



Australian Government

MSS024003 Apply an understanding of environmental principles to a site

Release: 1

MSS024003 Apply an understanding of environmental principles to a site

Modification History

Release 1. Supersedes and is equivalent to MSS024003A Apply an understanding of environmental principles to a site

Application

This unit of competency covers the ability to ‘read the landscape’ in terms of the physical and biological components of the environment and the ecological linkages in operation at a site. Personnel are required to apply basic principles of geomorphology, hydrology and ecology in a systematic, scientific appraisal of site condition. This requires sufficient knowledge of chemistry, physics, geology and biology to support a scientific approach to field ecology.

This unit of competency is applicable to environmental technicians working in a range of industry sectors, such as environmental monitoring, and sampling (e.g. air quality, water, soil and noise); environmental compliance, auditing and inspection; groundwater and clean water (e.g. catchment supply, environmental flows); water treatment, storm and wastewater management; solid and hazardous waste management; site remediation; management of contaminated sites; geotechnical services and civil engineering; and natural resource 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

Nil

Competency Field

Environmental monitoring

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 | Prepare for site | 1.1 | Obtain and use maps, photos and related documentation |
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	inspection	to gain a preliminary understanding of site features.
	1.2	Collect site-specific or regional data on expected flora, fauna, soils and climate.
	1.3	Review site history and previous environmental or ecological studies, if available.
	1.4	Review all emergency plans, risk assessments, and safety and environmental management requirements associated with the field activities.
	1.5	Review legislative and planning instruments applicable to current and future site usage.
	1.6	Confirm site access requirements and identify potential site hazards.
2	Conduct initial site survey	2.1 Sketch, map and/or photograph the site. 2.2 Observe and record the surface geology and geomorphology of the site. 2.3 Observe and record hydrology of the site. 2.4 Observe and record the major flora of the site. 2.5 Observe and record evidence of site fauna. 2.6 Observe and record infrastructure and other modifications to the site. 2.7 Consider the potential for presence of cultural and indigenous heritage items and record, as necessary. 2.8 Check for evidence of illegal or inappropriate activities.
3	Make an initial assessment of site condition	3.1 Use geomorphological and hydrological observations to describe surface condition and infer potential future impacts. 3.2 Make inferences on apparent ecological health of the site to plan for an initial ecological study of the site. 3.3 Determine the physical, chemical and biological parameters that would need to be measured and/or sampled during subsequent ecological appraisal of the

site.

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| 4 | Prepare for field study | 4.1 | Identify and describe the biological and chemical components of interest, sampling areas and field techniques to be used. |
| | | 4.2 | Identify, obtain and check required equipment and materials required for field study. |
| | | 4.3 | Securely stow all field equipment in vehicle to prevent damage in transit. |
| | | 4.4 | Safely transport all field equipment to site and prepare it for use. |
| | | | |
| 5 | Perform a basic ecological field study of the site | 5.1 | Perform ecological sampling for abundance and diversity parameters using the general techniques of transects and quadrats. |
| | | 5.2 | Record appropriate descriptions of the habitat structure. |
| | | 5.3 | Perform sampling for simple population, demographic and age structure parameters. |
| | | 5.4 | Perform simple sampling and measurements on abiotic components. |
| | | 5.5 | Perform simple targeted species sampling. |
| | | 5.6 | Ensure compliance with relevant legislation, policy, codes of practice and accepted workplace procedures. |
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| 6 | Finalise field study | 6.1 | Ensure all samples and data are stored safely. |
| | | 6.2 | Rehabilitate sampling sites to render them safe and minimise environmental impacts. |
| | | 6.3 | Clean all equipment, containers, work area and vehicles according to workplace procedures. |
| | | 6.4 | Pack and safely transport all samples, equipment and supplies back to home base. |
| | | 6.5 | Ensure dispatch of collected samples for subsequent |

			analysis, as necessary.
		6.6	Check serviceability of all equipment before storage.
7	Process and present field data	7.1	Summarise field data using simple calculations, graphs, tables and/or maps.
		7.2	Provide reports that include simple conclusions and interpretations based on raw or summarised data.
8	Maintain a safe work environment	8.1	Use defined safe work practices and personal protective equipment (PPE) to ensure personal safety and that of others.
		8.2	Minimise the generation of waste.
		8.3	Ensure the safe collection of all hazardous wastes for appropriate disposal.

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, Australian Heritage Council Act, Native Title 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; cultural/heritage sites; vegetation management; nature conservation and wildlife/plant protection; water and water management; soil conservation; pollution and contaminated sites;

fisheries, forestry and mining operations

- legislation, standards and codes of practice for workplace health and safety (WHS); care and use of animals for scientific purposes; handling of dangerous goods
- Australian and international standards covering environmental management, such as AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set, and AS 1726 Geotechnical site investigations;
- registration/licensing and/or accreditation requirements
- workplace environmental management plans and procedures for specific sites and/or activities (e.g. sampling, monitoring, construction and mining)
- workplace documents, such as standard operating procedures (SOPs), work schedules, recording and reporting procedures, equipment manuals and warranties; safety data sheets (SDS) and safety procedures; waste minimisation, containment, processing and safe disposal procedures.

