Brunswick River Dam

Proposal for a sustainable water future

A Private Infrastructure & Development Project by Southern Cross Water & Infrastructure Corporation Pty Ltd

October 2008

PROPOSAL FOR Brunswick River Dam

Foreword

In today's world, water is a scarce and valuable life sustaining resource.

Considerable volumes of natural drinking water are lost, before reaching the consumer.

Our mission is to lower loss by harnessing natural water and deliver to consumptive users, by lower energy consumption, that assists in improving our environment.

The importance of water as a social good and a human right has been well recognised in numerous international flora.

The United Nations as Committee on Economic, Social and Cultural Rights declared access to water a fundamental human right, entitling everyone to affordable, safe and accessible water supplies for domestic uses.

While water is recognised as a human right and social good that should be affordable to all people, this does not mean that water should or can be free for all people.

Extracting, collecting, treating, testing and distributing water all require certain levels of infrastructure and resources.

In order to deliver potable water to the tap, maintain system infrastructure and expand to underserved areas, a sustainable source of funds needs to be maintained. [OECD 2007].

It is in this spirit and endeavour that this Corporation has taken the initiative to proceed.

Contents

Maps and Diagrams

Acknowledgements:
Front Cover Photography & Design: Kingston Marketing
Internal Design, Layout & Typesetting: Kingston Marketing
Copy: Southern Cross Water & Infrastructure Corporation Pty Ltd
Maps & Diagrams: Brunswick River Catchment and Location © K.Annan 2006
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Southern Cross Water & Infrastructure Profile

Southern Cross Water and Infrastructure Corporation Pty Ltd (SCWIC) the project proponent is a Caruso Group owned Western Australian Corporation, specifically incorporated business unit to invest and undertake water, infrastructure, and renewable sustainable energy initiatives in Western Australia.

The Group has further, a long and active standing engineering disciplined recognition in the construction fields of civil engineering, energy, water and industrial mining disciplined infrastructure projects, and it is aligned with major national and global engineering and operator industry leaders in these fields.

The operating group has active, integrated, owned and operating managed companies specialising in heavy civil engineering, earthmoving, infrastructure, raw materials and mining services, as stand alone successful operations, the parent has further the capacity to construct and commission the project works.

The Southern Cross Water and Infrastructure "Corporate, Engineering and Environmental" Team are committed to the Projects execution.

The Project's live key infrastructure components of the Brunswick Dam Project consist and includes:

Project Calendar, Background and Approach

Reports

• Report WRAP 1 1996 from Water & Rivers Commission :

"The Brunswick River is one of the largest undeveloped freshwater resources on the Darling Scarp (Western Australia), it has the potential to play a major role in the future water supply developments in the South West.

Water quality is fresh, average TSS value of 230mg/l.

The Proposed Brunswick Dam will complete a revised 2008 study undertaken by independent authorities. to support dam construction and linking into the Stirling Dam IWSS Trunk Main".

• Report by Southern Cross Water and Infrastructure Corporation – 2005, updated by Golder & Associates 2008.

• Report by Dr David Reynolds October 2006
(The University of Western Australia – October 2006) :

"A comparison of techniques for investigating groundwater – surface water interactions along the Brunswick River, Western Australia."

• Report Water Corporation 'Water Forever' – August 2008:

"Water Sources - Brunswick Dam" a possible 30gl.

Reports

• Report Independent to SCWIC by Golder & Associates on the Proposed Brunswick River Dam Reservoir Operations - October 2008:

"Primary objectives of the work outlined in this report include:

- Review of existing hydrometerological data in the vicinity of the project area.
- Development of a reservoir operation model for the proposed Dam 5.
- Assessment of reliable yield from the dam; and
- Preliminary assessment of the impact of future changes in catchment rainfalls (and flows) on the reliability of the proposed dam."

Conclusions:

20 - 25g storage @ 70% climate risk reliability can be constructed.

• Report WRP 39 2001 from Water & Rivers Commission:

Brunswick Catchment Area Water Source Protection plan.

• Report Integrated Water Supply Scheme source development plan 2005 :

Clause 4.12 states

"A new dam on the Brunswick River has the potential to supply up to 30 gl a year to the IWSS. While it is a highly prospective water source, it is anticipated that up to five years will be required to complete regulatory approval processes."

