

# Agriculture and Resource Management Council of Australia and New Zealand

Standing Committee on Agriculture and Resource Management

## ALLOCATION AND USE OF GROUNDWATER

### A National Framework for Improved Groundwater Management in Australia

Policy Position Paper for Advice to States and Territories

Task Force on COAG Water Reform  
Sustainable Land Water Resource Management Committee

Occasional Paper Number 2  
December 1996

© COMMONWEALTH OF AUSTRALIA 1997

[ISBN 0 642 27117 81

[printed by - Goanna Print Pty Ltd]

#### **AGRICULTURE AND RESOURCE MANAGEMENT COUNCIL OF AUSTRALIA AND NEW ZEALAND**

The Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ), established in 1993, is one of a number of Ministerial Councils set up by the Commonwealth and State Governments to further co-operation and collaboration in particular fields of mutual concern. ARMCANZ consists of Australian Commonwealth/State/Territory and New Zealand Ministers responsible for agriculture, land and water resources, and rural adjustment policy issues.

The Council is a non-statutory body. It provides a forum for the exchange of views on the development of policies, guidelines and programs to assist the beneficial and orderly assessment, development and management of Australia's resources. It is supported by a permanent Standing Committee, the Standing Committee on Agriculture and Resource Management (SCARM). Membership of the Standing Committee comprises relevant Departmental Heads/Chief Executive Officers of Australian Commonwealth/State/ Territory and New Zealand agencies as well as representatives of CSIRO and the Bureau of Meteorology.

#### **FURTHER INFORMATION**

Inquiries concerning COAG Water Reform publications should be directed to:

Secretariat, Task Force on COAG Water Reform  
GPO Box 858  
CANBERRA ACT 2601 Australia  
Tel: (06) 272 5216; Fax: (06) 272 4526

# ALLOCATION AND USE OF GROUNDWATER

## A NATIONAL FRAMEWORK FOR IMPROVED GROUNDWATER MANAGEMENT IN AUSTRALIA

### TABLE OF CONTENTS

PREFACE .....	ii
EXECUTIVE SUMMARY .....	iii
1. INTRODUCTION .....	1
2. NEED FOR GOOD GROUNDWATER MANAGEMENT .....	1
3. ROLES AND FUNCTIONS OF STATES IN GROUNDWATER RESOURCE MANAGEMENT .....	2
4. KEY REFORMS .....	2
4.1 SUSTAINABILITY .....	2
4.2 DRILLING .....	3
4.3 GROUNDWATER / SURFACE WATER MANAGEMENT .....	3
4.4 INEFFICIENT WELL DESIGN .....	3
4.5 WATER MARKETS .....	4
4.6 SUSTAINABLE YIELD / ALLOCATION / USE LINKAGE .....	4
4.7 AVAILABILITY OF WELL CONSTRUCTION DATA .....	5
4.8 INFORMATION FROM HIGH YIELDING WELLS .....	5
4.9 PRICING .....	5
4.10 FEDERAL GOVERNMENT EXPENDITURE .....	7
4.11 INSTITUTIONAL ARRANGEMENTS .....	7
4.12 EDUCATION .....	8
5. RESPONSIBILITIES FOR IMPLEMENTATION AND TIMETABLE .....	8

## PREFACE

This paper is the result of an undertaking in the Council of Australian Governments (COAG) Water Reform Framework Agreement of 1994.

Preparatory documentation for the Framework recognised the importance of groundwater in Australia's natural resource base as well as the need for the "industry as a whole to pay its way." Issues such as efficient and sustainable use of water resources, full cost recovery and provision of adequate water for the environment were seen as areas of reform necessary to assist Australia's competitive position in the world.

ARMCANZ has prepared this paper in response to COAG's specific request, in Section 3 of the Framework, for the Council to further investigate and report on groundwater. In so doing, ARMCANZ recognises that groundwater is already implicitly included in the many provisions of the Framework Agreement, 1994, but there are also further specific opportunities for reform in relation to groundwater that warrant consideration in the context of ongoing development of reforms built on, and around, the original Framework.

