PROGRAM EVALUATION

Evaluation of Cap and Pipe the Bores Program
Executive Summary

This publication is part of a series summarising program evaluations to enhance the accountability and transparency of NSW Department of Industry activities. The completed program evaluation template is attached.

The Cap and Pipe the Bores Program

The Cap and Pipe the Bores Program (hereafter the Program) is part of the Great Artesian Basin Sustainability Initiative, jointly funded by the Australian and NSW Governments. The Program is designed to protect endangered spring-dependent ecosystems that rely on sufficient artesian pressure to survive and to ensure a reliable and efficient supply of good quality water for properties across north west NSW.

The Program involves Great Artesian Basin (GAB) bore monitoring, GAB aquifer modelling, technical advice on water efficiency measures (including capping and piping GAB bores) and construction of water efficiency measures (primarily capping and piping GAB bores).

Objective

In the absence of government intervention, it is likely that the loss of artesian pressure in the GAB would result in the drying up of natural springs, resulting in the loss of spring-dependent ecosystems that include endangered species that do not exist anywhere else. Loss of artesian pressure would also impact landholders and rural communities, who would experience a decline in the availability (and reliability) of water supplied from the GAB.

The objective of the Program is, therefore, to improve water pressure within GAB aquifers for the long-term sustainability of high value GAB-dependent springs and the farming and rural communities reliant on GAB water supplies.

Options

The alternative options for pursuing the objective that were considered in the evaluation of the Program included:

- the existing program with government provided cap and piping works;
- the introduction of market provided cap and piping works, similar to the model used in Queensland, underpinned by government grants; and
- a program that enforces conveyance charges for water wasted.

Assessment

NSW Department of Industry program evaluations compare the efficiency and effectiveness of alternative options with that of the existing or proposed program. This involves an assessment of the costs and benefits of each option relative to the base case of ‘no program’ and, where these benefits and costs have been quantified, a comparison of the net benefit and benefit-cost ratio (BCR) of each option.

A qualitative assessment of options to achieve the stated objective was undertaken. The preferred option is Option 1 (the existing program). It is believed that Option 1 would (does currently) achieve the stated objectives with the net benefits greater than those of the alternative options.
As Option 2 involves the payment of grants to landholders to engage private contractors to undertake capping and piping works, it is assumed costs would be about the same. However, with greater risks of pricing variance due to periods of stronger demand or supply, it is expected net benefits would be lower than for Option 1.

With Option 3 involving the enforcement of water conveyance charges, it is assumed the benefits would be fewer than in Option 1 as the price is unlikely to be high enough to achieve the same level of water savings. Option 3 is expected to result in a probable net cost.

Cost Recovery

The evaluation assessed the existing program pricing arrangements relative to the cost recovery principles outlined by the Productivity Commission in its 2001 Inquiry Report on Cost Recovery by Government Agencies.

Application of the Productivity Commission’s cost recovery principles to the existing Program indicates that the program should be cost recovered up to the value of the public benefit of protecting endangered spring-dependent ecosystems. However, as the value of these public benefits is difficult to accurately estimate on a case-by-case basis, an alternative approach of recovering costs equal to the estimated value of the landholder’s private benefit, via a fee, is appropriate.

The Australian and NSW governments each presently contribute 45% of program cost, with landholders contributing the remaining 10%. This pricing strategy is roughly consistent with the alternative cost recovery approach described above.

Performance Measures

Key performance measures and indicators measure program performance and progress towards meeting government policy objectives. They demonstrate how effective a program is in producing the required outputs and achieving the desired outcomes.

The Program’s output measures include the number of projects implemented as a percentage of total planned, the number of priority bores rehabilitated and participation rates at community workshops.

Examples of the Programs outcome measures include the:

- volume of water saved;
- pressure recovery at GAB springs; and
- water pressure in around 90% of capped bores having either stabilised or increased.

Future Evaluations

This is the first evaluation of the Cap and Pipe the Bores Program as part of the regular Departmental cycle of evaluations informed by the recently superseded NSW Government Evaluation Framework. The evaluation concentrated on the qualitative aspects of ‘formative’ evaluation to build capacity of program management to monitor program performance in the future - problem identification, program logic and KPI design. Under recent changes to the NSW Government Evaluation Framework, programs will be expected to carry out ‘outcome’ evaluation, measuring the causal impacts of a program’s activities. Data collection will be essential to enable an ‘outcome’ evaluation when the Program is next scheduled for evaluation under the updated Framework.
Attachment: Program Evaluation Template

<table>
<thead>
<tr>
<th>Division:</th>
<th>Department of Primary Industries - Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program (Current):</td>
<td>Cap and Pipe the Bores (in the Great Artesian Basin)</td>
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</tbody>
</table>

**Step 1 Issue or Challenge and Objectives**

a. **Describe the issue or challenge that the program aims to address. That is, why should the department intervene? What would happen in the absence of the program?**

The Great Artesian Basin (GAB) is one of the most important water resources in Australia. It underlies an area of 1.7 million square kilometres (22% of Australia) and is the only source of reliable water for all human activity and water-dependent ecosystems in much of the arid and semi-arid landscape overlaying the GAB in Queensland, New South Wales, South Australia and the Northern Territory.

