

# Essential Services Commission

## Water Price Review 2009: Response to Draft Decision, Demand



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# 1 Introduction

## 1.1 Objective

PricewaterhouseCoopers (PwC) has been engaged by the Essential Services Commission of Victoria (ESCV) to review the Metropolitan Water Businesses' responses to the Commission's Draft Decision in relation to the Melbourne metropolitan water price review 2009-10 to 2012-13.

In its Draft Decision the ESCV generally accepted the recommendations made by PwC in its prior advice. The ESCV stated that it considered the at PwC's recommended demand forecasts reasonably take into account customer growth, water restriction assumptions, Target 155 and savings made from conservation measures.

The Commission went on to note that PwC's recommended adjustments provide a reasonable sharing of risk between businesses and customers. However, the Commission also noted that the volumes and restriction assumptions are based on conservative forecasts in relation to behavioural responses to restrictions, Target 155 and total inflow given the anticipated augmentation of Melbourne's water supply.

In response to the Commission's Draft Decision both South East Water and Yarra Valley Water submitted further information regrading each businesses' demand forecasts. Melbourne Water and City West Water made no material submissions relating to demand in response to the Draft Decision.

This report and the analysis contained within it will be an input into the ESCV's consideration of the businesses' proposals in its Final Decision. In providing this advice, PwC has had regard to:

- any guidance issued by the ESCV with respect to how it will assess the businesses' proposed demand forecasts
- the prior advice provided by PwC in the document *Water Price Review 2009: Demand*
- the information set out in the businesses' Water Plans (and accompanying templates) and any explanations that the businesses provide with respect to the basis used to derive the forecasts including any assumptions used
- comparisons amongst the businesses of their forecasting methodologies and assumptions and resulting forecasts
- any additional data provided by businesses in their responses to the Draft Decision
- PwC's own experience in preparing and assessing the veracity of forecasts of demand for rural and urban water services in Victoria and other Australian states.

In the event that PwC believe that the businesses' responses to the Draft Decision are valid or material we are required to provide the ESCV with an alternative forecast.

## 1.2 Consultation

As with PwC's advice prior to the Draft Decision, in order to provide meaningful assessment, conclusions and recommendations the water businesses have been engaged in a high level of consultation. PwC consultants met with each business that responded to the Draft Decision in relation to demand, individually in June 2009. The purpose of these meetings was to provide businesses with an opportunity to present the method and findings underlying their responses.

In light of the information provided in these meetings, and in the responses, PwC also asked each business to provide further information addressing issues that preliminary analysis identified.

After consideration of this further information PwC developed this report for submission to the ESCV.

Throughout the process of drafting this report, PwC has adopted an approach of openness and transparency aimed at allowing businesses the opportunity to fully inform our process.

## 1.3 Scope of recommendations

It should be noted that only South East Water and Yarra Valley Water responded to the ESCV's draft decision in relation to demand. Subsequently the recommendations contained within this report relate directly to South East Water and Yarra Valley Water.

One of the recommendations relates to the adjustment of volume forecasts in consideration of the timing of restriction announcements (particularly in relation to T155). Although only South East Water raised concerns regarding timing the resulting recommendation was applied to both South East Water and Yarra Valley Water on the grounds of consistency.

It was not applied to City West Water for a number of reasons, including, that City West Water has not proposed any material decrease in usage associated with the T155 program. In addition, we have accessed residential usage on a lppd basis for City West Water residential customers and have confidence in City West Water's proposed forecasts in this regard.

## 1.4 Limitations

This report has been prepared consistently with the terms and conditions agreed to between PwC and the ESCV for the provision of services.

This report has been prepared by PwC for the ESCV for the sole purpose of providing advice in relation to the responses to the Draft Decision by metropolitan water businesses. While PwC understands that

the ESCV may make this report or material herein publicly available, it is not intended to be relied upon by any person other than the ESCV, nor is it to be used for any purpose other than that articulated above. Accordingly, PwC accepts no responsibility in any way whatsoever for the use of this report by any other persons or for any other purpose.

This report has been prepared using information provided to the ESCV and PwC by the businesses in their responses to the Draft Decision. We have also relied on the information that we have received from the businesses in response to information requests that we have made.

Importantly, PwC has not undertaken any independent verification of the reliability, accuracy or completeness of this information. Therefore, it should not be construed that PwC has carried out any form of audit or other verification of the adequacy, completeness, mathematical accuracy, or reasonableness of the information provided by the businesses and upon which this report is based.

## 1.4 Structure of this report

Of the four water businesses included in the price review only South East Water and Yarra Valley Water responded to the ESCV's Draft Decision in relation to demand forecasts. The remainder of this report is structured as follows:

- Chapter 2 South East Water — reviews the Draft Decision and the business's key responses. The chapter then provides an assessment of these Responses and makes recommendations to the ESCV in regard to their validity or materiality.
- Chapter 3 Yarra Valley Water — reviews the Draft Decision and the business's key responses. The chapter then provides an assessment of these Responses and makes recommendations to the ESCV in regard to their validity or materiality.

The report also has attached three appendices relating to:

- A: T140 in Queensland. This information was provided to the ESCV as an appendix to our demand advice prior to the Draft Decision. It has been reiterated in this advice as it remains relevant and the advice itself is structured as a stand alone document.
- B: SEW's response to PwC's request for further information
- C: YVW's response to PwC's request for further information.

## 2 South East Water

In this chapter, we review the ESCV's Draft Decision and South East Water's (SEW) response. We also assess this response in terms of its validity and materiality.

### 2.1 Draft Decision

The advice provided by PwC to the ESCV prior to its Draft Decision included the following:

- We adjusted SEW's forecasts to reflect the most recent edition of Victoria in Future.
- We also amended non-residential water volumes to remove elasticity impacts to avoid any double counting of such impacts resulting from waterMAP programs.
- PwC also noted that, although it did not apply to SEW in this regulatory period, it was concerned that the general practice of applying elasticity estimates to a base line demand generated by an end use model was methodologically unsound.
- Water volumes were first adjusted for changes in connections for both residential and non residential customers. Residential forecasts were amended further to account for new assumptions regarding restriction levels and the introduction of T155.
- We made amendments to the schedules provided by SEW to reflect our concerns over the assumed impacts of T155 on water consumption. Specifically, we placed a floor of 155 litres per person per day (lppd) and removed any residual impacts of T155 from the subsequent years.
- The final amended numbers also reflect a rebalancing of the anticipated savings from the imposition of T155 such that they fall equally on blocks one and two as opposed to two and three.

In order to limit T155 to 155 lppd we assumed the per connection consumption associated with each level of restriction as proposed by SEW in its Water Plan were applicable. For example, where SEW had originally proposed per connection consumption for a level 2 restriction in its water plan we took this to apply to the revised numbers in its response where level 2 restrictions were being applied.

