



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **MSS025008A Monitor and evaluate noise**

**Release: 1**

## **MSS025008A Monitor and evaluate noise**

### **Modification History**

Not applicable.

### **Unit Descriptor**

This unit of competency covers the ability to monitor noise using handheld sound level meters and fixed sound monitoring stations with either data logging or telemetry. It includes the ability to perform noise surveys, process data and report results in accordance with enterprise standards.

### **Application of the Unit**

This unit of competency is applicable to environmental technicians in a range of industry sectors, such as:

- environmental services (e.g. monitoring of environmental and/or occupational noise)
- environmental compliance, auditing and inspection
- environmental management
- occupational hygiene.
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### **Licensing/Regulatory Information**

Not applicable.

### **Pre-Requisites**

Not applicable.

### **Employability Skills Information**

Not applicable.

### **Elements and Performance Criteria Pre-Content**

Not applicable.

## Elements and Performance Criteria

- |   |                                       |     |  |
|---|---------------------------------------|-----|--|
| 1 | Confirm noise monitoring requirements | 1.1 | Confirm the purpose for noise monitoring with supervisor   |
|   |                                       | 1.2 | Confirm locations, timing and frequency of monitoring from enterprise or client's monitoring plan or other instructions  |
|   |                                       | 1.3 | Check that all noise measurement procedures are in accordance with client or enterprise requirements, relevant standards and codes   |
| 2 | Prepare for noise measurement         | 2.1 | Identify site hazards and review enterprise safety procedures  |
|   |                                       | 2.2 | Liaise with relevant personnel to arrange site access and obtain all clearances and/or permits, as necessary   |
|   |                                       | 2.3 | Select noise monitoring instruments and any ancillary equipment that are required for the particular task  |
|   |                                       | 2.4 | Assemble all field test equipment and complete all pre-use and calibration checks in accordance with enterprise procedures and manufacturer instructions                       |
|   |                                       | 2.5 | Stow all equipment for safe and secure transport   |
|   |                                       | 2.6 | Arrange suitable transport to, from and around site, as required   |
| 3 | Perform noise measurement             | 3.1 | Record significant site features, such as noise sources, their direction and approximate distance, relevant barriers, structures, noise sensitive areas and adjacent land uses |
|   |                                       | 3.2 | Select and record sampling sites and ensure that site conditions are conducive for valid and reliable noise measurement  |
|   |                                       | 3.3 | Measure and record relevant site condition parameters and make any modifications to  |

- procedures as appropriate
- 3.4 Check calibration of sound level meter and make any required adjustments and record results
  - 3.5 Conduct noise measurements in accordance with enterprise, regulatory and manufacturer procedures
  - 3.6 Ensure that background measurements are obtained at an appropriate time, under appropriate conditions and in accordance with enterprise/regulatory procedures
  - 3.7 Repeat and record calibration measurements at the conclusion of the measurement sequence in accordance with enterprise/regulatory procedures
  - 3.8 Collect and/or record all results and ensure that they are accurately transferred to enterprise information database
- 4 Process and interpret noise data
- 4.1 Review test data noting atypical observations
  - 4.2 Manipulate raw data to obtain corrected and adjusted data and ensure that calculated values are consistent with expectations
  - 4.3 Estimate and document uncertainty of measurement in accordance with enterprise procedures, if required
  - 4.4 Interpret trends in data and/or results and report out-of-specification or atypical results promptly to appropriate personnel
  - 4.5 Determine if obvious procedure or equipment problems have led to atypical data or results
  - 4.6 Compare results with established noise standards, statutory noise limits or similar, if relevant
  - 4.7 Record and report data and results in accordance with enterprise requirement

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|---|----------------------------------|-----|---|
| 5 | Maintain a safe work environment | 5.1 | Use established safe work practices and personal protective equipment to ensure personal safety and that of other personnel |
|   |                                  | 5.2 | Minimise the generation of wastes and environmental impacts   |
|   |                                  | 5.3 | Care for and store equipment and materials as required.   |

