

41245**Operate and control coagulation and flocculation processes for drinking water**

Kaupae Level	4
Whiwhinga Credit	15
Whāinga Purpose	This skill standard is for people who work as drinking water treatment operators. People with this skill standard have the skills to operate and control coagulation and flocculation processes for drinking water to ensure water quality and compliance with regulatory requirements. This skill standard aligns with the New Zealand Certificate in Drinking Water Treatment Operations (Level 4) with optional strands in Pre-Treatment, Clarification, Coagulation and Flocculation, Non-Chlorine Disinfection, Fluoridation, and Filtration [Ref: 5672], and may also contribute to other water services industry credentials.

Hua o te ako me Paearu aromatawai | Learning outcomes and assessment criteria

Hua o te ako Learning outcomes	Paearu aromatawai Assessment criteria
1. Operate coagulation and flocculation processes for drinking water treatment.	a. Outline coagulation and flocculation processes in terms of purpose, operating principles, and relevant regulations.
	b. Operate coagulation and flocculation processes to meet downstream, operational and compliance requirements.
2. Control coagulation and flocculation processes for drinking water.	a. Perform process tests and measures, and undertake operational and control system observations to optimise coagulation and flocculation processes to meet operational and compliance requirements. processes.
	b. Interpret monitoring results to identify trends, variations and emerging process issues.
	c. Record monitoring results and operational adjustments, in accordance with operational requirements.

Hua o te ako Learning outcomes	Paearu aromatawai Assessment criteria
3. Maintain plant and equipment for coagulation and flocculation processes for drinking water treatment.	a. Maintain plant and equipment to ensure optimal process functionality.
	b. Identify and respond to faults or failures in accordance with operational requirements.
	c. Record maintenance in accordance with operational requirements.

Pārongo aromatawai me te taumata paearu | Assessment information and grade criteria

Assessment specifications:

Ākonga must demonstrate that they can safely, consistently, and competently operate and control coagulation and flocculation processes in accordance with operational requirements, and applicable legislative and regulatory requirements.

Assessment for this skill standard must be based on practical performance and supported by evidence that must take place in an operational drinking water treatment environment where coagulation and flocculation processes are in use.

Assessment must cover the full range of coagulation and flocculation processes relevant to this skill standard that are in use at the candidate's workplace.

Evidence must demonstrate consistent performance over time, not one-off tasks.

Definitions

Candidate's workplace (for assessment purposes) means the operational treatment site(s) nominated by the employer as the workplace for assessment, that includes the full range of processes relevant to this assessment standard and to the candidate's expected duties. Where the employer operates multiple treatment sites, the nominated workplace must not be limited to a site with minimal relevant processes where this would prevent evidence being gathered for the full range of processes relevant to this assessment standard.

Operational requirements refer to the documented and embedded ways of working that govern how activities are planned, performed, monitored, and controlled in the workplace to ensure safe, consistent, and compliant operations.

Water services refer to industries responsible for working on or around water supplies, networks, plants, and systems.

Ngā momo whiwhinga | Grades available

Achieved.

Ihirangi waitohu | Indicative content

Regulatory and risk context

- Relevant legislation, drinking water standards, and quality requirements.
- Consequences of process failure e.g. non-compliance, public health risk, dosing errors, sludge carryover, downstream impacts.

Process fundamentals and operating parameters

- Core coagulation/flocculation principles e.g. charge neutralisation, sweep floc, mixing, floc formation/breakage, hydraulics.
- Raw water changes that affect dosing and floc quality e.g. turbidity, colour, natural organic matter (NOM), temperature, pH/alkalinity, UV254 where used.
- Common chemicals and dosing approach e.g. aluminium/ferric/polyaluminum chloride (PACl), polymers where used, alkalinity adjustment, dose calculations, preparation and feed points.

Monitoring, testing and optimisation

- Routine monitoring and tests (as applicable) to confirm process performance e.g., turbidity, pH, alkalinity, jar tests, floc observations.
- Trend checking including interpreting results, spotting abnormal patterns, and verifying changes.
- Basic control strategies (as applicable) such as setpoints, dose pacing, alarms, and response/escalation.

Residuals management

- Residuals and sludge handling e.g. solids capture, disposal routes, washwater return where used, protecting downstream processes and the environment).

Maintenance and supporting activities

- Common process faults and causes.
- Adjustment and verification of plant, instruments, and equipment.
- Routine and corrective maintenance.
- Process failure and incident response procedures.
- Completion of process records and reports to meet operational and compliance requirements.

Rauemi | Resources

Legislation, regulations and/or industry standards relevant to this skill standard include, but are not limited to:

- Drinking Water Safety Planning (DWSP) - <https://www.taumataarowai.govt.nz/drinking-water-suppliers-and-operators/for-drinking-water-suppliers/how-to-guidance/preparing-a-drinking-water-safety-plan>.
- Drinking Water Quality Assurance Rules - [Drinking Water Quality Assurance Rules](#).
- Drinking Water Standards for New Zealand - [Water Services \(Drinking Water Standards for New Zealand\) Regulations 2022 \(SL 2022/168\) – New Zealand Legislation](#).
- Water Services Act 2021 - [Water Services Act 2021, Public Act Contents – New Zealand Legislation](#).
- Hazardous Substances and New Organisms Act 1996 - [Hazardous Substances and New Organisms Act 1996 No 30 \(as at 05 April 2025\), Public Act Contents – New Zealand Legislation](#).

Pārongo Whakaū Kouna | Quality assurance information

Ngā rōpū whakatau-paerewa Standard Setting Body	Energy and Infrastructure Industry Skills Board
Whakaritenga Rārangi Paetae Aromatawai DASS classification	Engineering and Technology > Water Industry > Water Treatment
Ko te tohutoro ki ngā Whakaritenga i te Whakamanatanga me te Whakaōritenga CMR	0120

Hātepe Process	Putanga Version	Rā whakaputa Review Date	Rā whakamutunga mō te aromatawai Last date for assessment
Rēhitatanga Registration	1	28 May 2026	N/A
Kōrero whakakapinga Replacement information	This skill standard replaced unit standard 29984.		
Rā arotake Planned review date	31 December 2032		

Please contact Energy and Infrastructure Industry Skills Board at qualifications@energyinfra-skills.nz if you wish to suggest changes to the content of this skill standard.