This paper offers advice to jurisdictions on further opportunities for reform in groundwater management, consistent with the principles agreed in the Water Reform Framework, 1994 and the Competition Policy, 1995, but additional to the specifics of these agreements. The paper also establishes inter-governmental agreement or guidance on some implementation issues relating to groundwater within the formal commitments of the Framework Agreement, 1994 and the Competition Policy, 1995.

The subject matter of the paper has been deliberately confined to dealing with issues associated with groundwater allocation, pricing and use, and has not considered issues of groundwater quality protection. Groundwater protection has been adequately covered in the Groundwater Protection Guidelines published in September 1995, as a module of the National Water Quality Management Strategy.

This paper should be read in conjunction with the National Principles for the Provision of Water for Ecosystems prepared jointly for ARMCANZ and the Australian and New Zealand Environment Conservation Council, and the ARMCANZ policy position paper on Water Allocations and Entitlement - a National Framework for the Implementation of Property Rights in Water. It is based on a more comprehensive report prepared jointly by ARMCANZ and the National Landcare Program - "Towards a National Groundwater Management Policy and Practice, October 1995."

## EXECUTIVE SUMMARY

The Council of Australian Government (COAG) has endorsed a wide ranging program of reform of the water industry. This program specifically includes groundwater in recognition of the economic and social importance of the resource and also because of major potential impacts on the wider natural resource basis.

The fundamental importance of groundwater across Australia for irrigation, urban, industrial, domestic and stock uses cannot be over emphasised. Across the nation, however, there are many groundwater management practices which differ from the spirit of intent of the COAG Water Reform Framework Agreement.

A joint NLP/ARMCANZ report "Towards a National Groundwater Management Policy and Practice, November 1995" addressed gaps and makes a range of recommendations aimed at improving groundwater management.

From the above report this policy discussion paper sets out specific advice to jurisdictions on appropriate arrangements to ensure that groundwater management practices are consistent with the intent of the Framework Agreement and identifies a range of key reforms directly related to the COAG reform agenda:

### *Policy and Management*

- achievement of efficient sustainable use of groundwater in accordance with a nationally agreed approach to sustainability
- public identification of the sustainable yield, allocation and use of aquifers, with allocations limited to sustainable levels where appropriate
- removing restrictions on groundwater use imposed by inefficiently designed or constructed wells
- establishment of systems to support transferability of groundwater entitlements
- improved integration of groundwater and surface water management
- expansion of the National Driller's licensing system

### *Data and Information*

- provision of adequate funding for groundwater investigation in high priority areas
- requirements for drillers to provide well construction data for all wells drilled
- management and licensing of high yielding wells

### *Pricing*

- introduction of arrangements to provide for full recovery of direct costs of groundwater management with consideration being given to consequences of differential pricing between surface and groundwater where relevant.

### *Other Matters*

- identification by the Federal Government of its full costs of groundwater related activities
- elimination of conflict of interest situations within Government institutional arrangements
- assessment of opportunities for development of groundwater education program(s)

# ALLOCATION AND USE OF GROUNDWATER

## A NATIONAL FRAMEWORK FOR IMPROVED GROUNDWATER MANAGEMENT IN AUSTRALIA

### 1. Introduction

In February 1994 the Council of Australian Governments (COAG) endorsed a Framework Agreement for reform of the water industry in Australia. This framework comprises several elements, one of which is *"in relation to pricing that management arrangements relating to groundwater be considered by Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) by early 1995 and advice from such consideration be provided to individual jurisdictions and the report be provided to COAG."*

The Report of the Working Group on Water Resources Policy to COAG (February 1994) elaborates further: *"ARMCANZ by early 1995 might also consider the licensing/charging arrangements surrounding groundwater use given the importance of this resource and the adverse impact its indiscriminate use can have on the wider natural resource base. Advice could then be provided to individual jurisdictions to be used by them in their development of appropriate groundwater arrangements with the details of this advice to be contained in the report to COAG at the appropriate time."*

As part of the general COAG water reform process a broad range of other management reforms have been agreed which either directly or indirectly impact upon groundwater management. These reforms include consideration of:

- water pricing to recover costs
- development of water allocation or entitlement systems that will provide for water trading and which include provisions for the environment
- integrating natural resource management, integrated catchment approaches and consultative mechanisms

COAG noted that reliable data on Australia's groundwater resources were deficient. It was also noted that pricing principles and tradeable arrangements consistent with practices in surface water resource use should be applied to groundwater.

