

1. Module details**Module name****Potable Water Treatment Facility****Module duration**

It is expected that students with the appropriate entry knowledge and skills will successfully complete this module in 36 - 40 hours.

Module code

NUE021

Discipline code

0702130

2. Module purpose

This module will provide the learner with the skills required to operate and maintain the water treatment facility in a safe and efficient manner.

3. Prerequisites

NUE025 Remote Area Essential Services.

4. Relationship to competency standards

This module provides part of the underpinning knowledge and skills in the 'Evidence Guide' of specific units of competency in the National Electrotechnology Training Package and provides similar support, where mapped, to equivalent units in the National Metals and Engineering Competency Standards. For details refer to the module to unit maps, available from NUEITAB.

5. Content**Valve systems isolation**

Location

Identification

Isolation of valve systems

Operation of valve systems

Make safe procedures

Maintenance (filtration)

Recording of work performed

Safety awareness

Treatment plant instrumentation

Location

Identification

Reading and recording

Recognition of fault/s

Fault condition/s

Notification of fault condition/s

Safety awareness

Facilities maintenance

Corrosion control

Painting

Descaling

Bolt replacement

Water leaks
Site clearing (debris and weeds)
Notification of work (completed or required)
Emergency repairs
Safety awareness

Chemicals

Identification
Storage procedures
Ventilation
Signage
Haz-chem awareness
Fire control
Emergency procedures
Application
Personal protective equipment
Safety awareness

Gas cylinders

Location
Identification
Hoses and fittings
Storage and handling
Signage
Personal protective equipment
Safety awareness

Stock control

Recording
Receiving
Gas cylinders
Filters and seals
Chemicals

Water sampling for analysis

Cleaning and scouring
Water samples
Chemical addition
Recording and reporting of information
Report findings
Safety awareness

6. Assessment strategy

Assessment methods

Assessment should be progressive reflecting a holistic approach to ensure the module purpose is met. To assist in ensuring validity, reliability and fairness assessment instruments should include practical exercises, assignments and written tests consisting of a number of item types, such as multiple choice, short answer and problem solving.

Conditions of assessment

Learning and assessment will take place in an environment that is conducive to a learner's development.

7. Learning outcome details

Learning outcome 1

Locate, operate and maintain the water valve system of the water treatment facility in a safe manner.

Assessment criteria

- 1.1 Locate and explain the operation of the various types of valves which are incorporated within the treatment facility.
- 1.2 Identify the system(s) which the valve or valve set service.
- 1.3 Select the appropriate valves in order to isolate a particular part of the system as directed.
- 1.4 Describe the methods of make safe protection as applied to the treatment facilities equipment.
- 1.5 Operate the various types of valve systems located within the treatment facility.
- 1.6 Perform minor maintenance to the valves and ancillary equipment located within the treatment facility.
- 1.7 Record all repairs and maintenance activities in the treatment facilities log book.
- 1.8 Notify the appropriate person(s) if any major repairs to the facility are required.
- 1.9 Observe all safety procedures including the wearing of personal protective equipment.

Learning outcome 2

Read and record the information displayed on the instruments and meters used in the potable water treatment facility.

Assessment criteria

- 2.1 Locate and identify the various types of instrumentation and meters being used in the facility.
- 2.2 Read and record the information displayed on the electrical instruments.
- 2.3 Read and record the water pump volume and pressure instruments (water flow rate both in and out of the pumping unit).
- 2.4 Report any irregularities in the readings on the instruments to the appropriate person(s).
- 2.5 Identify fault conditions by observations of the treatment plant instruments and meters, both mechanical and electrical.
- 2.6 Observe all safety procedures including the wearing of personal protective equipment.

Learning outcome 3

Perform minor repairs/maintenance and emergency repairs to the water treatment facilities building(s) and equipment.

Assessment criteria

- 3.1 Demonstrate the correct preparation methods necessary before repainting timber, brick, concrete or a steel surface.
- 3.2 Describe the correct methods used for corrosion control and explain the necessity of the procedures.
- 3.3 List the correct undercoat application and thinning agent as recommended by the manufacturer for both new and previously painted surfaces.
- 3.4 Select the most suitable top coat application and thinning agent as recommended by the manufacturer for the given task.
- 3.5 Explain the problems arising from the use of paints that are incompatible with other paints.

- 3.6 Discuss the health and safety aspects of paint thinning products other than water.
 - 3.7 Select the most appropriate method of application eg, roller, brush or paint pads.
 - 3.8 Paint selected surface textures located within the community's essential services facilities.
 - 3.9 Refurbish all of the paint application equipment in the appropriate cleaning agent.
 - 3.10 Store paint and any flammable thinning agent in a designated area eg, a flammable liquid storage compartment.
 - 3.11 Observe all safety procedures including the wearing of personal protective equipment.
- Note The storage of all flammable substances must be stored in the appropriate manner eg, a flammable liquid storage compartment. Any activity involving the handling of paint and thinning agents is to be done under supervision.*
- 3.12 Carry out minor repairs to the water treatment facility and equipment eg, replacing bolts, hoses, clamps, water leaks, etc.
 - 3.13 Remove all weeds, long grass and debris from around the facility and maintain the area in a clean and tidy manner.
 - 3.14 Record all R&M (repairs and maintenance) activities and report any major work required to the appropriate person(s).
 - 3.15 Carry out emergency repairs to the plant and equipment as instructed by supervisor.
 - 3.16 Observe all safety procedures including the wearing of personal protective equipment.

