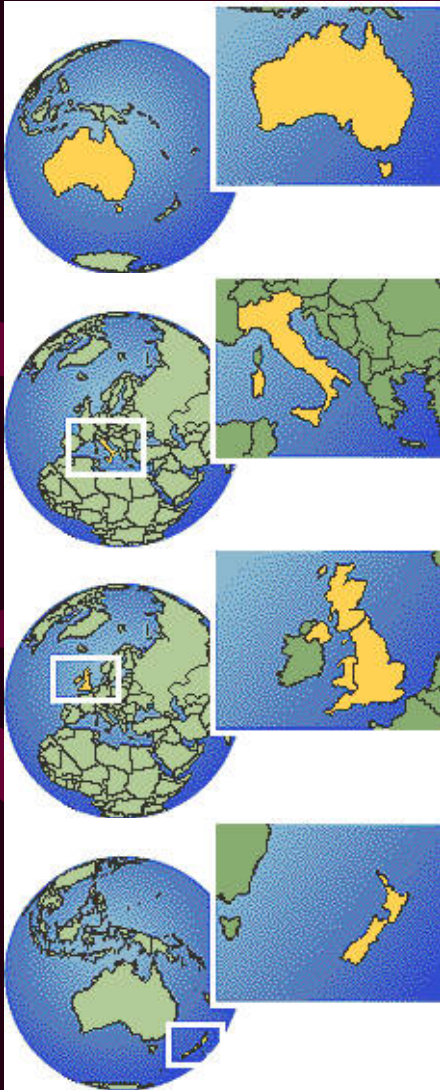


Will Water Limitations Drive Better Management: Gladstone Drought: Comalco Perspective

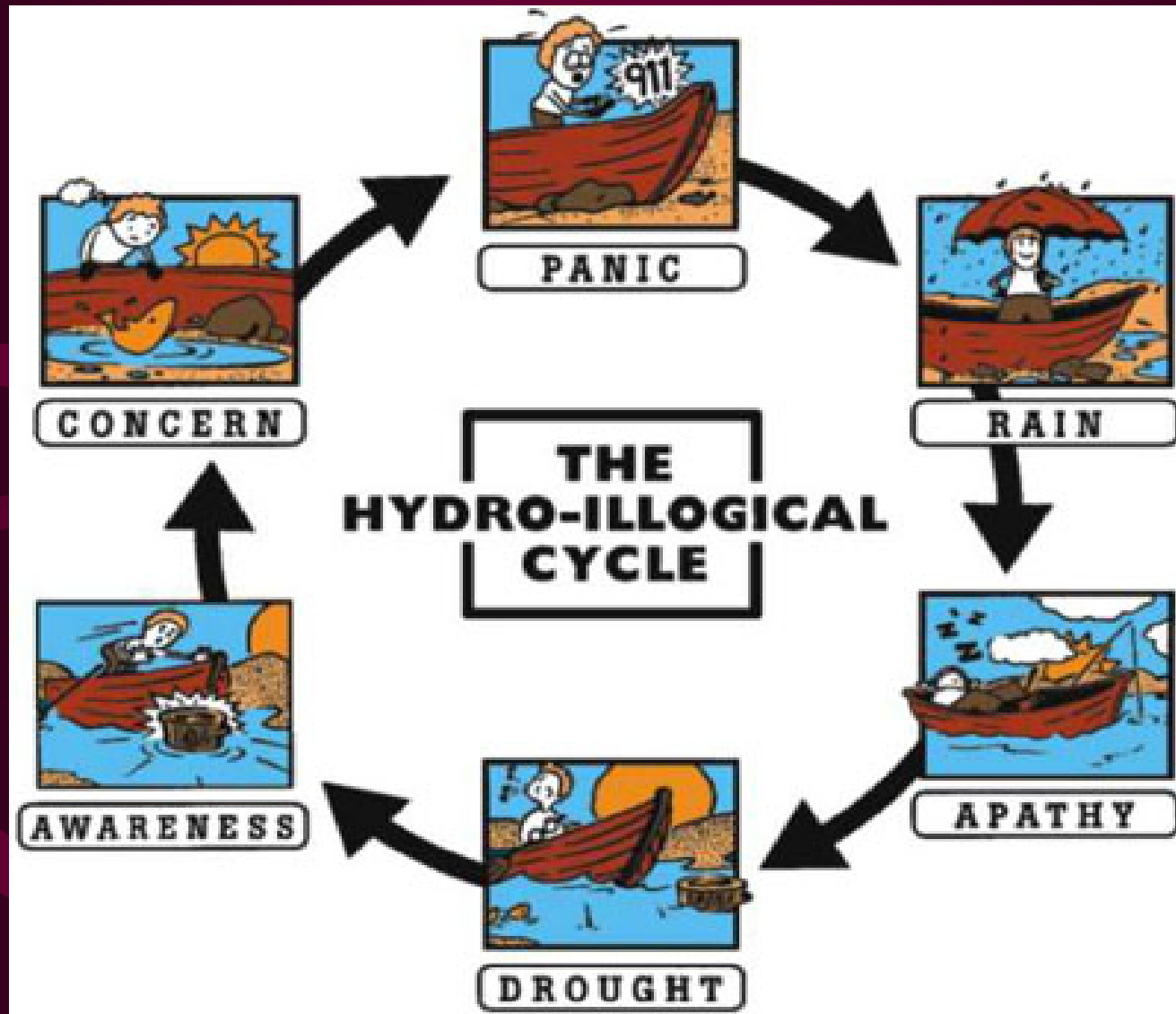
Dr Keith Halford
Manager Environment, Comalco