On the fundamental premise that management of groundwater is included in the provisions of the Water Reform Framework 1994, and the Competition Policy Agreement on Water 1995 ARMCANZ has commissioned this paper to provide advice to the States<sup>1</sup> on how the general principles contained in the water reform framework might apply to groundwater management in Australia. This paper draws from a joint National Landcare Program (NLP)/ARMCANZ report entitled "Towards a National Groundwater Management Policy and Practice, October 1995". Readers are referred to this report for more detail concerning the issues discussed in this paper. It should be noted that ARMCANZ endorsement of this paper does not imply endorsement of the recommendations contained in the broader report.

This policy discussion paper identifies key issues and recommendations which represent advice from ARMCANZ to the States for their consideration and implementation. In addition, several matters which ARMCANZ needs to address at a national level are identified. The recommendations of this report are consistent with approaches agreed to in the COAG Framework Agreement as they apply to surface water management.

### 2. Need for Good Groundwater Management

Groundwater is of fundamental importance to the development and growth of Australia. It is extensively used for urban water supplies, agriculture, irrigation, industry and mining. It is also important in sustaining a range of environmental systems.

<sup>1</sup>Note that whenever reference to the States is made, it should be taken to mean "States and Territories of Australia".



Use of groundwater has grown significantly since the 2nd World War and has raised the need for management. The irreversibility of groundwater processes demands serious consideration of the needs for management to ensure sustainability of the resource.

In more recent years, the interdependence between groundwater and the broader natural resource base has been increasingly recognised and management needs to take account of the interactions with vegetation, surface waters and other ecosystems.

While at the national level, only 15% of the nation's groundwater resources are being used, local overuse is becoming a major concern. This overuse and inadequate management is creating resource degradation through processes such as depletion, salt water intrusion and pollution. Often this degradation is irreversible.

Through 500,000 wells and an asset base valued at about \$6.5 billion, Australia has made a huge investment in groundwater development. This investment can be expected to continue to grow, particularly as environmental concerns on increasing use of surface water force the use of groundwater as an alternative. The need for improved management will correspondingly increase and become more complex as environmental and social issues have to be taken into account and use levels approach sustainable limits.

### 3. Roles and Functions of States in Groundwater Resource Management

The legislative responsibility for management of groundwater in Australia is vested in the States. Most States have chosen to adopt a similar model with the primary management responsibility resting with the Statewide water agency, which traditionally also had responsibility for water supply functions. These institutional arrangements are changing rapidly in many States where water supply agencies are being separated from those with groundwater management functions. In some States, groundwater management responsibilities are being taken into agencies with broader natural resource management responsibilities. Investigation and monitoring functions relating to groundwater are undertaken either within the primary water management agency or alternatively by the associated Geological Survey Department. A variety of other agencies in each State, notably the environmental protection agencies, have other groundwater related responsibilities.

An ethic which recognises the need for groundwater management to protect the resource for future generations and to protect the environment is common to all States, however management practices vary considerably.

### 4. Key Reforms

#### 4.1 Sustainability

Although groundwater use, at a State or National level, is well below the total assessed sustainable yield, nonetheless, in many specific areas allocations and/or use is in excess of the sustainable yield. In addition there is no single understanding or definition of sustainable yield across Australia. As any definition of sustainable yield embraces a range of technical as well as social environmental and economic factors, it is necessary for considerable community input to make judgement of what is sustainable. It is essential that sustainable yield incorporate water quality considerations. Many of the allocations (and use) across Australia are in excess of the sustainable yield. In some cases this "overdraw" of the resource is publicly acknowledged, whereas in other cases it is not. To ensure sustainability of the groundwater resources of Australia it is important to recognise those areas where use, allocation or other practices do not comply with the fundamental principles of Ecological Sustainable Development. A key requirement is the need to better define acceptable environmental impacts as part of the allocation process.

There are some specific (and exceptional) circumstances where management policies are consciously adopted to "overdraw" the groundwater. Examples include the use of hypersaline water and dewatering for mining purposes, in areas where water resources are extremely limited. It is considered that this is acceptable provided there is a publicly accepted strategic benefit, the resource is used efficiently, not wasted, and is tightly managed.

