**Purpose of this water security outlook**

The Water Security Outlook (WSO) is an annual update to Barwon Water’s Water Supply Demand Strategy (WSDS). The WSDS was completed in 2012 and has built on previous Barwon Water strategies by looking into the long term future and identifying ways to balance supply and customer demand for water.

The WSO aims to:

- present updated long term and short term water supply and demand forecasts, taking into account recent catchment inflows and any changes to demand patterns
- provide updates on progress in the implementation of WSDS actions, and
- add, change, or remove actions, should the water security situation change.

For all other information, please refer to the WSDS document also found on Barwon Water’s website.

**Reporting on progress**

One of Barwon Water’s challenges is to make sound investment decisions despite an inherently uncertain outlook. In response, Barwon Water has adopted an adaptive planning approach. This includes scenario planning for a range of possible futures. To determine if there is a need for action, Barwon Water assesses both the long term and short term performance of each water supply system.

This report contains information on:

- the amount of water currently available
- a forward storage outlook for the coming year under a range of plausible climate scenarios
- whether agreed levels of service will be able to be met under these scenarios and if not
- what action will be taken to improve system performance so that these agreed levels of service can be met.

**Understanding the long term forecast**

The long term forecasts show the expected supply and demand balance over 50 years. Each graph considers a number of water availability scenarios, ranging from wet to very dry conditions.

Once the forecast demand starts to exceed the supply projections, a new action may need to be implemented. This can be any one of a number of available supply or demand options that will adequately keep demand below the projected ability to supply water. This ensures that restrictions are only used under the most extreme water shortage scenarios, and ultimately that supply will not fail.

Currently the median climate change scenario (based on information from the CSIRO) is used to indicate the ‘most likely’ timing of the next major upgrade.

The shaded areas of the graph indicate that other better or worse case scenarios are also possible in the future. For example, using higher or lower demand growth rates. When the worst case supply and demand scenarios combine, a system upgrade must be brought forward. However whilst important to consider, the likelihood of these two worst case scenarios combining is extremely low.

**Understanding the short-term forecast**

The short term forecast assesses water supply system performance based on historical inflow scenarios that may occur again in any given year. This is presented as a storage level projection for the next 12 months. Barwon Water uses a storage level trigger approach to decide whether or not short term actions are needed at any point in time. Levels continue to be tracked weekly throughout the year and drought response actions for each system (shown in the WSDS) are implemented as required.
Action plans

Plans for each service region were developed to highlight priority actions needed in the next five years. These actions range from undertaking further investigation and planning works through to implementation of actions if an immediate need has been identified.

Action summary

<table>
<thead>
<tr>
<th>Service region</th>
<th>Supply secure?</th>
<th>Water efficiency program focus</th>
<th>Supply upgrade</th>
<th>Alternative water sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aireys Inlet</td>
<td>✓</td>
<td>PWSP</td>
<td>2058</td>
<td>Investigate</td>
</tr>
<tr>
<td>Apollo Bay</td>
<td>✓</td>
<td>PWSP</td>
<td>2047</td>
<td>Investigate</td>
</tr>
<tr>
<td>Colac</td>
<td></td>
<td>Prepare for upgrade</td>
<td>2019–2020*</td>
<td>Investigate</td>
</tr>
<tr>
<td>Geelong</td>
<td>✓</td>
<td>PWSP</td>
<td>2050</td>
<td>Investigate</td>
</tr>
<tr>
<td>Lorne</td>
<td>✓</td>
<td>PWSP</td>
<td>2062+</td>
<td>Investigate</td>
</tr>
</tbody>
</table>

PWSP Permanent Water Saving Plan

2062+ Beyond the long term outlook period of 50 years. For further explanation please refer to the relevant sections of this document or the Water Supply Demand Strategy.