• Report Water Corporation – Climate Change, the Environment and water in 2027 (Report in Progress)

- Report CSIRO - (In progress due to be released in December 2009 -South West Sustainable Yields (SWSY).

  The most comprehensive assessment of water yield in 2030 in Western Australia ever undertaken.

  SCWIC have held discussions with CSIRO and will provide input if required for the Brunswick area, but supports this CSIRO initiative.

Key Features- Operational

- Project is Climate Risk Weather Rainfall Insured (First in Western Australia).
- It further ranks as a serious option (as per the previous published Reports) and, under the Water Sources Forever Summary as shown on the attached table under Appendix (Table), as a Water Storage Infrastructure (Dam) 15 - 25 gl and further staging to 70gl.
- Water distribution infrastructure (pipes, pumps, scour valves) including fire hydrants for fire control that link IWSS, including visual amenity.
- Other support essential infrastructure, (telecommunications, power and access), presently installed and available.
- Construction of community shared facilities, and strict awareness to land management and protection.
- Lowest cost water delivery / 100 year life cycle and lowest water production energy rating.
- Meets greenhouse emissions regime with offset carbon footprint.

A unique civil engineering infrastructure feature of the Project is the strategic link forming a *"Central Regional Water Hub"* allowing inter-connecting to the *Water Corporation's Harris, Stirling and Wellington DAMS* existing water storage and allow the transport of water via new and existing pipelines into the IWSS, to be received at Stirling Dam.

The Project further allows water intake delivery from the existing Wellington Dam into the proposed Brunswick Dam to recharge and supplement increased Brunswick Dam Water Volume Capacity by allowing controlled water blending (dention) compliant to Australian Drinking Water Guidelines, to be offered as a potable water supply source into the IWSS.

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Key Elements to the Western Australian Government

- No financial input capital required from the West Australian Government and allows preservation of treasury expenditure for other social and economic needs. The project offers the carriage risk free balance sheet debt to State Treasury and Finance.
- Delivery of 15-20 gl of water commencing from the year 2013-2014 in meeting second source water initiative supply demand and completing strategic infrastructure water "hub" further allows re-charge water from Wellington Dam into the proposed "Brunswick Dam" to supplement reliable supply.
- Delivery Risk Weather Climate Insurance to safeguard and guarantee water delivery purchase to the Government.
- Formation of Water Research Team, to study ongoing surface water resources and climate change impacts on ecology, hydrology and bio-diversity to work with State and national institutions.
- Provision for shared community facilities.

Key Outcomes - Project Objectives

Location Attributes

Proposed footprint intended for construction and inundation flooding:

- Passive crown (UCL) and commercial Forrest Products Commission plantation land.
- Excellent steep natural valley and rock basin valley floor.
- Use of natural valley basin will enable possible future construction of a much larger staged dam with storage future capacity beyond 100 gl.

Water Supply and Highlights

Integrating into existing water pipe network (IWWS):

- Linking hub for the existing Southern IWWS system.
- Provide detention time for pathogen breakdown, from other water services and blending of poorer quality water from Wellington Dam with Brunswick.
- Access to government water, rail, road and power / energy infrastructure.
- Opportunities for storing surplus water that would otherwise be lost.
- 17.5 km water pipeline connection to IWWS at Stirling Dam.
- Creates and completes the IWSS water hub, linking Wellington, Stirling and Harris Dams; and
- Allows strategic Infrastructure Water Pipelines allows for third party access.

- Reducing greenhouse gases and benefitting climate change, (low Co2 emissions).
- Total dam footprint - 200ha - very small impact.
- Located to receive overflows from other nearby dams (using existing infrastructure trunk line) and management attention to environmental awareness of pipeline corridor "route", with little clearing, thereby minimising impacts to erosion and rehabilitation.

Project Risk- Reliable District Rainfall

Water Modelling and Water Risk Management Strategy:

- Ecological water and ecosystems requirements are met.
- Environmental water hydrology provisions are met.
- Weather risk insurance against delivery.
- Allows environmental balance for bio-diversity / wetlands ecology protection.
- Allows water from Wellington Dam to re-charge the storage basin.

