

**Field      ENGINEERING AND TECHNOLOGY****Review of *Water Industry* unit standards**

<b>Subfield</b>	<b>Domain</b>	<b>ID</b>
Water Industry	Water Treatment	17890, 17891, 17894-17897, 17900, 17901, 19199, 19347-19349, 19356, 19357, 24915, 24950-24975
	Drinking-Water	18449-18451, 18456, 22873, 22874, 24896-24903, 24905, 24906

The Infrastructure Industry Training Organisation has completed the review of the unit standards listed above.

**Date new versions published**

**March 2017**

**Planned review date**

**December 2021**

**Summary**

Gazetted coverage of the Water Industry, including Water Treatment and Drinking-Water, was transferred to Infrastructure ITO in May 2015. Review of the unit standards had been due, but this and the transfer of responsibility was delayed due to TRoQ. The review was conducted in 2016 to align the unit standards with current industry need and to support the New Zealand Certificate in Water Treatment (Small Scale Systems Operator) (Level 3) [Ref: 2240], the New Zealand Certificate in Water Treatment (Drinking-Water/Wastewater) (Level 3) [Ref: 2241], the New Zealand Certificate in Water Treatment (Level 4) with strands in Drinking-Water Treatment, Wastewater Treatment, Drinking-Water Multistage Process, and Wastewater Multistage Process [Ref: 2242], and the New Zealand Diploma in Water Treatment (Level 5) with strands in Drinking-Water Treatment, and Wastewater Treatment [Ref: 2245].

In 2016, a Water Treatment Industry Working Group comprised of industry experts and tertiary providers met to review the structure, levels, credits, and content of the unit standards to update and align with current industry practice. The draft standards were then circulated to wider industry including industry peak bodies, wastewater treatment plant staff, providers, and district and regional councils for further consultation and feedback.

The review took place as part of a larger review of all standards within the *Water Industry* subfield, which included aligning levels and credits to achieve parity between similar skill sets across the industries and to support the qualifications. Additionally, the focus on processes within the qualifications led to an industry wide decision to combine theory and practical aspects associated with treatment processes into single unit standard for each process. The decision was made to move standards from the *Drinking-Water* domain to the *Water Treatment* domain to align with recognised industry terminology and qualification titles.

## Main changes

- Updates were made to titles, purpose statements, explanatory notes, outcomes, and evidence requirements to align the standards with current industry practice.
- Theory and practical process unit standards were combined and allocated levels and credits appropriate to the required knowledge and skills.
- Process-based standards were written more broadly to allow for different practices across the industry, and seven new process standards were developed to cover all water treatment processes at both operational and supervisory/management levels.
- Levels and credits were adjusted to align with similar skill sets across the industries and to more appropriately reflect content.
- Seven new standards were developed to address emerging skills and identified gaps within the current suite.
- Four standards were moved from the *Drinking-Water* domain to the *Water Treatment* domain to align with industry terminology.
- One standard was moved from the *Drinking-Water* domain to the *Drinking-Water Assessment* domain to align with its usage.
- 10 Drinking-Water standards were replaced by standards in the *Water Treatment* domain.
- Two standards will expire and not be replaced.
- A last date for assessment of superseded Category B standards was specified.

**Category C and D unit standards will expire at the end of December 2018.**

**The last date for assessment of superseded versions of Category B unit standards is December 2018**

### Impact on existing organisations with consent to assess

Current consent for			Consent extended to		
Nature of consent	Classification or ID	Level	Nature of consent	Classification or ID	Level
Standard	22873	4	Standard	29965	3
Standard	22874	4	Standard	29996	3

### Impact on Consent and Moderation Requirements (CMR)

All standards transferred from CMR 0179 to CMR 0101.

### Detailed list of unit standards – classification, title, level, and credits

All changes are in **bold**.