*Given timeframes for the implementation of a supply upgrade and limited storage capacity in this system, planning and design should commence now so that implementation can be brought forward if needed. Refer to the Colac forecasts for more information.
Greater Geelong long term forecast

What was forecast in the 2012?
The long term forecast in the WSDS indicated that with a number of new water supply sources in place, Greater Geelong will remain water secure well into the future. Even under extreme climatic scenarios, this system will remain secure for many years.

New water sources included: Anglesea bore field, the Melbourne Geelong Pipeline and Class A recycled water schemes in Armstrong Creek and Torquay North.

Has anything changed since?
Review of the Water Security Outlook since 2012 has resulted in a slight decrease to the demand forecast. This is due to revised Australian Bureau of statistics population figures, and updated state government forecasts. This indicates that a water supply upgrade or demand reducing action will be needed by 2050.

This graph incorporates both the extra water available through new sources, but also the expected substitution of recycled water for drinking water demand.

At 2042 the rate of growth in the demand forecast increases. This is when the current committed dual pipe residential developments of Armstrong Creek and Torquay North will be fully developed. Any new demand growth after 2042 would then be serviced by drinking water unless a new demand reduction option is implemented.
What was the operational philosophy in 2012?
The operational rule curve in the WSDS was developed to ensure that climate resilient sources such as the Barwon Downs borefield and the Melbourne to Geelong Pipeline (MGP) are reserved for use in dry conditions during times of water shortage. These options have enough supply capability to withstand several dry periods or sudden changes to supply capability.

Has anything changed since?
Inflows to storages for the past year have been in the average to above average range, therefore the storage curve has behaved as expected under normal climatic conditions.

The blue ‘predicted storage level range’ indicates that storages should remain at ‘normal’ levels over the next 12 months.

Even if conditions return to dry, greater Geelong won’t need to activate drought response options such as the Barwon Downs or Anglesea Borefield within the next 12 months.
Greater Geelong action plan

Greater Geelong is serviced by a range of different water supplies including surface water, groundwater and recycled water. Total water storage is high. Therefore there is no need to activate any drought response initiatives. Long term forecasts indicate that demand will not exceed supply until 2050. Despite this, some actions were identified in 2012 to ensure long term water security.

<table>
<thead>
<tr>
<th>Action</th>
<th>Target</th>
<th>Completion date</th>
<th>Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>G-1</td>
<td>Produce annual Water Security Outlook (WSO) report.</td>
<td>Release WSO.</td>
<td>November 30 annually</td>
</tr>
<tr>
<td>G-2</td>
<td>Complete Aquifer Storage and Recovery (ASR) research program.</td>
<td>Investigate remaining options where the timing of servicing requires action, or where efficiency gains are available.</td>
<td>2017</td>
</tr>
<tr>
<td>G-3</td>
<td>Engage in industry research into potential potable (drinking water) reuse techniques and opportunities.</td>
<td>Engage and participate in industry research and trials over the next five years.</td>
<td>2017</td>
</tr>
</tbody>
</table>
| G-4    | Identify and deliver targeted actions to support Integrated Water Cycle Management (IWCM) | a) Develop IWCM framework  
   b) Engage where co-investment is available | a) 2012  
   b) 2017 | a) Complete  
   b) Underway |
| G-5    | Develop broad IWCM strategy for the Barwon region | Finalise IWCM strategy document | 2015 | Underway |
| G-6    | Redirect water security driven water efficiency programs to Colac supply area | Redirect resourcing and budget after June 2012 | 2012 | Complete |
| G-7    | Collect and utilise improved customer end use data | Update end use accounting with new data | November 30 annually | Complete |
| G-8    | Review and deliver non-revenue water reduction program where it is cost effective | a) Identify leakage reduction projects.  
   b) Deliver if it proves cost effective. | a) 2012  
   b) 2017 | a) Underway  
   b) Underway |
| G-9    | Update outlook using updated growth forecasts | Complete revised forecast | 2013 | Complete |
| G-10   | Anglesea borefield | Complete commissioning | 2012 | Complete |
| G-11   | Barwon Downs licence renewal | Complete renewal process | 2018 | Underway |
| G-12   | Administer Permanent Water Saving Plan (PWSP) | Continue current programs | Ongoing | Ongoing |
Colac long term forecast

What was forecast in 2012?
The long term forecast in the WSDS indicated that Colac’s water supply system is vulnerable to reduction in catchment yield under certain climate scenarios. This is compounded further by the heavy reliance on surface water and limited storage capacity. The 2011 forecast indicated that new water must be sourced or saved by 2017.

