

<b>Title</b>	<b>Describe, operate, and control recyclable water systems at an extraction site</b>		
<b>Level</b>	<b>4</b>	<b>Credits</b>	<b>12</b>

<b>Purpose</b>	People credited with this unit standard are able to: operate recyclable water systems and describe their operational characteristics and performance; describe and demonstrate the safety systems, adjustments and checks required for recyclable water systems; describe the environmental constraints and demonstrate controls for recyclable water systems; carry out shift-end, shut-down procedures and complete documentation for recyclable water systems.
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<b>Classification</b>	Extractive Industries > Extractive Industries Management
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<b>Available grade</b>	Achieved
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### Guidance Information

- 1 Performance of the outcomes of this unit standard must comply with the following:  
Health and Safety at Work Act 2015 (HSW);  
Health and Safety at Work (General Risk and Workplace Management) Regulations 2016;  
Health and Safety at Work (Mining Operations and Quarrying Operations) Regulations 2016;  
Health and Safety at Work (Worker Engagement, Participation, and Representation) Regulations 2016;  
approved codes of practice issued pursuant to the HSW Act.
- 2 Any new, amended or replacement Acts, regulations, standards, codes of practice, guidelines, or authority requirements or conditions affecting this unit standard will take precedence for assessment purposes, pending review of this unit standard.
- 3 Definitions  
*Company procedures* mean the documented methods for performing work activities and include health and safety, operational, environmental, and quality management requirements. They may refer to manuals, codes of practice, or policy statements.  
*Industry best practice* refers to those practices which competent practitioners within the industry recognise as current industry best practice. These may be documented in management plans, company procedures, managers' rules, occupational health and safety policy, industry guidelines, codes of practice, manufacturers' instructions, and safe working and/or job procedures (or equivalent).
- 4 This unit standard is intended for, but is not limited to, workplace assessment.

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## Outcomes and performance criteria

### Outcome 1

Operate recyclable water systems and describe their operational characteristics and performance.

#### Performance criteria

- 1.1 The types of pumps and pumping systems used in recyclable water systems are described.
- Range pump types, valves, pipelines, structures, pump-houses, controls, inlets, pipe couplings, discharge, filters, screens, drainage, ponds, reservoirs, tanks, weirs, power source and supply, topography, water circuits, diesel generator pumps.
- 1.2 The pump and pipeline calculations required for recyclable water systems are described.
- Range pump curves, hydraulic gradient, system resistance, suction head, static pressure, static head, velocity head, flow rates, discharge.
- 1.3 The operating procedures required for recyclable water systems are demonstrated in accordance with industry best practice.
- Range start-up and shut-down, priming, inlet gates, pond level adjustments, flow rate and volume, water flow diagram, slimes control, quality control, make-up water.

### Outcome 2

Describe and demonstrate the checks and adjustments, and the safety systems for recyclable water systems.

#### Performance criteria

- 2.1 The checks, adjustments and monitoring are described and demonstrated in accordance with industry best practice.
- Range inlet gate operation, pump performance, leakage from pumps and pipes, structure integrity, screen and filter clearance, cavitation, water hammer, blockages, slimes control, sediment removal, weed control, contaminant control, flow rate, drainage, loss of water flow, housekeeping, controls, pre-start checks.
- 2.2 The safety systems for recyclable water systems are described and demonstrated in accordance with industry best practice.
- Range warning signs, gates and fencing, alarms, fire fighting, water isolation, power isolation procedures.

### Outcome 3

Describe the environmental constraints and demonstrate controls for recyclable water systems.

#### Performance criteria

3.1 The control and monitoring systems required are described and demonstrated in accordance with resource consents and industry best practice.

Range water take-up, water discharge, water quality monitoring, losses to ground, tailings disposal, aqua life protection, temperature, sampling, water treatment, wetland effects, stream diversions, cultural effects.

3.2 The management of settlement ponds and other ponds is described in accordance with resource consents and industry best practice.

Range slimes control, dredging, cleaning drains and ponds, additives, water quality, weed control, pond stability.

### Outcome 4

Carry out the shift-end, shut-down procedures and complete documentation for recyclable water systems.

#### Performance criteria

4.1 The pumping and recyclable water system is shut-down in accordance with the manufacturer's recommendations, plant operation plan, and industry best practice.

Range shut-down procedures, non-return suction valve operation, control settings.

4.2 Defects are listed in accordance with industry best practice.

Range pumps, pipelines, associated equipment inspections, hazard inspections, pond inspections, checks for leaks, sediment accumulations, water intake gates, discharge points, dredge operation.

4.3 Documentation is completed in accordance with company procedures.

Range recyclable water operator log sheets, control room reports, hazard reports, water treatment records, water quality records, defect reports.

<b>Planned review date</b>	31 December 2022
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**Status information and last date for assessment for superseded versions**

Process	Version	Date	Last Date for Assessment
Registration	1	31 July 2001	31 December 2019
Review	2	24 November 2005	N/A
Rollover and Revision	3	16 July 2010	N/A
Rollover and Revision	4	25 January 2018	N/A

<b>Consent and Moderation Requirements (CMR) reference</b>	0114
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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 MITO New Zealand Incorporated [info@mito.org.nz](mailto:info@mito.org.nz) if you wish to suggest changes to the content of this unit standard.