Key to review category	
<b>A</b>	Dates changed, but no other changes are made - the new version of the standard carries the same ID and a new version number
<b>B</b>	Changes made, but the overall outcome remains the same - the new version of the standard carries the same ID and a new version number
<b>C</b>	Major changes that necessitate the registration of a replacement standard with a new ID
<b>D</b>	Standard will expire and not be replaced

## Engineering and Technology &gt; Water Industry &gt; Water Treatment

ID	Title	Level	Credit	Review Category
17890	Undertake sampling and testing procedures for water treatment <b>Undertake sampling and site analysis for water treatment</b>	3 4	7 6	B
17891	Demonstrate knowledge of quality sampling techniques and programme design for a water treatment site	3 4	5	B
17894	Demonstrate knowledge of surface water and groundwater sources and pre-treatment <b>Demonstrate knowledge of surface water and groundwater sources</b>	3 4	7	B
17895	Demonstrate knowledge of water treatment separation processes	3	5	C
24959 29983	Operate separation processes in water treatment <b>Describe and operate clarification processes in drinking-water treatment</b>	4 4	8 10	C
17896	Demonstrate knowledge of water treatment filtration processes	4	10	B
17897	Demonstrate knowledge of water treatment disinfection processes	4	6	B
17900	Describe organic compounds including taste and odour control in water treatment processes	4	4	C
24955 29991	Operate organic control processes, including taste and odour control, in water treatment <b>Describe and operate organics control processes in drinking-water treatment</b>	3 4	8 12	C
17901	Demonstrate knowledge of water treatment waste management processes	3	4	C
24962 30000	Operate waste separation processes in water treatment <b>Describe and operate waste management processes in water treatment</b>	3 4	8 8	C
19199	Report on a water supply topic or improvement	5	12 10	B
19357	Manage preventive maintenance and monitoring of product standards for drinking-water treatment	5	3 6	B
24915	Demonstrate knowledge of the legislative framework and agencies relevant to drinking-water supply	3	3 5	B
24950	Operate and report on a water treatment plant under supervision <b>Operate and report on a water treatment plant</b>	4	10	B
24951	Describe emergency situations and process failure conditions in a water treatment plant	4	2	D
24952 29992	Operate ultraviolet disinfection processes in water treatment <b>Describe and operate ultraviolet disinfection processes in drinking-water treatment</b>	4 4	10 8	C

ID	Title	Level	Credit	Review Category
24953	Operate chlorine disinfection processes in water treatment	4	12	C
<b>29982</b>	<b>Describe and operate chlorine disinfection processes in drinking-water treatment</b>	<b>4</b>	<b>12</b>	
24954	Operate ozone disinfection processes in water treatment	4	12	C
<b>29985</b>	<b>Describe and operate ozone disinfection processes in drinking-water treatment</b>	<b>4</b>	<b>8</b>	
24956	Operate pH and alkalinity control processes in water treatment	4	8	C
24964	Demonstrate knowledge of hardness, pH, and alkalinity control processes in water treatment	4	8	C
<b>29990</b>	<b>Describe and operate pH and alkalinity control processes in drinking-water treatment</b>	<b>4</b>	<b>8</b>	
24957	Operate pre-treatment processes in water treatment	3	6	C
<b>29981</b>	<b>Describe and operate abstraction and pre-treatment processes in drinking-water treatment</b>	<b>4</b>	<b>12</b>	
24958	Operate coagulation and flocculation processes in water treatment	4	16	C
24974	Demonstrate knowledge of coagulation and flocculation processes	3	6	C
<b>29984</b>	<b>Describe and operate coagulation and flocculation processes in drinking-water treatment</b>	<b>4</b>	<b>12</b>	
24960	Operate media filtration processes in water treatment	4	10	C
<b>29988</b>	<b>Describe and operate media filtration processes in water treatment</b>	<b>4</b>	<b>16</b>	
24961	Operate membrane filtration processes in water treatment	4	12	C
<b>29989</b>	<b>Describe and operate membrane filtration processes in drinking-water treatment</b>	<b>4</b>	<b>12</b>	
24963	Operate fluoridation processes in water treatment	4	8	C
24965	Demonstrate knowledge of water treatment fluoridation processes	3	2	C
<b>29986</b>	<b>Describe and operate fluoridation processes in drinking-water treatment</b>	<b>4</b>	<b>6</b>	
24966	Optimise and manage sand filtration processes for drinking-water treatment	5	8	C
24967	Optimise and manage mechanical filtration processes for drinking-water treatment	5	4	C
24969	Optimise and manage diatomaceous earth filtration processes for drinking-water treatment	5	4	C
<b>29972</b>	<b>Manage, monitor and optimise media filtration processes for drinking-water treatment</b>	<b>5</b>	<b>18</b>	

