Black Mountain Mining

BMM-HSE-ENV-SOP-0052 Correct Storage Of Hazardous Material v10

VZI Doc #	SBU Doc #	Document Type	Review Status
BMM-HSE-ENV-SOP-0009	BMM-HSE-ENV-SOP-0052	Standard Operating Procedure	Approved
Version	**Confidentiality Level**	**Audit Standard**	**HOD**
10.0	Internal (C3)	ISO 14001	Catharina Kotze

Effective Date	Review Date	Review Cycle	Next Review Date
10 November 2006	8-5-2025	2 Years	8-5-2027

Content Owner(s)
Anne-Marie Cloete (Senior Environmental Officer | BMM)

Content Reviewer(s)
Pieter David Venter (Head of HSE & ESG | BMC)

Content Approver(s)
Catharina Kotze (Head of HSE | BMM)

❖ Change History

Modified Date	Version	Modified by	Description of change
31/06/2025	1.0	L. Ziphethe	New Document

Table of Contents

❖ Definitions and Abbreviations

Word / Phrase / Abbreviation	Definition
PEME	PEME is an acronym used in Black Mountain Mining and has the following meaning: - People, - Equipment, - Materials, - Environment, The use of this in written documentation helps to comply with Resources Clause 7 – ISO 9001, ISO 14001 and ISO 45001. It is advisable to include in all written documentation.
Acute toxicity:	Describes the adverse effects of a substance that result either from a single exposure or from multiple exposures in a short time period (usually less than 24 hours). Acute toxicity tests in animals (i.e, rat) use mortality as the main observational endpoint in order to derive a LD50 or LC50
Hazardous material:	Material that may by circumstances of use, quantity, concentration or inherent physical, chemical or infectious characteristics, cause ill-health or increase mortality in humans, fauna and flora, or adversely affect the environment when improperly treated, stored, transported or disposed of.
HazMat:	Refers to any hazardous materials
HazChem:	Refers to any hazardous chemicals / or alternately may be used as HazChem sheet which is the same as a Material Safety Data Sheet.
MSDS:	Material Safety Data Sheet
Materials Controller:	Coordinating and expediting the flow of work and materials between various departments are the main responsibilities of a Material Controller.

1. POLICY STATEMENT

Black Mountain's Standard Operating Procedures (SOP's) shall be written in a clear concise manner, communicated to all employees and applied accordingly.

2. OBJECTIVES

The objective of Procedure BMM-HSE-ENV-SOP-0052: Storage of Hazardous Material is to ensure that all hazardous materials on Black Mountain property are stored and managed correctly. The procedure also indicates how and when monitoring and clean-up of stored substances should take place. The aim of the procedure is to:

- Ensure compliance with the environmental policy principles in particular that of utilising hazardous resources responsibly and efficiently.
- Establish the way the company deals with correct storage of hazardous material on Black Mountain Complex premises in order to comply with relevant legislation.
- Record sufficient information regarding the correct way of cleaning up spilt hazardous material.

3. SCOPE

This procedure applies to all hazardous materials stored at the Black Mountain Complex which will be used by the various activities on the mine premises. It also stipulates the use of waste identification principles prior to introducing any new hazardous substances to the mine.

A full record shall be kept by the Materials Controller detailing the following information relating to hazardous materials on the mine:

- The name of the agent and manufacturer of the hazardous material;
- The Material Safety Data Sheet specific to each and every type of hazardous material stored on mine property; and
- The location of where each type of hazardous material is stored and the department responsible for the safe storage thereof.(see section 4.2)

4. PROCEDURE CONTENT

4.1 General storage requirement for hazardous materials

- Hazardous materials are stored at various locations on the mine site. A Surface Plan indicating the location of hazardous materials storage areas is available at the Survey Department.
- The HazMat storage areas must be demarcated, and an access control system shall be in place to monitor access to the areas as per the following area identified below:

  o Reagent mixing

- Reagent storage
- Cyanide plant

- Signboards depicting what material is being stored as well as the relevant Hazardous MSDS must be clearly and legibly displayed at the storage areas:
- The floor for hazardous material storage sites shall be an impervious (e.g. concrete or plastic lined) floor, graded to a sump (or flow into a process drain).
- Any bunded area constructed with an outlet pipe and isolating valve that opens to an area outside the bunded area must have the valve locked out. This will ensure that the valve is only opened when necessitated by authorised personnel.
- The clean out material sludge's of such drains or sumps should be dispose of as hazardous material to the Salvage yard or Tailings dam. A handheld pump can be used for clean out of spilt material in the sumps.
- Materials must be stored within a bounded bund wall area, the capacity of which must be 110% of the total volume of materials stored within the bund wall area, unless otherwise determined by a risk assessment.
- In all instances, fire extinguishers should be readily available and easily accessible.