Project Deliverables

- Meets determined timelines for a supplementary (part) 45gl water demand for 2013 (Source: Our Water Future 2030).
- Best practice, lowest water pricing and energy rating.
- Adaptation to surface and maintains ground water resources by recharging the groundwater aquifer from the Darling Scarp.
- Allows summer flow environmental release to an otherwise stressed (summer flow) river system.
- No greenhouse impact.
- Provides water quality and purity.

- Local construction materials, resources and industry engagement.
- Forms strategic Hub, integrating into existing IWSS trunk pipeline and can be integrated into smaller regional and major dams, Wellington, Stirling and Harris Dams.
- Project location and local suitable soil / river rock construction materials.
- Sustainable water resource.
- Removes measured risk of severe water restrictions.
- Comprehensive Environmental Impact Assessment Study.
- Staged development to increase storage capability and capacity.
- Funded and operated by private company - (No cost to State Government).
- Meets Economic Regulatory Authority Regulations as an independent PPE service provider.

Project Deliverables

Historical Milestones to Date(s)

2001 to 2002

- Southern Cross Water and Infrastructure Corporation has an interest in water infrastructure development, and the stream flow of all the major South Western rivers systems flowing westerly from the Darling Scarp.

2002 - 2005

- Reconnaissance, civil engineering, hydrology / study of potential fresh water rivers and dam sites in South West of Western Australia.

2007

- Decision to proceed with Environmental Protection Authority risk assessment study and feasibility.

Future Milestones - Ongoing

2008

- Environmental risk studies continuing.
- Draft and final scoping documents to be drafted and reviewed.
- Draft Environmental Risk Study 2008 (December) - review.
- Review CSIRO South West Sustainable Yields Climate Water Surface and Ground Water Report, under the 2030 continuing best available scientific weather models to assist climate, surface water and demand estimation for our project.

Future Milestones cont.

Second Half of 2009

- Environmental Impact Assessment submitted to the Environmental Protection Authority and subject to peer review.
- Environmental Protection Authority Minister's decision - approval with conditions.

Fourth Quarter of 2009

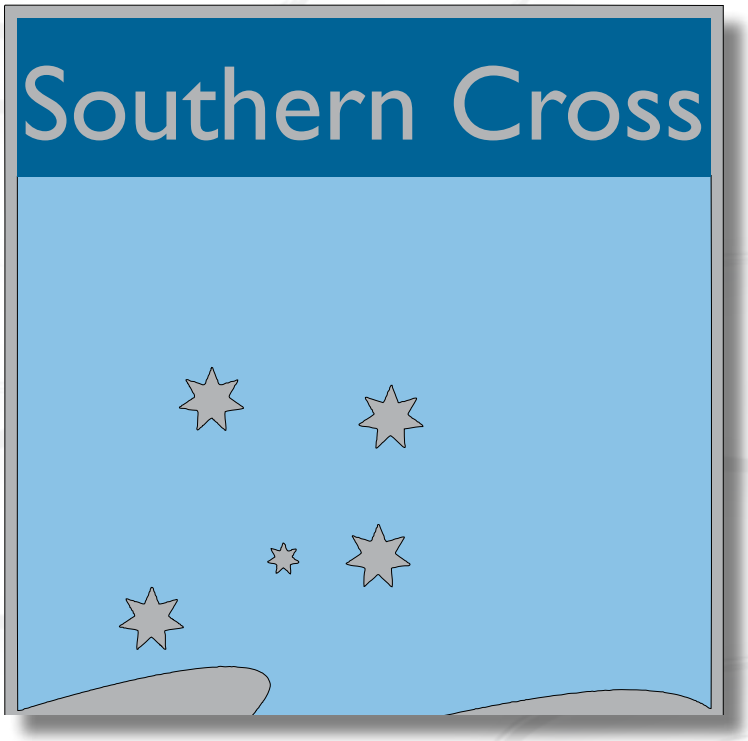
- Dam construction begins.
- Eighty weeks construction period.

First Quarter of 2011

- Commissioned.
- Winter of 2011 / 2012, the reservoir is filled.