COMALCO



- Wholly owned subsidiary of Rio Tinto
- Investments in 9 operations in Australia, Europe and NZ
- Focus is on **bauxite** – alumina – aluminium
- HQ in Brisbane
- Employs ~3,400 people

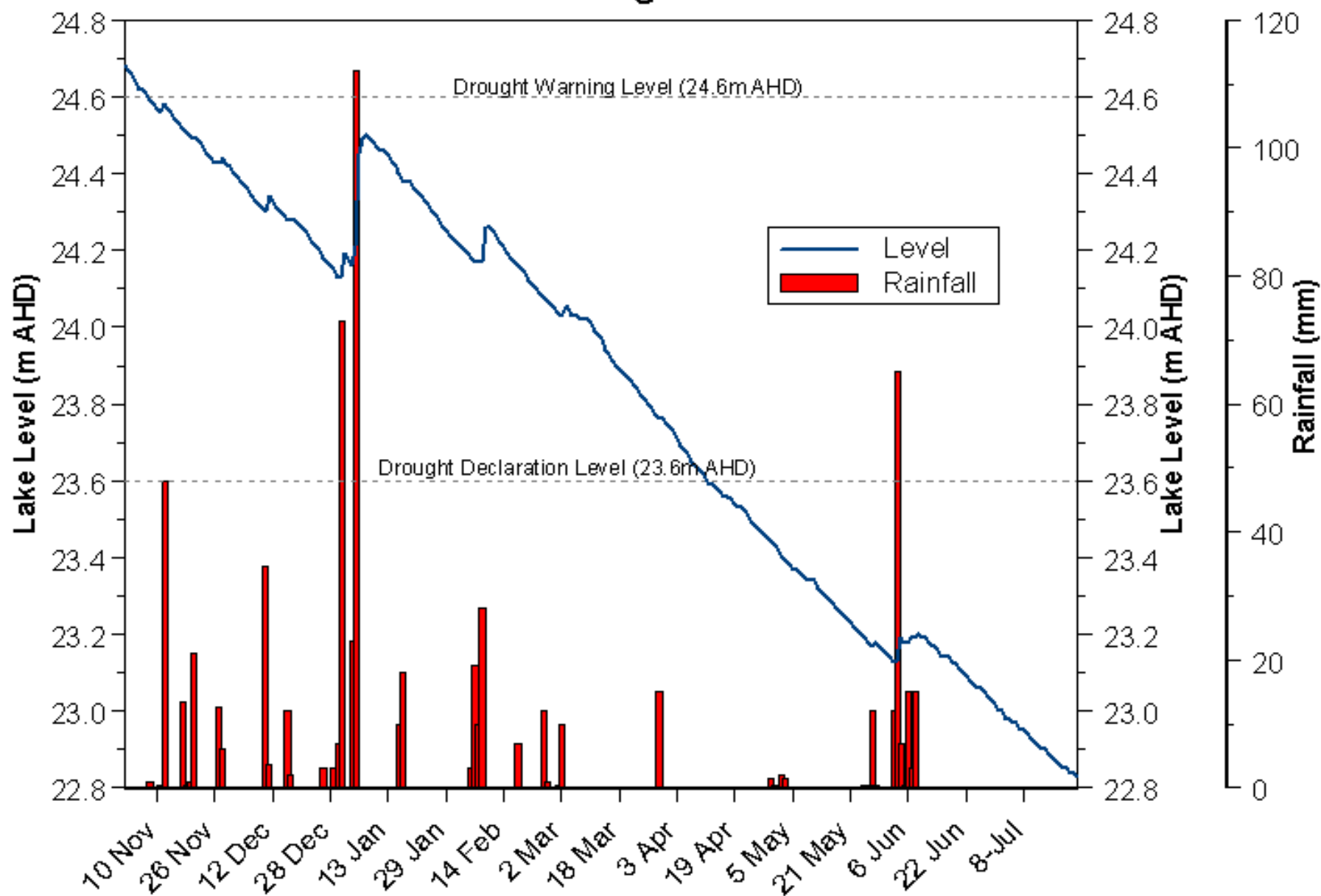
The Hydro-illogical Cycle



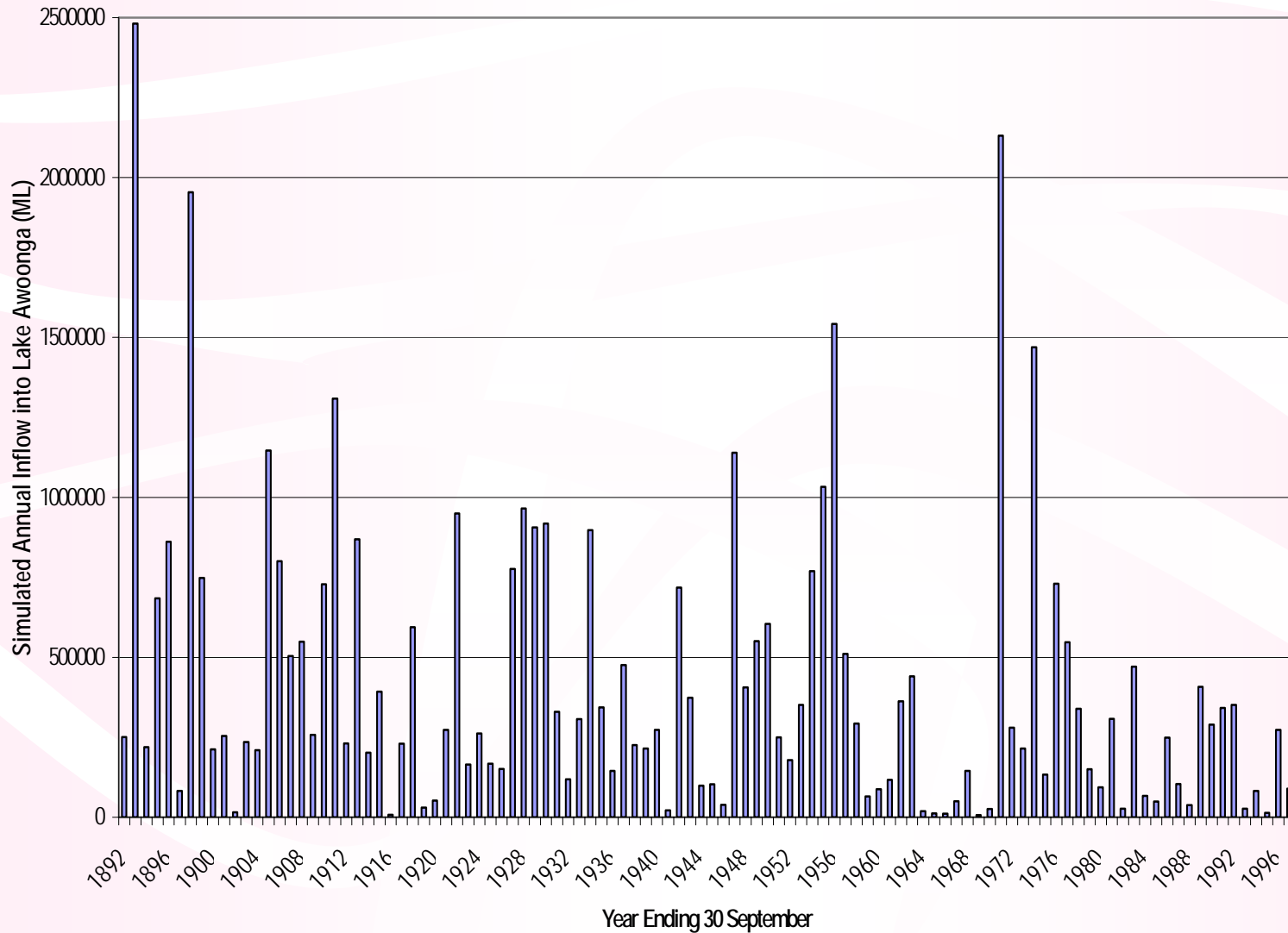
Background

- **2001 to 2003, the Port Curtis Region of Qld, was in the brace of a severe drought which placed considerable pressure on the availability of water from the Awoonga Dam (Water source for Gladstone) to both domestic and industrial users.**
- **Due to these serious drought conditions, the Gladstone Area Water Board (GAWB) introduced incremental water restrictions in mid 2002 (10 and 25%) as part of the GAWB Drought Management Plan.**
- **In the event the 2002/2003 wet season did not materialise, a 50% water restriction was forecast for introduction in mid 2003.**