## Required Skills and Knowledge

### Required skills

Required skills include:

- identifying and interpreting statutory requirements accurately
- confirming type, quantity and quality of data needed for defined monitoring activity
- planning and preparing for field activities
- undertaking reconnaissance and evaluating monitoring sites
- observational skills, including the ability to ‘step back’, question and interpret those observations
- assembling, testing, operating and closing down a field-based, sound monitoring station
- packaging and transporting supplies, equipment and instruments into the field
- identifying and establishing a secure field monitoring site according to defined criteria
- using noise measurement instrumentation to obtain verifiable, quantitative results
- correcting and adjusting sound pressure level measurements and calculating required noise parameters
- performing automatic and manual measurement and calibration procedures
- responding effectively to problems, changed or unforeseen circumstances
- identifying and rectifying basic instrument faults
- researching and summarising existing data and reports
- seeking advice when issues/problems are beyond scope of competence/responsibility
- communicating effectively and writing/compiling concise and accurate reports
- working safely

### Required knowledge

Required knowledge includes:

- appropriate terminology for noise measurements
- principles and concepts of the physics of sound, the physiology of hearing and the measurement of environmental noise
- function of key components and operating principles of noise measurement instrumentation
- effects on test results of modifying equipment/instrument variables
- data processing procedures to convert measured values to final reportable data
- specific legislation, policies and codes of practice related to environmental noise measurement, noise limits
- procedures for maintaining, storing and transporting noise measurement equipment and instrumentation
- relevant health, safety and environment requirements, including field safety principles

## Evidence Guide

Overview of assessment	Competency must be demonstrated in the ability to perform consistently at the required standard.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>Assessors must be satisfied that the candidate can competently and consistently apply the skills covered in this unit of competency in new and different situations and contexts. Critical aspects of assessment and evidence include:</p> <ul style="list-style-type: none"> <li>• demonstrating an understanding of the legislative and regulatory framework relevant to noise monitoring</li> <li>• using noise measurement terminology accurately</li> <li>• planning and conducting a noise survey to produce valid data</li> <li>• operating, maintaining and calibrating noise measurement instrumentation to obtain reliable results</li> <li>• performing field tests in accordance with written instructions/enterprise procedures and obtaining reliable data</li> <li>• manipulating raw data to obtain corrected and adjusted data in the required format</li> <li>• applying basic principles of sound and noise science to evaluate noise data</li> <li>• providing accurate, complete records of noise measurements, field observations, data and results</li> <li>• working safely.</li> </ul>
Context of and specific resources for assessment	<p>This unit of competency is to be assessed in the workplace or a simulated workplace environment.</p> <p>Assessment should emphasise a workplace context and procedures found in the candidate's workplace.</p> <p>This unit of competency may be assessed with:</p> <ul style="list-style-type: none"> <li>• <i>MSS024007A Collect and evaluate meteorological data</i></li> <li>• <i>MSL974007A Undertake environmental field-based monitoring.</i></li> </ul> <p>The competencies covered by this unit would be demonstrated by an individual working alone or as part</p>

	<p>of a team.</p> <p>Resources may include:</p> <ul style="list-style-type: none"> <li>• noise measuring equipment, data loggers and telemetry equipment, vehicles, survey equipment, cameras, consumables and manuals</li> <li>• work program, enterprise procedures, codes of practice, maps and field protocols.</li> </ul>
Method of assessment	<p>The following assessment methods are suggested:</p> <ul style="list-style-type: none"> <li>• review of noise measurements, results and calculations provided by the candidate</li> <li>• feedback from peers and supervisors that the candidate consistently follows enterprise procedures and works safely</li> <li>• oral and written questioning to check the candidate's understanding of the principles of noise measurement, operation of noise instruments and processing of data</li> <li>• observation of the candidate performing a range of noise measurement tasks</li> <li>• review of workplace documentation completed by the candidate.</li> </ul> <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>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>
Guidance information for assessment	