2013

- 20 gl saleable deliverable water available for delivery into Stirling Dam.
- Water available to meet Water Corporation Sustainable Water requirements (Source: Our Water Future 2030).



Map 1.1 Locality Map
Brunswick River Catchment and Location

Other PPE options are available to the Western Australian Government

Southern Cross Water & Infrastructure Corporation constructs the Dam and pipelines; and

- The State Government elects to either build and own the Dam, the pipelines and pump stations and live infrastructure; *and*
- Form a PPE Alliance between Water Corporation and SCWIC; *and / or*
- Lease the Transport (Pipeline) Infrastructure for 99 years from SCWIC; *or*
- The Government lease the entire project for 99 years from SCWIC; *or*
- The Government purchase only water under 50 year supply delivery contract; *or*
- Southern Cross Water & Infrastructure Corporation own the asset and the Government manage;
- Other, Brunswick models that benefit greater community, social and economic needs including involvement of the Indigenous Australians.
- Other models that have greater community, social and regional benefit into the sustainable cycle of water.

Suggested Target Construction Programme Subject to Environmental Protection Authority Approval

EPA Final Report 2009		Completed June
Construction (Commencement)	(Subject to EPA approval)	(3/4) 2009
Construction (Completion)	(Subject to EPA approval)	(1/4) 2011
Water Delivery commencing 18gl - 20gl into IWSS	(Subject to EPA approval)	(3/4) 2012/13
Capital Costs		
Water Transfer Pipelines to Stirling and Harris Dams		$70M
Construction of Main Dam embankment, spillway and Infrastructure		$70M
Construction of Access Roads		$5M
Community Facilities (Indigenous / European) and formation of Water Research Team		$5M
TOTAL COST at October 2008		$150M

Table 1.1

Comparative Costs / Scenarios to other Proposed Western Australian Water Projects

Proponent	Comaprison	Capital Cost	Time to Compete	Comments	Costed	Delivery Date	Cost per GL
WA Govt.	Pipeline Fitzroy	$11.9 Billion	6 years / 72 months	Cost Prohibitive	2007	Not Certain	-
WA Govt.	Canal Ord	$14.5 Billion	6 years / 72 months	Cost Prohibitive	2007	Not Certain	-
WA Govt.	Recycle Process Plant (45gl)	$500 Million	5 years / 60 months (Not Proven)	Not Proven	2007	Not Certain	-
Various	Ocean Super Tanker	$6.2 Billion	Unknown	Not Proven, untested	2006	Not Certain	-
Various	Tug Boats / Water Bag	$5.3 Billion	Unknown	Not Proven, untested	2006	Not Certain	-
SCWIC	Cloud Seeding	Unknown	Unknown	Not Proven, untested, in discussions with Hydro Tasmania	-	Not Certain	-
WA Govt.	Yarragadee Aquifer 45gl / yr	$445 Million	2.5 years to 30 months	Scientific Dilemma, untested. Potential ecological/ Geotechnical Environmental impacts. Further trials and research required Public Opposition to project.	2007	Not Certain	High
WA Govt.	Southern Desalination Plant (45gl) Binningup	+$1 Billion	2 years / 24 months	Last Resort - EPA Approval. Public Opposition. Incorrect location. High energy requirement and greenhouse gas.	2008	2013	High
WA Govt.	Wellington Desalination Plant	$750 Million to $1 Billion	Unkown	No approval - cost prohibitive	2007	Uncertain	High
SCWIC	Brunswick "New Generation" Dam 25gl with staged development. Forms central water infrastructure "Hub"	$150 Million	2 years / 24 months	EPA in progress. Scientifically tested and proven, no adverse known environmental impacts. Provides potable water delivery.	2008	2012/13	Low

