African Mineral Standards
MATRIX REFERENCE MATERIALS

Tel: +2711 923 8000 Fax: +2711 923 3924715 web: www.amis.co.za, D1 Isando Business Park,
11 Gewel St (off Hulley Rd), Kempton Park, Johannesburg 1609. P.O. Box 856,
Isando, 1600, South Africa, a division of the Set Point Group

# INTERNATIONAL SHIPPING OF URANIUM BEARING REFERENCE MATERIALS

Shipping of AMIS uranium bearing reference materials to countries such as Canada and Australia should not be a problem for two reasons. Firstly AMIS uranium standards contain such small quantities of uranium and thorium they generally do not classify as radioactive (ref Table 1). Secondly African Mineral Standards is licensed by the South African National Nuclear Regulator to produce, distribute and export reference materials containing uranium according to Nuclear Authorisation COR-260.

This guide summarizes the relevant parts of the international regulations for the safe transport of radioactive material (IAEA Safety Standards Series No. TS-R-1, see reference). These are written in officialese, making them a bit inaccessible, but the ultimate responsibility to let the goods past will in any event rest on local customs officials. Customers are advised to clear the South African and African Mineral Standards procedures (below) with them first.

Mike McWha
*Managing Director*
*African Mineral Standards*

**Directors:** GJ Horsfield (CEO), MD Evers (CFO)(British), SJ Ingram,
M McWha, N Robinson, MH Snelling, J Vassiloudis, D Williams

## 1. SAFETY THROUGH INTERNATIONAL STANDARDS

While safety is a national responsibility, international standards and approaches to safety promote consistency, help to provide assurance that nuclear and radiation related technologies are used safely, and facilitate international technical cooperation and trade. The standards also provide support for States in meeting their international obligations. One general international obligation is that a State must not pursue activities that cause damage in another State. More specific obligations on Contracting States are set out in international safety related conventions. The internationally agreed International Atomic Energy Agency (IAEA) safety standards provide the basis for States to demonstrate that they are meeting these obligations.

## 2. THE IAEA STANDARDS

The IAEA safety standards have a status derived from the IAEA's Statute, which authorizes the Agency to establish standards of safety for nuclear and radiation related facilities and activities and to provide for their application. The IAEA's Statute, entered into force in 1957 after a conference at the United Nations, authorizes the Agency to establish safety standards to protect health and minimize danger to life and property; which the IAEA must use in its own operations, and which a State can apply by means of its own regulatory provisions for nuclear and radiation safety. The IAEA currently has 146 member state signatories

The IAEA first published Safety Series No. 6 in 1961 for application to the national and international transport of radioactive material by all modes of transport. Subsequent reviews, conducted in consultation with Member States and the international organizations concerned, resulted in comprehensive revisions being published in 1964, 1967, 1973, 1985,1996, 2003 and 2005. The current transport of radioactive material is governed by the "Regulations for the Safe Transport of Radioactive Material, 2005 Edition, IAEA Safety Standards Series No. TS-R-1, International Atomic Energy Agency, Vienna, 2005".

## 3. THE SOUTH AFRICAN NATIONAL NUCLEAR REGULATOR

The South African National Nuclear Regulator (NNR) was established by the National Nuclear Regulator Act, Act No 47 of 1999 and set up for the protection of the public, property and environment against nuclear damage. South Africa is a member state of the International Atomic Energy Agency and adopts the IAEA's safety standards as do most other countries.

## 4. AMIS URANIUM STANDARDS

AMIS uranium reference materials are all low specific activity (LSA) material (clause 226) which by its nature has a limited specific activity, or radioactive material for which limits of estimated average specific activity apply. They fall into the lowest hazard ranking of three groups - LSA-I (uranium and thorium ores and concentrates of such ores).

The present AMIS inventory contains material that is (by the regulations) material that is exempt from special precautions, material that is excepted and only needs a placard and only one reference material (AMIS0133 below) that would be considered radioactive according to the uranium and thorium content, if it was shipped in a larger mass than we would normally transport.

