



AUSTRALIAN
INDUSTRY
STANDARDS

SKILLS FORECAST 2019

WATER

INDUSTRY REFERENCE COMMITTEE





Australian Industry Standards acknowledges and thanks those organisations who supplied images to be used in this report. Water Image on Cover page - Water Industry Operators Association of Australia (WIOA)

CONTENTS

4

EXECUTIVE SUMMARY

6

**IRC
SKILLS FORECAST**

7

WATER IRC SKILLS FORECAST

8

**WATER INDUSTRY
REFERENCE
COMMITTEE**

10

**WATER INDUSTRY
OVERVIEW**

20

**EMPLOYMENT AND SKILLS
OUTLOOK**

28

**2018 INDUSTRY SKILLS
FORUMS**

29

**INDUSTRY LEADERS'
DINNERS**

30

REFERENCES

32

**PROPOSED SCHEDULE OF
WORK**

40

**AUSTRALIAN INDUSTRY
STANDARDS**

EXECUTIVE SUMMARY

The Water industry provides vital services that are fundamental to our national prosperity and economic growth, providing water and sewerage systems to households and businesses, and irrigation water in agriculture. Water and sewerage services provided an estimated annual revenue of \$23.56 billion in 2018. The industry employs over 28,000 people across its sub-sectors in water catchment supply, sewerage, drainage services and water pipeline transport.

New technological innovations have transformed the industry's operations, providing opportunities to save costs, improve services, and boost efficiency. Smart lining of pipes and robotics are utilised to enable predictive maintenance, saving the industry millions of dollars. Other innovations such as digital water metering units and IoT devices generate enormous amount of data which are captured in cloud-based systems. Data capture and remote system operations via tablets and smart phones are increasingly used at water treatment plants and in the field when assessing network issues. Asset monitoring is conducted remotely via smart devices and Remotely Piloted Aircraft Systems (RPAS). In line with these technologies, big data will be a strong focus into the future and the industry will require skills in data analytics, digital literacy, and cybersecurity.

New advancements in technology can improve the maintenance and renewal of infrastructure. Data-based management solutions to predict demand and manage peak periods can reduce asset management costs and improve operational efficiency. Traditional water treatment techniques are also being revamped by technological breakthroughs. The industry is increasingly using solar power which can address issues of remoteness, and augment existing power requirements.

The industry is utilising more digital technology and transitioning away from an asset-centric mindset to a customer-centric one. To fully achieve the objectives of a customer-centric model, the workforce requires skills such as creativity, problem-solving, critical thinking, and digital skills.


In response to recent changes, the IRC intends to review and develop skills in water operations and water treatment technologies to ensure recent innovations are reflected in the Training Package. Workforce development strategies and future-oriented planning can help the industry attract, develop, and retain a skilled workforce to fully benefit from new opportunities.



John Harris

Water IRC Chair

This IRC Skills Forecast was agreed to by the Water IRC on 29 April 2019.

A close-up, low-angle shot of water flowing through a series of large, dark metal pipes. The water is captured in motion, creating a blurred, dynamic effect. In the background, out-of-focus trees with autumn-colored leaves are visible against a bright sky. The overall tone is industrial yet natural.

***THE INDUSTRY IS UTILISING
MORE DIGITAL TECHNOLOGY AND
TRANSITIONING AWAY FROM AN
ASSET-CENTRIC MINDSET TO A
CUSTOMER-CENTRIC ONE.***

IRC SKILLS FORECAST

The Industry Reference Committee (IRC) Skills Forecasts focus on the prioritisation of the skill needs of the industry sectors each IRC has responsibility for. They are developed and reviewed annually and submitted on behalf of the IRC to the Australian Industry and Skills Committee (AISC) for approval.

The document is deliberately brief. It does not seek to identify every issue within every sector. It is a snapshot of a continually evolving story that is intended to alert and inform a wide audience and enhance the industry's capacity to act.

IRCs are required to consult broadly with stakeholders to ensure a whole-of-industry view about the opportunities and challenges for the workforce and the Training Package review work necessary to meet industry needs. The information is then used to develop the four-year IRC Proposed Schedule of Work.



WATER IRC SKILLS FORECAST

This annual IRC Skills Forecast will be submitted by the Water IRC to the AISC for approval.

The IRC Skills Forecast identifies the priority skill needs of the Water industry following a research and stakeholder consultation process conducted by Australian Industry Standards (AIS) on behalf of the IRC.

Once approved by the AISC, the IRC Skills Forecast informs the development of a four-year rolling National Schedule for review and development work within the NWP National Water Training Package.

More information on the National Schedule can be found at: www.aisc.net.au/content/national-schedule.





WATER INDUSTRY REFERENCE COMMITTEE

The Water IRC has been assigned responsibility for the NWP National Water Training Package.

More information about the Water IRC and its work can be found here: www.australianindustrystandards.org.au/committee/water-industry-reference-committee/

WATER IRC MEMBERS

John Harris (Chair)

Wannon Water

George Wall (Deputy Chair)

Water Industry Operators Association of Australia

David Cameron

Queensland Water Directorate

David Scott

United Services Union/Australian Service Union

Debra Henderson

City West Water

Jason Ip

NSW Water Directorate

Jeff Rigby

Water Services Association of Australia

Kate Blizzard

TasWater

Neil Hooley

Water Corporation

Robert Allen

Icon Water

Steven Porter

Power and Water Corporation

Akhil Palta

South Australia Water

Tess McDowell

Sydney Water Corporation

Tony Wright

VIC Water

For more information please contact:

Klausch Schmidt

Water Industry Manager

Australian Industry Standards

M 0417 568 967

E klausch.schmidt@australianindustrystandards.org.au

WATER INDUSTRY OVERVIEW

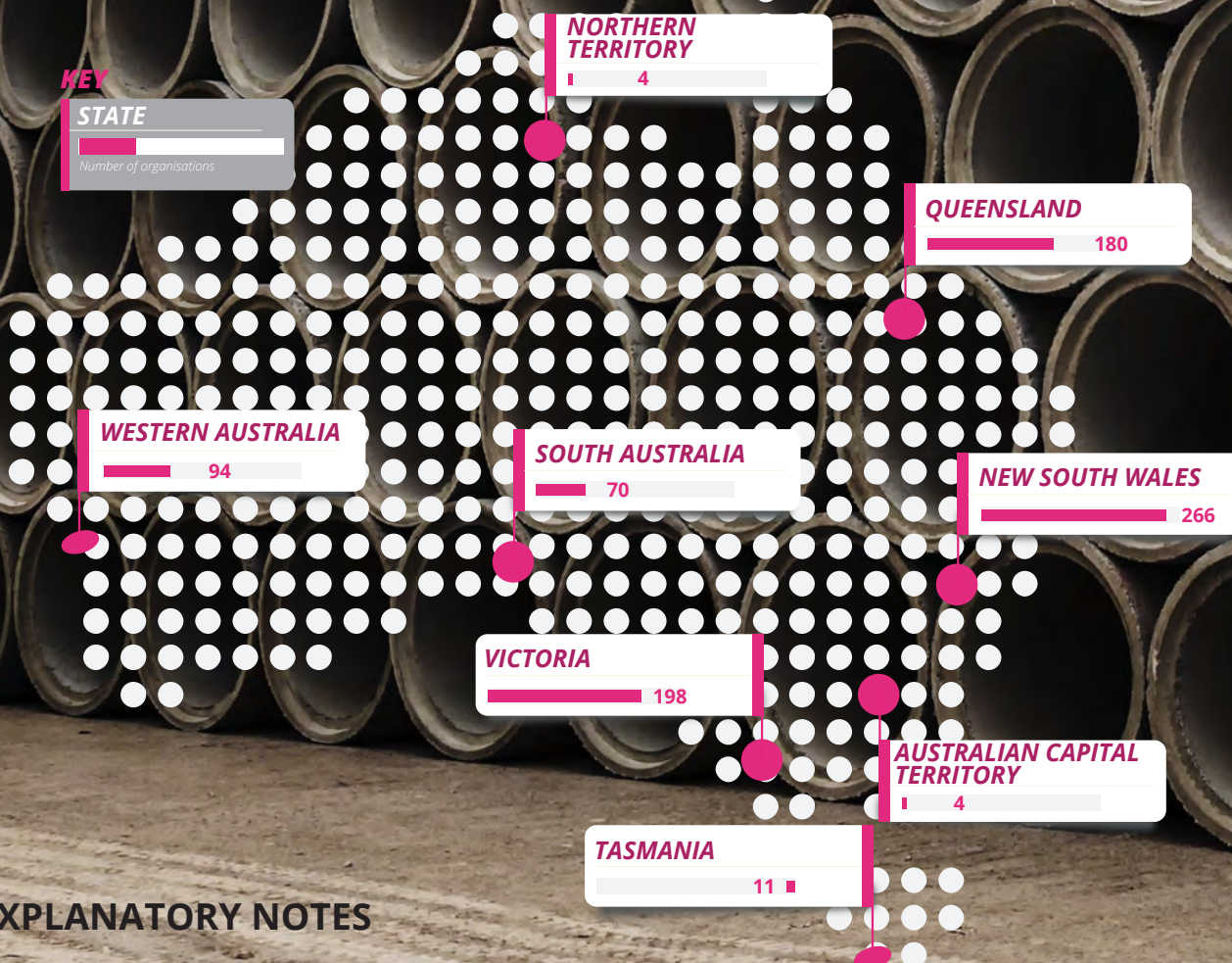
The Water industry in Australia has an estimated annual revenue of \$23.56 billion, adding \$14.15 billion to the Australian economy in 2017-18. The industry employs over 28,000 people across its

sub-sectors: water supply, sewerage, drainage services and pipeline transport (water).

