management Act 1991 - Sect 3a	Applies to Water Supply Business (WSBs)
New South Wales	Water Bill 2000 State Owned Corporations Act 1989 - Sect 8 NSW Principal objectives of company SOCs 8 Principal objectives of company SOCs Sydney Water Act 1994 - Sect 21 Local Government Act 1993 - Sect 89 Catchment management act NSW 2003 The EPA Act is one such legislative enactment. It expressly states that one of the objects of the EPA Act is to encourage ecologically sustainable development: s 5(a)(vii). The Act defines ecologically sustainable development as having the same meaning as it has in s 6(2) of the Protection of the Environment Administration Act 1991. EPA act	Applies to Water Supply Business (WSBs) The principles of ecologically sustainable development are to be applied when decisions are being made under any legislative enactment or instrument which adopts the principles: Murrumbidgee Ground-Water Preservation Association v Minister for Natural Resources [2004] NSWLEC 122 (7 April 2004) at [178]; and Bentley v BGP Properties Pty Ltd [2006] NSWLEC 34 (6 February 2006) at [57]; See Telstra.
Queensland	Water Act 2000 - Sect 10 Local Government Act 1993 - Sect 798	Applies to Water Supply Business (WSBs)
Victoria	Commissioner for Environmental Sustainability Act 2003 - SECT 4	Water Act 1989 - SECT 1 Water Industry Act 1994 - Sect 4c Other formulation of words about sustainability. Foundation act for all 24WSB'S
Northern Territory	Territory-Owned Corporations Act 1990 - Sect 7	
South Australia	Natural Resources Management Act 2004 SA River Murray Act 2003 (No 35 of 2003) - Sect 6	Also the Development Act 1993 which regulated Local Government land use planning decision making through the creation of plans under s3. Section 3 expresses the aim of sustainability

The institutional reforms within the Australian water sector after the COAG reforms of 1994 has resulted in an array of Water Supply Businesses ranging from local government to companies and State owned corporations. In general terms from reading the open responses to the survey it can be stated that the WSBs in 2005:

1. Were path dependent on past structures
2. Were not tending to be isomorphic i.e. maintaining differences
3. Had different cultures for action and reporting and did not cooperate even within the one water planning region or NRM region
4. Mostly had multiple missions as they were local governments with water only one of their reasons for being
5. Had different ways of relating to government, different dependencies on government for ratification of decisions appointment of board members, and
6. Were bound by different mosaic of laws.

As Lindblom²⁹ wrote, laws and policies are experiments and much learning needs to go on, and evaluation of the laws and the policies and the institutions, to achieve the condition of sustainability. This empirical data presents evidence from CEOs about their interpretation of ESD. Sustainability in Australia has three aspects social/cultural, economic and environmental and hence sustainability law will have three principle design criteria to judge its success, effectiveness, efficiency and equity.

As explained earlier, the interview schedule included questions that reflected various issues related to water resource management and ESD. The CEOs were requested to agree or disagree with these items. These questions were assessed on a 11 point scale with 5 neutral and 11 don't know.

This section of the report focuses mainly on ESD related issues and so the results highlight the perceptions of the CEOs regarding the degree of effort and in relation to the issues in Box 1. Table 9 provides the descriptive statistics of the scale items used to arrive at the results.

A one-sample t-test was used to determine whether the population mean is equal to the test mean, a hypothesised value. The null hypothesis in this case is $H_0: \mu = 0$ and the alternate hypothesis $H_1: \mu \neq 0$. The t-statistics were highly significant ($p < 0.01$) leading to the rejection of the null hypothesis ($\mu = 0$). The alternate hypothesis ($\mu \neq 0$) is accepted which implies that the mean of the deviation is significantly different from 0. The means move around neutral 5 in most of the cases and ranged between 7 on the agree side to 3 on the disagree side but was short of strongly agree or disagree.

²⁹ Lindblom, C. E. (1959), "The science of muddling through", *Public Administration Review*, 19: 79-88.

Table 9: Descriptives of the scale items used in the survey

	Scale items	Mean	Std. Deviation	t
1.	I am well informed by the State Government about their water policy	6.14 (0.17)	2.25	36.91***
2.	This organisation is well equipped to make long term strategies	6.28 (0.15)	2.05	41.46 ***
3.	The State Government makes long term strategies on ESD	5.54 (0.14)	1.95	38.51***
4.	We have the resources to understand the demands of our irrigation users	6.66 (0.23)	3.17	28.38***
5.	We have the resources to understand the demands of our customers	5.88 (0.16)	2.14	37.13***
6.	I have had enough information to really develop an understanding of the customers	6.51 (0.12)	1.58	55.64***
7.	I have had enough information to really develop an understanding of ESD	5.54 (0.15)	1.99	37.54***
8.	There are well established intergovernmental processes that ensure co-ordination and the State government.	4.56 (0.16)	2.12	29.06***
9.	All natural resource management units like this organisation advance a common mission to promote ESD.	5.48 (0.14)	1.91	38.71***
10.	This organisation is TOO complex.	3.65 (0.15)	1.96	25.22***
11.	This organisation needs to have fewer external stakeholders calling on us to provide information	6.50 (0.18)	2.42	36.39***
12.	The transaction costs in meeting external requirements of other Government are huge.	7.10 (0.15)	2.04	47.12***
13.	The transaction costs in meeting community requirements are small.	4.57 (0.16)	2.21	27.90***
14.	We are always consulted and given time to respond to policy changes.	4.08 (0.16)	2.18	25.31***
15.	This organisation is nested in a mutually supportive State government policy environment.	4.78 (0.15)	1.97	32.76***
16.	This organisation is designed to be adaptive to change.	6.36 (0.13)	1.74	49.40***
17.	This organisation promotes collective action of its customers.	6.15 (0.15)	2.03	40.90***
18.	I have been able to learn to adapt to state government ways of changing policy.	6.21 (0.14)	1.96	42.88***
19.	State government policy making processes follow a predictable pattern.	5.32 (0.16)	2.18	33.05***
20.	I am able to achieve sustainable water management	6.41 (0.14)	1.91	45.32***
21.	I understand the State Governments water planning process	6.50 (0.15)	2.04	43.05***
22.	We have trouble sorting out conflicts between customers	3.88 (0.15)	2.07	25.36***
23.	There is a huge amount of trust between this organisation and the State government.	4.74 (0.17)	2.25	28.49***
24.	The State government policies disregard complexity of the administrative system.	6.42 (0.15)	1.97	44.08***

Note: Figures in parentheses indicate standard error; *** indicate significance at 1% level

5.1.3 CEOs and Achieving ESD

The study wanted to determine the difficulty faced by the CEOs and the efforts they put towards achieving the ESD principles. For this, the seven guiding principles were emailed to the CEOs whilst they were on the telephone and they were asked to rate each guiding principle on a 10 point likert scales. Difficulty in achieving ESD principles was measured on a scale where 0 meant no at all difficult and 10 implied extremely difficult. Similarly, for effort put in towards achieving the principles 0 meant least effort and 10 meant most effort (see Figure 29).

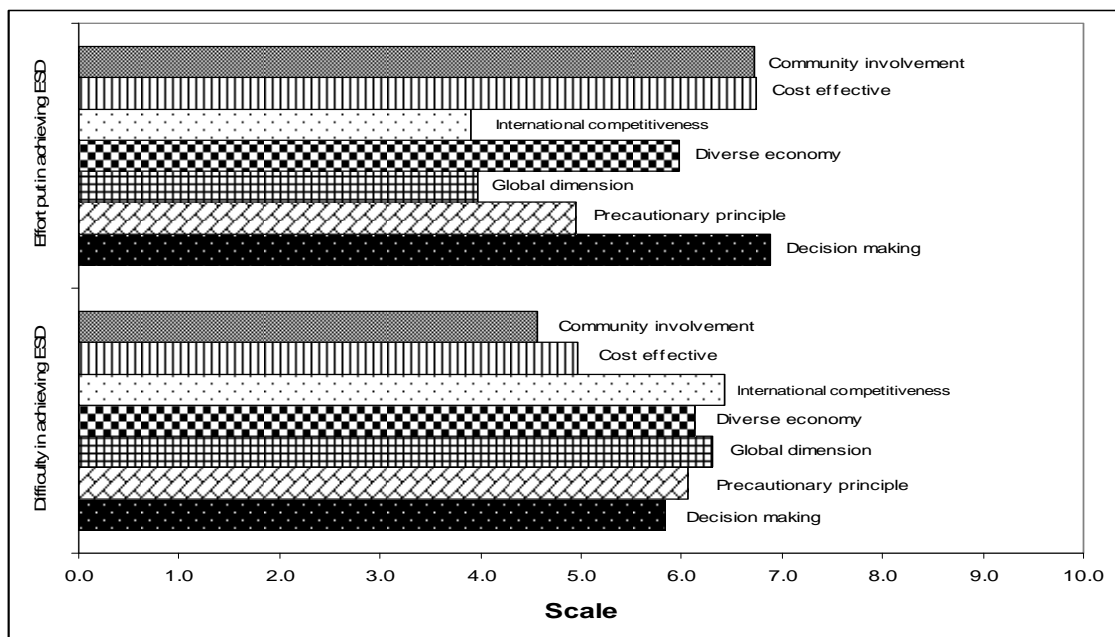


Figure 29: Degree of difficulty and effort put in by the CEOs in achieving ESD

Based on the mean values, the CEOs felt that principle 5: *need to maintain and enhance international competitiveness in an environmentally sound manner should be recognised* was the most difficult to achieve followed by the 3rd principle: *the global dimension of environmental impacts of actions and policies should be recognised and considered*. The CEOs felt the 7th principle regarding community involvement was the least difficult to achieve in the region.

Further, in response to the effort put into achieving these principles the results reveal that CEOs put most effort into achieving the 1st principle: *Decision making processes should effectively integrate both long and short-term economic, environmental, social and equity considerations*, while the least effort was put towards achieving the 5th and 3rd principles.

The other key question was their individual assessment of their ability to achieve ESD. Only one third considered they could achieve ESD. The results showed that around 66 percent agreed and 3 percent strongly agreed with the statement 'I am able to achieve sustainable water management'. Further, the chi-square statistic ($\chi^2 = 30.050$) although not highly significant ($p \leq 0.10$) indicates that whether the CEOs agree or disagree with the statement depends on the legal structure of the WSB they represent. Some of the common barriers in achieving the ESD guiding principles as described by the CEOs were:

- Artificial barriers put up from the state government and federal government
- Lack of finance, resources
- Lack of information, training, knowledge, skill personnel
- State government legislation policy
- Hard to bring all information together
- Apathy of people
- Current state water management act and the current community outlook on water
- Getting the people to think long term
- Short term political and board appointment cycles
- Environmental considerations have been given first consideration with economic and social pushed to the background
- Dealing with environmental regulators
- Different people involved in water issues all have own agendas
- Governments think local rather than global
- Competing priorities and competitive nations
- Conflict of economy vs environment
- Conflicts between environment, social and economic triple bottom line

5.1.4 Relationship between CEO Perceptions on Water Issues and Legal Structure

This study also looked in to the relation between the legal structure and the perception of the CEOs regarding water governance issues and ESD. Any test of statistical significance tells us the degree of confidence we can have in accepting or rejecting a hypothesis. Chi-square (χ^2) test was used in this case and the following hypotheses were formulated:

H₀: CEO perception about the water governance issues and ESD is independent of the WSBs legal structure.

H₁: CEO perception about the water governance issues and ESD depends on the legal structure of WSB.

Results of the chi-square statistics revealed that in most of the cases the chi-square values were not significant implying that the opinion/perception of the CEOs about the water industry and the governance issues facing water supply businesses is not associated with the legal structure of the businesses. This meant that all the water supply business had a similar thinking about most of the water governance issues.

However, the test statistics were significant in some cases (see Table 10) implying that the legal structures of the water supply businesses have an association with the perceptions of the CEOs regarding certain water governance issues. Clearly the chi-square statistics was highly significant in case of CEOs perception about the State government policies disregarding complexity of the administrative system ($p \leq 0.01$). This means that there is significant evidence that whether or not the CEOs agree or disagree with this statement depends on the legal structure of the WSB they represent. Similarly, in case of CEOs perception about high transaction costs in meeting external requirements of other government the chi-square statistic was moderately significant ($p \leq 0.05$) implying that the perceptions of the CEOs about this statement varied with the legal structure of the WSB. The chi-square statistics in case of the remaining statements regarding CEOs being able to achieve sustainable water management, understanding the state government's water planning process and facing trouble with conflict resolution were significant but were weak ($p \leq 0.1$). This implies that there is suggestive evidence that the CEOs perception about these statements depends on the legal structure of WSB.