## **Recommendation 1**

**Groundwater management policies should employ the principles of ecologically sustainable development and should be directed at achieving sustainable use of the resource. ARMCANZ should develop an agreed nationally consistent definition and approach to sustainable groundwater yield.**

### **4.2 Drilling**

The licensing of drillers varies considerably between the States. In some States, driller licensing is only required in declared areas or for artesian wells. Considerable work has gone into the development of a National Drillers Licensing system. However the system is insufficiently comprehensive as not all water drillers are required to be licensed, contaminated site and other environmental drilling is not included and means to protect groundwater from other drilling activities (geotechnical, mining, etc.) are not addressed. It is considered that the National Drillers Licensing system needs to be expanded. Initially, by the end of 1997, this expansion should cover all water production wells, with the end aim being to cover all drilling which can affect the groundwater resource.

## **Recommendation 2**

**All States should adopt the National Drillers Licensing system for water production wells by 1997 and should seek to expand the system to all drilling.**

### **4.3 Groundwater | Surface Water Management**

In many situations groundwater and surface water are interconnected and interchangeable resources where decisions made in one area affect the other. Consider, for example, the situation which exists in parts of Australia where no groundwater licence is required for a well adjacent to a stream, whereas the stream is fully allocated. Currently there are many cases where different approaches to pricing, allocations and trade in entitlements create poor management decisions, adverse environmental impacts and less than optimum use of the total water resource. Single resource policies embracing conjunctive use and integrated management of groundwater and surface water through allocation and pricing mechanisms need to be more actively pursued by the States.

## **Recommendation 3**

**Groundwater and surface water resource management should be better integrated, including approaches to pricing (especially adjacent to public surface water regulated schemes), water allocations and trading to ensure consistency.**

### **4.4 Inefficient Well Design**

There are many cases throughout Australia where relatively shallow wells tap the top of an aquifer. This especially applies to domestic and stock wells. As a consequence, new and frequently deeper wells readily dewater existing wells and their owners seek redress in varying forms. As a policy position, these frequently old and inefficiently designed wells should not be used as a basis for "tying up" the resource. To limit new development on the basis of the shallowest well is considered to be economically inefficient and poor management as new users frequently cannot gain access to a largely under-utilised resource.

## **Recommendation 4**

**In preparing groundwater management plans, policies and strategies, States should ensure that the efficient utilisation of groundwater resources is not compromised by protection of existing users with inefficiently designed or constructed wells. This particularly applies to domestic and stock wells.**

## 4.5 Water Markets

The development of water markets in groundwater is in its infancy in Australia. This is to be expected as there are few areas in Australia where embargoes on allocations exist. However, there is considerable potential for groundwater trading to expand throughout Australia as it offers the potential to solve difficult management issues as demand for use increases. Markets offer an alternative to 'command and control' approaches to moving water use to areas of higher economic value and higher efficiency.

The COAG Framework requires the implementation tradeable property rights, and in its National Framework for the Implementation of Property Rights of October 1995, ARMCANZ endorsed as one of the principles: *"that all consumptive and non-consumptive water entitlements be allocated and managed in accordance with comprehensive planning systems and based on full basin-wide hydrologic assessment of the resource. "*

It is noted that this includes groundwater and would require the development of groundwater management plans involving processes of community consultation and the development of strategies to reduce use to sustainable levels. The framework also sets out other principles for dealing with allocations and entitlements.

It is essential that the surface water market framework is consistent with a groundwater water market framework, if conjunctive use and other resource policies are to be followed.

### Recommendation 5

**States should develop groundwater management plans based on a sound understanding of the resource. These plans should be the primary support for the development of groundwater allocation and property right systems to support intra-aquifer trading both within the States, and across State borders.**

## 4.6 Sustainable Yield/Allocation/Use Linkage

It has been estimated that 26 million ML/year of groundwater is available on a sustainable basis in Australia. Of this, it is estimated that about 15% is actually used in an average year. The amount of water that has been allocated (or committed to use) is difficult to estimate because of the variety of means of defining allocations. However, it is expected that the total allocated or committed exceeds usage for several reasons, particularly the occurrence of unused or under-used allocations.

