

Title	Demonstrate knowledge of wastewater composition, corrosion in sewers, odours, and odour control		
Level	4	Credits	4

Purpose	People credited with this unit standard are able to demonstrate knowledge of: wastewater, and wastewater composition; wastewater source control; corrosion in sewers and related structures; the causes of odours, and techniques for minimising odours in sewers.
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Classification	Water Industry > Water Reticulation
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Available grade	Achieved
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Guidance Information

- 1 Legislation and references relevant to this unit standard include:
 Health Act 1956;
 Resource Management Act 1991;
 Local Government Act 2002;
 Local Government Trade Waste Bylaws, and subsequent amendments;
 Dr. Pomeroy, R. D. and Boon A. G., *The Problem of Hydrogen Sulphide in Sewers*, 2nd edition, 1992; available from https://www.mullaly.com.au/wp-content/uploads/2017/01/Problem_of_Hydrogen_Sulphide_in_Sewers.pdf.
- 2 Definition
Water reticulation – in this context refers to all pipe systems, pumping systems, and components that contribute to the collection and disposal of wastewater and stormwater.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of wastewater, and wastewater composition.

Performance criteria

- 1.1 Wastewater is described in terms of its general characteristics and reasons for variations of these characteristics.

 Range pH, temperature, suspended solids, biochemical oxygen demand (BOD), chemical oxygen demand (COD).

- 1.2 The presence of microbes in wastewater is described in terms of the potential impact on public health.
- 1.3 Wastewater is described in terms of specific characteristics in relation to source types.
- Range domestic waste, trade waste.

Outcome 2

Demonstrate knowledge of wastewater source control.

Performance criteria

- 2.1 A wastewater source control programme is described in terms of its features.
- Range three of – bylaws, monitoring and enforcement programmes, educational and awareness programmes, codes of practice, trade waste charges, pollution prevention plans.
- 2.2 Wastewater source control is described in terms of the reasons for, and methods of implementation.
- Range reasons include but are not limited to – prevent degradation to sewers by aggressive chemicals, minimise risk to public health and sewer maintenance personnel, protect wastewater treatment processes, control polluting effect on environment following treatment.
- 2.3 Wastewater sampling is described in terms of laboratory tests, and analysing laboratory requirements for sample quality.
- Range tests include but are not limited to – faecal coliform count, BOD, COD, chemical composition.

Outcome 3

Demonstrate knowledge of corrosion in sewers and related structures.

Performance criteria

- 3.1 Corrosion is described in terms of the contributing physical and biological mechanisms occurring in wastewater pipes.
- Range two of – sewage retention time, septicity, humidity, flow turbulence, bacterial action, aerobic and anaerobic conditions, conversion of hydrogen sulphide to sulphuric acid.
- 3.2 Corrosion is described in terms of the techniques for its minimisation.
- 3.3 Corrosion is described in terms of its effect on materials.

Range concrete, polyvinyl chloride (PVC), ceramic, polyethylene (PE), stainless steel.

Outcome 4

Demonstrate knowledge of the causes of odours, and techniques for minimising odours in sewers.

Performance criteria

4.1 Odours and odour nuisance are described in terms of the mechanisms which contribute to their occurrence in sewers.

Range three of – sewage retention time, septicity, low flow, flow turbulence, bacterial action, emission points.

4.2 Odour generating substances are described in terms of the reasons for their presence.

Range hydrogen sulphide (sewer gas), mercaptans, volatile organic compounds (solvents), substances generated by bacterial action under anaerobic conditions.

4.3 Odour management is described in terms of the prevention techniques and treatment systems for minimising or treating odours.

Range evidence is required for two each of prevention techniques and treatment systems.

4.4 Olfactometry is described in terms of the procedures for measuring odour.

Replacement information	This unit standard, unit standard 19212 and unit standard 22113 were replaced by unit standard 31527.
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This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	26 October 2005	31 December 2018
Rollover and Revision	2	20 February 2009	31 December 2018
Rollover and Revision	3	21 July 2011	31 December 2018
Review	4	16 March 2017	31 December 2021
Review	5	29 November 2018	31 December 2021

Consent and Moderation Requirements (CMR) reference

0101

This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.