An analysis of Industry and Occupational codes and their impact on Queensland's water sector

August 2025

Purpose

Queensland's urban water sector has long faced challenges attracting talent. Despite being an essential service balancing government, community, and industry demands, it rarely receives attention from workforce and skills leaders.

This project was a pro-active approach to better aligning industry experiences with available data, documenting findings to enable industry and government to collaborate on solutions to agreed bottlenecks.

This document is prepared by the Industry Skills and Jobs Advisor (ISJA) for the water sector in Queensland. The ISJA Program is supported and funded by the Queensland Government.

Scope

The scope of this project was Queensland's water industry inclusive of the urban water sector and organisations which employ water operators. As a collective, these organisations handle the same resource (water), are similarly regulated by government bodies, compete for the same workforce and share similar labour and skilling challenges. In addition, there are a range of small and large businesses that enable these outcomes.

During the course of this project, it was observed that there was differing boundaries around what businesses make up the water sector, and thus the occupations. This is likely to result in a 'watering down' of sectoral problems.

Opportunities identified

Opportunity 1	Provide findings within this document to stakeholders to support workforce planning and future-proofing the sector. **Note: BuildSkills Australia is set to commence a 10-year Water Sector Roadmap (pending funding approval).*
Opportunity 2	Participate in the annual Jobs Queensland AFS data validation activity, providing findings of this project to better enhance available data at a state level in Queensland.
Opportunity 3	In the absence of ANZSIC and ANZSCO-level job vacancy data, promote existing industry-led resources such as ***qldwater***'s 2024 Urban Water Industry Workforce Composition Snapshot Report.
Opportunity 4	Gather job vacancy data from the broader water industry, including from small businesses, contractor organisations, laboratories and resources/mining businesses.
Opportunity 5	Raise awareness of occupations currently available on the CSOL with water sector employers, broadening recruitment and talent pools.
Opportunity 6	Working with the Department of Trade, Employment and Training and BuildSkills Australia, unlock opportunities for the addition of: • 712921 Waste Water or Water Plant Operator to be identified as in Shortage in Queensland on the Occupation Skills List (OSL) • 139999 Specialist Managers nec to be identified as in shortage in Queensland on the Occupation Skills List (OSL) • 712921 Waste Water or Water Plant Operator to be listed on the Core Skills Occupation List (CSOL) • 139999 Specialist Managers nec to be listed on the Core Skills Occupation List (CSOL)
Opportunity 7	Raise awareness of the water sectors role as an input to economic development including: • Supporting a labour market (healthy drinking water) • Provision of health services • Production of agricultural products including livestock, grain, horticulture, aquaculture and forestry and timber products • Manufacturing • Resources, mining and gas • Parks, gardens, greenspaces and tourism Enabling the people and infrastructure behind these revenue-generating industries is a necessary investment.

Industry-level analysis

Australian and New Zealand Standard Industrial Classification (ANZSIC) data is best used to identify the number of businesses primarily offering water services. The ANZSIC provides a basis for the standardised collection, analysis and dissemination of economic data on an industry basis for Australia and New Zealand. The ABS states that 'ANZSIC is widely used by government agencies, industry organisations and researchers for various administrative, regulatory, taxation and research purposes throughout Australia and New Zealand'.

The ANZSIC categories that best describe the water sector in Queensland are:

1. **Class 2811 Water Supply; and**
2. **Class 2812 Sewerage and Drainage Services.**

170 businesses identify themselves as primarily either Water Supply or Sewerage and Drainage businesses in Queensland, according to BuildSkills Australia's Industry data portal.

In parallel, there are 84 registered drinking water providers and 86 registered sewerage service providers in Queensland (identified via Queensland Government Open Data Portal August 2025) made up of:

- 69 councils including 15 Aboriginal shire councils and two Torres Straight Island shire councils
- Two (2) state-owned entities that oversee bulk water supply
- Two (2) state-owned statutory authorities (Water Boards)
- Two (2) statutory authorities providing distribution and retail services
- a range of private providers such as resorts and mining organisations

With over 89% of regulated service providers in Queensland being Councils, it is likely ANZSIC data is not capturing Queensland's primary providers of drinking water and sewerage services.

