# Table of Contents

Preamble ......................................................................................................................... 3  
Updated Industry Profile ................................................................................................. 4  
Executive Summary ......................................................................................................... 5  
1 Planning Advice ........................................................................................................... 7  
   1.1 Between Industry Planning Advice........................................................................ 7  
   1.2 Within Industry Planning Advice ......................................................................... 7  
2 Industry Need for VET ................................................................................................. 8  
   2.1 Introduction .......................................................................................................... 8  
   2.2 Forecast Employment Growth and Net Replacement Rates .................................. 8  
   2.3 Skills Shortages ..................................................................................................... 9  
   2.4 Major Industry Change Drivers .......................................................................... 9  
   2.5 Emerging Skills .................................................................................................... 11  
   2.6 Conclusion – Industry Need ................................................................................. 11  
3 VET Provision for the Water Industry .......................................................................... 13  
   3.1 Introduction .......................................................................................................... 13  
   3.2 Industry Training – Student Contact Hours ......................................................... 13  
   3.3 Industry Training – Enrolments .......................................................................... 15  
   3.4 Regional Distribution of Training ....................................................................... 16  
   3.5 Apprenticeships and Traineeships ...................................................................... 18  
      3.5.1 Apprenticeships ............................................................................................. 18  
      3.5.2 Traineeships .................................................................................................. 18  
   3.6 Summary ............................................................................................................... 19  
4 VET in Schools Activity ............................................................................................... 20  
5 Higher Education vs VET ............................................................................................ 21  
6 Employment Outcomes for VET Students .................................................................. 22  
   6.1 Graduate Outcomes ............................................................................................. 22  
   6.2 Module Completers Outcomes ............................................................................ 22  
7 Review of moderating factors .................................................................................... 23  
   7.1 Between and Within Industry Advice For 2007 .................................................... 24  
8 Conclusion .................................................................................................................... 25  
Appendix A Sectors and Occupational Groups ............................................................. 26  
Appendix B Summary of government-funded VET Provision for the Water industry and all occupational groups, 2002-2006 ........................................................ 27
The Ministerial Statement *Knowledge and Skills for the Innovation Economy* (2002) announced that the Victorian Learning and Employment Skills Commission (VLESC) would consider a new strategy for establishing strategic directions and planning advice for publicly-funded Vocational Education and Training (VET) in Victoria. Specifically, the VLESC was to provide more detailed advice on how to determine the share for public expenditure on VET in an innovation economy.

A framework for establishing planning advice for VET was subsequently endorsed by the VLESC in order to:
- identify the nature and extent of industry and community training needs;
- map those needs against the supply of publicly-funded training in order to identify where there is undersupply/over-supply and/or poor training outcomes; and
- assess the capacity and develop strategies to re-align training from areas of minimal need to those with a general training need, both between and within industries.

In 2006, *Maintaining the Advantage: Skilled Victorians* was released and is the Government’s strategy to meet the demands of business and industry for a highly qualified and skilled workforce. This strategy seeks to address a workforce characterised by older workers, fewer new entrants and potential skill shortages. It builds on the Ministerial Statements *Knowledge and Skills for the Innovation Economy* released in 2002 and *Moving Forward: Making Provincial Victoria the Best Place to Live, Work and Invest* released in 2005.

The following report is a planning document. It updates the policy context and data presented in a similar report published in 2006. It presents findings emerging from research and analysis of the key data used to determine and review statewide industry planning advice for Government-funded VET in Victoria. It provides a snapshot of industry characteristics (in 2006), and training supply (2002 to 2006).

The aim of the report is to inform decisions regarding VET planning advice at the macro level by analysing the relationship between the factors affecting industry need for training and supply of training. Ongoing consultations with stakeholders are undertaken to review industry training planning advice, and to support future OTTE training purchasing plans.

This document updates previous industry reports. It incorporates the latest employment and industry need data (2006 Labour Force Survey) and training supply data (2006), and should be read in conjunction with the 2004, 2005 and 2006 Industry Reports (see [http://www.otte.vic.gov.au/vetoutputs.asp](http://www.otte.vic.gov.au/vetoutputs.asp)).

The report refers to industries and occupational groups. Occupational groups are subsets of sectors, and Appendix A outlines the concordance between industries, sectors and occupational groups.

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The aim of the report is to inform decisions regarding VET Planning advice, and to guide purchasing of Government-funded training at the macro level by analysing the relationship between the factors affecting industry need for training, and supply of training.
### Updated Industry Profile

**Occupational Groups**
- Water

**Employment**
- Employment in the Water industry has been trending upwards since 2001.

**Occupational Distribution, Change and Qualifications**
- Employment is concentrated among Intermediate production/transport workers.
- Between 2005 to 2006:
  - Labourers and related workers declined by 17.7 percentage points;
  - Intermediate production/transport workers increased by 19.5 percentage points; and
  - Intermediate clerical/sales and service workers decreased by 1.8 percentage points.
Globalisation of economic activity and rapid advances in technology are driving major changes in the structure of industry and the nature of work, the way work is organised and the knowledge and skills the workforce requires. This report addresses the training needs for the Water industry.