Lake Awoonga Levels



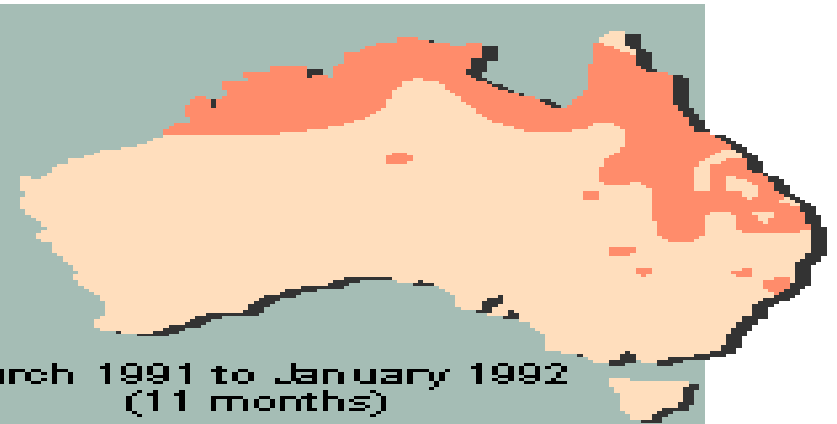
INFLOWS INTO AWOONGA DAM



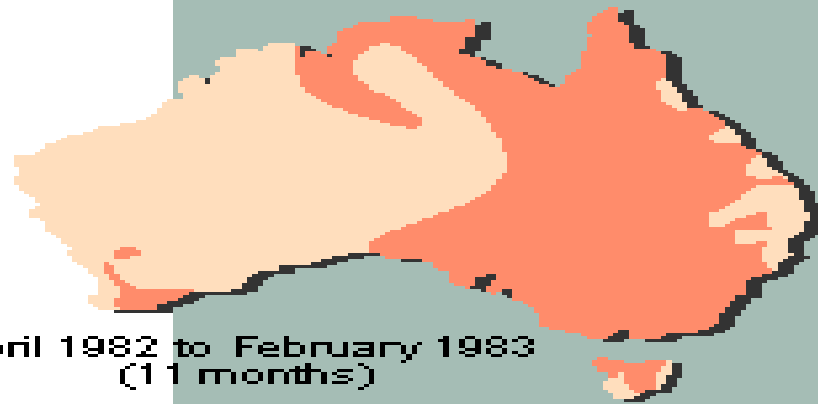
El Niño related drought areas in Australia since 1965



April 1994 to December 1994
(9 months)



March 1991 to January 1992
(11 months)



April 1982 to February 1983
(11 months)



March 1972 to January 1973
(11 months)