While overall usage is well within sustainable limits, use at the local scale in many areas is known to exceed availability, and the consequences of overdraw are being experienced or are expected in the future. Good groundwater management requires an understanding of the level of sustainable availability, allocation and use, particular at aquifer scales.

The COAG Framework requires that environmental water provisions should be formally made in allocation processes. In a groundwater context this frequently translates to a consideration of environmental impacts due to groundwater abstraction, and for provisions to be adopted which place constraints on other uses so as to achieve appropriate protection of ecological values. The need to provide for water for the environment is one of the factors that defines the sustainable yield of the resources in terms of the amount of water that might be abstracted for consumptive uses.

Groundwater management plans should be developed from an understanding of the relationship between sustainable yield, allocation and use on an aquifer basis, as a primary basis for management decision making.

## **Recommendation 6**

**In developing groundwater management plans, State agencies responsible for groundwater management ensure those plans include identification of the sustainable yield and the levels of allocation and use of aquifers. These plans should also include an identification of environmental water provisions in accordance with the principles set out in the joint ARMCANZ and ANZECC National Principles for the Provision of Water for Ecosystems. Where allocations exceed the sustainable yield, the agencies should develop strategies to reduce abstractions to sustainable levels within time frames that minimise permanent damage to the resource.**

### **4.7 Availability of Well Construction Data**

The requirement to provide well construction data from the driller to the relevant State authority varies widely across Australia. Well construction data is fundamental data upon which good groundwater management depends.

One requirement should be made mandatory across the Nation - the provision of data and information to the relevant authority.. This must include location and construction data. However, States should have the ability to allow exemptions in exceptional circumstances and specific areas as appropriate. This is because the aim is to better manage groundwater, not to collect data per se. Hence if adequate data exists in an area then mandatory data reporting can be waived.

If the data collection is linked to conditions in drilling licensing, then the cost impost will be minimal to both government and private businesses with a very high level of competent compliance assured.

## **Recommendation 7**

**The provision by the driller, to the relevant State Authority, of well construction data for all wells should be a mandatory requirement, with provisions made for exemption in areas, or circumstance, where the information is not required.**

### **4.8 Information from High Yielding Wells**

Only two States require licensing of all high yielding wells Statewide. Licensing of extraction is the major management tool which is used throughout Australia. The ability to specify an allocation, extraction rate and other requirements is considered to be fundamental to good management. Licensing should be encouraged wherever management is required, either now or in the foreseeable future. In all areas where there are high yielding wells, monitoring and data collection should be undertaken to a sufficiently high standard to ensure adequate information is available to manage the water resource sustainability. Where licensing is used as the primary mechanism for data collection, the provision of necessary management information will generally require licensing of all high yielding wells.

## **Recommendation 8**

**In all areas where there are high yielding wells, monitoring and data collection should be undertaken to a sufficiently high standard to ensure adequate information is available to manage the water resource sustainably. Where licensing is used as the primary mechanism for data collection, the provision of necessary management information will generally require licensing of all high yielding wells.**

### **4.9 Pricing**

Most States are not able to fully identify their expenditure on groundwater resource management and a variety of different costing approaches are used to describe their expenditure. Nevertheless, the total expenditure for all of Australia is estimated to be of the order of \$32 million, of which explicit State Government funding accounts for some 65%. Fees and charges on groundwater users for resource management are either zero or at a very nominal level in most States, except

Victoria, New South Wales and South Australia. Nationally, the level of cost recovery for groundwater management is 10%. However the level of cost recovery for direct management costs (i.e. licensing, day to day management and administration) is 35%. A broad range and type of fees and charges exist for licence application fees, annual charges and other charges.

COAG has supported a policy of cost recovery for the Australian water industry. However, the Water Reform Framework of 1994 and the Report of the Expert Group on Asset Valuation and Cost Recovery specifically relate to cost recovery for water services provided by utilities. The agreements also address cost recovery of groundwater management for utility services, implicitly in the Framework and explicitly in the Report of the Expert Group. However, cost recovery in relation to private withdrawals is not directly addressed by the agreement and is seen as one of the reasons for commissioning advice through this report.