Table 10: CEO perceptions on sustainable water management

Items related to issues facing water supply businesses	df	χ^2 statistic
I am able to achieve sustainable water management	25	35.05*
I understand the State Governments water planning process	25	35.05*
We have trouble sorting out conflicts between customers	20	29.83*
The transaction costs in meeting external requirements of other Government are huge.	25	42.40**
The State government policies disregard complexity of the administrative system.	20	39.15***

Note: *, **, *** indicate significance at 10%, 5% and 1% levels respectively

The study also looked into CEO satisfaction and confidence with the organisation of the Board. The results revealed that generally, there is an understanding by the Board members of their role. However, when it comes to ESD there are vast differences between the organisation types in understanding of ESD. Chi-square analysis was conducted to determine the relationship (see Table 11).

Table 11: CEO satisfaction and confidence with the organisation of the Board

Statements	df	Chi-square
The non executive members of the board understand their role	20	30.36*
The non executive members of the board understand ESD	25	24.02
The non executive members see themselves as guardians over the executive behaviour	25	25.22
All board members work together cohesively	20	19.81
The board understands that it governs not manages	20	28.37
Some members of the board compete with each other	25	45.20***
Some members of the board are friendly with each other	25	31.59
The water customers see non executive members as a source of goodness	15	10.96
Some board members show little interest in the organistaion	25	32.25
The relationship of the Chair of the board and the CEO is competitive	25	44.18***
The board controls and plans its own agenda	25	26.69

Note: *, *** indicate significance at 10% and 1% levels respectively

The results were highly significant ($p \leq 0.01$) in two cases implying that whether the CEOs agree or disagree with the statements: *The relationship of the Chair of the board and the CEO is competitive*, and *some members of the board compete with each other* depends on the legal structure of the WSB they represent. The chi-square statistics in other cases were not significant although there was a suggestive indication ($p \leq 0.1$) that CEO perceptions about non executive members of the board understanding their role varied with the legal structure.

6 Perceptions of the Water Supply Business CEOs about Coherence of State Government Water Policies

Ecologically Sustainable Development (ESD) represents one of the greatest challenges facing Australia's governments, industry, business and community. The Federal and the State Governments recognize that there is no identifiable point where we can say we have achieved ESD. However, some changes in the way we think, act and make decisions, can ensure Australia's economic development is ecologically sustainable and sustainable development laws aim to achieve this objective. The development of National strategy for Ecologically Sustainable Development (ESD) in 1992 was an initiation in this direction. The Commonwealth has defined ESD as:

“using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased”.

In relation to the Australian water industry, the laws requiring Water Supply Businesses (WSB) to achieve environmentally sustainable development have existed in all States since 1994. Each State now has adopted the definition provided by the Commonwealth or a variant of it in its laws that govern the WSBs. Further, the institutional reforms within the Australian water sector after the 1994 COAG reforms has resulted in an array of water supply businesses ranging from local government to companies and State owned corporations. As a result, there are 333 water supply businesses in Australia that fall into 14 different types of legal forms³⁰ discussed earlier in this report. So, how do these different WSBs interpret ESD and what are the barriers encountered and efforts put in towards achieving the ESD objectives?

This section of the report presents evidence from CEOs about their interpretation of ESD and related issues. The aim is to discern the perceptions and attitudes of the CEOs towards ESD implementation and identify the factors influencing ESD implementation by the WSBs. Factor analysis in addition to simple tabular analysis was carried out to arrive at the results.

6.1 Factor analysis of the CEO Perceptions and Attitudes towards ESD

The present study uses a set of Likert-type scales in the survey questionnaire and the traditional statistical methods for analysing survey responses, like frequency analysis, t-test, and measures of central tendency, do not account for correlation occurring at or between scale level responses, thus omitting the more important aspect of being able to detect and evaluate unobservable patterns (Santos & Clegg, 1999). One approach to analysing subjective perceptions and gaining insights from survey responses is factor analysis (Kim & Muller, 1978), which requires no pre-existing theory of functional relationships, can handle masses of diverse data relating to a large number of social and economic characteristics and communities, and is not sensitive to the scale chosen for the quantitative specification of the variables (Adelman & Dalton, 1971).

Factor analysis and Principal Component Analysis (PCA) share a common goal: to investigate interrelationships among a large number of variables and to explain these variables in terms of their common underlying factors (Hair et. al, 1992). Nevertheless, the choice between these two is not clear, because there is disagreement among statistical theorists about when each should be used (Costello & Osborne, 2005; Gilley & Uhlig, 1993). Although PCA is the more popular method and has been widely employed by researchers (Velicer & Jackson 1990, p. 1) this study employs true Factor Analysis/ Principal Axis

³⁰ McKay, J. M. (2006). Issues for CEOs of water utilities with the implementation of Australian water laws. *Journal of Contemporary Water Research and Education*, Issue 135, December 2006, 120-136.

Factoring (PAF) because it provides more accurate estimates of the initial communalities. According to Widaman (1993, p.271), “the inaccuracy in representing parameters of a common factor analysis should always be rather less than would occur in a component solution, because commonly used communality estimates are virtually always more accurate estimates of communality than is unity, the value used in component analysis”.

In this case, the SPSS software is used to perform the analysis, while the factors are extracted using principal axis factoring and the rotation method is promax rotation with Kaiser Normalisation.

6.1.1 Criteria for model fit and inclusion of variables

During factor analysis, the models' fit is guided by two criteria: (1) the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, and (2) Bartlett's test of sphericity. The KMO explains the proportion of variance in the variables that might be caused by underlying factors. In simple terms, it suggests the suitability for factor analysis. The rule of thumb is that if KMO measure of sampling adequacy is greater than 0.50, then it is a good fit. The Bartlett's test of sphericity is a chi-square test and a significant chi-square value implies a good model fit. This implies that the items have uneven variability and are therefore factorable. An insignificant value indicates lack of good fit.

Generally, the extraction of factors is guided by the magnitude of the Eigen value and any factor with an Eigen value of greater than unity is considered to be included. Further, in SPSS it is a default setting for factor extraction. However, we can also determine the number of factors to be extracted by using the scree plot (graph of Eigen values) as done in this study. Usually, the number of factors above bend or elbow is enough. In the present case three factors were above the elbow indicating they were important and so, instead of the default option in SPSS, factors to be extracted were specified as three. Inclusion of a variable in definition of a factor varies according to the context of the research. For instance, common social science practice uses a minimum cut-off of 0.3 or 0.35, while another rule-of-thumb terms loadings as “weak” if less than 0.4, “strong” if more than 0.6, and otherwise as “moderate” (Mulaik, 1972 cited in Anton, Balkou & Vobecky, 1984). In this case, all items with a loading of 0.4 or more were considered appropriate for including a variable in the definition of a factor.

6.1.2 Results of Factor Analysis (PAF)

The first round of factor analysis was performed including all the 52 items (see Table 12) it was observed that some of the items had lower communalities which were considered to be outliers. These outliers were removed and PAF was performed again including 23 items (see Table 13). Communalities indicate the variance in an item accounted for by other factors. Unlike in the case of Principal Component Analysis where the initial and after extraction Eigen values are unchanged, in case of factor analysis (PAF) they do change. Variance explained drops for FA techniques because the communalities are re-estimated based on better estimate of relationships between items and factors. Nevertheless, the communalities indicated that the extracted components or factors represent the variables well.

Table 12: List of scale items used in the first round of factor analysis

-
1. I am happy with the charter of the organisation
 2. I am able to achieve sustainable water management
 3. I am clear on what it means to this organisation to achieve sustainable water management.
 4. All stakeholders are consulted in water planning.
 5. The water planning process instigated by the State government in the 90's has worked well here.
 6. I understand the State Governments water planning process.
 7. I am well informed by the State Government about their water policy?
 8. The community in this area works well together in water planning?
-

-
9. All sectors of the community of this water business understand the viewpoint of others in the area.
 10. The non executive members of the board understand their role.
 11. The non executive members of the board understand ESD.
 12. The non executive Board members see themselves as guardians over the executive behaviour.
 13. All board members work together cohesively.
 14. The board understands that it governs not manages?
 15. Some members of the Board compete with each other.
 16. Some members of the board are too friendly with each other.
 17. The water customers see non executive directors as a source of probity (goodness).
 18. Some board members show little interest in the organisation.
 19. The relationship of the Chair of the Board and the CEO is competitive.
 20. The board controls and plans its own agenda.
 21. The ESD process is transparent.
 22. I am happy with the ESD process.
 23. Of all the regulators, the environmental regulator is the hardest to please.
 24. Of all the regulators, the price control regulator is most difficult to please.
 25. There are well established intergovernmental processes that ensure co-ordination and the State government.
 26. All natural resource management units like this organisation advance a common mission to promote ESD.
 27. Over the last 2 years change in this organisation has been incremental.
 28. Over the last 5 years change in this organisation has been massive.
 29. Over the last 10 years change in this organisation has been incremental.
 30. This organisation is TOO complex.
 31. This organisation needs to have fewer external stakeholders calling on us to provide information.
 32. The transaction costs in meeting external requirements of other Government are huge.
 33. The transaction costs in meeting community requirements are small.
 34. There is a huge amount of trust between this organisation and the State government.
 35. We are always consulted and given time to respond to policy changes.
 36. This organisation is nested in a mutually supportive State government policy environment.
 37. This organisation is designed to be adaptive to change.
 38. This organisation promotes collective action of its customers.
 39. I have been able to learn to adapt to state government ways of changing policy.
 40. State government policy making processes follow a predictable pattern.
 41. The State government policies disregard complexity of the administrative system.
 42. The State government has stable policies toward global environmental change.
 43. It is important to act in relation to global environmental change.
 44. This organisation is well equipped to make long term strategies.
 45. The State Government makes long term strategy GENERALLY.
 46. The State government makes long term strategies on ESD.
 47. We have the resources to understand the demands of our irrigation water users.
 48. We have the resources to understand the demands of our customers.
-

-
49. We have trouble sorting out conflicts between customers.
50. This organisation is in the front line in achieving ESD.
51. I have had enough INFORMATION to really develop an understanding of the customers.
52. I have had enough information to really develop and understanding of ESD.
-

Table 13: Communalities of the items retained in factor analysis

Items	Initial	Extraction
1. I am clear on what it means to this organisation to achieve sustainable water management.	.296	.212
2. I understand the State Governments water planning process.	.270	.196
3. I am well informed by the State Government about their water policy?	.292	.240
4. The non executive members of the board understand their role.	.532	.546
5. The non executive members of the board understand ESD.	.431	.429
6. The non executive Board members see themselves as guardians over the executive behaviour.	.416	.278
7. All board members work together cohesively.	.426	.357
8. The board understands that it governs not manages?	.423	.404
9. Some members of the Board compete with each other.	.456	.441
10. Some members of the board are too friendly with each other.	.336	.323
11. The water customers see non executive directors as a source of probity	.332	.296
12. Some board members show little interest in the organisation.	.477	.535
13. The relationship of the Chair of the Board and the CEO is competitive.	.472	.575
14. The board controls and plans its own agenda.	.318	.245
15. The ESD process is transparent.	.317	.250
16. I am happy with the ESD process.	.297	.236
17. There are well established intergovernmental processes that ensure co-ordination and the State government.	.282	.263
18. There is a huge amount of trust between this organisation and the State government.	.372	.348
19. We are always consulted and given time to respond to policy changes.	.278	.241
20. This organisation is nested in a mutually supportive State government policy environment.	.447	.476
21. The State government has stable policies toward global environmental change.	.339	.311
22. The State Government makes long term strategy GENERALLY.	.381	.264
23. The State government makes long term strategies on ESD.	.394	.314

In addition, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity is also used to confirm the assumption of factorability. Table 5 presents the details of the KMO and Bartlett's test. The KMO value for the variables considered in this case is 0.784. This implies that 78.4% of the variance is explained by the underlying factors. Bartlett's test of sphericity indicates that the chi-square value is significant; implying that the variables are related and suitable for factor structure detection and so factor analysis is useful for the data under consideration.

Table 14: KMO and Bartlett's test for model's fit

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.784
Bartlett's Test of Sphericity	Approx. Chi-Square	1154.955
	df	253
	Sig.	.000

The PAF was run again including the 23 items and as explained earlier, the number of factors to be extracted was specified as three. Based on the set cut-off for factor loadings (0.4), items with less than 0.4 loadings were not considered. This reduced the number of items to 19 (see Table 15) which were considered appropriate for defining a factor. Each of these three factors represents the variables of interest.