We accounted for assumed conservation due to long run trends in water use efficiency by deriving an annual average efficiency gain based on SEW's end use model output and applying this to the restriction level per connection use where appropriate

## 2.2 South East Water's Response

In response to the Draft Decision South East Water's submission raised four main issues. These were:

- customer numbers
- price elasticity
- the timing of restriction changes
- the impact of restrictions (specifically T155) on demand

Each of these issues is outlined separately.

### 2.2.1 Customer numbers

In its response SEW stated that the customer numbers proposed by the ESCV in the Draft Decision maintain customer growth at levels greater than those experienced during the recent building boom. South East Water does not consider these levels of growth to be sustainable into the future given the declining levels of building approvals and the recent cuts to the first home buyers grant.

However, South East Water has adopted the Commission's proposed numbers on the basis that it could not identify a viable alternative to the forecasts contained within the ViF.

#### Assessment

While South East Water has stated that the forecasts based on ViF provide for unsustainable levels of growth, it has not been able to provide an alternative. SEW have provided no additional information that would require an amendment to customer numbers.

#### Recommendation

Given SEW have accepted ViF forecasts as a basis for customers numbers there is no reason to further amend SEW's forecasts in this regard.

### 2.2.2 Price elasticity

South East Water did not agree with the advice provided by PwC to the ESCV regarding the double counting that may occur as a result of applying elasticity assumptions to demand forecast generated by end use models.

As indicated in its water plan and subsequent consultation with PwC during the drafting of its demand advice, SEW reiterated that it had not

included elasticity for residential users based on the rule of thumb that were savings from price elasticity were less than those from restrictions it was excluded. SEW stated:

*Therefore while no residential price elasticity was included in South East Water's forecasts for the Water Plan, South East Water supports its inclusion in an environment where prices are rising and water use is unrestricted.*

Unlike residential customer, for non-residential customers South East Water included cumulative price elasticity. SEW is of the view that these elasticities should not be removed by the Commission. The rationale for their removal is the possible double counting of savings in relation to the WaterMap program.

South East Water indicated that it had not included the ongoing impacts of Water Map in its original forecasts. South East water had only included the Water Map savings realised in 2007-08.

## Assessment

While South East Water has stated that it believes that the ESCV's proposed forecasts may overestimate residential demand due to the exclusion of an elasticity estimate, it has not provided any additional information that addresses the issue identified by PwC in its demand report in relation to method. On the basis of this response PwC remains concerned that the application of elasticity assumptions to estimates generated by end use models, which implicitly already account for changed water use behaviours, will exaggerate savings.

In relation to non residential customers we note that elasticity was removed from forecasts of those customers consuming greater than 10 ML per year on the basis that (as with end use models) elasticity and assumed water use efficiencies from the WaterMap program may lead to exaggerated savings.

Subsequent to the Draft Decision, SEW has informed the ESCV that it did not apply any WaterMap saving assumptions to the demand forecasts for these users. Accordingly we believe that there is no risk of exaggerating savings and we recommend demand forecasts for greater than 10 ML non residential customers include elasticity assumptions.

## Recommendation

On the basis that SEW did not include waterMAP savings in its forecasts for non-residential customers over 10 ML per annum we recommend the ESCV allow for elasticity assumptions for this group of customers. The amended demand schedule is attached to the back of this chapter.



### 2.2.3 Timing of restriction changes

SEW noted that recent Government policy has been to announce changes to restriction levels in November after the winter/spring rain period. Therefore, where the restriction level is expected to change during the year, it had included five months at the old level and seven months at the new level.

South East Water expects government to continue this practice and seeks re-instatement of the relevant volume reductions.

#### Assessment

Given that restrictions are generally announced in November, we believe there is merit in SEW's response. However we also note that traditionally the first five months of the year represent a period of relatively low use and that the main impact of T155 (and subsequently the main impact from its removal) would most likely occur in the high use period after November. Subsequently the impact of the additional months of restrictions is somewhat marginalised by the fact that use on a lppd basis may be under 155 lppd ordinarily during this period regardless of the restriction level.

We also note that expectations would be that businesses ramp down their advertising and promotional campaigns in the final months of the T155 program, thus making the restriction less effective than it would otherwise be. In addition we are concerned that the timing of restrictions may change in the future as major augmentations to Melbourne's supply system are commissioned.

Taking into consideration the uncertainty surrounding the impact of T155 on the first five months of the financial year and given that the restrictions are not announced until November we have adjusted the ESCV's proposed forecasts to account for four months of T155 in 2010-11.

However, we have not adjusted subsequent years to account for timing on the grounds of immateriality. The effects of doing so are so marginal that any subsequent underestimation most likely falls within reasonable bounds of acceptability given general levels of uncertainty.

#### Recommendation

On the basis that restrictions are announced in November we recommend the ESCV amend its proposed forecasts to allow for four months of T155 in 2010-11.

## 2.2.4 Impact of restrictions on demand

South East Water has based its estimate of water savings in relation to T155 on the Drought Response Plan. South East Water has two issues with the Commission's approach:

- The T155 program was designed by Government to achieve the savings required under stage 4, and
- Experience from Queensland also indicates that such a program can result in lower than expected consumption (T140 program resulted in 128 lppd).

SEW also stated that the T155 program is asking customers to limit their consumption to 155 lppd. If those customers that are already using less than 155 lppd do nothing and the customers who are using more than 155 lppd reduce their consumption, then mathematically, the average across the customer base is likely to be less than 155.

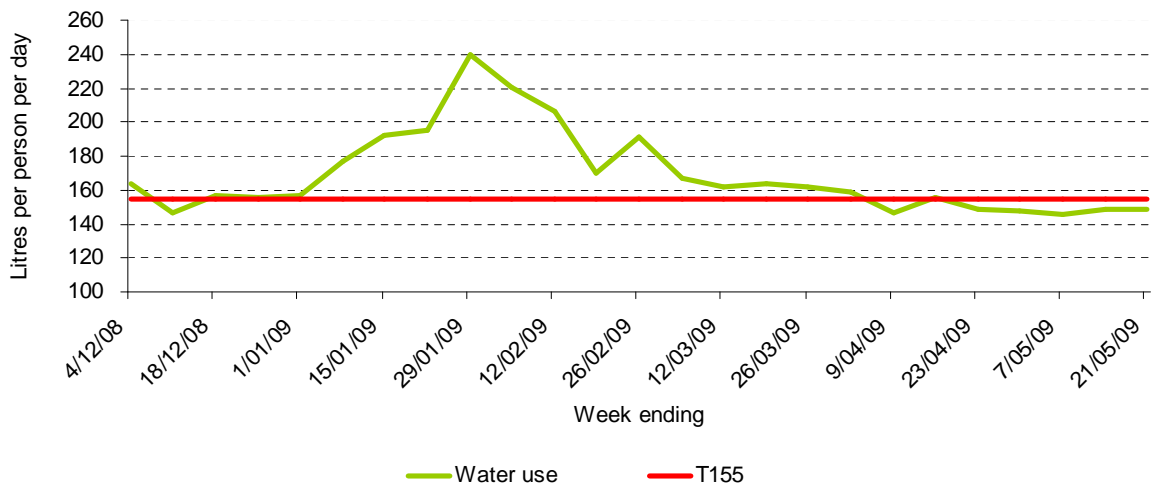
For the above reasons South East Water is of the view that the Drought Response plan estimate of savings is the most valid number.