Formed between 100 and 250 million years ago, the GAB is a primarily sedimentary basin comprising a complex, multilayered system of permeable (water can flow through) and non-water-bearing strata. The impermeable strata confine the aquifers, causing the groundwater to become pressurised. In most areas the water is under sufficient pressure to provide a flowing source once it rises to the surface through artesian bores and natural springs.

Over the past 120 years, sinking artesian bores has underpinned the establishment and growth of the pastoral industry across much of inland Australia. Many of these bores are for domestic or stock purposes, and therefore represent a landholder’s basic water rights with no need for a water access licence (see Appendix A).

Bores were left unchecked to flow freely, most for nearly a century. As a consequence, substantial decline in artesian pressure has occurred, restricting water access for landholders and the environment. Most free flowing artesian water is wasted through evaporation and seepage, with less than 5% of water from uncapped bores used.

In the absence of government intervention, it is likely that the loss of artesian pressure in the GAB would result in the drying up of natural springs, resulting in the loss of spring-dependent ecosystems that include endangered species that do not exist anywhere else. These springs are home to a diverse array of unique and unusual aquatic invertebrates and fishes, and are also important habitats for plants, birds and other animals in an otherwise barren landscape. In addition to the pressure decline, uncapped bores have resulted in weed and feral animal infestation, salinity, erosion, and avoidable greenhouse gas emissions.

Loss of artesian pressure would also impact landholders and rural communities, who would experience a decline in the availability (and reliability) of water supplied from the GAB. Droughts reduce the availability of water supply from the GAB, with these impacts expected to become more severe as artesian pressure continues to decline across the GAB. Predicted changes in climate would exacerbate the loss of artesian pressure in the GAB by reducing aquifer recharge. Cumulatively, these impacts significantly reduce the expected long-term sustainability of farming and rural communities reliant on GAB water supplies. This in turn could result in the abandonment of farms and the de-population of towns in north west NSW, for example: Tibooburra (population of 260); Wanaaring (population of 195); and Walgett (population of 2,260).

Biophysical modelling using the ‘GABtran’ model developed by the CSIRO for the GAB estimates that pressure and groundwater levels would continue to decline if water losses from existing uncapped bores are not stemmed.
b. **Identify the groups that would be affected by the issue or challenge without departmental involvement (individuals, industry or community).**

- The community and environment, as natural springs dry up and the associated endangered spring-dependent ecosystems become extinct.
- Landholders who would have an increasingly unreliable water supply as water pressure within GAB aquifers decreases, particularly in times of drought and with predicted climate change. Existing farms may be abandoned as economical supplies of water become unavailable.
- Local communities who would have an increasingly unreliable water supply as water pressure within GAB aquifers decreases, particularly in times of drought and with predicted climate change. Communities may experience job losses, social and economic disadvantage, and declining populations as water supplies become increasingly unsecure.

c. **Quantify the impact of the issue in the absence of departmental involvement - the severity of the issue should be demonstrated with quantitative data where possible on the significance and consequences of the issue or challenge in the absence of departmental involvement. If no such 'cost' estimate exists, proxy information can be provided to give an indication of potential 'scale', such as industry value of production.**

The GAB is one of the largest underground freshwater resources in the world. It lies below 25 per cent of New South Wales supporting a population of over 120,000.

Over the past 100 years natural pressure has significantly declined due to overuse, reducing access to this vital resource. About 95% of artesian water flowing into bore drains across the NSW Great Artesian Basin is wasted. Mound springs occur when water from the Great Artesian Basin reaches the surface through fault lines in the overlying rock. Mounds are formed from the sediments and salts that are deposited by the spring water as it evaporates. These springs are often home to a diverse array of unique and unusual aquatic invertebrates and fishes and are also important habitats for plants, birds and other animals in an otherwise barren landscape. Many are endangered ecosystems not found elsewhere in NSW.

d. **Describe who or what created the issue or challenge. Examples include specific industry participants (such as producers or consumers) and environmental factors (such as the effect of climate change).**

Over allocated groundwater aquifers can be considered an open access resource in which users are in rivalry with each other for a limited supply of water, and it is not possible for an existing user (e.g. a spring-dependent ecosystem) to exclude another user (e.g. a pastoralist) or a new user (e.g. a proposed new mine).