Table 15: Factor loadings for CEOs perceptions and attitudes regarding water issues

List of items	Factors		
	1	2	3
1. I understand the State Governments water planning process.	.427		
2. I am well informed by the State Government about their water policy?	.470		
3. There are well established intergovernmental processes that ensure co-ordination and the State government.	.525		
4. There is a huge amount of trust between this organisation and the State government.	.578		
5. We are always consulted and given time to respond to policy changes.	.509		
6. This organisation is nested in a mutually supportive State government policy environment.	.716		
7. The State government has stable policies toward global environmental change.	.509		
8. The State Government makes long term strategy GENERALLY.	.530		
9. The State government makes long term strategies on ESD.	.576		
10.The non executive members of the board understand their role.		.750	
11.The non executive members of the board understand ESD.		.636	
12.The non executive Board members see themselves as guardians over the executive behaviour.		.404	
13.All board members work together cohesively.		.544	
14.The board understands that it governs not manages?		.670	
15.The water customers see non executive directors as a source of probity		.480	
16.Some members of the Board compete with each other.			.689
17.Some members of the board are too friendly with each other.			.490
18.Some board members show little interest in the organisation.			.713
19.The relationship of the Chair of the Board and the CEO is competitive.			.734
% of Variance	15.63	13.26	4.93
Cronbach's Alpha	0.78	0.77	0.77

Note: Extraction Method: Principal Axis Factoring. Rotation Method: Promax with Kaiser Normalization.

Factor 1 (F1): Factor one account for around 16% of the overall variance in the items considered in the analysis. The items with highest loadings on this factor relates to the CEOs perceptions about State government's water planning process, its water policies, and relation between the WSB and State Government(s). This factor is therefore named as 'Coherence of State Government Water Policy' and higher loadings imply that the CEOs tend to agree with the propositions on the coherence of State Government water policy.

Factor 2 (F2) explains around 13% of the overall variance and the items with high factor loadings represent the CEO perceptions' about the functioning of the Board. Accordingly, this factor is named as 'Functions of the Board'. Again, higher loadings on an item indicate that the CEOs tend to agree with the statement related to the functioning of the board.

Factor 3 (F3) accounts for around 5% of the overall variance and this factor characterises the behaviour of the board members. Therefore, the factor is named as 'Board Behaviour'. Higher factor loadings imply that CEOs tend to agree with the statements related to the behaviour of the board members.

6.1.3 Reliability analysis

Reliability analysis was carried out to address the question - Does the set of items measure the same construct/factor? This was possible by determining the Cronbach's Alpha which is a measure of the average correlation of each item with all other items that make up that factor or construct or variable. It measures the internal consistency of each factor determined using PAF. There is no absolute cut-off for the alpha value as it is always relative. Nevertheless, values less than 0.7 shows less than desirable reliability and therefore Cronbach's alpha should be more than 0.70 at minimum. In some cases when there are only three items, an alpha over 0.65 is adequate, but as number of items increases acceptable level rises (Cortina, 1993).

In this case, Cronbach's alpha for all three factors is more than 0.7. It was 0.78 for factor 1 and 0.77 for both, factors 2 and three (see table 6). This implies that the items used to define the factors are reliable. In other words, the items measure a specific construct and these items form a reliable scale.

7 Summary and Recommendations

There have been massive reforms of State water laws, policies, institutions and organisations in Australia over the last 12 years. These reforms have created many new bodies and completely restructured ownership of assets and management in all Water Supply Businesses. The reforms aim to achieve ESD but each State defined it differently and has implemented it in different ways.

This project has employed distinct methods to try to benchmark ESD reporting in 2003/4 and then to engage the CEOs of the major water supply businesses in reporting the barriers to them in ESD achievements. The study also sought to classify the WSBs by corporate governance type and hence distinguish the CEO responses by this factor. This brought a new level of refinement to the understanding as it focussed on the organisational type as a factor in achievement of water policy in this case.

The first part of the study revealed that there are 14 different types of WSBs in Australia. Some states have multiple types i.e. NSW having nine types spread over 79 major water supply businesses. Some such as Victoria only have two types. Nevertheless, the study identified Local Government Shire Council (LGSC) and Local Government City Council (LGCC) as the two major types of corporate governance typology.

These are all relatively new in form being a product of the 1994 reforms. However whilst new in form each of these forms and the operation of the organisation relates to past methods of operation. This path dependency (North 1990) then determines the way the WSB operated in each State. The different types of legal organisation mean that there are different organisational cultures, processes and regimes to satisfy from coercive institutions such as the plethora of laws within and between States.

After establishing the classification of WSB, a content analysis was constructed to determine what the organisations were reporting about ESD action. This revealed marked differences in reporting with single mission bodies reporting the most ESD actions. These were government owned corporations, Corporation law companies and statutory boards. Another characteristic of these is that they are bigger bodies with larger budgets. However, Irrigation trusts also came up as the highest reporters of ESD actions. These are unlike the above being smaller former co-operatives. These reported much infrastructure funded to support preservation of the resource.

The massive reforms of State water laws, policies, institutions and organisations in Australia has resulted in complete restructuring of the water supply businesses. With emphasis given to ESD requires that each state implement ESD principles in all the future water projects. This makes the CEOs of these businesses the key actors in implementing ESD. In relation to the CEOs the survey of 183 of them demonstrated many concerns and differences between organisational types in ability to implement ESD. All CEOs were clear on what it means for them to achieve it but most were not confident that they could achieve it. Most reforms require partnerships between Commonwealth and State agencies and also partnerships between different sectors of the community to achieve ESD implementation as defined by the relevant acts.

This study has shown that the ESD policy implementers, the CEOs, have made considerable effort to achieve ESD. The partnerships between sectors of the community and between them and State governments are impaired by a lack of trust and a perception that the water policies are not mutually supportive. Many of them are also puzzled as to how to achieve ESD, and with acute differences between the States in definitions there is a limited scope for them to learn from each other. Notably the environmental regulator is seen as harder to please in New South Wales and also for local governments. The price regulator is seen as hardest in Victoria and by Statutory Boards.

The results of this study establish a relationship between the legal structures of the water supply businesses and the CEO perceptions. This means that in some cases the perceptions of the CEOs about achieving ESD, sustainable water resource management

and other water governance issues depends on the typology of the Water Supply Businesses they represent.

Some of the important findings of this study are:

- differences between organisational types in ability to implement ESD
- no differences between CEOs personally in attitude to and knowledge of ESD (all knew about it)
- CEOs have put in considerable effort to achieve ESD in partnership with the community
- CEO's feel impaired by a lack of trust in the State government and a feeling that water policies are not mutually supportive
- barriers to achievement of ESD are community resistance in many places and apathy in others

Finally, the factor analysis yielded a set of three factors or themes that are representative of the CEOs perception and attitude towards Water management and achieving ESD in particular. In order to capture the dimension of implementing ESD by the water supply businesses in Australia these three factors – Coherence of State Water Policies; Organisation and functioning of the Board; and behaviour and attitude of the Board members are important. I

In addition, since these factors are assigned statements, they form a feature checklist which when used alongside other evaluation tools should pick up the more qualitative nature of the investigation. Also, it is short and concise and hence can be easily administered.

8 References

- ABC Website Rural Online Radio National. <http://www.abc.net.au/rural/drought2002/gallery-westerntour.html>
- Accountability Rating (2004) Institute of social and ethical accountability, UK
- Adelman, I., & Dalton, G. (1971). A factor analysis of modernisation in village India. *The Economic Journal*, 81 (323), 563-579.
- Anderson J Hon MP A Historic week for Water Reform, 9 December 2004,
- Anderson J Hon MP, 'National Water Initiative' - Press release 29 August 2004
- Anton F. de Man., Balkou, S.T., & Vobecky, J. (1984). Factor analysis of a French- Canadian form of the parental attitude research instrument. *The Journal of Psychology*, 119 (3), 225-230.
- Australian Bureau of Statistics (2004). Water Account Australia. Canberra, Australian Government.
- Australian National Committee on Irrigation and Drainage website <http://www.ancid.org.au/>
- Australian Water Resource Assessment 2000 - surface and groundwater availability and quality, a report of the National Land and Water Resources Audit (Audit).
- Beattie and Jones (1992)
- Berkes F George R and Peson RJ (1991) "Co Management; The evolution of theory and practice of the joint administration of living resources" In: *Alternatives* vol 18. p 12-18.
- Blackmore D (2000) Managing for scarcity –water resources in the Murray-Darling Basin, CEDA Bulletin July ,pp50-54.Don Blackmore former CEO of MDBC.
- Blackmore, D. (2000). Managing for scarcity –water resources in the Murray-Darling Basin. CEDA Bulletin July: 50-54.
- Brisbane Water Annual Report (2003), Queensland
- Bromley D.W. (1985) "Resources and Economic Development an institutionalist perspective" In: *Journal of Economic Issues*, 23, 3, 735-759
- Broughton W ed. (1999) A century of Water Resources Development in Australia 1900 - 1999, Institute of Engineers Australia, Sydney.
- Brundtland Report (1987) Our Common Future. Oxford
- Buck LE , Geisler CG, Schelhas J and Wollenberg E (2001) Biological diversity; Balancing Interests through Adaptive Collaborative Management, CLC Press LLC Florida.
- Camazine et al 2001.
- Centre for Comparative Water Policies & Laws Website <http://business.unisa.edu.au/commerce/waterpolicylaw/>
- Clark SD and AJ Meyers (1969) Vesting and divesting: the Victorian Groundwater act 1969, 7 Melbourne University law Review, 238.
- Clark SD and I A Renard (1970) The Riparian Doctrine and Australian Legislation 7 Melbourne University Law review 475.
- CoAG reform papers see Jones, Whittington ,Mckay, Arthinton, Lawrence , Cartright and Cullen Independent Assessment of Jurisdictional reports on the achievements of the CoAG Water reforms 2001
- Cooperative Research Centre for Irrigation Futures Website <http://www.irrigationfutures.org.au>
- Cortina, J. M. (1993). What is coefficient alpha? An examination of theory and application. *Journal of Applied Psychology*, 78, 98-104.
- Costello, A. B., & Osborne, J. W. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research and Evaluation*, 10 (7), 1-9.
- Council of Australian Governments (2004). "Intergovernmental Agreement on a National Water Initiative, Canberra." Viewed 21 September 2004 http://www.coag.gov.au/meetings/250604/iga_national_water_initiative.pdf

- Crawford, J (1991) 'The constitution and the environment', Sydney Law Review, vol 13, pp 13–15.
- Deegan and Rankin (1996) "Do Australian Companies report environmental news objectively? - An Analysis of environmental disclosures by firms prosecuted successfully by the Environmental Protection Authority?" In: Accounting, Auditing and Accountability Journal, Vol 9, No.2, pp 50-67
- Dennis CJ, The Spoilers, published in the Herald Sun, 6 December 1935, p 6.
- Department of Sustainability and the Environment (2004) Securing our Water Future together.
- Di Maggio (1995) Comments on What theory is not. Administrative Science Quarterly vol 40 pp 391-397
- Dobson (1996) Environmental sustainabilities an analysis and typology Environmental politics 5(3) 4012-428
- Dworkin, Ronald M. (1973). "Taking Rights Seriously", in Simpson, AWB, ed, Oxford Essays in Jurisprudence, Second Series, Oxford: Clarendon Press, 202; reprinted in his Taking Rights Seriously, revd edn, London: Duckworth, 1978, 184.
- Dworkin, Ronald M. (1975). "Hard Cases" (1975) 88 Harvard Law Review 1057; reprinted in his Taking Rights Seriously, supra, 81.
- Ecologically sustainable Development Steering Committees (1992) National Strategy for Ecologically Sustainable Development, endorsed by the Council of Australian Governments in 1992.
- Eisenhardt K (1989) Building theory from case study research Academy of Management review 14(4) 532-550
- Ellis (2000) Rural Livelihoods and Diversity in Developing Countries, Oxford University Press England
- Embid A and F Gurrea Relevance and application of the EU Water Directive in terms of Spain's Hydrological plan. Water Science and Technology vol 49; 7 2004 p111-116.
- Evans R (2001) Managing Over-Allocated Groundwater Systems, Paper presented at the 3rd Australasian Natural Resources Law and Policy Conference, Adelaide p 194.
- Explanatory memorandum to the Water (Irrigation Farm Dams) Act 2002 amending the Water Act.
- Finco A and P Nijkamp (2001) Pathways to urban sustainability Journal of Environmental Policy and Planning Vol 3, p 289-302
- Galanter M (1981) Justice in many rooms; Courts, Private Orderings and Indigenous Law Journal of legal Pluralism 19;1-47.
- Gilley, F. W., & Uhlig, E. G. (1993). Factor analysis and ordinal data. *Education*, 114 (2), 258-264.
- Gladstone Area Water Board Annual Report 2003 Queensland
- Government of Western Australia (2003). A State Water Strategy for Western Australia. Perth, Viewed 21 September 2004
- Gray, A. & McKay, J. M. (2006). Are Utility attitudes to the environment shaped by corporate governance? Assessing the evidence from Australian Utility reports, *Water Utility Management International*, Vol 1 pp8-11.
- Griffiths J (1986) What is legal pluralism? Journal of Legal Pluralism, vol 24, 1-4
- Halaniak D and JM McKay (2003) Groundwater Conflicts - How Water Allocation Management Plans can help?, Water, Journal of the Australian Water Association, 30(8), 23-26
- Hallows P and D Thompson, (1999) The history of irrigation in Australia, Australian National Committee on Irrigation and Drainage, Canberra.
- Hair J.F., Anderson R.E., Tatham R.L. , & Black W.C. (1992). *Multivariate Data Analysis*. (3rd Edition). Macmillan, New York.
- Harris S and D Throsby (1997) The ESD Process: Background, implementation and aftermath, in Hamilton C and D Throsby editors , The ESD Process Evaluating a policy experiment, Workshop the ESD Process: Organised by the Academy of the Social Sciences and the Graduate Program in Public policy, Australian National university, ANU Canberra 28-29 October 1997.
- Hart HLA (1961) The concept of law Oxford University Press