The evidence base for this Industry Report comprises a number of sources including data relating to training delivery for 2002 to 2006 and student outcomes (i.e. supply data), and industry, employment and labour market data, including advice from the ITAB (i.e. demand data).

Estimates of the annual demand for labour, derived from forecasts of both industry employment growth and its net replacement rate, indicate that for each year to 2011, an average of around 40 additional workers, will be required by the Water industry. This is equivalent to 2.7% of the industry’s total employment.

The major factors identified as affecting this industry’s training needs over the next decade include:

- Climate change and drought;
- Technological capability gaps;
- Demand for services resulting from new residential development;
- Skill shortages; and
- Major regulatory reform.

Some of the general and specific skill needs highlighted by the ITAB are:

- Water-sensitive urban design;
- Wetland design;
- Aquifer storage and assessment;
- Groundwater;
- Stormwater;
- Water trading;
- Environmental flows;
- Wastewater management;
- Hydraulic modelling for pipes and pumps;
- Surge analysis;
- Treated water re-use; and
- The potential need for training related to dam safety with empty storages and refilling of empty storages, as identified by the Department of Sustainability and Environment, and VicWater.

Total student contact hours (SCHs) delivered to the Water industry have increased by 540.1% since 2002. Government-funded SCHs have increased by 174.2% over the same period.

Over the period 2001 to 2006, there were 885 traineeship commencements in the Water industry, with a decrease of 16.7% between 2005 and 2006.

In 2006, apprentice/traineeship delivery accounted for 73.6% in Government-funded enrolments while non-apprentice/traineeships accounted for 26.4% of Government-funded enrolments.

The 2006 Student Outcomes survey reveals that graduate and/or module completers in the Water industry achieve better than Victorian industry average employment outcomes with a higher proportion in employment.

Analysis of the demand and supply for training in the Water industry suggests that, after taking into account a number of moderating factors, Government-funded training effort should be maintained as the industry’s need for training is currently met by its share of delivery.
Key Messages:

• In 2005 the share of training effort for the Water industry was slightly less than the estimated industry need. This gap decreased in 2006 by 0.1 percentage points.

• After consideration of the moderating factors, it is recommended that the industry’s share of training effort be *maintained* in 2008 to ensure sufficient resources are available for training.
1 PLANNING ADVICE

Government-funding needs to achieve a balance between broad access to training for individuals across Victoria, and investment in skill development in areas of high economic and social importance to the economy.

In determining the planning advice for 2008 for the allocation of Government-funded training, a detailed analysis of the relationship between the factors affecting industry need for training, and supply of training was undertaken. The Industry Shares Model was used to compare an industry’s share of training effort with its share of need for training across all Victorian industries. This model focuses on the skill needs of industry, return on training investment, and government policy. A number of moderating factors are also taken into consideration when determining the planning advice.

1.1 BETWEEN INDUSTRY PLANNING ADVICE

Between industry analysis identifies an industry’s need for training, relative to other industries.

The share of training effort for the Water industry in 2005 was 0.1 percentage points less than the share of training need. As this gap was small and following consideration of the moderating factors, it was advised that the share of training effort and industry need for training are in balance and that Government-funded training effort be maintained.

Analysis of the industry’s share of training effort and its share of training need for 2006 suggests that the share of training effort for water was less than the industry’s share of training need. However, the gap between the shares of training need and effort remains very small (0.1 percentage points). After taking the moderating factors (including skills shortages) into account, the industry need for training is considered to be in balance.

Therefore, it is recommended that at the between industry level, Government-funded training be maintained for 2008.

1.2 WITHIN INDUSTRY PLANNING ADVICE

Within industry analysis identifies imbalances between the share of training effort and the share of training need for occupational groups within the Water industry.

The Water industry has only one occupational group, therefore within industry advice is the same as the between industry advice i.e. that training effort should be maintained.

Figure 1.1: Planning advice for Government-funded training

- **Between Industry**
  - Maintain – Following moderation, the industry’s share of training need and training effort is in balance.

- **Within Industry**
  - Maintain – The Water industry has only one occupational group. Therefore, the within industry advice is the same as the between industry advice, i.e. that training effort should be maintained.
2 Industry Need for VET

2.1 Introduction

This section quantifies the future level of industry need for VET, taking into account the different factors affecting an industry’s need for training. The projected growth in demand for VET will be influenced by factors such as employment growth, employment turnover, the number of new entrants, concentration of qualifications, skills shortages and emerging skill needs, and the age profile of persons employed in the industry.

The Water industry has experienced employment growth since 2001. After growth between 2001 and 2004, employment remained stable in 2004, before displaying some volatility between 2004 and 2006. However in relation to this volatility, it should be noted that the Water industry employs a relatively small number of people and employment has grown steadily since 2001. Estimates of employment based on the ABS Labour Force Survey may be subject to considerable variation year on year as the sample size on which estimates are based is small.

