



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **NWP359B Monitor, operate and control nutrient removal processes**

**Revision Number: 2**

## NWP359B Monitor, operate and control nutrient removal processes

### Modification History

NWP359B Release 2: Layout adjusted. No changes to content.

NWP359B Release 1: Primary release.

### Unit Descriptor

This unit of competency describes the outcomes required to monitor, operate and control nutrient removal plant; and to measure and report on system performance and process quality control. The ability to identify faults, determine and apply technical adjustments, conduct chemical dosing procedures and produce technical reports are essential to performance.

### Application of the Unit

This unit supports the attainment of skills and knowledge required for operational staff with a specific responsibility for ensuring that nutrient removal processes in treatment plants conform to organisational standards and comply with statutory requirements.

### Licensing/Regulatory Information

Not applicable.

### Pre-Requisites

Not applicable.

### Employability Skills Information

This unit contains employability skills.

### Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the required performance needed to demonstrate achievement of the element. Where <b><i>bold italicised</i></b> text is used, further information is detailed in the range statement. Assessment of performance is to be consistent with the evidence guide.
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## Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
<b>1 Monitor nutrient removal process performance.</b>	<p>1.1 Monitor test results and <i>processes</i> to maintain the parameters of operation.</p> <p>1.2 Identify and report process faults and the operational condition of plant according to <i>organisational and statutory requirements</i>.</p>
<b>2 Operate and control nutrient removal processes.</b>	<p>2.1 Carry out <i>routine plant inspections</i> according to organisational and plant requirements.</p> <p>2.2 Conduct and analyse process <i>tests</i> and compare performance to plant operational requirements.</p> <p>2.3 Make integrated <i>system adjustments</i> and <i>process calculations</i> to optimise system performance according to organisational and statutory requirements.</p> <p>2.4 Collect, interpret and record process data according to organisational and plant requirements.</p> <p>2.5 Use <i>chemicals</i> as required and record handling, storage, dosage and use according to organisational requirements.</p>
<b>3 Compile nutrient removal process reports.</b>	<p>3.1 Compile <i>reports</i> from plant and system data to meet organisational procedures and statutory requirements.</p> <p>3.2 Report observations outside defined parameters for further action.</p>

## Required Skills and Knowledge

This describes the essential skills and knowledge and their level, required for this unit.

### Required skills:

- identify and correct operational and control system problems
- take samples and perform tests
- produce logs and reports
- perform process calculations
- interpret plans, charts and instructions
- interpret policies, procedures and standards
- give and receive instructions
- determine chemical dosing requirements
- operate control and communication systems
- use safety and personal protective equipment
- communicate with employees and customers

### Required knowledge:

- process layout
- features and components of nutrient removal systems
- theory of process operation and monitoring
- biological and/or chemical treatment principles that form the basis of nutrient removal processes
- chemicals used for pH control, odour control, nutrient removal
- chemical dosing processes
- risk factors and potential hazards related to nutrient removal systems
- risk control requirements including safety equipment and material safety data sheets
- lockout procedures for mechanical and electrical installations and hydraulic isolation
- equipment operation, capacity and limitations
- operation of pumping and valving systems
- control and communications systems
- policies, procedures and relevant legislation
- relevant utilities and service bodies
- hazardous materials handling
- interpretation and use of material safety data sheets
- environmental aspects of wastewater treatment

## Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for the Training Package.

### **Critical aspects for assessment and evidence required to demonstrate competency in this unit**

The candidate should demonstrate the ability to monitor, operate and control nutrient removal processes, including:

- monitoring test results and processes
- identifying and reporting faults
- conducting routine plant inspections
- taking samples and performing basic tests
- preparing and applying chemical dosing
- making basic process adjustments according to instructions
- collecting data and completing required documentation

### **Context of and specific resources for assessment**

Access to the workplace and resources including:

- documentation that should normally be available in a water industry organisation
- relevant codes, standards and government regulations

Where applicable, physical resources should include equipment modified for people with disabilities.

Access must be provided to appropriate learning and/or assessment support when required.

Assessment processes and techniques must be culturally appropriate, and appropriate to the language and literacy capacity of the candidate and the work being performed.

Validity and sufficiency of evidence requires that:

- competency will need to be demonstrated over a period of time reflecting the scope of the role and the practical requirements of the workplace
- where the assessment is part of a structured learning experience the evidence collected must relate to a number of performances assessed at different points in time and separated by further learning and practice
- a decision of competence only taken at the point when the assessor has complete confidence in the person's competence over time and in various contexts
- all assessment that is part of a structured learning experience must include a combination of direct, indirect and supplementary evidence
- where assessment is for the purpose of recognition (RCC/RPL), the evidence provided will need to be

authenticated and show that it represents competency demonstrated over a period of time

- assessment can be through simulated project-based activity and must include evidence relating to each of the elements in this unit

In all cases where practical assessment is used it will be combined with targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in a manner appropriate to the skill levels of the operator, any cultural issues that may affect responses to the questions, and reflecting the requirements of the competency and the work being performed.

## Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. ***Bold italicised*** wording, if used in the Performance Criteria, is detailed below. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts.

***Processes*** may include:

- chemical and adsorption techniques
- chemical nitrogen removal
- biological nitrogen removal
- enhanced ammonia removal
- chemical phosphorus removal
- biological phosphorus removal

***Organisational and statutory requirements*** may include:

- by-laws and organisational policies
- standard operating procedures
- National Water Quality Management strategy
- environment protection
- occupational health and safety, including use of personal protective equipment
- chemicals
- dangerous goods
- lifts and cranes
- Environment Protection Authority regulations
- World Health Organisation standards
- licensing agreements
- electrical standards

***Routine inspection of plant*** may include:

- use of equipment, including:
  - electronic monitoring and metering systems
  - chart recording systems
  - basic hand tools
  - sampling and laboratory testing equipment
  - computerised equipment
  - personal protective equipment
- interaction and communication with other employees, other authorities and the general public
- visual observation
- implementation of reporting procedures that may also include procedures for the implementation of by-laws, organisational policies and statutory requirements

***Tests*** may include:

- solids analysis
- nitrogen and phosphorus analysis
- microscopy and routine jar testing

- System adjustments*** may include:
- oxygen demand
  - pH
  - recirculation rates
  - wasting rates
  - organic and hydraulic loadings
  - surface loading rates
  - pH adjustment
  - chemical dosing
- Process calculations*** may include:
- chemical feed rates

- Chemicals*** may include:
- aluminium and iron based coagulants
  - synthetic organic polymers
  - carbon sources

- Reports*** may include:
- environmental reports
  - chemical usage
  - plant performance data

## **Unit Sector(s)**

Not applicable.

## **Competency field**

Treatment.