

Title	Test for gases, interpret findings, and demonstrate knowledge of follow-up actions in an underground coal mine		
Level	4	Credits	15

Purpose	People credited with this unit standard are able to, in an underground coal mine: evaluate gas testing requirements; demonstrate the methods and equipment used for measuring and interpreting gases and mixtures of gases, and describe the potential harm to personnel and the environment; evaluate and describe methods of dispersing gas; and demonstrate knowledge of evacuation and notification procedures in the case of a gas incident.
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Classification	Extractive Industries > Underground Extraction
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Available grade	Achieved
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Prerequisites	Unit 7146, <i>Demonstrate basic knowledge and ability required to work in an underground operation</i> , or demonstrate equivalent knowledge and skills.
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Guidance Information

- Performance of the outcomes of this unit standard must comply with the following:
Health and Safety at Work Act 2015 (HSW);
Health and Safety at Work (General Risk and Workplace Management) Regulations 2016;
Health and Safety at Work (Mining Operations and Quarrying Operations) Regulations 2016;
Health and Safety at Work (Worker Engagement, Participation, and Representation) Regulations 2016;
approved codes of practice issued pursuant to the HSW Act.
- Any new, amended, or replacement Acts, regulations, standards, codes of practice, guidelines, or authority requirements or conditions affecting this unit standard will take precedence for assessment purposes, pending review of this unit standard.
- Joint assessment must be conducted in the assessment of this unit standard because of the high degree of risk. To conduct a joint assessment, two assessors, or one assessor and one technical verifier, must have witnessed the learner undertaking the tasks required in the unit standard and have come to the same conclusion in regards to the learner being competent or not yet competent.

At least one assessor or verifier must hold the unit standard they are assessing on their NZQA Record of Achievement.

- 4 Due to the high degree of risk associated with this unit standard, the assessment process must include a learner interview with one or both assessors.
- 5 **Definitions**
Company procedures mean the documented methods for performing work activities and include health and safety, operational, environmental, and quality management requirements. They may refer to legislation, regulations, guidelines, standard operating procedures, manuals, codes of practice, or policy statements.
Industry best practice may be documented in management plans, control plans, company procedures, managers' rules, occupational health and safety policy, industry guidelines, codes of practice, manufacturers' instructions, and safe working and/or job procedures (or equivalent).
- 6 This unit standard is intended for, but is not limited to, workplace assessment.
- 7 All evidence for assessment against this unit standard must be in accordance with industry best practice and company procedures.

Outcomes and performance criteria

Outcome 1

Evaluate gas testing requirements in an underground coal mine.

Performance criteria

- 1.1 Company procedures for testing and the timing of gas testing are evaluated to ensure they meet statutory requirements.
- 1.2 Methods for notification of underground personnel are described when carrying out gas testing in accordance with regulatory requirements.
- 1.3 Required documentation is completed.

Outcome 2

Demonstrate the methods and equipment used for measuring and interpreting gases and mixtures of gases, and describe the potential harm to personnel and the environment in an underground coal mine.

Range includes but is not limited to – carbon monoxide, carbon dioxide, methane, hydrogen, oxygen, nitrogen, sulphur dioxide, hydrogen sulphide, damp, oxides of nitrogen, higher hydrocarbons.

Performance criteria

- 2.1 Critical physical and chemical factors in gases are identified and interpreted in terms of health and safety underground.
- Range may include but is not limited to – name, chemical symbol, flammable limits, relative density, occurrence in mines, physical properties, physiological effects, legal limits, gases and mixes of gases.
- 2.2 Methods for examining for gases or mixes of gases and related hazards in an underground coal mine are described.
- 2.3 Use of gas monitoring instruments and systems is demonstrated or described in accordance with manufacturer's specifications.
- Range may include but is not limited to – hand-held gas detector, chemical, electronic, remote monitoring.
- 2.4 Results of gas measurements are interpreted in terms of potential hazards that may have consequences for mine site and personnel.
- Range includes but is not limited to – spontaneous combustion, Coward's Triangle, Boyle's law, Charles's law, atmospheric pressure, exposure limits, oxygen depleted atmosphere.
- 2.5 Tests and results are documented.

Outcome 3

Evaluate and describe methods of dispersing gas in an underground coal mine.

Performance criteria

- 3.1 Methods for gas detection, identification, and estimation of volume and concentration are described and evaluated.
- 3.2 Methods for safely dispersing the gas detected are described and evaluated.
- 3.3 Tests and results are documented.

Outcome 4

Demonstrate knowledge of evacuation and notification procedures in the case of a gas incident in an underground coal mine.

Performance criteria

- 4.1 Procedures in event of evacuation as a consequence of a gas incident are described.

- 4.2 Signalling devices, gas monitoring and detection instrumentation, and alarms systems are located.
- 4.3 Methods of alarm activation are described.
- 4.4 Method of alerting personnel to initial response procedures is described in accordance with trigger action response plans (TARPs).

Replacement information	This unit standard replaced unit standard 12632.
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Planned review date	31 December 2022
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	24 November 2005	31 December 2017
Rollover and Revision	2	16 July 2010	31 December 2017
Review	3	18 June 2015	31 December 2019
Review	4	1 March 2018	N/A

Consent and Moderation Requirements (CMR) reference	0114
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

Comments on this unit standard

Please contact MITO New Zealand Incorporated info@mito.org.nz if you wish to suggest changes to the content of this unit standard.