### Assessment

We acknowledge that the Government's stated aim for T155 is to achieve savings equivalent to a level 4 restriction. However, while this information has informed our assessment it is not in and of itself an adequate basis for forecasts. The forecasts should be based on expectations of future consumption based on the best and latest available data. To date there has been no indication from government that it would increase restrictions to level 4, were T155 not to achieve savings equivalent to level 4.

On the basis of the most recently available data T155 does not appear to be achieving savings in excess of those associated with 155 lppd. The average over the period from the week ending 4 December 2008 to 21 June 2009 is 169.04 lppd. The average weekly lppd over the period of the program are reported in figure 2.1.

**Figure 2.1** SEW residential water use, lppd.



Given the levels achieved thus far we feel that capping the program at 155 lppd is in of itself a conservative approach and to amend forecasts such that they referenced lower consumption levels would be excessively conservative.

SEW also referenced the experience with T140 in Queensland. Any comparison between the two states should reference the fundamental differences between the programs. One of the primary differences is that the Queensland program had incentives for compliance. Specifically it included the:

- development of a rigorous water restrictions compliance regime where the scope for on-the-spot fines and other penalties increased with non-compliance
- the following steps were implemented for excessive use and other non-compliance:
  - household notified of their excessive use through their water bill
  - if continual non-compliance with the threshold, household notified again and asked to explain their excessive usage
  - if continual non-compliance, a \$450 fine and an outdoor watering ban will be imposed
  - if continual non-compliance, a flow restrictor will be installed and an additional penalty (\$1050 fine) will be imposed.

T155 has no equivalent to the above incentives and therefore any comparison with T140 must be qualified.

SEW also contend that if residential customers using more than 155 lppd dropped their consumption, and those currently under 155 lppd maintained their levels then the average would be lower than 155 lppd. However, this proposition ignores the question at hand which is by how much will those currently exceed 155 lppd actually drop their

consumption. In order for the average to fall below 155 lppd it would appear that relatively high users would need to limit consumption considerably more than they have currently showed an inclination to do so.

### Recommendation

On the basis of the latest information regarding savings achieved under the T155 program we recommend the ESCV not amend its proposed forecasts to allow for water use less than 155 lppd.

## 2.2.5 Revised forecasts

Tariff	Unit	2009-10	2010-11	2011-12	2012-13
Non-residential water usage charge	kL	28,947,482	33,486,317	33,786,618	36,240,175
Non-residential sewerage disposal charge	kL	13,945,074	15,925,179	16,067,994	17,031,428
Residential water usage charge block 1	kL	63,522,734	64,180,584	65,167,113	65,604,428
Residential water usage charge block 2	kL	14,388,197	17,562,953	18,721,194	21,145,351
Residential water usage charge block 3	kL	5,443,695	8,021,288	7,991,742	9,991,807
<i>Total residential water volume</i>	<i>kL</i>	<i>83,354,626</i>	<i>89,764,824</i>	<i>91,880,050</i>	<i>96,741,586</i>
Residential sewerage disposal charge	kL	58,023,516	60,497,534	61,923,102	64,525,779

## 3 Yarra Valley Water

In this chapter, we review the ESCV's Draft Decision and Yarra Valley Water's (YVW) response. We also assess this response in terms of its validity and materiality.

### 3.1 Draft Decision

The advice provided by PwC to the ESCV prior to its Draft Decision included the following:

- We adjusted YVW's forecasts to account for its new revised restriction schedule. We also adjusted the resulting volume projections to reflect our concerns over the treatment of T155.
- We amended the forecasts such that they do not reflect per person per litre per day consumption less than T155. These calculations were based on the ViF 2008 population forecasts for those relevant local statistical areas as advised by YVW.
- Residual impacts from T155 were removed from the year 2010-11. These calculations rely on the proposed consumption associated with level 2 restrictions as originally proposed by YVW for 2010-11.
- T155 impacts have also been distributed evenly between tiers 1 and 2 of the inclining block tariff to reflect the focus of the program on both indoor and outdoor use.
- Increased residential volumes also impact on residential sewage volumes. Residential sewage volumes were adjusted based on the ratio of proposed residential sewage volume to residential water volume.

### 3.2 Yarra Valley Water's response

YVW's principal concern raised in response to the Draft Decision is the proposed increase by the ESCV of consumption in 2009-10 from 150 lppd to 155 lppd while the target 155 program is in place.

YVW also raised two further issues:

- watering/non watering day impact on consumption
- block shares

Each of these issues is outlined separately.

### 3.2.1 T155 and consumption

YVW maintains that residential customer's consumption to date in relation to T155 is consistent with its proposed forecasts of 150 lppd for 2009-10. YVW state:

*Our customers are heeding the call to save water and are investing in changes to support water savings. As storages are expected to remain low, we expect aggressive conservation programs to continue with messages to reduce consumption up to en 2009-10 and we expect our customers will continue to respond with water savings accordingly*

In its response to the Draft Decision YVW outlined two possible scenarios for consumption in 2009-10. These scenarios were labelled High End and Most Likely. These scenarios are outlined in the figure below.

Figure 3.1 YVW proposal, lppd

Litres per person per day	YVW 2007/08 3a	YVW 2008/09 3a/3a+T155	High	Most Likely
			YVW 2009/10 3a+T155	YVW 2009/10 3a+T155
Jul	147	141	133	129
Aug	150	143	135	131
Sep	160	152	144	139
Oct	174	167	159	152
Nov	173	158	150	144
Dec	175	145	145	145
Jan	181	185	185	185
Feb	173	186	186	186
Mar	187	151	151	151
Apr	164	139	139	139
May	147	139	139	139
Jun	139	139	139	131
Financial Year Average	164	154	150	147

The main attributes of each scenario are:

- High End
  - July-Nov 2009 based on current year usage adjusted for savings observed in May 2009.
  - May 2008 less May 2009 gives 8 litre saving – used as a proxy saving for forecasting July to Nov 2009
  - For 2009-10, December 2009 to April 2010 held at 2008-09 levels
  - June 2010 held at 2007-08 level
- Most likely

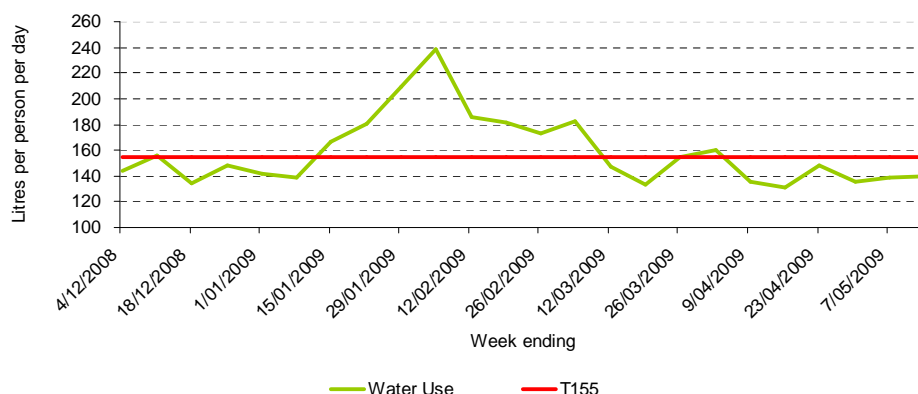
- 2009-10 based on the average actual percentage reduction observed from Dec 2008 to April 2009 (period of actual data for T155)
- Dec 2009 to May 2010 held at “High End” scenario levels.