4.2 Hazardous Materials Classes and descriptions

Chemicals have a toxicity classification that classifies toxicity into four categories:

- **Toxicity category I:** Highly toxic and Severely irritating,
- **Toxicity category II:** Moderately toxic and Moderately irritating,
- **Toxicity category III:** Slightly toxic and Slightly irritating,
- **Toxicity category IV:** Practically non-toxic and not an irritant.

Acute toxicity is categorised as per the table below

Acute Toxicity	Category 1	Category 2	Category 3	Category 4
Oral (mg/Kg)	< 5	>5, <50	>50, <300	>300, <2000
Dermal (mg/Kg)	< 50	>50, <200	>200, <1000	>1000, <2000
Gasses (ppm)	<100	>100, <500	>500, <2500	>2500, <5000
Vapours (mg/L)	<0.5	>0.5, <2.0	>2.0, <10	>10, <20
Dust & mist (mg/L)	<0.05	>0.05, <0.5	>0.5, <1.0	>1.0, <5

Further classification of chemicals is according to the properties and this is especially important for storage of chemicals.

Class 1	Explosives	Primary explosive substance or Article that contains a primary explosive substance and does not contain two or more independent safety features.
Class 2.1	Flammable gases	Flammable gases are gases that, at a temperature of 20 °C and at a standard pressure of 101.3 kPa are ignitable when in a mixture of 13% or less (by volume) with air, or have a flammable range with air of at least 12 percentage points.

Class 2.2	Non Flammable, Non Toxic gases	Non-flammable, non-toxic gases are gases that are transported at a pressure of at least 280 kPa at a temperature of 20 °C, or as refrigerated liquids, and that a) are asphyxiant (gases that dilute or replace the oxygen in the atmosphere), or are oxidizing.
Class 3.1	Flammable liquid	Flammable liquids are liquids, or mixtures of liquids, that might contain solids in solution or in suspension (for example paints, varnishes and lacquers, but not substances that, on account of their other dangerous characteristics, have been included in other classes), that give off a flammable vapour at or below 60 °C.
Class 3.2	Flammable liquids	Viscous flammable liquids that have a closed-cup flash point of less than 23°C are assigned to packing group III, provided that less than 3% of the clear solvent layer separates in the solvent separation test.
Class 3.3 **Class 3.4**	Flammable liquids	Viscous substances that a) have a flash point equal to or exceeding 23 °C and less than or equal to 60 °C, b) are not toxic, corrosive, or hazardous to the environment, c) contain no more than 20 % nitrocellulose, provided that the nitrocellulose contains not more than 12,6 % nitrogen (by dry mass), and d) are packed in receptacles of capacity less than 450 L,
Class 4.1	Flammable solids	Flammable solids are readily combustible and can cause, or contribute to, fire through friction. Readily combustible solids are powdered, granular, or pasty substances that can easily be ignited on brief contact with an ignition source, such as a burning match, and the flames of which spread rapidly. When heated or when on fire, some of these substances can emit toxic combustion products.
Class 4.2	Spontaneous flammable	Substances of division 4.2 are liable to spontaneous heating under normal conditions, or to heating when they come into contact with air, and are then liable to catch fire. Some of these substances can emit toxic gases when they are involved in a fire. Pyrophoric substances and self-heating substances are included in division 4.2.
Class 4.3	Flammable if wet	Certain substances, on contact with water, emit flammable gases that can form explosive mixtures with air. This substance can react violently with water at ambient temperature with a general tendency for the gas evolved to ignite. Spontaneously or readily with water at ambient temperature at such a rate that the evolution of flammable gas is equal to or exceeds 10 L/kg of the substance in any 1 min or reacts slowly with water at ambient temperature at such a rate that the evolution of flammable gas is equal to or exceeds 1 L/kg of the substance
Class 5.1	Oxidizing substanc	A solid substance is classified as an oxidizing substance of division 5.1 on the basis of its potential to increase the burning rate or burning intensity of a combustible substance when the two are thoroughly mixed. A liquid substance is classified as an oxidizing liquid of division 5.1 on the basis of its potential to increase the burning rate or burning intensity of a combustible substance, or for spontaneous ignition to occur when the liquid and the combustible substance are thoroughly mixed.
Class 5.2	Organic peroxides	Organic peroxides are thermally unstable substances that can undergo exothermic decomposition at normal or at elevated temperatures. Most organic peroxides burn rapidly and decomposition of the substance can result in the evolution of harmful or flammable gases or vapours.

