New SAMREC Representative

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30 years experience in South Africa
THE SOUTH AFRICAN CODE FOR THE REPORTING OF EXPLORATION RESULTS, MINERAL RESOURCES AND MINERAL RESERVES (THE SAMREC CODE)

2015 EDITION

Launch and Effective Date May 2016

Release in June 2015

Prepared by:
The South African Mineral Resource Committee (SAMREC) Working Group

www.samcode.co.za

South African Framework
**Phase 1**
- Review and rewrite Code
- Public Consultation
- Review and update issues
- Comparison with other codes
  - GSSA, SAIMM, SACNASP, ECSA, PLATO, and SSC
  - Other CRIRSCO codes
  - Mining Industry

**Phase 2**
- Finalise Code
- Review submission
- Finalise Code
- Ratify at SSC

**Phase 3**
- Launch together with a Companion Volume
- Launch function
- Conference
- Companion guide
- Marketing and ongoing education

**Phase 4**
- Q3 2014
- Q4 2014 – Q1 2015
- Q2/3 2015
- Q1 - 2016

**Aspects to change**
- CRISCO Definitions adopted
- Exploration Results
- Information from the property concerned
- Technical Studies
- ‘if not, why not’
- New Table 1 format
- Expansion of aspects of Table 1
- Emphasis on economics & transparency/materiality
- Independence
- Point of reference
- Site Visit
Aspects to change

- Revision of aspects relating to Coal
- More comprehensive Diamond and Gemstone section
- Introduction of a section on Industrial Minerals
- Table of contents
- Signature page
- Revision of the Classification Diagram
- South African Geomatics Council (SAGC) (statutory) and Institute of Mine Surveyors of South Africa (IMSSA) (learned society) replace PLATO

CRISCO Definitions adopted

- Comparison with all Codes
- Adoption of the CRIRSCO Definitions
Exploration Results

- More definition
- Adoption of Mineralisation in place of Deposit
- Aware of concepts are being high jacked by esp. valuation
- Must not be presented in a way that unreasonably implies the discovery of potentially economic mineralisation.
- At least some physical evidence of assumed continuity of the mineralisation on the property of interest must be presented.
- Details of the Mineralisation may not appear in any tabulation of Mineral Resources or be included in a Preliminary Economic Assessment or Pre-feasibility/Feasibility study.

Technical Studies

- More definition
- Table to be added
- Additional table in line with SME
<table>
<thead>
<tr>
<th>Mineral Scoping Study</th>
<th>Prefeasibility Study</th>
<th>Feasibility Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resource categories</td>
<td>Mostly Inferred</td>
<td>Mostly Indicated</td>
</tr>
<tr>
<td>Reserve categories</td>
<td>None</td>
<td>Mostly Probable</td>
</tr>
<tr>
<td>Mining method</td>
<td>Assumed</td>
<td>General Optimized</td>
</tr>
<tr>
<td>Mine design</td>
<td>None or high-level</td>
<td>Preliminary mine</td>
</tr>
<tr>
<td>Scheduling</td>
<td>Annual approximation</td>
<td>3-monthly to</td>
</tr>
<tr>
<td></td>
<td></td>
<td>annual</td>
</tr>
<tr>
<td>Risk tolerance</td>
<td>High</td>
<td>Medium</td>
</tr>
</tbody>
</table>

### Capital Cost Category

<table>
<thead>
<tr>
<th>Scoping Study</th>
<th>Prefeasibility Study</th>
<th>Feasibility Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basis of Estimate</td>
<td>to include the following areas:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Civil/structural, architectural, piping/HVAC, electrical, instrumentation, construction</td>
<td></td>
</tr>
<tr>
<td></td>
<td>labour, construction labour productivity, material volumes/amounts, material/equipment, pricing, infrastructure</td>
<td></td>
</tr>
<tr>
<td>Contractors</td>
<td>Included in unit cost or as a percentage of total cost</td>
<td>Percentage of direct cost by area for contractors; historic for subcontractors</td>
</tr>
<tr>
<td></td>
<td>Written quotes from contractor and subcontractors</td>
<td></td>
</tr>
<tr>
<td>Engineering, procurement, and construction management (EPCM)</td>
<td>Percentage of estimated construction cost</td>
<td>Percentage of detailed construction cost</td>
</tr>
<tr>
<td></td>
<td>Calculated estimate from EPCM</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pricing FOB mine site, including taxes and duties</td>
<td>Pricing FOB mine site, including taxes and duties</td>
</tr>
<tr>
<td>Owner's costs</td>
<td>Historic estimate</td>
<td>Estimate from experience, factored from similar project</td>
</tr>
</tbody>
</table>

*Estimate prepared from detailed zero-based budget for design engineering and specific permit requirements*.