KEY

STATE

Number of organisations



EXPLANATORY NOTES

Counts of Australian Businesses

Distinct from the Census and Labour Force data, the Counts of Australian Businesses data uses a top down approach where industries are primarily classified by the single predominant industry class associated with a business' ABN. A limitation of this approach is that organisations with a presence in several States/Territories will be counted only once. This can lead to enterprise figures appearing low for a given state/territory, but it's not that there are no enterprises existing in the state/territory, it's that the headquarters are located elsewhere. A further consideration is that organisations in more than one industry will also be only counted in one industry.

WORKFORCE AGE

AT 44.2 YEARS OLD, THE TYPICAL WORKER IS **3 YEARS, 5 MONTHS** OLDER THAN THE NATIONAL AVERAGE.

THE WORKFORCE IS AGEING AT **0.9 TIMES** THE NATIONAL RATE

WORKFORCE SIZE

28,200
2019

29,600
2024



BUSINESS COMPOSITION

763
SMALL
BUSINESS

52
MEDIUM
BUSINESS

21
LARGE
BUSINESS

GENDER DISTRIBUTION

77%  23% 



EMPLOYMENT
GROWTH TO 2024

5.0%

INDUSTRY VALUE YEAR 2018-19

REVENUE
\$23.56B

**+\$14.15B
TO GDP**

12

KEY WATER STAKEHOLDERS

EMPLOYERS

- Barwon Water
- City of Gold Coast
- City West Water
- Coliban Water
- Hunter Water
- Icon Water
- Melbourne Water
- Power and Water Corporation - NT
- Queensland Urban Utilities
- Seqwater
- South Australia Water
- South East Water
- Sydney Water Corporation
- Tas Water
- Unitywater
- Wannon Water
- Water Corporation
- Yarra Valley Water

INDUSTRY PEAK BODIES

- Australian Water Association
- Queensland Water Directorate
- Victorian Water Industry Association
- Water Directorate - NSW
- Water Industry Operators Association
- Water Services Association of Australia

EMPLOYEE REPRESENTATIVES

- Australian Service Union
- The Australian Workers Union
- United Services Union

STATE LICENSING / REGULATORY

- Environmental Protection Authorities
- State Departments of Health

GOVERNMENT

- Department of Agriculture and Water Resources
- Federal, State/Territory Departments
- National Health and Medical Research Council (NHMRC)

INDUSTRY ADVISORY

- Electrical, Utilities and Public Administration Training Council Inc
- Industry Skills Advisory Council - NT
- Public Sector Training Advisory Board - NSW
- Utilities, Engineering, Electrical, Automotive - WA

TRAINING ORGANISATIONS

- TAFEs, Private RTOs, Enterprise RTOs



**THE NWP NATIONAL
WATER TRAINING PACKAGE
COMPRISES**

7

QUALIFICATIONS

10

SKILL SETS

168

UNITS OF COMPETENCY
and associated assessment
requirements and covers water
supply, sewerage, drainage
services and pipeline transport
(water).

NWP NATIONAL WATER TRAINING PACKAGE

The NWP National Water Training Package provides the only nationally recognised Vocational Education and Training (VET) qualifications for occupations involved in water industry operations (generalist, treatment, networks, source, irrigation, hydrography, trade waste), treatment (drinking water, waste water) and irrigation.

The NWP National Water Training Package contains the following qualifications:

Certificates

- ▶ Certificate II in Water Industry Operations
- ▶ Certificate III in Water Industry Treatment
- ▶ Certificate III in Water Industry Operations
- ▶ Certificate III in Water Industry Irrigation
- ▶ Certificate IV in Water Industry Treatment
- ▶ Certificate IV in Water Industry Operations

Diploma

- ▶ Diploma of Water Industry Operations

**THE NWP NATIONAL WATER
TRAINING PACKAGE IS IN THE SCOPE
OF REGISTRATION OF 24 REGISTERED
TRAINING ORGANISATIONS.**

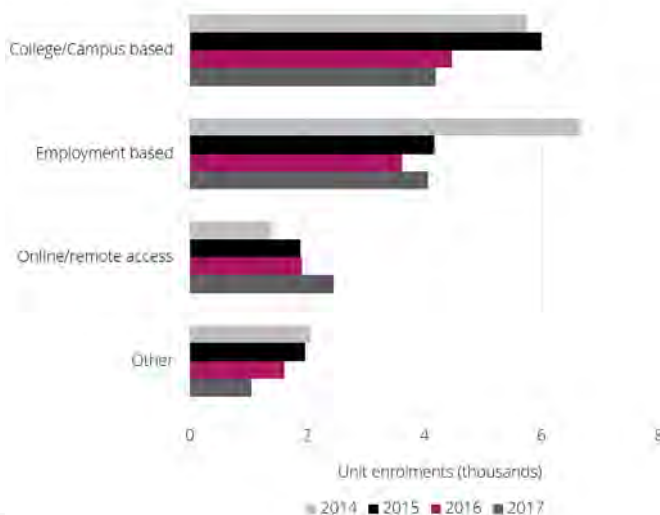
TRAINING DATA

The charts below show commencing qualification enrolments by apprentice/trainee status in each State and Territory along with Unit enrolments by delivery type over four years. At the national level, qualification enrolments in the NWP Training Package have decreased by 65% over the last four years while Units of Competency enrolments have decreased by nearly 30%.



QUALIFICATION ENROLMENTS BY STATE/ TERRITORY

With the exception of South Australia and Western Australia, enrolments have declined in every State and Territory since 2014. The decline is most obvious in Victoria where in 2014 a large proportion of those employed in the Water industry (approximately 15%) were enrolled in the Certificate II in Water Operations, suggesting upskilling in the broader workforce.



UNIT ENROLMENTS BY DELIVERY TYPE

Online/remote access unit enrolments have increased by more than 75% since 2014. Only two units; NWPGEN004 - Assess, implement and report environmental procedures and NWPGEN001 - Apply the risk management principles of the water industry standards, guidelines and legislation, which comprise the core bank of NWP30315 - Certificate III in Water Industry Treatment, accounted for nearly 20% of all online/remote access enrolments in 2017.

EXPLANATORY NOTES

Training Charts

Total VET Activity (TVA) data is collected from all types of training providers and not only those in receipt of Commonwealth or State funding. TVA data collection commenced in 2014. For Enrolments by Delivery type 'Other' includes; Recognition of Prior Learning (RPL), Credit Transfers and Units where the mode of delivery is mixed.

Exemptions

Where the submission of training data to TVA conflicts with defence or national security legislation or jeopardise the security or safety of personnel working in defence, border protection, customs or Australian police departments, an exemption from reporting training data is available.

Organisations that deliver training for vital services to the community (such as emergency, fire, first aid and rescue organisations) may have received an exemption to submit data to TVA. From 1 January 2016 however, the exemption from reporting applies only in respect of training activity not delivered on a fee for service / commercial basis.



CHALLENGES AND OPPORTUNITIES

TECHNOLOGY IS A GAME CHANGER

Industries are undergoing rapid changes with technological innovations revamping business models and the way industry operations are conducted. Emerging technologies offer a wide range of opportunities and benefits to save costs, improve services, and increase efficiency. The water industry is adopting new technologies and innovative approaches towards the treatment of water, water catchment, and asset management. These changes continue to have far-reaching effects on the way water is delivered to highly urbanised regions, commercial zones, and rural/regional locations, as well as industry skills required by the workforce.