| | U ppm | Th ppm | Bq/g | Shipping guide |
|---|---|---|---|---|
| AMIS0029 | 867 | 97.4 | 11.2 | Excepted material |
| AMIS0046 | 93 | 73.8 | 1.5 | Exempt material |
| AMIS0054 | 1472 | 8.62 | 18.4 | Excepted material |
| AMIS0077 | 477 | 46 | 6.2 | Exempt material |
| AMIS0078 | 346 | 36.1 | 4.5 | Exempt material |
| AMIS0079 | 244 | 27 | 3.2 | Exempt material |
| AMIS0080 | 114 | 8 | 1.5 | Exempt material |
| AMIS0085 | 266 | 48 | 3.5 | Exempt material |
| AMIS0091 | 264 | 7.4 | 3.3 | Exempt material |
| AMIS0092 | 399 | 6.5 | 5.0 | Exempt material |
| AMIS0097 | 543 | 12.4 | 6.8 | Exempt material |
| AMIS0098 | 848 | 13 | 10.7 | Excepted material |
| AMIS0100 | 1480 | 129 | 19.0 | Excepted material |
| AMIS0103 | 304 | 33 | 3.9 | Exempt material |
| AMIS0113 | 550 | 40 | 7.0 | Exempt material |
| AMIS0114 | 550 | 6.6 | 6.9 | Exempt material |
| AMIS0115 | 640 | 6 | 8.0 | Exempt material |
| AMIS0131 | 313 | 34.7 | 4.1 | Exempt material |
| AMIS0133* | 3323 | 194 | 42.3 | Excepted material* |

** see 5 and 6 below*

*Table 1 Of the 19 AMIS uranium reference materials listed above, only one is radioactive by U and Th content. However for shipping, the product will only be considered radioactive if it has a total activity concentration of 30 Bq/g* ***AND*** *a radiation level on the external surface of the package exceeding 5 µSv/h. In the small packages normally shipped, AMIS0133 is not radioactive.*

## 5. GOODS DESCRIPTION

Shipments are classified as EXEMPT MATERIAL (<10 Bq/g), EXCEPTED MATERIAL (>10 Bq/g)

Exempt material does not require special marking, labeling or placarding.

Excepted material requires the attachment of the white placard (below) to the packaging with the following information written onto the label:

1. measured radiation levels (activity) and
2. the calculated Transport Index number.

The ACTIVITY is a function of the mass of the package and is read, by a trained and certified technician using a calibrated dose meter, prior to shipping. The radiation levels on the external surface of the package shall not exceed 5 µSv/h.

The TRANSPORT INDEX of a shipment is determined by using the following method:

1. Scan all surfaces of a package, including the bottom at 1 metre distance.

2. The highest value measured in µSv per hour, divided by 10, is the value that determines the Transport Index for the package.

**6. SHIPPING DOCUMENTATION**

All shipments are accompanied by a transport consignor's note (see attached) which indicates the nature of the material (radionuclides, shipping class, physical form etc), maximum activity measured on the package, the Transport Index, emergency procedures in case of an accident as well as contact numbers.

**7. REFERENCES**

Regulations for the Safe Transport of Radioactive Material, 2005 Edition, IAEA Safety Standards Series No. TS-R-1, International Atomic Energy Agency, http://www-pub.iaea.org/MTCD/publications/PDF/Pub1225_web.pdf

**8. APPENDICES (attached)**

1. African Mineral Standards radiation protection policy.

2. Consignment form for the transport of radioactive material (EXCEMPT MATERIAL).

3. Consignment form for the transport of radioactive material (EXCEPTED MATERIAL).

African Mineral Standards
REFERENCE MATERIALS FOR AFRICAN ORES

Tel: +2711 923 7000 Fax: +2711 923 7027 e-mail: info@amis.co.za web: www.amis.co.za
30 Electron Avenue, Isando, 1600. P.O. Box 856, Isando, 1600, South Africa.
A Division of Set Point Industrial Technology ( Pty ) Ltd. Reg.No. 1989/000201/07.

# RADIATION PROTECTION POLICY

African Mineral Standard's Radiation Protection Policy is based on the principle of ethical practices at all times during the company's life.

The highest practical ethical level must be attained and maintained at all times and embraced by all stakeholders while operating or working in conjunction with African Mineral Standards operations.

The African Mineral Standards Team is conscious that the associated activities with their operations might have a radiological impact on the employees, members of the public and the environment. This impact will be kept as low as reasonably achievable at all times and where there is a natural and/or unavoidable impact on either the natural environment or surrounding communities and groups, every practical step will be taken to reduce, minimise and where possible eliminate any adverse effect.

As such the African Mineral Standards Team will continue to:

- Operate in compliance with the regulatory requirements in terms of the Nuclear Authorisation Conditions.
- Operate an effective radiological protection system with a commitment to performance measurements and credible verification of our contribution to any effects to the employees, members of the public and the environment.
- Communicate openly and honestly with all stakeholders.
- Apply the best practicable preventative measures in the design, development and management of the site.
- Continually focus on having all African Mineral Standards employees and stakeholders embrace the Radiation Protection principles through ongoing training and personal development.