An upgrade will ensure that restrictions are required only the most extreme drought years, and the chance of supply failure will be minimised.

Has anything changed since?
While 2014 demand was relatively low, 2013 did see high demand in Colac due to much drier weather between January and June. This resulted in water restrictions being implemented in Colac. The jump in demand highlights that Colac’s consumption can fluctuate significantly based on climate. This uncertainty highlights an additional risk to Colac customers.

The long term demand forecast presented here has been reduced due to the latest Australian Bureau of Statistics (ABS) data indicating a smaller population in Colac, but also based on savings being generated by new water saving projects on farms.

How will Colac’s water supply be upgraded?
The preferred strategic option for the Colac water supply upgrade is to source additional water from the Wurdee Boluc Channel, but also has the potential to source groundwater from the Barwon Downs Borefield.

This option was selected from a shortlist of six options with endorsement from a Colac Community Reference Group. This option provides Colac with the greatest level of supply diversity and increases the resilience of the existing water supply system, as well as supporting future growth in water demand from residential, farming and business customers.
This long term forecast indicates when an upgrade will be most likely needed, however other factors like added risk of bushfire in the catchment may mean that an upgrade is completed earlier. The timing of the works must be reviewed each year, and once tendered is expected to take less than 12 months to construct.

Closer monitoring of demand and climate (e.g. using the ‘short term’ forecast) may lead to earlier implementation if ‘worst case scenarios’ eventuate. Design and land purchase should commence soon so that construction can start quickly if required.

**Colac community engagement initiatives**

Engagement activities undertaken have included:

- Agency stakeholder briefing sessions
- A community survey (online and at Colac office)
- Information kiosks at community events
- The formation of a Colac Community Reference Group (CCRG).

The CCRG met six times between November 2012 and May 2013. The group comprised 11 community members representing different sectors of the community. The CCRG recommended that additional water be sourced from the Upper Barwon system to secure Colac’s supply. Barwon Water accepted this recommendation and selected this option in June 2013.

**Colac’s Integrated Water Cycle Management Plan**

This project involved investigating opportunities to integrate urban and water planning for Colac to enhance aspects of the city’s water cycle system to contribute towards liveability, productivity and sustainability outcomes.

The objectives of the plan are to:

- Raise awareness of the role of the water cycle in achieving Colac’s future aspirations, and
- Identify opportunities for integrated water cycle management to enhance Colac’s ability to become more liveable, productive and sustainable.

The plan is now being used by key stakeholders as a guide for planning.

**Colac water efficiency program**

Barwon Water’s Water Efficiency Officer, has visited more than 100 farms in the Colac-Otway region and identified potential savings at a number of sites.

A number of farmers in the region have now received grants from Barwon Water and the Department of Environment and Primary Industries (DEPI) to implement efficiency projects.

24 projects have been completed since 2012 with an expected combined savings of up to 150 million litres per year. Most projects have involved a combination of water efficiency and increased use of alternative water sources.

Approximately 30% of the annual demand in Colac comes from agricultural customers, and this is the first Barwon Water program to focus on opportunities in this sector.

As these programs take effect, the savings are incorporated into the demand forecasts, and the planned timing for major upgrade works.
Colac short term forecast

What was the operational philosophy in 2012?
The Colac supply system is heavily dependent on the timing of seasonal inflows and is vulnerable to any shortening of the seasonal fill pattern. The existing storage volume is no longer sufficient to safely see Colac through periods of very low inflows (dry climate). The operational rule curve in the WSDS illustrated when drought response initiatives may be needed if supply reaches critical levels. Drought responses for Colac include varying stages of water restrictions and an education and awareness campaign to save water during the summer months.