AUTOMATION IS OVERHAULING THE INDUSTRY

The water industry is advancing through systems automation, creating many opportunities to streamline processes and improve the cost-effectiveness of water management practices. Digital Water Metering (DWM) has been trialled in Victoria and Queensland with great success. Adoption of digital and automated meter reading technologies will enable improved water consumption management and enhance the customer experience. Water infrastructure

planning and deferring asset replacement are drivers for investment in new technologies. New technologies assist with infrastructure improvements via planning and deferring asset replacement through better peak demand management.¹

The water industry is now utilising dynamic and self-adaptive systems which can identify asset and system management issues in real-time with the use of model-diagnostic methods. These new technologies can provide predictive capabilities to detect leaks, improve asset management and operations as well as increased customer satisfaction.² The industry is also implementing Virtual Reality (VR) systems to support the training of system operators, and early hazard identification in asset design.³ With increased affordability of these technologies, they are being used more often to train employees before placing them in real-world and high-risk situations.⁴

The rapid onset of automation in the water industry is anticipated to have a significant impact on the industry and skilling requirements of the current and future workforce. Retraining and up-skilling will be needed to ensure the workforce stays abreast with emerging technologies, maintaining asset management, and improving water utility efficiency.

SMART DEVICES ARE IMPROVING INSPECTIONS AND SURVEYING

Inspection of water assets is a costly and time-consuming task which has been greatly alleviated via remote monitoring technologies. Technologies such as Remote Piloted Aircraft Systems (RPAS) and smart devices/sensors (Internet of Things (IoT)) enable remote monitoring which provides quality data on asset condition and water hygiene in reservoirs,⁵ improving safety, increasing task efficiency and saving asset management time and costs.⁶ Advances in Artificial Intelligence (AI) and machine learning can help make smart predictions about water pipes and prioritise maintenance that can minimise costs and reduce disruption to water supplies.⁷ Shifting to predictive asset maintenance has the potential to save the water industry \$700 million on reactive repairs and maintenance.⁸ Innovations such as smart lining of pipes and robotics are being rolled out in Australia which will repair leakages and pipes instead of replacing them. This will extend the service life of pipes by up to 50 years⁹ and save much of the leakage water which was wasted in Australia every year.¹⁰

These new systems and remote operations require highly specialised skills to monitor, diagnose, and interpret large volumes of data to determine faults and identify areas for investigation. Addressing this emerging skills deficit within the VET skills framework is considered a critical industry priority.

THE INTERNET OF THINGS IS DIGITALISING PROCESSES

The advent of the Internet of Things (IoT), the ever-increasingly miniaturised sensors and internet connected devices, has already altered the way the water industry operates. Water companies are deploying remote IoT monitoring for asset management that had been previously difficult and expensive. This technology collects additional data through sensors and smart devices which provide a better understanding of asset condition which can, in turn, reduce asset-related failures or disruptions to water supply. Smart monitoring systems provide real-time data, allowing timely response to faults which improves the safety and efficiency of operations and enhances customer service.¹¹ IoT is also generating an enormous volume of data which is integrated within IoT cloud platforms and applications. Data capture and remote system operations via portable devices (tablets and smart phones) is increasing at water treatment plants and in the field when assessing water network issues.

Based on these wide applications of IoT innovations, digital literacy has gained considerable significance within the water industry. These technologies will require specialist skills in data analysis and data literacy, higher-order skills, critical thinking, problem solving, and the capability to use digital platforms and devices. Industry experts and participants at the AIS Industry Skills Forums through 2018 also emphasized the need for digital skills for the current and future workforce. The water industry will need to be able to rapidly adapt and upskill its workforce to maximise productivity.

BIG DATA ENSURES OPERATIONAL EFFICIENCY AND WATER SECURITY

Big Data, the ever-increasingly large volume of data being captured by sensors and subject to analysis, is further transforming the management of water assets and supply in Australia. Data is constantly being collected from IoT sensors and

devices within pumping stations, water treatment plants, sewage plants, and reservoirs. This data may be used to improve management decision outcomes through faster data acquisition, with higher quality data analysis to make operations more cost efficient and customer-focused. Big Data can also enable water pipe failure prediction, customer demand analysis, sewer corrosion, and chokes prediction.¹² This capability, known as predictive data analytics as opposed to reactive data analytics, can reduce operating risks and service disruptions and improve reliability.¹³ The New South Wales Government is also using Big Data analytics to predict supply and demand availability to ensure water security and identify the need for infrastructure upgrades.¹⁴ For the industry to fully benefit from these opportunities, workforce skills in data analysis are required. A national survey in Australia has revealed that Big Data analytics is one of the top three digital skills¹⁵ in demand.

DIGITAL LITERACY IS ESSENTIAL

Digital transformation has completely revamped every aspect of life and workforce. New technologies and devices are widely used in the workplace, creating digitally-enabled environments that affect numerous occupations. Digital literacy and Information Communication Technology (ICT) skills are required to respond and adapt to the fast pace of implementation of these technologies. Digital literacy is defined as having practical skills in using technology to access, manage, manipulate, and create information as well as the skills to critically analyse, interpret and apply the information to relevant situations. Digital literacy also encompasses more technical skills in programming and coding, data analysis, technology design, system analysis, and presenting and managing content on the web to develop applications and manage networks.^{16 17}

Advancements in Artificial Intelligence, computer technology, automation, the Internet of Things, cloud computing, big data, customer-service platforms and social media are generating a massive volume of data and information, offering a range of benefits such as improved customer service and operational efficiency. In line with the Australian Government's National Innovation and Science Agenda,¹⁸ training and upskilling in digital literacy will help drive economic prosperity.

Benefitting from digital literacy will require a digitally competent workforce with a range of skills, from basic ICT skills to specialist skills, to



manipulate and interpret data in a meaningful manner and deploy technologies more effectively.

Data is the driver of improved customer service which is offered through digital platforms. Data specialists can provide organisations with insights into consumer behaviour. Organisations can use the data and insights that have been sourced from digital services and platforms to tailor consumer relationship processes. Programming skills will be pivotal as they are required in the design, construction and delivery of educational materials via digital platforms that enable interaction with consumers. Consumers are also increasingly demanding digitalised services, allowing them to directly communicate with service providers via smart devices and social media channels. The design and build of these digitalised service systems and their usability for consumers will be critical in order to attract and retain consumers.¹⁹

In a recent survey, employers prioritised digital technology training development for managers (33%) followed by technicians/trades workers and professionals at 18 and 16 per cent respectively.²⁰ Digital skills have been ranked as the second highest-priority skills needs with 64 per cent of IRCs listing them in their skills forecasts.²¹ Participants at the 2018 AIS Industry Skills Forums also emphasised digital literacy as a highly significant skill in demand. The IRC recognises that the ageing workforce in the Water industry is compounding the uptake of digital skills.

Australia is very well positioned to be a leader in the digital economy. This will be enhanced through continued planning and investment in educational programs to train and upskill the existing and future workforce in digital literacy.

INDUSTRY-SPECIFIC CYBER SECURITY IS REQUIRED

The growing pace of new innovations and technologies is accompanied with increasing exposure to cyber security threats. In a global survey evaluating the cybersecurity performance across twelve industries, the utilities sector, which includes water, ranked ninth, and in terms of country performance, Australia ranked fourteenth out of fifteen surveyed countries.²² Cyberattacks are a common risk to many industries including the water sector. According to a research report, 95 per cent of Chief Information Officers believe that cyberattacks will increase and impact organisations in the next three years.²³ Australia has also been identified as the nation most under cyberattack threats in the Asia-Pacific region with 80 per cent of companies reporting a total of 5,000 threats a day,²⁴ incurring a cost of \$29 billion per annum to Australian businesses.²⁵ Over two thirds (69 per cent) of Australian businesses report experiencing cyber fatigue against cyber threats.²⁶

Awareness of the nature of cyber security threats and skills to detect, report and resolve the issues remain a challenge. Under the Notifiable Data Breaches (NDB) scheme, established in early 2018, organisations that suffer a data breach causing serious harm to individuals are required to alert the Office of the Australian Information Commissioner (OAIC). They must also inform the affected customers/clients whose confidential data is breached.²⁷ This, in turn, could entail financial and/or reputational loss if a breach occurs due to lack of proper cyber security skills and procedures. About 66 per cent of Australian CEOs regard cyber security capabilities among the top three most important workforce capabilities to foster.²⁸ This was supported at the AIS Industry Skills Forums



where a clear majority of participants considered cyber security to be a highly significant issue to their organisations and industries.

The unique nature of the water industry and technologies such as Big Data, AI, automation, etc., and the digitalisation of services create large amounts of data and can expose the industry to growing cyber security risks. As utilities reach out to external organisations to optimise their performance through digitalisation, customer and operational data needs to be protected. If hackers can infiltrate water infrastructure operation systems and equipment, they pose critical public safety, infrastructure security and public health hazards.²⁹ Ensuring the safe handling of customers' personal data will continue to be a challenge.

In the light of such serious safety risks, it is imperative to have a tailored cyber security training program not only to inform the workforce of the nature and examples of the water industry cyberattacks, but also provide the skills and knowledge to be able to resolve them. Businesses need to continue to raise awareness about the

issue, implement proper procedures, and deploy the right technologies to help identify, block or remediate any malicious attacks. Investing in skills and capabilities through training and educational programs is key to understanding cyber security and being protected from cyber security threats.