Class 6.1	Poisonous	Toxic substances are substances that are liable to cause death or injury or to harm human health if they are swallowed, inhaled, or come into contact with the skin.
Class 8	Corrosive	Corrosive substances are solids or liquids that, by chemical action, severely damage living tissue. The leakage of such a substance from its packaging can also damage, other cargo or materials or the means of transport.
Class 9	Miscellaneous dangerous goods	Liquids or solids that has anaesthetic, noxious or other similar properties that could cause extreme annoyance or discomfort to humans and animals; Magnetized material that, when packaged as for transport, has a magnetic field strength of 0,159 A/m or more at a distance of 2,1 m from any point on the surface of the assembled package; Miscellaneous substances and articles, for example, asbestos, dry ice, life-saving appliances (for example, air bags and seatbelt pretentions'), internal combustion engines, polymeric beads, battery-powered vehicles, lithium batteries, electric wheelchairs and zinc dithionite; Substances at elevated temperature, i.e. liquids that are transported at a temperature of not less than 100 °C and solids that are transported at a temperature of not less than 240 °C; Environmentally hazardous substances (see 15.2) and waste; and GMMOs or GMOs that do not meet the definition of infectious substances of division 6.2 (see 12.2), but that are capable of altering animals, plants or microbiological substances in a way not normally the result of natural reproduction. They shall be assigned to UN 3245.

- Before a chemical is brought on site the toxicity especially the acute toxicity, need to be determined and understood as this impact on the storage of the chemical.

4.3 The segregation of hazardous material during storage and transporting

CLASS		2.1	2.2	3.1	3.2, 3.3, 3.4	4.1	4.2	4.3	5.1	5.2	6.1	8	9
2.1	Flammable gases	A	A	B	B	B	D	B	D	D	B	B	C
2.2	Non Flammable, Non Toxic gases	A	A	C	C	C	B	C	C	B	C	C	C
3.1	Flammable liquid	B	C	A	A	B	B	B	D	D	B	C	C
3.2 3.3 3.4	Flammable liquids	B	C	A	A	C	B	B	D	D	B	C	C
4.1	Flammable solids	B	C	B	C	A	B	B	D	D	B	C	C
4.2	Spontaneous flammable	D	B	B	B	B	A	B	D	D	B	C	C
4.3	Flammable if wet	B	C	B	B	B	B	A	D	D	B	B	C
5.1	Oxidizing substances	D	C	D	D	D	D	D	A	B	B	B	B
5.2	Organic peroxides	D	B	D	D	D	D	D	B	A	D	B	B
6.1	Poisonous	B	C	B	B	B	B	B	B	D	A	C	C
8	Corrosive	B	C	C	C	C	C	B	B	B	C	A	C
9	Miscellaneous qQ dangerous goods	C	C	C	C	C	C	C	B	B	C	C	A

D	The two classes are prohibited in the same storage area. The two classes must not be stored in adjoining areas which are attached to each other. The two classes must be stored in separate areas at least 10 meters apart
B	The two classes must be fire separated
C	The two classes must be separated from each other by a distance of at least 3 meters
A	Separation or segregation is not applicable to the two classes, and they may be stored in the same area.

4.4 Bulk fuel storage areas

- Bulk diesel tanks to provide diesel for the underground trackless mobile machines are located below surface in an area adjacent to the Washbay area.
- These tanks are the property of Black Mountain Mine (Pty) Ltd; hence the maintenance responsibility is Black Mountain's.
- The tanks (above ground) have been placed inside a concrete lined pit that should be inspected for integrity on a regular basis.
- Black Mountain Mine (Pty) Ltd will conduct internal inspections on bulk fuel storage on a bi-annual basis. The Warehouse Supervisor is responsible to ensure that this takes place
- The area on surface where the diesel / petrol pumps are located is to be concreted to ensure it is impervious to any spillages.
- The fuelling area is to be designed in such a way that any potential spillages are drained to a central sump and do not pollute clean soil adjacent to the pump station.

