COMMITTEE FOR MINERAL RESERVES INTERNATIONAL REPORTING STANDARDS

ICMM
International Council on Mining & Metals

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INTERNATIONAL REPORTING STANDARDS

INTERNATIONAL REPORTING STANDARDS WITH PARTICULAR REFERENCE TO SAMPLING TECHNIQUES AND DATA

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Presentation Agenda

- Principle objective CRIRSCO
- CRIRSCO Members
- Recent activities
- Potential Members
- International Reporting Template
- SAMREC – Sampling, QA/QC requirements Table 1

Principle Objective

To promote best practice in the international public reporting of Mineral Exploration Results, Mineral Resources and Mineral Reserves.

CRIRSCO is an international advisory body without legal authority, relying on its constituent members to ensure regulatory and disciplinary oversight at a national level.

It recognises the truly global nature of the minerals industry and the agreed need for international consensus on reporting standards.

CRIRSCO Members

Australia:	JORC Code
Canada:	NI 43-101 + CIM Standards
Chile:	The Code for the certification of Exploration Prospects, Mineral Resources and Ore Reserves
Europe:	PERC Code
South Africa:	SAMREC Code
United States:	SME Guide for Reporting Exploration Information Mineral Resources and Mineral Reserves
Russia	Naen Code

Recent Activities

- Ministry Land and Resources (MLR) joint meeting Beijing 2009
- Russian Naen code developed 2010
- Extractive Activities Discussion Paper April 2010
  - International Accounting Standards Board (IASB)
- UNECE 2013
  - Expert Group on Resource Classification (EGRC)
  - Specifications Task Force (STF)

Potential Members

Argentina

China

Indonesia

Mongolia

Peru

Philippines

Scandinavia

Korea

Brasil

INTERNATIONAL REPORTING TEMPLATE

for the public reporting of

EXPLORATION RESULTS, MINERAL RESOURCES AND MINERAL RESERVES

JULY 2006

Purpose

- Advisory only
- National Standards/Codes take precedence
- Model for development of new codes

Public Report

- Reports prepared for investors or potential investors
  - Annual Reports
  - Quarterly Reports
  - Information Memoranda
  - Websites
  - Public Presentations
  - Stock Exchange Information Systems

Principles

- Materiality - all relevant information
- Transparency- sufficient information to not be misled
- Competency

Competency

The Public Report is based on work that is the responsibility of *suitably qualified and experienced* persons who are subject to an enforceable Professional Code of Ethics

Competent Person

- Member or Fellow of professional body with enforceable code of ethics
- Five (5) years experience *relevant* to type of mineralization and deposit and the activity being undertaken

Competent Person

Team approach allowed but leader signs off.

NB. Satisfied in own mind able to face peers and demonstrate competence in the commodity, type of deposit and situation.

Disciplinary Procedure

- Responsibility of National Reporting Organization (NRO)
- International agreements through Recognizsed Overseas Professional Organizations (ROPO)

RPOs

Australasian Institute of Mining and Metallurgy	AusIMM
Australian Institute of Geoscientists	AIG
Canadian Council of Professional Geoscientists	CCPG
European Federation of Geologists	EFG
The Geological Society	GS
Institute of Geologists of Ireland	IGI
Institute of Materials Minerals and Mining	IMMM
Mining and Metallurgical Society of America	MMSA
Society for Mining Metallurgy and Exploration	SME

Fundamental Framework

Exploration Results

MINERAL RESOURCES

MINERAL RESERVES

Increasing level of geological knowledge and confidence

MINERAL RESOURCES	MINERAL RESERVES
Inferred	
Indicated	Probable
Measured	Proved

Consideration of mining, processing, metallurgical, economic, marketing, legal, environmental, infrastructure, social, and governmental factors (the "Modifying Factors").

Modifying Factors

- Mining
- Processing
- Metallurgical
- Economic
- Marketing
- Legal
- **Infrastructure**
- **Environmental**
- **Social**
- Governmental

Measured Mineral Resource

MMR is that part of a Mineral Resource for which tonnage, densities, shape, physical characteristics grade and mineral content can be estimated with a high level of confidence. It is base on detailed and reliable information from exploration, sampling and testing of material from locations such as outcrops, trenches, pits ,workings and drill holes. The locations are spaced closely enough to confirm geological and grade continuity.

Level of Confidence

26. The CP responsible for the resource estimate must determine the appropriate Mineral Resource category based upon the quantity, distribution and quality of data available and the level of confidence attached to the data with reference to Table 1. The method of determining these confidence levels must be disclosed

SAMREC Table 1: T3 Sampling

- T3.1 Sampling Governance
- T3.2 Sample Method, collection, validation, capture and storage
- T3.3 Sample Preparation
- T3.4 Sample analysis

Exploration Results, Mineral Resources, Mineral Reserves

T3.1 Sampling Governance

- Governance of the sampling campaign and process to ensure quality and representivity of samples and data

- Recovery, high grading, selective losses or contamination Core/hole diameter, internal and external QA/QC

- Sample recoveries properly recorded - relationship with grade and sample bias.