The proposed application of cost recovery principles to groundwater resource management is set out below. In this context the proposals are:

- For the purposes of considering cost recovery issues, groundwater management activities be classified as:
  - direct management activities - the operation of water allocation regulatory systems (i.e. licensing, day to day management and administration) as well as metering and water level monitoring that is carried out to directly support management
  - indirect management activities - policy, investigation, assessment, monitoring, maintenance of technical data bases and related activities
- Full costs of all direct and indirect groundwater management activities be identified by the States.
- User charging should be related to the costs of direct management activities but may also give consideration to appropriate apportionment of indirect costs which could be realistically assigned to users. *In urban water supplies* the charging should be in place by 1999. *In rural water supplies* it is desirable for charging to be in place by 2001 but if, in accordance with the COAG Reform Framework, there are circumstances where States choose not to charge the full cost to the users, the subsidy should be publicly reported. *For private withdrawals*, the target proposed is similar to that for rural water supplies, with a desirability that user charges are introduced progressively by 2001 and, where cross subsidies exist beyond that time, that they are made transparent. *Where and as, trading in particular groundwater entitlements becomes a demand of the market* it is desirable that provisions have been resolved in respect to cost recovery associated with those entitlements so that market transfers are likely to be properly valued in the market.
- In relation to the cost of indirect management activities not appropriately charged to users, the States should examine the means of explicitly recovering these costs from the community, as beneficiaries. Although no specific option for community funding is proposed, the States should consider explicitly recovering these costs.
- The options for the recovery of the costs of management of stock and domestic wells needs to be considered by the management agencies, to ensure an appropriate level of funding, that will be seen to be equitable with other users. This especially applies to intensively managed areas. (The relationship with surface water riparian users needs to be established if equity in a one resource policy<sup>2</sup> is to be resolved.)
- Specific government initiatives or other cases where clear benefits to the community are demonstrated (e.g. drought relief, salinity subsidies, capping Great Artesian Basin wells) be explicitly identified and not included in groundwater management costs.
- Provision of other services be on a full user pays basis unless alternative funding arrangements are clearly identified.

As most groundwater users currently do not pay for the management of the resource they are using, the introduction of full recovery of direct costs would represent a significant change. Although this is likely to be met by considerable public reaction, users should expect in return,

<sup>2</sup>A *one resource policy* refers to surface and groundwater resources being treated similarly in a policy and administrative sense.



through other COAG reforms, their entitlements to be better specified, particularly with regard to the renewal processes and dilution by continued allocation of entitlements. Public communication on the issue will be important. As users come to consider trading their entitlements on the market, the fairness of cost recovery so that public subsidies are not being sold, will be more easily argued.

It should also be noted that with the move to user-pays systems and full cost-recovery, there will be continuing pressures to reduce expenditure on investigations. Sound groundwater management depends fundamentally upon an adequate information base and an adequate information base requires resourcing. States will need to ensure that there is sufficient understanding of the groundwater resources and their vulnerability to quantity and quality degradation available as a basis for planning. Increased effort in groundwater resource quantification and assessment in priority areas is seen as a key action to ensure sustainability of the resource and the wider natural resource environment.

#### **Recommendation 9**

**The full cost of groundwater management should be identified by the States. The cost of direct management activities should be recovered from users and, within the context of the overall water cycle, appropriate apportionment of indirect costs be given consideration. Outside urban water supplies, the remaining subsidies should be transparent where full cost-recovery is not achievable. The necessary charges should be implemented progressively by 2001 and particular attention should be given to timely resolution where, and as, trading in groundwater is likely to be demanded by the market. Public communication on these matters will be important.**

**With reference to Recommendation 3 above, States should give consideration to the consequences of differential pricing between surface water and groundwater. States should examine means for meeting the indirect costs of groundwater management, including investigations which are not appropriately apportioned to users; options may include a direct but transparent subsidy. Recovery of management costs from domestic and stock well owners is to be considered by the States as part of their overall cost recovery strategy.**

#### **4.10 Federal Government Expenditure**

The Federal Government is involved in groundwater as follows:

1. Policy Development and National Co-ordination - DPIE and others
2. Direct Investigations / Research - AGSO, CSIRO, Universities
3. Investigation / Research Grants - LWRRDC, NLP, MDBC
4. Specific Initiatives, e.g. capping GAB wells, salinity, capital works, drought relief

The total expenditure, at a full cost level, by the Federal Government is difficult to identify.

