

# The Existing Resource and Reserve Reporting Guideline in India – Why We Need to Introspect?

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Presented at CRIRSCO Annual Meeting  
Date: 8 November 2016

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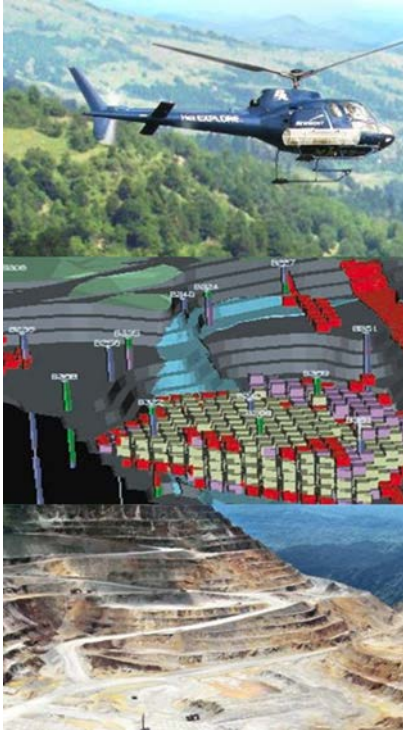
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# Content



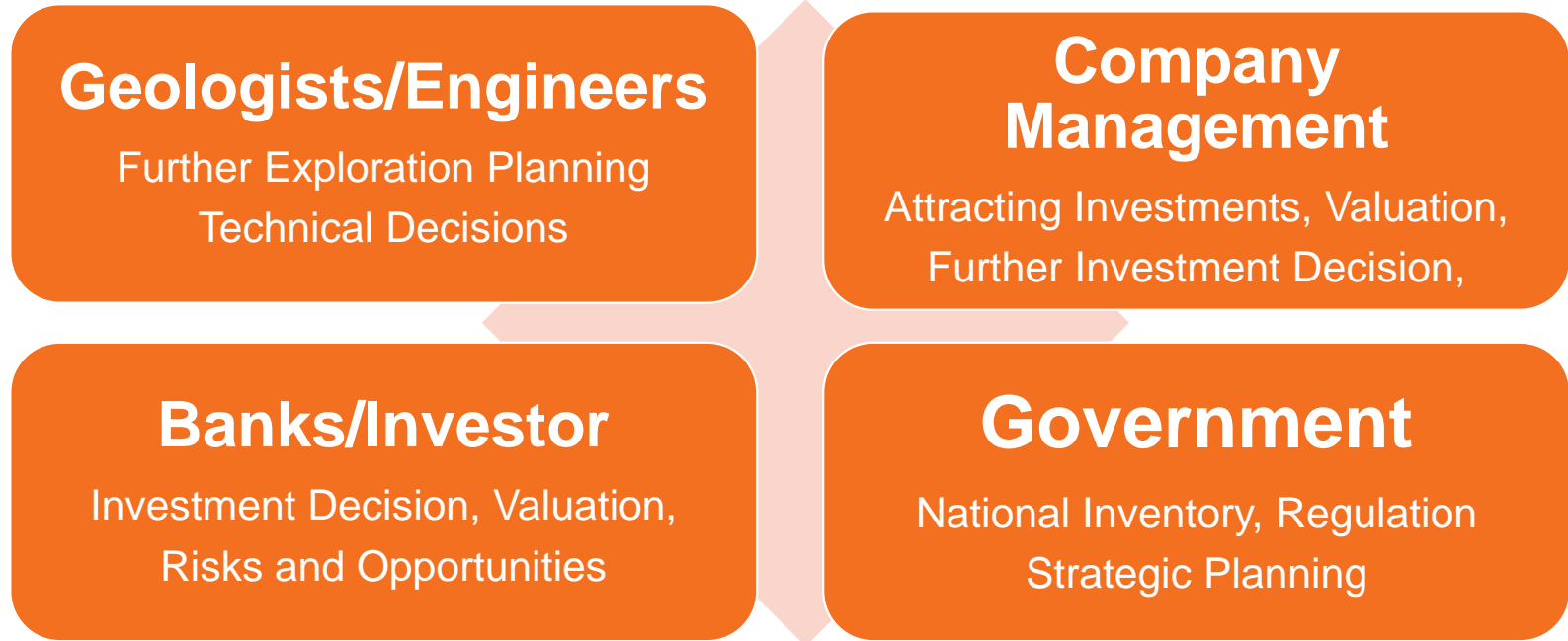
Background

Key Issues in the Existing Guideline

Concluding Remarks

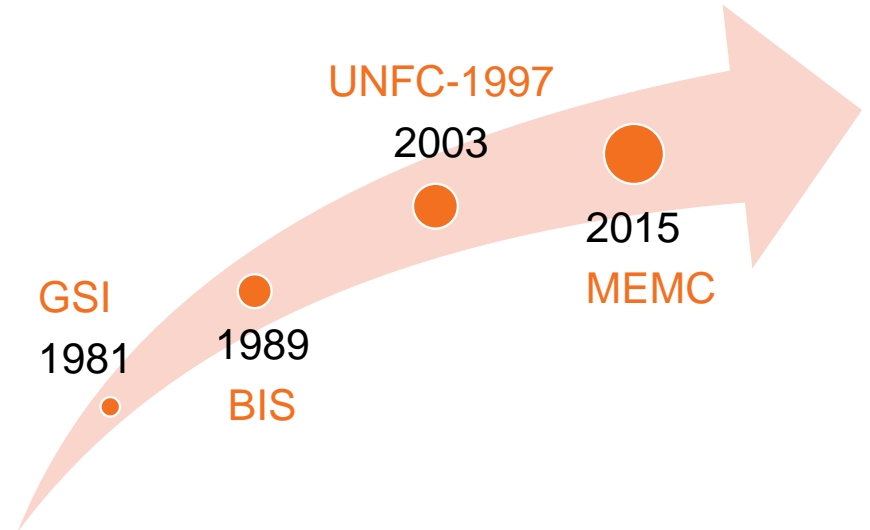
# Background

## Stakeholders of Reporting Guideline



# Background

- 2003-2015 – UNFC 1997 was the reporting guideline