Use of the GAB water was initially encouraged by the Government, with the Artesian Wells Act 1897 allowing settlers to have the drilling of their bore funded by the Crown. Subsequent regulation of groundwater use has limited or controlled access to GAB water for new users. Although these bores are registered, they are not metered.

Although the Water Act 1912 included provision to guard against indiscriminate boring or waste of water, the numerous bores already sunk in the GAB represent a first come, first served, or tragedy of the commons, problem.

Replenishment of the GAB is also expected to decline in the future, with predicted climatic changes
expected to result in an 11% reduction in average surface water availability and groundwater replenishment in the intake regions by 2030. This would further reduce water availability across the GAB, beyond the modelled reduction resulting from the continued water losses from uncapped bores.

e. List current programs or legal instruments (provided by industry or any level of government) which aim to address the issue or challenge. Could these be altered to address the issue or challenge?

<table>
<thead>
<tr>
<th>Other Programs</th>
<th>Able to be altered?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Great Artesian Basin Water Sharing Plan</strong>&lt;br&gt;The Water sharing plan is a legal document under the <em>Water Management Act 2000</em> which applies for a period of 10 years. The plan reserves the long-term storage component of the Eastern and Southern Recharge Groundwater Sources for the environment. In addition 30% of the average annual net recharge is set aside for the environment is set aside to provide for the needs of groundwater dependant ecosystems. Except for basic landholder rights all other water extraction must be authorised under a water access licence according to the plan.</td>
<td>Yes - due for extension/review in 2018</td>
</tr>
</tbody>
</table>

f. Identify who might benefit if action [such as the program being evaluated] is taken by the department.

**Primary beneficiaries:**
- The community and environment as natural springs are protected and the associated endangered spring-dependent ecosystems are preserved.
- Landholders who would have more reliable water supply as water pressure is maintained within GAB aquifers. This would reduce the impact of drought, improve agricultural productivity, and ensure that productive agricultural land remains in production. Other benefits to landholders include extending life of bores, improving water quality, more efficient stock management, and reduced pumping costs.

**Other beneficiaries:**
- Local communities who would have a reliable water supply as water pressure within GAB aquifers is maintained. This would enhance community confidence in respect of water security, alleviate uncertainty in future investment decisions and may culminate in reduced in population declines or increased population growth across affected regions.

g. Statement of Objectives: Determine whether there might be a role for the department in addressing the perceived problem (i.e. what high-level objective might a potential program achieve?)

**Objective:** to improve water pressure within GAB aquifers for the long-term sustainability of high value GAB-dependent springs and the farming and rural communities reliant on GAB water supplies.

**Policy Alignment:**
The Cap and Pipe the Bores Program is consistent with the NSW Department of Primary Industries Strategic Plan (2015-2019) strategic priority 1 and strategic priority 2 by:
- maximising productive use of water;
- mitigating and managing risks from use of land water; and
- maintaining sustainable and equitable access to and use of water.

**Market Failure:**
If water losses (or wasted water) from existing uncapped bores continue, then GAB water levels would continue to decline, drying up natural springs and risking the extinction of endangered spring-dependent ecosystems, i.e. resulting in a loss of biodiversity.

The cost of the lost biodiversity of endangered spring-dependent ecosystems would be imposed on society
by the actions of water users. Currently, too much water is being extracted from the GAB, and too much of the **public good** of biodiversity is being lost than is socially optimal.

The use of water from the GAB by one water user affects other water users (and the environment). These impacts are likewise not considered in the user’s decision, and where the impact is between water users (i.e. all users affect each other, and all users are affected by the actions of other users), hence a **tragedy of the commons** situation occurs that is characterised by over-extraction.

Capping bores would provide the **public good** benefits of protecting endangered spring-dependent ecosystems and ensuring the long-term sustainability of the farming and rural communities reliant on GAB water supplies by improving GAB water levels and pressure. However, there is likely to be significant under-investment, from a societal perspective, in such works by landholders as they cannot capture the full benefits of the investment. Government intervention is therefore required in order for society to realise the public good benefits of capping bores.