## Range Statement

<b>Codes of practice</b>	Where reference is made to industry codes of practice, and/or Australian/international standards, it is expected the latest version will be used
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<p><b>Legislation, standards, codes, procedures and/or enterprise requirements</b></p>	<p>Legislation, standards, codes, procedures and/or enterprise requirements may include:</p> <ul style="list-style-type: none"> <li>• federal legislation, such as:</li> <li>• Environment Protection and Biodiversity Conservation Act 1999</li> <li>• state/territory government legislation and regulations and local government by-laws, policies, and plans dealing with:</li> <li>• land use, acquisition, planning and protection</li> <li>• environmental protection</li> <li>• occupational health and safety (OHS)</li> <li>• Australian and international standards, such as:</li> <li>• AS 1055.1:1997 Acoustics - Description and measurement of environmental noise - General procedures</li> <li>• AS 1055.2:1997 Acoustics - Description and measurement of environmental noise - Application to specific situations</li> <li>• AS 1055.3:1997 Acoustics - Description and measurement of environmental noise - Acquisition of data pertinent to land use</li> <li>• AS IEC 61672.1:2004 Electroacoustics - Sound level meters - Specifications</li> <li>• AS IEC 61672.2:2004 Electroacoustics - Sound level meters - Pattern evaluation tests</li> <li>• AS IEC 60942:2004 Electroacoustics - Sound calibrators</li> <li>• Environmental Protection Authority (EPA) or government departmental guidelines and manuals, such as:</li> <li>• Noise Measurement Manual (QLD EPA)</li> <li>• A Guide to Measurement and Analysis of Noise (VIC EPA)</li> <li>• Noise Guide for Local Government (NSW)</li> <li>• equipment manuals and warranties, supplier catalogue and handbooks</li> <li>• government policy (e.g. sustainable development and impact assessment)</li> <li>• OHS national standards and codes of practice</li> <li>• site-specific requirements</li> <li>• specific environmental standards</li> </ul>
<p><b>Principles of noise measurement</b></p>	<p>Principles of noise measurement may include:</p> <ul style="list-style-type: none"> <li>• noise terminology:</li> </ul>

	<ul style="list-style-type: none"> <li>• sound and noise</li> <li>• frequency, pitch and wavelength</li> <li>• sound power and acoustic energy</li> <li>• sound pressure and sound pressure level</li> <li>• sound intensity</li> <li>• noise measurement units (dBA and others)</li> <li>• frequency weighting curves</li> <li>• adding and subtracting sound levels</li> <li>• physiology of hearing</li> <li>• perception of noise</li> <li>• sources of noise</li> <li>• typical noise levels</li> <li>• types of noise:</li> <li>• continuous</li> <li>• intermittent</li> <li>• impulsive</li> <li>• point sources and line sources</li> </ul>
<b>Purpose of noise measurement</b>	<p>Purpose of noise measurement may include:</p> <ul style="list-style-type: none"> <li>• assessing compliance with a statutory condition, such as a licence</li> <li>• investigation of a noise complaint</li> <li>• environmental impact assessment studies</li> <li>• long-term monitoring programs</li> <li>• occupational hygiene</li> <li>• noise surveys</li> </ul>
<b>Noise measurements and surveys</b>	<p>Noise measurements and surveys may include:</p> <ul style="list-style-type: none"> <li>• difference between sound power and sound pressure</li> <li>• frequency analysis and weighting networks (including at least A and Lin)</li> <li>• calculation of combined sound levels using graphical and mathematical equation techniques</li> <li>• methods for measuring noise exposure, including equivalent continuous sound level (<math>L_{eq}</math>)</li> <li>• components of a sound level meter</li> <li>• response rates for sound meters, including at least fast, slow, impulse and peak</li> <li>• hold circuits</li> <li>• integrating sound level meters</li> <li>• calibration of sound level meters, including both electrical and acoustic</li> <li>• common errors in sound level measurement, including mishandling of equipment, wind, humidity,</li> </ul>