- Hobart Water Annual Report 2003, Tasmania
- Hohfeld (1919) *Fundamental Legal Conceptions as Applied in Judicial Reasoning*, ed Cooke, WW, New Haven: Yale University Press.
- <http://newdev.business.unisa.edu.au/commerce/waterpolicylaw/default.asp>
- <http://www.deh.gov.au/esd/national/nescd/strategy/index.html>
- http://www.ourwaterfuture.com.au/Docs/State_Water_Strategy_complete.pdf.
- <http://www.pmc.gov.au/nwi/index.cfm>
- Hunter Water Annual Report 2003 Towards sustainability, Newcastle, NSW
- Hurlimann A and McKay JM (2005) Contingent Valuation by the Community if Indirect benefits of using recycled water –an Australian case study, *Efficient 2005*, IWA ,Chile.
- Hurlimann, A. and J. McKay (2004). "Attitudes to Reclaimed Water for Domestic Use: Part 2. Trust." In: *Water*, Journal of the Australian Water Association 31(5): 40-45.
- IAG Reports on CAP Implementation at Murray Darling Basin Commission website http://www.mdbc.gov.au/naturalresources/the_cap/the_cap.htm
- Industry Commission (1997) A full repairing lease enquiry into Ecologically sustainable land management September draft report.
- Irujo A and F G Casamayor (no date) Relevance and Application of the EU Water Directive in Terms of Spain's National Hydrological plan, Both University of Zaragoza Spain.
- Jessop B (1998) The rise of governance and the Risk of failure the case of economic development, *International social science journal* 50 (155) 29-40.
- Jose J (2004) Exploring the Genealogy of Governance with in Australian Political Discourse, Refereed Paper presented at the Australian Political Studies Association Conference, 2004
- Kelsen H (1949) *General Theory of Law and State* trans Wedberg quoted in Griffiths J 1986 What is legal pluralism? *Journal of Legal Pluralism*, vol 24, 1-4 and Singer JW, *The Legal Rights Debate in Analytical Jurisprudence from Bentham to Hohfeld*, 1982 *Wis.L.Rev.* 975, 986-87
- Kelsen H (1949) *General Theory of Law and State* trans Wedberg quoted in Griffiths
- Krippendorff (1980) *Content Analysis-An Introduction to its methodology*, Sage Publications, Newbury Park CA
- Kuks S (2004) *Water Governance and Institutional Change*, University of Twente, the Netherlands
- Lane PH (1986) *Lane's Commentary on the Australian Constitution Law Book compant North Ryde NSW.*
- Manning P and B Cullum-swan (1994) *Narrative, Content and Semiotic Analysis in Denzin and Lincoln eds Handbook of Qualitative research Sage, 1st edition p chapter 29 p. 465*
- Marshall G (2005) *economics for collaborative 21Environmental Management- Renegotiating the commons*, Earthscan,
- Martin K (2002) Local water management planning- collaborating in change, *Water*, 29(4), pp28-31
- McKay (2002), *Encountering the South Australian Landscape; Early European Misconceptions and Our Present Water Problems*, Hawke Institute Working Paper number 21. www.hawkecentre.unisa.edu.au/institute/
- McKay (2003) *Marketisation in Australian Freshwater and Fisheries Management Regimes in Dovers and S Wild River eds Managing Australia's Environment*, Federation Press, pp363- 390
- McKay (2005) *Water Institutional reforms in Australia in special issue Water Policy*, vol 7 35-53
- McKay JM, Diwakara H and S Barnett (2005) *An innovative Cost sharing scheme for Groundwater in SE South Australia; Policy to share the Benefits and Burdens*
- McKay, (2004) 'Corporate Governance Models In Major Australian Urban Water Businesses - A Typology In the First Decade After Reform And Issues For The Future', *Efficient2005*, IWA ,Chile
- McKay, (2005) 'Irrigation Water Providers and Environmentally Sustainable Outcomes - Examples from Australia.' 2005 OECD Workshop

- McKay, JM'(1994) Water planning in SA', Australasian Journal of Natural Resources Law and Policy, vol 1, no 2, 1994, pp 595–609.
- McManus P (1996) Contested Terrains Politics Stories and Discourses of Sustainability Environmental Policits 5(1) 48-73
- MDBC (1995), An Audit Of Water Use in the Murray darling Basin June 1995. MDBC, Canberra
- Meyers (2005) The Irrigation Industry in the Murray and Murrumbidgee Basins CRC Irrigation Futures and CSIRO Report. June.
- Midttun A and AL Koefoed (1990) Effectiveness and negotiability pf Environmental regulation International Journal of Regulation and Governance 1(1) 79-111.
- Moeller and McKay (2000) Is there power in the Australian Constitution to make laws for water quality? Environment and Planning Law Journal , Vol 17, no 4 pp294-307.
- Moral L and Sauri D (1999)Changing Course water policy in Spain, Environment, July Aug 1999 p14-36.
- Murray Darling Basin Commission The CAP was implemented as schedule F. The full text is available on the MDBC web site www.mdbc.gov.au
- Nancarrow, B. E., J. D. Kaercher, et al. (2002). Community Attitudes to Water Restrictions Policies and Alternative Sources, A longitudinal analysis 1988-2002. Perth, CSIRO: 36.
- National Groundwater Committee 2000 Reporting Jurisdiction Progress on Groundwater Reforms, June 2000. prepared by Salient Solutions on behalf of the Chair of the National Groundwater committee
- National Water Audit
- National Water Commission www.nwc.gov.au .
- National Water Initiative Website <http://www.pmc.gov.au/nwi/index.cfm>
- National Water Quality Management Strategy 1995 Guidelines for Ground water Protection in Australia, Agriculture and Resource Management Council of Australia and NZ AND Australian and NZ Environment and Conservation Council.
- National Strategy on ecologically sustainable development (1992) Australian Government Publishing service Published in 1992 prepared by the Ecologically sustainable development committee endorsed by the Council of Australian Governments in 1992 ISBN 0 644 27253 8 www://deh.gov.au/esd/national/nsesd.strategy
- Neibieski Zamek Pty Ltd v Southern Rural water (2001) Victorian Civil and Administrative Tribunal 31 May.
- NSW Water Supply and Sewerage Performance Monitoring Report, (2003/04) NSW Department Of Energy, Utilities & Sustainability
- Non-Major Urban Water Utilities - Queensland Report 2001 – 2002, (2004) Queensland Dept. of Natural Resources, Mines & Energy
- North (1995) Five propositions about institutional change In: Knight J and Sned I Eds Models, Interpretations and theories; constructing explanations of Institutional Emergence and change 15-26
- North, Douglas, (1990), Institutions, Institutional Change, and Economic performance, Cambridge University Press, Cambridge, Massachusetts.
- Ostrom E (2000) Collective Action and the evolution of social norms In: Journal of Economic Perspectives 14, 3, 137- 158.
- Paldam M (2000) Social capital; One or many? Definitions and measurement In: Journal of Economic Surveys 14,5, 629-653.
- Palmquist, Carley and Dale (1997) Two applications of automated text analysis; analyzing literary and non literary texts In: Roberts ed Text Analysis for the Social Sciences. Methods for drawing Statistical inferences from text and transcripts Hillsdale
- Parker S (2000) Separating and Unbundling managing water entitlements in Queensland Abare Conference paper

- Performance Monitoring Report (2000-2001) Australian non Major Urban Water Utilities, Australian Water Association and ARMCANZ, Sydney, 2000
- Peterson, D., Dwyer, G., Appels, D. and Fry, J. (2004), Modelling Water Trade in the Southern Murray–Darling Basin, Productivity Commission staff working paper, Melbourne.
- Pisaniello J and McKay JM (2005) Australian Community Responses to upgraded Farm Dam Laws and Cost effective Spillway Modelling, Water Resources Research Vol. 12. no.2,pp325-340.
- Power and Water Corporation Annual Report, Northern Territory, Darwin.
- Prime Minister's Science Engineering and Innovation Council (2003). Recycling Water for Our Cities. Canberra, Federal Government of Australia.
- Productivity Commission (2003). Rights Arrangements in Australia and Overseas, Canberra
- Quick J and R Garran (1976) Annotated Constitution of the Commonwealth of Australia, Angus and Robertson, Sydney. P 880
- Raar (2002). Environmental initiatives towards triple bottom line reporting. Corporate Communications and International Journal vol7 no 3 169- 181
- Rentshler and Guersen (1999) Entrepreneurship as a market mechanism - the case for Art Museums
- Review of Cap Operation (2000) see MDBC site
- Review of performance and administrative arrangements for Water Supply Councils vol 1 (1993) Prepared for NSW Water resources Council.
- Review of performance and administrative arrangements for Water Supply Councils vol 1 1993 Prepared for NSW Water resources Council.
- Richards A and N Singh (1996) Water and Federalism India's Institutions Governing Interstate River waters, Dept of Economics, University of California, Santa Cruz.
- Rochford F (2004) Private rights to water in Victoria; Farm dams and the Murray Darling Basin Commission cap on Diversions the Australasian Journal of Natural Resources Law and Policy Vol 9 No 2 229-253
- SA Water Annual Report (2003) Water for Growth, development and Quality of life for all South Australians, Adelaide.
- Sacco R (1991) Legal Formants; A dynamic Approach to Comparative law, American Journal of Comparative Law, vol 39, 1-
- Saleth R.M., and A. Dinar, 2004, The Institutional Economics of Water: A Cross-country Analysis of Institutions and Performance, Cheltenham, UK: Edward Elgar Publishing Pvt. Ltd.
- Section 100 of the Australian Constitution
- Selnes, F. (1998). "Antecedents and consequences of trust and satisfaction in buyer-seller relationships." In: European Journal of Marketing 32(3/4): 305-322.
- Shadwick (2002) A viable and Sustainable water industry, National Competition Council, staff Discussion Paper, Ausinfo, Canberra
- Shah M (2002) Water policy Blues the hindu News paper 7th June 2002
- Sharathchandra. (1991). Sustainable Development: A critical Review, *World Development* 19 (6): 607-621.
- Shi T (2005) Complex Water Entitlements, Water Vol. 32.no.5,pp 39-41
- Shi T (2005) Simplifying Complex Water Entitlements, Water Vol. 32.no.5,pp 39-41
- Singer JW, The Legal Rights Debate in Analytical Jurisprudence from Bentham to Hohfeld, (1982) Wis.L.Rev. 975, 986-87
- Smith.M and R J Taffler (2000) "The Chairman's Statement - a content analysis of discretionary narrative disclosures" In: Accounting, Auditing and Accountability Journal , Vol 13, no.5 pp. 624-646.
- State Government of Victoria (2002). New Water for Victoria, Victoria's Water Recycling Action Plan. Melbourne, Department of Natural Resources and Environment.