Figure 2.1: Employment for Water Industry, Victoria 2001-2006

Please note that employment data in Figure 2.1 for the years 2002 to 2006 are based on ABS Labour Force survey data. The ABS uses a sampling approach when collecting this data which has a standard error associated with it. Consequently, labour force employment figures, particularly when broken down to the sector level, should be treated as indicative only.

2.2 Forecast Employment Growth and Net Replacement Rates

Workers enter an industry for the first time as a result of both employment growth and turnover within the existing workforce. Both drivers of entry to an industry must be considered in an analysis of the potential future training demand from new workers. The forecast growth rate for an industry is an estimate of the extent to which employment growth will create training demand from new workers. The annual net replacement rate for an industry is an estimate of the percentage of employed persons within the industry who are hired as a result of turnover, but who have not previously worked in the industry. It translates into the number of workers entering the industry for the first time as a result of turnover and who might be in need of training. Net replacement rates (or estimates of the proportion of the workforce within an occupation that are new
2.3 Skills Shortages

The 2006 DEWR, Skills in Demand for Victoria list does not identify the skill shortages for the Water industry.

The DVC Regional Skills Shortages Survey (Statewide Report) identifies the following as skill shortages:

- Civil Engineers.

2.4 Major Industry Change Drivers

*Change drivers* are large-scale forces that produce change at lower levels of an economy or system. Typically, change drivers are global, social, economic, technological and/or information-based in nature, but are also derived from government policy and directions. These create a changing operating environment to which the training system must adapt and, over time, realign resources to meet these challenges.
The major factors highlighted by The Water Industry Advisory Board (ITAB) as affecting the industry’s training needs and responses over the next decade include:

<table>
<thead>
<tr>
<th>Change Driver</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Global</strong></td>
<td>➢ Climate change is an important factor to the Water industry. The impacts of climate change have been much more severe than the long-term predictions made in 2006. This has potential to impact on the long-term sustainability of water resources. Whilst Victoria has experienced an overall reduction in rainfall and inflows to dams since 1997, the drought became very severe in 2006.</td>
</tr>
</tbody>
</table>
| **Technological**  | ➢ Creates capability gaps (e.g. Water-sensitive urban design, Wetland design, Aquifer storage and assessment, Groundwater, Stormwater, Water trading, Environmental flows, Wastewater management, Hydraulic modelling for pipes and pumps, Surge analysis and Treated water re-use).  
➢ Technological advancements in relation to the use of water in other industries such as a manufacturing, food processing and electricity generation may also drive change in the Water industry. |
| **Environmental**  | ➢ The effects of both climate change and drought have led to water restrictions. The issue of compliance with water restrictions has required the hiring of additional staff by water authorities to undertake water patrol activities, and increased communications and call centre activities. There has since been a changed OH&S focus for water authorities in regards to the stress levels experienced by their customer contact staff.  
➢ The other major environmental change driver is the commencement of major infrastructure projects to provide enhanced interconnections between elements of the water supply system, or to replace open irrigation channels with closed pipes. These projects have seen an increase in employment levels across the industry.  
➢ The effects of climate change and drought are also driving research into improving methods of addressing water needs. |
| **Socio-Demographic** | ➢ In 2006 the ageing workforce was considered a significant issue to the Water industry. However, the industry has come to the realisation that the strength of the Australian economy, particularly in regard to supplying resources to China (the “mining boom”), had an impact on the industry’s ability to attract and retain staff.  
➢ The extent of the impact on the Water industry of the skill shortage in many industries in Australia became more apparent in 2006. The Water Industry was required to compete with other industries in order to attract and retain staff. As a result, the Water Industry Skills Council (Government Skills Australia) received Federal funding to promote careers in the Water industry to young people.  
➢ Many regional areas of Victoria were impacted by the increased demand for services resulting from new residential development driven by the “sea changers” and “tree changers” lifestyle choosers. This increased the demand for infrastructure and required additional staff resources in regional water authorities. |
2.5 EMERGING SKILLS

Water industries are most impacted by the current rapid rate of technological change. The introduction of new technologies, changes to work practices and the skills required for existing jobs will also have an impact. The rate of change in these industries places particular pressure on the training system to meet the ongoing demand for skills development, both for new entrants and the existing workforce. New technologies may require skills in relation to:

- Awareness training on water sustainability, in general;
- Implementing Cleaner Production programs;
- Leadership skills for small production work group leaders;
- Problem solving skills – “looking outside the boundaries”;
- Facilitating change;
- Managing change;
- Participating in change; and
- Setting up of green teams.

2.6 CONCLUSION – INDUSTRY NEED

The Water industry employs a relatively small number of workers. They are mostly male and employed on a full-time basis.

The Water Industry has a significantly lower proportion than the Victorian average of persons with degree and/or Certificates V and VI qualifications. The qualifications of the workforce are mostly at the Certificate III and IV level, reflecting the concentration of intermediate production/transport workers within the industry’s workforce.

Employment within Water occupations increased steadily between 2001 and 2006, and is forecast to grow at an average of 1.5% per annum until 2011. More importantly, the rate of turnover, currently estimated at 1.3% of employment per annum, will create jobs for workers entering the occupations for the first time.