**Social Equity Goal:**
Use of open access resources is often characterised by claims of inequity between users. About half of the existing water users in the NSW portion of the GAB have capped their bores, mostly with government support. Previous government funding was prioritised to high-flow bores to achieve the greatest water savings. Current government funding is prioritised firstly on proximity to high value GAB-dependent springs, and secondly on the amount of water savings. A strong focus of government funding is achieving the public good benefits of protecting endangered spring-dependent ecosystems.

If water losses from the uncapped bores are not reduced, then those water users who invested (along with the government) in capping their bores would not realise the benefit from their investment as the water pressure would continue to decline. This is likely to result in claims of inequity, both by capped bore owners against uncapped (water wasting) bore owners, and by uncapped bore owners against (government subsidised) capped bore owners. These claims are endemic to open access resources, and are not social equity justifications for government intervention.
## Step 2  Program Options & Design

*Identify all potential options for achieving the objective, including those that least impede business activity.*

<table>
<thead>
<tr>
<th>Option 1.</th>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The current Cap and Pipe the Bores Program</td>
<td><strong>Cap and Pipe the Bores Program (in the GAB)</strong></td>
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<tr>
<td></td>
<td>The current Program provides public good benefits from protecting endangered spring-dependent ecosystems. It does this by capping and piping free-flowing GAB bores. This increases artesian pressure, while establishing reliable and efficient supplies of good quality water to properties across north west NSW. In the past, up to 95 per cent of artesian water was being wasted through evaporation and seepage.</td>
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<td></td>
<td>The Cap and Pipe the Bores Program is part of the Great Artesian Basin Sustainability Initiative (GABSI), jointly funded by the Australian and NSW governments. GABSI phase 1 was implemented between 1999 and 2004 with $25 million funding. Phase 2 built on this with $32 million funding from July 2004 until June 2009. Remaining free flowing bores were targeted under phase 3 with $26 million funding, which finished in June 2014.</td>
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<tr>
<td></td>
<td>The current program (GABSI phase 4) involves GAB bore monitoring, GAB aquifer modelling, technical advice on water efficiency measures (including capping and piping GAB bores), construction of water efficiency measures (primarily capping and piping GAB bores), stakeholder engagement, project management and NSW Government and Australian Government GAB-related reporting requirements</td>
</tr>
<tr>
<td></td>
<td>Monitoring of artesian pressure in parts of the GAB shows that declining artesian pressure appears to be stabilising in areas where many bores have been capped and piped over the last 20 years. In addition, the removal and reduction of bore drains has been an effective management tool to address not only water wastage, but also to reduce the adverse environmental impacts associated with bore drains such as weed and pest incursions.</td>
</tr>
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</table>

### Resourcing requirements:

Resourcing requirements and estimated water savings are based on the 2015 Business Case for NSW to participate in Phase 4 of GABSI. The Business Case assumes that NSW will receive approximately $9.5 million of the $15.9m on offer from the Australian Government under GABSI Phase 4. Total Program costs based on this assumption are estimated to be $19m over 3 years (approximately $6.33m per year). This level of funding would allow approximately 40 bores to be rehabilitated over 3 years, around 13 per year.

### Governance arrangements:

Procedures and protocols stipulated in the existing Departmental Governance Framework apply, with the addition of:

- a program-oversight Steering Committee chaired by a NSW Office of Water executive and including stakeholder representatives, implementation officers, and representatives of the Australian Government Department of Environment; and
- a Program Control Group responsible for the day to day operations of the Program.

Nationally, the Great Artesian Basin Strategic Management Plan was endorsed by Australian Government, state and territory governments in 2000. The Great Artesian Basin Coordinating Committee (GABCC) was established in 2004 with a membership of Government officials from relevant jurisdictions. There is also a Great Artesian Basin
Technical Working Group that provides scientific and technical advice to the GABCC.

**Consultation strategy:**

The communications strategy focuses on engaging stakeholders at an early stage to build trust, and includes:

- targeted mail outs and meetings - contact and meetings with stakeholders to identify local issues and identify and resolve any possible landholder concerns;
- interviews and site visits - to identify landholder issues and develop options, and also including local landholder groups, stakeholder groups and staff from other organisations such as LLSs and local water user groups; and
- management of stakeholder issues - local issues can influence perspectives about the impact of specific projects. Issues generally relate to the reliability of water supply, equity in the delivery and supply of water, infrastructure costs, post-construction operational costs, and changes to access rights.

The Program’s communications plan outlines the following elements prior to consultation:

- defined consultation objectives;
- a list of potential stakeholders;
- likely issues for stakeholders which would need to be addressed;
- the main messages to communicate to stakeholders;
- the main information to receive from stakeholders and what to do with that information;
- the methods for reaching stakeholders and receiving information from them;
- a timeframe for consultation;
- the likely number of consultation cycles;
- how to monitor consultation outcomes at each milestone to check objectives are achieved; and
- a communications plan evaluation strategy.

