



Australian Government

MSL974009 Undertake field-based, remote-sensing monitoring

Release: 1

MSL974009 Undertake field-based, remote-sensing monitoring

Modification History

Release 1. Supersedes and is equivalent to MSL974009A Undertake field-based, remote-sensing monitoring

Application

This unit of competency covers the ability to organise and undertake defined field-based, remote-sensing monitoring activities. These may include assembling, setting up and checking appropriate monitoring equipment on-site, sampling, data collection and storage, equipment and system maintenance, and associated field testing and laboratory analysis. This unit of competency does not cover developing specific monitoring protocols or detailed design and/or construction of instruments, buildings, structures associated with the remote-sensing monitoring activities.

This unit of competency is applicable to technical, field and environmental officers working in the environmental services, geotechnical, construction materials testing and mining industry sectors.

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

Pre-requisite Unit

Nil

Competency Field

Testing

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
1	Confirm monitoring requirements with supervising staff	1.1	Clarify the purpose, objectives and the preferred site for the remote-sensing activities
		1.2	Review all emergency and hazard/risk assessments, site safety and environmental requirements, and data quality procedures for the field activities

- 1.3 Clarify details of all field parameters to be monitored and the preferred monitoring and data quality procedures
 - 1.4 Confirm final data formats will suit stakeholders who receive or use the data
 - 1.5 Clarify details of any statutory requirements that apply to the site and associated field activities
 - 1.6 Review existing remote-sensing monitoring protocols, and siting standards or associated in-house requirements which relate to the field activities
- 2 **Assemble remote-sensing field monitoring system**
 - 2.1 Identify required instruments, equipment and consumables and associated maintenance and replacement procedures
 - 2.2 Identify site access, services and security requirements and any site constraints
 - 2.3 Complete all administrative requirements and obtain appropriate approvals
 - 2.4 Confirm required instrument calibration and data storage, handling and transfer systems
 - 2.5 Field-check site suitability for monitoring activities and define alternative sites as necessary
 - 2.6 Assemble remote-sensing monitoring system and check all components under laboratory conditions
- 3 **Organise and establish the remote-sensing monitoring site**
 - 3.1 Identify, and confirm with senior staff, all resources required for operation of monitoring system in the field
 - 3.2 Confirm that all safety, emergency and risk assessment requirements and data quality procedures have been correctly applied to the field activities
 - 3.3 Ensure correct packaging and transportation of equipment and instruments to defined field site
 - 3.4 Establish remote monitoring station
 - 3.5 Test operation of total system under field conditions

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| 4 | Operate and maintain monitoring site | 4.1 | Undertake regular or emergency inspections of the site according to set procedures |
| | | 4.2 | Undertake calibration checks according to written instructions |
| | | 4.3 | Inspect and maintain all instruments, equipment and data systems and organise replacement of defective items |
| | | 4.4 | Perform all field and laboratory activities safely and with minimal impact on the environment |
| | | 4.5 | Document all site visits and associated actions |
| | | 4.6 | Review the total monitoring activity on a regular basis and implement any required modifications or improvements |
| | | | |
| 5 | Close down field monitoring activities | 5.1 | Confirm decision to close down site and finalise all data requirements with supervising staff |
| | | 5.2 | Dismantle monitoring system and arrange checking, packaging and transportation of all equipment and instruments back to base |
| | | 5.3 | Close down site in accordance with workplace and environmental requirements |
| | | 5.4 | Hand back site and inform all relevant authorities |
| | | 5.5 | Test, decontaminate, if required, and store all equipment appropriately |
| | | 5.6 | Document all close-down actions |

Foundation Skills

This section describes those language, literacy, numeracy and employment skills 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.

Standards, codes, procedures and/or workplace requirements

Standards, codes, procedures and/or workplace requirements include the latest version of one or more of:

- Australian and international standards covering the requirements for the competence of testing and calibration laboratories, laboratory safety and occupational clothing, quality management, environmental management and transport emergency procedures
- national work health and safety (WHS) standards and codes of practice, national measurement regulations and guidelines, and national environment protection measures
- specific codes, guidelines, procedures and methods, such as the principles of good laboratory practice (GLP), Australian Dangerous Goods Code, Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) Codes of Practice; and Government policies, such as sustainable development and impact assessment
- workplace documents, such as standard operating procedures (SOPs); quality and equipment manuals; instrument fault-finding procedures; calibration and maintenance schedules; material safety data sheets (MSDS) and safety procedures; incident/accident/injury report forms; laboratory schedules; workplace recording and reporting procedures; field protocols, procedures, note books and log books; and waste minimisation and safe disposal procedures
- standard methods for sampling, remote-sensing/monitoring protocols, data quality procedures and site-specific requirements

Remote-sensing monitoring activities

Remote-sensing monitoring activities include, but are not limited to, one or more of:

- meteorology (e.g. temperature, humidity and wind)
- geology/mining (e.g. movement of structures, vibration and blast shock waves)
- hydrology (e.g. water flow and water depth in catchment)
- environmental (e.g. air quality, water quality and noise)
- civil engineering (e.g. temperature, displacement and/or hydrostatic pressure on structures and movement of ions in structures)

Instruments and equipment

Instruments and equipment include, but are not limited to, one or more of:

