



Australian Government

MSS024008 Recognise common geological landforms and samples

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to MSS024008A Recognise common geological landforms and samples

Application

This unit of competency covers the ability to recognise common geological landforms and relate these to basic geological processes and other ecosystem components. Personnel are also expected to obtain (near) surface samples of common rocks, minerals and soils and identify them using classification tables and charts.

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

Sampling and testing

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 field work | 1.1 | Review job request to identify the equipment involved, samples to be collected and/or test methods. |
| | | 1.2 | Identify hazards and workplace safe work procedures associated with the site, samples, test methods and equipment used. |
| | | 1.3 | Confirm site location, access, timing and any client requirements. |
| | | 1.4 | Assemble all required equipment/materials and check that they are fit for purpose. |
| | | 1.5 | Stow equipment/materials to ensure their safe transport, as necessary. |
| | | 1.6 | Arrange transport to site, as necessary. |
| | | 1.7 | Liaise with appropriate personnel on arrival at site to ensure safety and minimise disruption to others, as necessary. |
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| 2 | Recognise geological structures and processes | 2.1 | Recognise common landforms and relate these to geological processes. |
| | | 2.2 | Interpret simple geological maps, diagrams and aerial photos. |
| | | 2.3 | Apply principles of geological processes and the geological timescale to explain the formation and occurrence of common rocks, minerals, soils and aquifers. |
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| 3 | Identify common rocks and minerals | 3.1 | Sort handheld specimens of common sedimentary, igneous and metamorphic rocks by observing their textural, structural and mineralogical properties. |
| | | 3.2 | Identify handheld specimens of common rocks and minerals by comparing their physical properties with classification charts and tables. |

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| 4 | Identify common soil types and their properties | 4.1 | Obtain soil samples using specified sampling equipment and methods. |
| | | 4.2 | Examine soil colour, texture and properties of soil components to classify common soils. |
| | | 4.3 | Identify and describe simple soil profiles at field sites. |
| | | 4.4 | Recognise influences of rock type, drainage, age and climate on development of soil profiles. |
| | | 4.5 | Recognise common forms of soil degradation. |
| 5 | Relate local geology to flora and fauna and land use | 5.1 | Apply the basic relationships between parent material, climate, topography, soils and living ecosystem components to interpret sites. |
| | | 5.2 | Recognise how local geology can influence the revegetation or rehabilitation of sites. |
| 6 | Maintain a safe work environment | 6.1 | Use safe work procedures and protective equipment to ensure personal safety and that of others. |
| | | 6.2 | Minimise environmental impacts of sampling/testing and generation of waste. |
| | | 6.3 | Collect and/or dispose of all waste in accordance with environmental/quarantine requirements and workplace procedures. |
| 7 | Report data and finalise documentation | 7.1 | Report field data in the required formats and expected timeframe. |
| | | 7.2 | Complete all required documentation. |
| | | 7.3 | Maintain the security and confidentiality of data and documentation in accordance with workplace requirements. |

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, acquisition and planning; environmental protection; cultural/heritage sites; vegetation management; nature conservation and wildlife/plant protection; water management; soil conservation; pollution and contaminated sites; fisheries, forestry and mining operations
- legislation, standards and codes of practice for work health and safety (WHS), handling of dangerous goods
- Australian and international standards covering environmental management such as AS/NZS ISO 14000 Set; testing of soils such as AS 1289 series
- registration/licensing and/or accreditation requirements
- workplace or regulator's procedures for sampling and in-field testing
- 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.

Equipment and materials include one or more of:

- survey equipment, compass, global positioning system (GPS), maps and aerial photos
- tape measure, clinometers and theodolite
- hammers, picks, shovel, scoops, buckets, bags, sieves and sample containers
- coring/excavation equipment (e.g. auger)
- hand lens and microscope
- pH meter and conductivity meter
- chemical field test kits
- worksheets, sampling/test methods
- portable computers and personal digital assistants (PDAs).

Common landforms include one or more of:

- mounds, hills, ridges, cliffs, valleys, rivers, peninsulas and numerous other structural and size-scaled (i.e. ponds vs. lakes, hills vs. mountains) elements, including various kinds of inland and oceanic water bodies and sub-surface features
- geological features characterised by physical attributes, such as elevation, slope, orientation, stratification, rock exposure and soil type.

Geological processes include one or more of:

- plate tectonics
- glaciation
- vulcanism
- action of wind and water
- weathering
- mass wasting or erosion
- action of groundwater and surface water.

Physical properties of common rocks and minerals include one or more of:

- composition, texture and structure
- colour, streak, crystal form, habit, cleavage, fracture and hardness.

Common soil properties include one or more of:

- colour
- structure (i.e. size and shape of aggregate particles)
- texture (i.e. varying percentages of sand, silt or clay, and organic matter)
- water retention and water repellence
- depth to bedrock
- pH
- chemical properties (e.g. nitrates, sulphates, phosphates and carbonates)
- electrical resistivity and conductivity.

Soil degradation includes one or more of:

- forms of erosion, such as gully, sheet, landslide, tunnel and stream bank
- erosion agents, such as wind, water, heating and cooling of rocks, freezing of water in cracks, plant roots, upheaval of trees and chemicals
- weathering
- decomposition of organic material
- salinity
- acidification

- structural degradation
- soil pollution (e.g. hydrocarbons and heavy metals).

Hazards include one or more of:

- sunlight, dust, noise and heat
- extreme weather conditions (e.g. fire, flood and storms)
- manual/handling of heavy equipment or materials
- crushing, entanglement and cuts associated with moving machinery
- vehicular traffic on roads and sites
- injuries caused by falling objects and working conditions, such as uneven surfaces, heights, slopes, wet surfaces, trenches and confined spaces
- biohazards (e.g. microbiological organisms in soils)
- chemical hazards/contaminants in soils.

WHS 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

MSA Training Package Implementation Guides - <http://mskills.org.au/training-packages/info/>