- State of Environment advisory council Report 1996, Australia State of the Environment 1996. CSIRO Publishing Melbourne.
- Sustainability (2003) The Global Reporters - sustainability Reporting Assessment Methodology May 2003, www.sustainability.com
- Sydney Water Annual Report 2003 Environmental, Social and Economic Performance, Sydney water NSW
- Syme, G. J. (2003). Delivering Fairness and Justice in Water Allocation and Catchment Management. Community Consultation in the Australian Water Industry, Sydney, Australian Water Association and the International Association for Public Participation.
- Thompson M (2005) Paper at OECD Workshop on Agricultural and water; Sustainability, Markets and Policies Adelaide, www.oecd.org/agr/env and National Water Commission www.nwc.gov.au
- UNEP (2003) Tracking Progress: implementing sustainable consumption policies UNEP, 2ND Edition
- Unerman J (2000) "Methodological Issues - reflections on quantification in corporate social reporting using content analysis" In: Accounting, Auditing and Accountability Journal , Vol 13, no.5 pp. 667-680
- Velicer, F. W., & Jackson, N. D (1990). Component analysis versus common factor analysis: Some issues in selecting an appropriate procedure. *Multivariate Behavioural Research*, 25(1), 1-28.
- Walters CJ and Holling CS (1990) "Large Scale management experiments and learning by doing" In: Ecology 71 2060-2068.
- Warner J (2004) "Water, wine, vinegar, blood; On politics, participation, violence and conflict over the hydrosocial contract" In: Proceedings of the Workshop on water and politics understanding the role of Politics in Water Management, Feb 2004, IUCN AND World Water Council
- Water and the Australian Economy (2000) Sustainable Australia? Australian Academy of Technological Sciences and Engineering Symposium November, report by Fitzpatrick. Report, <http://www.atse.org.au/publications/symposia/proc-2000>.
- Water Corporation of Western Australia, Annual Report 2003 Looking Forward. Perth
- Water Rights Arrangements in Australia and Overseas 2003 Productivity Commission Australia.
- Water Services Association of Australia website <http://www.wsaa.asn.au/>
- Watson A (1995) From Legal Transplants to Legal Formants The American Journal of Comparative Law, vol 43, 469-476.
- Xia L, K. B. Monroe, et al (2004) "The Price is Unfair! A Conceptual Framework of the Price Fairness Perceptions." Journal of Marketing 68: 1-15

9 Appendices

Appendix A: Content Analysis Pro Forma

The following sheet was used throughout the Manual Content Analysis process. The categories chosen for analysis were determined after a semantic comparison and examination of numerous Top Management Reports.

WSB	Number of pages in TMR	State
-----	------------------------	-------

IrrigationUsers		Irrigation Volume		Employees	
DomesticUsers		Domestic Volume		Gov. Model	
IndustryUsers		Industry Volume		Sub Model	
OtherUsers		Other Volume		MDBC	
Total Users		Total Volume		Class of Utility	

Blank Space		Current Drought	
Headings		Mission / Vision	

Water Content	
Community / Stakeholder Consultation	
Complaint – Govt. Policy (Water)	
Conservation Projects (Water)	
Corporate Social responsibility	
Current water sources	
Demand Management - Current	
Demand Management - Future	
Environment Plan	
ESD	
Global water issues	
Impacting litigation - Water	
Infrastructure – Maint. (Water)	
Infrastructure – New (Water)	
Internal or External audit process	
Investigation of other water	
Praise – Govt. Policy (Water)	
Reducing greenhouse gas	
Sustainability & water cycle strategy	
Sustainable policy unit	
Water Allocation	
Water Conservation - Agricultural	
Water Conservation - Other	
Water reuse or Grey water	
Water sales	
Water Technology	

Acknowledgements & Photos of CEO	
Acknowledgements	
Awards from or to WSB	
Biographies	
Decorative photos or graphics	
Introduction/Rhetoric	
Signature or identifying photo	
This Document	
Visiting Dignitaries	

Non Water	
Complaint – Govt. Policy (Non-Water)	
Conservation Projects (non Water)	
Impacting litigation – Not Water	
Infrastructure – Maint. (Non-Water)	
Infrastructure – New (Non-Water)	
Local Events (Non-Water)	
Non-Water related projects/initiatives	
Praise – Govt. Policy (Non-Water)	
Property Development levels	
Regional Development	

Staff	
Internal workplace culture	
Staff	

Governance	
Board of Management or Committees	
Meetings of Board or Committees	
Reports on other side of business	
Review of policies	
Structure of WSB	

Customers	
Aboriginal & Torres Strait Islanders	
Community Education	
Customer billing	
Customer satisfaction	
Customers	

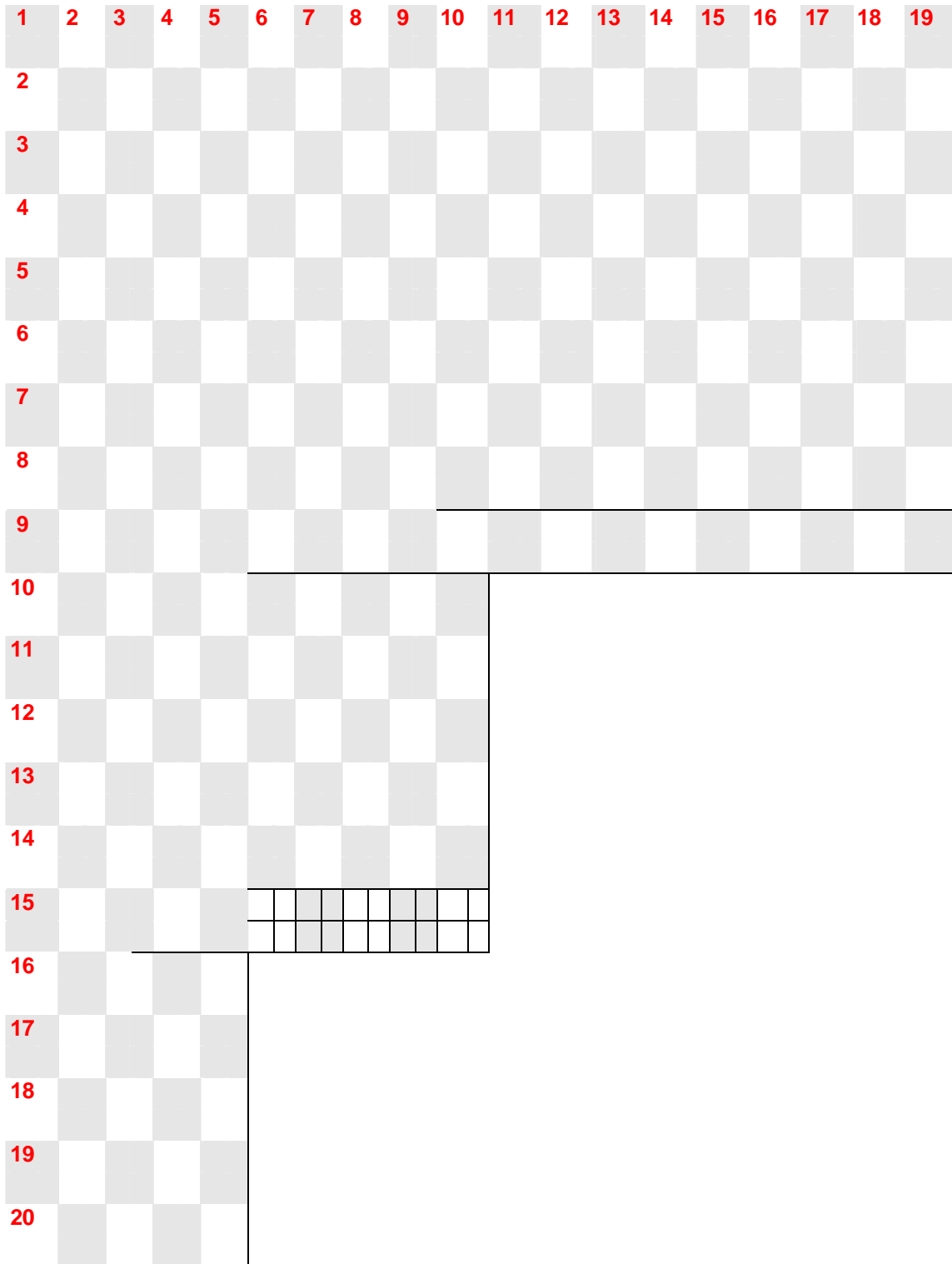
Elections / Profits	
Elections	
Impact of Legislation	
Other financial details	
Plans for the future	
Profit or Budget Surplus	

Appendix B: Content Analysis Transparency

This grid was printed onto clear plastic sheets to act as an overlay to measure the area of text dedicated to specific sections.

A standard A4 sized paper was used in the production of all hardcopies. The surface area of each page is 623.7cm².

The transparency was cut into an irregular shape to facilitate handling and provide better manual control of the transparency. The squares measure 5mm × 5mm. The larger grey shaded squares are 1cm × 1cm.



Appendix C: Survey Questions

Question # 1

Hello, my name is _____ from the University of South Australia. I am not selling anything; We are studying the obstacles and issues facing businesses that supply water. We would like to arrange an interview with _____.

The questions will be on their attitudes and opinions about the Water Industry and the Governance Issues facing Water Businesses in Australia. This is federally funded research and an ideal opportunity for CEOs to ensure that their issues are discussed at the national level.

The interview will take about 20 minutes. The information is collected for statistical purposes only and will be kept totally confidential.

Can we arrange a time to conduct the interview that would suit yourself or CEO? Before we conduct the interview we need to email/fax you some information sheets to outline the research and to refer to during the survey.

Question # 2 How long have you been the MD of this business?

Question # 3 What did you do before this?

Question # 4 How long have you lived in this state?

Question # 5 Now I am going to read you a series of statements and would like you to answer on a scale from 0 to 10.

If you strongly agree then you should choose the answer 10. If you strongly disagree, then the best answer would be 0. If you somewhat agree or disagree, choose another number as close to 0 or 10 as you think it should be.

Question # 6 I am happy with the charter of the organisation. Single response only

Question # 7 I am able to achieve sustainable water management. Single response only

Question # 8 I am clear on what it means to this organisation to achieve sustainable water management. Single response only

Question # 9 All stakeholders are consulted in water planning. Single response only

Question # 10 The water planning process instigated by the State government in the 90's has worked well here. Single response only

Question # 11 I understand the State Government's water planning process. Single response only

Question # 12 I am well informed by the state government about their water policy? Single response only

Question # 13 The community in this area works well together in water planning? Single response only

Question # 14 All sectors of the community of this water business understand the viewpoint of others in the area. Single response only

Question # 15 The non executive members of the board understand their role. Single response only

Question # 16 The non executive members of the board understand ESD. Single response only

Question # 17 The non executive Board members see themselves as guardians over the executive behaviour. Single response only

Question # 18 All board members work together cohesively. Single response only

Question # 19 The board understands that it governs not manages? Single response only

Question # 20 Some members of the Board compete with each other. Single response only

Question # 21 Some members of the board are too friendly with each other. Single response only

Question # 22 The water customers see non executive directors as a source of probity (goodness). Single response only

Question # 23 Some board members show little interest in the organisation. Single response only

Question # 24 The relationship of the Chair of the board and the CEO is competitive. Single response only

Question # 25 The board controls and plans its own agenda. Single response only

Question # 26 The ESD process is transparent. Single response only

Question # 27 I am happy with the ESD process. Single response only

Question # 28 Of all the regulators, the environmental regulator is the hardest to please. Single response only

Question # 29 Of all the regulators, the price control regulator is most difficult to please. Single response only

Question # 30 Please list your top 3 Key Performance Indicators (KPI's):

What is your first Key Performance Indicator?

Question # 31 What is your second Key Performance Indicator?

Question # 32 What is third Key Performance Indicator?

Question # 33 Which is the hardest to achieve in this area?

Question # 34 Why? (is this KPI the hardest to achieve)

Question # 35 How many committees do you have?

Question # 36 Do you have one that deals with ESD Issues? Single response only (Y/N/don't know)

Question # 37 Does it have a written charter? Single response only (Y/N/don't know)

Question # 38 How were the Directors selected for that Committee? (Greaves case). Please keep answer precise

Question # 39 Please look at the list of strategy formulation types. Please select the one that best corresponds to your water business.