	<p>temperature, reflected and absorbed sound, and background noise</p> <ul style="list-style-type: none"> <li>• background noise calculations</li> <li>• techniques for conducting noise level measurement</li> <li>• statistical analysis, including <math>L_{Aeq}</math>, <math>L_{A10}</math>, <math>L_{A50}</math> and <math>L_{A90}</math></li> <li>• time weighted exposure measurement (<math>L_{AeqT}</math>)</li> <li>• characterisation of noise by octave band analysis</li> <li>• background noise level (<math>L_{A90}</math>)</li> <li>• day and night sound levels (<math>L_{DN}</math>)</li> <li>• noise dosimeters</li> <li>• techniques for measuring different noise types, including steady noise, discretely varying noise and impulsive noise</li> <li>• calculation of individual noise exposure</li> <li>• noise mapping</li> <li>• noise rating curves</li> <li>• sound attenuation with distance and mathematical calculation of quantities linked to it</li> <li>• general guidelines for making sound measurements</li> <li>• effects of meteorological conditions on noise</li> <li>• effects of topography and built structures on noise</li> </ul>
<p><b>Noise monitoring instruments and ancillary equipment</b></p>	<p>Noise monitoring instruments and ancillary equipment may include:</p> <ul style="list-style-type: none"> <li>• type 1 and type 2 portable sound level meters</li> <li>• integrating and non-integrating sound level meters</li> <li>• noise dose meters</li> <li>• sound level calibrators</li> <li>• octave analysers</li> <li>• statistical analysers, data loggers and recorders</li> <li>• telemetry equipment</li> <li>• sound monitoring stations</li> <li>• microphones</li> <li>• wind shields</li> </ul>
<p><b>Additional resources and equipment</b></p>	<p><b>Additional resources and equipment</b> may include:</p> <ul style="list-style-type: none"> <li>• meteorological instruments:</li> <li>• thermometers</li> <li>• hygrometers</li> <li>• barometers</li> <li>• anemometers</li> <li>• digital cameras</li> <li>• global positioning system (GPS) equipment</li> </ul>

	<ul style="list-style-type: none"> <li>• maps and aerial photographs</li> <li>• noise measurement and survey forms</li> <li>• personal protective equipment</li> </ul>
<b>Meteorological measurements</b>	<p><b>Meteorological measurements</b> may include:</p> <ul style="list-style-type: none"> <li>• temperature</li> <li>• relative humidity</li> <li>• barometric pressure</li> <li>• wind speed and direction</li> </ul>
<b>Enterprise procedures for field activities</b>	<p>Enterprise procedures for field activities may include:</p> <ul style="list-style-type: none"> <li>• field notebooks or log books</li> <li>• standard operating procedures covering fieldwork, sampling and testing</li> <li>• equipment operating manuals, calibration procedures, instrument fault-finding procedures and general maintenance and repair procedures</li> <li>• emergency, first aid and survival procedures</li> <li>• requirements related to protection of the environment</li> <li>• incident/accident/injury report forms</li> </ul>
<b>Hazards</b>	<p>Hazards may include:</p> <ul style="list-style-type: none"> <li>• solar radiation, dust and noise</li> <li>• accidents, emergencies and incidents, such as snake, insect or animal bites</li> <li>• exposure to severe weather conditions</li> </ul>
<b>OHS and environmental management requirements</b>	<p>OHS and environmental management requirements:</p> <ul style="list-style-type: none"> <li>• 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</li> <li>• all operations assume the potentially hazardous nature of field work and require standard precautions to be applied</li> <li>• 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</li> </ul>

## Unit Sector(s)

Environmental

## **Custom Content Section**

Not applicable.