Businesses that contribute to the water workforce but are likely not counted as part of Water Supply or Sewerage and Drainage industry data include:

- Local Government/Councils
- Mining and resources businesses
- Major accommodation providers
- Maintenance businesses as well as large and/or major contractor organisations who provide a range of services (e.g. Waste, energy, water, other)
- Laboratory organisations

Risk: This gap is expected to widen commensurate with the growing demand for clean energy into the future. Businesses that specialise in pumped hydrogen and green hydrogen manufacturing and production will require occupational roles like water treatment operators, as identified in the Queensland Governments *Hydrogen Industry Workforce Development Roadmap 2022 – 2032*.

There were two primary findings throughout the ANZSIC data analysis:

1. **Many data portals and tools are available to support workforce planning however all provide disparate data which leads to uncertainty.**

2. **The total size of the water sector workforce cannot be determined from ANZSIC data, as many businesses – including Councils in Queensland - do not *primarily* offer water supply, sewerage and drainage services.**

See **Appendix 1 – Industry data analysis and findings** for a detailed view of findings from the data analysis.

Occupation-level analysis

The Occupation Standard Classification for Australia (OSCA) is a standardised framework for storing, organising and reporting occupation-related information. The ABS describes the OSCA as 'OSCA informs Australia's important decisions involving statistical outputs and labour market analysis.' ... 'Examples include developing workforce strategies to support industry and establishing mechanisms to ensure the availability of skilled job holders via skilled migration and educational pathways.'.

The OSCA categories that best describe occupations within the water sector in Queensland are:

1. 149399 Scientific and Environmental Managers not elsewhere classified *(occupations in this group include Water Resource Manager)*
2. 149999 Specialist Managers not elsewhere classified *(occupations in this group include Water Treatment Facility Manager)*
3. 149333 Laboratory Manager
4. 243236 Water Engineer *(occupations in this group include Water and Wastewater Engineer)*
5. 244432 Environmental Research Scientist *(Specialisation includes Water Quality Analyst)*
6. 244533 Hydrologist *(Specialisation includes Groundwater Modeller)*
7. 311534 Hydrographer *(Alternative titles include Water Monitoring Officer)*
8. 591141 Water inspector
9. 591135 Meter Reader
10. 732431 Wastewater and Water Plant Operators *(Specialisations include Dam or Reservoir Operator, Water or Wastewater Networks Operator)*
11. 821631 Drainage, Sewerage and Stormwater Labourer

OSCA is a new classification system, replacing the Australian and New Zealand Standard Classification of Occupations (ANZSCO) in 2024. With the introduction of OSCA came several new occupation categories which are anticipated to increase the accuracy of occupation-level statistical data into the future.

The are currently no government or industry portals or tools that enable a gathering of labour market data at OSCA level, with systems still relying on ANZSCO data. Findings within this report have been based on former ANZSCO categories that were related to the sector including:

1. 139912 Environmental Manager
2. 139999 Specialist Managers not elsewhere classified
3. 139913 Laboratory Manager
4. 233915 Environmental Engineer

5. 233999 Engineering Professionals not elsewhere classified
6. 234313 Environmental Research Scientist
7. 234399 Environmental Scientists not elsewhere classified
8. 234413 Hydrogeologist
9. 561912 Meter Reader
10. 712921 Waste Water or Water Plant Operator
11. 821112 Drainage, Sewerage and Stormwater Labourer

Many of these ANZSCO categories include specialisations or occupations within that are not related to water. An example of refinement between ANZSCO and OSCA is available in **Table 1:**

Table 1 – ANZSCO vs. OSCA for Specialist Managers

Classification	Occupation Group	Occupations within the group
ANZSCO (old)	13999 Specialist Managers not elsewhere classified	This occupation group covers Specialist Managers not elsewhere classified. - Airport Manager - Ambassador - Ambulance Services Manager - Archbishop - Bishop - Harbour Master - Security Manager (Non-ICT)
OSCA (new)	149999 Specialist Managers not elsewhere classified	This occupation group covers Specialist Managers not elsewhere classified. - Area Manager (Retail) - Bid Manager - Diplomat - Harbour Master - Power Station Manager - **Water Treatment Facility Manager**

The Australian Government leverages ANZSCO classifications for the Australian migration system. The Australian migration system supports overseas entrants to work and study in Australia. In this way, migration can support employers who are challenged by workforce vacancies and attraction.