YVW believe that the scenarios demonstrate that a consumption range of 147 and 150 lppd is possible for 2009-10 with 150 lppd in the higher usage case and 147 lppd representing a more likely picture. Subsequently, YVW does not believe that the proposed level of 150 lppd is overly conservative.

### Assessment

As with South East Water we note that on the basis of the most recently available data T155 does not appear to achieving savings in excess of those associated with 155 lppd. The average over the period from the week ending 4 December 2008 to 21 June 2009 is 159 lppd. The average weekly lppd over the period of the program are reported in figure 3.2.

Figure 3.2 Average weekly consumption lppd.



We have a number of concerns with the proposed demand in YVW's response. These relate primarily to:

- seasonality
- constant levels of assumed savings

We note the information provided by YVW shows a strong cyclical pattern with a trough that bottoms out in June and begins to recover in July. This pattern is not observable in YVW's response. YVW have forecast demand as steady over June 2009 and then decrease in July 2010, contrary to historically observable patterns.

We are also concerned that the assumed savings is constant and does not take into consideration that, due to the highly inelastic nature of water use the level of saving would be expected to decrease as consumption levels decreased. We would not expect to generate the same level of savings during periods were customers traditional consume lower levels of water. YVW's response applies a constant

saving of approximately 8 litres in the first scenario and in the second scenario a constant savings based on the average percentage decrease observable during the program.

For these reasons we believe there is sufficient uncertainty regarding the impact of T155 that the ESCV should maintain the precautionary approach we recommended prior to the Draft Decision of capping anticipated savings at the level of 155 lppd.

We also note that, as with SEW, in any given year the announcement of restrictions occurs in November, subsequently, as with SEW, we recommend that the ESCV adjust YVW's forecasts to include 5 months of T155 restrictions in the year 2010-11.

#### Recommendation

There is sufficient uncertainty regarding the impact of T155 that the ESCV should maintain the precautionary approach we recommended prior to the Draft Decision of capping anticipated savings at the level of 155 lppd.

On the basis that restrictions are announced in November we recommend the ESCV amend its proposed forecasts to allow for four months of T155 in 2010-11.

### 3.2.2 Watering/non-watering day impact on consumption

In its response to the Draft Decision YVW raised the issue of watering and non-watering days. YVW stated that it agreed with the ESCV that rainfall and temperature are drivers of consumption. However, it also identified whether consumption is occurring on a day that is a designated water day as a key driver.

In its response YVW did not outline how the quantitative impact of this issue on demand forecast.



## Assessment

While raising the issue YVW has not indicated how the Commission's proposed demand forecasts should account for watering and non-watering days. Upon inquiry YVW indicated that it was not seeking an amendment to the Draft Decision.

### Recommendation

We recommend the ESCV not amend the Draft Decision in relation to watering and non watering days.

### 3.2.3 Block shares

In response to the Draft Decision YVW proposed a new allocation of demand across residential tariff blocks. The allocation is based on work undertaken by YVW subsequent to the Draft Determination. The proposal is based primarily on a series of regressions (see attachment C). The regressions are given below.

**Block 2 share =  $0.045 + (0.0003396 \times \text{Ave consumption per household per day})$**

**Block 3 share =  $-0.163 + (0.000505 \times \text{Ave consumption per household per day})$**

## Assessment

Preliminary assessment of the regression output indicates that the regressions are reasonable. However, we also note that given the time constraints we have not been able to conduct a detailed assessment of the data and the functional form underlying the regressions. Nor have we had time to apply the necessary statistical tests to ascertain whether the regressions are robust.

From YVW's response it is unclear over which time period the billing data has been regressed. On the assumption that it focuses primarily on the six month period for which T155 has been in place, we are concerned that this may not be enough time series data to produce a regression regarding the average annual allocation of demand to tariff tiers that references a full seasonal cycle.

We also note that if the regressions are referencing a previous period such as 2007-08 the actual consumption of water at the different tariff tiers is more consistent with the ESCV's proposed allocation than with the regression results.

Given these concerns we believe that our original advice to the ESCV regarding the allocation of demand across tiers is still valid.

### Recommendation

We recommend the ESCV not amend the Draft Decision to reflect YVW's revised block shares or residential water customers on the basis of uncertainty regarding the data and its ability to adequately reflect seasonality.

### 3.2.4 Revised forecasts

Tariff	Unit	2009-10	2010-11	2011-12	2012-13
Residential water usage charge block 1	kL	71,047,119	71,938,645	72,007,361	72,960,522
Residential water usage charge block 2	kL	17,211,545	18,343,033	18,917,252	20,032,513
Residential water usage charge block 3	kL	4,601,408	6,855,042	6,790,386	7,274,965
<i>Total residential Volume</i>	<i>kL</i>	<i>92,860,072</i>	<i>97,136,720</i>	<i>97,715,000</i>	<i>100,268,000</i>
Residential sewerage disposal charge	kL	71,873,363	72,172,433	72,602,120	71,691,827

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# A T140 Queensland's experience

The following information was provided to the ESCV as an appendix to our demand advice prior to the Draft Decision. It has been reiterated in this advice as it remains relevant and the advice itself is structured as a stand alone document.

## A.1 A brief overview

Target 140 was a central part of the Queensland Water Commission's integrated demand management plan to reduce water consumption in south east Queensland in the face of the worst drought on record. The campaign was implemented in March 2007 and specified that households were to reduce their average residential consumption to 140 litres of water per person per day.

During 2007-08, the initiative contributed to reducing the region's residential use by 24%, translating into an estimated additional saving of 39 billion litres. The campaign reduced water consumption from a pre-drought residential peak of more than 300 lppd to an average 129 lppd.