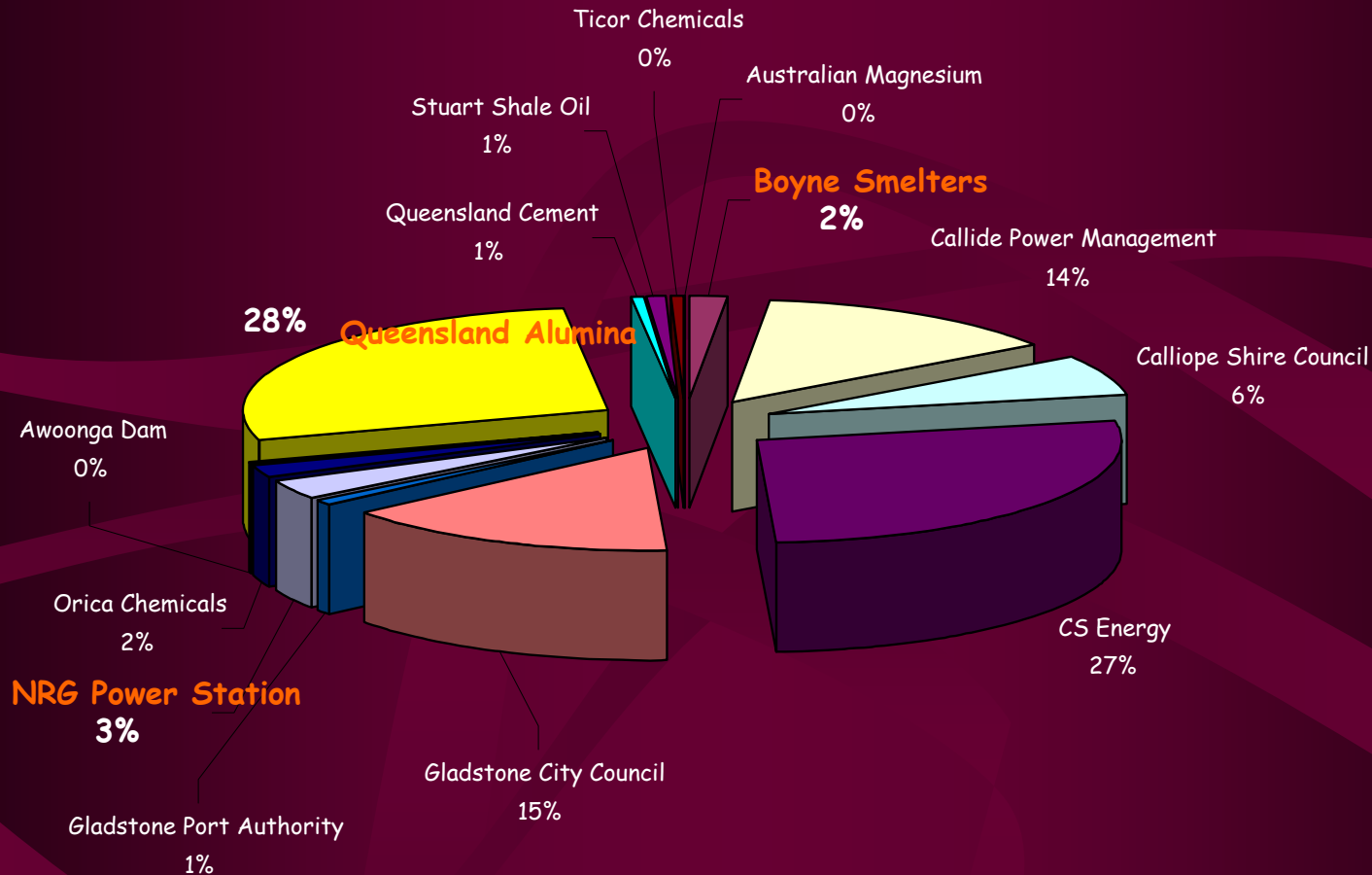


August 1968 to January 1970
(18 months)



January 1965 to November 1965
(11 months)

Historical Use: Gladstone Sites



Note: CAR equates to 0.05% of total usage

DROUGHT 2001-2003

Stage 1 Reductions in Allocation

- **GAWB introduced a 10% water reduction target on industry in April 2002.**
- **In preparation for this, Comalco managed and non-managed sites conducted internal investigations to reduce its water usage at managed and non-managed sites.**

DROUGHT 2001-2003

Stage 2: 25% Reductions in Allocation

- A 25% reduction was imposed on from the 5th November 2002.**
- All Comalco sites were meeting this 25% reduction prior to the introduction.**
- CAR required an extra 1.1ML/D over allocation (25% reduction in allocation) to complete construction, fill and commissioning.**

DROUGHT 2001-2003

Stage 3 50% Reductions in Allocation

- **Introduction of a 50% reduction in allocation planned for June 2003;**
- **Comalco managed and non-managed sites at the time of the announcement did not have a clear pathway to achieving this requirement;**
- **Potential loss of US \$100 Million in loss production.**

BSL Reduction and Augmentation Options

- Joint Effluent and Boyne Island grey water pipeline project with QAL (trading with QAL: 2ML/D – Aus \$ 1 Million)**
- Further optimise the cooling systems for the Casting Facility**
- Reverse Osmosis Plant (Aus \$ 4 Million)**

GPS Reduction and Augmentation Options

- Use of maturation and groundwater**
- Trading grey water with QAL (1ML/D allocation from GCC)**
- Thermal desalination (Aus \$ 6 Million)**

QAL Reduction and Augmentation Options

- Use of Seawater Cooling (Aus \$ 30 Million)**
- The grey water pipeline project (GCC to QAL project commissioned this week – Aus \$ 1.Million) and**
- Trading with BSL and GPS (3.5 - 4ML/D)**

CAR Reduction and Augmentation Options

- At the time of the restrictions, CAR did not have an allocation of water.**
- Buying grey water from GPS (1ML/D allocation from GCC) and**
- Possible joint thermal desalination project with GPS (Aus \$ 4-6Million)**
- Sea Water Cooling (Aus \$ 10 Million);and**

The construction of a \$1.3 billion “significant project” would have halted as a result of 0.7 ML/D of water.

OTHER OPTIONS INVESTIGATED

Included...

- **Trading (Political solution)**
- **Banking (Political solution)**
- **External Augmentation (Provision of RO and Thermal Desalination)**

GAWB and Qld State Government

- **GAWB was in the business of “selling water” and was not interested in trading, banking or relieving businesses of their “take or pay agreements” even though Comalco were operating in advance of restrictions;**
- **State Development was developing a proposal to build a pipeline from the Fitzroy River to Gladstone with limited consultation with other departments and industry;**

GAWB Drought Management Plan

- **The GAWB Drought management plan was based on restriction to use;**
- **Not based on what impact it may have on Industry and Infrastructure.**

Problems for the Pipeline Option

- The Fitzroy River pipeline project has considerable constraints to completion (acquisition, approvals etc).
- The Qld EPA opposes the pipeline on environmental and logistical grounds (does not reduce future demand).
- Regardless of what solution is put in place, if not in by June 2003, the 50% reduction in allocation will apply.
- If it had not rained by December 2003, the Fitzroy catchments would have restrictions imposed, and it was unlikely that water would be available to send.