Table 1.2

Summary and Conclusion

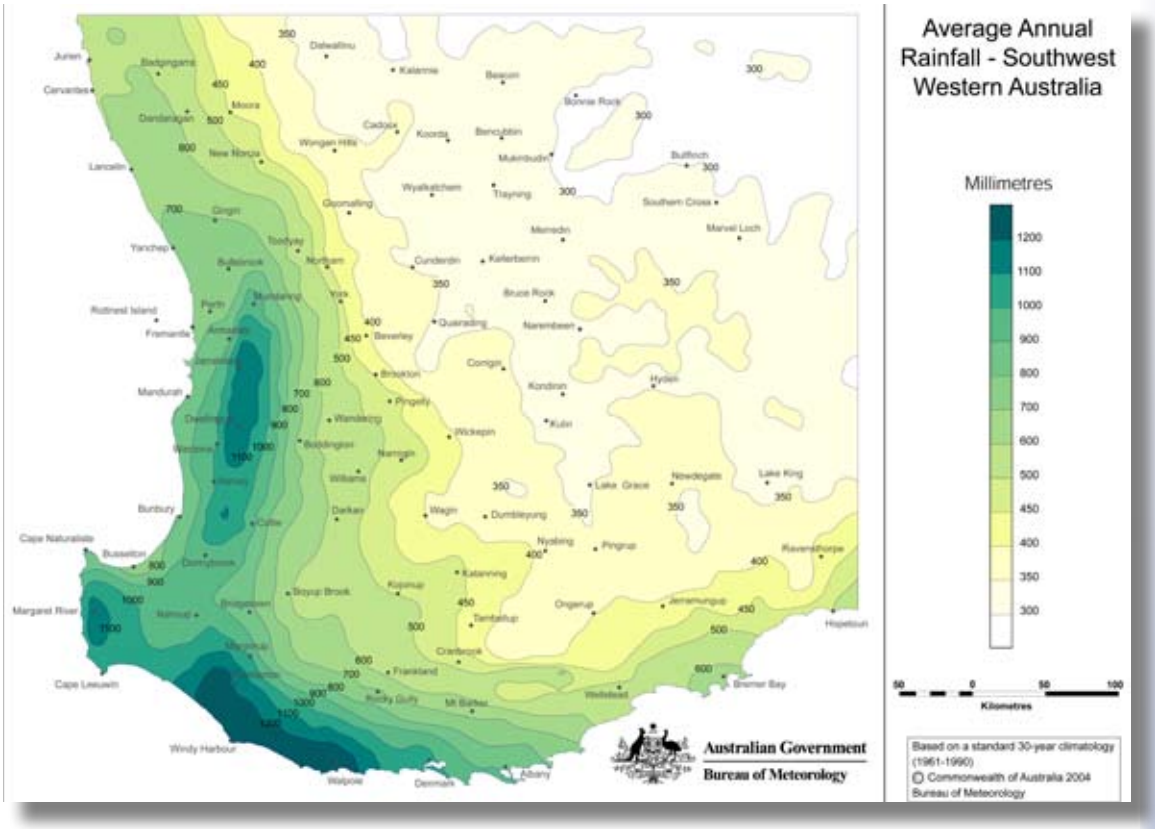
Brunswick Dam Project represents an investment for the sustainable water future that can deliver with reliability of 15 / 25gl with best available climate science of 70% to 90% reliablity per year, subject to climate as outlined by an independent specialist hydrologist Dam Reservoir consultancy– Hydro Metrological Study Report of October 2008.

Capital Project costs (externally) of $150 million representing best industry measured expenditure for capital delivery amortised life project value have been costed.

The project further has staged developments allowing expansion in future years; and the project initiative is in keeping with the Western Australian Government review the ERA's recent submission to "deregulating water reform". We would consider our Corporation as being ideally placed to be an early entrant into the "deregulated" water industry in Western Australia.

Southern Cross Water and Infrastructure Corporation scans the new horizon of opportunity, responsibility and vision to undertake initiatives that contribute to enriching the lives of Western Australians whilst engaging principles in responsible and ethical investment in securing sustainable livelihoods.

"The company has a culture of thinking beyond conventional boundaries."