**Existing or proposed program pricing strategy:**

The costs of the Program are shared between the Australian Government, NSW Government and landholders. This is based on the following sharing arrangement:

- 90% of the capital cost associated with the implementation of the Program are provided by the Australian Government and NSW Government in equal shares (95% for bores close to identified high-value natural springs); and
- 10% of project capital costs are provided by participating landholders (5% for bores close to identified high-value natural springs), along with the operation and maintenance of each project post-construction.

Application of the Productivity Commission’s cost recovery principles to the current program indicates that the cost of the Cap and Pipe the Bores Program should not be recovered up to the value of the public benefit of protecting endangered spring-dependent ecosystems. The pathway through the cost recovery decision framework for this public benefit portion of costs is represented as 1, 2c, 3, 4, 9a, 9b, 11, 12, recommending provision with no cost recovery (see Appendix B).

However, as the value of the public benefit of protecting endangered spring-dependent ecosystems is difficult to accurately estimate on a case-by-case basis, an alternative approach of recovering costs to the estimated value of the landholder’s private benefit is
used. Proxies for a landholder’s private benefit are 10% of project capital costs across the GAB, and 5% where bores close to identified high-value natural springs. The pathway through the cost recovery decision framework for this private benefit portion of costs is represented as 1, 2c, 3, 4, 9a, 10a, 11, 13a, 14, recommending provision with cost recovery via a fee on individuals or firms set at commercial cost (see Appendix B).

Apart from recovering the private benefit portion of costs at fully distributed cost (instead of commercial cost), the Program’s pricing strategy is roughly consistent with the Productivity Commission’s cost recovery principles. The difference between fully distributed cost and commercial cost is a profit margin, which is deemed not appropriate to charge in a cost sharing arrangement where the majority of the costs are funded by government.

### Key performance measures:

**Output measures:**
- number of projects implemented as a percentage of total planned;
- length of drains removed;
- monitoring of extracted water;
- number of priority bores rehabilitated;
- number of participants and participation rates at community workshops.

**Outcome measures:**
- water pressure in around 90% of capped bores either stabilised or increased;
- number of users receiving piped water;
- volume of water saved;
- ceased flowing bores start to flow; and
- pressure recovery at GAB springs.

The following Key Performance Indicators (KPIs) have been developed to measure performance of the Program in achieving its intended outcomes.
<table>
<thead>
<tr>
<th>Critical Success Factor Focus Area</th>
<th>Key Performance Indicator (KPI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rehabilitation of bores impacting pressure at GAB springs</td>
<td>• Pressure recovery at GAB springs (kPa)</td>
</tr>
<tr>
<td>Improved delivery of S &amp; D water</td>
<td>• Number of projects implemented as a % of total planned</td>
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<td></td>
<td>• Number of users receiving piped water</td>
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<tr>
<td></td>
<td>• Length of drains removed</td>
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<td></td>
<td>• Monitoring of extracted water</td>
</tr>
<tr>
<td>Program Cost and Investment Flow</td>
<td>• Program to be completed on budget</td>
</tr>
<tr>
<td></td>
<td>• Program funding milestones to be met</td>
</tr>
<tr>
<td>Distribution of investment across priority bores</td>
<td>• Number of priority bores rehabilitated</td>
</tr>
<tr>
<td></td>
<td>• Program costs</td>
</tr>
<tr>
<td>Sustainable management of GAB water resources</td>
<td>• Volume of water saved</td>
</tr>
<tr>
<td>Community Support and positive social outcomes</td>
<td>• Participation Rates</td>
</tr>
<tr>
<td></td>
<td>• Number of participants at community workshops</td>
</tr>
<tr>
<td></td>
<td>• Receipt of landholder surveys with anecdotal evidence of project benefits</td>
</tr>
<tr>
<td>Work Health Safety</td>
<td>• Number of work-related lost time injuries incurred by Program related staff during the life of the Program</td>
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</tbody>
</table>
**Option 2.**

**QLD grant funding model**

**Description:**

**Market provided cap and piping work similar to QLD**

This option would see the NSW Government adopt a similar model to the Queensland GABSI program, whereby the government provides landholders with a grant to undertake capping and piping works, which would be undertaken by private contractors. The government would cease directly undertaking capping and piping works for landholders.