M. McWha
Managing Director

African Mineral Standards
REFERENCE MATERIALS FOR AFRICAN ORES

# TRANSPORT OF RADIOACTIVE MATERIAL (EXEMPT MATERIAL)

## TRANSPORT OF RADIOACTIVE MATERIALS IN COMPLIANCE WITH IAEA SAFETY SERIES TS-R-1 (ST 1 – REVISED) REGULATIONS

| | |
|---|---|
| Date of shipment: | _____ |
| Package number: | _____ |
| Consignor's address: | 30 Electron Avenue<br>Isando<br>1600 |
| Consignee's name: | _____ |
| Consignee's address: | _____<br>_____ |
| UN shipping name: | Radioactive Material, Low Specific Activity (LSA) |
| Shipping number: | UN-2912 |
| UN class number: | 7 (RADIOACTIVE MATERIAL) |
| LSA class: | LSA-1 |
| SCO class: | N/A |
| Radionuclide: | Uranium and Progeny |
| Physical/Chemical form: | Sealed foil explorer packs containing from 50g – 250g of reference material or sealed tubs containing either 1kg of reference material packed in foil bags or tubs. |
| Activity concentration: | < 10 Bq/g |
| Maximum activity: | _____ µSv/h |
| Exclusive use: | No |
| Package label category: | White-1 |
| Transport index: 0 | |
| Accident instructions: | Keep public away from the packages and contact Colwyn van der Linde for instructions |
| Emergency Tel Nr: | **083 305 6800 – Colwyn van der Linde**<br>082 808 0960 – Mike McWha |

**CONSIGNOR'S DECLARATION**

"I HEREBY DECLARE THAT THE CONTENTS OF THIS CONSIGNMENT ARE FULLY AND ACCURATELY DESCRIBED ABOVE BY PROPER SHIPPING NAME AND ARE CLASSIFIED, PACKED, MARKED AND LABELLED AND ARE IN ALL RESPECTS IN PROPER CONDITION FOR TRANSPORT BY ROAD/RAIL ACCORDING TO THE APPLICABLE INTERNATIONAL AND NATIONAL GOVERNMENTAL REGULATIONS"

Signature of responsible person: _____

Name of responsible person: _____ Date: _____

Transporter's Signature: _____

Transporter's Signature: _____ Date: _____

African Mineral Standards
REFERENCE MATERIALS FOR AFRICAN ORES

# TRANSPORT OF RADIOACTIVE MATERIAL (EXCEPTED MATERIAL)

## TRANSPORT OF RADIOACTIVE MATERIALS IN COMPLIANCE WITH IAEA SAFETY SERIES TS-R-1 (ST 1 – REVISED) REGULATIONS

| | |
|---|---|
| Date of shipment: | _____ |
| Package number: | _____ |
| Consignor's address: | 30 Electron Avenue<br>Isando<br>1600 |
| Consignee's name: | _____ |
| Consignee's address: | _____<br>_____ |
| UN shipping name: | Radioactive Material, Low Specific Activity (LSA) |
| Shipping number: | UN-2912 |
| UN class number: | 7 (RADIOACTIVE MATERIAL) |
| LSA class: | LSA-1 |
| SCO class: | N/A |
| Radionuclide: | Uranium and Progeny |
| Physical/Chemical form: | Sealed foil explorer packs containing from 50g – 250g of reference material or sealed tubs containing either 1kg of reference material packed in foil bags or tubs. |
| Activity concentration: | > 10 Bq/g, <30 Bq/g |
| Maximum activity: | _____ µSv/h |
| Exclusive use: | No |
| Package label category: | White-1 |
| Transport index: 0 | |
| Accident instructions: | Keep public away from the packages and contact Colwyn van der Linde for instructions |
| Emergency Tel Nr: | **083 305 6800 – Colwyn van der Linde**<br>082 808 0960 – Mike McWha |

**CONSIGNOR'S DECLARATION**

"I HEREBY DECLARE THAT THE CONTENTS OF THIS CONSIGNMENT ARE FULLY AND ACCURATELY DESCRIBED ABOVE BY PROPER SHIPPING NAME AND ARE CLASSIFIED, PACKED, MARKED AND LABELLED AND ARE IN ALL RESPECTS IN PROPER CONDITION FOR TRANSPORT BY ROAD/RAIL ACCORDING TO THE APPLICABLE INTERNATIONAL AND NATIONAL GOVERNMENTAL REGULATIONS"

Signature of responsible person: _____

Name of responsible person: _____ Date: _____

Transporter's Signature: _____

Transporter's Signature: _____ Date: _____