
Mine closure and reclamation — Vocabulary

Fermeture et remise en état des mines — Vocabulaire

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. The different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 82, *Mining*, Subcommittee SC 7, *Mine closure and reclamation management*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This vocabulary has been prepared to facilitate effective communication within the subject field of mine closure and reclamation and to ensure that key terminology concepts and concept representations are agreed and used amongst participants.

Terms on mine closure and reclamation management have been classified into ten sections representing key concepts within the subject field:

- mine closure status;
- mine closure phases;
- mine closure strategies;
- mine features;
- mine materials;
- mine closure risks;
- mine closure treatments;
- mine closure activities;
- mine closure finance;
- social and cultural aspects.

This document is not intended to present an exhaustive list of all terms or concepts utilized within mine closure and reclamation.

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Mine closure and reclamation — Vocabulary

1 Scope

This document establishes a vocabulary for mine closure and reclamation management.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

mine closure status

status of a mine or *mine feature* (3.4) with respect to the *mine closure phase* (3.2)

3.1.1

abandoned

derelict

orphan

legacy mine

mine or *mine feature* (3.4) that has not been formally *relinquished* (3.1.3) and for which the responsibility for *mine closure* (3.3.2) cannot be allocated to an individual or organization

Note 1 to entry: Liability for an abandoned mine can fall to the landowner in the event of freeheld land.

3.1.2

closed

mine or *mine feature* (3.4) for which mining has ceased and for which the mine owner or operator has implemented, or has yet to implement, *mine closure* (3.3.2)

3.1.3

relinquished

closed (3.1.2) mine or *mine feature* (3.4) for which management and *monitoring* (3.8.4) has been completed and tenure has been surrendered, with responsibility transferred to the relevant regulating authority or third party

3.1.4

suspended

mine or *mine feature* (3.4) for which mining, or processing, has temporarily ceased and operations have been placed in *care and maintenance* (3.2.1)

3.2

mine closure phase

phase during which *mine closure activities* (3.8) are undertaken to achieve a specific *mine closure status* (3.1)

3.2.1

care and maintenance

temporary mine closure

period when a mine is *suspended* (3.1.4), and *mine facilities* (3.4.2) remain intact and are maintained in anticipation of production recommencing

Note 1 to entry: Can also refer, in some jurisdictions, to the *post closure* (3.2.3) phase.

3.2.2

closure

period when a mine or *mine feature* (3.4) is *closed* (3.1.2) and during which the *mine closure plan* (3.8.3.2) is executed

3.2.3

post closure

period, following *closure* (3.2.2), when *monitoring* (3.8.4) and *maintenance* (3.8.2) and other relevant management activities are undertaken

3.2.4

pre-closure

period, prior to *closure* (3.2.2), during which *mine closure planning* (3.8.3) is undertaken to progressively develop the scope of closure

3.3

mine closure strategy

strategic or tactical elements applied to a mine or *mine feature* (3.4) to achieve *post mining land use* (3.8.1.2) and *mine closure* (3.3.2) objectives.

Note 1 to entry: All strategic and tactical elements of mine closure can be implemented progressively [e.g. progressive *reclamation* (3.3.3)].

3.3.1

decommissioning

de-energisation, removal and disposal of redundant *mine facilities* (3.4.2)

3.3.2

mine closure

planning for, and implementation of, strategies associated with the completion of mining activities and the establishment of the agreed *post mining land use* (3.8.1.2)

3.3.2.1

progressive mine closure

staged and ongoing implementation of *mine closure strategies* (3.3) for *mine features* (3.4) during the operating life of a mine

3.3.3

reclamation rehabilitation

reinstating of disturbed land, associated with a mine or a *mine feature* (3.4), to be safe, stable, non-polluting and consistent with the agreed *post mining land use* (3.8.1.2)

Note 1 to entry: Whilst reclamation and rehabilitation are used interchangeably in many jurisdictions, some jurisdictions consider rehabilitation to be the reclamation of a *mine feature* (3.4), *domain* (3.4.1) or other area disturbed by mining to a sustainable condition in which ecosystem function is reinstated but for which *repurpose* (3.3.3.1) or *restoration* (3.3.3.2) is not the objective.