CUSTOMER SERVICE IS AT THE HEART OF THE WATER INDUSTRY

One of the main drivers of digitalisation of services is improving customer satisfaction, which increases consumer trust in the industry. Digital technologies and online platforms are rapidly reshaping customer behaviour. The water industry needs to be agile to engage and manage the relationship with customers to increase their value proposition. This is one of the key focus areas for the water industry which is shifting from an asset-centric mindset to a customer-centric model.³⁰ The industry's priorities are to encourage customer-centric behaviour, define a standardised Customer Intelligence approach to improve customer experience, and increase the use of AI to improve data analysis and learn from customer behaviour.³¹ Companies are increasingly engaging clients through educational programs delivered via digital platforms where customers are involved in influencing decision-making and initiatives regarding water services and sewerage service options.³²

To fully achieve the objectives of a customer-centric model, the industry requires a resilient workforce with skills such as creativity, problem-solving, critical thinking and specialists who may create human-centred techniques such as design thinking.³³ Digital skills are equally important as customer engagement is mediated via digital platforms. Digitalisation also allows proactive communication with customers in detecting and rectifying their issues before they call to report a disruption.³⁴

DATA INFLUENCES INFRASTRUCTURE AND ASSET MANAGEMENT

The water industry is highly reliant on physical assets and infrastructure, which requires ongoing maintenance and renewal. Given the dependency on aging infrastructure and increasing urbanisation, new challenges are anticipated to emerge. The industry will increasingly focus more

on data-based asset management solutions where data and demand analysis are used to manage peak times and direct important decisions as an alternative to building new assets.³⁵

The ongoing development and maintenance of water infrastructure has implications for the workforce. Companies are seeking appropriately skilled labour and management skills for these projects. Water security and the implementation of new approaches such as Integrated Urban Water Management (IUWM) and Water Sensitive Urban Design (WSUD) help to provide reliability of the supply and management of water assets in high-density urbanised areas.^{36 37}

TREATMENT INNOVATIONS REQUIRE NEW SKILLS

New advancements in technology are reshaping the way water and wastewater is treated. Water treatment processes are also being overhauled with new techniques aided by solar power. New treatment techniques employ sunlight power to remove micropollutants.³⁸ Another world-first Australian new technology is called 'graphene oxide membrane' which uses atomically thin sheets with multilayered structures, through which water flows to be purified. This method is highly cost effective and energy efficient.³⁹ These new technologies will potentially augment traditional treatment methods, demanding that current and future workforce skills be adapted to operate these new technologies efficiently.

CERTIFICATION AND INFLEXIBILITY OF SKILLS SET

Waste water operators and water treatment operators are among the most critical jobs in the Water industry and have been identified as difficult to recruit. A recent survey in Queensland indicated that 28.3 percent of local councils identified a current shortage of waste water/sewage operators, and 35.8 per cent report there will be a future shortage. Water treatment operators were identified as the second occupation shortage with 22.6 per cent of local councils indicating a current shortage and 30.2 percent reporting a future shortage. Companies also had to recruit less skilled applicants to meet the current demand.⁴⁰ The IRC has suggested operator certification and provision for new pathways as a solution to assist in addressing these shortages.

The IRC has identified potential Skill Sets for conventional water treatment plants which includes the most likely unit requirements to address the evolving needs of typical operators as they move from system to system. However, the rules governing Skill Sets are currently too rigid. There needs to be more flexibility to assist the industry meet its demand and better align training to job roles.

CLIMATE CHANGE AND DROUGHT CALL FOR NEW APPROACHES

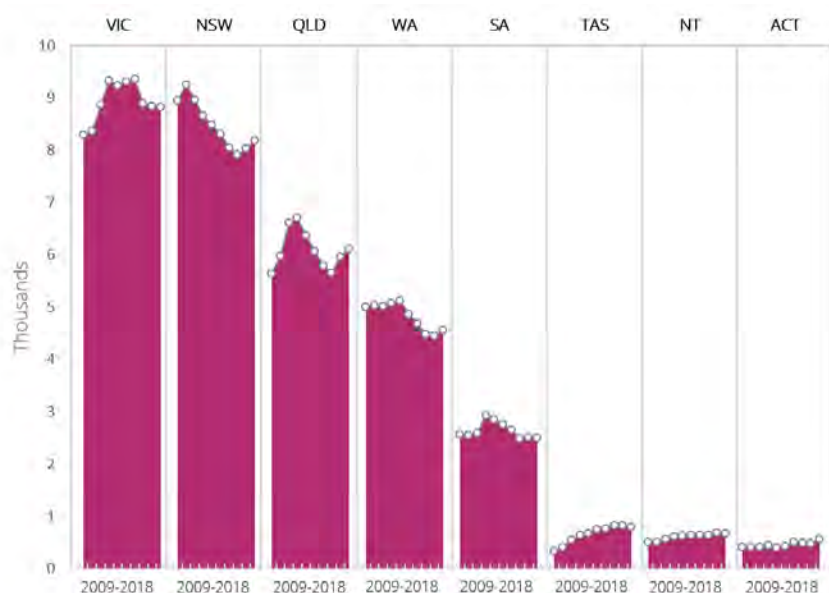
Water catchments are under pressure to maintain sustainable water supplies. The impacts of climate change are already being felt across Australia, especially with the recent drought in regional areas. Rainfall variability is beginning to place increasing pressure on all facets of the water industry. A Zero Carbon Emissions strategy identifies water supply security at risk, due to increasing greenhouse gas emissions.⁴¹ These effects will have long-lasting and negative impacts on the industry. To ensure the stable and reliable supply of water across all of Australia, the water industry will have to proactively manage available water resources. It is essential to adopt an integrated water management approach rather than a disparate approach to water stewardship.⁴² Another imperative for the industry is to adopt a collaborative approach across all sectors involved with water resource planning and development. It is essential for the industry to work together to educate and prepare communities for a change in attitudes and behaviours regarding water consumption.⁴³

The water industry acknowledges the critical impact of climate change and drought and is revising water demand models, focussing on assets and solution-based strategies to mitigate these issues.^{44 45} An industry-led focus on the planning, development and forecasting of water industry skill needs will help ensure that the future workforce capabilities can meet anticipated demands and challenges.

EMPLOYMENT AND SKILLS OUTLOOK

EMPLOYMENT DEMOGRAPHICS

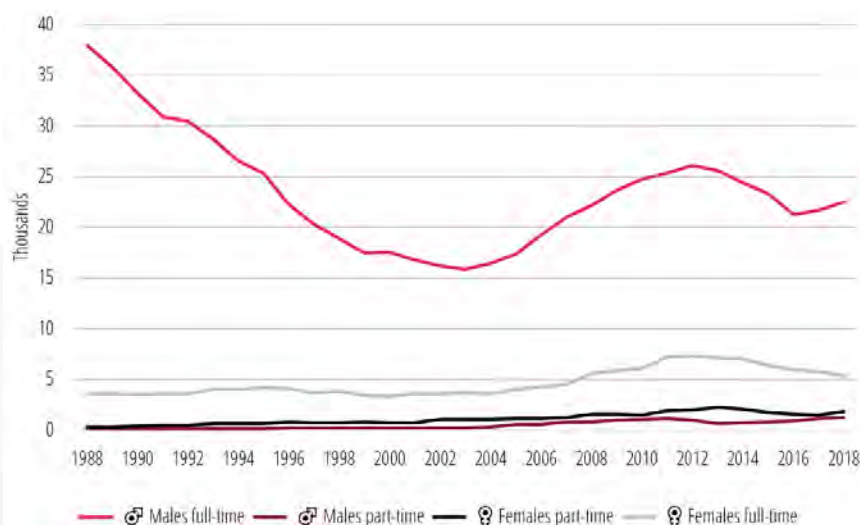
The following charts provide an overview of the Water workforce at a glance. These include workforce by State/Territory, gender-composition by employment type, and the projected employment for the next five years.



WATER WORKFORCE BY STATE/TERRITORY (2009 – 2018)

Downward trends in the Water workforce in Queensland, Western Australia and South Australia were corroborated against Census data. The New South Wales workforce, as represented in the Census data, was found to have a stable trajectory for the decade to 2016 where it is shown as declining in the Labour force data below.