- Storage of fuel already issued by the stores is the responsibility of the section to whom the fuel is issued to and the above-mentioned storage procedures applies.
- Below ground fuel, storage shall be pressure tested for leaks on a regular basis and the Warehouse Supervisor will keep records of these tests. Tank integrity testing needs to be done on a two-yearly basis. The Warehouse Supervisor will keep records of these tests.
- Fire suppression in the form of foam will be available to supress any fires at any bulk fuel storage area. A 50kg foam trolley serviced annually by a third party.
- Fuel taken underground will be stored in tanks (steel) and parked at shaft bank before being taken underground via Deeps shaft. This process is the responsibility of the shaft mine overseer.
- A spill kit needs to be available at the refuelling points to immediately treat spills.
- No fuel should be stored in small volumes/containers and if it is stored in a smaller container it needs to be an approved container according to, SANS 10131. Plastic containers <10l and steel containers <20l. Hazardous warning sign on container and clear indication of content and capacity. SANS 10087

4.5 Gas cylinder stores

- The Main Stores is the main storage holding area for oxygen, acetylene, handigas, chlorine (near Salvage yard) and nitrogen gas cylinder, both full and empty.
- Gas cylinders are issued from the stores to other activities on the mine as required. All empty bottles are returned to the stores.
- Cylinders to be stored in a separate lockable store, with shade covering appropriate signage, adequate through ventilation.
- Storage area is to be kept free from combustible materials. No other materials to be stored in cylinder store.
- Cylinders are to be chained in the upright position and stored in rows with aisles in between for easy removal.
- Water hoses or Fire extinguishers needs to be available at gas storage areas.
- Attention must be given to ensure that all safety precautions are taken when dealing with gas cylinders.
- The relevant MSD sheets are to be clearly displayed, as well as signs indicating which types of gas are stored in which area. For other Signes refer to BMM mandatory notices and signages standard BMM-HSE-SAF-STD-0002.
- Paint (oil based, water based and aerosols) stores

- Paint are to be stored in a well-ventilated, secured area under a roof / cover and inside a bunded area with fire extinguishers easily accessible.
- No other flammable materials may be stored in the paint store and accessible fire extinguisher within 30m.
- All MSD sheets are to be displayed at the storage area and required signs and notices to be displayed, refer to BMM mandatory notices and signages standard BMM-HSE-SAF-STD-0002.
- Paint store may not store more than 300l with the exception of the dedicated paint store at the commercial yard.
- Aerosol spray paint may become explosive in case of fire and must be stored the same as other paint if more than 24 cans is stored in one area.

4.6 Chemical/Reagent stores

- Wear required PPE (Personal Protective Equipment) as communicated through Risk assessment and BMM mandatory notices and signages standard BMM-HSE-SAF-STD-0002
- Ensure MSDS for all reagents stored are available and displayed
- Ensure all containers are properly closed and labelled
- Do not store Sodium Cyanide and Acid in the same storage space.
- Do not store Sodium Cyanide in the Metallurgical Laboratory
- Store dry chemical away from solutions to prevent inadvertent reactions or contamination.
- Bulk storage of reagents are stored within BMM Concentrator Plant, other less reactive and hazardous chemicals are stores in smaller volumes in other appropriate stores.
- These storage areas must be secure, undercover and the containment area must be adequately bunded.
- MSD sheets must be clearly displayed as well as any relevant emergency telephone numbers for the appropriate chemical.
- Fire extinguishers, PPE and operational procedures should be readily available and accessible.
- To ensure that any chemical spill is cleaned up and disposed of correctly refer to BMM-HSE-ENV-SOP-0039 – Handling of Chemical Spillages and BMM-HSE-ENV-SOP-0040 – Handling, Storage and Disposal of Waste.

4.7 Resin casuals

- Resin capsule should be stored at a 20- 25°C. Storage at lower temperatures will extend the shelf life when stored at 0-5°C.Storage at higher temperatures reduces shelf life.
- Store in a cool, dry place away from direct sunlight. Do not double stack pallets.

- When using cool room storage, the resin capsules should be allowed time to attain ambient temperature before use otherwise SPIN and HOLD TIMES will be extended.
- Do not store near ignition sources as resin is flammable.

4.8 Waste identification principles

- Any person wishing to use a new product must ensure compliance with the commercial process and complete BMM-HSE-ENV-SOP-0008 Chemicals New form with the assistance of an environmental officer or manager.
- In the case of the trial product being any chemical substance with the potential to pollute the environment, the supplier of such product must furnish Black Mountain Mine (Pty) Ltd with the Material Safety Data Sheet of that product.
- This MSDS must specify any potential environmental impacts of the product (16 point).
- Where there is an indication that the product can impact on the environment this product must then be stored according to the requirements stipulated under 5.1 of this procedure.

5. REVISION HISTORY

Revision 7 SOP 52 - "Correct Storage of Hazardous Material" dated 12 July 2019

- Changed BMM to BMC
- Removed storage areas locations at section 5.2.
- Update clean-out process of the sumps and add use of handheld pump at section 5.2.
- Change MSDs sheets to MSD sheets.
- Include Gamsberg Plant at section 5.7
- Removed M.E.O store and replace with Wash bay area.
- Update section 5.4

Revision 8 SOP 52 - "Correct Storage of Hazardous Material" dated February 2021.

