

<b>Title</b>	<b>Demonstrate knowledge of extraction methods, and selection of plant and equipment for surface extraction</b>		
<b>Level</b>	<b>5</b>	<b>Credits</b>	<b>15</b>

<b>Purpose</b>	People credited with this unit standard are able to demonstrate knowledge of: the effects of geological and geotechnical characteristics on surface extraction methods; and surface extraction methods and selection of plant and equipment.
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<b>Classification</b>	Extractive Industries > Extractive Industries Management
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<b>Available grade</b>	Achieved
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### Guidance Information

- 1 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.
- 2 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.
- 3 Range  
Excavation plant and equipment includes – front-end loaders, hydraulic shovels, hydraulic excavators, bucket wheel excavators, bulldozers, motor scrapers, suction and bucket-line dredges.  
Transportation plant and equipment includes – front end loaders, conveyors, rigid trucks and articulated units, motor scrapers, slurry pipeline.

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### Outcomes and performance criteria

#### Outcome 1

Demonstrate knowledge of the effects of geological and geotechnical characteristics on surface extraction methods.

**Performance criteria**

- 1.1 The effects of geological features at surface extraction sites are described in relation to extraction methods.
- Range may include but is not limited to – faults, folds, joints, bedding planes, washouts, dykes, sills, weak and/or crush zones.
- 1.2 The physical characteristics of rock material at surface extraction sites are described in terms of their effect on fragmentation.
- Range includes but is not limited to – strength, bedding, jointing, bulking, fabric, hardness.
- 1.3 Potential extraction methods are evaluated in relation to geological and geotechnical characteristics and fragmentation.
- Range includes but is not limited to – drill and blast, digging, loading, scraping, dozing, ripping, haulage.
- 1.4 Potential processing methods are evaluated in relation to geological and geotechnical characteristics and fragmentation.
- Range may include but is not limited to – crushing, screening, washing, dilution, reject, quality, product deterioration, contamination.

**Outcome 2**

Demonstrate knowledge of surface extraction methods and selection of plant and equipment.

**Performance criteria**

- 2.1 Extraction methods are evaluated in terms of site geography and topography and required plant and equipment.
- Range may include but is not limited to – safety considerations and requirements, dump heights, contouring, diversions, rehabilitation, bunds, visual screening, re-vegetation, gradients, benching, rock faces, ponding, underwater excavations, location, face height and slope, water effects, water management, old workings, climate, neighbours;  
plant and equipment includes – excavation plant and equipment, transportation plant and equipment.

2.2 The design and attributes of plant and equipment are identified and evaluated in terms of the material to be excavated and the profile of extractive sites.

Range plant and equipment includes – excavation plant and equipment, transportation plant and equipment.

2.3 Other factors that impact the selection of extraction methods, plant and equipment are explained.

Range other factors may include but are not limited to – risk assessment, financial considerations, safety considerations and requirements (e.g. guarding), equipment compatibility, job requirements; plant and equipment includes – excavation plant and equipment, transportation plant and equipment.

<b>Replacement information</b>	This unit standard replaced unit standard 15658 and unit standard 15667.
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<b>Planned review date</b>	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	1 March 2018	N/A

<b>Consent and Moderation Requirements (CMR) reference</b>	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](mailto:info@mito.org.nz) if you wish to suggest changes to the content of this unit standard.