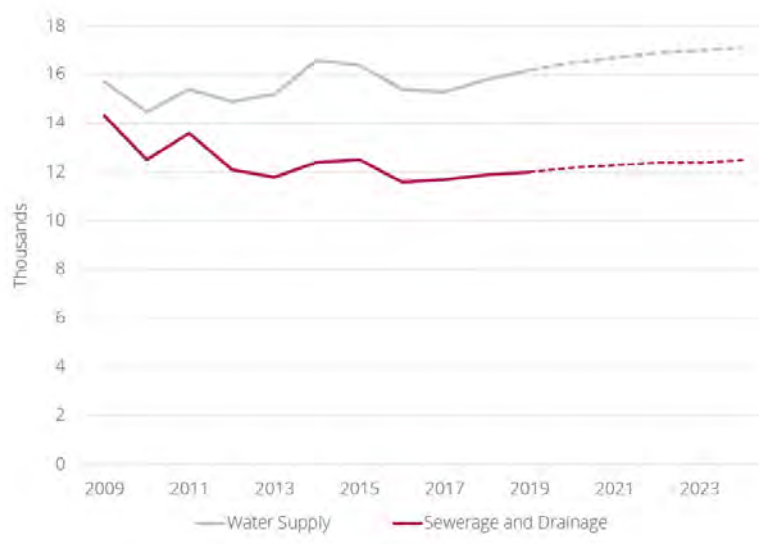
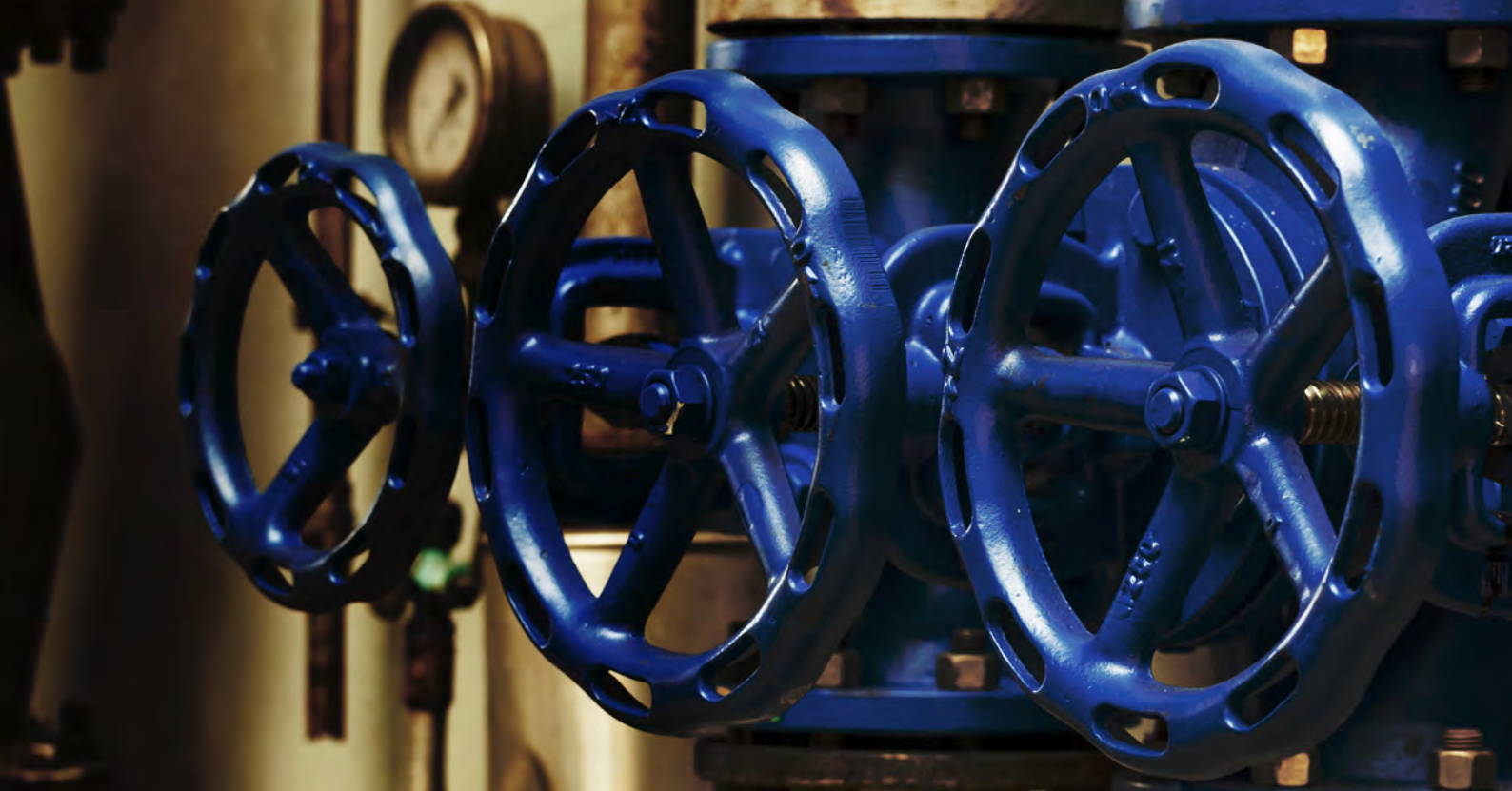
Source: Australian Bureau Statistics (2017)
6291.0.55.003 - Labour Force, Australia, Detailed.
Australian Government.



GENDER BY EMPLOYMENT TYPE

The number of females in the Water industry has increased by 84.3% since 1988, however there has been a noticeable decline in the last eight years. The percentage of females working part-time has increased from 7.6% to 25.5% over the same period.

Source: Australian Bureau Statistics (2017)
6291.0.55.003 - Labour Force, Australia, Detailed.
Australian Government



PROJECTED AND HISTORICAL WATER WORKFORCE (2009 – 2024)

The Water Supply and Sewerage and Drainage workforces are projected to grow by an average of 1.4% and 1% per year respectively for the next five years. This rate lags the expected population growth rate for Australia (1.8% per year) over the same period.

Source: IBISWorld Reports on Sewerage and Drainage Services, Water Supply.

EXPLANATORY NOTES

Labour Force Data

Outside of Census years, the size of an industry's workforce is established by the Australian Bureau of Statistics using the Labour Force survey. This dataset provides a 30-year view of the industry where, like the Census, industry is assigned at the discretion of the individual respondent. Given that the survey is sample-based, it should also be understood that the smaller the industry being measured, the larger the margin of error.

The scope of the Labour Force survey is limited to the civilian population of Australia and therefore members of permanent defence forces are excluded from the survey.

IBISWorld Data

IBISWorld data is comprised from a variety of economic, demographic, government and company data, including the Australian Bureau of Statistics.

WATER INDUSTRY SKILL SHORTAGES

On behalf of the Water IRC, AIS conducted an online survey for stakeholders, between 11 September 2018 and 14 January 2019. The IRC sought feedback on the current skill shortages and the reasons for the shortages, as perceived by industry stakeholders.

WATER SKILL SHORTAGES

Over 26 per cent of respondents reported experiencing a skills shortage in the last 12 months. The occupations reported as being in shortage were:

- 1** WATER/WASTEWATER TREATMENT OPERATORS
- 2** MAINTENANCE
- 3** ENGINEERS (VARIOUS)
- 4** WATER QUALITY MANAGEMENT
- 5** MANAGERS (VARIOUS)

REASONS FOR SHORTAGE

Employers identified the following reasons for the shortage with the most frequent response listed first.

- 1** WAGES / SALARIES CONSIDERED TOO LOW
- 2** COMPETITION FROM OTHER ORGANISATIONS
- 3** GEOGRAPHIC LOCATION OF THE VACANCY
- 4** AGEING WORKFORCE / CURRENT STAFF RETIRING
- 5** UNATTRACTIVE JOB / POOR INDUSTRY IMAGE

PRIORITY SKILLS

The priority skills of the Water industry are drawn from stakeholder responses to the Water IRC Skills Forecast survey conducted between 11 September and 14 January 2019.

SKILL CATEGORY

In order of priority to the industry, the following skills were identified from the survey as the most important for the Water workforce within the next three to five years.

- 1** HEALTH/SAFETY
- 2** TREATMENT/PROCESSING
- 3** MAINTENANCE/SERVICING
- 4** OPERATIONAL
- 5** DIGITAL

GENERIC SKILLS

The Generic Skills listed are provided to AIS by the Department of Education and Training. Within the survey, the IRC asks stakeholders to rank these skills in order of importance to the industry. Ranking of the 12 generic workforce skills in order of importance to the Water industry are as follows:

- 1** TECHNOLOGY
- 2** LANGUAGE, LITERACY AND NUMERACY (LLN)
- 3** MANAGERIAL / LEADERSHIP
- 4** LEARNING AGILITY / INFORMATION LITERACY / INTELLECTUAL AUTONOMY AND SELF-MANAGEMENT
- 5** SCIENCE, TECHNOLOGY, ENGINEERING, MATHEMATICS (STEM)
- 6** DESIGN MINDSET / THINKING CRITICALLY / SYSTEM THINKING / SOLVING PROBLEMS
- 7** COMMUNICATION / VIRTUAL COLLABORATION / SOCIAL INTELLIGENCE
- 8** DATA ANALYSIS
- 9** CUSTOMER SERVICE / MARKETING
- 10** ENVIRONMENTAL AND SUSTAINABILITY
- 11** FINANCIAL
- 12** ENTREPRENEURIAL

WORKFORCE SUPPLY SIDE CHALLENGES AND OPPORTUNITIES

REGULATORY CHANGES AND COMPLIANCE ISSUES

Federal, state and territory governments have increased the regulation and reporting requirements for water utilities. These changes ensure the delivery of reliable water to the public while minimising the effects on the surrounding environment. A recent survey identified compliance and environmental regulations among the top five factors influencing the water industry workforce.⁴⁶

AGEING WORKFORCE

The water industry of Australia has a large proportion (36 per cent) of its workforce aged over 50 and are projected to retire in the next 10-15 years.⁴⁷ Attraction and recruitment of new employees, who can be mentored by experienced staff, will help companies to retain industry knowledge as people leave the industry.