Although a training response alone will not address the problem of skill shortages, a supply of skilled new entrants is necessary in a tightening labour market. This will continue to stimulate the demand by industry for Water industry training.

Applying the MONASH Model employment forecasts and CEET net replacement rates, it is estimated that industry demand for new entrants to Water industry occupations will be 40 per annum.
A report by The Victorian Water Industry Association, which also performs the role of the Industry Advisory Body, identified that change drivers will result in the following skills needs:

<table>
<thead>
<tr>
<th>Occupational Group</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>Water-sensitive urban design</td>
</tr>
<tr>
<td></td>
<td>Wetland design</td>
</tr>
<tr>
<td></td>
<td>Aquifer storage and assessment</td>
</tr>
<tr>
<td></td>
<td>Groundwater</td>
</tr>
<tr>
<td></td>
<td>Stormwater</td>
</tr>
<tr>
<td></td>
<td>Water trading</td>
</tr>
<tr>
<td></td>
<td>Environmental flows</td>
</tr>
<tr>
<td></td>
<td>Wastewater management</td>
</tr>
<tr>
<td></td>
<td>Hydraulic modelling for pipes and pumps</td>
</tr>
<tr>
<td></td>
<td>Surge analysis</td>
</tr>
<tr>
<td></td>
<td>Treated water re-use</td>
</tr>
<tr>
<td></td>
<td>Dam safety with empty storages</td>
</tr>
<tr>
<td></td>
<td>Refilling of empty storages</td>
</tr>
</tbody>
</table>
3 VET Provision for the Water Industry

3.1 Introduction

In the following discussion, the term 'training delivery' refers only to publicly-funded VET delivery and fee-for-service delivery by public providers. Training provided outside the VET system and fee-for-service training delivered by private providers is not included in the analysis, nor is training delivered to Adult, Community and Further Education (ACFE) programs.

3.2 Industry Training¹ – Student Contact Hours

<table>
<thead>
<tr>
<th>Industry Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>In 2006, <strong>total</strong> student contact hours (SCHs) delivered to the Water industry represented 0.14% of all training delivery to industries covered by ITABs in Victoria, and 0.03% of <strong>Government-funded</strong> delivery.</td>
</tr>
<tr>
<td>Between 2002 and 2006, <strong>total</strong> SCHs delivered in the Water industry increased by 540.1% (see Figure 3.1).</td>
</tr>
<tr>
<td>In 2006, 14.9% of the training delivered in the Water industry was <strong>Government-funded</strong>, compared with 6.4% in 2005 (i.e. an increase of 8.5 percentage points in the proportion of <strong>Government-funded</strong> training delivered between 2005 and 2006) (see Figure 3.1).</td>
</tr>
<tr>
<td>Between 2002 and 2006, there was a 174.2% increase in <strong>Government-funded</strong> SCHs in the Water industry: from 7,305 SCHs in 2002 to 20,030 SCHs in 2006 (Figure 3.1 presents further details).</td>
</tr>
<tr>
<td>Over the same period, <strong>fee-for-service</strong> delivery increased by 734.7% measured by SCHs.</td>
</tr>
<tr>
<td>In 2006, the largest share of <strong>Government-funded</strong> training at industry level was the Certificate II level accounting for 48.8%. This was followed by training in Certificate III 38.6% of <strong>Government-funded</strong> delivery (see Table 3.1).</td>
</tr>
<tr>
<td>Apprentice/traineeship training grew 13.7 percentage points from 62.1% in 2005 to 75.8% of all <strong>Government-funded</strong> training delivery in 2006 (see Table 3.1).</td>
</tr>
<tr>
<td>Between 2005 and 2006 non-apprenticeship training declined from 37.9% to 24.2% (see Table 3.1).</td>
</tr>
<tr>
<td>TAFE delivered the vast majority of <strong>Government-funded</strong> training in this industry providing 73.9% of training in 2006 – a decline from 77.0% in 2005. Private Providers delivered 26.1% of <strong>Government-funded</strong> training in 2006 – an increase from 23.0% in 2005.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Occupational Group Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over the period 2005 to 2006, <strong>total</strong> SCHs delivery decreased in the water occupational group by 16.6% (see Industry Tables B.1 in Appendix B).</td>
</tr>
<tr>
<td>Over the same period, <strong>Government-funded</strong> delivery of SCHs increased for water by 94.7% (see Industry Tables B.1 in Appendix B).</td>
</tr>
</tbody>
</table>

¹ The following tables refer to Student Contact Hours (SCHs) and enrolments at Australian Qualification Framework (AQF) levels. A Student Contact Hour refers to an hour of training delivered to a student.
Figure 3.1: Water Industry in SChs, 2002-2006

Table 3.1: Characteristics of Government-funded Training in the Water Industry, SChs 2002-2006