The market for capping and piping works is considered to be sufficiently developed to allow NSW landholders to readily buy the services required to undertake capping and piping of their GAB bores. Private contractors from Queensland, who are familiar with the grant funding model, would be encouraged to enter the NSW market. Consideration would be given to divesting the ‘in-house’ businesses assets of the NSW Government that currently undertake capping and piping.

This option would continue to provide the public good benefits from protecting endangered spring-dependent ecosystems with reduced government involvement in undertaking capping and piping works.

A benefit to the NSW Government of this option would be avoided contingent liabilities; specifically, any redundancies, asset write-offs, and organisation restructuring costs that may occur in the scenario that Australian Government funding of the Program ceases once GABSI Phase 4 has run its course (at the end of 2016-17).

**Resourcing requirements:**

As there would be no government works to cap and pipe bores under this option, the resourcing requirements may be lower than Option 1 (depending upon market prices to undertake these works).

Existing Program staff may either transition to providing technical advice to landholders on proposed works and grant applications or move to work for private contractors undertaking similar work capping bores in the GAB. Some administration function would also be required to oversee the grant application and approval process, and for reporting to the Australian Government.

**Governance arrangements:**

As per Option 1, but expanded probity arrangements to ensure that the tendering and grant approval processes are appropriate and the work undertaken by private contractors is of sufficient quality and standard.

**Consultation strategy:**

As per Option 1, possibly without landholder interviews and site visits.

**Existing or proposed program pricing strategy:**

Application of the Productivity Commission's cost recovery principles to this Option indicates that the cost of the Program should not be recovered as it represents a public benefit of protecting endangered spring-dependent ecosystems. The pathway through the cost recovery decision framework is represented as 1, 2c, 3, 4, 9a, 9b, 11, 12, recommending provision with no cost recovery (see Appendix B).
Key performance measures:
Similar to Option 1 with less focus on work health and safety which would become a statutory responsibility of the private contractors undertaking the capping and piping works.
<table>
<thead>
<tr>
<th><strong>Option 3.</strong></th>
<th><strong>Description:</strong></th>
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<tbody>
<tr>
<td>Introduce conveyance charges</td>
<td><strong>Charge for domestic and stock (conveyance) access licences</strong></td>
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<tr>
<td></td>
<td>Under this option, a provision within the GAB water sharing plan would come into force and result in landholders paying a volumetric charge for wasted water.</td>
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<tr>
<td></td>
<td>With an uncapped bore, water is typically transported (conveyed) from the bore to the point of consumption via an open channel resulting in the loss, either through evaporation or absorption into the ground, of around 95% of the water. The water sharing plan allows the unmetered use of water for domestic and stock purposes (see Appendix A), but includes a provision to charge for water used (wasted) during the conveyance. Water used during conveyance would be estimated based on the flow rate of the bore less water used by stock or in other domestic use.</td>
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<td>This option would introduce a price signal for landholders using (wasting) water during the conveyance of water from the bore to the point of use. The price signal is expected to encourage landholders to become more efficient in the use of water during conveyance, potentially by investing in capping and piping their GAB bores using private contractors.</td>
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<tr>
<td></td>
<td>The government would cease undertaking capping and piping works, which would then be provided by the market. There may be some transition whereby government grants are available to landholders undertaking water efficiency measures. However, over time the price signal of the conveyance charge would be expected to provide sufficient incentive for landholders to avoid water losses during conveyance.</td>
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<td></td>
<td>Currently no conveyance charges apply, and the water sharing plan states that conveyance charges may be imposed for domestic and stock (conveyance) access licences consistent with any determination by the Independent Pricing and Regulatory Tribunal.</td>
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<tr>
<td></td>
<td>Considering the socio-economic impacts of introducing conveyance charges, it is likely that this charge would be phased in, and that the final level of conveyance charges may be lower than that required to change behaviour sufficiently to achieve the level of water savings achieved by the current Program (Option 1).</td>
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<td></td>
<td>Additionally, this option would require the installation of water meters on all registered GAB bored that are not already capped (currently 228). The installation of a water meter on one of these bores is estimated to cost $10,000.</td>
</tr>
<tr>
<td><strong>Resourcing requirements:</strong></td>
<td>Government costs for licence administration, regulation and compliance likely to be in the range of $1m to $2m per year to implement and administer the conveyance licence regime. The installation of water meters may also be paid for by the NSW Government, in which case an additional $2.28 million would be required.</td>
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<tr>
<td></td>
<td>As there would be no government funding to cap bores under this option, staffing and construction resourcing requirements, as outlined in Option 1, would mostly not be required. Existing Program staff may either transition to providing technical advice to landholders on water efficiency measures (extension officers) or move to work for private contractors undertaking similar work capping bores in the GAB.</td>
</tr>
<tr>
<td><strong>Governance arrangements:</strong></td>
<td>Initially as per Option 1, with a gradual phasing out of the Steering Committee.</td>
</tr>
</tbody>
</table>
### Consultation strategy:
As per Option 1, but without landholder interviews and site visits focusing on providing technical advice only.

