



VULCAN MINE

Mine Operating Procedure Trenches



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1. PURPOSE

The purpose of this procedure is to describe the requirements and effectively manage the hazards and risks associated with trenches at the Vulcan Mine.

2. SCOPE

This procedure is applicable to all persons at the Vulcan Mine including employees, contractors, and visitors.

3. DEFINITIONS

Authorised Person	A person who has the required competencies and who has been appointed by the Site Senior Executive to carry out a designated scope of duties.
CMSHA	Queensland Coal Mining Safety and Health Act (1999).
CMSHR	Queensland Coal Mining Safety and Health Regulation (2017).
CMW	Coal Mine Worker.
Competent Person	Competence for a task at a coal mine is the demonstrated skill and knowledge required to carry out the task to a standard necessary for the safety and health of persons. The CMW must be assessed as competent and authorised by the SSE or SSE delegate to perform the task.
JHA	Job Hazard Analysis.
LPG	Liquid Petroleum Gas.
MOP	Mine Operating Procedure.
SHMS	Safety and Health Management System.
SOP	Standard Operating Procedure.
SSE	Site Senior Executive.
Take 5	Personal Risk assessment.

4. PROCEDURE

4.1. Penetration Permit

Excavation applies to excavations taking place for construction, facilities and maintenance purposes, and does not apply to excavation conducted as part of the mining process (e.g. pit expansion).

A risk assessment shall be completed for any trench greater than 100 millimeters in a designated area as defined by the VUL-MOP-088-Concealed Services, and VUL-FRM-19-12-Penetration Excavation Permit is required.

4.2. Concealed Services

No trench work associated with the installation or maintenance of in-ground services is to take place without identifying the location of any possible concealed service (e.g. gas, electricity, sewage, water). Refer to the VUL-MOP-088-Concealed Services for information on concealed services.



4.3. Job Hazard Analysis

A JHA shall be completed where the construction of a trench does not fall under the controls listed in this procedure, or a higher level or risk exists due to:

The type and competency of the ground;

If the depth of the trench is greater than that required by a standard to lay services If isolation of services is required;

If the type of equipment being used to dig trenches is not normally used on site;

Emphasis shall be given to hazards associated with all the following scenarios, where a person may be injured as a result of:

- Being trapped by the collapse of the trench;
- Becoming engulfed by water entering a trench;
- Being struck by an object falling into the trench;
- Falling into the trench;
- Breathing in contaminated, oxygen rich or oxygen deficient air such as carbon dioxide; and
- Striking energised or pressurised underground services.

4.4. Ventilation and Contaminated Air

Where a risk of contaminated, oxygen deficient or oxygen rich air may be present, the air within the trench shall be tested prior to entry. If the test shows the air is contaminated, or oxygen deficient or rich, then work shall not continue until a VUL-FRM-19-02-Confined Space Permit is obtained. Management and controls of gas are outlined in VUL-SOP-142-Flammable and Toxic Gas in Work Environment.

Bottles of heavier than air gases, e.g. LPG, shall not be placed in any trench. If gas is used in a trench, it shall be delivered via hoses that do not have any joins and are not to be left in the trench between uses.

A combustion engine shall not be in a trench or within proximity to the trench where the fumes from the engine may enter the trench and cause a hazard.

4.5. Barricades

Trenches shall be protected by suitable barricades. These may include bunting, trench spoil, warning signs, flashing lights etc.

All trenches remaining open at the end of shift in which the trench was carried out shall be barricaded and signposted to prevent accidental entry.

In vehicle traffic areas, signage shall be provided and barricades shall be erected to restrict inadvertent access to the trench, unless either a barricade or hoarding is impracticable.

4.6. Lighting

During the hours of darkness or in limited light, the edges of a trench shall be illuminated in locations where there is likely interaction with pedestrian or vehicle traffic.

If work is undertaken in the trench, lighting shall be provided in accordance with VUL-MOP-144-Lighting.



4.7. Access and Egress

Safe and serviceable ladders, stairways or ramps shall be provided for access to and egress from every place where workers are required to work in a trench. Two points of access or egress should be always provided.

Where ladders are used as a means of access or egress, such ladders shall extend from the bottom of the trench to at least 1 metre above the top.

Where a trench remains open and unattended for more than 24 hours it shall be checked for entrapment of persons or wildlife unless an access ramp has been provided.

4.8. Storing Materials and Equipment Near Trenches

Equipment, excavated material or other matter must not be placed within 1.5 metres of the edge of a trench, or where there is a likelihood of a collapse of the edge of a trench.

