



Australian Government

Department of Education, Employment and Workplace Relations

MSL975011A Design and supervise complex environmental field surveys

Revision Number: 1

MSL975011A Design and supervise complex environmental field surveys

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the ability to design and supervise complex field surveys for a wide range of environmental systems. This unit covers confirming survey requirements, designing and organising field surveys to achieve their purpose and supervising the field survey according to a defined plan.
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Application of the Unit

Application of the unit	<p>This unit of competency is applicable to technical officers working in the environmental industry sector. All operations must comply with relevant standards, appropriate procedures and/or enterprise requirements.</p> <p>Industry representatives have provided case studies to illustrate the practical application of this unit of competency and to show its relevance in a workplace setting. These can be found at the end of this unit of competency under the section 'This competency in practice'.</p>
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		
	MSL974007A	<i>Undertake environmental</i>

Prerequisite units	
	<i>filed-based monitoring</i>

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. Confirm survey requirements with senior staff	<p>1.1. Confirm the purpose and objectives of the field survey activities with senior management and the level/detail of information required</p> <p>1.2. Clarify with all stakeholders the purpose and objectives of the field survey activities within the context of the enterprise's overall environmental program</p> <p>1.3. Identify and accurately interpret all external statutory requirements and enterprise protocols that relate to the defined field survey activities</p> <p>1.4. Analyse drivers and constraints that may influence field survey activities</p> <p>1.5. Document the type, quantity and quality of data needed to meet the defined objectives</p> <p>1.6. Refine and document the detailed objectives of the field activities with senior management and key stakeholders</p>
2. Design field survey activities	<p>2.1. Develop and document details of the field survey methodology and, if appropriate, trial and refine them under field conditions</p> <p>2.2. Discuss and confirm survey methodology with senior staff and external experts or stakeholders, as appropriate</p> <p>2.3. Develop work program, including timetable and staff roles and responsibilities for the total field survey and all related activities</p> <p>2.4. Ensure that work program conforms to enterprise requirements covering risk management, data quality procedures, safety, environmental and emergency requirements</p> <p>2.5. Document work program, address all administration requirements and obtain appropriate approvals</p>
3. Identify resources and supervise pre-survey checks	<p>3.1. Identify and list all resources required to implement the agreed work program</p> <p>3.2. Arrange collection and checking of all equipment, field instruments, and supplies required for implementation of the work program</p> <p>3.3. Supervise calibration of all appropriate field instruments</p> <p>3.4. Arrange correct packaging and transportation of equipment and instruments</p>

ELEMENT	PERFORMANCE CRITERIA
	3.5. Ensure that all access, transport, communication and emergency systems have been arranged and are suitable for all field locations and activities
4. Supervise field survey activities	4.1. Supervise all field survey and associated activities 4.2. Monitor equitable duty rosters covering field surveys activities in consultation with all staff 4.3. Ensure that all data quality procedures are followed 4.4. Ensure that all survey work is performed safely and with minimal impact on the environment
5. Supervise close down of field activities	5.1. Arrange for the checking, packaging and transportation of all samples, equipment, and instruments back to base 5.2. Ensure that site is left in accordance with enterprise and environmental requirements 5.3. Monitor dispatch of collected samples for subsequent laboratory analyses 5.4. Ensure before final storage that all equipment and instruments are tested and decontaminated, as necessary 5.5. Ensure all field data is stored appropriately for subsequent analysis 5.6. Report results, any anomalies and recommendations to data analysers, users and/or supervisor

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- selecting and applying appropriate field survey practices
- identifying and using equipment and instruments
- sample collection, preservation, labelling, packaging, storage and transportation
- project management
- communicating effectively with senior staff and stakeholders
- modifying existing field survey protocols
- supervising junior staff
- developing, documenting and supervising field survey work programs
- managing day-to-day field surveys and associated activities
- adapting field activities to suit changing circumstances
- completing field survey planning and documentation
- communicating specific activities to all relevant staff as part of the total field survey work program
- negotiating effectively with staff and stakeholders and resolving conflict

Required knowledge

Required knowledge includes:

- understanding of the purpose and objectives of the activity including:
 - information and analysis required
 - end users of information
 - significance of outcomes for broader programs
- rights and responsibilities of employers and employees
- enterprise legal requirements regarding field survey activities
- enterprise risk-management requirements
- field survey protocols
- specific field survey practices and techniques
- correct terminology relevant to the defined field survey activity
- data quality procedures
- survey principles and practices
- field safety, environmental and emergency requirements
- data recording and storage methods
- environmental planning and assessment procedures
- current developments in field instrumentation, survey equipment and communication systems

