

Excavators on Mine Sites

Since 2007, the mining industry in British Columbia (BC) has experienced five significant events involving excavators – four fatalities, three from drowning and one from an excavator rollover, and one high-potential incident from a ground sloughing. Excavators are an integral part of mining in BC, however, they can be dangerous.

Following safe work practices and regulatory requirements is essential to mine site safety. Listed below, are some hazard-specific and general risk controls to consider while operating an excavator, followed by a list of related Health, Safety and Reclamation Code for Mines in British Columbia requirements.



WORKING ON SLOPES

In July 2015, a mine worker, operating an excavator, was killed while conducting trenching activities on a steep slope. While the excavator was trenching, the machine became stuck on the steep slope. As the excavator operator made attempts to free the machine by driving it down the slope, the machine tipped over and rolled several times. The excavator operator was ejected while the machine rolled. The operator was taken to the hospital but succumbed to his injuries shortly after arriving.

In September 2007, a mine worker, operating an excavator, was working on a sloped area. An estimated 17,000-35,000 tonnes of material sloughed from the wall above, burying the excavator and operator. The operator was trapped in the cab of the excavator for approximately 13 hours before being successfully rescued. Fortunately, the operator was not injured in the event.



Recommended controls:

- Ensure there is adequate supervision and monitoring, especially during higher-risk excavator activity
- Ensure workers are adequately trained; keep good training records
- Ensure workers have a good understanding of the mine plan, best practices, safe operating procedures and regulatory requirements essential to the safe operation of excavators in sloped areas
- Consult a qualified professional to identify and address any geotechnical concerns that may be hazardous to the health and safety of an excavator operator, other mine workers or the public

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WORKING ON OR NEAR WATER

In April 2018, a fatality with an amphibious excavator at a BC mine site occurred. A sub-contractor was operating an amphibious excavator when it capsized in five meters of water. The operator was not able to escape from the overturned cab and drowned.

In February 2008, a mine worker died while operating an excavator that tipped over into standing water, causing the operator to drown. All attempts at an extrication and resuscitation failed.

In June 2007, a mine worker died while operating an excavator during a cleaning event on a settling pond. During the cleaning event, the excavator became unbalanced and tipped into the pond, causing the operator to drown.



Recommended controls:

- If practicable, consider using remotely controlled amphibious equipment to mitigate the risk of drowning
- Amphibious heavy equipment and any changes or modifications to the original equipment design should be evaluated by an engineer or licenced professional before being used on water;
- Operate amphibious equipment within recommended water depths; deeper water operations may require additional floatation pontoons or stabilizing spuds
- Consider securing doors open and removing bush guards, barriers or other items that may impair a quick exit
- Use appropriate personal floatation devices (PFDs) – buoyant PFDs may hinder an operator more than a manually activated PFD when escaping from a submerged cab
- Ensure the Mine Emergency Response Plan is adequate for emergency responses involving water: a well-developed plan provides rescuers with the ability to execute a successful extraction in water
- Consider additional safeguards, for example, providing an emergency air supply in the cab for the operator



GENERAL EXCAVATOR ACTIVITY

Recommended controls:

- Conduct a thorough risk assessment for all proposed work, including when the nature of existing work changes
- Perform site safety inspections to ensure hazards are identified, evaluated and controlled
- Only use mobile equipment for its designed and intended purpose, complying with manufacturers' specifications
- Ensure excavators are in good working order, regularly maintained and suitable for the proposed work, including using the appropriate tracks and ensuring there is an alternate means of escape from equipment cabs
- Ensure mine workers and supervisors are adequately trained and qualified to perform their duties

Health, Safety and Reclamation Code for Mines in BC (Code)

The following requirements are only some of the regulations that must be considered when using an excavator on a mine site in BC, for a complete list, please review the Code.

Health and Safety Program – Code s.1.6.9(1): The manager shall develop a mine health and safety program which includes; (c) safe working procedures on a departmental basis

Working Conditions – Code s.1.9.1(1): The manager shall take all reasonable and practicable measures to ensure that the workplace is free of potentially hazardous agents or conditions which could adversely affect the health, safety, or well-being of the workers

Unsafe Work – Code s.1.10.1: A person shall not carry out any work or operate any equipment, tool, or appliance if he/she has reasonable cause to believe that to do so would create an undue hazard to the health or safety of any person.

Unsafe Work – Code s.1.10.2: A supervisor shall not knowingly perform or permit a worker to perform work which is, or could create, an undue hazard to the health or safety of any person

Training – Code s.1.11.1: The manager shall ensure that workers are adequately trained to do their job or are working under the guidance of someone who has competency both in the job and in giving instruction, and ensure that all employees receive thorough orientation and basic instruction in safe work practices

Supervision – Code s.1.12.7(1): The manager shall ensure that every worker, other than those persons referred to in sections 1.12.1 (1), 1.12.2, 1.12.3 and 1.12.6, and other than office employees, is under the supervision of the holder of a supervisor's certificate

Hazardous Work – Code s.3.3.1: The manager or a person authorized by him/her shall personally supervise all work involved in correcting an unusual hazard and such work shall be carried out in accordance with safe working practices and in compliance with this code, and a plan approved by the manager

Mine Emergency Response Plan – Code s.3.7.1(2): The Mine Emergency Response Plan must outline the response procedures that are essential for effective and timely management of an emergency response

Rubber-tired and Tracked Mobile Equipment Maintenance – Code s.4.9.01(1): The manager shall ensure that brake and steering systems on tracked or rubber-tired mobile equipment are maintained in a safe operating condition through a regularly scheduled preventative maintenance program

¹Amphibious excavator photo credit: Sergey Panikratov/Shutterstock.com