Any factors that may have resulted in or identified sample bias

T3.2 Sample method, collection, validation, capture and storage

- Describe each data set (eg geology, grade, density, quality) sample type, size selection, collection method
- Demonstrate adequate field QA/QC techniques have been applied
- Geometry of mineralisation with respect to drill hole angle
- Describe validation procedures to ensure integrity eg transcription, input or other errors
- Describe retention policy and storage of samples
- Describe audit process and frequency

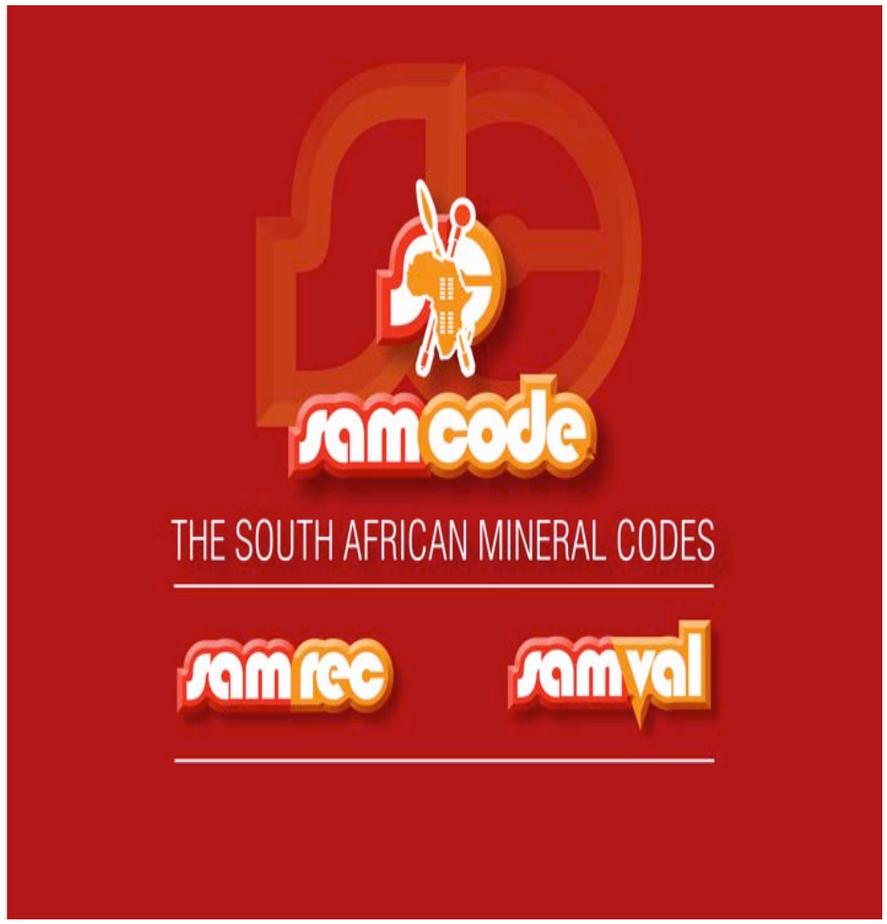
T3.3 Sample Preparation

- Location and accreditation of the lab, process and method for sample prep
- Nature, quality, verification and appropriateness of sample prep technique
- Drill core sample techniques
- QA/QC procedures for all processes including sub-sampling to maximise representivity
- Audit process and frequency

T 3.4 Sample analysis

- Identify the lab(s) and analytical method. Nature, quality and appropriateness of the process
- Accreditation status and Reg No
- Discuss QA/QC procedures (reference material, standards, blanks, duplicates and external checks)
- Audit process and frequency

Acknowledgements



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CRIRSCO TEMPLATE

ALL SLIDES

WWW.CRIRSCO.COM

Exploration Results

Exploration Results include data and information generated by exploration programmes that may be of use to investors but is not part of a formal declaration of Mineral Resources or Reserves

Tonnage and grade not to be reported!

Mineral Resource

Concentration or occurrence of material of ***economic*** interest in or on the earths crust in such form quality and quantity that there are ***reasonable*** prospects for ***eventual economic*** extraction

Not an inventory of all mineralization!

Mineral Reserve

- The ***economically mineable*** part of Measured and/or Indicated Mineral Resource

- Includes dilution and losses

- Appropriate assessments have been carried out and modifying factors have been considered

- Demonstrated at time of reporting extraction is reasonably justified

- Proven and Probable

Mineral Resources/Reserves

- Must be clearly stated Mineral Resources are ***inclusive or exclusive*** of Mineral Reserves

- Two should never be added together

- If inclusive relevant details of unmodified resources should be reported

History

- CMMI 1994
- Denver Accord 1997
- UNECE agreement November 1999
- CRIRSCO formed in Cairns, Australia 2002
- Template initiated Reston VA 2003, published 2006