The pace of technological change, and the capacity for the existing older workforce to adopt the new technologies are a challenge for the industry. Workforce planning requires the need to balance employing the younger generation with technological skills, while ensuring accumulated corporate knowledge of the more experienced water industry workforce is maintained.

Water companies need to continue to look at how they promote careers in the industry, particularly in entry level roles. The workforce planning and development strategies such as mentoring programs undertaken by enterprises are essential to creating and retaining a viable and productive workforce.

WORKPLACE AND GENDER DIVERSITY

The average rate of female participation has grown by 2.1 per cent since 1988. The current workforce gender composition is approximately 25 per cent female⁴⁸. Workplace diversity is recognised as a way to sustainably respond to industry challenges and improve organisational





performance by creating better quality outcomes and improved employee engagement. It can also remedy the historical challenge of an ageing male-dominated workforce.⁴⁹ Encouraging diversity is now a strategic objective of the Water Services Association of Australia. Workforce planning and development strategies and initiatives are needed to promote further diversity and inclusion.

SOFT SKILLS ARE INTEGRAL FOR THE FUTURE

Today's workplace has fundamentally changed over the past decade and will continue to be transformed due to the advent of new technologies. In addition to technical and digital skills, soft skills will be equally important. Non-technical skills such as teamwork, problem-solving, and creativity are integral to the successful adoption and implementation of disruptive technologies.⁵⁰ Creativity and problem-solving skills will help individuals to explore new technologies and deploy them effectively in the workplace. The World Economic Forum has also indicated that these skills, as well as critical thinking, leadership, and emotional intelligence will be in demand in the next four years.⁵¹ Industry experts and participants at the AIS Industry Skills Forums also emphasized the significance of soft skills as well as lifelong learning to have a workforce prepared for the future. Having an agile and resilient workforce, which is ready to adapt to changes, is essential.

26

STAKEHOLDER CONSULTATION

An extensive consultation process has been undertaken in the development of the Skills Forecast and Proposed Schedule of Work.

Among many issues and sensitivities raised throughout the consultation process, the top three key themes that emerged were:

Employing for attitude

The major impact identified affecting water industries is the skills required for future workers. When hiring, greater consideration is given to the importance of non-technical or soft skills. The industry needs employees to have exceptional customer service skills which provides a point of difference between different suppliers. A term that was used was “employing for attitude” as the technical water skills can be taught but attitude cannot.

Micro learning

The water sector is moving towards micro learning to improve knowledge gaps. A common theme from stakeholders was the need for shorter training courses and that Skill Sets will assist resolve this issue. There is not always the need for a full qualification, and a Skill Set can offer a worker the opportunity to move between different sectors of the water industry or to other worksites that use different technology to perform the same skill. Feedback suggested Skill Sets can respond more quickly to industry needs. However, rules governing Skill Sets are currently rigid and inflexible to meet the industry's skill needs.

Remote Operating Equipment

Water industries are looking to invest in remote operating equipment to perform tasks currently undertaken by workers. Water utilities routinely undertake a variety of remote monitoring techniques to help manage costs, worker safety and public health. These include, but are not limited to: CCTV inspections especially for sewerage networks, acoustic monitoring, pressure transient devices and other “smart” technologies (for leaks), and emerging remote monitoring tools including the use of drones for sampling, asset modelling and fault detection. These techniques are conducted both in-house and through contractors, meaning an increased need for technical, contract management and analytical/interpretive skills.



Stakeholders involved in the consultation process;

14

IRC Members (see listed earlier in the Skills Forecast)

380

AIS NWP National Water Training Package subscribers

8

State Training Authorities

AIS Industry Skills Forum, Water Industry breakout sessions were attended by representatives/s from the following organisations;

- ▶ AMS Training & Solutions
- ▶ Department of Natural Resources, Mines and Energy
- ▶ Holmesglen Institute of TAFE
- ▶ Institute of Managers and Leaders
- ▶ Melbourne Water
- ▶ Performance Training
- ▶ Pump Industry Australia (PIA)
- ▶ Southern Rural Water
- ▶ Water Industry Operators Association of Australia (WIOA)



2018 INDUSTRY SKILLS FORUMS



AIS facilitated a series of Industry Skills Forums across the country between September and November 2018. Respected journalist and author Kerry O'Brien moderated the events across all States and Territories that attracted over 1100 people, with an additional audience watching the Melbourne event that was live streamed online.

Attendees represented small, medium and large businesses (both employers and employees), education providers (from high school, the Vocational Education and Training sector and University), unions, State/Territory and Federal Department officials and peak bodies.

The Industry Skills Forums were set up as the central platform in AIS' intelligence gathering activity for 2018 allowing AIS to



identify industry skills needs, now and into the future.

The purpose of the forums was twofold:

To provide participants with the opportunity to directly shape the skills and workforce priorities across a broad range of Australia's industries; and

To provide AIS with the opportunity to capture data and intelligence for the 2019 Skills Forecasts.

Each forum consisted of two Panel discussions, facilitated by Kerry O'Brien. The panels were made up of Industry Leaders and focused on the current challenges facing our industries. Panel One discussed "Industry Leadership - new thinking about jobs and careers". This was followed by Panel Two discussing "Future Skilling our people in an age of digital transformation".

Following the panel sessions, attendees participated in industry-specific breakout sessions, facilitated by AIS Industry Managers. This provided participants with the opportunity to talk about the issues affecting their industry. The discussions kicked off with looking at the impact of new technologies and then focused on the barriers and opportunities to recruiting skilled employees and the emerging skill needs for each industry.



INDUSTRY LEADERS' DINNERS

Industry leaders across AIS' 11 industries met to discuss the high-level workforce and skills issues at a series of Industry Leaders' Dinners hosted by AIS on the evening preceding each 2018 Industry Skills Forum. Attendees from around the country included leaders from Industry, Government, the education sector, and relevant unions. AIS was delighted that the Minister for Jobs and Industrial Relations and Minister for Women, the Hon Kelly O'Dwyer was able to attend the Melbourne dinner.

The dinner meeting discussions were facilitated by Kerry O'Brien and the clear message from attendees was that they provided an excellent opportunity to bring together multiple industries to discuss common workforce development challenges and opportunities.



Many attendees from both the Industry Skills Forums and the Industry Leaders' Dinners commented on the opportunity that the events provided to engage with industry directly on workforce issues. Kerry O'Brien summarised the sentiment very well when wrapping up the final forum in Adelaide, noting that at every forum around the country, significant issues and ideas were raised about the pathway that we need to take as a nation. He noted that it is critical that these issues have been discussed at this level with the key players and the challenge for AIS now is twofold. The first is to formulate policy advice to take back to government. The second is to continue the conversation.



