

<b>UNIT CODE</b>	<b>SISCAQU016</b>
<b>UNIT TITLE</b>	<b>Manage pool water quality</b>
<b>APPLICATION</b>	<p>This unit describes the performance outcomes, skills and knowledge required to determine pool water maintenance, monitoring and treatment requirements using operational and regulatory specifications as the basis. It covers skills to monitor test data, and treat water on an ongoing basis. It requires the ability to evaluate water quality problems and contamination incidents, and to respond with corrective chemical treatments.</p> <p>This unit applies to public aquatic facilities including those operated by commercial, not-for-profit, community and government organisations.</p> <p>It applies to senior technical and operational staff and managers who work independently or with limited guidance from others, taking responsibility for their own work functions and outputs.</p> <p>The skills in this unit must be applied in accordance with Commonwealth and State or Territory legislation, Australian standards and industry codes of practice.</p> <p>No occupational licensing, certification or specific legislative requirements apply to this unit at the time of publication.</p>
<b>PREREQUISITE UNIT</b>	Nil
<b>COMPETENCY FIELD</b>	Aquatics
<b>UNIT SECTOR</b>	Community Recreation
<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b>
<i>Elements describe the essential outcomes</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Determine pool water maintenance requirements.	1.1 Interpret pool and water treatment plant operational specifications to confirm pool water maintenance requirements. 1.2 Access public health regulatory documents to ascertain prescribed and recommended pool water maintenance requirements specific to the facility. 1.3 Seek assistance from manufacturer and regulatory bodies as needed to confirm requirements.

2. Maintain and monitor pool water quality.	<p>2.1 Develop schedules for pool water monitoring and treatment in line with operational and regulatory specifications.</p> <p>2.2 Calculate amount of chemicals required to maintain optimum pool water quality and clarity according to operational specifications.</p> <p>2.3 Operate chemical dosing system according to operational specifications of water treatment plant.</p> <p>2.4 Complete periodic and remedial backwash to ensure functionality of filtration system according to operational specifications.</p> <p>2.5 Monitor and evaluate pool water test data and visual inspection reports against normal reference range.</p> <p>2.6 Identify any significant variation and determine need for corrective action.</p>
3. Rectify pool water problems.	<p>3.1 Determine significance of pool water problem and urgency of corrective action to plan response.</p> <p>3.2 Identify chemical water imbalance from data and determine mix of chemicals required to rectify.</p> <p>3.3 Respond to emergency contamination incidents according to operational and regulatory response procedures.</p> <p>3.4 Calculate amount of chemicals and use remedial dosing methods suited to the circumstance and according to operational and regulatory specifications.</p>
4. Handle and store chemicals safely.	<p>4.1 Select and fit personal protective equipment and handle chemicals according to manufacturer instructions and work health and safety practices.</p> <p>4.2 Store chemicals in environmental conditions specified in manufacturer instructions and regulatory specifications.</p> <p>4.3 Dispose of chemicals and storage containers according to manufacturer and regulatory specifications.</p> <p>4.4 Record quantities of chemicals used, unused, and disposed of in chemical registry.</p> <p>4.5 Secure chemical storage facility when unattended according to organisational procedures.</p>
5. Complete pool water maintenance records and reports.	<p>5.1 Record accurate details of all monitoring, evaluation and treatment actions including details of chemicals and dosage administered.</p> <p>5.2 Complete facility incident reports and mandatory reports to regulatory authorities.</p> <p>5.3 Maintain records for effective access and according to operational and regulatory specifications.</p>
<b>FOUNDATION SKILLS</b>	
<i>Foundation skills essential to performance in this unit, but not explicit in the performance criteria are listed here, along with a brief context statement.</i>	
<b>SKILLS</b>	<b>DESCRIPTION</b>
Reading skills to:	<ul style="list-style-type: none"> <li>interpret complex and potentially unfamiliar technical specifications and regulatory information.</li> </ul>