- navigation and communication equipment, such as compass, maps, global positioning system (GPS), two-way radio and mobile phone
- sampling and autosampling equipment for air, water, stormwater, wastewater and sewage
- instruments that measure air pollutants, such as oxides of carbon, oxides of sulphur, oxides of nitrogen, hydrocarbons and particulates (PM10, PM2.5 total suspended), and ozone
- instruments that measure water quantity and/or hydrological parameters, such as flow, dissolved oxygen (DO), electrical conductivity, pH, turbidity, nitrates, phosphates and temperature
- instruments that measure meteorological parameters, such as pressure, minimum and maximum temperature, wet and dry bulb temperatures, humidity, rainfall, and wind speed and direction
- instruments that measure sound pressure levels, such as noise or sound pressure meter
- instruments that measure displacement or durability of civil engineering structures and consolidation, such as load cells, inclinometers, piezometers, strain gauges and accelerometers

Communication and consultation strategies

Communication and consultation strategies include:

- face-to-face and/or telephone conversations
- meetings and written documents
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Purpose of field monitoring activities

Purposes of field monitoring activities include, but are not limited to, one or more of:

- single or multiple site monitoring
- component of workplace environmental management plan
- remote-sensing monitoring of physical/chemical and mechanical/geotechnical parameters
- monitoring of consolidation of soils and foundations
- monitoring the durability of structures (e.g. roads)
- requirement to comply with statutory requirements
- requirement to comply with industry sampling/monitoring protocols/codes of practice

Administrative requirements and appropriate approvals

Administrative requirements and appropriate approvals include, but are not limited to, one or more of:

- travel requisitions

- authority for use of vehicles and equipment
- permits
- insurance

Site safety and environmental requirements

Site safety and environmental requirements include, but are not limited to, one or more of:

- use of personal protective equipment (PPE), such as sunscreen, hats, safety glasses, gloves, coveralls and safety boots
- ‘stay with vehicle’ and other survival techniques
- following a regular communication schedule
- using GPS, maps and aerial photos
- handling, storing and disposing of all hazardous materials/waste in accordance with MSDS, labels, workplace procedures, codes and regulations
- regular cleaning of vehicles and equipment to prevent transfer of pests and contaminants
- driving vehicles to minimise soil erosion and damage to fauna and vegetation

WHS and environmental management requirements

WHS and environmental management requirements include:

- complying with WHS and environmental management requirements at all times, which may be imposed through state/territory or federal legislation. These requirements must not be compromised at any time
- applying standard precautions relating to the potentially hazardous nature of samples

Unit Mapping Information

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Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=5c63a03b-4a6b-4ae5-9560-1e3c5f462baa>

Assessment Requirements for MSL974009 Undertake field-based, remote-sensing monitoring

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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:

- organising and safely undertaking defined field-based, remote-sensing monitoring activities on at least two (2) occasions
- accurately identifying and interpreting statutory requirements
- safely undertaking reconnaissance and evaluating monitoring sites
- confirming type, quantity and quality of data needed for defined monitoring activities
- safely packaging and transporting supplies, equipment and instruments into the field
- identifying and establishing a secure field monitoring site according to defined criteria
- assembling, testing and closing down a field-based, remote-sensing monitoring system on-site
- performing calibration and pre-use checks and maintaining equipment and systems in accordance with workplace procedures
- operating the monitoring system to collect and store reliable data in accordance with workplace and data quality procedures
- communicating effectively and efficiently with staff and other relevant parties and negotiating satisfactory agreements
- responding effectively to changed or unforeseen circumstances
- recognising hazards and risks and following all safety and environmental requirements.

Knowledge Evidence

Must provide evidence that demonstrates knowledge of:

- terminology, protocols and statutory requirements relevant to field-based environmental monitoring activities conducted as part of job role
- purpose and objectives of the monitoring activities conducted as part of job role, including:
 - information and analysis required
 - end users of information
 - significance of outcomes for broader programs
- operating principles, technical capabilities and limitations of remote-sensing equipment and instruments used

- basic fault identification and rectification procedures for field instruments and monitoring system
- data quality, data storage, analysis and presentation procedures
- workplace and/or legal traceability requirements
- hazards and risks associated with field-based, remote-sensing monitoring
- field-based work health and safety (WHS) requirements, emergency plans and environmental requirements.

Assessment Conditions

- Judgment 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).
- This unit of competency may be assessed with:
 - MSL935004 Maintain instruments and equipment
- Holistic assessment methods include:
 - review of data and results obtained by the candidate
 - feedback from supervisors and peers about the candidate's performance in the field
 - observation of the candidate assembling, conducting calibration and pre-use checks and operating a field-based, remote-sensing monitoring system on-site to collect and store reliable data
 - review of the candidate's response to simulation exercises, such as accident and emergency situations, and/or checking and testing equipment
 - oral and/or written questions covering specifications, requirements, workplace procedures and equipment/instruments used for monitoring activities conducted as part of job role.
- Access is required to instruments, equipment, materials, workplace documentation, procedures and specifications associated with this unit, including, but not limited to:
 - work program, workplace procedures covering safety and risk assessment, first aid, survival and emergency procedures, environmental requirements, codes of practice and field protocols
 - vehicles, monitoring and communication equipment, consumables and 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 competence 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 a laboratory about performing the competency being assessed within the last twelve months.

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