REFERENCES

- 1 KMPG. (2018). Digital Water Metering: The Time is Now.
- 2 Water Services Associations of Australia. (2017). Smart Control of Water Systems to Improve Management of Drinking Water: Executive Summary.
- 3 Utility Magazine. (2018). "Melbourne Water's Digital Journey to More Efficient Operations". Retrieved from <https://utilitymagazine.com.au/melbourne-waters-digital-journey-to-more-efficient-operations/>
- 4 Australian Water Association. (2018). Is the Water Sector Ready for the Next Industrial Revolution? Retrieved from http://www.awa.asn.au/AWA_MBRR/Publications/Latest_News/Is_the_water_sector_ready_for_the_next_industrial_revolution_.aspx
- 5 Australian Water Association. (2018). Drone Tech Aids Seqwater's Water Condition Assessment. Retrieved from http://www.awa.asn.au/AWA_MBRR/Publications/Latest_News/Drone_tech_aids_Seqwaters_water_condition_assessment.aspx
- 6 Kovacs. M. (2018). "Drone Disruption." Current Magazine. Vol. 2, No: 2.
- 7 Osman. H. (2018). "Virtual Reality Pipe Inspection." Current Magazine. Vol. 2, No: 1.
- 8 CSIRO & DATA 61. (2018). Water Pipe Failure Prediction. Retrieved from <https://data61.csiro.au/en/Our-Work/Future-Cities/Planning-sustainable-in-frastructure/Water-pipes>
- 9 Utility Magazine. (2018). "Smarter Pipes, Longer Life." Retrieved from <https://utilitymagazine.com.au/smarter-pipes-longer-life/>
- 10 Bureau of Meteorology. (2018). National Performance Report 2017-18: Urban Water Utilities Part A.
- 11 Iannunzio, Elisa. (2018). Melbourne Water's Digital Journey to More Efficient Operations. Utility Magazine. Retrieved from <https://utilitymagazine.com.au/melbourne-waters-digital-journey-to-more-efficient-operations/>.
- 12 Vintage. D., et al., (2018). Success in Data Analytics. Australian Water Associations Journal. Vol. 3, Issue 1.
- 13 Water Services Association of Australia. (2018). Harness the Digital Economy.
- 14 Baker. D, et al. (2018). A Novel Data Driven Approach to Ensuring Water Security, via Data Analytics and Visualisation. AWA Journal. Vol. 3, Issue 2.
- 15 Ai Group. (2018). Skilling: A National Imperative.
- 16 Western Sydney University. (2017). Digital Literacy. Retrieved from https://www.westernsydney.edu.au/_data/assets/pdf_file/0009/1105398/eBook_-_Digital_literacy.pdf
- 17 McPherson, S. (2017). Digital Literacy: "What is it and How Important is it in the Future of Work?" Foundation of Young Australians. Retrieved from <https://www.fya.org.au/2017/06/29/digital-literacy-important-future-work/>
- 18 Australian Government. (2015). National Innovation and Science Agenda.
- 19 Energy Networks Australia and CSIRO. (2017). Future Workforce Skilling.
- 20 Ai Group. (2018). Skilling a National Priority.
- 21 Australian Industry and Skills Committee. (2018). Digital Skills. Retrieved from <https://nationalindustryinsights.aisc.net.au/national/digital-skills>
- 22 Accenture. (2017). The Accenture Security Index: Redefining Security Performance and How to Achieve It.
- 23 Gartner. (2018). Mastering the New Business Executive Job of the CIO: Insights from the 2018 CIO Agenda Report.
- 24 CISCO. (2018). CISCO 2018 Asia Pacific Security Capabilities Benchmark Studies: Regional Breach Readiness.
- 25 Microsoft. (2018). Direct Costs Associated with Cybersecurity Incidents Costs Australian Businesses \$29 Billion Per Annum. Retrieved from <https://news.microsoft.com/en-au/features/direct-costs-associated-with-cybersecurity-incidents-costs-australian-businesses-29-billion-per-annum/>
- 26 CISCO. (2018). CISCO 2018 Asia Pacific Security Capabilities Benchmark Studies: Regional Breach Readiness.
- 27 Office of Australian Information Commissioner. (na). Notifiable Data Breaches Scheme.
- 28 KMPG. (2018). 2018 Global CEO Outlook: An Australian Perspective: A Year of Cautious Optimism, Digital Crusaders, and Concerns about Protectionism.
- 29 Water Services Association of Australia. (2018). Harness the Digital Economy.
- 30 Water Services Association of Australia. (2018). The Customer of the Future.
- 31 Ibid.
- 32 Water Services Association of Australia. (2018). Harness the Digital Economy.
- 33 Water Services Association of Australia. (2018). The Customer of the Future.
- 34 Armstrong, S. et al., (2018). "Making and Keeping Customer Promises." Current Magazine. Vol. 2, No: 1.
- 35 Water Services Association of Australia. (2018). Harness the Digital Economy.
- 36 Furlong, C., De Silva, S. and Guthrie, L. (2016). Understanding Integrated Urban Water Management as an Ideology, Method, and Objective. AWA Water e-Journal.
- 37 Radcliffe, J. (2017). The Evolution of Low Impact Development. AWA Water e-Journal.
- 38 Utility Magazine. (2018). "Utilising sunlight for New Water Treatment Technology." Retrieved from <https://utilitymagazine.com.au/utilising-sunlight-for-new-wastewater-treatment-technology/>

- 39 Process Online. (2018). Monash Pours Energy into Clean Water Future. 4 December 2018.
- 40 Local Government Association of Queensland. (2018). Local Government Workforce and Future Skills Report.
- 41 Australian Water Association. (2015). Water Recycling Fact Sheet.
- 42 Savage, R. (2018). Drought Triggers –Is Integrated Water Management Essential for Ensuring a Sustainable Water Future for Australia? Retrieved from http://www.awa.asn.au/AWA_MBRR/Branches/QLD/Newsletter/Drought_triggers.aspx?WebsiteKey=9dc929a7-973a-452a-8ebd-7ac0870e5ba9
- 43 Goldsmith, S., and Day, D. (2018). Stretching the Sustainable Development Goals. Retrieved from http://www.awa.asn.au/AWA_MBRR/Communities/Specialist_Networks/SDG/Stretching_the_Sustainable_Development_Goals.aspx?WebsiteKey=9dc929a7-973a-452a-8ebd-7ac0870e5ba9
- 44 Sarker, R., and Gato-Trinidad, S. (2016). Current Issues in Water Demand Models Being Used in Australia: A Survey. AWA Journal.
- 45 Australian Water Association. (2016). Australian Water Outlook Report 2016.
- 46 Water Services Association of Australia. (2017). Workforce Skills of the Future.
- 47 Australian Bureau of Statistics (2017) 2016 Census – Employment, Income and Education. Australian Government.
- 48 Australian Bureau of Statistics. (2018). 6291.0.55.003 - Labour Force, Australia, Detailed. Australian Government.
- 49 Water Services Association of Australia. (2017). Tapping the Power of inclusion and Diversity in Urban Water.
- 50 National Centre for Vocational Education Research. (2018). The Fourth Industrial Revolution: The Implications of Technological Disruption for Australian VET.
- 51 World Economic Forum. (2018). The Future of Jobs Report 2018.

PROPOSED SCHEDULE OF WORK

KEY DRIVERS

WATER OPERATIONS AND TREATMENT TECHNOLOGY

Industry have requested qualifications that allow flexibility for operators at both large and small plants to undertake the specific relevant training they require to appropriately operate their plants and manage the risk to both public health and the environment. Operator certification skill and knowledge requirements, technology developments and process methodology changes in water storage, delivery and treatment are driving this development.

Industry requires a pathway to achieve higher level water and treatment operators. Due to the difficult attraction issues the industry faces, particularly in remote regional and rural areas of Australia, there must be a relevant pathway to provide a succession plan utilising existing workers.

Water or wastewater treatment plants do not meet a one size fits all concept. There are differences in the range of technology and complexity of process steps employed at large and small treatment plants.

Currently, when seeking to apply for operator certification, additional training is required to address skills gaps. These identified skills gaps need to be addressed and included in the Qualifications.

PROPOSED RESPONSES

WATER OPERATIONS AND TREATMENT TECHNOLOGY

The Water IRC has proposed to revise the two Certificate IV water qualifications to meet the changing needs of the water industry. Addressing identified gaps in workforce skill and knowledge requirements of water operators will meet employer needs, certification compliance and increase skills to use available technologies.

This revision will provide appropriate career pathways for water enterprises, enabling them to create succession plans to provide appropriately skilled and compliant operators. It will also enhance the ability of water operators to transition between sectors and provide employers with flexible and appropriate education pathways to retrain workers. It will have a direct impact on an enterprises ability to manage the risk to both public health and the environment.

PROPOSED SCHEDULE OF WORK

2019-20

NWP Water Treatment and Operations – Review and development

The IRC has proposed a project to review and develop the Certificate IV in Water Industry Operations and Certificate IV in Water Industry Treatment qualifications and associated Units of Competency to ensure technology developments, methodologies and operator certification changes in water treatment and operations are updated and reflect contemporary industry practices.

Operating guidelines have been developed after consideration of the best available scientific evidence and provide a framework for good management of drinking water supplies to ensure safety at point of use. They address both the health and aesthetic quality aspects of supplying good quality drinking water.

2020-23

NWP National Water Training Package

Currently there are no NWP National Water Training Package products currently identified by the Water IRC for review or development during this forecast period.

Where imported Units of Competency are identified as either deleted or superseded, the IRC may elect to revise the affected qualification(s) through the IRC minor upgrade process.

2019-20 PROJECT DETAILS

WATER INDUSTRY OPERATIONS - REVIEW AND DEVELOPMENT

Description

This project will review and develop the NWP40515 Certificate IV in Water Industry Operations qualification and 19 Units of Competency. This project will also update any associated Water Skill Sets that utilise the units contained within scope of this project.

Rationale

Public and operator safety is dependent on appropriately skilled operators in the various sectors that provide water to all Australians. Water must be delivered to Australian consumers as safe drinking water. The water industry is now finding it increasingly difficult to attract and retain workers at a higher level in rural and remote areas. This has created a need for water bodies to develop workforce succession plans for existing employees, with VET qualifications providing the water industry the ways and means to achieve this.