Jobs and Skills Australia (JSA) leads work on occupational shortage analysis including the Occupation Shortage List (OSL). The OSL provides a detailed view of occupations in shortage in Australia and by each state and territory. The OSL defines occupations by ANZSCO code. Only ANZSCO levels 1 – 4 are included due to their links to tertiary education and training. JSA uses the following definition of occupation shortages (found within the *2024 Occupation Shortage List - Key Findings and Insights Report*):

An occupation is in shortage when employers are unable to fill or have considerable difficulty filling vacancies for an occupation or cannot meet significant specialised skill needs within that

occupation, at current levels of remuneration and conditions of employment and in reasonably accessible locations.

Sources used to assess occupational shortages include data modelling, statistical analysis, employer and stakeholder surveys, stakeholder groups and feedback from state and territory governments and Jobs and Skills Councils.

There were three primary findings throughout the OSCA and ANZSCO data analysis:

1. **Data portals do not distil occupation-level information at usable levels for Queensland's water sector.**

2. **There is no data available on occupational vacancies for the Water Supply, Sewerage and Drainage Services industry.**

3. **Skilled migration opportunities depend on data analysis, state and territory governments and Jobs and Skills Councils agreeing on the same challenges.**

See **Appendix 2 – Occupational data analysis and findings** for a detailed view of findings from the data analysis.

Appendix 1 – Industry data analysis findings

Industry findings	
Finding 1	**Many data portals and tools are available to support workforce planning however all provide disparate data which leads to uncertainty.** **Table 1 – ANZSIC data by source website** below summarises findings.

Table 1 – ANZSIC data by source website

Source	# of businesses
Queensland Government open data portal **– provides a list of registered water supply and sewerage services providers for 2025 under the *Water Supply (Safety and Reliability) Act 2008*.**	84 drinking water providers 86 sewerage service providers
Australian Governments Jobs and Skills Atlas.	800 Active Businesses in Australia. Does not provide a breakdown at state level.
Queensland Governments Anticipating Future Skills series.	Does not identify number of businesses.
BuildSkills Australia's Industry Profile **– identifies businesses against ANZSIC Groups.**	170 businesses broken down as: 6.25% (approx. 11 businesses) with 20 or more employees 37.5% (approx. 64 businesses) with 1 – 19 employees 56.25% (approx. 96 businesses) are sole traders

Finding 2	**The total size of the water sector workforce cannot be determined from ANZSIC data, as many businesses – including Councils in Queensland – do not *primarily* offer water supply, sewerage and drainage services.** ANZSIC data will likely not include water workforce numbers within the below types of businesses: • Local governments/Councils • Mining and resources business • Major accommodation providers • Maintenance businesses as well as large and/or major contractor organisations who provide a range of services (e.g. Waste, energy, water, other) • Laboratory organisations

Appendix 2 – Occupational data analysis and findings

Occupational findings

Finding 1 **Data portals do not distil occupation-level information at usable levels for Queensland's water sector.**

Whilst portals provide data with estimated employment numbers, all available platforms filter data at broader levels resulting in a risk of unspecific and irrelevant data.

Table 1 – ANZSCO data explains:

Table 1 – ANZSCO data

Source	Findings
Australian Governments Jobs and Skills Atlas.	- Cannot search by the identified relevant ANZSCO codes. For example, '712921 Waste Water or Water Plant Operator' is not searchable. Users must refer to the broader category of '7129 Other Stationary Plant Operators' including occupations such as Concrete Pump Operators, Paper and Pulp Mill Operators, Railway Signal Operators and Train Controllers. - Can search one category at a time, as opposed to making multiple occupational selections on other platforms. - Cannot cross-reference against an Industry/ANZSIC code.
Queensland Governments Anticipating Future Skills series.	The Anticipating Future Skills tool provides workforce data by Industry or Occupations. Results of each are below: ***Occupations*** - Cannot search by the identified relevant ANZSCO codes. Data refers to broader categories only (similar to other source platforms within this table). - Can cross-reference Occupation (ANZSCO) categories against Industry (ANZSIC) categories to refine data.