4.8.1 Shoring

Shoring occurs when the sides of the trench are shielded by using either timber or metal sheeting. If the shoring is commercially manufactured shielding, it must be erected in accordance with the manufacturer's instructions. If timber shoring is used, then it shall be inspected and approved by a competent person.

Shoring shall be erected and maintained where there is a risk of earth or other material becoming dislodged and collapsing. Shoring shall be of sufficient strength and rigidity to prevent the walls of the trench from collapsing. No worker should be in a trench > 1.5 m deep unless support / shoring has been installed.

During trench work, the competent person shall examine the shoring at least once each shift before work commences and so often as may be necessary to determine whether the shoring is adequate and secure.

Shoring shall be of good construction, sound material, free from defects and of the required dimensions and strength for the purpose for which such shoring is to be used.

Where shoring is likely to move inward at the bottom and bracing or strutting at the bottom is not practicable, then such shoring shall be strutted or braced from a higher level to prevent such movement.

Shoring struts, braces and walling in a trench shall be secured to prevent any accidental displacement or fall thereof.

Plans of the shoring shall be prepared by a competent person and kept on the site where the walls of a trench are to be temporarily shored.

In all methods of shoring a trench, the sheeting shall be placed vertically against the sides of the trench and shall extend at least 300 millimetres above the surrounding ground level. Where it is impracticable for the sheeting to extend this distance, a suitable fender greater than 300 millimetres high shall be provided to the edge of such trench.

4.8.2 Benching

Benching occurs when the side of a trench is stepped back, usually where the height of each rise is no greater than the width of the bench, achieving a batter angle of 45 degrees overall. This is done for ground that is incompetent or the bench height is greater than 1.5 metres.

4.9. Monitoring and Inspection

Trenches shall be monitored by the Supervisor of the task on a regular basis throughout each day that the trench is open. The monitoring shall be performed to determine if the condition of the trench has changed and if additional controls are required.

Where the trench will remain open for more than the one day, a competent person is to re-examine the trench each day before any worker and/or contractor is permitted to enter the trench. The competent person is to check for the following signs:

- Shoring becoming unstable;
- Shoring components not secure;
- Premature removal of shoring;
- Workers and/or contractors in trenches venturing outside the confines of shoring or benching;



- Cracks appearing near and parallel to the edge of a trench;
- Excavated material being placed close to sides of the trench;
- Machinery operating close to the sides of trenches (weight and vibrations);
- Surface soil falling into trench;
- Water seeping into trench from side walls or base;
- Surface water entering the trench or accumulating on surface near the trench;
- Inclined bedding planes 'dipping' into the trench;
- Heaving or swelling of the ground at the bottom of the trench; and
- Subsidence alongside the trench.
- Levels of gas in the trench

Where any of the above factors are identified, the trench shall not be entered. The JHA shall be reviewed to identify additional control measures. Any additional control measures shall be fully implemented prior to any trench entry.

5. ROLES AND RESPONSIBILITIES

SSE	Shall review and approve this procedure.
HST Superintendent	Shall ensure that all provisions of this procedure are implemented, and that compliance is achieved.
Managers/Superintendents	Shall be responsible for their area of operations and the implementation and application of this procedure; Provide adequate training, information, structure and supervision to ensure that this procedure is implemented; Carry-out a periodic review of activities to ensure the appropriate application and understanding of this procedure; and Ensure immediate and appropriate steps are taken to investigate and rectify any risks to health and safety arising from these activities.
Supervisors	Ensure all CMWs are familiar with, have access to and comply with the requirements set out in this procedure.
All CMWs (including visitors and contactor)	Shall comply with the requirements of this procedure.

6. REFERENCES

- Coal Mining Safety and Health Act 1999 (Qld)
- Coal Mining Safety and Health Regulation 2017 (Qld)
- VUL-FRM-19-02-Confined Space Permit
- VUL-FRM-19-12-Penetration Excavation Permit
- VUL-MOP-088-Concealed Services
- VUL-MOP-144-Lighting
- VUL-SOP-142-Flammable and Toxic Gas in Work Environment
- Qld Excavation work Code of Practice 2021



7. REVIEW

To be reviewed at a minimum every two (2) years, or as follows:

- when there is a change of method and/or technology and/or legal or other requirement that may affect the accuracy of this document;
- when operational changes occur that effect the currency of the document;
- when there has been a significant event to which this document was relevant; and
- as a result of relevant audit findings.

8. DOCUMENT CONTROL

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