<table>
<thead>
<tr>
<th>Characteristics of Government-funded training</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>AQF LEVEL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Certificate I</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Certificate II</td>
<td>96.6</td>
<td>78.5</td>
<td>87.0</td>
<td>57.3</td>
<td>48.8</td>
</tr>
<tr>
<td>Certificate III</td>
<td>3.4</td>
<td>7.0</td>
<td>8.0</td>
<td>42.7</td>
<td>38.6</td>
</tr>
<tr>
<td>Certificate IV</td>
<td>0.0</td>
<td>14.4</td>
<td>5.0</td>
<td>0.0</td>
<td>12.6</td>
</tr>
<tr>
<td>Diploma</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Advanced Diploma</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Other *</td>
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<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Type of study</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apprenticeships/Traineeships</td>
<td>81.2</td>
<td>58.6</td>
<td>82.0</td>
<td>62.1</td>
<td>75.8</td>
</tr>
<tr>
<td>Non-Apprentice/Traineeship</td>
<td>18.8</td>
<td>41.4</td>
<td>18.0</td>
<td>37.9</td>
<td>24.2</td>
</tr>
<tr>
<td>Region</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Metropolitan</td>
<td>27.4</td>
<td>28.9</td>
<td>20.6</td>
<td>25.7</td>
<td>28.7</td>
</tr>
<tr>
<td>Non-Metropolitan</td>
<td>72.6</td>
<td>71.1</td>
<td>78.9</td>
<td>25.3</td>
<td>34.5</td>
</tr>
<tr>
<td>Balance</td>
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<td>0.0</td>
<td>0.5</td>
<td>49.1</td>
<td>36.8</td>
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<tr>
<td>Providers</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>TAFE</td>
<td>48.4</td>
<td>35.9</td>
<td>31.3</td>
<td>77.0</td>
<td>73.9</td>
</tr>
<tr>
<td>Private Providers</td>
<td>51.6</td>
<td>64.1</td>
<td>68.7</td>
<td>23.0</td>
<td>26.1</td>
</tr>
<tr>
<td>ACFE</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Source: 2006 OTTE Student Statistical Collection
Notes: (a) Includes not defined and secondary schools.
3.3 Industry Training – Enrolments

Between 2002 and 2006, there was an increase of 37 enrolments (53.6%) in Government-funded training. Over the same period, fee-for-service delivery increased by 392 enrolments (83.6%).

In 2006, there were 967 enrolments in training, of which 106 were in Government-funded training. Total enrolments decreased by 139 between 2005 and 2006. However, Government-funded enrolments increased by 56 (112.0%) between 2005 and 2006.

Over the same period, there was a decline of 195 fee-for-service enrolments (18.5%) (see Figure 3.2).

In 2006, apprentice/traineeship delivery comprised 73.6% of Government-funded enrolments, while non-apprentice/traineeship delivery accounted for 26.4% of Government-funded enrolments.

Figure 3.2: Water Industry in Enrolments, 2002-2006
Table 3.2: Characteristics of Government-funded Training in the Water Industry, Enrolments 2002-2006

<table>
<thead>
<tr>
<th>AQF LEVEL</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certificate I</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Certificate II</td>
<td>94.2</td>
<td>68.0</td>
<td>70.5</td>
<td>66.0</td>
<td>51.9</td>
</tr>
<tr>
<td>Certificate III</td>
<td>5.8</td>
<td>3.3</td>
<td>11.6</td>
<td>34.0</td>
<td>34.9</td>
</tr>
<tr>
<td>Certificate IV</td>
<td>0.0</td>
<td>28.7</td>
<td>17.9</td>
<td>0.0</td>
<td>13.2</td>
</tr>
<tr>
<td>Diploma</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
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<td>0.0</td>
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<tr>
<td>Advanced Diploma</td>
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<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Other a</td>
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<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Type of study</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apprenticeships/Traineeships</td>
<td>58.0</td>
<td>23.0</td>
<td>37.5</td>
<td>82.0</td>
<td>73.6</td>
</tr>
<tr>
<td>Non-Apprentice/Traineeship</td>
<td>42.0</td>
<td>77.0</td>
<td>62.5</td>
<td>18.0</td>
<td>26.4</td>
</tr>
<tr>
<td>Region</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metropolitan</td>
<td>7.2</td>
<td>5.7</td>
<td>8.0</td>
<td>22.0</td>
<td>30.2</td>
</tr>
<tr>
<td>Non-Metropolitan</td>
<td>92.8</td>
<td>94.3</td>
<td>90.2</td>
<td>52.0</td>
<td>46.2</td>
</tr>
<tr>
<td>Balance</td>
<td>0.0</td>
<td>0.0</td>
<td>1.8</td>
<td>26.0</td>
<td>23.6</td>
</tr>
<tr>
<td>Providers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAFE</td>
<td>14.5</td>
<td>9.0</td>
<td>17.9</td>
<td>62.0</td>
<td>59.4</td>
</tr>
<tr>
<td>Private Providers</td>
<td>85.5</td>
<td>91.0</td>
<td>82.1</td>
<td>38.0</td>
<td>40.6</td>
</tr>
<tr>
<td>ACFE</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Source: 2006 OTTE Student Statistical Collection
Notes: (a) Includes not defined and secondary schools.