3.3.3.1

repurpose

reclamation (3.3.3) of a *mine feature* (3.4), *domain* (3.4.1) or other area disturbed by mining to a productive condition corresponding with a *post mining land use* (3.8.1.2) alternative to the pre-mining land use

3.3.3.2**restoration**

reclamation (3.3.3) of a *mine feature* (3.4), *domain* (3.4.1) or other area disturbed by mining to a sustainable condition corresponding with its natural or reference state

Note 1 to entry: Generally, it relates to the return of the natural ecosystem (i.e. ecological restoration) but can also apply to return to the pre-mining condition.

3.3.4**remediation**

reduction of human and environmental exposure to hazardous contaminants to acceptable levels

3.4**mine feature**

unique features within a mine, that have a defined function or purpose and that require *mine closure activities* (3.8) to achieve *post mining land use* (3.8.1.2) and *mine closure* (3.3.2) objectives

3.4.1**domain**

group of *mine facilities* (3.4.2) that have a similar or common *mine closure strategy* (3.3)

Note 1 to entry: A domain is generally defined by a physical, cadastral or hydrological boundary.

Note 2 to entry: A domain can constitute one or more *post mining landforms* (3.4.4) with common geophysical characteristics.

3.4.2**mine facility**

built infrastructure, plant or facility with a defined operational, or productive function, associated with mining or processing activities

3.4.2.1**mine void**

excavation made for the purpose of exploiting ore

3.4.2.1.1**mine opening**

excavation enabling access from surface to underground mine workings

Note 1 to entry: Depending on mine geometry and local surface topography, mine openings can appear to be vertical (i.e. mine shaft), horizontal (i.e. mine adit) or inclined (i.e. mine decline).

3.4.2.1.2**mine pit**

open pit

open cast mine

excavation in the surface made for the purpose of exploiting ore

3.4.2.1.3**stope**

stepped excavation within an underground mine, generally along a strike or ore body

3.4.2.2**tailings storage facility**

dam, impoundment or structure designed and constructed to contain and store *tailings* (3.5.1.3)

Note 1 to entry: Can also include *mine pits* (3.4.2.1.2) subject to *in pit disposal* (3.7.3.2) of *tailings* (3.5.1.3).

Note 2 to entry: Includes *tailings* (3.5.1.3) deposited underground for stability and disposal.

3.4.2.3

waste rock dump

stockpile of *waste rock* (3.5.1.4), formed by dumping in bottom up constructions or by dropping loose material over a crest and allowing it to come to rest

Note 1 to entry: Can include *backfill* (3.7.1.1) placed within a *mine pit* (3.4.2.1.2).

3.4.3

post closure facility

built infrastructure that is retained and that supports or contributes to *post mining land use* (3.8.1.2)

3.4.4

post mining landform

constructed topographic feature for which *reclamation* (3.3.3) has been completed to support long term stability and *post mining land use* (3.8.1.2)

Note 1 to entry: It can incorporate one or more *mine features* (3.4) or *domains* (3.4.1).

3.4.4.1

pit lake

body of water formed within a *mine pit* (3.4.2.1.2) at cessation of mining activities by either ground, surface or marine water inflow

3.4.4.2

waste landform

post mining landform (3.4.4) constructed from *mine waste* (3.5.1)

3.5

mine material

material that presents a risk or that requires *mine closure activities* (3.8) to be undertaken during *mine closure* (3.3.2)

3.5.1

mine waste

mine spoil

materials derived from mining or processing activities, that are disaggregated and stored on site within a defined *mine feature* (3.4)

Note 1 to entry: Generally, it includes all *mine materials* (3.5) except *topsoil* (3.5.3) and *mine water* (3.5.2).

3.5.1.1

overburden

surficial materials, excluding *topsoil* (3.5.3) and subsoils, lying above the ore body that are removed for the mining process

3.5.1.2

reactive mine waste

mine waste (3.5.1) that is chemically reactive and that is likely to produce *leachate* (3.5.2.1)

Note 1 to entry: It can include reactive *waste rock* (3.5.1.4) or *tailings* (3.5.1.3).

3.5.1.3

tailings

residual material that has been crushed and ground and/or washed and rejected from a mill or processing plant after the recoverable minerals have been extracted

3.5.1.4

waste rock

rock removed in the mining process, that does not contain ore and will not be processed

3.5.2**mine water**

outflow of water from a *mine facility* (3.4.2)

Note 1 to entry: It can also be referred to as mine contact water and includes process water, run off from fixed plant, and *leachate* (3.5.2.1).

