

Title	Demonstrate knowledge of wastewater collection and treatment systems		
Level	3	Credits	10

Purpose	People credited with this unit standard are able to describe: the purpose of wastewater collection systems, and the composition of wastewater; the components of wastewater collection and treatment systems; the hydraulics of wastewater collection systems; and factors that affect the operation of wastewater collection systems.
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Classification	Water Industry > Water Reticulation
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Available grade	Achieved
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Guidance Information

- 1 Legislation relevant to this unit standard includes:
 Health and Safety at Work Act 2015;
 Resource Management Act 1991;
 Hazardous Substances and New Organisms (HSNO) Act 1996, and subsequent amendments;
 NZS 4404:2010 *Land Development and Subdivision Infrastructure*, available from <http://www.standards.govt.nz>.
- 2 Definition
Wastewater includes stormwater and sewage systems.

Outcomes and performance criteria

Outcome 1

Describe the purpose of wastewater collection systems, and the composition of wastewater.

Performance criteria

- 1.1 The purpose of wastewater collection systems is described in terms of the protection of public health.
- 1.2 Wastewater is described in terms of domestic and industrial wastewater composition.

Outcome 2

Describe the components of wastewater collection and treatment systems.

Performance criteria

- 2.1 Sources of domestic and industrial wastewater are described in terms of the quantities and qualities of the wastewater.
- Range quantity – domestic flows, peak flows, stormwater infiltration, industrial flows;
quality – concentration of pollutants in domestic water, pollutants in industrial wastewater.
- 2.2 Property drainage systems are described in terms of their component parts.
- 2.3 Wastewater pumping stations are described in terms of their design features.
- Range wet well options, dry well options, pump types and layouts, delivery pipework, level operation devices and alarms, covers, stand-by provisions, duty and stand-by pumps.
- 2.4 Wastewater treatment plants are described in terms of type, limitations of treatment processes, and general considerations.
- Range considerations – environmental resource consents, monitoring; plant types – primary, secondary, tertiary; discharges to – land, streams, rivers, lakes, sea; dilution criteria.

Outcome 3

Describe the hydraulics of wastewater collection systems.

Performance criteria

- 3.1 The drainage system is described in relation to the natural lie of the land.
- 3.2 The capacity of a gravity sewer is described in terms of the fall available, and diameter.
- Range friction loss over distance, velocity, surcharge, corrosion.
- 3.3 The velocity in a sewer is described in terms of self-cleaning limits.
- 3.4 Wastewater pumping stations are described in terms of their impact on system hydraulics.

Outcome 4

Describe factors that affect the operation of wastewater collection systems.

Performance criteria

4.1 Stormwater infiltration is described in terms of the causes and their impacts on wastewater flows.

Range causes – illegal property connections, root penetration, leaking sewers, access chamber entries, groundwater levels and effects on inflow leaks.

4.2 The sources of grease and fat, and impacts of high grease and fat discharges into a gravity sewer are described in terms of the maintenance required.

4.3 The presence of slime and gases are described in terms of maintenance requirements.

Replacement information	This unit standard, unit standard 22112 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	27 May 2002	31 December 2018
Review	2	19 September 2008	31 December 2018
Review	3	16 March 2017	31 December 2021
Review	4	29 November 2018	31 December 2021

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>.