ID	Title	Level	Credit	Review Category
24968	Optimise and manage membrane filtration processes for drinking-water treatment	5	8	C
<b>29973</b>	<b>Manage, monitor and optimise membrane filtration processes for drinking-water treatment</b>	<b>5</b>	<b>14</b>	
24975	Describe drinking-water consumption, and water loss and methods of leak detection in drinking-water supply	5	5	B
<b>29962</b>	<b>Carry out drinking-water treatment operations under supervision</b>	<b>3</b>	<b>5</b>	<b>New</b>
<b>29963</b>	<b>Carry out water treatment plant maintenance under supervision</b>	<b>3</b>	<b>5</b>	<b>New</b>
<b>29964</b>	<b>Demonstrate knowledge of treatment processes for drinking-water treatment</b>	<b>3</b>	<b>6</b>	<b>New</b>
<b>29966</b>	<b>Demonstrate knowledge of treated drinking-water supply processes and describe critical control points</b>	<b>4</b>	<b>20</b>	<b>New</b>
<b>29975</b>	<b>Manage, monitor and optimise organics control processes for drinking-water treatment</b>	<b>5</b>	<b>14</b>	<b>New</b>
<b>29976</b>	<b>Manage, monitor and optimise fluoridation processes for drinking-water treatment</b>	<b>5</b>	<b>8</b>	<b>New</b>
<b>29974</b>	<b>Manage, monitor and optimise inorganics control processes for drinking-water treatment</b>	<b>5</b>	<b>14</b>	<b>New</b>
<b>29977</b>	<b>Manage application of Ministry of Health strategy and drinking-water standards for a water treatment plant</b>	<b>5</b>	<b>6</b>	<b>New</b>
<b>29987</b>	<b>Describe and operate inorganics control processes in drinking-water treatment</b>	<b>4</b>	<b>12</b>	<b>New</b>
<b>29995</b>	<b>Describe the regulatory framework and support tools relevant to the management of drinking-water supplies</b>	<b>4</b>	<b>8</b>	<b>New</b>
<b>29997</b>	<b>Operate and maintain a small drinking-water supply system</b>	<b>3</b>	<b>8</b>	<b>New</b>
<b>29998</b>	<b>Undertake sampling and water quality monitoring for a small drinking-water supply</b>	<b>3</b>	<b>7</b>	<b>New</b>
<b>29999</b>	<b>Undertake sampling and site testing procedures for drinking-water treatment</b>	<b>4</b>	<b>6</b>	<b>New</b>

## Engineering and Technology &gt; Water Industry

ID	Domain	Title	Level	Credit	Review Category
18449	Drinking-Water	Describe the management of the separation process of water and solids	5	4	C
19348	Water Treatment	Optimise and manage separation processes for drinking-water treatment	5	4	C
<b>29970</b>	<b>Water Treatment</b>	<b>Manage, monitor and optimise clarification processes for drinking-water treatment</b>	<b>5</b>	<b>10</b>	

