



Australian Government

NWPTRT057 Assess and improve coagulation and flocculation processes

Release: 1

NWPTRT057 Assess and improve coagulation and flocculation processes

Modification History

Release 1. This is the first release of this unit of competency in the NWP National Water Training Package.

Application

This unit involves the skills and knowledge required to assess and improve coagulation and flocculation processes.

It includes reviewing, coordinating and optimising coagulation and flocculation processes and evaluating and reporting on system performance and process quality control.

This unit applies to those working as technical staff with a responsibility for optimising chemical addition processes in water treatment plants and processes. Those undertaking this unit would work autonomously, usually with supervisory responsibilities, while performing complex tasks in a range of contexts.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

Not applicable.

Competency Field

Treatment

Unit Sector

Not applicable.

Elements and Performance Criteria

ELEMENTS

PERFORMANCE CRITERIA

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1 Evaluate coagulation and flocculation process

1.1 Review existing process performance data against coagulation and flocculation organisational operating

performance	protocol
2 Investigate coagulation and flocculation configuration	1.2 Identify the impact of changing raw water quality on coagulation and flocculation processes
	1.3 Identify any additional sampling and testing required for valid evaluation of current process performance
	2.1 Assess existing fault reports and other plant asset information
	2.2 Investigate the operational status of plant components with reference to manufacturer and plant design specifications
3 Investigate coagulation and flocculation for process optimisation	2.3 Contribute to plant configuration investigations to identify potential operational improvements
	2.4 Identify hazards, assess risks and control measures according to workplace procedures
	3.1 Review current coagulation and flocculation practices with reference to organisational protocol to identify potential deficiencies
4 Develop and record a plan for process optimisation	3.2 Investigate dosing options for current chemicals
	3.3 Identify and investigate tests to assess effectiveness of existing or alternative chemicals and related dosing options
	4.1 Determine plant configuration or chemical options for process optimisation
	4.2 Plan a trial to test the performance of the determined optimisation options
	4.3 Compile report with recommendations on optimisation options

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to NWPTRT011 Assess and improve chemical dosing process.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037>

Assessment Requirements for NWPTRT057 Assess and improve coagulation and flocculation processes

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements and performance criteria on at least one occasion and includes:

- analysing and evaluating reports and reference materials
- analysing problems and recommending appropriate remedial solutions
- assessing effectiveness of treatment chemicals by conducting a range of tests
- assessing fault reports and investigating the current operational status of plant components
- conducting investigations and reporting on operational and control system problems
- identifying and responding to risks and hazards
- identifying data deficiencies and plan additional data collection through appropriate sampling and testing
- identifying opportunities for improved water treatment
- interpreting a range of complex and technical documents including at least one of the following:
 - codes of practice
 - national and industry standards
 - organisational policies
 - regulatory, legislative, licensing and organisational requirements
 - specifications
- investigating chemicals and current and potential coagulation and flocculation practices
- operating a coagulation and flocculation process
- planning trials to test the performance of the determined optimisation options and compiling recommendation reports
- reviewing existing process performance with reference to historical or seasonal data, differences in raw water quality and plant configuration

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements and performance criteria and include knowledge of:

- chemical concepts and reactions relevant to coagulation and flocculation processes, including pH and alkalinity

- chemical dosing system layout
- coagulation and flocculation plant and equipment
- dosing pump capacity and calibration chart including:
 - detention times
 - draw down tests
 - mixing intensity for flash or rapid mixing and flocculation
- factors affecting the selection of chemicals in coagulation and flocculation processes
- factors influencing the effectiveness of chemicals in coagulation and flocculation processes
- functions of various chemicals in coagulation and flocculation processes
- identify chemical dosing points
- impacts of incorrect dosing
- range and characteristics of chemicals used in coagulation and flocculation processes
- range of appropriate measuring and testing procedures
- risk and hazard management principles
- safety data sheets, site manifests and dangerous goods handling
- workplace documentation for data and reports

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must occur in workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated workplace operational situations that replicate workplace conditions.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Resources for assessment must include access to:

- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including legislation, regulations, codes of practice, workplace procedures and operation manuals.

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