### Operating Cost Category

<table>
<thead>
<tr>
<th>Scoping Study</th>
<th>Prefeasibility Study</th>
<th>Feasibility Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basis</td>
<td>Order-of-magnitude estimate</td>
<td>Quantified estimates with some factoring</td>
</tr>
<tr>
<td>Operating quantities</td>
<td>General</td>
<td>Specific estimates with some factoring</td>
</tr>
<tr>
<td>Unit costs</td>
<td>Based on historic data for factoring</td>
<td>Estimates for labour, power, and consumables, some factoring</td>
</tr>
<tr>
<td></td>
<td>Letter quotes from vendors; minimal factoring</td>
<td></td>
</tr>
<tr>
<td>Accuracy Range</td>
<td>±25% - 35%</td>
<td>±15% - 25%</td>
</tr>
<tr>
<td>Contingency Range</td>
<td>Allowance for items not specified in scope that will be needed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>+25%</td>
<td>+15%</td>
</tr>
</tbody>
</table>

*Estimate prepared from historic factors or percentages and vendor quotes based on material volumes. Engineering at 5-20% complete. Detailed from engineering at 20%-50% complete, except mining capital outlay is fully estimated at 5-10% complete. Operating costs at 5-20% complete.*
‘if not, why not’

- Agreed to the principle
- Used of a verb i.e. ask a question
- Resistance in terms of additional reporting requirement from majors and JSE
- Use of the word “shall” in place of “must”

Updated Table 1

Table 1 is applicable to all declarations in terms of the guidelines of the SAMREC Code

<table>
<thead>
<tr>
<th>Section</th>
<th>Exploration Results</th>
<th>Mineral Resources</th>
<th>Mineral Reserves</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Section 1: Project Outline</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Section 2: Geological Setting, Deposit, Mineralisation</td>
<td></td>
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</tr>
<tr>
<td>Section 3: Exploration and Drilling, Sampling Techniques and Data</td>
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<tr>
<td>Section 4: Estimation and Reporting of Exploration Results and Mineral Resources</td>
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</tr>
<tr>
<td>Section 5: Technical Studies</td>
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<tr>
<td>Section 6: Estimation and Reporting of Mineral Reserves</td>
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<td></td>
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<tr>
<td>Section 7: Audits and Reviews</td>
<td></td>
<td></td>
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<tr>
<td>Section 8: Other Relevant Information</td>
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<td></td>
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</tr>
<tr>
<td>Section 9: Qualification of Competent Person(s) and other key technical staff. Date and Signature Page</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Section 10: Reporting of Diamonds and Gemstones</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Section 11: Reporting of Coal Resources and Reserves</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4.1 Geological model and interpretation

Describe any obvious geological, mining, metallurgical, environmental, infrastructural, legal and economic factors that could have a significant effect on the prospects of any potential exploration target or deposit.

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Describe the geological model, construction technique and assumptions that forms the basis for the Exploration Results or Mineral Resource estimate. Discuss the sufficiency of data density to assure continuity of mineralization and geology and provide an adequate basis for the estimation and classification procedures employed.

Describe the nature, detail and reliability of geological information with which lithological, structural, mineralogical, alteration or other geological, geotechnical and geo-metallurgical characteristics were recorded.

Describe the nature, detail and reliability of geological information with which lithological, structural, mineralogical, alteration or other geological, geotechnical and geo-metallurgical characteristics were recorded.

Describe the nature, detail and reliability of geological information with which lithological, structural, mineralogical, alteration or other geological, geotechnical and geo-metallurgical characteristics were recorded.

(iii) The estimation techniques and assumptions used to determine the grade and tonnage ranges shall be described in detail.

Discuss whether consideration was given to alternative interpretations or models and their possible effect (or potential risk) if any, on the Mineral Resource estimate.

Discuss geological discounts (e.g. magnitude, per reef, domain, etc.) applied to the model, whether applied or unapplied and/or on the Mineral Resource estimate.

Discuss geological discounts (e.g. magnitude, per reef, domain, etc.) applied to the model, whether applied or unapplied and/or on the Mineral Resource estimate.

(iii) Discuss the nature and appropriateness of the estimation techniques applied and key assumptions, including treatment of extreme grade values (capping or capping), capping (including by length and/or density), domaining, sample spacing, estimation unit size (block size), selective mining units, interpolation parameters and the maximum distance of extrapolation from data points.

Discuss geological discounts (e.g. magnitude, per reef, domain, etc.) applied to the model, whether applied or unapplied and/or on the Mineral Resource estimate.

Describe assumptions and justification of correlations made between variables. Any relevant specialized computer program (software) used should be named (with the version number) together with the parameters used.

Discuss geological discounts (e.g. magnitude, per reef, domain, etc.) applied to the model, whether applied or unapplied and/or on the Mineral Resource estimate.

Describe the processes of checking and validation, the comparison of model information to sample data and use of reconciliation data, and whether the Mineral Resource estimate takes account of such information.