Map 1.2 Rainfall Map- Based on a Standard 30-year Climatology
Courtesy Australian Government Bureau of Meteorology
© Commonwealth of Australia 2004

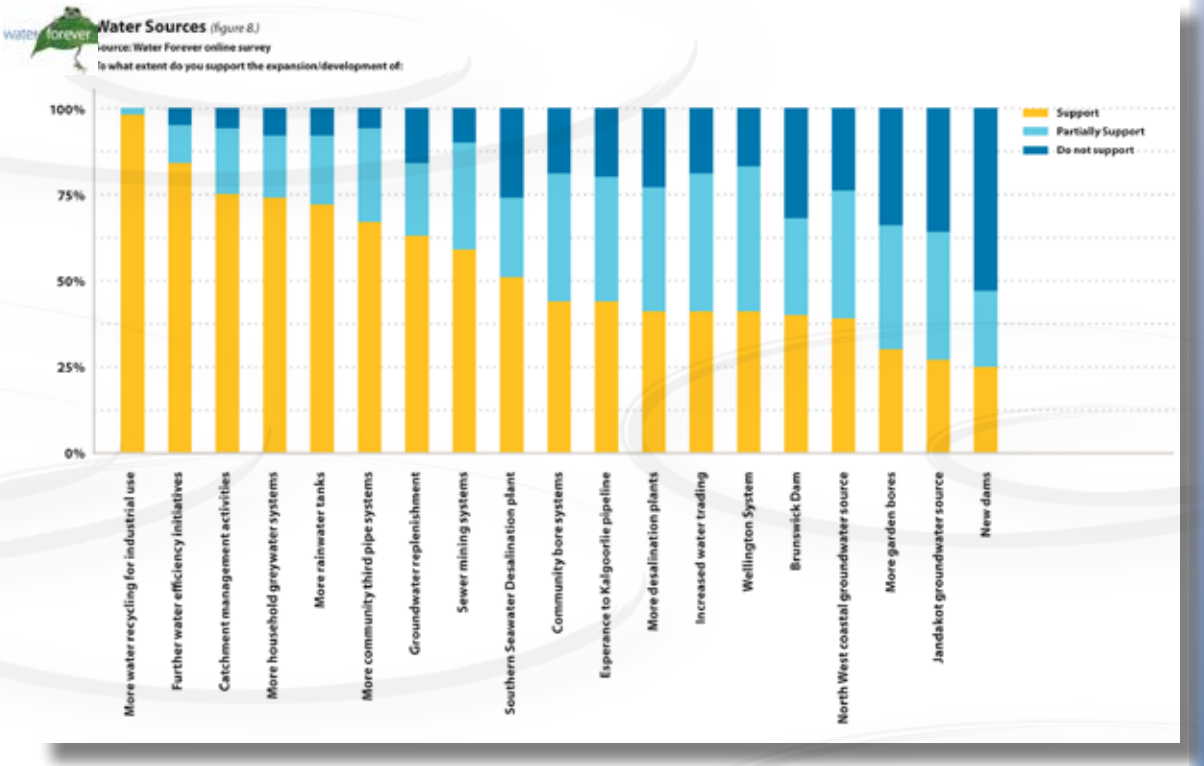
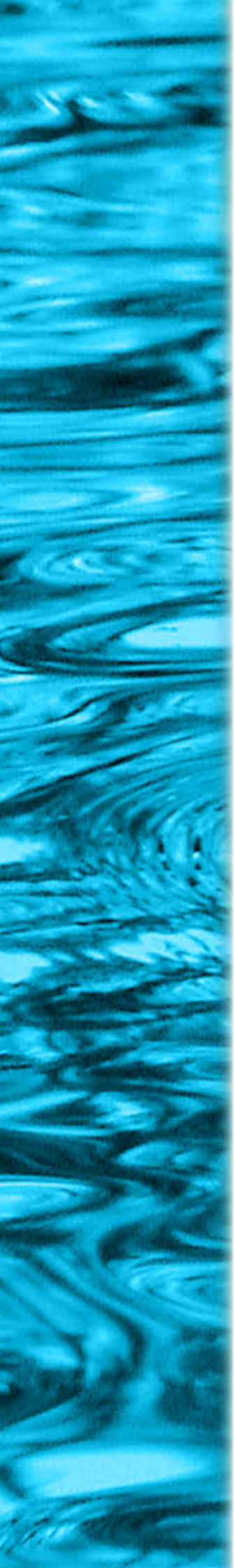


Diagram 1.1 Water Sources *(figure 8)*
Water Corporation- Water Forever *Reflections*
Source: Water Forever online survey published 2008
© Water Corporation 2008



A Company of uncommon enterprise and vision.

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