Learning outcome 4

Apply correct purifying chemicals to the water at the water treatment facility in a safe manner.

Assessment criteria

- 4.1 Locate, identify and list the water treatment chemicals used in the treatment facility.
- 4.2 Explain the purpose of each of the above mentioned chemicals and the hazards associated with them.
- 4.3 Identify the personal protective equipment considered necessary for the safe handling of the chemicals.
- 4.4 Explain the storage and ventilation requirements set down for the chemicals in 4.1.
- 4.5 Explain the necessary chemical handling and storage safety signage in accordance with the regulations.
- 4.6 Locate and report on the condition, location and appropriateness of the facilities chemical handling and storage safety signage.
- 4.7 Explain the Haz-Chem emergency procedures information outlined for dangerous goods.
- 4.8 Demonstrate the correct safe handling procedures for the chemicals.
- 4.9 Identify the facilities fire fighting equipment and describe their methods of operation.
- 4.10 Identify the various types of breathing apparatus.
- 4.11 Demonstrate the use of self contained breathing apparatus in a simulated situation.
- 4.12 Describe the correct methods used to care for and maintain the breathing apparatus.
- 4.13 Formulate and explain a plan for emergency planning and evacuation procedures.
- 4.14 Operate the equipment which introduces the required chemicals into the water treatment plant.

Note The handling of all gas operations must be done under strict supervision.

Learning outcome 5

Assessment criteria

4.15 Observe all safety procedures including the wearing of personal protective equipment.

4.16 Demonstrate good housekeeping procedures in and around the facility.

Identify, store and change industrial gas cylinders when required in a safe and correct manner.

5.1 List and identify by colour and labels all of the industrial gas cylinders associated with the water treatment facility (in accordance with the Australian standard (AS 1943) dated 1987).

5.2 Explain the purpose of each of the above mentioned gases and the hazards associated with them.

5.3 Explain the storage and ventilation requirements set down for the above mentioned gases.

5.4 Discuss the necessary gas handling and storage safety signage in accordance with the regulations.

5.5 Locate and report on the condition, location and appropriateness of the gas handling facilities and storage safety signage.

5.6 Demonstrate the correct safe handling procedures for the gas cylinders.

5.7 Demonstrate the fitting of hoses and gauges to a new gas cylinder.

5.8 Demonstrate the change over procedures necessary when fitting a new gas cylinder to the system.

5.9 Observe all safety procedures including the wearing of personal protective equipment.

5.10 Demonstrate good housekeeping procedures in and around the facility.

Learning outcome 6

Maintain a stock control register for the recording of outgoing goods and incoming consumables in relation to the R&M (repairs and maintenance) of the water treatment facility.

Assessment criteria

- 6.1 Record all outgoing consumables against the appropriate stock register or job card.
- 6.2 Prepare a list of consumables and forward it to the appropriate person(s).
- 6.3 Receive the incoming goods and log their receipt:
 - Chemicals
 - Gas cylinders
 - Safety equipment
 - R&M hardware
 - Other R&M (repairs and maintenance) consumables as required.
- 6.4 Store the incoming consumables as required.
- 6.5 Report any broken or damaged stock to the appropriate person(s).
- 6.6 Observe all necessary safety procedures including manual lifting techniques.
- 6.7 Wear **all** of the appropriate personal protective equipment when handling gas cylinders and water treatment chemicals.

Learning outcome 7

Gather and record water samples from the facility and forward them to the appropriate person(s) for analysis in preparation for treatment of the water.

Assessment criteria

- 7.1 Clean thoroughly the areas immediately around the water testing take off positions.
- 7.2 Clean thoroughly all water testing equipment.
- 7.3 Operate the equipment and gather samples of the water.
- 7.4 Label and record the samples.
- 7.5 Forward the samples to the appropriate person(s) for their analysis of the water condition.

- 7.6 Operate the equipment necessary to introduce the correct amount of chemicals to the system as directed.
- 7.7 Take further water samples after completion of the treatment and forward them to the appropriate person(s) for analysis.
- 7.8 Observe all safety procedures including the wearing of personal protective equipment.

8. Delivery of the module

Delivery strategy

Delivery strategies must be suitable for learning both theoretical and practical aspects described in the module purpose. It is considered that the most effective method to achieve this is by integration of theory and practice where students learn by experimentation, research and reports. It is recommended that learning and assessment be facilitated in a holistic manner that may require learning outcome sequence other than that indicated in the module.

Resource requirements

Students will need access to an operational powerhouse to gain maximum benefit from this module. They will also need access to all service manuals for the equipment they are undertaking training.

Occupational health and safety requirements

A safe and healthy environment will be provided for students and teachers as well as the particular safety procedures followed as part of the learning / teaching activity and content.