Has anything changed since?
Stage 2 water restrictions were implemented in Colac in 2013 after storage levels were drawn down by higher demands whilst catchment inflows were negligible through summer and autumn. These restrictions lasted for about five weeks until storage levels bounced back after catchments finally received higher rainfall. The farming sector relies heavily on town water supply during the summer period and can increase its water demand quite quickly. During dry climate conditions early action by activating drought response initiatives during the summer months is necessary to maintain supply above critical levels (the reserve storage). This approach will change once this system is upgraded.
<table>
<thead>
<tr>
<th>Action</th>
<th>Target</th>
<th>Completion date</th>
<th>Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>Produce annual Water Security Outlook report.</td>
<td>Release WSO</td>
<td>November 30 annually</td>
</tr>
<tr>
<td>C2</td>
<td>Complete further investigations into options for additional drinking water supply in Colac.</td>
<td>Complete detailed options report</td>
<td>2013</td>
</tr>
<tr>
<td>C3</td>
<td>Undertake further community consultation on new options for Colac.</td>
<td>Incorporate into options report</td>
<td>2014</td>
</tr>
<tr>
<td>C4</td>
<td>Deliver community water grants in Colac.</td>
<td>a) Identify opportunities and ensure initiatives installed within 12 months. b) Allocate resources to administer process</td>
<td>June 30 (annually) up until 2016</td>
</tr>
<tr>
<td>C5</td>
<td>Allocate Capital Works Investment Plan (CWIP) funding for 2017.</td>
<td>Include in CWIP</td>
<td>2012</td>
</tr>
<tr>
<td>C6</td>
<td>Identify new water saving initiatives for Colac.</td>
<td>a) Allocate one full time officer for five years. b) Conduct a minimum of 100 site visits. c) Identify and deliver projects or initiatives to reduce forecast demand by a minimum of 100 ML</td>
<td></td>
</tr>
<tr>
<td>C7</td>
<td>Deliver non-revenue (network leakage) water reduction program.</td>
<td>a) Identify leakage reduction projects b) Deliver if water source efficiency exists</td>
<td>a) 2012 b) 2015</td>
</tr>
<tr>
<td>C8</td>
<td>Review and update growth forecasts.</td>
<td>Complete revised forecasts</td>
<td>2013</td>
</tr>
<tr>
<td>C9</td>
<td>Administer Permanent Water Saving Plan (PWSP).</td>
<td>Continue current programs</td>
<td>Ongoing</td>
</tr>
<tr>
<td>C10</td>
<td>Implement all water efficiency options in Colac.</td>
<td>a) Develop implementation plan b) Allocate resources required c) Complete programs d) Monitor value for money against program levelised cost estimates in this strategy</td>
<td>a) 2013 b) 2014 c) 2018 d) Ongoing</td>
</tr>
</tbody>
</table>
Apollo Bay and Skenes Creek long term forecast

What was forecast in 2012?
The long term forecast in the WSDS indicated that when the new storage and diversion point is complete in 2014, both townships will be water secure well into the future under all scenarios. Even under the most extreme climatic scenario, this system will remain secure for many years.

Has anything changed since?
This year’s Water Security Outlook includes a revised population growth rate which has led to a slight decrease in the demand forecast. The population growth rate was downgraded based on Council growth projections. With the new storage basin now in place, the next upgrade will not be required until 2047.
What was the operational philosophy in 2012?
The operational rule curve in the WSDS illustrated the new functioning storage range of the Apollo Bay system, the range of total storage used in drier years and the reserve storage. The curve also described when drought response initiatives may be needed if supply reaches critical levels. Drought responses for these townships would include varying stages of water restrictions, an education and awareness campaign, additional summer pumping from the Barham River to increase supply, and additional water trucked in by water tankers.