Key Messages:

SCHs
- Total SCHs increased by 540.1% over the period 2002-06.
- Over the same period Government-funded SCHs increased by 174.2%.
- Fee-for-service delivery increased by 734.7%.

Enrolments
- Total student enrolments increased by 79.7% over the period 2002-06.
- Over the same period, Government-funded enrolments increased by 53.6%.
- Fee-for-service delivery increased by 83.6%.

3.4 Regional Distribution of Training

Training for the Water industry is concentrated in non-metropolitan study areas (46.2% of the Victorian total enrolments), with Goulburn Ovens accounting for the largest share with 40.6% of total Water industry enrolments. Training in metropolitan study areas accounts for 30.2% of enrolments. The balance 23.6% of enrolments was delivered in modes that cannot be readily attributed to regions (see Table 3.3).
Between 2003 and 2006, enrolments decreased in non-metropolitan study areas by 57.4%, but increased in metropolitan study areas by 357.1%, albeit from a small base.

In 2006, 34.5% of Government-funded training, as measured by SCHs, was delivered in non-metropolitan study areas and 28.7% in metropolitan study areas. A balance of 36.8% was delivered in modes that cannot be readily attributed to regions.

Between 2003 and 2006 the delivery of SCHs in both the non-metropolitan and metropolitan study areas increased by 0.3% and 105.4%, respectively.

Between 2003 and 2006, the South West study area experienced the strongest growth in SCHs with an overall increase of 148.5%, and a 50.0% increase in enrolments. In the metropolitan area, the South East Metropolitan study area experienced the largest growth in SCHs (26.4%) and an overall increase of 171.4% in enrolments between 2003 and 2006.

### Table 3.3: Government-funded Training for the Water Industry by OTTE Study Areas, 2006

<table>
<thead>
<tr>
<th>OTTE Study Area</th>
<th>Regional Share of Enrolments</th>
<th>Growth in enrolments 2003-2006 %</th>
<th>Regional Share of SCHs</th>
<th>Growth in SCHs 2003-2006%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ballarat</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>-61.3</td>
</tr>
<tr>
<td>Bendigo</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>26.1</td>
</tr>
<tr>
<td>Central Gippsland</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>-15.9</td>
</tr>
<tr>
<td>East Gippsland</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>148.5</td>
</tr>
<tr>
<td>Geelong</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>-15.9</td>
</tr>
<tr>
<td>Goulburn Ovens</td>
<td>40.6</td>
<td>-61.3</td>
<td>26.1</td>
<td>-15.9</td>
</tr>
<tr>
<td>Southwest</td>
<td>5.7</td>
<td>50.0</td>
<td>8.4</td>
<td>148.5</td>
</tr>
<tr>
<td>Sunraysia</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>26.4</td>
</tr>
<tr>
<td>Wodonga</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>-15.9</td>
</tr>
<tr>
<td>Non-Metropolitan</td>
<td>46.2</td>
<td>-57.4</td>
<td>34.5</td>
<td>0.3</td>
</tr>
<tr>
<td>North West</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>-15.9</td>
</tr>
<tr>
<td>CBD</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>148.5</td>
</tr>
<tr>
<td>South East</td>
<td>17.9</td>
<td>171.4</td>
<td>17.7</td>
<td>26.4</td>
</tr>
<tr>
<td>Eastern</td>
<td>12.3</td>
<td>11.0</td>
<td>11.0</td>
<td>148.5</td>
</tr>
<tr>
<td>Metropolitan</td>
<td>30.2</td>
<td>357.1</td>
<td>28.7</td>
<td>105.4</td>
</tr>
<tr>
<td>Balance</td>
<td>23.6</td>
<td>36.8</td>
<td>36.8</td>
<td>-15.9</td>
</tr>
<tr>
<td>Total (number)</td>
<td>106</td>
<td>-16</td>
<td>20,030</td>
<td>10,340</td>
</tr>
</tbody>
</table>

Source: 2006 OTTE Student Statistical Collection

### Key Messages:
- Between 2003 and 2006 enrolments **increased** in both the South West and South East Metropolitan study areas by 50.0% and 171.4% respectively.
- Delivery of SCHs in both the South West and South East Metropolitan study areas **increased** by 148.5% and 26.4% respectively, over the same period.
3.5 **APPRENTICESHIPS AND TRAINEE SHIPS**

This section briefly comments on apprenticeship and traineeship participation for the Water industry.

Some 73.6% of Apprenticeship and Traineeship enrolments in the Water industry were Government-funded in 2006. This proportion had increased significantly since 2002.

OTTE has developed a methodology to measure apprenticeship and traineeship completion rates by tracking commencing cohorts over 6 (apprentices) or 4 (trainees) years to record their training outcomes. This method allows for people who may cancel their training contract and commence a new contract, because they change employer or training provider while continuing to train in the same occupation, to be counted as continuing their apprenticeship or traineeship. The average completion rate for all industries statewide for people who commenced an Apprenticeship between 1995 and 2000 is 65.1%, and 54.1% for people who commenced a Traineeship between 1995 and 2002.