REQUIRED SKILLS AND KNOWLEDGE

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| <ul style="list-style-type: none">• relevant health, safety and environment requirements |
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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

Assessors should ensure that candidates can:

- demonstrate understanding of the purpose and objectives of the activity including:
 - information and analysis required
 - end users of information
 - significance of outcomes for broader programs
- demonstrate understanding of the rights and responsibilities of employers and employees in terms of the following:
 - enterprise legal requirements regarding field survey activities
 - enterprise data quality procedures
 - enterprise field safety procedures
 - riskmanagement requirements
 - enterprise field emergency plans
 - enterprise environmental requirements
 - field survey protocols
- communicate effectively with senior staff and stakeholders
- modify existing field survey protocols
- supervise junior staff, where appropriate
- develop, document and supervise field survey work program
- manage day-to-day field surveys and associated activities
- adapt field activities to suit changing circumstances
- complete field survey planning and documentation clearly and accurately within specified time frame
- accurately communicate to all relevant staff their specific activities as part of the total field survey work program
- negotiate effectively with staff and stakeholders and resolve conflicts, where possible.

EVIDENCE GUIDE	
Context of and specific resources for assessment	<p>This unit of competency is to be assessed in the workplace or simulated workplace environment.</p> <p>This unit of competency may be assessed with:</p> <ul style="list-style-type: none"> • <i>MSL935004A Maintain instruments and equipment.</i> <p>Resources may include:</p> <ul style="list-style-type: none"> • legislation, regulations, codes of practice, enterprise procedures and field protocols • vehicles, survey equipment, sampling/monitoring equipment, consumables and manuals.
Method of assessment	<p>The following assessment methods are suggested:</p> <ul style="list-style-type: none"> • review of environmental field survey plan designed by the candidate • observation of fieldwork performed by the candidate with a focus on: <ul style="list-style-type: none"> • field survey practices and procedures • accurate data recording and reporting • safety, emergency and environmental impact assessment associated with survey activities • communication techniques • general pre-survey site reconnaissance • feedback from peers and supervisors that relevant enterprise procedures were clearly and accurately followed • feedback from stakeholders that consultation and outcomes met their needs, where appropriate • oral and written questions to assess underpinning knowledge • simulation exercises to observe general field survey preparation, accident situations and emergency responses. <p>In all cases, practical assessment should be supported by questions to assess underpinning knowledge and those aspects of competency which are difficult to assess directly.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p> <p>Access must be provided to appropriate learning and/or</p>

EVIDENCE GUIDE	
	<p>assessment support when required.</p> <p>The language, literacy and numeracy demands of assessment should not be greater than those required to undertake the unit of competency in a work like environment.</p>
This competency in practice	<p>Industry representatives have provided the case studies below to illustrate the practical application of this unit of competency and to show its relevance in a workplace setting.</p> <p>Environmental (1)</p> <p>An environmental officer is asked to design and supervise a series of field surveys covering soils, flora, fauna and water quality. Part of the study area is potentially high in nature conservation value with the rest of the area being considered for low density residential development. The aim of the study is to determine which parts of the study area should be set aside for protected open space and, if so, to develop an environmental management plan based on the results of the field surveys.</p> <p>Environmental (2)</p> <p>A technical officer is part of a team preparing an environmental impact statement (EIS) for a large industrial site. The technical officer is responsible for supervising all associated field surveys. They need to understand the requirements of the relevant environment protection legislation and local environment department, full details of all field surveys and associated enterprise procedures and how to present data so that it can be efficiently incorporated into the draft EIS. Based on this information the technical officer prepares a detailed work plan, and associated timeline, which identifies all field survey activities and associated resources. They are also careful to identify all quality assurance requirements. The draft EIS report is reviewed closely by management before its release given the level of public interest and the possibility of court action sometime in the future.</p>

Range Statement

RANGE STATEMENT	
<p>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.</p>	
Codes of practice	Where reference is made to industry codes of practice, and/or Australian/international standards, it is expected the latest version will be used
Standards, codes, procedures and/or enterprise requirements	<p>Standards, codes, procedures and/or enterprise requirements may include:</p> <ul style="list-style-type: none"> • animal welfare codes and ethics committee approval • codes of practice and field protocols • consultation (e.g. with traditional owners) • data quality assurance procedures • emergency plans • environmental audits • environmental impact assessment procedures • environmental protection and conservation legislation • environmental standards (e.g. air, water and noise) • existing plans covering environmental field activities • field survey plans • fieldwork procedures and standard operating procedures (SOPs) • industry based protocols • national environment protection measures • occupational health and safety (OHS) national standards and codes of practice • permits for access to land (e.g. Aboriginal reserves) • permits for wildlife capture and handling • policies and statutory requirements • risk management plans • safety and accident/injury plans