Has anything changed since?
Inflows in 2013 were very low and limited the ability to use backup pumping to maintain supply late in summer. In 2013 Stage 4 water restrictions were implemented. With the upgrade in place, restrictions are unlikely even under the worst case scenario in the next 12 months.
Apollo Bay and Skenes Creek action plan

Apollo Bay is serviced by a usually high yielding catchment but until 2014 the storage was too small. Work has recently been completed to construct a new 250 million Litre storage basin securing supply for the long term. The Permanent Water Saving Plan remains in place as ongoing reminder for people to use water wisely. No other operational actions will be required unless a severe water shortage develops and further drought response actions are activated.

<table>
<thead>
<tr>
<th>Action</th>
<th>Target</th>
<th>Completion date</th>
<th>Progress</th>
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</thead>
<tbody>
<tr>
<td><strong>AB1</strong></td>
<td>Produce annual Water Security Outlook (WSO) report</td>
<td>Release WSO</td>
<td>November 30 annually</td>
</tr>
<tr>
<td><strong>AB2</strong></td>
<td>Deliver water efficient home and business programs</td>
<td>Minimum of 30 homes or business visits</td>
<td>2014</td>
</tr>
<tr>
<td><strong>AB3</strong></td>
<td>Review growth forecasts</td>
<td>Complete revised forecast</td>
<td>2013</td>
</tr>
<tr>
<td><strong>AB4</strong></td>
<td>Administer Permanent Water Saving Plan (PWSP)</td>
<td>Continue current programs</td>
<td>Ongoing</td>
</tr>
<tr>
<td><strong>AB5</strong></td>
<td>Secure Apollo Bay water supply for the long term</td>
<td>a) Complete planning processes and construct additional 250 million litre storage basin. b) Upgrade the pump station on the Barham River</td>
<td>2014</td>
</tr>
</tbody>
</table>
What was forecast in 2012?
The long term forecast in the WSDS indicated that the catchment and reservoir storage will provide adequate water supply well into the future under all scenarios. Even under the most extreme climatic scenario, this system will remain secure for many years.

Has anything changed since?
After considering community feedback on options, Barwon Water recently announced that it will interconnect the Aireys Inlet and Fairhaven supply with the Geelong Supply System. In addition to being much less expensive than upgrading the ailing water treatment plant, water security will be linked to the now very secure Geelong System. Geelong is expected to remain secure until 2050.
Aireys Inlet and Fairhaven short term forecast

What was the operational philosophy in 2012?
Aireys Inlet is currently served by a relatively large reservoir which has enough of a storage buffer that drought response initiatives are not needed under normal circumstances. But this single source of supply also means that Aireys Inlet and Fairhaven are more susceptible to the potential impacts that bushfires in the catchment can cause.
Once connected to the Geelong supply system, these towns will no longer be vulnerable to this hazard.

Has anything changed since?
Over the last 12 months the storage levels behaved as expected under relatively normal climatic conditions. Over the next 12 months it is unlikely that restrictions will be needed due to water shortage.

The restriction range was recently modified to account for operational factors that would influence the implementation of restrictions during a water shortage; however the overall change is small.

Aireys Inlet and Fairhaven action plan
No further targeted actions are required for Airey’s Inlet or Fairhaven. The Permanent Water Saving Plan (PWSP) will continue to be applied consistent with all other service areas.

