

ASSA policy - If you find something which looks like a meteorite

The earth is bombarded every day by hundreds of tonnes of meteoroids, which is the term given to particles travelling through space. When the particle enters the atmosphere it burns up due to the effects of friction in a fiery streak of light we call a meteor (aka shooting star). Very bright meteors, equal or brighter than the planet Venus, are termed fireballs, and very bright meteors seen to explode are called bolides. Most of these particles are the debris left behind by comets in their passage around the sun, and burn up completely before they reach the ground. They range in size from a few micrometres to a few millimetres in size. Occasionally much larger particles, mostly fragments of asteroids, enter the atmosphere and survive their passage to reach the ground. These are what we call meteorites.

Meteorites are broadly characterised by three types:

- Stones, which comprise mainly silicate minerals
- Irons, which are almost entirely metallic, mainly iron and nickel
- Stony irons, which are a mixture of minerals and metals

What a real meteorite looks like depends on a number of factors, including its composition, origin in the solar system, the forces it is subjected to during its fiery passage through the atmosphere, and how fresh it is before it is found. Freshly fallen meteorites are often dark grey or black, smooth and shiny, and may show signs of a fusion crust from the effects of intense heating. Very quickly they may change colour and the surface will become rough under the effects of terrestrial weathering. Visually differentiating between meteorites and terrestrial rocks then becomes more difficult.

Many terrestrial rocks look like meteorites. The fact that a rock is heavy and is attracted to a magnet does not mean it is a meteorite. Depending on their composition and origin, many terrestrial rocks are heavy, magnetic, dark coloured or appear to have been molten or exposed to heat.

If you think you have found a meteorite on your property, please note the following:

- **ASSA cannot authenticate meteorites – this needs to be done by a qualified geologist.**
- **ASSA is not mandated to value meteorites, or to give any advice on the disposition of meteorites.**
- **Meteorites are governed by The National Heritage Resources Act (Act No. 25 of 1999), and more specifically by section 35(4) of the Act. Section 35 reads as follows:**

35. (1) Subject to the provisions of section 8, the protection of archaeological and palaeontological sites and material and meteorites is the responsibility of a provincial heritage resources authority: Provided that the protection of any wreck in the territorial waters and the maritime cultural zone shall be the responsibility of SAHRA.

(2) Subject to the provisions of subsection (8)(a), all archaeological objects, palaeontological material and meteorites are the property of the State. The responsible heritage authority must, on behalf of the State, at its discretion ensure that such objects are lodged with a museum or other public institution that has a collection policy acceptable to the heritage resources authority and may in so

doing establish such terms and conditions as it sees fit for the conservation of such objects.

(3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority.

(4) No person may, without a permit issued by the responsible heritage resources authority—

(a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;

(b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;

(c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or

(d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

(5) When the responsible heritage resources authority has reasonable cause to believe that any activity or development which will destroy, damage or alter any archaeological or palaeontological site is under way, and where no application for a permit has been submitted and no heritage resources management procedure in terms of section 38 has been followed, it may—

(a) serve on the owner or occupier of the site or on the person undertaking such development an order for the development to cease immediately for such period as is specified in the order;

(b) carry out an investigation for the purpose of obtaining information on whether or not an archaeological or palaeontological site exists and whether mitigation is necessary;

(c) if mitigation is deemed by the heritage resources authority to be necessary, assist the person on whom the order has been served under paragraph (a) to apply for a permit as required in subsection (4); and

(d) recover the costs of such investigation from the owner or occupier of the land on which it is believed an archaeological or palaeontological site is located or from the person proposing to undertake the development if no application for a permit is received within two weeks of the order being served.

(6) The responsible heritage resources authority may, after consultation with the owner of the land on which an archaeological or palaeontological site or a meteorite is situated, serve a notice on the owner or any other controlling authority, to prevent activities within a specified distance from such site or meteorite.

(7) (a) Within a period of two years from the commencement of this Act, any person in possession of any archaeological or palaeontological material or object or any meteorite which was acquired other than in terms of a permit issued in terms of this Act, equivalent provincial legislation or the National Monuments Act, 1969 (Act No. 28 of 1969), must lodge with the responsible heritage resources

authority lists of such objects and other information prescribed by that authority. Any such object which is not listed within the prescribed period shall be deemed to have been recovered after the date on which this Act came into effect.

(b) Paragraph (a) does not apply to any public museum or university.

(c) The responsible authority may at its discretion, by notice in the Gazette or the Provincial Gazette, as the case may be, exempt any institution from the requirements of paragraph (a) subject to such conditions as may be specified in the notice, and may by similar notice withdraw or amend such exemption.

(8) An object or collection listed under subsection (7)—

(a) remains in the ownership of the possessor for the duration of his or her lifetime, and SAHRA must be notified who the successor is; and

(b) must be regularly monitored in accordance with regulations by the responsible heritage authority.

ASSA recommendation is to offer the suspected meteorite to the geology department of any national museum or university, who will be qualified to decide on the authenticity and disposition of any meteorites or otherwise.

There are currently 48 known South African meteorites in the National History Museum - Catalogue of Meteorites (see <https://www.nhm.ac.uk/our-science/data/metcat/search/metsPerCountry.dsml>). There have been no recent discoveries, and the last one discovered was the Merweville meteorite in 1977, weighing just under 7kg.

There are 49 South African meteorites listed in Meteoritical Bulletin Database of The Meteoritical Society, which can be viewed at <https://www.lpi.usra.edu/meteor/metbull.php>. These include falls and finds, falls being where the event was witnessed and finds where it was not witnessed, and the discovery was serendipitous.

If your rock turns out to be a meteorite, it will be added to these catalogues by the relevant authorities.

Please note these regulations apply to South Africa. Neighbouring states are governed by similar legislation and residents of those countries should consult the applicable regulations.

References:

Government Gazette of the Republic of South Africa at:

https://www.gov.za/sites/default/files/gcis_document/201409/a25-99.pdf

National History Museum at:

<https://www.nhm.ac.uk/discover/types-of-meteorites.html>

The Meteoritical Society at:

<https://meteoritical.org/meteorites>