ID	Domain	Title	Level	Credit	Review Category
18450	Drinking-Water	Describe the management of coagulation and flocculation processes	5	6	C
19349	Water Treatment	Optimise and manage coagulation and flocculation processes for drinking-water treatment	5	6	C
<b>29971</b>	<b>Water Treatment</b>	<b>Manage, monitor and optimise coagulation and flocculation processes for drinking-water treatment</b>	<b>5</b>	<b>14</b>	
18451	Drinking-Water	Describe the management of pH, alkalinity, hardness, and corrosion control	5	5	C
19356	Water Treatment	Optimise and manage hardness and corrosion control for drinking-water treatment	5	5	C
<b>29979</b>	<b>Water Treatment</b>	<b>Manage, monitor and optimise pH and alkalinity control processes for drinking-water treatment</b>	<b>5</b>	<b>10</b>	
18456	Drinking-Water	Describe preventive maintenance and monitoring of product standards for drinking-water treatment	5	3	B
	<b>Water Treatment</b>	<b>Describe preventive maintenance and monitoring of standards and compliance conditions for drinking-water treatment</b>		<b>6</b>	
22873	Drinking-Water	Demonstrate knowledge of, and evaluate, a small drinking-water supply	4	6	C
<b>29965</b>	<b>Water Treatment</b>	<b>Demonstrate knowledge of small drinking-water supplies</b>	<b>3</b>	<b>6</b>	
22874	Drinking-Water	Demonstrate knowledge of, and develop, a PHRMP for a small drinking-water supply	4	6	C
<b>29996</b>	<b>Water Treatment</b>	<b>Demonstrate knowledge of and apply principles of water safety planning for a small drinking-water supply</b>	<b>3</b>	<b>5</b>	
24896	Drinking-Water	Describe the Health (Drinking Water) Amendment Act 2007 relating to drinking-water and drinking-water suppliers	5	4	B
	<b>Drinking-Water Assessment</b>	<b>Describe the Health Act 1956 relating to drinking-water and drinking-water suppliers</b>		<b>8</b>	

ID	Domain	Title	Level	Credit	Review Category
24897	Drinking-Water <b>Water Treatment</b>	Describe the contribution of catchment characteristics to raw water quality management	5	8	B
24898	Drinking-Water	Describe abstraction and pre-treatment processes for potable water	5	8	C
19347	Water Treatment	Optimise and manage abstraction and pre-treatment processes for drinking-water supply	6	10	C
<b>29967</b>	<b>Water Treatment</b>	<b>Manage, monitor and optimise abstraction and pre-treatment processes for drinking-water supply</b>	<b>5</b>	<b>14</b>	
24899	Drinking-Water	Describe the management of drinking-water treatment filtration processes	5	10	D
24900	Drinking-Water	Describe the management of chlorine and chlorine dioxide disinfection processes	5	8	C
24970	Water Treatment	Optimise and manage chlorine disinfection processes for drinking-water treatment	5	8	C
<b>29969</b>	<b>Water Treatment</b>	<b>Manage, monitor and optimise chlorine disinfection processes for drinking-water treatment</b>	<b>5</b>	<b>14</b>	
24901	Drinking-Water	Describe the management of ozone disinfection processes	5	5	C
24971	Water Treatment	Optimise and manage ozone disinfection processes for drinking-water treatment	5	8	C
<b>29978</b>	<b>Water Treatment</b>	<b>Manage, monitor and optimise ozone disinfection processes for drinking-water treatment</b>	<b>5</b>	<b>10</b>	
24902	Drinking-Water	Describe the management of ultraviolet (UV) disinfection processes	5	5	C
24972	Water Treatment	Optimise and manage ultraviolet (UV) disinfection processes for drinking-water treatment	5	8	C
<b>29968</b>	<b>Water Treatment</b>	<b>Manage, monitor and optimise ultraviolet (UV) disinfection processes for drinking-water treatment</b>	<b>5</b>	<b>10</b>	

ID	Domain	Title	Level	Credit	Review Category
24903	Drinking-Water	Describe the management of water treatment plant waste management processes	5	8	C
24973	Water Treatment	Optimise and manage drinking-water treatment waste processes	5	4	C
<b>29980</b>	<b>Water Treatment</b>	<b>Manage, monitor and optimise waste management processes for drinking-water treatment</b>	<b>5</b>	<b>10</b>	
24905	Drinking-Water	Assess the optimisation of a drinking-water treatment plant	6	12	B
	<b>Water Treatment</b>	<b>Assess the optimisation of a drinking-water treatment plant, and describe critical control points</b>	<b>5</b>	<b>10</b>	
24906	Drinking-Water	Describe drinking-water contaminants of public health significance	4	4	B
	<b>Water Treatment</b>			<b>8</b>	

## Engineering and Technology &gt; Water Industry &gt; Wastewater Treatment

ID	Title	Level	Credit	Review Category
<b>29993</b>	<b>Manage, monitor, and optimise preliminary processes in wastewater treatment</b>	<b>5</b>	<b>8</b>	<b>New</b>