<table>
<thead>
<tr>
<th>Action</th>
<th>Target</th>
<th>Completion date</th>
<th>Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI-1 Produce annual Water Security Outlook report (WSO)</td>
<td>Release WSO</td>
<td>November 30 each year</td>
<td>Complete</td>
</tr>
<tr>
<td>AI-2 Deliver water efficient home and business programs</td>
<td>Minimum 30 home and business visits</td>
<td>2017</td>
<td>Deferred</td>
</tr>
<tr>
<td>AI-3 Review growth forecasts</td>
<td>Complete revised forecast</td>
<td>2013</td>
<td>Complete</td>
</tr>
<tr>
<td>AI-4 Administer PWSP</td>
<td>Continue current programs</td>
<td>Ongoing</td>
<td>Ongoing</td>
</tr>
</tbody>
</table>
Lorne’s long term forecast

What was forecast in 2012?
The long term forecast indicates that Lorne is susceptible to only the most extreme climatic scenario (return to dry coupled with a dry climate drinking water demand forecast). However under the long term median scenario (most likely) the Lorne system will remain secure beyond 2062. Water restrictions, from time to time, may be necessary if consumption increases significantly, or if there is a return to drier conditions.

Has anything changed since?
Updates to demand and population growth were made to this year’s Water Security Outlook. These revisions mean the need for a water supply upgrade or demand reducing action can be deferred for a further four years compared to last year. This means that Lorne is water secure until 2044 (under a dry climate demand coupled with a median climate change supply scenario).
Careful monitoring is required if consecutively very dry years occur which reflect the severity of the ‘return to dry’ scenario.
What was the operational philosophy in 2012?
The operational rule curve highlights the fill patterns of storages and how the storage behaves in response to an annual climate cycle. The curve also describes when drought response initiatives may be needed to extend the life of the storage if water supplies reach critical levels.

Has anything changed since?
Additional information has been provided to show how the storage will react under wet and dry climatic conditions. The blue range represents all the possible outcomes in between. Dry conditions reduce the total runoff into catchments, placing more stress on water storages. Even under dry climate scenarios, Lorne is unlikely to need water restrictions in the next 12 months.

Lorne’s action plan
Following the review of growth forecasts, the Water Security Outlook has concluded that water efficiency programs will be deferred for the short term. This will be assessed again in next year’s Water Security Outlook. The Permanent Water Saving Plan (PWSP) will continue to be applied.

<table>
<thead>
<tr>
<th>Action</th>
<th>Target</th>
<th>Completion date</th>
<th>Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-1 Produce annual Water Security Outlook (WSO)</td>
<td>Release the WSO</td>
<td>November 30 annually</td>
<td>Complete</td>
</tr>
<tr>
<td>L-2 Deliver water efficient home and business</td>
<td>Minimum 30 home and/or business visits</td>
<td>2017</td>
<td>Deferred</td>
</tr>
<tr>
<td>programs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L-3 Review growth forecasts</td>
<td>Complete revised forecast</td>
<td>2013</td>
<td>Complete</td>
</tr>
<tr>
<td>L-4 Administer PWSP</td>
<td>Continue current programs</td>
<td>Ongoing</td>
<td>Ongoing</td>
</tr>
</tbody>
</table>
Gellibrand

River flow and demand patterns in Gellibrand show that there is no need to implement any supply or demand initiatives for the township of Gellibrand. The average monthly flow in Lardner Creek is 2,270 megalitres, which is well above the average demand of 1.6 megalitres.

Even during the worst year on record, Lardner Creek flows were on average 1,155 megalitres per month which means that risk from dry climatic conditions is insignificant. For this reason, detailed supply and demand forecasts were not undertaken for this water supply system.

Gellibrand’s action plan

<table>
<thead>
<tr>
<th></th>
<th>Action</th>
<th>Target</th>
<th>Completion date</th>
<th>Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ge-1</td>
<td>Administer Permanent Water Saving Plan (PWSP)</td>
<td>Continue current programs</td>
<td>Ongoing</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Ge-2</td>
<td>Monitor growth and risks to supply</td>
<td>Include in Water Security Outlook (WSO) process</td>
<td>November 30 annually</td>
<td>Ongoing</td>
</tr>
</tbody>
</table>

Glossary

ML                  Megalitre = One million litres
Supply Upgrade      This may mean adding a new source or increasing the amount of water an existing source can produce.
Water Efficiency Program Working with customers to help them save water.