However, with recent rainfall and rising dam levels, Brisbane City, Ipswich City, Lockyer Valley Regional Council, Logan City, Moreton Bay Regional Council and Somerset Regional Council have implemented Target 170 (an easing of the restrictions from Target 140) from 31 July 2008. In addition, the QWC has released the Drought Exit Strategy which details the phased easing of water restrictions across SEQ based on specified dam level triggers and outlines permanent water conservation measures for the region to take effect once the drought is over. The following table A.1 and graph provide a summary of the measures implemented by the QWC:

**Table A.1.** Queensland water restrictions and target programs

Time Period	Restriction Level
Commenced 13 May 2005	Level 1 Restrictions
Commenced 3 October 2005	Level 2 Restrictions
Commenced 13 June 2006	Level 3 Restrictions
Commenced 1 November 2006	Level 4 Restrictions
Commenced 10 April 2007	Level 5 Restrictions
Commenced March 2007	Target 140 Program (Target 140's implementation straddled both Level 5 and 6 Restrictions)
Commenced 23 November 2007	Level 6 Restrictions
Commenced 31 July 2008	Target 170 Program and 'High Level' Restrictions
Commenced 1 July 2009 (residential); 30 March 2009 (non-residential)	Target 200 Program

Source: <http://www.qwc.qld.gov.au/tiki-index.php?page=Water%20restrictions>

## A.2 Initiatives of Target 140

The Target 140 Program was a comprehensive suite of initiatives rolled out by the QWC. Each of the QWC's initiatives was underpinned by a detailed communications plan. Market research was conducted to monitor trends in water-related attitudes and behaviours. Some of these are set out below.

- Target 140 and its own suite of initiatives
  - Target 140 Residential Education Campaign: this was a high profile, coordinated education and awareness program aimed at achieving a specified average target for residential water use. It identified the benefits of improved water efficiency and provided tools for changing water use habits and behaviours. It also recognised the need for effective linkages between State and local governments to consistently emphasise key messages. The education program was part of an integrated communications campaign centred on substantial mass marketing
  - The provision of a 'Target 140 Water Saving Sheet' to enable families to monitor their consumption on an on-going basis ([http://www.target140.com.au/myfiles/uploads/Target%20140%20documents/TARGET140\\_CUTS.pdf](http://www.target140.com.au/myfiles/uploads/Target%20140%20documents/TARGET140_CUTS.pdf))
  - The provision of a 'Water Saving Calculator' for householders to calculate and monitor water use (<http://www.target140.com.au/tiki-index.php?page=Water%20-Saving%20Calculator>)
  - Recommended daily meter readings (<http://www.target140.com.au/-How+to+read+your+meter>)
  - The provision of a 'Water Use Survey' to assist householders monitor water use (<http://www.target140.com.au/Water+usage+survey>). For those households using above average water, the site then directs them to a set of water saving tips (<http://www.target140.com.au/tips>)
  - Major councils also have similar documentation publicly available (for example, Brisbane City Council: [http://www.brisbane.qld.gov.au/bccwr/lib199/water-smart\\_city-indoor\\_water\\_saving\\_fact\\_sheet\\_08.pdf](http://www.brisbane.qld.gov.au/bccwr/lib199/water-smart_city-indoor_water_saving_fact_sheet_08.pdf))
  - Ongoing education programs for schools
    - Other Councils have also administered complementary schemes. An example is Gold Coast Water's School Watersaver Education Program which has been designed to engage students in an awareness campaign that highlights the value of water (see [http://www.goldcoastwater.com.au/t\\_gcw.asp?PID=3437](http://www.goldcoastwater.com.au/t_gcw.asp?PID=3437) and [http://www.goldcoastwater.com.au/attachment/goldcoastwater/education\\_make\\_water\\_mark09.pdf](http://www.goldcoastwater.com.au/attachment/goldcoastwater/education_make_water_mark09.pdf))
  - The preparation and submission of Water Efficiency Management Plans for businesses using more than 10ML/year (this was amended from Level 4 restrictions where businesses did not have to prepare a Water Efficiency Management Plan if they could

demonstrate the achievement of a 25% reduction in water consumption over their last billing period)

- Restrictions aimed at the business community were accompanied with stakeholder engagement with peak industry groups
- A greater emphasis on high volume water users (HVWU) where HVWUs were required to complete and submit an audit of their water consumption as part of a strategy to encourage them to take further action
- Other state and local government funded programs
- Home WaterWise Rebate Scheme provided by the Department of Natural Resources and Water (carried out by the Brisbane City Council in partnership with 20 other local councils). This scheme provided rebates for the installation of various water-saving devices around the home (outlined below).
  - Up to \$1000 for new rainwater tanks, including installation, pumps, diverters and a slab
  - \$200 rebate for a new 4-star (or better) WELS water-rated washing machine
  - \$150 per suite for new dual-flush toilet suites
  - Assistance with 50% of purchase and installation costs, of up to \$200 for an aboveground greywater system or \$500 towards the purchase and installation of a below-ground greywater system
  - Assistance with 50% of purchase price, up to \$30 per showerhead, to replace existing showerheads with new 3-star (or better) WELS water-rated showerheads
  - Up to \$200 for a swimming pool cover and/or roller
  - 4 minute shower timers distributed with the daily newspaper (<http://www.qwc.qld.gov.au/Free+shower+timer>)
  - \$20 household audit carried out by a licenced plumber, who would install a water efficient showerhead, place aerators in the taps and fix up to three leaking taps (<http://www.target140.com.au/Rebates>)
  - Certain Councils also administered complementary and overlapping schemes. See for instance the Gold Coast Home Watersaver Rebate Scheme. This scheme is similar in nature to the Home WaterWise scheme outlined above. Note that this scheme concluded 30 June 2008 ([http://www.goldcoastwater.com.au/t\\_gcw.asp?PID=2439](http://www.goldcoastwater.com.au/t_gcw.asp?PID=2439))
  - Business Water Efficiency Program: provides funding and technical support to help businesses save water and reduce water costs. It was funded by the Queensland Government, managed by Seqwater and delivered by the Brisbane City Council for Brisbane. Applications closed on 31 January 2008

- Development of a rigorous water restrictions compliance regime where the scope for on-the-spot fines and other penalties increased with non-compliance
- The following steps were implemented for excessive use and other non-compliance:
  - Household notified of their excessive use through their water bill
  - If continual non-compliance with the threshold, household notified again and asked to explain their excessive usage
  - If continual non-compliance, a \$450 fine and an outdoor watering ban will be imposed
  - If continual non-compliance, a flow restrictor will be installed and an additional penalty (\$1050 fine) will be imposed
- Note that households with a legitimate reason for high water use were exempt from these penalties. Excessive use was defined to mean more than 800 litres per household per day or 200 lppd if there are five or more residents
- Reforms to water pricing and billing methods: this will require bills to be issued at a pre-determined fixed frequency with specific and consistent advice provided to customers about their water use. Billing information would include detailed information on water consumption, comparisons with average daily water consumption across the local area, and messages about water consumption and ways to help save water

### A.3 Comparative Analysis

In terms of comparing the Target 140 Program and the situation in Queensland to the circumstances surrounding water use and management in Victoria, it is necessary to consider both the way the initiative was implemented and the underlying forces at work.