### Existing or proposed program pricing strategy:
Application of the Productivity Commission’s cost recovery principles to conveyance changes indicates that the cost of water used during conveyance should be recovered via a fee on individuals or firms set at fully distributed cost. The pathway through the cost recovery decision framework is represented as 1, 2b, 3, 4, 6, 8, 10a, 11, 13a, 15, recommending a fee set to achieve fully distributed cost recovery (see Appendix B). In addition, a sustainability charge may be imposed to strengthen the price signal (increase the price) to further encourage landholders to become more efficient in the use of water during conveyance.

Application of the Productivity Commission’s cost recovery principles to the provision of technical advice on the efficient use of water indicates that these costs should not be recovered. The pathway through the cost recovery decision framework is represented as 1, 2c, 3, 4, 9a, 9b, 10a, 10b, 11, 12, recommending provision with no cost recovery (see Appendix B).

### Key performance measures:
Similar to Option 1 with the addition of regulation-related output measures, including compliance activity undertaken and level of compliance by water users.

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### Step 3  Options Assessment

*Shortlist options by qualitatively listing below the benefits and costs of each option relative to the base case of ‘no program’. If the program contains sub-components, it may be easier to consider the benefits and costs of each subcomponent.*

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Costs</th>
<th>Qualitative assessment of net impact</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Option 1. The current Cap and Pipe the Bores Program</strong>&lt;br&gt; Cumulative benefits of the Program (since 1999) include:&lt;br&gt; • stabilised the decline in artesian pressure, with signs of recovery in many areas;&lt;br&gt; • water savings of 78,500ML per year;&lt;br&gt; • over 40,000 square kms (5% of NSW) supplied with permanent, reliable, efficient and strategically located watering points;&lt;br&gt; • salt discharge reduced by 62,800 tonnes per year; and&lt;br&gt; • greenhouse gas emissions reduced by 41,600 tonnes per year.&lt;br&gt; Additional benefits from each year the Program continues are estimated to be:&lt;br&gt; • approximately 13 free flowing bores controlled;&lt;br&gt; • water saving of approximately 3,500ML per year;&lt;br&gt; • further recovery in artesian pressure;&lt;br&gt; • environmental benefits from increased protection of endangered spring-dependent ecosystems; and&lt;br&gt; • landholder benefits, including agricultural production benefits.&lt;br&gt; Government costs (Australian Government GABSI 4 costs attributable to NSW, and NSW Government costs) or approximately $6.33 million per year.&lt;br&gt; Landholder costs (estimated based on 10% contribution) or approximately $0.7m per year.&lt;br&gt; Benefits expected to outweigh costs with average cost of water saved of around $2,000 per additional ML.&lt;br&gt; <strong>Ranking 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option 2. QLD grant funding model</td>
<td>Similar number of bores controlled as Option 1 as government funding would simply be delivered via a different mechanism. Similar landholder benefits, including agricultural production benefits, and Option 1. Environmental benefits expected to be lower than Option 1 due to the reduced ability to target uncapped bores close to identified high-value natural springs.</td>
<td>Similar level of costs to Option 1, but with greater risk of variance due to ‘market pricing’ of capping and piping works. Benefits expected to outweigh costs but likely to have a higher average cost of water saved than Option 1 and fewer environmental benefits than Option 1.</td>
</tr>
<tr>
<td>Option 3. Introduce conveyance charges</td>
<td>Significantly fewer benefits than Option 1 as the price is unlikely to be high enough to achieve the same level of water savings. The high one-off capital costs of capping bores relative to the (low) annual conveyance charge would likely result in only a small number of additional bores being capped by landholders.</td>
<td>Estimated $2.28m one off costs to install water meters on uncapped bores. Government costs for licence administration, regulation and compliance likely to be in the range of $1m to $2m per year. Likely to result in a net cost as the small benefits would not be expected to outweigh the costs.</td>
</tr>
</tbody>
</table>
Appendix A: Domestic and stock rights

Under the *Water Management Act 2000*, an owner or occupier of a landholding is entitled to take water from a river, estuary or lake which fronts their land or from an aquifer which is underlying their land for domestic consumption and stock watering without the need for an access licence. This is a domestic and stock right.