Single response only

- 1 Design - distinctive competence SWOT
- 2 Planning - programming, budgeting, scheduling, scenarios
- 3 Positioning - generic strategy, competitive analysis
- 4 Entrepreneurial - bold stroke, vision insight
- 5 Cognitive - map frame, concept, scheme
- 6 Learning - incrementalism
- 7 Power - bargaining, conflict, coalition
- 8 Cultural - values, beliefs, myths
- 9 Contextual - adaption, evolution, contingency
- 10 Configuration - period stage life cycle
- 11 Dont know/refused (do not read)

Question # 40 Why did you select this strategy formulation type?

Question # 41 Referring again to the list of strategy formulation types, which one or two would best help you to achieve ESD in this region?

Question # 42 Why? (do you believe this or these strategies would best help you achieve ESD in your region). Please keep response precise

Question # 43 In ESD, economic development must be balanced against the protection of biological diversity, the promotion of equity within and between generations, and the maintenance of essential ecological processes.

The commonwealth government working groups on ESD drafted this statement and the 7 principles in 1992. It has 7 guiding principles:

Decision making processes should effectively integrate both long and short term economic, environmental, social and equity considerations,

Lack of scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation (the Precautionary Principle).

The global dimension of environmental impacts of actions should be recognised and considered.

The need to develop a strong, growing and diversified economy which can enhance the capacity for environmental protection should be recognised.

The need to enhance and maintain international competitiveness in an environmentally sound manner should be recognised.

Cost effective and flexible policy instruments should be adopted; and

Broad community involvement should be facilitated.

This statement has been accepted by CoAG for Australia and reflects that economic efficiency is not the main goal of water institutions but rather that there is a need to achieve a balance between social, economic, and the environmental.

Please rank these in ascending order in terms of difficulty of achieving them in your region.

Question # 44 Please describe the barriers to achieving :

Firstly, 'Decision making processes should effectively integrate both long and short term economic, environmental, social and equity considerations.'

Question # 45 Please describe the barriers to achieving :

'Lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation (the Precautionary Principle).'

Question # 46 Please describe the barriers to achieving :

'The global dimension of environmental impacts of actions should be recognised and considered.'

Question # 47 Please describe the barriers to achieving :

'The need to develop strong, growing and diversified economy which can enhance the capacity for the environmental protection should be recognised.'

Question # 48 Please describe the barriers to achieving :

'The need to enhance and maintain international competitiveness in an environmentally sound manner should be recognised.'

Question # 49 Please describe the barriers to achieving :

'Cost effective and flexible policy instruments should be adopted.'

Question # 50 Please describe the barriers to achieving :

'Broad community involvement should be facilitated.'

Question # 51 Please rate each guiding principle between 0 and 10 where 0 is not at all difficult and 10 is extremely difficult.

'Decision making processes should effectively integrate both long and short term economic, environmental, social and equity considerations.'

Question # 52 Please rate each guiding principle between 0 and 10 where 0 is not at all difficult and 10 is extremely difficult.

'Lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation'.

Question # 53 Please rate each guiding principle between 0 and 10 where 0 is not at all difficult and 10 is extremely difficult.

'The global dimension of environmental impacts of actions should be recognised and considered.'

Question # 54 Please rate each guiding principle between 0 and 10 where 0 is not at all difficult and 10 is extremely difficult.

'The need to develop a strong, growing and diversified economy which can enhance the capacity for environmental protection should be recognised.'

Question # 55 Please rate each guiding principle between 0 and 10 where 0 is not at all difficult and 10 is extremely difficult.

'The need to enhance and maintain international competitiveness in an environmentally sound manner should be recognised.'

Question # 56 Please rate each guiding principle between 0 and 10 where 0 is not at all difficult and 10 is extremely difficult.

'Cost effective and flexible policy instruments should be adopted.'

Question # 57 Please rate each guiding principle between 0 and 10 where 0 is not at all difficult and 10 is extremely difficult.

'Broad community involvement should be facilitated.'

Question # 58 Which if the following strategies have you put the most effort into?

'Decision making processes should effectively integrate both long and short term economic, environmental, social and equity considerations.'

Question # 59 Which if the following strategies have you put the most effort into?

'Lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation'.

Question # 60 Which if the following strategies have you put the most effort into?

The global dimension of environmental impacts of actions should be recognised and considered'.

Question # 61 Which if the following strategies have you put the most effort into?

The need to develop a strong, growing and diversified economy which can enhance the capacity for environmental protection should be recognised.

Question # 62 Which if the following strategies have you put the most effort into?

The need to enhance and maintain international competitiveness in an environmentally sound manner should be recognised.

Question # 63 Which if the following strategies have you put the most effort into?

Cost effective and flexible policy instruments should be adopted.

Question # 64 Which if the following strategies have you put the most effort into?

Broad community involvement should be facilitated.

Question # 65 How much has it cost as a percentage of turnover?

Question # 66 How do you think an ESD could work best in this area?

Question # 67 What is the single most important factor in achieving ESD?

Question # 68 Now can you take a look at the Blue Diagram. Please evaluate the model on a 10 point scale where 0 is strongly dislike and 10 is strongly like /prefer.

Question # 69 Why did you give that score?

Question # 70 Now I am going to ask you some questions regarding your prior education.

What subject area was your 1st degree in?

Question # 71 When did you complete your first degree?

Question # 72 What subject area did you complete your 2nd degree?

Question # 73 When did you complete your 2nd degree?

Question # 74 Which study is most relevant to your job today?

Question # 75 What future study would you like to do?

Question # 76 I am sure you have a wish list in relation to this water supplier. Could you please tell me the top 3 items?

What is your 1st top wish item?

Question # 77 What is your 2nd top wish item?

Question # 78 What is your 3rd top wish item?

Question # 79 How many extra staff would you need to achieve ESD here?

Question # 80 What skill bases would you need to achieve this?

Question # 81 Now I am going to read you a series of statements and would like you to answer on a scale from 0 to 10.

If you strongly agree then you should choose the answer 10. If you strongly disagree, then the best answer would be 0. If you somewhat agree or disagree, choose another number as close to 0 or 10 as you think it should be.

Question # 82 There are well established intergovernmental processes that ensure co-ordination and the State government.

Question # 83 All natural resource management units like this organisation advance a common mission to promote ESD.

Question # 84 Over the last 2 years change in this organisation has been incremental.

Question # 85 Over the last 5 years change in this organisation has been massive.

Question # 86 Over the last 10 years change in this organisation has been incremental.

Question # 87 This organisation is TOO complex.

Question # 88 This organisation needs to have fewer external stakeholders calling on us to provide information.

Question # 89 The transaction costs in meeting external requirements of other Government are huge.
Prompt where needed

Question # 90 The transaction costs in meeting community requirements are small.

Question # 91 There is a huge amount of trust between this organisation and the State government.

Question # 92 We are always consulted and given time to respond to policy changes.

Question # 93 This organisation is nested in a mutually supportive State government policy environment.

Question # 94 This organisation is designed to be adaptive to change.

Question # 95 This organisation promotes collective action of its customers.

Question # 96 I have been able to learn to adapt to state government ways of changing policy.

Question # 97 State government policy making processes follow a predictable pattern.

Question # 98 The State government policies disregard complexity of the administrative system.

Question # 99 The State government has stable policies toward global environmental change.

Question # 100 It is important to act in relation to global environmental change.

Question # 101 It is important to act in relation to global environmental change.

Question # 102 This organisation is well equipped to make long term strategies.

Question # 103 The State Government make long term strategy GENERALLY.

Question # 104 The State government makes long term strategies on ESD.

Question # 105 We have the resources to understand the demands of our irrigation water users.

Question # 106 We have the resources to understand the demands of our customers.

Question # 107 We have trouble sorting out conflicts between customers.

Question # 108 This organisation is in the front line in achieving ESD.

Question # 109 I have had enough INFORMATION to really develop an understanding of the customers.

Question # 110 I have had enough information to really develop and understanding of ESD.

Appendix D: Australian Water Supply Businesses

The Territories – ACT 1 WSB & NT 1 WSB			
WSB	Legal Type	Website/Email	Contact
ACT - ACTEW	GOC		02 6248 3111
NT - Power & Water	GOC		08 8924 7002

New South Wales – 145 WSBs / 9 Legal Structures / 79 Assessed			
WSB	Legal Type	Website/Email	Contact
Armidale Dumaresq Council	LGSC	http://www.armidale.local-e.nsw.gov.au	02 6770 3600
Ballina	LGSC		02 6686 1226
Balranald Shire Council	LGSC		03 5020 1300
Bathurst Regional Council	LGRC		02 6331 1622
Bega Valley Shire Council	LGSC		02 6499 2222
Bellingen Shire Council	LGSC		02 6655 7300
Berrigan	LGSC		
Bogan	LGSC		02 6831 1100
Bombala Council	LGSC		02 6458 3555
Boorowa Council	LGSC		02 6385 3303
Bourke Shire	LGSC		02 6872 2055
Brewarrina Shire	LGSC		02 6839 2106
Byron	LGSC	http://www.byron.nsw.gov.au	02 6626 7000
Cabonne	LGSC	http://www.cabonne.nsw.gov.au	02 6392 3200
Carrathool Shire Council	LGSC	http://www.carrathool.nsw.gov.au	02 6965 1306
Central Darling Shire	LGSC	http://www.centraldarling.nsw.gov.au	
Cobar	LGSC	http://www.cobar.nsw.gov.au	02 6836 5888
Coffs Harbour City Council	LGCC	http://www.coffsharbour.nsw.gov.au/	02 6648 4000
Coleambally	IT		
Cooma-Monaro	LGSC	http://www.cooma.nsw.gov.au	02 6450 1777
Coonamble Shire Council	LGSC	http://www.coonamble.org/council.htm	02 6827 1900
Corowa	LGSC	http://www.corowa.nsw.gov.au	02 6033 8919
Deniliquin Council	LGSC	http://www.deniliquin.nsw.gov.au	03 5898 3000
Dubbo	LGOC	http://www.dubbo.nsw.gov.au	02 6801 4000
Dungog Shire	LGSC	http://www.dungog.nsw.gov.au	02 4992 2044
Eurobodalla	LGSC	http://www.esc.nsw.gov.au	02 4474 1000
Forbes Shire Council	LGSC	http://forbes.local-e.nsw.gov.au	02 6850 1300
Gilgandra Shire Council	LGSC	http://www.gilgandra.nsw.gov.au	02 6847 2709
Glen Innes Severn Shire Council	LGSC	council@gisc.nsw.gov.au	02 6732 2611
Gloucester Shire Council	LGSC	http://www.gloucester.org.au	02 6538 5250
Gosford City Council	LGCC	http://www.gosford.nsw.gov.au	02 4325 8222
Goulburn Mulwaree Council	LGSC	council@goulburn.nsw.gov.au	02 4823 4444
Grafton	JLGG		
Griffith City Council	LGCC	http://www.griffith.nsw.gov.au	02 6962 8100
Guyra Shire	LGSC	http://www.guyra.nsw.gov.au	02 6779 1577
Harden Shire Council	LGSC	http://www.harden.nsw.gov.au	02 6386 2305
Hastings	LGRC	http://www.hastings.nsw.gov.au	
Hunter Water	GOC		
Inverell Shire Council	LGSC		02 6728 8288
Jemalong	IT		
Jerilderie Shire Council	LGSC	http://www.jerilderie.nsw.gov.au	03 5886 1200
Kyogle Council	LGRC	http://www.kyogle.nsw.gov.au	02 6632 1611

Lachlan Shire Council	LGSC	http://www.lachlan.nsw.gov.au	02 6895 4444
Leeton Shire Council	LGSC	http://www.leeton.nsw.gov.au	02 6953 2611
Lismore City Council	LGCC	http://www.lismore.nsw.gov.au	02 6625 0500
Maitland	GOC		
Midcoast Water	GOC		
Morree Plains	LGSC	http://www.mpsc.nsw.gov.au	
Mudgee	LGSC		
Murray Irrigation Limited	CLC	http://www.murray.nsw.gov.au	
Murrumbidgee Irrigation	CLC	http://www.murrumbidgee.local-e.nsw.gov.au	
Muswellbrook	LGSC	http://www.muswellbrook.nsw.gov.au	
Nambucca	LGSC	http://www.nambucca.nsw.gov.au	
Narrabri	LGSC	http://www.narrabri.nsw.gov.au	
Narromine	LGSC	http://www.narromine.nsw.gov.au	
Oberon	LGSC	council@oberon.nsw.gov.au	
Parkes Shire	LGSC	http://www.parkes.nsw.gov.au	
Pristine Waters	LGSC		
Queanbeyan	LGOC	http://www.qcc.nsw.gov.au	
Richmond Valley	LGOC	http://www.richmondvalley.nsw.gov.au	
Shoalhaven	LGOC	http://www.shoalhaven.nsw.gov.au	
Singleton Shire	LGSC	http://www.singleton.nsw.gov.au	
Snowy River	LGSC	http://www.snowyriver.local-e.nsw.gov.au	
State Water	GOC		
Tamworth	LGOC	www.tamworth.nsw.gov.au	
Tenterfield	LGSC	http://www.tenterfield.nsw.gov.au	
Tumbarumba	LGSC	http://www.tumbashire.nsw.gov.au	
Tweed	LGSC	http://www.tweed.nsw.gov.au	
Walgett Council	LGOC	http://www.walgettshire.com	
Wellington Council	LGSC	http://www.wellington.nsw.gov.au	
West Corugan Irrigation	SB/CLC		
Western Murray Irrigation	IT/CLC		
Wingecarribee	LGOC	http://www.wsc.nsw.gov.au/	
Young	LGSC	http://www.young.nsw.gov.au	
Sydney Water	GOC		