The clear identification of Federal Government funds directed to groundwater will assist the Federal Government and the States in negotiating priorities for Commonwealth funding of groundwater management activities.

#### **Recommendation 10**

**The Federal Government should publicly identify its full costs of involvement in groundwater activities to assist the negotiation of priorities for Commonwealth funding of groundwater management activities.**

#### **4.11 Institutional Arrangements**

A component of the COAG Water Reform Framework is the need to separate regulatory from commercial and service functions. Major organisational changes are under way in many of the States with a variety of models for groundwater investigations and management emerging.

Conflict of interest can occur in several ways:

- *Commercial or sectoral interest conflicts:* - the allocation of water might be made to favour commercial considerations, or the specific sectoral interests of an agency, to the disbenefit of State interests. This applies to both surface water and groundwater.
- *Internal 'self assessment' conflicts:* - a new issue has emerged in recent times as a result of organisational changes. The policy/management/regulatory part of a Government organisation has the responsibility to review and technically assess the work undertaken within another part of the same organisation. Often this "other part" has a specific commercial consulting/research focus. This issue can occur at both a State and Federal agency level.
- *Funding conflicts:* - there may be a financial conflict whereby there is competition for internal resources for a function that does not derive sufficient revenue to cover its (full) costs.

State and Federal agencies need to be aware of the potential for conflicts of interest to arise through institutional arrangements in developing and implementing organisational arrangements for groundwater management. The separation of commercial functions from policy/ regulatory/ resource management function is one means of minimising potential conflicts of interest. Ensuring water management decision making processes, particularly in allocation, are carried out in an open and public way can also assist in this.

#### **Recommendation 11**

**State and Federal agencies should develop and implement organisational arrangements and processes which specifically eliminate conflict of interest situations In groundwater assessment and management.**

#### **4.12 Education**

Good groundwater management must essentially be user based and user driven. As such it must be intimately linked with comprehensive advisory, consultation and education mechanisms which are community focused.

A variety of State based education mechanisms in groundwater currently exist. These are of variable effectiveness. The need to increase general community awareness of groundwater processes is considered to be essential to facilitate good groundwater management. This especially applies to understanding the implications of the interaction between groundwater and the environment. National Water Week, run under the auspices of ARMCANZ, provides an opportunity to focus on groundwater issues and raise public awareness.

There is also a need for education of groundwater practitioners to ensure skilled resources are available for future management.

#### **Recommendation 12**

**SCARM should assess the opportunities for Increasing public awareness of the value of groundwater, Its vulnerability to over-use and damage through other activities and the need for groundwater management as key issues, and encourage the States to develop appropriate awareness programs.**

### **5. Responsibilities for Implementation and Timetable**

The above recommendations primarily represent advice from ARMCANZ to the States for their implementation.

The joint NLP/ARMCANZ report referred to in Section I contains many other recommendations to assist in improving approaches to groundwater management. These should be considered and implemented at the discretion of the States. It is clearly acknowledged that significantly different hydrogeological and management environments exist between the States, and any approaches they adopt should therefore be specific to their particular circumstances. For example, introduction of a regime of groundwater fees needs to reflect local conditions and circumstances. The States need to decide what is more appropriate for their specific situations.

Nonetheless, groundwater knows no State borders and major management problems can (and do) emerge where different practices exist either side of a State border. Also, it is important to note that many of the recommendations are interlinked and not implementing some recommendations will undermine or even negate other recommendations. This especially applies to the recommendation concerning charges and cost recovery.

The COAG Water Reform timetable generally involves adoption within 3 years, i.e. by 1998, of major reforms. The pricing reforms proposed above are consistent with the COAG timetable for the full implementation of pricing reform. This 5 year time frame will be needed for groundwater pricing in particular, because of the significant community consultation required before the reforms can be introduced and the desirability to introduce the changes gradually. It is proposed that the States develop programs for implementation of these recommendations, including community consultation, within their general water reform timetables.