



Australian Government

MSS024007 Collect and evaluate meteorological data

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to MSS024007A Collect and evaluate meteorological data

Application

This unit of competency covers the ability to site and set up basic ‘ground level’ meteorological equipment and collect and record reliable data. It also includes the ability to assess data quality, interpret significant data features and use the data to assist with analysing or processing other environmental monitoring measurements.

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; solid and hazardous waste management, and site remediation; management of contaminated sites; 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

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 field work | 1.1 | Review job request to identify the equipment required and the appropriate meteorological parameters to be measured. |
| | 1.2 | Identify hazards and workplace safe work procedures associated with the site, 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 **Perform basic meteorological measurements**
 - 2.1 Select an appropriate location for the meteorological equipment at the site to achieve valid readings for the required parameters.
 - 2.2 Install and check instrumentation and any recording/data logging equipment to ensure it is functioning correctly.
 - 2.3 Confirm calibration status of meteorological equipment.
 - 2.4 Perform measurements using 'ground level' meteorological equipment.
 - 2.5 Collect meteorological data using physical or electronic methods.
 - 2.6 Ensure wind direction sensors are aligned or corrected to true north rather than magnetic north.
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- 3 **Verify meteorological data**
 - 3.1 Ensure that quality requirements for data are met.
 - 3.2 Perform any required corrections, calculations and data manipulations and identify significant trends in data.
 - 3.3 Check for anomalous data and take appropriate corrective action.
 - 3.4 Verify that processed data meets requirements.

4	Interpret and apply meteorological information	4.1	Relate meteorological data to weather maps and other sources of meteorological data.
		4.2	Associate meteorological conditions with related weather maps.
		4.3	Compare weather patterns and data for different time periods and geographic locations.
		4.4	Interpret meteorological data in terms of local atmospheric conditions.
		4.5	Use meteorological data to interpret and/or assist with processing air and/or noise monitoring data.
5	Maintain a safe work environment	5.1	Use safe work procedures and protective equipment to ensure personal safety and that of others.
		5.2	Minimise environmental impacts of meteorological measurements and generation of waste.
		5.3	Collect and/or dispose of all waste in accordance with environmental/quarantine requirements and workplace procedures.
6	Report data and finalise documentation	6.1	Report field data in the required formats and expected timeframe.
		6.2	Complete all required documentation.
		6.3	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; 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 work health and safety (WHS)
- Australian and international standards covering environmental management, such as AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set; and air measurements, such as AS 2923 Ambient air
- industry methods and guidelines, such as:
 - Australian Bureau of Meteorology Observation Specification 2013.1 Guidelines for the siting and exposure of meteorological instruments and observing facilities
 - National Environment Protection (Ambient Air Quality) Measure Technical Paper No 6: Meteorological Measurements
 - World Meteorological Organisation - No. 8: Guide to Meteorological Instruments and Methods of Observation
- registration/licensing and/or accreditation requirements
- workplace or regulator's procedures for meteorological monitoring; recording, processing, presenting and reporting meteorological data
- 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.

Siting and installation considerations for meteorological instrumentation include one or more of:

- topography
- vegetation and built structures
- exposure
- availability of services
- site security.

Meteorological instrumentation includes one or more of:

- thermometers, such as liquid in glass, thermocouples, Pt resistance, thermistors, hygrometers and psychrometers
- barometers, such as aneroid, mercury
- anemometers, such as rotational, pressure tube and Doppler
- rain gauges, such as manual, tipping bucket, automatic weather stations (AWS), radiometers, net pyranometer, total solar radiometer.

Meteorological parameters include one or more of:

- temperature and temperature gradient
- atmospheric pressure
- humidity
- precipitation
- wind speed and direction (vector and scalar)
- vertical wind speed
- insolation and net radiation
- evaporation.

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 and wet surfaces
- 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

Companion Volume implementation guides are found in VETNet -

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

Assessment Requirements for MSS024007 Collect and evaluate meteorological data

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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:

- siting and setting up basic ‘ground level’ meteorological monitoring equipment and collecting reliable field data on at least two (2) occasions
- analysing, interpreting and summarising the key features of at least two (2) sets of meteorological data
- explaining the purpose and objectives of meteorological monitoring tasks, including:
 - information and analysis required
 - end users of information
 - significance of outcomes for broader programs
- accurately interpreting maps, aerial photos, instructions, specifications, procedures and/or manuals associated with job role
- planning and organising resources for efficient meteorological data collection
- setting up, checking and operating meteorological equipment at a field site in accordance with manuals and/or workplace procedures
- accurately recording and/or storing field data
- assessing quality of field data and interpreting significant features and anomalies
- identifying and rectifying basic instrument faults
- verifying that processed data meets quality requirements
- comparing collected/processed data with other meteorological data sets, associating meteorological parameters, interpreting results and drawing logical conclusions
- seeking advice when issues/problems are beyond scope of competence/responsibility
- accurately reporting field data and site observations
- following procedures for working safely and minimising environmental impacts and waste.

Knowledge Evidence

Must provide evidence that demonstrates knowledge of:

- distinction between weather and climate and an awareness of climate change science
- composition and structure of the atmosphere, especially the lower atmosphere
- solar energy spectrum and link to atmospheric conditions
- seasonality, effects of latitude and continental geography

- atmospheric motion (horizontal and vertical)
- lifting (orographic, convective and frontal)
- basic pressure/temperature/volume principles
- high and low pressure cell formation
- weather effects (e.g. precipitation, temperature and wind strength/direction)
- local wind effects (e.g. sea breeze, city breeze, katabatic winds and anabatic winds)
- forms of atmospheric moisture and humidity
- atmospheric conditions related to wind direction
- measurement of atmospheric conditions (e.g. precipitation, temperature, humidity, wind speed and direction)
- interpretation of weather maps (e.g. symbols used, terminology, interpretation and forecasts)
- historical and geographic comparison of weather data
- scalar and vector wind speed and direction calculations
- wind run
- operation, calibration and maintenance of meteorological equipment
- effects of instrument set-up, such as different sampling intervals and averaging times.

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 meteorological field/processed data and field records generated by the candidate
 - review of candidate's interpretation of meteorological data sets for accuracy and completeness
 - feedback from supervisors that the candidate is able to safely site, set-up and operate basic 'ground level' meteorological monitoring equipment; generate verified meteorological data; accurately interpret data sets and report the findings within the agreed timeframe.

- oral and/or written questions to check the candidate's understanding of basic meteorology, in-field measurement of meteorological parameters and interpretation of data sets, relevant workplace procedures
- observation of the candidate working in the field with a focus on:
 - identification of monitoring site according to defined criteria
 - safe, reliable set-up and operation of equipment
 - accurately recording and storing basic meteorological data.
- 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 vehicle
 - meteorological monitoring equipment; camera; consumables; calculator, computer and relevant software or laboratory information system
 - documentation, such as site information and history, maps, aerial photos; workplace procedures governing siting and operation of meteorological monitoring equipment and data collection; and equipment manuals.
- 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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