Writing skills to:	<ul style="list-style-type: none"> <li>■ use fundamental sentence structure, technical terminology and abbreviations to complete forms and reports that require factual information.</li> </ul>
Numeracy skills to:	<ul style="list-style-type: none"> <li>■ extract, interpret, and record sometimes complex numerical data, symbols and abbreviations involving degrees, volume, percentages and ratios in manufacturer instructions, monitoring specifications and record keeping documents</li> <li>■ interpret, use and record temporal data, including minutes, hours, days and weeks</li> <li>■ complete complex calculations for chemical use, involving volume, percentages and ratios using manufacturer instructions and technology to assist.</li> </ul>
<b>UNIT MAPPING INFORMATION</b>	Supersedes and is not equivalent to SISCAQU004 Develop and implement pool water maintenance procedures
<b>LINKS</b>	Companion Volume Implementation Guide

<b>TITLE</b>	Assessment Requirements for SISCAQU016 Manage pool water quality
<b>PERFORMANCE EVIDENCE</b>	<p>Evidence of the ability to complete tasks outlined in elements and performance criteria of this unit in the context of the job role, and:</p> <ul style="list-style-type: none"> <li>■ develop and document one schedule covering one monthly period for chemical and microbiological monitoring, ensuring the schedule complies with operational and regulatory specifications</li> <li>■ evaluate data from three pool water samples, collected at different times, for one of the following types of disinfectant: <ul style="list-style-type: none"> <li>○ free chlorine, combined chlorine and total chlorine (where chlorine is used at the facility), or</li> <li>○ cyanuric acid, free chlorine, combined chlorine and total chlorine (where cyanuric acid used with chlorine at the facility), or</li> <li>○ free bromine and total bromine (where bromine is used at the facility)</li> </ul> </li> <li>■ evaluate data from three pool water samples, collected at different times, for each of the following: <ul style="list-style-type: none"> <li>○ pH</li> <li>○ total alkalinity</li> <li>○ calcium hardness</li> <li>○ total dissolved solids</li> <li>○ temperature</li> </ul> </li> <li>■ use safe work practices and manufacturer instructions to handle chemicals and treat pool water on two occasions</li> <li>■ from evaluation activities personally completed, or from case study documentation: <ul style="list-style-type: none"> <li>○ determine and document the required chemical treatment response for two different types of water imbalance issues</li> <li>○ determine and document the required chemical treatment response for two different types of water contamination</li> <li>○ complete accurate records of all evaluation, treatment, and corrective actions including records of chemical use in the organisational register.</li> </ul> </li> </ul>

**KNOWLEDGE EVIDENCE**

Demonstrated knowledge required to complete the tasks outlined in elements and performance criteria of this unit:

- an overview of the provisions of the local state or territory government public health legislation that relate to pool water quality for public pools:
  - purpose in managing risks to public health
  - overarching compliance and risk management requirements and consequences of non-compliance
- regulatory and advisory functions of local government (councils) that relate to pool water quality
- [how to access regulatory documents and select information](#) relevant to the pool facility:
  - prescribed and recommended:
    - chemical parameters of pool water
    - types of pool water tests and testing schedules
    - record keeping requirements
    - codes of practice
    - water quality guideline and advisory documents
- microbiological hazards associated with pool water:
  - micro-organisms in pool water and typical sources, both bathers and the environment
  - common related illnesses
- effects of chemicals on bathers, both discomfort and more serious effects
- reasons to maintain clarity of pool water:
  - safety reasons
  - aesthetic reasons
  - reasons relating to effectiveness of disinfection
- reasons to maintain optimum chemical balance of pool water:
  - avoiding degradation of pool surfaces, metal fixtures and water treatment plant
  - bather comfort
  - clarity of water
  - reasons relating to effectiveness of disinfection
- key operational features of pool water treatment system components, and their role in maintaining pool water quality:
  - water circulation and distribution system
  - filtration system, including backwash processes and indicators for remedial backwash
  - disinfection system:
    - [automated dosing system](#)
    - [continuous metered dosing system](#)
  - pH control system
- methods used to monitor pool water quality and to record and evaluate data:
  - manual sampling and by automated probes
  - manual reports using spreadsheets
  - data logging technology - automated in-line tests recorded electronically
- chemical parameters measured to control water balance, typical periodic schedules, and the role of the Langelier Saturation Index (LSI):
  - pH
  - total alkalinity
  - calcium hardness
  - total dissolved solids
  - temperature

