



Australian Government

MSS027006 Coordinate water quality management activities

Release: 2

MSS027006 Coordinate water quality management activities

Modification History

Release 1. Supersedes and is equivalent to MSS027006A Coordinate water quality management activities.

Release 2. Prerequisite code updated. Equivalent outcome.

Application

This unit of competency covers the ability to oversee the day-to-day water quality management activities for a site, project or an ongoing program. Personnel are required to interpret and implement a water quality management plan, organise specified management activities, verify the quality of monitoring data and investigate and rectify unexpected or unacceptable results, monitor compliance with relevant water quality objectives or standards and provide reports. They work under the supervision of an environmental scientist or engineer, site manager or workplace environmental manager.

This unit of competency is applicable to environmental site coordinators, environmental managers and senior environmental officers working in a range of industry sectors, such as environmental services involved with sampling, monitoring and/or management of surface water, groundwater, stormwater or wetlands; and environmental compliance, auditing and inspection. Note that the term ‘manager’ is used to refer to management of a function, project and/or program and does not necessarily imply line management.

While no specific licensing or certification requirements apply to this unit at the time of publication, environmental monitoring and management activities are governed by relevant legislation, regulations and/or external accreditation requirements. Local requirements should be checked.

Pre-requisite Unit

MSS024018	Perform sampling and testing of water
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Competency Field

Management

Unit Sector

Environmental

Elements and Performance Criteria

Elements describe the essential outcomes.

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

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| 1 | Confirm scope of water quality management | <p>1.1 Review legislative, regulatory and licensing requirements and approvals that apply to site/project/program.</p> <p>1.2 Review current water quality management plan, including objectives, known issues, specified management activities and any required changes.</p> <p>1.3 Review previous water quality records and reports, if available.</p> <p>1.4 Confirm that water quality monitoring sites, sampling and measurement methods, instrumentation and workplace procedures are in accordance with relevant standards and guidelines.</p> <p>1.5 Clarify own scope of responsibility/authority for achieving specific outcomes and the roles of other key personnel.</p> <p>1.6 Identify resources available to conduct water quality management activities.</p> |
| 2 | Organise water quality management activities | <p>2.1 Develop a consolidated schedule to ensure all activities can be conducted efficiently with the available resources.</p> <p>2.2 Develop checklists/clear work instructions to enable personnel to perform assigned tasks efficiently and with minimal errors.</p> <p>2.3 Ensure that personnel who conduct monitoring and/or collect water samples are competent to undertake their assigned tasks.</p> <p>2.4 Ensure water quality monitoring equipment is regularly calibrated and maintained and that adequate stocks of consumables are available.</p> <p>2.5 Ensure water samples are handled in accordance with the sampling method and chain of custody requirements and dispatched promptly for analysis.</p> |

- 2.6 Conduct, or arrange for, regular site inspections to monitor the effectiveness of water quality management actions (if relevant to site/project/program).
 - 2.7 Advise relevant personnel when specified water quality management actions are not being implemented effectively (if relevant to site/project/program).
 - 2.8 Conduct, or arrange for, additional monitoring/inspections after atypical events, legitimate complaints or government requests.
- 3 **Verify water quality data**
 - 3.1 Identify relevant job instructions, data and technical records in workplace information management system.
 - 3.2 Confirm that technical records provide sufficient information to ensure traceability/chain of custody for the monitoring activities involved.
 - 3.3 Compare monitoring data with expected values and identify any outliers.
 - 3.4 Inspect data records to identify any gaps and to check the integrity of data entry, transfers, alterations and calculations.
 - 3.5 Notify manager when data is incomplete or contains significant errors, and clarify what action to take.
- 4 **Determine if results are acceptable and within expectation**
 - 4.1 Compare results with expected and/or relevant guideline values and identify any significant differences or trends.
 - 4.2 Check the reliability of results by examining data or results from repeat measurements and/or tests of duplicate samples or other monitoring stations.
 - 4.3 Assess the significance of any recorded observations of atypical environmental or meteorological conditions.
 - 4.4 Check that all calculations are free from error.
 - 4.5 Check that estimations of uncertainty are reasonable and consistent with the sampling method and relevant guidelines, if relevant.