Ecological principles and concepts include one or more of:

- ecosphere, biome and major ecosystem types
- ecological niche and biogeography
- trophic dynamics, autotrophs, heterotrophs and detritivores, and food webs
- distribution and abundance of organisms, populations and communities, and biodiversity
- abiotic and biotic components and their interrelationships and dependencies
- energy and material flows and cycles, including biogeochemical cycles
- population ecology:
- distribution, abundance and dispersion
- growth rates and age structures
- migration and dispersal in space and time
- behavioural ecology (communication and learning, aggression and territoriality, and social group dynamics)
- community ecology (ecological interactions):
- intra/interspecific competition
- concepts of coexistence, adaptive and competitive, including mimicry, coevolution, parasitism, mutualism, commensalism and predator/prey systems
- species diversity in time and space.

Earth science principles

- geological concepts and principles, such as:

and concepts include one or more of:

- earth structure and plate tectonics
- classification of rocks (e.g. igneous, sedimentary, volcanic and stratigraphy)
- weathering
- geomorphological concepts and principles, such as:
 - erosion and mass wasting
 - transportation and deposition, and sedimentation
 - fluvial, aeolian, hillslope and weathering processes
- soil science concepts and principles, such as:
 - soil classification
 - soil formation and soil profiles
 - pedology
 - edapology.

Hydrological principles and concepts include one or more of:

- aspects of the hydrologic cycle, such as:
 - run-off
 - infiltration
 - subsurface flow
 - water quality
 - ecohydrology
 - hydrogeology
 - water resources
- aspects of hydrologic measurement such as:
 - surface flows (stream gauging)
 - groundwater (infiltration and flow)
 - precipitation and evaporation.

Workplace procedures for field activities include one or more of:

- use of field notebooks or log books
- SOPs covering fieldwork, sampling and testing
- equipment operating manuals, calibration procedures, instrument fault-finding procedures and general maintenance and repair procedures
- emergency, first aid and survival procedures
- requirements related to protection of the environment
- incident/accident/injury report forms.

Field monitoring activities include one or more of:

- sample collection, preservation, labelling, storage and transportation according to workplace procedures
- use and calibration of field instruments according to

written instructions

- performance of field tests for specific parameters using standard methods
- recording of data
- safe operation of motor vehicles and boats.

Hazards include one or more of:

- solar radiation, dust and noise
- personnel getting lost
- accidents, emergencies and incidents, such as snake, insect or animal bites
- exposure to severe weather conditions
- manual handling of heavy objects
- vehicle and boat handling in rough/remote conditions.

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

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Links

Companion Volume implementation guides are found in VETNet -

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

Assessment Requirements for MSS024003 Apply an understanding of environmental principles to a site

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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 conducting at least one (1) site appraisal that involves an initial survey and assessment of site condition and a basic ecological field study
- applying relevant aspects of environmental legislative and planning framework to site appraisal
- interpreting emergency, safety or environmental management plan requirements and procedures for conducting site inspections, surveys and ecological field studies
- researching, reviewing and summarising site information, including its environmental history
- accurately observing and recording the site's significant features, including the ability to 'step back' and carefully consider observations and inferences
- assessing site condition and determining relevant parameters to be measured/sampled during ecological field study
- planning and conducting an ecological study to obtain relevant and reliable data
- setting-up, calibrating and using instruments and equipment under laboratory and field conditions
- applying specified methods and data quality procedures to accurately perform field sampling and measurements
- applying a working knowledge of relevant terminology, concepts and principles in geology, geomorphology, hydrology and ecology to provide a scientific, systematic appraisal of site environmental condition
- seeking advice when issues/problems are beyond scope of competence/responsibility
- using clear and concise verbal communication to convey information and avoid or resolve work conflicts
- preparing concise and accurate reports that contain simple conclusions and interpretations based on raw or summarised data
- following procedures for working safely, transporting and storing equipment, minimising environmental impacts and responding to emergency incidents and accidents.

Knowledge Evidence

Must provide evidence that demonstrates knowledge of:

- scientific terminology for environmental and ecological systems relevant to job role

- fundamental concepts and principles in chemistry, physics, geology and biology to support a scientific approach to basic field ecology, including:
 - structure of earth systems, including lithosphere, hydrosphere, atmosphere and biosphere (ecosphere)
 - geomorphology, climate and hydrology
 - energy and material flows and cycles, including biogeochemical cycles
- fundamentals of ecology, including:
 - ecosphere, biome and major ecosystem types
 - trophic structure of ecosystems, and hierarchies
 - organism, population, community, ecosystem hierarchy; habitat and biodiversity
 - abiotic and biotic components and their interrelationships and dependencies
 - ecological systems and dynamics; stability, succession and disruption
- specific legislation, policies and codes of practice related to ecological field activities
- ecological, chemical and physical field monitoring procedures relevant to job role
- procedures for maintaining, storing and transporting samples/specimens to ensure their wellbeing, viability and integrity
- relevant hazards; health, safety and environment requirements, including field safety/survival principles.

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 data, results and site reports prepared by the candidate
 - feedback from supervisors that the candidate consistently follows workplace procedures when conducting site appraisals; works safely; accurately observes site features; and produces work outputs within agreed timeframes
 - review of candidate's responses to simulated emergency incidents, accidents and/or field survival scenarios

- oral and/or written questions to assess the candidate's understanding of scientific terminology, concepts and principles associated with appraising the environmental condition of sites; regulations and workplace procedures associated with field activities; sampling and measurement methods; and interpretation of site observations
- observation of the candidate conducting site appraisals.
- Access is required to all instruments, equipment, materials, workplace documentation, procedures, and specifications associated with this unit, including, but not limited to:
 - access to suitable sites and a vehicle
 - survey equipment, sampling/monitoring equipment, cameras, consumables, maps and flora/fauna keys
 - documentation, including site information, environmental management plans, codes of practice and field protocols, equipment manuals, workplace procedures and test/survey methods.
- 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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