- common microbiological parameters measured, typical periodic schedules, and how to locate and use specifications for normal and elevated counts that trigger mandatory reports to the local regulatory authority:
  - heterotrophic colony count (HCC)
  - *Escherichia coli* (E. coli)
  - *Pseudomonas aeruginosa*
- range of treatments required to maintain optimum pool water quality, and how to locate and use specifications for calculating the chemical dose specific to the pool facility:
  - disinfection
  - pH adjustments
  - de-chlorination
  - ozonisation or use of sanitiser
- different types of disinfectant agents and systems used in pools:
  - chlorine based chemicals in different forms
  - chlorine stabilised with cyanuric acid
  - bromine based chemicals in different forms
  - ultraviolet light plus hydrogen peroxide
- for each of the above listed disinfectant types:
  - applicability to different types of pools and source water
  - chemical abbreviations
  - an overview of how they work
  - by products
  - effects on pH, total alkalinity, total hardness, total dissolved solids OR
  - relationship to pH total alkalinity, total hardness, total dissolved solids?
- types of remedial and emergency dosing methods, circumstances requiring their use, and how to locate and use specifications for calculating the chemical dose specific to the pool facility and problem:
  - superchlorination
  - shock dosing
- pH agents for raising and lowering pH:
  - common chemicals used and abbreviations
  - an overview of how these work
  - how these interact with disinfectant agents
- formats and inclusions of:
  - organisational pool water monitoring and treatment schedules
  - pool water evaluation reports
  - facility incident reports, mandatory reports to regulatory authorities, and how to complete these
- for the handling and storage of pool water chemicals:
  - work health and safety practices including types of personal protective equipment used
  - manufacturer instructions and local state or territory regulatory specifications for correct environmental storage, and security of storage
  - importance of maintaining correct labelling of chemical containers
  - safe environmental disposal methods
  - format and inclusions of a chemical registry, and how to complete.

<b>ASSESSMENT CONDITIONS</b>	<p>Skills must be demonstrated in an aquatic facility with an operating indoor or outdoor pool used by members of the public. Facilities can include those operated by commercial, not-for-profit, community and government organisations.</p> <p>Assessment must ensure use of:</p> <ul style="list-style-type: none"> <li>■ pool water monitoring and treatment equipment</li> <li>■ personal protective equipment for chemical handling</li> <li>■ commercial pool water treatment chemicals and measuring equipment</li> <li>■ operational specifications for pool and water treatment plant</li> <li>■ public health regulatory documentation and specifications</li> <li>■ pool water test data and visual inspection reports</li> <li>■ template: <ul style="list-style-type: none"> <li>○ pool water monitoring and treatment schedules</li> <li>○ chemicals registry</li> <li>○ pool water evaluation reports</li> <li>○ facility incident reports</li> <li>○ mandatory regulatory reports</li> </ul> </li> <li>■ manufacturer instructions and regulatory specifications for chemical handling and storage.</li> </ul> <p>Assessors must:</p> <ul style="list-style-type: none"> <li>■ satisfy the Standards for Registered Training Organisations requirements for assessors, and</li> <li>■ have a collective period of at least two years' experience working in public pool water maintenance, where they have applied the skills and knowledge covered in this unit of competency; the two years' experience can incorporate full and part time experience.</li> </ul>
<b>LINKS</b>	Companion Volume Implementation Guide