Queensland – 133 WSBs / 7 Legal Structures / 115 Assessed			
WSB	Legal Type	Website/Email	Contact
Atherton Shire Council	LGSC	http://www.athertonsc.qld.gov.au	(07) 4091 0700
Balonne Shire Council	LGSC	http://www.balonne.qld.gov.au	(07) 46208888
Banana Shire Council	LGSC	http://www.banana.qld.gov.au	(07) 49929500
Barcaldine Shire Council	LGSC	http://www.barcaldine.qld.gov.au	(07) 4651 1211
Barcoo Shire Council	LGSC	http://www.barcooshire.com	(07) 4658 6133
Beaudesert Shire Council	LGSC	http://www.bsc.qld.gov.au	(07) 5540 5111
Belyando Shire Council	LGSC	http://www.belyando.qld.gov.au	(07) 49831133
Blackall Shire Council	LGSC	http://www.blackall.qld.gov.au	(07) 4657 4222
Boonah Shire Council	LGSC	http://www.boonah.qld.gov.au	(07) 54633000
Booringa Shire Council	LGSC	http://www.booringa.qld.gov.au	(07) 46238111
Boulia Shire Council	LGSC		(07) 4746 3188
Bowen Shire Council	LGSC	http://www.bowen.qld.gov.au	(07) 47613600
Brisbane City Council	LGCC	http://www.brisbane.qld.gov.au	(07) 34038888
Brisbane Water	LGOC		07 3403 3200

Broadsound Shire Council	LGSC	http://www.broadsound.qld.gov.au	(07) 4964 5400
Bundaberg City Council	LGCC	http://www.bundaberg.qld.gov.au	(07) 41539999
Bungil Shire Council	LGSC	http://www.bungil.qld.gov.au	(07) 46221144
Burdekin Shire Council	LGSC	http://www.burdekin.qld.gov.au	(07) 4783 9800
Burnett Shire Council	LGSC	http://www.burnett.qld.gov.au	(07) 4150 5400
Caboolture Shire Council (CabWater)	LGSC	http://www.caboolture.qld.gov.au	07 5420 0701
Cairns City Council (Cairns Water)	LGCC	http://www.cairns.qld.gov.au	07 4044 8220
Calliope Shire Council	LGSC	http://www.calliope.qld.gov.au	(07) 4975 8100
Caloundra City Council (CalAqua)	LGCC	http://www.caloundra.qld.gov.au	07 5420 8200
Cambooya Shire Council	LGSC	http://www.cambooya.qld.gov.au	(07) 4697 0200
Cardwell Shire Council	LGSC	http://www.csc.qld.gov.au	(07) 4043 9100
Charters Towers City Council	LGCC	http://www.charterstowers.qld.gov.au	(07) 4752 0347
Chinchilla Shire Council	LGSC	http://www.chinchilla.org.au	(07) 4662 7056
Clifton Shire Council	LGSC	http://www.clifton.qld.gov.au	(07) 46974222
Cloncurry Shire Council	LGSC	http://www.cloncurry.qld.gov.au	(07) 47424100
Cook Shire Council	LGSC	http://www.cook.qld.gov.au	(07) 4069 5444
Cooloola Shire Council	LGSC	http://www.cooloola.qld.gov.au	(07) 54810800
Crow's Nest Shire Council	LGSC	http://www.crowsnestshire.qld.gov.au	(07) 4698 1155
Croydon Shire Council	LGSC		(07) 4745 6185
Dalby Town Council	LGCC	http://www.dalby.qld.gov.au	(07) 46721100
Dalrymple Shire Council	LGSC	http://www.dalrymple.qld.gov.au	(07) 47615300
Douglas Shire Council	LGSC	http://www.dsc.qld.gov.au	(07) 40999444
Duaringa Shire Council	LGSC	http://www.duaringa.qld.gov.au	(07) 49256444
Eacham Shire Council	LGSC	http://www.eachamshire.qld.gov.au	(07) 40965311
Eidsvold Shire Council	LGSC		(07) 41657200
Emerald Shire Council	LGSC	http://www.emerald.qld.gov.au	(07) 49828333
Esk Shire Council	LGSC	http://www.esk.qld.gov.au	(07) 54244000
Etheridge Shire Council	LGSC		07 40621233
Fitzroy Shire Council	LGSC		(07) 4931 5430
Flinders Shire Council	LGSC	http://www.flinders.qld.gov.au	(07) 4741 1288
Gatton Shire Council	LGSC	http://www.gatton.qld.gov.au	(07) 5462 4000
Gayndah Shire Council	LGSC		07 41611377
Gladstone City Council	LGSC	http://www.gladstonecc.qld.gov.au	(07) 4970 0700
Gold Coast City Council	LGCC	http://www.goldcoast.qld.gov.au	(07) 55828211
Goondiwindi Town Council	LGCC	http://www.goondiwindi.qld.gov.au	(07) 4671 1122
Herberton Shire Council	LGSC		(07) 40976159
Hervey Bay City Council	LGSC	http://www.herveybay.qld.gov.au	(07) 4197 4444
Hinchinbrook Shire Council	LGSC	http://www.hinchinbrook.qld.gov.au	(07) 4776 4600
Inglewood Shire Council	LGSC	http://www.inglewood.qld.gov.au	(07) 4652 1444
Ipswich City Council (Ipswich Water)	LGSC	http://www.ipswich.qld.gov.au	(07) 3810 6666
Isis Shire Council	LGSC		(07) 4192 1000
Jericho Shire Council	LGSC	http://www.jericho.qld.gov.au	(07) 4985 1166
Johnstone Shire Council	LGSC	http://www.jsc.qld.gov.au	(07) 4030 2276
Jondaryan Shire Council	LGSC	http://www.jondaryan.qld.gov.au	(07) 4691 1388
Kilcoy Shire Council	LGCC	http://www.kilcoy.qld.gov.au	(07) 54224900
Kilkivan Shire Council	LGSC	http://www.kilkivanshire.qld.gov.au	(07) 5484 1133
Kingaroy Shire Council	LGSC	http://www.kingaroy.qld.gov.au	(07) 4162 6200
Kolan Shire Council	LGSC	http://www.kolan.qld.gov.au	(07) 41332000
Laidley Shire Council	LGSC	http://www.laidley.qld.gov.au	(07) 54668888
Livingstone Shire Council	LGSC	http://www.livingstone.qld.gov.au	(07) 4939 3388
Logan City Council (Logan Water)	LGCC	http://www.logan.qld.gov.au	(07) 38265555

Mackay City Council (Mackay Water)	LGCC	http://www.mackay.qld.gov.au	07 4955 8622
Mareeba Shire Council	LGSC	http://www.msc.qld.gov.au	(07) 4030 3900
Maroochy Water Services	LGOC	http://www.maroochy.qld.gov.au	07 54758508
Maryborough City Council	LGSC	http://www.maryborough.qld.gov.au	(07) 4190 5800
McKinlay Shire Council	LGSC		(07) 4746 7166
Millmerran Shire Council	LGSC	http://www.millmerran.qld.gov.au	(07) 4695 1399
Mirani Shire Council	LGSC		(07) 4959 1101
Miriam Vale Shire Council	LGSC	http://www.miriamvale.qld.gov.au	(07) 4974 6222
Monto Shire Council	LGSC	http://www.monto.qld.gov.au	(07) 41669999
Mount Isa City Council	LGCC	http://www.mountisa.qld.gov.au	(07) 47473200
Mount Morgan Shire Council	LGSC	http://www.mountmorgan.com	(07) 4938 1022
Mundubbera Shire Council	LGSC	http://www.mundubbera.qld.gov.au	(07) 41655700
Murgon Shire Council	LGSC	http://www.murgon.qld.gov.au	(07) 41699000
Murilla Shire Council	LGSC	http://www.murilla.qld.gov.au	(07) 4627 1355
Murweh Shire Council	LGSC	http://www.murweh.qld.gov.au	(07) 4656 8355
Nanango Shire Council	LGSC	http://www.nanango.qld.gov.au	(07) 41716800
Nebo Shire Council	LGSC	http://www.nebo.qld.gov.au	(07) 4950 5133
Noosa Shire Council	LGSC	http://www.noosa.qld.gov.au	(07) 5449 5200
NQ Water	JLGG		07 4726 0000
Peak Downs Shire Council	LGSC	http://www.peakdowns.qld.gov.au	(07) 49887200
Perry Shire Council	LGSC	http://www.perry.qld.gov.au	0407 126 676
Pine Rivers Shire Council (Pine Water)	LGSC	http://www.prsc.qld.gov.au	07 3480 6834
Pittsworth Shire Council	LGSC	http://www.pittsworth.qld.gov.au	(07) 46198000
Redcliffe City Council	LGCC	http://www.redcliffe.qld.gov.au	(07) 3283 0233
Redland Shire Council (Redland Water)	LGSC	http://www.redland.qld.gov.au	07 3829 8539
Richmond Shire Council	LGSC		(07) 4741 3277
Rockhampton City Council	LGSC	http://www.rockhampton.qld.gov.au	(07) 4936 8000
Roma Town Council	LGCC	http://www.roma.qld.gov.au	(07) 4622 9249
Rosalie Shire Council	LGSC	http://www.rosalie.qld.gov.au	(07) 4696 7900
Sarina Shire Council	LGSC	http://www.sarina.qld.gov.au	(07) 49648100
SEQWater	CLC		07 3229 3399
Stanthorpe Shire Council	LGSC	http://www.stanthorpe.qld.gov.au	(07) 4681 5500
SunWater	GOC		
Tambo Shire Council	LGSC	http://www.tambo.qld.gov.au	(07) 4654 6133
Tara Shire Council	LGSC	http://www.tara.qld.gov.au	(07) 46653133
Taroom Shire Council	LGSC	http://www.taroom.qld.gov.au	(07) 46289555
Thuringowa City Council	LGSC	http://www.thuringowa.qld.gov.au	(07) 47738411
Tiaro Shire Council	LGSC	http://www.tiaro.qld.gov.au	(07) 41292133
Toowoomba City Council	LGCC	http://www.toowoomba.qld.gov.au	(07) 4688 6611
Townsville City Council (CitiWater)	LGOC	http://www.townsville.qld.gov.au	07 4727 8777
Waggamba Shire Council	LGSC	http://www.waggamba.qld.gov.au	(07) 4671 7400
Wambo Shire Council	LGSC	http://www.wambo.qld.gov.au	(07) 4669 9000
Warroo Shire Council	LGSC	http://www.warroo.qld.gov.au	(07) 46265299
Warwick Shire Council	LGSC	http://www.warwick.qld.gov.au	(07) 4661 0414
Whitsunday Shire Council	LGSC	http://www.whitsunday.qld.gov.au	(07) 49450200
Wide Bay Water Corporation	LGOC		07 4197 4101
Wondai Shire Council	LGSC	http://www.wondai.qld.gov.au	(07) 4168 5155

South Australia – 8 WSBs / 3 Legal Structures / 4 Assessed			
WSB	Legal Type	Website/Email	Contact
SA Water Corporation	GOC	www.sawater.com.au	
Barossa Infrastructure LTD	CLC	N/A	08 8563 2300
United Water	CLC	http://www.uwi.com.au/	Tel: 61 8 8301 2700
Central Irrigation Trust	IT	N/A	Tel 61 8 8580 7100
Renmark Irrigation Trust	IT	ritrust@riverland.net.au	Tel 61 8 8586 6911
Goldenheights Irrigation Trust	IT	N/A	
Sunlands Irrigation Trust	IT	N/A	08 8541 2165
Langhorne Creek Water Company	Undetermined	N/A	0407373106