While owners and occupiers of landholdings do not need a water access licence to take water under a domestic and stock right, they still need to obtain a water supply work approval to construct a dam or a water bore.

Water taken under a domestic and stock right may be used for normal household purposes around the house and garden and/or for drinking water for stock. It cannot be used for irrigating fodder crops for stock, washing down in a dairy or machinery shed, intensive livestock operations (such as feedlots, piggeries or battery chickens), aquaculture or for commercial purposes (including caravan parks or large-scale bed and breakfast accommodation) other than for the personal use of the proprietors.

A licence is required for water taken for commercial activities such as irrigation, mining, aquaculture, feedlots, piggeries, poultry farms, golf/sporting areas and snow making.

**Do I need a licence for domestic and stock use of water?**

<table>
<thead>
<tr>
<th>If your land fronts a river or lake or overlies an aquifer</th>
<th>...and you want to take water from the river, lake or estuary for domestic or stock use</th>
<th>Domestic and stock rights apply. You do not require a licence to take water in this situation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>...and you want to take water from the aquifer for domestic or stock use</td>
<td>You do not need a licence to take groundwater for domestic or stock use. However you must obtain a water supply work approval to construct a bore or well</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>If your land does not front a river or lake and does not overlie an aquifer</th>
<th>...and you want to build a small dam for domestic or stock use</th>
<th>Harvestable rights may apply in this situation. You do not need a licence or an approval for a harvestable right dam. You must obtain a water supply work approval to construct an in-river dam</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>...and you want to take water from a river, lake or aquifer for domestic or stock use</td>
<td>You must obtain a licence before taking water or installing a pump</td>
</tr>
</tbody>
</table>

Appendix B: Cost Recovery Decision Framework

1. ACTION: Identify the nature of the issue that may potentially involve government intervention
   Then conduct a ‘market failure’/‘welfare’ test as below:

   2 (a) Market Power: Are there participants in the market that have sufficient market power so as to artificially influence trade or price? (See Notes)
   2 (b) Externalities: Are participants in the market imposing an unwanted cost on others not involved in the market transaction? (See Notes)
   2 (c) Public Goods: If left uninsured, would the market fail to provide an adequate level of investment to address the issue identified above? (See Notes)
   2 (d) Asymmetric Information: Does one party to a transaction have more or better information than the other party, thus creating an imbalance of power? (See Notes)

   If market failure present – Government action may be justified (See Notes)

3. ACTION: Devise a Proposed Government Program or Activity (if one does not already exist)
   The proposed intervention should be designed to overcome the specific market failure identified above (see notes).

   4. Is it (or would it be) necessary to regulate the provision of this activity/program? (e.g., to pursue impactors, establish industry levies, enforce compliance certification, etc)

   5. Do not provide
   Unless Industry requests government involvement and agrees to pay for the provision! (this may also require a regulatory basis) (fees preferred over levies)

   6. Does/would the activity/program involve ‘Registration / Approvals’ or ‘Compliance / Enforcement’?

   7. Is it appropriate to have a registration fee or compliance fee? (e.g., to deter bad behavior)

   8. Are/ would other individuals/organizations able to free ride on the approval of the first applicant?

   9. (a) Are/ would the major beneficiaries be a narrow identifiable group? (e.g., individuals or industries)

10. (a) Is/ would charging an individual or a firm for the activity/program be efficient and cost effective? i.e., are the affected parties identifiable, is there (or could there be) a fee collection mechanism in place and would the amount of money collected be likely to significantly outweigh the administrative costs of doing so?

11. ACTION: Conduct a Benefit Cost Analysis
   Only proceed with options in which benefits are greater than costs

12. If the impacts of the issue lie solely within one sector or industry, the responsible funding party (government/levied industry) may decide for the proposed activity/program not to be provided. Otherwise:

   13(a) cost recovery via FEE on individuals/firms
   13(b) cost recovery via LEVY on industry

   Provided with No Cost Recovery (Taxpayer Funding)

   Provided with Cost Recovery of Commercial Cost
   *(A + B + C + D + I)*

   Provided with Cost Recovery of Fully Distributed Cost
   *(A + B + C + D)*

   Provided with Cost Recovery of Avoidable Cost
   *(A + B)*

   Provided with Cost Recovery of Marginal Cost
   *(A + B)*

14. Would there be actual or potential competition for the provision of this activity/program?

15. If costs exceed benefits:

   16. Would the provision of this activity/program involve additional data collection, analysis or research beyond what is already taxpayer funded?

17. Provision of this activity/program involves the further dissemination of a basic product.