February 2003

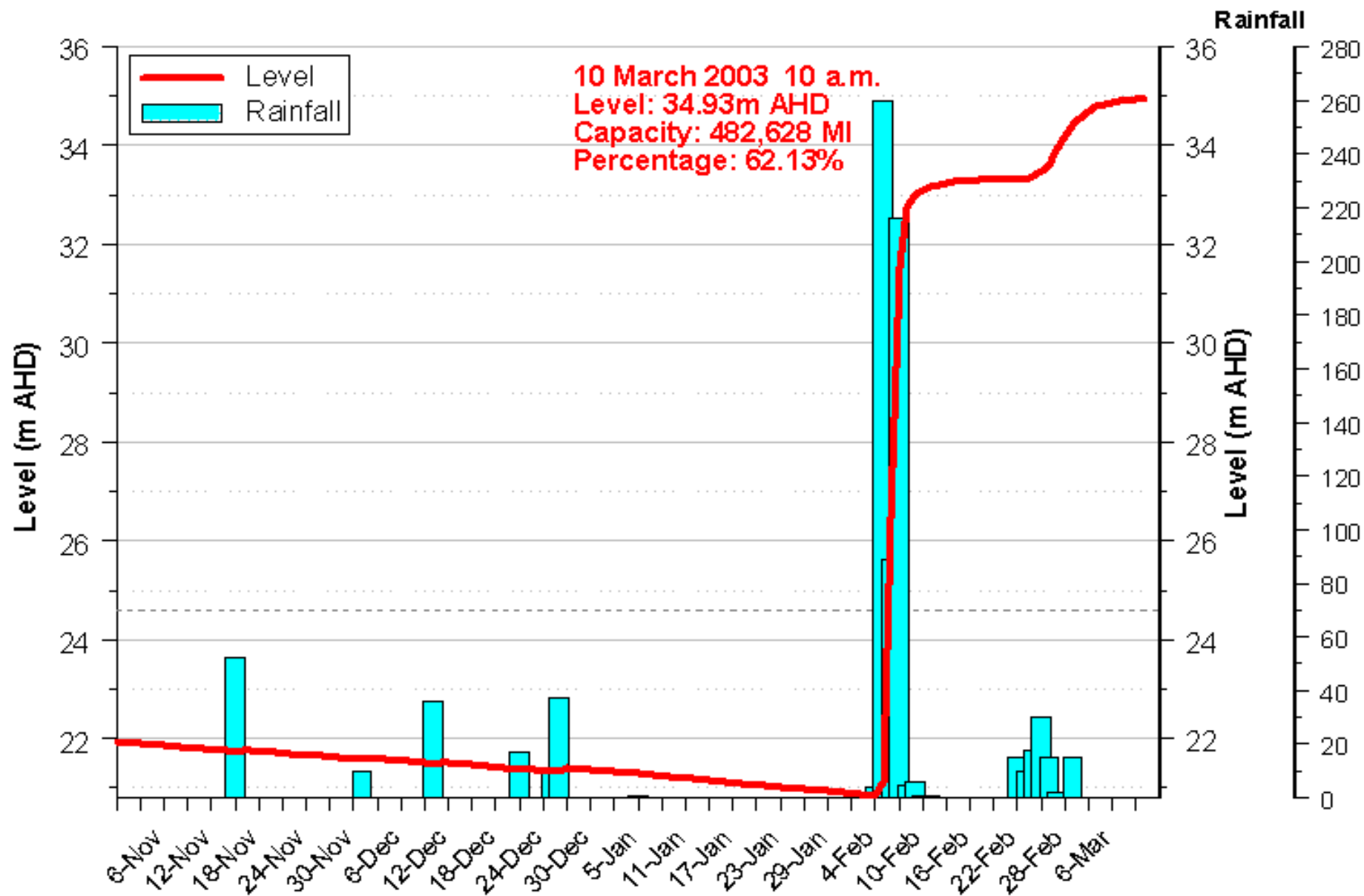
- **Comalco on the verge of committing to projects to meet the 50% reduction in allocation as a result of large lead times to get these projects approved and operational.**
- **CAPEX : < A\$ 50 Million Dollars**

What Happened next!

