

<b>Title</b>	<b>Describe and operate pre-treatment systems for effluent water in an energy and chemical plant</b>		
<b>Level</b>	<b>4</b>	<b>Credits</b>	<b>8</b>

<b>Purpose</b>	<p>This unit standard is intended for people working as boiler operators and energy and chemical process operators in an energy and chemical plant.</p> <p>People credited with this unit standard are able to describe: pre-treatment equipment and processes for effluent water in the energy and chemical industry; and effluent pre-treatment discharge requirements, water treatment chemicals, and protection systems in an energy and chemical plant. They are also able to: operate the effluent pre-treatment equipment and processes for biological effluent water treatment; and collect and interpret data for effluent water quality, in an energy and chemical plant.</p>
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<b>Classification</b>	Energy and Chemical Plant > Operation of Energy and Chemical Plant
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<b>Available grade</b>	Achieved
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**Guidance Information**

- 1 Legislation relevant to this unit standard includes but is not limited to:
  - Health and Safety at Work Act 2015;
  - Hazardous Substances and New Organisms Act 1996;
  - Resource Management Act 1991;
  - and any subsequent amendments.
  
- 2 Definitions
 

*Energy and chemical plant* may be in – petrochemical, agri-nutrient, power generation, dairy processing, meat processing, and wood fibre manufacturing, or other plants that operate with a combination of high temperatures, pressures, steam and/or chemicals in gas, liquid or solid form.

*Organisational requirements* – documented policies and procedures. These may include: equipment manufacturers’ procedures; plant procedures; suppliers’ instructions; site signage; codes of practice; company health and safety plans; on site briefings; and supervisor’s instructions. This includes all regulatory and legislative obligations that apply to the plant.

*Plant* – the operational unit, equipment and/or workplace at which the person is working.

3 For the purposes of assessment:

- evidence for the practical components of this unit standard must be supplied from the workplace.

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## Outcomes and performance criteria

### Outcome 1

Describe pre-treatment equipment and processes for effluent water in the energy and chemical industry.

#### Performance criteria

1.1 Describe processes for the removal of toxic substances from effluent water in terms of the operating concepts.

Range substances include but are not limited to – toxic organics, heavy metals.

1.2 Describe pre-treatment in terms of equalisation methods.

Range equalisation methods include but are not limited to – mechanical mixing, aeration mixing, equalisation basins.

1.3 Describe pre-treatment in terms of neutralisation materials and methods.

Range materials include but are not limited to – acids, bases;  
methods include but are not limited to – physical, chemical.

1.4 Describe the removal of grease and oil from effluent water in terms of the methods and equipment.

Range methods include but are not limited to – gravity separation, chemical treatment;  
equipment includes but is not limited to – grease traps, American Petroleum Institute separator, skimmers.

1.5 Describe the reuse of treated effluent water in terms of the benefits and any potential problems.

Range evidence of two benefits and one problem is required.

### Outcome 2

Describe effluent pre-treatment discharge requirements, water treatment chemicals, and protection systems in an energy and chemical plant.

**Performance criteria**

2.1 Describe plant effluent discharge requirements in terms of regulatory and legislative requirements.

Range requirements include but are not limited to – local, regional, national.

2.2 Describe water treatment chemicals in terms of the handling requirements, use and potential hazards of effluent.

Range chemicals include but are not limited to – acids, alkalis, other plant specific chemicals.

2.3 Describe protection systems used in an effluent water pre-treatment plant in terms of the operating concept and protection provided.

Range protection systems include but are not limited to – trip interlocks, over pressure control, under pressure control.

**Outcome 3**

Operate the effluent pre-treatment equipment and processes for biological effluent water treatment in an energy and chemical plant.

**Performance criteria**

3.1 Identify the location of the effluent pre-treatment equipment in accordance with the site-specific identification coding system and organisational requirements.

3.2 Operate the effluent pre-treatment equipment and processes using safe work practices in accordance with organisational requirements.

3.3 Carry out checks and routine procedures on the effluent pre-treatment equipment and processes in accordance with organisational requirements.

3.4 Identify plant disruptions and take corrective actions in accordance with organisational requirements.

Range disruptions may include but are not limited to – process deviations, equipment malfunctions; evidence of three different types of plant disruption is required.

3.5 Complete all plant documentation related to the process and equipment operation in accordance with organisational requirements.

**Outcome 4**

Collect and interpret data for effluent water quality in an energy and chemical plant.

Range data includes but is not limited to – pH, site-specific contaminants.

**Performance criteria**

- 4.1 Take and analyse samples in accordance with organisational requirements.
- 4.2 Log results in accordance with organisational requirements.
- 4.3 Interpret results in accordance with organisational requirements.

<b>Planned review date</b>	31 December 2024
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**Status information and last date for assessment for superseded versions**

Process	Version	Date	Last Date for Assessment
Registration	1	25 November 2000	31 December 2014
Revision	2	24 July 2002	31 December 2014
Review	3	27 June 2005	31 December 2014
Rollover and Revision	4	25 July 2006	31 December 2014
Review	5	22 May 2009	31 December 2016
Review	6	24 October 2014	31 December 2022
Review	7	27 February 2020	N/A

<b>Consent and Moderation Requirements (CMR) reference</b>	0079
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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 the Primary Industry Training Organisation [standards@primaryito.ac.nz](mailto:standards@primaryito.ac.nz) if you wish to suggest changes to the content of this unit standard.