This project will enable alignment of the qualification to water industry supervisory job role requirements, and incorporate emerging technologies used within the water Industry. This will include aligning the

34

skill and knowledge requirements of the Units of Competency to industry certification requirements for operators, provided by the Operator Certification organisation. The various job roles this qualification supports have evolved, and emerging technologies and new methodologies are being incorporated into the delivery network (supply) and construction of water assets.

Without this revision and update, the water industry will not have the required workforce capabilities to implement the required technology solutions into the water networks, or to provide a pathway for the training of existing workers to fill the identified skill gaps.

The Certificate II and two Certificate III's along with the Diploma have been previously reviewed and are now considered as 'fit for purpose' to meet industry needs. To ensure an aligned AQF skills pathway for the water industry, the revision of this qualification is required to be completed. In 2017 over 130 people completed this qualification, with further alignment of industry qualifications to the changes in methodology and technology, it is expected that this number will increase accordingly.

Units of Competency within these qualifications are also used as part of the National "Water Industry Operators Certification" scheme and need to reflect the certification requirements required by Water Operators.

This qualification is currently funded in;

- ▶ NSW
- ▶ QLD
- ▶ VIC
- ▶ TAS

Ministers' Priorities Addressed

- ▶ The project will not propose removal of obsolete and superfluous qualifications from the National Register
- ▶ The project will ensure that more information is made available about water industry operations and training delivery to training providers
- ▶ The project will address the needs of individuals and industry and provide transferable skills from one occupation to another within the water operations sector
- ▶ The project may support development of Units of Competency that may be owned and used by multiple industry sectors
- ▶ The project does not propose the development of additional Skill Sets
- ▶ The project does not propose the incorporation of existing accredited course materials into the NWP National Water Training Package

Consultation Plan

AIS will:

- ▶ undertake consultation on the IRCs behalf with all State Training Authorities and other key national stakeholders
- ▶ seek public feedback and input into development of material through the project's duration

- communicate to enterprises, State/Territory Training authorities, State/Territory Industry Training Advisory Bodies, Peak Bodies, Registered Training Authorities (RTOs) and other interested parties, of the establishment of the project
- conduct initial consultation with stakeholders to identify and invite key representatives to establish the Technical Advisory Committee (TAC) and posting information about the project on the AIS website and newsletter
- conduct face to face consultation and engagement sessions as required
- conduct TAC meetings to explain the process and gather comments/feedback
- communicate the process of drafting, identified Training Package materials (Qualifications/ Units of Competency/Skill Sets), verify and validate this material with stakeholders through email, the AIS website and the AIS newsletter for wider stakeholder involvement, throughout the review process
- continue communication on the project via the AIS website and newsletter.

Scope of Project

To incorporate the new methodologies and technologies and other Industry requirements, being used by the Water Industry and certification requirements into the NWP National Water Training Package qualification and associated Units of Competency. Updating of imported Units of Competency that are superseded or deleted will also be undertaken within scope of this project.

The Training Package is planned to be developed from July 2019, with a Case for Endorsement planned for submission in September 2020.

Training Package

- NWP National Water Training Package

Qualifications

One qualification requires review:

- NWP40515 Certificate IV in Water Industry Operations

Units of Competency

Units of Competency to be reviewed:

- 19 Units of Competency requiring review

Skill Sets

- Six Skill Sets to be reviewed

36

WATER INDUSTRY TREATMENT - REVIEW AND DEVELOPMENT

Description

This project will review and develop the NWP40615 - Certificate IV in Water Industry Treatment and 12 Units of Competency and may develop up to four new Units of Competency.

Rationale

Public and operator safety is dependent on appropriately skilled operators in the various sectors that provide water to all Australians. Water must be delivered to Australian consumers as safe drinking water. The water industry is now finding it increasingly difficult to attract and retain workers at a higher level in rural and remote areas.

There are various water types requiring treatment, and the technology, plant and methodologies available continue to develop and are vastly different depending on various influencing factors. High technology wastewater treatment processes can include intermittent aeration/oxidation ditches, membrane bioreactors, biological nutrient removal and dissolved air flotation. The changing and evolving job roles that operators are now facing require a qualification that supports these changes.

The typical water or wastewater treatment plant is not a one size fits all concept. There are a variety of individual treatment processes that can be chosen and utilised at a plant, depending on factors such as location, flow volume or level of contaminants in the water or wastewater to be treated. There are also differences in the range of technology and complexity of process steps employed at large and small treatment plants.

The Certificate II and two Certificate III's along with the Diploma have been previously reviewed and are considered 'fit for purpose' to meet industry needs. To ensure an aligned AQF skills pathway for the water industry, the revision of this qualification is required to be completed. In 2017, 150 people completed this qualification, with further alignment of industry qualifications to the changes in methodology and technology, it is expected that this number will increase accordingly.

This project will enable alignment of the qualification to water industry supervisory job role requirements, and incorporate emerging technologies used within the Water Industry. This review will enable alignment of the qualifications to the evolving job role requirements and technologies used within the water industry to be provided for within the qualifications and associated units of competency. Units of Competency within these qualifications are also used as part of the National "Water Industry Operators Certification" scheme and need to reflect the certification requirements required by Water Operators.

This qualification is currently funded in;

- ▶ NSW
- ▶ QLD
- ▶ VIC

Ministers' Priorities Addressed

- The project will not propose removal of obsolete and superfluous qualifications from the National Register
- The project will ensure that more information is made available about water industry operations and training delivery to training providers
- The project will address the needs of individuals and industry and provide transferable skills from one occupation to another within the water treatment sector
- The project may support development of Units of Competency that may be owned and used by multiple industry sectors
- The project does not propose the development of additional Skill Sets
- The project does not propose the incorporation of existing accredited course materials into the NWP National Water Training Package

Consultation Plan

AIS will:

- undertake consultation on the IRCs behalf with all State Training Authorities and other key national stakeholders
- seek public feedback and input into development of material through the project's duration
- communicate to enterprises, State/Territory Training authorities, State/Territory Industry Training Advisory Bodies, Peak Bodies, Registered Training Authorities (RTOs) and other interested parties, of the establishment of the project
- conduct initial consultation with stakeholders to identify and invite key representatives to establish the Technical Advisory Committee (TAC) and posting information about the project on the AIS website and newsletter
- conduct face to face consultation and engagement sessions as required
- conduct TAC meetings to explain the process and gather comments/feedback
- communicate the process of drafting, identified Training Package materials (Qualifications/ Units of Competency/Skill Sets), verify and validate this material with stakeholders through email, the AIS website and the AIS newsletter for wider stakeholder involvement, throughout the review process
- continue communication on the project via the AIS website and newsletter.

Scope of Project

To review and incorporate new methodologies and technologies being used by the water industry and certification requirements into the NWP National Water Training Package qualification and associated Units of Competency. This will include the development of up to four new units of competency. Operator certification requirements will also be addressed. Updating of imported Units of Competency that are superseded or deleted will also be undertaken within scope of this project.

The Training Package is planned to be developed from July 2019, with a Case for Endorsement planned for submission in September 2020.

38

Training Package

- ▶ NWP National Water Training Package

Qualifications

One qualification requires review:

- ▶ NWP40615 - Certificate IV in Water Industry Treatment

Units of Competency

Units of Competency to be reviewed and developed:

- ▶ 12 Units of Competency requiring review
- ▶ Up to four new units of competency to be developed

Skill Sets

- ▶ No Skill Sets to be reviewed



AUSTRALIAN INDUSTRY STANDARDS

Australian Industry Standards (AIS) provides high-quality, professional secretariat services to the Water IRC in our role as a Skills Service Organisation. AIS provide services to eleven allocated IRCs which cover Aviation, Corrections, Gas, Electricity Supply (Generation and Transmission, Distribution and Rail), Electrotechnology, Maritime, Public Safety (including Police, Fire and Emergency Services, Defence), Rail, Transport and Logistics, and Water industries. AIS supports these important industry sectors using our in-house capability and capacity in technical writing, quality assurance, project management and industry engagement in the production of Training Packages.

AIS was established in early 2016, 20 years after its predecessor the Transport and Logistics Industry Skills Council (TLISC) was established in 1996. More information about AIS can be found at <http://www.australianindustrystandards.org.au>.

- ▶ We support industry growth and productivity through our modern innovative approach to establishing skills standards.
- ▶ We provide high-quality, professional secretariat services to help our allocated industry reference committees develop the skills that industry needs.
- ▶ We partner with industry to shape the workforce of the future.

CONTACT US



[instagram.com/ausindstds/](https://www.instagram.com/ausindstds/)



twitter.com/AusIndStds



www.linkedin.com/company/australian-industry-standards/

www.australianindustrystandards.org.au

enquiries@australianindustrystandards.org.au