QWC's website carries weekly updates on dam levels and household consumption. If residents collectively were able to stick to the announced threshold, certain benefits (for example, watering plants) were granted.

Much of the success surrounding water use in south east Queensland can be attributed to the fact that there was a genuine sense of trepidation at an individual, business and broader community level that South East Queensland was going to run out of water. This underlying factor helped to galvanise community acceptance and adoption of the Target 140 Program.



## B SEW further information response

### Timing of Restriction Calculations:

Using the previous trends of the announcement of the water restrictions (30<sup>th</sup> November), the calculation in our model using those trends where to apply 42% of Stage 3a + T155 for the 2010/11 financial year (for the first five months) and the remaining 7 months at stage 2.

The assumptions were applied to the 2012/13 financial year between Stage 2 (42%) and 58% for Stage 1. The table below shows the difference in restrictions if were to apply for the whole year rather than the split.

	2010/11	2012/13
Impact of Restrictions without the Split (100%)	12GL	3.75GL
Impact of Restriction with the split percentages	18GL	7.2GL

## C YVW's further information response

### YVW population assumption underlying Water Plan submission

The following table shows end of year population underlying YVW's customer and demand forecasts. Annual mid-points are used for the calculation of demand forecasts. These show growth rates materially consistent with the VIF 2008 series:

2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
1,568,171	1,585,299	1,603,191	1,616,200	1,633,100	1,649,700	1,666,100	1,682,300

Note that YVW's population includes part of Wallan which is outside the Melbourne statistical division. I have also attached a spreadsheet showing the derivation of retailer populations from the Melbourne population (Melb Retailers Pop'n March08\_ABS3218.xls)

### Block Share Regression Results

As discussed, we regressed quarterly billed block shares (dependent variable) against average daily consumption per household (explanatory variable) on the basis that average daily consumption per household – not average daily consumption per person - determines block shares. That is, under the existing tiered pricing structure, consumption is charged as Block 1 if average consumption per day is less than or equal to 440 litres for the household. The second 440 litres for that household that day is charged as Block 2 and any usage in excess of 880 litres per day is charged as Block 3.

The resulting regression equation represents how block shares change at different levels of average daily consumption for the average YVW household and provides a sound basis for estimating billed block shares for the regulatory period at a given average daily household consumption.

Separate regressions were run for Block 2 and Block 3 shares. Regression statistics for each is supplied below:

## Block 2 Share regression

**Block 2 share = 0.045 + (0.0003396 x Ave consumption per household per day)**

Regression Statistics	
Multiple R	0.94593153
R Square	0.89478647
Adjusted R Squa	0.89263925
Standard Error	0.00896043
Observations	51

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.033458158	0.033458	416.7196	0.000000000
Residual	49	0.00393418	8.03E-05		
Total	50	0.037392338			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.0451104	0.00845699	5.3341	0.0000	0.02811547	0.062105	0.02811547	0.06210538
X Variable 1	0.0003396	0.00001664	20.41371	0.0000	0.000306184	0.000373	0.000306184	0.00037305

## Block 3 Share regression

**Block 3 share = -0.163 + (0.000505 x Ave consumption per household per day)**

Regression Statistics	
Multiple R	0.96906426
R Square	0.93908553
Adjusted R Squa	0.93784238
Standard Error	0.00988645
Observations	51

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.073834873	0.073835	755.4066	1.96505E-31
Residual	49	0.004789353	9.77E-05		
Total	50	0.078624226			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.1632471	0.009330977	-17.49517	1.03E-22	-0.181998365	-0.144496	-0.18199836	-0.14449577
X Variable 1	0.00050451	1.8356E-05	27.48466	1.97E-31	0.000467621	0.000541	0.000467621	0.0005414

## Impact of rainfall on usage/savings under T155

We offer the following as an indication of the breaking of the historical link between usage and rainfall during periods of restrictions, particularly under the T155 Campaign.

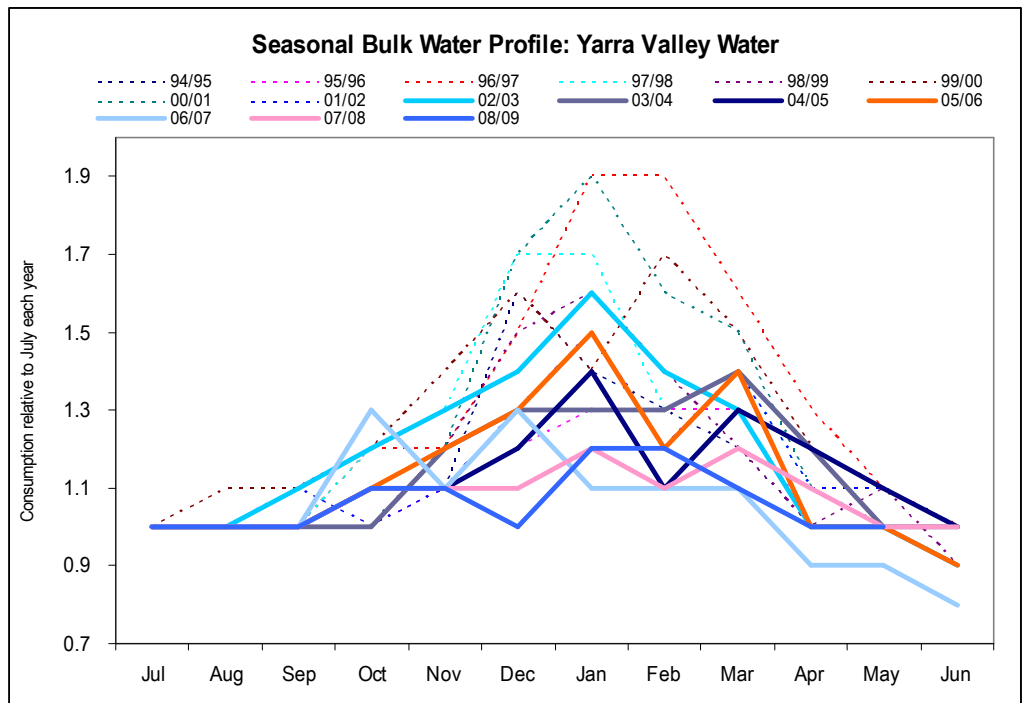
Period		2007/08 Restrictions	2008/09 Restrictions
Sep, Oct, Nov	Rainfall	103.4	78.2
	Ave temp	21.5	21.5
	Ave l/c/d	168 Stage 3a	164 Stage 3a
Mar, Apr, May	Rainfall	128.6	93.6
	Ave temp	21.8	21.1
	Ave l/c/d	168 Stage 3a	143 3a+T155

Comparison of spring and autumn temperature and rainfall over the two years show considerably lower rainfall received during 2008/09 while average maximum temperatures have remained largely unchanged.

