

Title	Demonstrate knowledge of basic science theory relating to water		
Level	3	Credits	6

Purpose	People credited with this unit standard are able to: demonstrate knowledge of basic microbiology; and describe basic chemistry and physics; relating to wastewater.
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Classification	Water Industry > Water - Generic
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Available grade	Achieved
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Explanatory notes

None.

Outcomes and evidence requirements

Outcome 1

Demonstrate knowledge of basic microbiology relating to water.

Range viruses, bacteria, cyanobacteria, protozoa, helminths, algae and pathogens.

Evidence requirements

- 1.1 Microbiological populations are identified in terms of their basic differences.
- 1.2 Environmental factors affecting each microbiological population are described in terms of nutrition requirements, temperature, pH, sunlight, aerobic, anaerobic, and facultative.
- 1.3 Natural and artificial controls on each microbiological population are described in terms of reproduction, die-off, disinfection, and marine salinity.
- 1.4 Microbiological population measurement methods for indicator organisms are described in relation to water quality monitoring.

Outcome 2

Describe basic chemistry relating to water.

Evidence requirements

2.1 Chemicals and compounds are described with reference to water quality.

Range acids, bases, pH, alkalinity, nitrogen, phosphorus, gases, organics, inorganics.

2.2 Mixtures of solids and water are described in terms of their physical forms.

Range suspensions, solutions, colloids.

Outcome 3

Describe basic physics relating to water.

Evidence requirements

3.1 The hydrological water cycle is described in terms of the way in which it impacts on an effluent receiving environment.

Range precipitation, surface flow, groundwater, oceans, evaporation, transpiration, percolation, infiltration, permeability.

3.2 Variations in natural water quality are described in terms of flow volumes, suspended solids, organics, pH, dissolved gases, and inorganics.

3.3 The states of energy relating to water are described in terms of the different types of energy and energy losses.

Range static, potential, pressure, kinetic, velocity head, friction losses, pumps, hydraulic fall, water hammer, surges.

3.4 Water velocities and volumes are calculated for constant flows and the volumes of simple shapes.

Range rectangular and circular volumes, time to fill/empty, flow rates and their units.

Planned review date	31 December 2021
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	1 February 2001	31 December 2018
Review	2	19 September 2008	31 December 2018
Review	3	16 March 2017	N/A

Consent and Moderation Requirements (CMR) reference	0101
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

Please note

Providers must be granted consent to assess against standards (accredited) by NZQA, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be granted consent to assess against standards by NZQA before they can register credits from assessment against unit standards.

Providers and Industry Training Organisations, which have been granted consent and which are assessing against unit standards must engage with the moderation system that applies to those standards.

Requirements for consent to assess and an outline of the moderation system that applies to this standard are outlined in the Consent and Moderation Requirements (CMR). The CMR also includes useful information about special requirements for organisations wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

Comments on this unit standard

Please contact the Infrastructure Industry Training Organisation qualifications@connexis.org.nz if you wish to suggest changes to the content of this unit standard.