



Australian Government

AHCNRM502A Develop a water quality monitoring program

Release: 1

AHCNRM502A Develop a water quality monitoring program

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency covers the process of developing a water-quality monitoring program. It requires the ability to assess the requirements of such a program, determine the type and extent of data to be collected, store and manage data, interpret and analyse the data, assess water quality, assess factors contributing to water quality, monitor and evaluate the program. Developing a water quality monitoring program required knowledge of the hydrological cycle, catchment and coastal management issues contributing to surface and groundwater quality, water quality parameters, chemical principles, sampling techniques, analytical techniques, data storage and management and accepted scientific process.
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Application of the Unit

Application of the unit	This unit is appropriate for persons working in the role of coordinator/manager in an organization, group or enterprise concerned with gathering information for land or water management purposes. The role is likely to include delegation of implementation tasks and may include consultation with specialists such as hydrologists, hydrographers etc.
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and 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
1. Determine water quality monitoring program requirements	1.1. Survey client to identify scope, objectives and constraints of project and intended use of the data. 1.2. Research, collate and evaluate background information relevant to survey type and site. 1.3. Determine water quality indicators to be measured, frequency and volume of sampling required to meet scope, objectives and constraints of project. 1.4. Determine that procedures required for data collection and processing and reporting format are consistent with the survey scope, objectives and constraints of program and legislative requirements. 1.5. Seek estimates of costs involved and/or sources of funds for the program as required by the client and according to enterprise policies and procedures. 1.6. Provide a survey strategy to client that reflects project requirements, scope, objectives and constraints for discussion and approval.
2. Undertake a site analysis	2.1. Identify and record physical and biological features at the site of the monitoring program. 2.2. Identify and record resource management factors that are contributing to water quality. 2.3. Survey biota as required to meet the scope and objectives of the program. 2.4. Identify and assess OH&S hazards and risks associated with conducting the sampling program. 2.5. Identify and evaluate sampling points for safety, accessibility and opportunities for repeatable data collection.
3. Plan monitoring program	3.1. Evaluate information gathered to select suitable monitoring sites for repeatable monitoring and to obtain representative samples. 3.2. Source and cost laboratory and field equipment, tools, machinery and other material required for the monitoring program, assess for suitability/reliability and confirm availability with suppliers, contractors and enterprise personnel. 3.3. Confirm surveyor access to site with land manager for the duration of the monitoring program. 3.4. Determine and document OH&S controls and emergency procedures required for the program to be presented to appropriate personnel according to

ELEMENT	PERFORMANCE CRITERIA
	enterprise policies and guidelines. 3.5. Document methods of data collection, monitoring and field techniques for field operators according to enterprise policies and guidelines. 3.6. Present to appropriate personnel and the client for briefing and acceptance, survey schedules and procedures developed in accordance with enterprise guidelines and relevant legislation.
4. Monitor water quality	4.1. Carry out surveying tasks out in line with monitoring plan and enterprise/agency guidelines/protocols and in accordance with OH&S guidelines. 4.2. Store and transport and treat samples with regard to temperature, maximum holding periods and other variables and according to enterprise/agencies guidelines and policies. 4.3. Monitor surveying process for accuracy, compliance with the survey plans and procedures, OH&S policies and regulatory requirements. 4.4. Assess and evaluate for errors and inconsistencies, implementing contingency plans when problems arise with the monitoring plans and procedures.
5. Evaluate program	5.1. Analyse data collected according to industry policies and guidelines and scientific standards. 5.2. Outcomes, conclusions and/or trends from the monitoring program are drawn from relevant information including industry standards for interpretation of water quality data and are based on appropriate evidence and reasoned arguments. 5.3. Advice is sought from client as to satisfaction with monitoring program in terms of the process and outcomes. 5.4. Provide report on outcomes to client with recommendations for changes and improvements any further monitoring activities.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communicate effectively with the client, enterprise staff, managers, community groups and consultants both orally and in writing
- research and evaluate information
- collect, store and evaluate data
- produce written reports and conclusions based on appropriate evidence and reasoned arguments
- comply with legislative requirements
- undertake water quality monitoring
- use interpersonal skills to work with others and relate to people from a range of cultural, social and religious backgrounds and with a range of physical and mental abilities.

Required knowledge

- hydrological cycle
- catchment and coastal management issues contributing to surface and groundwater quality
- aquatic ecology
- water quality indicators
- standard techniques to assess ecological health of aquatic sites
- chemical principles
- sampling techniques
- analytical techniques
- data storage and management
- accepted scientific process
- statistical analysis
- OH&S and other related legislative requirements
- hazard identification, assessment and control.

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The critical requirements that are valuable for this unit of competency as a whole are listed below. Assessment must confirm one's ability to: • determine water quality monitoring requirements for a project brief • undertake research and a site analysis to select suitable monitoring sites • develop the monitoring plan • monitor and evaluate the program.
Context of and specific resources for assessment	For valid and reliable assessment of this unit, competency should be consistently demonstrated over a period of time and observed by the assessor.

Range Statement

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. 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) may also be included.	
Survey scope may include:	• the time over which the water-quality monitoring program is to be undertaken • size of the area to be surveyed • the type of monitoring • frequency of sampling • the extent of analysis and recommendations required.
Objectives may include:	• monitoring of the health of an aquatic system

RANGE STATEMENT	
	• measuring trends in quality over time • measuring outcomes in response to changes in catchment or coastal management • conforming to regulatory requirements related to quality of discharge water from an enterprise.
Processes for data collection may include:	• the sampling techniques • treatment • storage and transport of samples • measurement standards • identification of species
Processes may include:	• data recording • organising • storage • analysis and presentation techniques including
Methods of data collection, monitoring and field techniques to be documented may include:	• the scope and frequency of monitoring reports • the collecting, recording and storing of data (eg. logbooks, recording sheets, dataloggers). • techniques and guides for the field identification of species • recording of site information and use of information for classification, coding systems etc • checklists for equipment, tools and machinery for field trips • the storage, transport, calibration, maintenance and safe operation of equipment, tools and machinery including the manufacturers instructions • guidelines for the treatment, preservation, transport and storage of specimens.

Unit Sector(s)

Unit sector	Natural resource management
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Co-requisite units

Co-requisite units		

Competency field

Competency field	
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