Tasmania - 14 WSBs / 5 Legal Structures / 29 Assessed			
WSB	Legal Type	Website/Email	Contact
Break O' Day	LGSC		
Burnie	LGCC		03 6431 1033
Central Highlands	LGSC		62863202
Dorset	LGSC		63526500
Flinders	LGSC		
Glamorgan Spring Bay	LGSC		62574777
Huon Valley	LGSC		62648400
King Island	LGSC		64621177
Northern Midlands	LGSC		63977303
West Coast	LGSC		64714700
Hobart Water	JLGG		03 6233 6533
Esk Water	JLGG		03 6336 2512
Cradle Coast	JLGG		03 6428 2339
DPIWE	GD		
Rivers & Waters Commission	GD		
Cressy-Longford Irrigation Scheme	Undetermined		6397 6174
Winnaleah Irrigation Scheme	Undetermined		(03) 6354 2455

Victoria - 24 WSBs / 2 Legal Structures / 24 Assessed			
WSB	Legal Type	Website/Email	Contact
Barwon Water	SB	www.barwonwater.vic.gov.au	(03) 5226 2500
Central Highlands Water	SB	www.chw.net.au	(03) 5320 3100
City West Water	GOC	www.citywestwater.com.au	131 691
Coliban Water	SB	www.coliban.vic.gov.au	(03) 5434 1222
East Gippsland	SB	www.egwater.vic.gov.au	(03) 5152 5335
First Mildura	SB	enquiry@fmit.com.au	(03) 5021 1811
Gippsland Water	SB	www.gippswater.com.au	(03) 5177 4600
Glenelg Water	SB	Glenelg Region Water	(03) 5551 0400
Goulbourn – Murray Water	SB	www.gvwater.vic.gov.au	(03) 5832 0400
Goulbourn Valley Water	SB	www.g-mwater.com.au	(03) 5833 5500
Grampians Water	SB	www.grampianswater.org.au	(03) 5382 4611
Lower Murray	SB	www.lmrwa.vic.gov.au	(03) 5051 3400
Melbourne Water	GOC	www.melbournwater.com.au	131 722
North East Water	GOC	www.nerwa.vic.gov.au	1300 361 622
Portland coast Water	GOC	johnw@portlandwater.net.au	(03) 5523 6244
South East Water	GOC	www.sewl.com.au	(03) 9552 3000
South Gippsland Water	SB	www.sgwater.com.au/	(03) 5682 1222

South West Water	SB	.rwor@swwa.com.au	(03) 5564 7600
Southern Rural	SB	www.srw.com.au	(03) 5139 3100
Sunraysia	SB	www.srwa.org.au	(03) 5021 9777
Western Water	SB	www.westernwater.vic.gov.au	1300 650 425
Westport Water	SB	www.westernportwater.com.au	(03) 5952 2393
Wimmera Mallee	SB	www.wmwater.org.au	(03) 5362 0200
Yarra Valley	GOC	www.yvw.com.au	131 721

Western Australia – 8 WSBs / 5 Legal Structures / 22 Assessed			
WSB	Legal Type	Website/Email	Contact
Water Corporation	GOC		(08) 9420 3006
Harvey Water	CLC		(08) 9729 0100
Busselton Water Board	WB		(08) 9754 1811
AQWest	WB		(08) 9780 9500
Gascoyne	Undetermined	N/A	(08) 9941 4488
Ord	Undetermined	N/A	N/A
Preston	Undetermined	N/A	N/A

Appendix E: Extended Content Analysis Summary by State

The following tables detail the number of WSBs that reported on a listed category or subcategory. The categories are listed by State, Governance Type and there is a national summary. The National percentage summary column lists the mean percentage for all WSBs content analysed.

CA Category	National	N/Y	NSW	N/Y	QLD	N/Y	SA	N/Y	TAS	N/Y	VIC	N/Y	WA	N/Y
Community / Stakeholder Consultation	1.8%	107/85	2.6%	24/27	1.4%	55/33	1.5%	1/3	1.5%	10/6	1.9%	8/16	0.0%	7/0
Complaint – Govt. Policy (Water)	2.2%	186/6	3.0%	47/4	1.5%	86/2	0.0%	4/0	0.0%	16/0	0.0%	24/0	0.0%	7/0
Corporate Social responsibility	1.6%	161/31	1.4%	45/6	1.3%	71/17	0.0%	4/0	0.0%	16/0	2.1%	16/8	0.0%	7/0
Current water sources	1.4%	156/36	1.6%	47/4	0.8%	73/15	2.2%	1/3	1.2%	11/5	1.1%	17/7	4.6%	5/2
Demand Management - Current	1.4%	163/29	2.2%	43/8	0.7%	81/7	1.1%	2/2	0.3%	15/1	1.4%	14/10	3.6%	6/1
Demand Management - Future	1.1%	134/58	1.5%	39/12	0.9%	67/21	1.0%	2/2	0.8%	13/3	1.3%	7/17	1.7%	5/2
Environment Plan	0.9%	167/25	0.9%	43/8	0.9%	82/6	0.0%	4/0	0.0%	16/0	1.0%	14/10	1.0%	6/1
ESD	1.8%	130/62	2.0%	40/11	1.5%	62/26	0.9%	2/2	1.5%	13/3	2.2%	6/18	1.0%	5/2
Infrastructure – Maint. (Water)	2.0%	143/49	1.4%	41/10	1.2%	74/14	10.2%	1/3	1.0%	11/5	1.6%	11/13	2.3%	5/2
Infrastructure – New (Water)	1.8%	117/75	1.3%	40/11	1.5%	53/35	0.8%	3/1	1.8%	11/5	2.2%	5/19	4.6%	4/3
Internal or External audit process	1.5%	156/36	0.9%	46/5	1.2%	69/19	2.8%	3/1	3.3%	12/4	1.0%	18/6	1.7%	6/1
Praise – Govt. Policy (Water)	1.8%	185/7	2.4%	47/4	0.0%	88/0	0.0%	4/0	0.0%	16/0	1.2%	23/1	1.7%	5/2
Sustainability & water cycle strategy	1.5%	161/31	1.3%	42/9	1.2%	77/11	3.1%	2/2	1.4%	15/1	1.6%	17/7	3.0%	6/1
Water reuse or Grey water	1.4%	160/32	0.9%	48/3	0.7%	76/12	0.0%	4/0	1.1%	14/2	2.1%	9/15	0.0%	7/0
Water sales	1.8%	159/33	4.5%	48/3	1.2%	79/9	4.3%	2/2	2.3%	14/2	1.1%	9/15	6.2%	6/1
Complaint – Govt. Policy (Non-Water)	2.1%	170/22	3.5%	43/8	1.7%	75/13	0.0%	4/0	0.8%	15/1	0.0%	24/0	0.0%	7/0
Praise – Govt. Policy (Non-Water)	1.5%	183/9	1.4%	46/5	1.7%	84/4	0.0%	4/0	0.0%	16/0	0.0%	24/0	0.0%	7/0
Current drought	1.2%	124/68	1.6%	32/19	1.1%	61/27	1.0%	2/2	0.0%	16/0	1.3%	6/18	0.5%	6/1

N = No entry
Y = Entry recorded

Source: McKay, 2006. CRC-IF Project 1.06

	CLC	N/Y	R-LGA	N/Y	U-LGA	N/Y	IT	N/Y	CLC = Corporations Laws Company
Community / Stakeholder Consultation	1.7%	3/2	1.8%	68/43	1.5%	6/8	1.8%	N/Y	
Complaint – Govt. Policy (Water)	0.2%	4/1	3.1%	107/4	0.0%	14/0	0.0%	2/2	
Corporate Social responsibility	0.0%	5/0	1.3%	98/13	0.8%	9/5	0.0%	4/0	
Current water sources	1.4%	2/3	0.8%	97/14	0.9%	11/3	2.4%	2/2	
Demand Management - Current	1.1%	2/3	0.9%	104/7	1.4%	13/1	1.7%	2/2	
Demand Management - Future	1.3%	2/3	0.9%	88/23	1.4%	12/2	1.7%	2/2	R-LGA = Rural Local Government Authority
Environment Plan	0.4%	3/2	0.8%	103/8	1.5%	11/3	0.0%	4/0	
ESD	1.7%	3/2	1.4%	88/23	1.6%	11/3	0.7%	2/2	
Infrastructure – Maint. (Water)	2.2%	3/2	1.0%	99/12	0.9%	10/4	8.7%	1/3	
Infrastructure – New (Water)	2.3%	2/3	1.5%	77/34	1.1%	10/4	0.7%	3/1	
Internal or External audit process	1.3%	2/3	1.1%	97/14	2.3%	9/5	0.0%	4/0	
Praise – Govt. Policy (Water)	1.8%	3/2	0.0%	111/0	0.0%	14/0	0.0%	4/0	U-LGA = Urban Local Government Authority
Praise – Govt. Policy (Water)	1.7%	2/3	1.0%	101/10	0.6%	11/3	3.4%	3/1	
Sustainability & water cycle strategy	0.2%	4/1	0.9%	99/12	0.5%	12/2	0.0%	4/0	
Water reuse or Grey water	3.1%	2/3	1.1%	107/4	2.0%	13/1	3.7%	2/2	
Water sales	0.0%	5/0	2.3%	92/19	0.7%	13/1	0.0%	4/0	IT = Irrigation Trust
Complaint – Govt. Policy (Non-Water)	0.0%	5/0	1.6%	104/7	0.0%	14/0	0.0%	4/0	
Praise – Govt. Policy (Non-Water)	0.2%	2/3	1.4%	79/32	0.7%	11/3	1.1%	1/3	
Current drought									
GOC									
Community / Stakeholder Consultation	1.5%	7/8	2.1%	7/11	2.1%	4/8	0.5%	N/Y	GOC = Government Owned Corporation
Complaint – Govt. Policy (Water)	0.0%	15/0	0.0%	18/0	0.0%	12/0	0.0%	2/2	
Corporate Social responsibility	2.6%	10/5	1.4%	13/5	2.5%	10/2	2.0%	4/0	
Current water sources	1.2%	12/3	1.2%	12/6	0.0%	12/0	1.5%	3/1	
Demand Management - Current	0.9%	11/4	1.6%	9/9	0.4%	11/1	1.2%	1/3	
Demand Management - Future	0.9%	5/10	1.4%	5/13	0.5%	10/2	1.2%	3/1	
Environment Plan	1.3%	12/3	0.9%	10/8	0.0%	12/0	0.4%	3/1	SB = Statutory Body
ESD	1.6%	6/9	2.2%	4/14	3.8%	8/4	1.9%	2/2	
Infrastructure – Maint. (Water)	1.6%	4/11	1.4%	9/9	1.2%	8/4	1.4%	1/3	
Infrastructure – New (Water)	1.6%	7/8	2.8%	3/15	0.8%	8/4	2.4%	1/3	
Internal or External audit process	1.5%	11/4	0.9%	14/4	0.9%	10/2	2.4%	1/3	
Praise – Govt. Policy (Water)	0.6%	14/1	1.3%	17/1	0.0%	12/0	0.0%	4/0	LGOC = Local Government Owned Company
Sustainability & water cycle strategy	2.0%	8/7	1.3%	14/4	2.1%	11/1	0.8%	2/2	
Water reuse or Grey water	2.3%	11/4	2.2%	7/11	1.1%	11/1	0.0%	4/0	
Water sales	1.2%	9/6	1.1%	7/11	0.4%	10/2	2.2%	2/2	
Complaint – Govt. Policy (Non-Water)	0.0%	15/0	0.0%	18/0	1.4%	10/2	0.0%	4/0	JLGG = Joint Local Government Owned Company
Praise – Govt. Policy (Non-Water)	0.6%	14/1	0.0%	18/0	2.2%	11/1	0.0%	4/0	
Current drought	0.9%	5/10	1.6%	5/13	1.1%	9/3	0.0%	4/0	

N = No entry Y = Entry recorded Source: McKay, 2006. CRC-IF Project 1.06

- NOTES -



Partner Organisations

CHARLES STURT
UNIVERSITY



Australian Government
Land & Water Australia



NSW DEPARTMENT OF
PRIMARY INDUSTRIES



Government
of South Australia



SOUTH AUSTRALIAN
RESEARCH AND
DEVELOPMENT
INSTITUTE



THE UNIVERSITY OF
MELBOURNE



Cooperative Research Centre for
IRRIGATION FUTURES