### 3.5.1 APPRENTICESHIPS

Over the period 2001 to 2006, there were no apprenticeship commencements in the Water industry. Refer to section 3.5.2 below.

### 3.5.2 TRAINEE SHIPS

Over the period 2001 to 2006, there were 885 traineeship commencements in the Water industry, with a decline of 16.7% between 2005 and 2006 (see Figure 3.3).

The completion rate for trainees in the Water industry who commenced between 1995 and 2002 was 83%, well above the average for all industries of 54.1%.

**Figure 3.3: Traineeship Commencements for the Water Industry**
Key Messages:

- The completion rate for trainees in the Water industry (83%) is above the average for all Victorian industries (54.1%). However, it should be noted that the Water industry only have a very small number of Trainees.

3.6 SUMMARY

Analysis of 2006 delivery data, compared to 2005, reveals that there was a 540.1% increase in SCHs for the industry as a whole, with a 174.2% increase in Government-funded SCHs, as well as an increase of 734.7% for fee-for-service SCHs. Government-funded enrolments increased by 53.6%, and fee-for-service enrolments increased by 83.6%.

The alignment of Government-funded delivery in 2006 was consistent with 2005 planning advice at the industry level, i.e. that Government-funded training be maintained at the same level for Water industry occupational groups.

In 2006, the share of training effort and industry need for training in the Water industry continues to be in balance.
4 VET in Schools Activity

The data relating to VET in Schools (VETiS) is drawn from the Victorian Curriculum and Assessment Authority’s register of students engaged in VET programs that contribute to the Victorian Certificate of Education (VCE) and the Victorian Certificate of Applied Learning (VCAL).

Secondary school students may undertake VET courses at TAFE Institutes on a taster basis, as well through School Based New Apprenticeships (SBNAs).

Table 4.1 provides the VETiS data from 2002 to 2006, relating to all VET (including SBNAs) which counts towards a senior secondary certificate and/or a VET certificate, and provided either at the student’s home school or by TAFE.

As Table 4.1 indicates, there have been no enrolments since 2002 in students undertaking VETiS activities associated with the Water industry.

Table 4.1: VET in Schools Completions for the Water Industry, 2002-2006

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>7,809</td>
<td>9,358</td>
<td>13,073</td>
<td>13,127</td>
<td>14,517</td>
</tr>
<tr>
<td>ALL INDUSTRIES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Victorian Curriculum and Assessment Authority
Graduates from some Higher Education courses compete with VET graduates for employment in the same industry. This needs to be taken into account in any assessment of the balance between training supply and industry need.

In this section of the report, the latest data available (2005) on enrolments in Higher Education qualifications in fields of study of relevance to the industry are presented and compared to VET enrolments for the same year.

As would be expected, the distribution of courses across fields of education between VET and Higher Education varies according to qualification level and the nature of the occupation. A number of fields are well represented in both Higher Education and VET such as Health, management and commerce, the creative arts and information technology.

While the Water industry does employ graduates from Higher Education courses (e.g. Environmental Scientists, Water Engineers, etc), they are not employed in occupations that may be filled with VET graduates.
Each May, the National Centre for Vocational Education and Research (NCVER) conducts a survey of persons who undertook VET in the preceding calendar year. The NCVER collects data on a range of variables including, motivations for undertaking VET, and employment outcomes and the relevance of VET undertaken to the respondents’ employment, at the time of the survey. The Student Outcomes survey reveals that both graduates and module completers in the Water industry achieve slightly higher than Victorian industry average outcomes with regard to employment and reasons for undertaking study.

## 6.1 Graduate Outcomes

Survey results for graduates who completed training in the Water industry in 2005 and who were surveyed at 31 May 2006, revealed that their participation in VET was motivated by a range of reasons:

- 95.3% undertook training with the intention of gaining employment in the Water industry, compared to the Victorian average of 78.1%;
- 4.7% undertook training for personal interest or other reasons compared to 21.9% average for all industries;
- A total of 100% were employed, but not necessarily in the Water industry compared to a Victorian average of 80.8%; and
- Of those employed, 86.0% found their training to be of relevance to their employment, compared to a Victorian average of 73.9%.

## 6.2 Module Completers Outcomes

Survey results for persons who completed competencies in the Water industry in 2005 and who were surveyed at 31 May 2006, reveal that their participation in VET was motivated by a range of reasons:

- 100%\(^2\) undertook the training with the intention of gaining employment in the Water industry occupational groups compared to the average for all industries 66.9%;
- 100% were employed, but not necessarily in the Water industry compared to a Victorian average of 75.4%; and
- Of those employed, 100% found their training to be of relevance to their employment compared to an average for all industries of 59.7%.

\(^2\) It should be noted that the sample size on which this survey result is based is very small and therefore it should be interpreted with care.

---

### Key Messages:

- Graduate and/or module completers in the Water industry achieve better than Victorian industry average employment outcomes with a higher proportion in employment.
7 REVIEW OF MODERATING FACTORS

A key process in reviewing planning advice for 2007 is adjusting the gap between training need and training effort based on qualitative data for additional or updated moderating factors. The annual change driver reports provided by Victorian Industry Training Boards (ITABs) and Study Area Reference Groups are important sources of qualitative data. The conclusion, following a review of updated moderating factors, is that the difference between training need and effort is close to balance and it is advised that Government-funded training be maintained.