RANGE STATEMENT	
Field survey activities	<p>Field survey activities may include:</p> <ul style="list-style-type: none"> • meteorology • geology • soils • hydrology • geomorphology • water quality • noise • vegetation • wildlife • climate • land uses • land resources • agriculture • forestry • mining • conservation • recreation
Clients and stakeholders	<p>Clients and stakeholders may include:</p> <ul style="list-style-type: none"> • Commonwealth, state/territory and local government agencies • organisation with monitoring and/or survey responsibilities • regulatory authorities • private companies • developers
The purpose or objective of the field survey	<p>The purpose or objective of the field survey may include:</p> <ul style="list-style-type: none"> • part of enterprise environmental management plan • statutory requirements • environmental impact assessment for major development • environment audit • pollution control activity • general environmental and ecological surveys • research studies
Drivers and constraints	<p>Drivers and constraints may include:</p>

RANGE STATEMENT	
	<ul style="list-style-type: none"> • political agendas, social and economic issues • new field survey protocols or codes of practice • recent judicial decisions • recent environmental impact assessments or audits • media or public concerns • field safety or accident/incident issues • competencies and availability of staff • time available to design and implement field activities
Hazards	<p>Hazards may include:</p> <ul style="list-style-type: none"> • 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 • power tools, generators and moving machinery • vehicle and boat handling in rough/remote conditions
Safety procedures and control measures	<p>Safety procedures and control measures may include:</p> <ul style="list-style-type: none"> • use of personal protective equipment, such as sunscreen, hats, safety glasses, gloves, coveralls and safety boots • 'stay with vehicle' and other survival techniques • regular communication schedule • global positioning system (GPS), maps and aerial photos • handling, storage and disposal of all hazardous materials/waste in accordance with material safety data sheets (MSDS), labels, enterprise procedures, codes and regulations
Administrative requirements and approvals	<p>Administrative requirements and approvals may include:</p> <ul style="list-style-type: none"> • travel requisitions • authority for use of vehicles and equipment • insurance • permits

RANGE STATEMENT	
Field survey resources	<p>Field survey resources may include:</p> <ul style="list-style-type: none"> • staff with appropriate competencies • transport systems (e.g. vehicles, boats and aircraft) • navigation and communication equipment • sampling and monitoring equipment • standard and specialised monitoring equipment • survey equipment • general field monitoring and/or field testing equipment • first aid and/or survival kits and equipment • consumables
Field instruments and equipment	<p>Field instruments and equipment may include:</p> <ul style="list-style-type: none"> • samplers (e.g. air, surface and groundwater, bottom sediments, soils and animals) • meters (e.g. dissolved oxygen, conductivity, pH, turbidity, liquid flow, light, rainfall, humidity, temperature, oxides of carbon, oxides of sulphur, oxides of nitrogen, particulates, ozone and hydrocarbons) • associated information, such as equipment operating manuals, field instrument operating instructions, calibration procedures, instrument fault finding procedures, general maintenance and repair procedures, first aid and survival manuals
Field procedures	<p>Field procedures may include:</p> <ul style="list-style-type: none"> • sampling • field testing (validated and authorised) • animal trapping (and release), tagging and keeping • emergency response, safety and survival aspects • data collection, analysis and reporting • protection of the environment
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • unexpected restriction on access to sites • seasonal conditions • equipment failure or loss

RANGE STATEMENT	
	<ul style="list-style-type: none"> • communication failure/difficulties • unforeseen environment impacts • contact with hazardous wastes
Occupational health and safety (OHS) and environmental management requirements	<p>OHS and environmental management requirements:</p> <ul style="list-style-type: none"> • all operations must comply with enterprise OHS and environmental management requirements, which may be imposed through state/territory or federal legislation - these requirements must not be compromised at any time • all operations assume the potentially hazardous nature of samples and require standard precautions to be applied • where relevant, users should access and apply current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and State and Territory Departments of Health

Unit Sector(s)

Unit sector	Testing
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Competency field

Competency field	
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Co-requisite units

Co-requisite units	

