

<b>Title</b>	<b>Describe and operate nutrient removal processes in wastewater treatment</b>		
<b>Level</b>	<b>4</b>	<b>Credits</b>	<b>14</b>

<b>Purpose</b>	People credited with this unit standard are able to: describe nutrient removal processes; monitor and adjust nutrient removal processes; carry out maintenance procedures on nutrient removal equipment; and describe the storage, handling, and preparation of any chemicals, and chemical dosing systems used in nutrient removal in wastewater treatment.
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<b>Classification</b>	Water Industry > Wastewater Treatment
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<b>Available grade</b>	Achieved
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### Guidance Information

- 1 Evidence presented for assessment against this unit standard must be consistent with safe working practices and be in accordance with applicable legislative and industry requirements. Evidence for assessment of the practical aspects of this unit standard must be gathered using the nutrient removal processes (biological and/or chemical) in the candidate's own workplace.
- 2 Legislation relevant to this unit standard includes the Health and Safety at Work Act 2015, Water Services Act 2021, Resource Management Act 1991, Hazardous Substances and New Organisms (HSNO) Act 1996, and any subsequent amendments.
- 3 Definitions  
*Industry requirements* include manufacturers' specifications; and enterprise requirements which may include documented workplace policies, procedures, specifications, business, and quality management requirements relevant to the workplace in which assessment is carried out.  
*Wastewater* may include stormwater and sewage systems.
- 4 In the context of this unit standard, nutrient removal includes the separation process.
- 5 Learning and assessment activities for this unit standard must be informed by Te Mana o te Wai (refer to [Taumata Arowai](#)) and the *National Policy Statement for Freshwater Management 2020* available from <https://environment.govt.nz/>.

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## Outcomes and performance criteria

### Outcome 1

Describe nutrient removal processes in wastewater treatment.

Range biological, chemical.

### Performance criteria

- 1.1 The purpose and principles of nutrient removal are described in terms of the stabilisation of contaminants and reduction of nutrients.
- 1.2 Plant configuration options for nutrient removal are described in terms of their hydraulic layout options, solids wasting and return methods, separation requirements, advantages, and disadvantages.
- Range evidence of two plant configuration options is required.
- 1.3 The nutrient removal process is described in terms of the function of its component parts and identification of process failure.
- 1.4 Nutrient removal is described in terms of the process outputs.
- Range Biochemical Oxygen Demand (BOD), total suspended solids, nutrients, indicator organisms, sludge.

### Outcome 2

Monitor and adjust nutrient removal processes in wastewater treatment.

### Performance criteria

- 2.1 Process tests are described for nutrient removal.
- Range may include but is not limited to – Mixed Liquor Suspended Solids (MLSS), sludge volume index, sludge age, Dissolved Oxygen (DO) control, phosphorus, nitrogen.
- 2.2 The performance measures for nutrient removal are described in terms of efficiency and downstream effects.
- Range BOD, total suspended solids, nutrients.
- 2.3 Testing equipment is calibrated, tests or measurements for monitoring process inputs are carried out, and results are recorded
- 2.4 Process inputs are adjusted.
- Range reasons for adjustment – results of testing, analysis and identification of trends, response to process failure.

2.5 Any relevant consumables are checked and ordered.

### Outcome 3

Carry out maintenance procedures on nutrient removal equipment in wastewater treatment.

#### Performance criteria

- 3.1 Preventative maintenance procedures are carried out and recorded.
- 3.2 Any required repairs are carried out according to process and/or equipment failure.
- 3.3 Actions for maintaining process continuity are carried out.

### Outcome 4

Describe the storage, handling, and preparation of any chemicals, and chemical dosing systems used in nutrient removal in wastewater treatment.

#### Performance criteria

- 4.1 The storage, handling, and preparation of any chemicals used in nutrient removal are described in terms of the HSNO Act 1996.
- 4.2 Any chemical dosing systems used in nutrient removal are described in terms of the components, methods, and points of application.

<b>Planned review date</b>	31 December 2026
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#### Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	16 March 2017	31 December 2023
Review	2	28 April 2022	N/A

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

#### Comments on this unit standard

Please contact Waihangā Ara Rau Construction and Infrastructure Workforce Development Council at [qualifications@waihanga.nz](mailto:qualifications@waihanga.nz) if you wish to suggest changes to the content of this unit standard.