



Australian Government

NWPTRT050 Assess and improve anaerobic digestion processes

Release: 1

NWPTRT050 Assess and improve anaerobic digestion 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 anaerobic digestion processes.

It includes evaluating system performance and investigating and reporting on optimisation of anaerobic bioreactor processes.

This unit applies to those working as technical staff with a specific responsibility for optimising mixed, fixed and suspended media anaerobic bioreactor processes in wastewater treatment plants. 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

Elements describe the essential outcomes.

1 Evaluate anaerobic treatment process performance

PERFORMANCE CRITERIA

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

1.1 Review existing process performance data against organisational operating protocol

	1.2	Identify the impact of incoming feed quality on anaerobic treatment processes
	1.3	Identify any additional sampling and testing required for valid evaluation of current process performance
2 Investigate anaerobic treatment plant configuration	2.1	Assess existing fault reports and other relevant plant asset information
	2.2	Investigate the operational status of plant components with reference to manufacturer or plant design specifications
	2.3	Contribute to plant configuration investigations to identify potential deficiencies
	2.4	Identify hazards, assess risks and control measures according to workplace procedures
3 Investigate the operational options for process optimisation	3.1	Review relevant fault and incident reports and report on effectiveness of remedial action
	3.2	Investigate potential changes to operational processes to identify possible optimisation strategies
4 Develop and record a plan for process optimisation	4.1	Plan a trial to test the performance of the determined optimisation options
	4.2	Compile a report making 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 NWPTRT093 Assess and improve anaerobic digestion processes.

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 NWPTRT050 Assess and improve anaerobic digestion 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:

- assessing fault reports and investigating the current operational status of anaerobic treatment process plant components
- evaluating system performance
- facilitating anaerobic treatment process inspection, sampling and testing and interpreting tests results
- identifying and responding to risks and hazards
- identifying data deficiencies and organising additional data collection through appropriate sampling and testing
- 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 current and potential chemical addition practices
- operating an anaerobic treatment process
- performing mathematical calculations to provide data for the analysis and development of options and solutions for at least one of the following:
 - chemical oxygen demand (COD) removal
 - solids retention time
 - volatile solids reductions
- planning trials to test the performance of the determined anaerobic treatment process optimisation options
- preparing reports with recommendations
- reviewing existing anaerobic treatment process performance with reference to historical data, differences in feed 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:

- anaerobic microbiology
- anaerobic treatment process variations including:
 - anaerobic digesters
 - bulk volume fermenters (BVF)
 - fluidised bed reactors
 - high rate anaerobic lagoons (HRAL)
 - up flow anaerobic sludge blanket reactors (UASB)
- chemical and nutrient dosing processes
- gas production and characterisation including:
 - carbon dioxide
 - hydrogen sulphide
 - methane
 - sulphur dioxide
- inhibitory substances
- macro and micronutrient requirements
- pH range and alkalinity
- principles of anaerobic system maintenance and troubleshooting
- principles of anaerobic treatment processes including:
 - design parameters
 - feed water quality
- relevant legislation, industry standards and workplace policies and procedures
- relevant operational protocols
- risk and hazard management principles relating to anaerobic treatment processes
- sampling and testing requirements
- strategies to evaluate system performance
- system layout
- volatile fatty acids (VFA)/to alkalinity ratio
- workplace data recording and reporting requirements

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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