Despite the materially lower rainfall this Spring, Melburnians used less water per capita during spring this financial year compared to the previous financial year. The difference is more marked when comparing autumn consumption. We attribute this to the impact of T155 on this autumn's consumption. That is, despite materially lower rainfall in autumn this year, Melburnians are using 25 l/c/d less this autumn compared to last autumn.

#### 4. Seasonal Profiles

The following chart depicts historical by month profile of bulk water, pegged to usage in July (ie. July = 1). Years during which usage was restricted are represented by bold lines. Unrestricted years are represented by dotted lines:



The following table shows relative bulk water data by month (pegged to July consumption in each financial year):

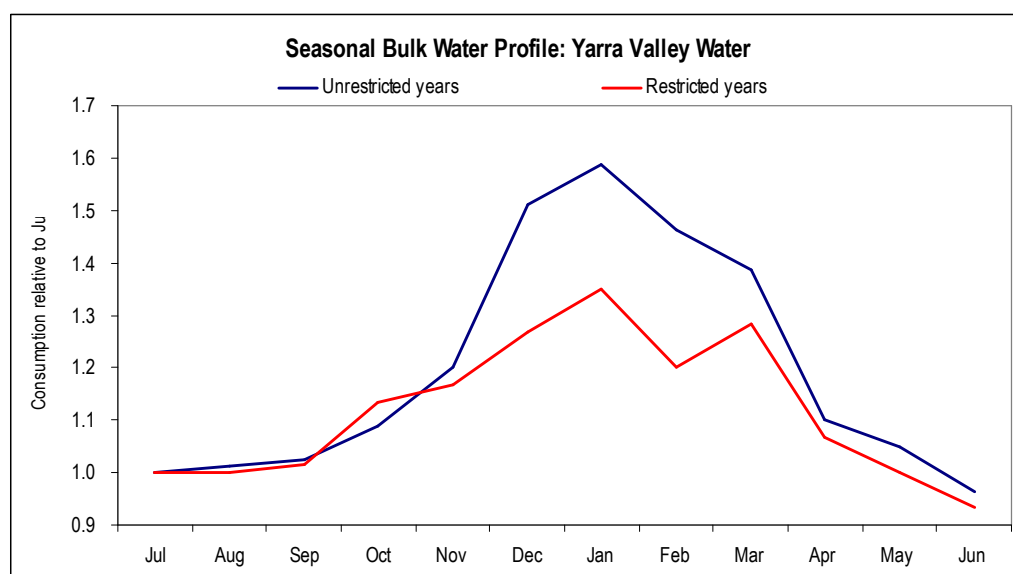
Year	Restrictions	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
94/95	Unrestricted	1.0	1.0	1.0	1.1	1.1	1.6	1.4	1.3	1.2	1.0	1.0	0.9
95/96	Unrestricted	1.0	1.0	1.0	1.0	1.1	1.2	1.3	1.3	1.3	1.0	1.0	1.0
96/97	Unrestricted	1.0	1.0	1.0	1.2	1.2	1.5	1.9	1.9	1.6	1.3	1.1	1.0
97/98	Unrestricted	1.0	1.0	1.0	1.2	1.3	1.7	1.7	1.3	1.4	1.1	1.0	0.9
98/99	Unrestricted	1.0	1.0	1.0	1.0	1.2	1.5	1.6	1.4	1.2	1.0	1.1	0.9
99/00	Unrestricted	1.0	1.1	1.1	1.2	1.4	1.6	1.4	1.7	1.5	1.2	1.1	1.0
00/01	Unrestricted	1.0	1.0	1.0	1.0	1.2	1.7	1.9	1.6	1.5	1.1	1.0	1.0
01/02	Unrestricted	1.0	1.0	1.1	1.0	1.1	1.3	1.5	1.2	1.4	1.1	1.1	1.0
02/03	Stage 1	1.0	1.0	1.1	1.2	1.3	1.4	1.6	1.4	1.3	1.0	1.0	0.9
03/04	Stage 1, then 2	1.0	1.0	1.0	1.0	1.2	1.3	1.3	1.3	1.4	1.2	1.0	1.0
04/05	Stage 2, PWSR	1.0	1.0	1.0	1.1	1.1	1.2	1.4	1.1	1.3	1.2	1.1	1.0
05/06	PWSR	1.0	1.0	1.0	1.1	1.2	1.3	1.5	1.2	1.4	1.0	1.0	0.9
06/07	Stage 1, 2,3,3a	1.0	1.0	1.0	1.3	1.1	1.3	1.1	1.1	1.1	0.9	0.9	0.8
07/08	Stage 3a	1.0	1.0	1.0	1.1	1.1	1.1	1.2	1.1	1.2	1.1	1.0	1.0
08/09	Stage 3a, 3a+T155	1.0	1.0	1.0	1.1	1.1	1.0	1.2	1.2	1.1	1.0	1.0	1.0

In general,

- Unrestricted years have a higher curved profile, with peak consumption over summer, lows in winter.
- Restricted years have a flatter curved profile, with lower peaks over summer.
- Consumption during years when multiple stages of restrictions are in operation show unpredictable profiles. For example, the lower low in June 2007 is attributable to the more severe restrictions in June (Stage 3a) of that year compared to July 2006 (Stage 1).

By applying averages across restricted and unrestricted years, a clearer picture of the impact of restrictions on seasonal profile emerges, ie.

- flatter and less predictable over restricted years.
- Lower summer peaks
- Consumption continues to trend down from May to June.