		- Can make multiple occupational selections, making it easier to collect data. - **Findings:** Estimated 1,362 people employed against available Occupation categories, cross-referenced against the ANZSIC category of Water Supply, Sewerage and Drainage Services. ***Industry*** - **Findings:** Estimated 7,291 people employed against the Industry of Water Supply, Sewerage and Drainage, irrespective of Occupational categories.
	BuildSkills Australia's Industry Profile – identifies businesses against ANZSIC Groups.	BuildSkills Australia's Industry Profile tool provides workforce data by Industry or Occupation. Results of each are below ***Occupations*** - Cannot search by the identified relevant ANZSCO codes. Data refers to broader categories only (similar to other source platforms within this table). - **Findings:** Estimated 7,785 people employed against available Occupation categories. ***Industry*** - **Findings:** Estimated 12,890 people employed against available Industry categories of Water Supply, Sewerage and Drainage.
Finding 2	**There is no available data on occupational vacancies for the Water Supply, Sewerage and Drainage Services industry.** Whilst the ABS provides a Jobs Vacancy Survey (JVS) tool, data is available only at the level of Electricity, Gas, Water and Waste, not the sub-sector level of Water Supply, Sewerage and Drainage. Further, where data is available it does not detail criticality to other outcomes. For example, in May 2025 vacancy rates in Retail Trade were 25.3% (May 2025, ABS Job Vacancy Survey data) whilst vacancy rates in Electricity, Gas, Water and Waste are 3.4%. On numbers alone, the need for Retail Trade staff could appear more dire, despite the retail industry depending on water provision to operate.	
Finding 3	**Skilled migration opportunities depend on data analysis, state and territory governments and Jobs and Skills Councils.** As at August 2025, an analysis was made of the Occupation Shortage List as identified in **Table 1 – Occupation Shortage List**:	

Table 1 – Occupation Shortage List	
ANZSCO	**Finding**
139912 Environmental Manager	No Shortage in Queensland
139999 Specialist Managers nec	No Shortage in Queensland
139913 Laboratory Manager	No Shortage in Queensland
233915 Environmental Engineer	**Shortage** in Queensland
233999 Engineering Professionals not elsewhere classified	**Shortage** in Queensland
234313 Environmental Research Scientist	**Shortage** in Queensland *Not listed on CSOL
234399 Environmental Scientists not elsewhere classified	No Shortage in Queensland
234413 Hydrogeologist	**Shortage** in Queensland
561912 Meter Reader	*Not on list**
712921 Waste Water or Water Plant Operator	No Shortage in Queensland
821112 Drainage, Sewerage and Stormwater Labourer	*Not on list**
Not within ANZSCO Skill Levels 1 - 4	

On 3 December 2024 the Australian Government announced the release of the Core Skills Occupation List (CSOL), a single consolidated list of occupations that is leveraged by Skills in Demand Visas (employer-sponsored visas, temporary skill shortage visas):

As at August 2025, an analysis was made of the CSOL as identified in **Table 2 – Core Skills Occupation List**:

Table 2 – Core Skills Occupation List	
ANZSCO	**Finding**
139912 Environmental Manager	**Listed on CSOL**
139999 Specialist Managers nec	Not listed on CSOL
139913 Laboratory Manager	**Listed on CSOL**
233915 Environmental Engineer	**Listed on CSOL**
233999 Engineering Professionals not elsewhere classified	**Listed on CSOL**
234313 Environmental Research Scientist	Not listed on CSOL * is identified as in Shortage in Queensland on OSL
234399 Environmental Scientists not elsewhere classified	**Listed on CSOL**
234413 Hydrogeologist	**Listed on CSOL**
561912 Meter Reader	Not listed on CSOL
712921 Waste Water or Water Plant Operator	Not listed on CSOL
821112 Drainage, Sewerage and Stormwater Labourer	Not listed on CSOL