- Updated section 4 to include definition of acute toxicity
- Updated section 5.1 to include toxicity description of chemicals
- Replaced STD with SOP
- Removed Gamsberg referencing on the document
- Repla

Revision 9 SOP 52 - "Correct Storage of Hazardous Material" dated August 2022.

- Updated section 5.5 to include signage

Revision 10 SOP-0052- "Correct storage of Hazardous Material" dated July 2025.

- Total update of procedure to include Resin capsules, oil storage and overall fire suppression.

Please Note: Hard copies of old Procedures available in *Environmental Procedures Archive* file in Environmental Department

6. RESPONSIBILITIES

- The Environmental manager shall implement and maintain this Document.
- Department Heads shall ensure that this SOP is applied with due diligence.
- Deviations from this SOP shall be effected via approved “Deviations from Standard” documentation.
- Should additional precautions, due to special circumstances unique to that Department/Section, over-and-above the requirements of the Procedure be necessary, then the Department Head shall ensure that, in consultation with the relevant specialists, such requirements are specified in writing, conveyed over to the end users and recorded as such.

7. ASSOCIATED DOCUMENTS

- SSD-ENV-SOP-039 Handling of a Chemical Spillage
- SSD-ENV-SOP-40 Handling, Storage and Disposal of Waste
- SSD-ENV-SOP-008 Chemicals New form

8. VALIDITY AND DOCUMENT MANAGEMENT

8.1 Document Validity

This SOP is effective from 2006/11/10 and was last reviewed on 05-08-2025. This SOP will be reviewed every 2 Years.

8.2 Document Management

8.2.1 This SOP replaces any other SOP issued earlier by BMM to the extent specifically covered here. This SOP should be followed in letter and spirit.

8.2.2 BMM is committed to continuously reviewing and updating policies and procedures, based on the Entity's risk assessment and shall incorporate for any regulatory requirement which is required to do so.

8.2.3 Any amendment to this SOP or issue of any guidance or circular etc. under this procedure must be approved in writing by the approving authority as listed in this document.

8.2.4 BMM reserves the right to withdraw, modify or revise the SOP as a whole / partial without providing any justification for the same. On revision, it should be duly communicated to the personnel involved.

8.2.5 If compliance with this SOP ever conflicts with the applicable law, regulation, directives issued by the statutory and or regulatory authority, then compliance must be ensured with the law.

8.2.6 In order to ensure compliance or to address any known conflicts with the law or to address any specific local requirements, BMM may adopt local sub-procedures which shall be by way of addendum to this SOP and which

shall be approved by the approver of this SOP. Proposing of such addendum shall be the responsibility of the respective Entity's competent authority who is at an equivalent level with the SOP owner as set out in this document.

8.3 Violation of Sop

8.3.1 BMM follow a "Zero Tolerance Policy" with respect to non-compliance with this SOP and/or any other SOP / guidance issued by BMM and its constituent Entities.

8.3.2 Violation of this SOP is subject to appropriate disciplinary actions which may include but not limited to termination of employment. This determination will be based on the facts and circumstances of each situation. Any accused of violation of this SOP will be given an opportunity to present their case prior to any determination of appropriate disciplinary actions. Violation of this SOP may also be subject to substantial civil damages, criminal fines and prison terms.

8.3.3 Each employee is responsible for ensuring that their conduct and the conduct of anyone reporting to them shall fully comply with this SOP. Compliances, both personal and by subordinates, will be a factor in periodic performance appraisals.

8.4 Disclaimer

8.4.1 This SOP issued by BMM is for internal compliance and does not create, nor shall it be construed to create, directly or implicitly, any rights, duties or obligations of BMM to any person, body or legal Entity.

8.4.2 This document and its contents are the copyright property of BMM. The release of this document to any third party outside BMM is strictly prohibited without prior consent.

9. REVIEW AND APPROVAL

Content Owner(s)
Anne-Marie Cloete (Senior Environmental Officer | BMM) TimeStamp: 2025/08/12 11:32:49 AM ||

Content Reviewer(s)
Pieter David Venter (Head of HSE & ESG | BMC) TimeStamp: 2025/08/12 11:58:15 AM ||

Content Approver(s)
Catharina Kotze (Head of HSE | BMM) TimeStamp: 2025/08/12 1:56:44 PM ||

This document was approved (in sequence) by the individuals above using electronic approval in our Document Control System.

Final approval status: Approved

Approvals were done electronically.

❖ Annexures / Appendix