

Title	Evaluate plans to manage old workings and inundations at extractive sites		
Level	5	Credits	10

Purpose	People credited with this unit standard are able to, at extractive sites: explain the reasons why old workings are a hazard, and explain methods for safely approaching and working through them; explain the type of infrastructure and plans required to safely work in proximity to, and through, old workings; evaluate the hazards and causes of inrush and inundations and explain methods for risk management; identify and evaluate the documentation and reporting requirements for approaching and working through old workings, and for inundation management.
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Classification	Extractive Industries > Extractive Industries Management
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Available grade	Achieved
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Guidance Information

- 1 Legislation, regulations and/or industry standards relevant to this unit standard include but are not limited to:
 - 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 (Worker Engagement, Participation, and Representation) Regulations 2016;
 - Health and Safety at Work (Mining Operations and Quarrying Operations) Regulations 2022;
 - Health and Safety at Work (Hazardous Substances) Regulations 2017 and related Safe Work Instruments (SWIs) published by WorkSafe NZ; approved codes of practice issued pursuant to the HSW Act available at <http://www.worksafe.govt.nz/worksafe/information-guidance/approved-codes-of-practice-acops>.

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.

- 2 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 good practices are approved codes of practice and standardised procedures accepted by the wider mining industry as examples of good practice. They 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).

3 Assessment information

Evidence for this unit standard may be obtained by reference to historic or a theoretical workplace that reflects current workplace conditions.

Outcomes and performance criteria

Outcome 1

Explain the reasons why old workings are a hazard at extractive sites, and explain methods for safely approaching and working through them.

Performance criteria

1.1 Hazards of old workings are identified and evaluated in accordance with industry good practice.

Range hazards may include but are not limited to – inflow of water and other fluid material, old plan inaccuracy, fault variations and throw, inadequate barrier dimensions, type of rock barriers, inherent gas make, gas accumulations, spontaneous combustion, working under the sea and other surface water bodies, proximity to other seams, interconnections, fault and weak zone channels.

1.2 Methods for safely approaching old workings are explained in accordance with industry good practice.

Range methods may include but are not limited to – old plan review, digitising old plans, realignment to survey grid system, research old documents and reports, examination of risks, exploratory drives, advance boreholes, refuge holes, escape routes, emergency sumps, probe drilling, drilling into water-filled workings, drilling equipment and safety features (stuffing boxes, pressure valves), gas release control, spontaneous combustion control, re-ventilation, re-stabilisation of the ground.

Outcome 2

Explain the type of infrastructure and plans required to safely work in proximity to, and through, old workings at extractive sites.

Performance criteria

2.1 Methods of ensuring plans of old workings are accurate and explained in accordance with industry good practice.

Range plans may include but are not limited to – old plan review, digitising old plans, realignment with survey grids, research of old documents and reports, re-survey known old working locations, visual inspections of portals and shafts.

2.2 Infrastructure required to work safely in proximity to, and through, old workings is explained in accordance with industry good practice.

Range infrastructure may include but are not limited to – drilling equipment and safety measures, water drainage and pumps, ventilation, ventilation control devices (VCDs), seals, dams, proximity to surface, spontaneous combustion control, re-ventilation, re-stabilisation of the ground, gas monitoring systems, gas drainage systems.

Outcome 3

Evaluate the hazards and causes of inrush and inundations and explain methods for risk management at extractive sites.

Performance criteria

3.1 Origins, causes, and hazards associated with inrush and inundations and the risks are evaluated.

Range causes may include but are not limited to – old working location, elevated water accumulations, surface located sources, barrier failure, inaccurate surveying, multiseam mining, interactions with goafs or stopes, gas pressure, geological stresses, induced stress, geological structures, gas outbursts, coal and rock outbursts, underground dam failure.

3.2 Risk management methods for identifying and managing hazards associated with inrush and inundations are explained.

Range risk management methods may include but are not limited to – surface dams and barriers, emergency drainage routes, geotechnical monitoring, barrier protection, gas make, gas desorption tests and analysis, gas characteristics, inrush principal hazard management plan (PHMP), delineation of risks areas, drilling ahead, gas drainage, shotfiring controls, authority to work, gas and environment monitoring, geophysical techniques.

Outcome 4

Identify and evaluate the documentation and reporting requirements for approaching and working through old workings, and for inundation management at extractive sites.

Performance criteria

- 4.1 Documentation is identified in terms of recording hazards and occurrences of old workings and inundations.
- 4.2 Documentation is evaluated in terms of its purpose in accordance with industry good practice.

Range documentation may include, but is not limited to, risk assessments, gas analysis reports, environmental monitoring system reports, workplace reports, geological structure evaluation, geotechnical reports, shift supervisor reports, hazard reports, updated plans, and piezometer readings.

Replacement information	This unit standard replaced unit standard 17746.
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Planned review date	31 December 2029
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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	31 December 2026
Review	5	30 January 2025	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 Hanga-Aro-Rau Manufacturing, Engineering and Logistics Workforce Development Council qualifications@hangaarorau.nz if you wish to suggest changes to the content of this unit standard.