Describe the assumptions made regarding the estimation of any co-products, by-products or deleterious elements.
Environmental

- Permitting required
- Reasonable expectation of obtaining

Classification Diagram

Increasing level of scientific and engineering knowledge and confidence

Current

Exploration Results
- Mineral Resources
- Measured
- Indicated
- Probable
- Proved

Revised

Exploration Results
- Mineral Resources
- Inferred
- Indicated
- Probable
- Proved

Consideration of mining, processing, metallurgical, infrastructural elements, marketing, legal, environmental impacts, taxation (also Modifying Factors)
Classification Diagram: Coal

- Classification Diagram: Diamonds and Gemstones
Emphasis on economics & transparency/materiality

- Issue of what investors require – noted in Readers Panel
- Information about the assessment of RPEEE

Independence

- Defined by the commissioning entity
Point of Reference

- Introduction of the principle
- Point of sale applicable to bulk commodities and industrials minerals
- Shaft head for precious and base metals

Revision of aspects relating to Coal

- Revision of the SANS 10320 document
- Consultation with SAMREC
- Moved away from mineral reserves in-situ
More comprehensive Diamond and Gemstone section

- More definition
- Concern with alluvial diamonds

Introduction of a section on Industrial Minerals

- Adoption of JORC approach
Table of Contents

- Introduction of a Table of Contents
- Along the lines of NI 43-101

Signature page

- Inclusion of an “Certificate of Competent Person”
• South African Geomatics Council (SAGC) and Institute of Mine Surveyors of South Africa (IMSSA) replace PLATO

• Draft Document
• Finalisation and public comment required
CP Training

- CP training by the GSSA for SAMREC Code compliance.
- More CP training to be undertaken
- A number of companies/consultancies also offer aspects of CP and the SAMREC Code

Public awareness

- Roadshows
- Companion Volume
- Exposure draft for distribution
- GSSA and SAIMM implemented a peer review process
- SAMVAL have an issue with CV – workshop on CP and CV
- ECSA has a job reservation paper out with the Competition Commission
- A number of reporting issues are being highlighted with eg JSE and SSC
Self Regulation

- Complaints are filed
- Procedure to review/assess
- Making Public?

SAMOG - Oil and Gas

- New Code in SAMCODE family
- Adopted the NI51-101 standards
- Approved by SSC
- Public comment and process through JSE
Background to the SAMREC Code
Organisational Structure

- South African Institute of Chartered Accountants (SAICA)
- South African Council of Natural Scientific Professions (SACNASP)
- Engineering Council of South Africa (ECSA)
- The Banking Association of South Africa
- Committee for Mineral Reserves International Reporting Standards (CRIRSCO)
- Council of Geoscience
- The Law Society of the Northern Provinces
- Geological Society of South Africa (GSSA)
- Directorate of Mineral Economics/Minerals Bureau
- Southern African Institute of Mining and Metallurgy (SAIMM)
- South African Council for Professional Land Surveyors and Technical Surveyors (PLATO)
- Investment Analysts Society
- United Nations Economic Commission for Europe (UNECE)
- JSE Securities Exchange Commission
- Chamber of Mines
- General Council of the Bar of SA

SAMREC/SAMVAL Committee

SAMVAL Working Committee
SAMREC Working Committee
Oil and Gas Working Committee

Why CRIRSCO and why Relevant?
The mining industry is a vital contributor to national and global economies; never more so than at present with soaring demand for the commodities that it produces. It is a truly international business that depends on the trust and confidence of investors and other stakeholders for its financial and operational well-being. Unlike many other industries, it is based on depleting mineral assets, the knowledge of which is imperfect prior to the commencement of extraction. It is therefore essential that the industry communicates the risks associated with investment effectively and transparently in order to earn the level of trust necessary to underpin its activities.

(CRIRSCO Website)

Why CRISCRO and why Relevant

- Family of Codes
- Same approach
- Identical definitions
- Conformity – investor confidence
- Compare Projects/Mines
### What is the benefit of SAMREC

- **Common language**
- **Common concepts**
- Non-technical professionals understand it
- Comparative for transactions/projects/mines etc
- Relevant to SA and Southern Africa
- Basis for valuation

### How are we doing it?

- Interested industry professionals meet monthly
- Go through Code section by section
- Sub-committee to deal with issues and provide feedback
- Critical path is the completion of all the issue papers
- Put out for debate
- Put out for comment
- Release and write a companion volume

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#### Top 10 risks

<table>
<thead>
<tr>
<th>2014</th>
<th>Over 7 years (2008 peak of supercycle)</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Productivity improvement</td>
</tr>
<tr>
<td>02</td>
<td>Capital dilemmas - allocation and access</td>
</tr>
<tr>
<td>03</td>
<td>Social license to operate (STLQ)</td>
</tr>
<tr>
<td>04</td>
<td>Resource nationalism</td>
</tr>
<tr>
<td>05</td>
<td>Capital projects</td>
</tr>
<tr>
<td>06</td>
<td>Price and currency volatility</td>
</tr>
<tr>
<td>07</td>
<td>Infrastructure access</td>
</tr>
<tr>
<td>08</td>
<td>Sharing the benefits</td>
</tr>
<tr>
<td>09</td>
<td>Balancing talent needs</td>
</tr>
<tr>
<td>10</td>
<td>Access to water and energy (new to top 10)</td>
</tr>
</tbody>
</table>

Remained on the risk radar over seven years
Questions?

ALL SLIDES AND NEWS RELEASE

WWW.SAMCODE.CO.ZA