Cyclone Beni

(1 in 60 -Year Event)

Lake Awoonga Levels November 2002 - March 2003

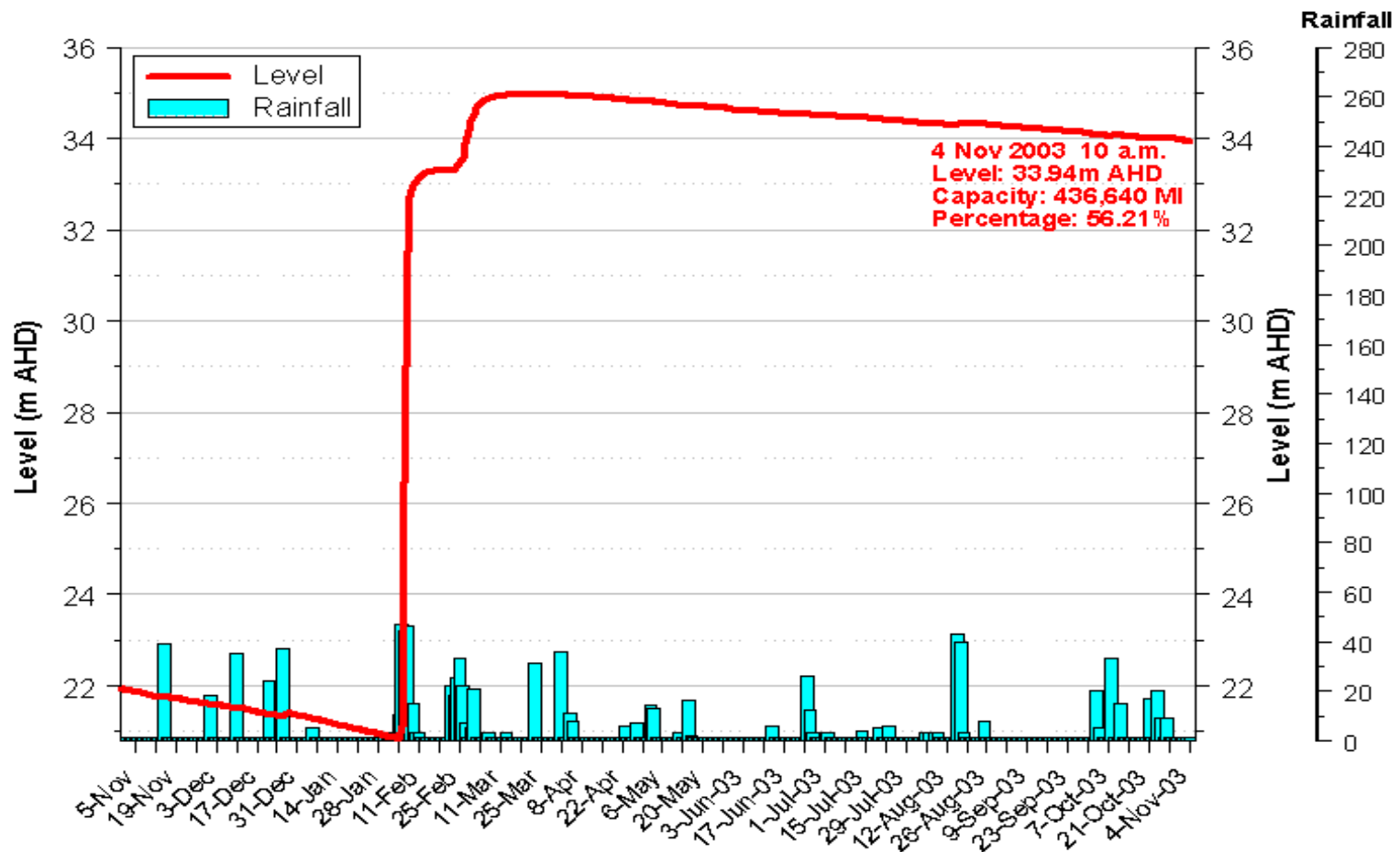


Post- Cyclone Beni

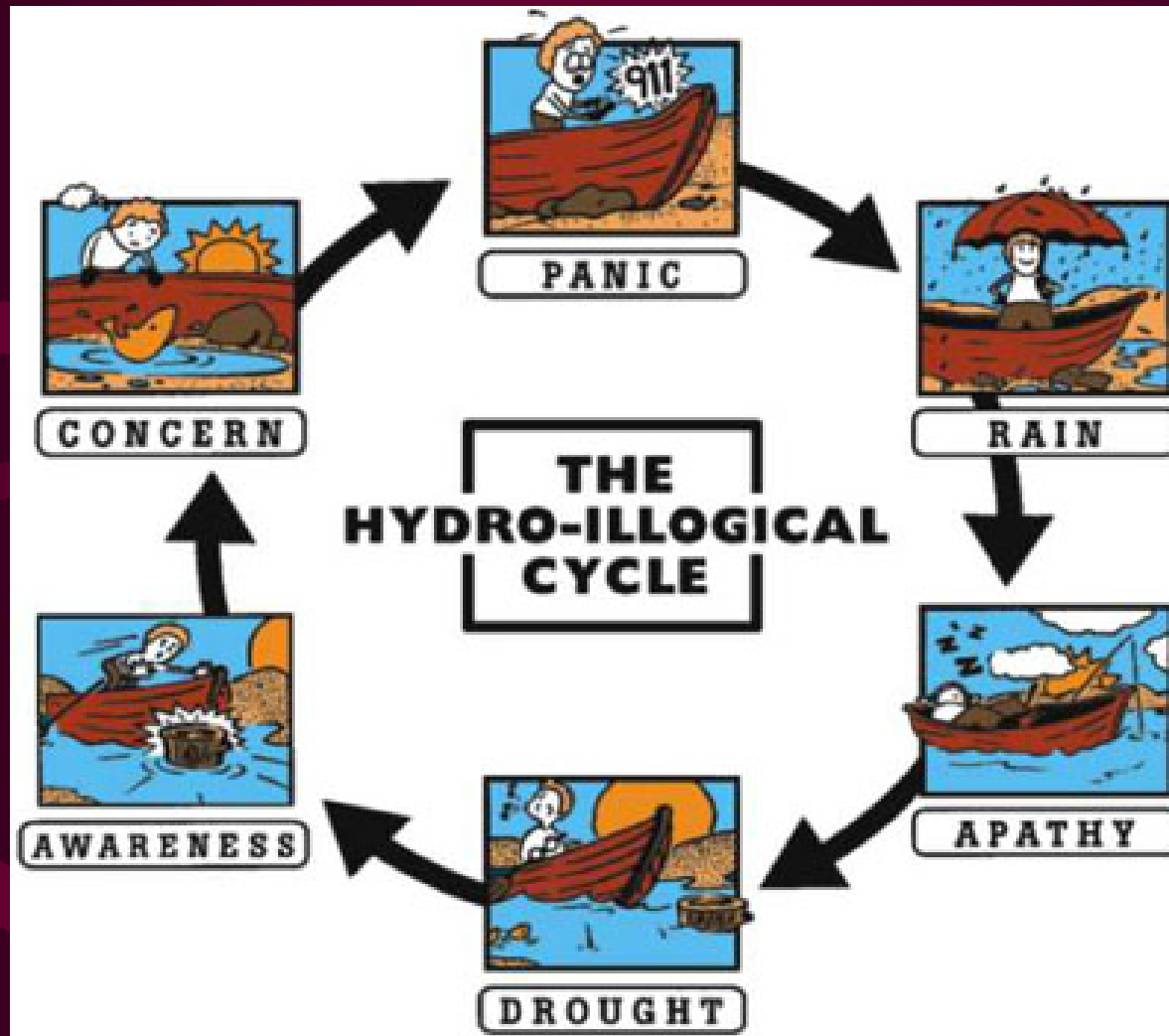
- As a result of dam levels raising to above RL 35m, all Comalco projects put on hold;
- Comalco voluntarily remaining on the 25% restriction of allocation;
- The Fitzroy River Pipeline project was halted; and
- 3 Years of water in dam based on current usage (Problem solved?)

What Is Happening at Present: Still in Drought!

Lake Awoonga Levels November 2002 - November 2003



Remember The Hydro-illogical Cycle?



Comalco Operations in Gladstone

- As of 30 September 2003, all Comalco managed and non-managed operations are operating to the 25% reduction on allocation.
- GAWB has not rewarded Comalco in any form.

Growth Risks

- There will be significant new industrial demand in the Aldoga State Development Area (where CAR is located), strong domestic growth in Gladstone and Boyne Island-Tannum Sands and significant tourism and domestic growth in Town of 1770-Agnes Waters.
- The “continuing” drought has shown the vulnerability of having a single dam or source of supply.

Learnings

- Gladstone - based on history of inflow and future usage should be classified a “Water Stressed Area”;
- Not enough was known about the capacity of the Awoonga/Boyne Catchment by Comalco, Industry or Government;
- During the drought, Comalco and government assumed it was going to rain;
- Comalco did not lobby government effectively;
- No emergency provisions available for issues relating to water at any of the sites.
- Could Comalco operations in Gladstone cut its capacity by 12% over 5 years without losing allocation and to obtain recognition of such savings with suppliers;

Recommendations

- **Obtain data and model (IQQM) to better understand the resource to:**
 - **Develop A Long Term Strategy That Will Allow Comalco To:**
 - **Effectively lobby all levels of Government to ensure reliability of supply;**
 - **Influence GAWB to ensure it does not “give or sell our water away”**
 - **Ensure the sustainable entry of future industry to ensure supply;**

- **Better understand own needs and potential augmentation options;**
- **Develop a drought management plan with activation triggers for Comalco; and**
- **Assist in the development of better contractual arrangements with GAWB to consider sustainable development principles.**
- **Apply the “real cost” of water – i.e.: what would it cost us if we did not have any.**

The Message

FOR COMALCO –

- **RELIABILITY OF SUPPLY IS
PARAMOUNT**