Key Messages:
- The difference between training need and effort is close to balance and it is recommended that training be maintained at current levels.

The impact of following moderating factors was considered:

<table>
<thead>
<tr>
<th>Factor</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope of Change</td>
<td>- Water restrictions have brought compliance issues and with that, new water patrol staff. The development of ‘big ticket’ infrastructure projects has implications for the industry in regard to project management skills in the short term, and maintenance and operational skills in the longer term.</td>
</tr>
<tr>
<td>Impact of Shifts in TAFE delivery</td>
<td>- Fee-for-service delivery has decreased by 24.2% in SCHs and by 18.5% in enrolments between 2005 and 2006. However, over the same period, there was an increase in Government-funded SCHs and enrolments by 94.7% and 112% respectively.</td>
</tr>
<tr>
<td>Impact of Government Regulation</td>
<td>- Government has targeted the Water industry to ensure the quality of drinking water and to improve, and ensure, efficient use of water. This may result in additional training requirements. Through Government regulation, strict water restrictions have been implemented resulting in the hiring of additional staff to undertake water patrol activities.</td>
</tr>
<tr>
<td>Employment Turnover</td>
<td>- While the numbers of existing worker trainees have slowed, the demand for new entrant trainees remains steady.</td>
</tr>
</tbody>
</table>

Office of Training and Tertiary Education
June 2007
7.1 **Between and Within Industry Advice For 2007**

Planning advice for government-funded training:

- **Between Industry**
  - Maintain – Following moderation, the industry’s share of training need and training effort is close to balance.

- **Within Industry**
  - Maintain – The Water industry has only one occupational group. Therefore, the within industry advice is the same as the between industry advice, i.e. that training effort should be maintained.
8 CONCLUSION

The aim of this report is to inform decisions regarding VET planning advice at the macro level by analysing the relationship between the factors affecting industry need for training, and supply of training. The key findings that emerged can be summarised below.

1. Industry demand for VET:
   - Between 2005 and 2006, there has been significant growth in the level of employment. An average of 40 additional workers will be required each year, until 2011.
   - The 2006 DEWR Skills in Demand List does not identify any skills shortages for the Water industry.
   - Advice from the ITAB suggests that training should focus on:
     i. Water-sensitive urban design;
     ii. Wetland design;
     iii. Aquifer storage and assessment;
     iv. Ground water;
     v. Stormwater;
     vi. Water trading;
     vii. Environmental flows;
     viii. Wastewater management;
     ix. Hydraulic modelling for pipes and pumps;
     x. Surge analysis;
     xi. Treated water re-use;
     xii. Advanced wastewater treatment;
     xiii. Contract management;
     xiv. Regulatory compliance;
     xv. Customer communications;
     xvi. Occupational health and safety issues associated with customer response to water restrictions;
     xvii. Dam safety with empty storages; and
     xviii. Refilling of empty storages.

2. Supply of training:
   - Total SCHs increased by 540.1% over the period 2002-2006;
   - Total student enrolments increased by 79.7% over the same period;
   - Traineeship commencements decreased by 16.7% between 2005 and 2006.

3. Other factors:
   - 95.3% of student graduates undertook training with the sole intention of gaining employment; and
   - 86.0% of graduates who were employed found that training assisted their employment.

4. Planning Advice
   Analysis of the demand and supply for training in the Water industry suggests that, after taking into account a number of moderating factors, Government-funded training effort should be maintained for occupational groups in this industry.
## Appendix A  SECTORS AND OCCUPATIONAL GROUPS

Table A.1: Occupational groups to sectors concordance

<table>
<thead>
<tr>
<th>ITAB</th>
<th>Occupational Group</th>
<th>Industry</th>
<th>Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Office of Training and Tertiary Education
June 2007
Table B.0.1: Training Delivery in the Water Industry, SCHs 2002-2006

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Student Contact Hours (all funding sources)</strong></td>
<td>21,045</td>
<td>40,166</td>
<td>116,865</td>
<td>161,624</td>
<td>134,719</td>
</tr>
<tr>
<td><strong>Student Contact Hours (Government-funded)</strong></td>
<td>7,305</td>
<td>9,690</td>
<td>15,915</td>
<td>10,290</td>
<td>20,030</td>
</tr>
</tbody>
</table>

Table B.0.2: Training Delivery in the Water Industry, Enrolments 2002-2006

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Student Enrolments (all funding sources)</strong></td>
<td>538</td>
<td>708</td>
<td>947</td>
<td>1,106</td>
<td>967</td>
</tr>
<tr>
<td><strong>Student Enrolments (Government-funded)</strong></td>
<td>69</td>
<td>122</td>
<td>112</td>
<td>50</td>
<td>106</td>
</tr>
</tbody>
</table>

Source: 2006 OTTE Student Statistical Collection
Notes: (a) Data do not include fee-for-service delivery by private providers.