3.5.2.1**leachate**

mine water (3.5.2) that has washed or seeped from natural materials or *mine material* (3.5), that can contain contaminants of concern

3.5.3**topsoil**

organic enriched native soil layer (horizon) that can be removed, stored and returned to *post mining landforms* (3.4.4) and other disturbed areas to facilitate *revegetation* (3.7.3.4)

Note 1 to entry: Topsoil is distinct from lower soil layers (i.e. subsoils) which contain less organic enrichment but still can be used to facilitate revegetation.

3.6**mine closure risk**

risk and impact associated with *mine features* (3.4) and *mine materials* (3.5) that require *mine closure treatment* (3.7)

3.6.1**erosion**

loss of surface materials from *mine facility* (3.4.2) or *post mining landform* (3.4.4) as a result of wind or water forces

3.6.2**inherent risk**

potential impact to successful *mine closure* (3.3.2) as a result of the intrinsic characteristics of a *mine material* (3.5), *mine feature* (3.4) or *mine closure activity* (3.8) being undertaken and for which no *mine closure treatment* (3.7) has yet been applied

3.6.3**latent risk**

potential impact to successful *mine closure* (3.3.2) from a *mine material* (3.5), *mine feature* (3.4) or *mine closure activity* (3.8) that can remain hidden or concealed or that can manifest in the future, for which a *mine closure treatment* (3.7) may or may not have been applied

3.6.4**residual risk**

potential impact to successful *mine closure* (3.3.2) from a *mine material* (3.5), *mine feature* (3.4) or *mine closure activity* (3.8) following application of a *mine closure treatment* (3.7)

3.6.5**seepage**

outflow of *leachate* (3.5.2.1) or gas from a *mine feature* (3.4)

3.6.5.1**acid and metalliferous drainage**

outflow of *leachate* (3.5.2.1) that is sulfate rich and metal laden

Note 1 to entry: Generally, it results from the exposure of rock containing an abundance of sulfide minerals to atmospheric conditions.

Note 2 to entry: It can be either acid, neutral, alkaline or saline.

3.6.6

subsidence

instability or failure of *mine pit* (3.4.2.1.2) crest, *waste rock dump* (3.4.2.3) slope or underground void (e.g. sinkhole)

Note 1 to entry: Can result from geotechnical instability or failure, groundwater extraction or underground mining (e.g. block caving).

3.7

mine closure treatment

treatments, measures and methods used to mitigate *mine closure risks* (3.6) and/or to achieve *mine closure activities* (3.8) during *mine closure* (3.3.2)

3.7.1

mine waste treatment

treatments, measures and methods used to mitigate *mine closure risks* (3.6) and/or achieve *mine closure activities* (3.8) related to *mine waste* (3.5.1)

3.7.1.1

backfill

waste rock (3.5.1.4), *overburden* (3.5.1.1), *tailings* (3.5.1.3) or other *mine materials* (3.5) that have been deposited into a *mine void* (3.4.2.1)

3.7.1.2

cover

one or more engineered layers of synthetic material or (non-reactive) *mine material* (3.5) placed over *reactive mine waste* (3.5.1.2) or *tailings* (3.5.1.3) to control percolation and runoff from precipitation

Note 1 to entry: A cover can be designed and engineered for multiple purposes, including to prevent production of *leachate* (3.5.2.1) or to support vegetation establishment.

3.7.1.2.1

store and release cover

cover (3.7.1.2) that includes layers designed to capture precipitation and limit net percolation, allowing release of water through evapotranspiration between events

3.7.1.2.2

water shedding cover

cover (3.7.1.2) that includes placement of impermeable layers or barriers to minimise infiltration and percolation through *reactive mine waste* (3.5.1.2)

3.7.1.2.3

wet cover

cover (3.7.1.2) that includes a layer of water to prevent oxidation of *reactive mine waste* (3.5.1.2)

3.7.1.3

encapsulation

process of surrounding *reactive mine waste* (3.5.1.2) with benign material to prevent the ingress of oxygen or water

3.7.2

mine water treatment

treatments, measures and methods used to mitigate *mine closure risks* (3.6) and/or achieve *mine closure activities* (3.8) associated with *mine water* (3.5.2)

3.7.2.1

active water treatment

mine water treatment (3.7.2) process that uses power or dedicated chemicals to remove metals, contaminants of concern or hazardous substances from *mine water* (3.5.2)