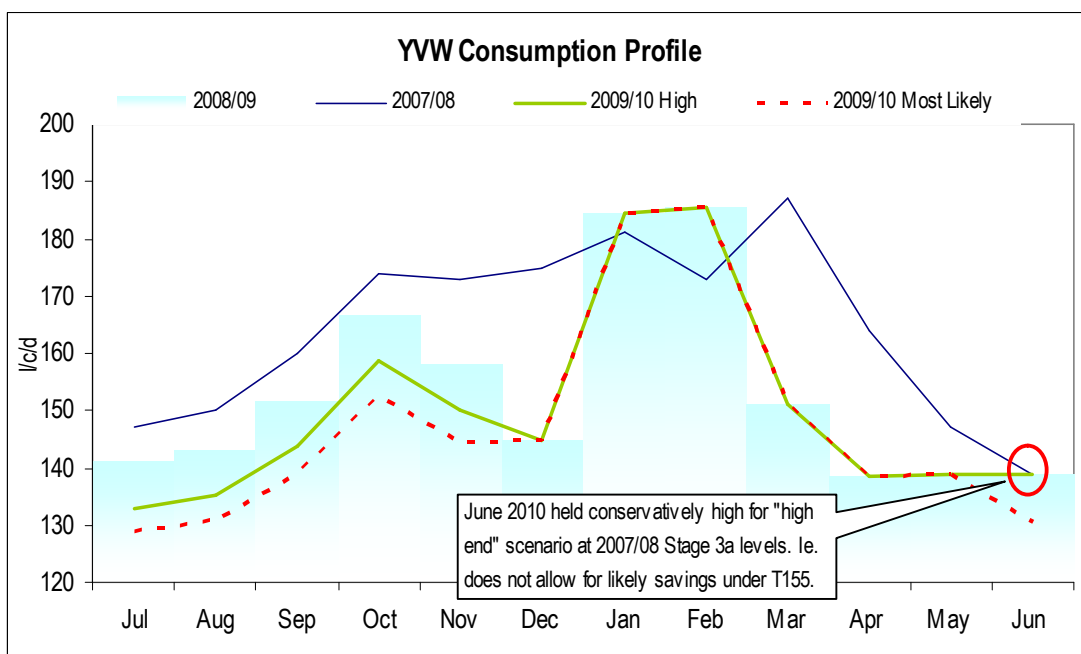


## Re-profiling and sensitivity in YVW's 2009/10 forecasts

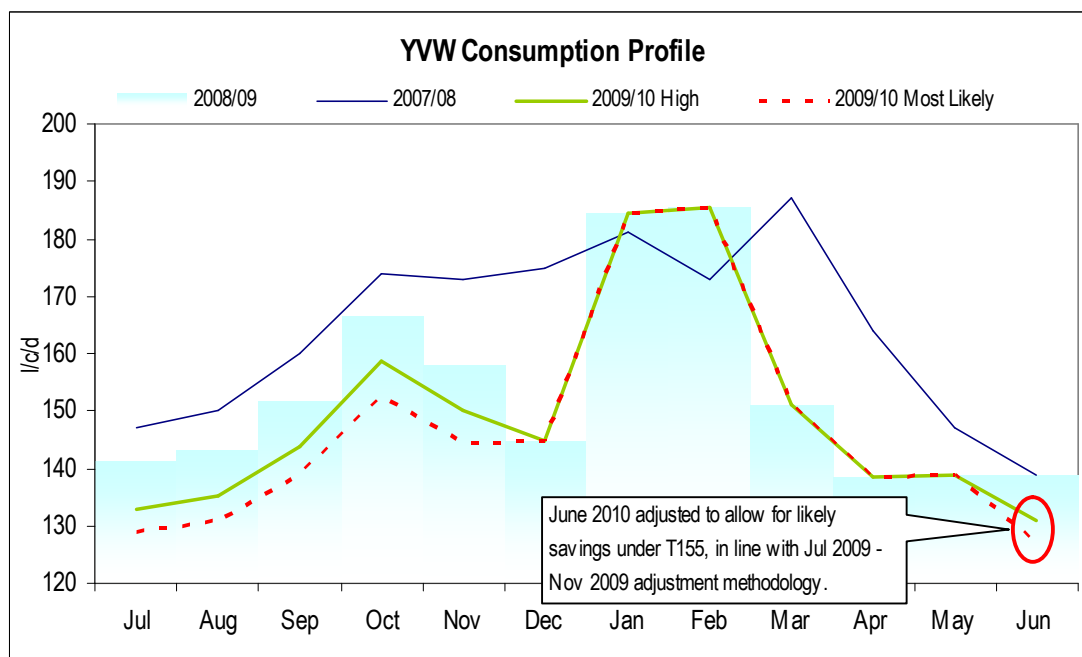
We note your concern in relation to the winter consumption profile used in our response to the draft determination. In the 'high end' scenario offered as part of our response, we held June 2010 consumption conservatively high at consumption levels in line with those observed during June 2008 under Stage 3a. While this provided a conservative (high demand) scenario for pricing purposes, it resulted in a 2009/10 seasonal profile that was out of alignment with the historical profile.

We have made adjustments to reflect a more realistic usage and savings expectation for June 2010. The following charts show the before and after impact of this adjustment on the 2009/10 consumption profile.

Before adjustment for June 2010 consumption:



After June 2010 adjustment to more realistic consumption:



The adjustments to June 2010 for the two scenarios were made as follows:

- “High end” scenario: June 2010 usage was derived by reducing June 2009 usage by the smallest savings observed to-date under T155; ie. used May 2009 savings of 8 l/c/d as a proxy. This resulted in an adjustment for June 2010 consumption from 139 l/c/d to 131 l/c/d. This approach is consistent with the methodology adopted in this scenario for deriving usage for July 2009 through to November 2009.
- “Most likely” scenario: June 2010 usage was derived by reducing June 2009 usage by the average percentage savings observed during the Campaign to-date, including the high consumption months of January and February 2009. This resulted in an adjustment for June 2010 consumption from 131 l/c/d to 127 l/c/d. This approach is consistent with the methodology adopted in this scenario for deriving usage for July 2009 through to November 2009.

The result of this adjustment is a profile more typical of winter consumption. Post adjustment, the forecast average consumption for 2009/10 remains unchanged, ie. within the 147 l/c/d (“Most likely” scenario) to 150 l/c/d (“High end” scenario) range.

Raw data underlying the above charts for both before and after June 2010 adjustments are supplied below for your information.

Before adjustment for June 2010 consumption:

Litres per person per day	YVW 2007/08 3a	YVW 2008/09 3a/3a+T155	High	Most Likely
			YVW 2009/10 3a+T155	YVW 2009/10 3a+T155
Jul	147	141	133	129
Aug	150	143	135	131
Sep	160	152	144	139
Oct	174	167	159	152
Nov	173	158	150	144
Dec	175	145	145	145
Jan	181	185	185	185
Feb	173	186	186	186
Mar	187	151	151	151
Apr	164	139	139	139
May	147	139	139	139
Jun	139	139	139	131
Financial Year Average	164	154	150	147

After June 2010 adjustment to reflect more realistic consumption. Adjustment circled for ease of reference:

Litres per person per day	YVW 2007/08 3a	YVW 2008/09 3a/3a+T155	High	Likely
			YVW 2009/10 3a+T155	YVW 2009/10 3a+T155
Jul	147	141	133	129
Aug	150	143	135	131
Sep	160	152	144	139
Oct	174	167	159	152
Nov	173	158	150	144
Dec	175	145	145	145
Jan	181	185	185	185
Feb	173	186	186	186
Mar	187	151	151	151
Apr	164	139	139	139
May	147	139	139	139
Jun	139	139	131	127
Financial Year Average	164	154	150	147

### Note on January and February 2010 forecasts:

We note that historical profiles indicate a flatter profile over summer is a reasonable assumption for periods of restrictions. We have presently maintained a conservatively high usage profile for January and February 2010 for both scenarios. This is in line with the consumption experienced this year under Target 155 and significantly above Stage 3a consumption levels in 2007/08. We are happy to conduct a further scenario to reflect the flatter profile more typical of consumption under restrictions. Our expectations for this scenario is for average consumption for 2009/10 to fall below the current 147 – 150 l/c/d.