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| | | 4.6 | Report results that meet workplace data quality standards and are consistent with expectations. |
| 5 | Investigate/rectify unexpected or unacceptable results | 5.1 | Examine records of pre-use checks and calibration performance to ensure that the sampling equipment and/or monitoring/test instruments used meet specifications and workplace requirements. |
| | | 5.2 | Establish whether human, environmental and/or meteorological factors could have affected the reliability of results. |
| | | 5.3 | Check for obvious sources of interference that may have occurred during measurements or analysis of samples. |
| | | 5.4 | Retrieve stored samples (if available) and assess whether they are atypical or contaminated. |
| | | 5.5 | Arrange for control tests using the same or new samples to check unexpected results, if relevant. |
| | | 5.6 | Report unexpected results that meet workplace data quality standards. |
| | | 5.7 | Identify possible root causes of unacceptable results and appropriate preventative/corrective actions. |
| | | 5.8 | Report investigation outcomes and recommendations for improvements in accordance with workplace procedures. |
| | | 5.9 | Seek manager's advice when challenges are beyond own technical competence or when input from environmental specialists may be required. |
| 6 | Keep management informed about water quality performance | 6.1 | Provide regular reports about water quality, including instances of potential/actual non-conformance, incidents and the actions taken in each case. |
| | | 6.2 | Report opportunities and recommendations for improvements in water quality monitoring or management in accordance with workplace procedures. |
| 7 | Maintain water | 7.1 | Ensure all water quality records are legible, accurate and |

quality records

satisfy workplace/legislative requirements.

- 7.2 Store water quality records to enable easy access and review by authorised personnel in accordance with workplace procedures.
- 7.3 Regularly review water quality records to identify any significant trends and impacts.
- 7.4 Identify any problems with the maintenance and security of water quality records and resolve them promptly.

Foundation Skills

This section describes those required skills (language, literacy and numeracy) that are essential to performance.

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

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Legislation, regulations, standards, codes, workplace procedures and requirements include the latest version of one or more of:

- federal legislation such as the Environment Protection and Biodiversity Conservation Act, and National Environmental Protection Measures
- state/territory government legislation and local government by-laws, policies, regulations and plans dealing with land use; environmental protection; water and water management; pollution and contaminated sites; fisheries, forestry and mining operations
- legislation, standards and codes of practice for work health and safety (WHS)
- Australian and international standards covering environmental management (e.g. AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set), sampling and analysis of water (e.g. AS 2031 Water quality, AS 3550 Waters series, AS/NZS 4276 Water microbiology series, and AS/NZS 5667 Water quality – Sampling series)
- industry methods and guidelines, such as US Environmental Protection Authority (EPA) Methods and guidance for the analysis of water, American Public Health Association (APHA)

Standard methods for the examination of waters and wastewaters, ANZECC Guidelines for fresh and marine water quality, and Australian guidelines for water quality monitoring and reporting

- registration/licensing and/or accreditation requirements
- site-specific requirements; workplace procedures for sampling, monitoring and in-field testing; recording, processing, presenting and reporting data
- workplace documents, such as standard operating procedures (SOPs); work schedules; recording and reporting procedures; equipment manuals and warranties; supplier catalogue and handbooks; safety data sheets (SDS) and safety procedures; waste minimisation, containment, processing and safe disposal procedures

Water quality measurement parameters (field and laboratory) include one or more of:

- physical and chemical tests, such as:
 - temperature
 - electrical conductivity
 - phosphorus (total and soluble reactive)
 - nitrogen (nitrate, organic, ammonia and Kjeldahl)
 - ratio of total phosphorus to total nitrogen
 - total organic carbon (TOC)
 - dissolved organic carbon (DOC)
 - biological oxygen demand (BOD)
 - chemical oxygen demand (COD)
 - true colour (Pt/Co units)
 - turbidity
 - Secchi disk depth
 - total suspended solids
 - volatile suspended solids
 - chlorophyll and phaeophytin
 - pH
 - silica
 - metals (total and dissolved)
 - organic and inorganic pollutants
 - microorganisms
- ecotoxicological tests, such as:
 - toxicity tests (bioassays) using bacteria, algae, invertebrates and fish
 - use of biomarkers and bioaccumulation
 - ecological assessment (e.g. Australian River Assessment)

System (AUSRIVAS) for rapid assessment of health using macro invertebrates).

- Sampling and field monitoring equipment include one or more of:**
- bottle sampling containers (e.g. glass, polyethylene and plastic)
 - pumping systems for shallow depths, depth samplers, automatic samplers and integrating samplers
 - groundwater sampling systems
 - sediment sampling systems
 - samplers for aquatic organisms, such as nets, traps, cages, hose pipe, sticks and modified brushes
 - reagents, such as acid washes, electrode filling and storage solutions, and preservatives
 - filters, such as membrane, microfiber and paper
 - parameter specific meter or multi-probes (e.g. dissolved oxygen, electrical conductivity, pH, turbidity, nitrates, phosphates and temperature)
 - field test kits to determine such parameters as dissolved gases, chemical anions and cations, heavy metals, E. coli and BOD
 - portable colorimeters, field microscopes
 - data loggers and global positioning system (GPS).
- Water quality reports include one or more of:**
- weekly and monthly environmental reports
 - non-conformance report form
 - contributions to regulatory agency reports as required by permit, approval or licence conditions.
- Water quality records include one or more of:**
- digital photographs of water quality monitoring sites
 - data files
 - records required by permit, approval or licence conditions
 - records of monitoring equipment purchase, calibration, inspection, maintenance and service
 - records of complaints and government requests
 - records of water quality non-conformances, incidents or significant impacts
 - contractor and supplier information
 - internal quality/environmental audit reports
 - electronic/hard copy correspondence
 - records of approved expenditure and orders.
- Water quality management actions**
- correct handling and storage of chemicals and fuels to prevent spills to wetlands and stormwater system

include one or more of:

- minimising water consumption through substitution, water efficient devices and recycling/reuse
- scheduling of works to enable disturbed areas to be promptly re-vegetated or stabilised progressively
- regular inspection and maintenance of sediment control structures and stormwater drainage pits
- keeping stormwater run-off free of litter, gross pollutants and contaminants
- diversion of clean run-off away from disturbed areas
- use of vegetated swale drains and filter strips
- use of erosion control structures, such as silt fences, sand bags and geofabric wrapped hay bales
- checking water for contaminants before disposal
- controlling the timing, frequency and magnitude of water releases from the site
- controlling access of feral/stock and domestic animals to wetlands
- limiting disturbance of wetlands, riparian areas and drainage channels by vehicles and/or boats.

WHS and environmental management requirements include:

- compliance with relevant federal/state/territory WHS legislation at all times
- assuming that samples are potentially hazardous and applying standard precautions
- accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and state/territory Departments of Health, where relevant.

Unit Mapping Information

Release 1. Supersedes and is equivalent to MSS027006A Coordinate water quality management activities

Links

The MSS Sustainability Companion Volume implementation Guides are available from VETNet: -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=5b04f318-804f-4dc0-9463-c3fb9a3fe998>

Assessment Requirements for MSS027006 Coordinate water quality management activities

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Performance Evidence

Evidence of competence in this unit must satisfy all of the requirements of the elements and performance criteria, and include demonstration of:

- planning and implementing the day-to-day water quality management activities for at least **one (1)** site, project or ongoing program
- accessing, interpreting and applying relevant legislative/regulatory requirements, standards, codes, guidelines and manuals
- explaining relevant water quality standards and management plans, sampling/monitoring methods, equipment operating procedures and workplace water quality management actions
- verifying the accuracy and completeness of water quality data, results and technical records
- using statistical tests (e.g. to determine data acceptability, estimate uncertainties, examine trends and infer basic relationships)
- investigating unexpected or unacceptable water quality results in a logical and efficient manner to identify possible root causes
- seeking advice when issues/problems are beyond scope of competence/responsibility
- recommending appropriate preventative/corrective actions to control potential/actual non-conformances or incidents
- responding effectively to complaints and requests for information
- providing accurate, complete and timely reports of water quality performance and identifying opportunities for improvements
- maintaining water quality records in accordance with legislative/licensing/workplace requirements
- working safely and monitoring the safety of others.

Knowledge Evidence

Must provide evidence that demonstrates knowledge of:

- water quality management terminology, concepts and principles used in job role
- legislative/regulatory requirements, standards, codes and guidelines dealing with water quality

- workplace water quality management plans and procedures, common water quality issues, control measures and mitigation/management actions
- measurement parameters for waters, sediments or biota relevant to site/project/program
- detailed scientific and technical knowledge of the samples, sampling/monitoring methods, equipment, materials and instrumentation used to generate the water quality data, including calibration, fault-finding and troubleshooting
- expected values for water quality parameters, relevant ANZECC guidelines, and statutory environmental quality concentration limits or similar
- problem-solving techniques and cause analysis
- impacts of common human, environmental and/or meteorological factors on data quality
- sources of interference, uncertainty, limitations of methods and sources of variability
- workplace procedures for identifying/assessing environmental risks/impacts, responding to complaints and environmental incidents, and record management and reporting water quality data
- interpersonal communication, negotiation and conflict resolution techniques
- relevant hazards, health, safety and workplace emergency response procedures.

Assessment Conditions

- Judgement of competence must be based on holistic assessment of the evidence. Assessment methods must confirm consistency of performance over time, rather than a single assessment event.
- This unit of competency is to be assessed in the workplace, or a simulated workplace environment. A simulated workplace environment must reflect realistic operational workplace conditions that cover all aspects of workplace performance, including the environment, task skills, task management skills, contingency management skills and job role environment skills.
- Foundation skills are integral to competent performance of the unit and should not be assessed separately.
- 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.
- Knowledge evidence may be collected concurrently with performance evidence or through an independent process such as workbooks, written assessments or interviews (provided a record is kept in each case).
- Holistic assessment methods include:
 - review of water quality management data files, results and records verified by the candidate
 - review of work schedules, checklists/clear work instructions, water quality performance reports prepared by the candidate
 - feedback from manager and/or site personnel regarding the candidate's ability to safely coordinate day-to-day water quality management activities
 - oral and/or written questions to assess the candidate's understanding of procedures governing the validation of data, acceptability of data/results, sources of water quality data variability, interferences and uncertainty, and relevant preventative or corrective actions

- analysis of case studies/reports of water quality management issues and incidents relevant to the candidate's job role.
- Access is required to all instruments, equipment, materials, workplace documentation, procedures and specifications associated with this unit including, but not limited to:
 - site/project/program history
 - relevant legislation, codes and standards; workplace environmental management policies, plans, actions, procedures, checklists and equipment manuals; sampling methods and description of monitoring set-up
 - water quality data sets, records and reports, computer and relevant software or workplace information management system
 - water sampling and testing equipment.
- Assessors must satisfy the assessor competency requirements that are in place at the time of the assessment as set by the VET regulator.
- The assessor must demonstrate both technical competency and currency.
- Technical competence can be demonstrated through:
 - relevant VET or other qualification/Statement of Attainment AND/OR
 - relevant workplace experience
- Currency can be demonstrated through:
 - performing the competency being assessed as part of current employment OR
 - having consulted with an organisation providing environmental monitoring, management or technology related services about performing the competency being assessed within the last twelve months.

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