- 2015 - Mineral (Evidence of Mineral Content) Rule, 2015 (MEMC) was introduced
  - Existing Resource and Reserve Guideline in India
  - Draws definitions and terminologies from UNFC 1997 and CRIRSCO



# Background

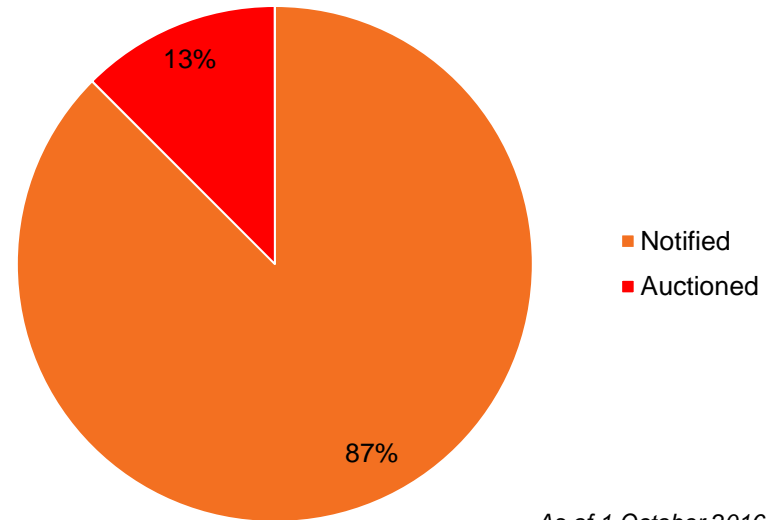
- What was the need for introducing CRIRSCO terminologies and definitions to Indian mining industry?
  - CRIRSCO promotes International Best Practice in the Public Reporting of Exploration Results, Mineral Resources and Mineral Reserves
  - Based on Transparency, Materiality and Competency
  - Encourages consistent and high quality reporting
  - Enjoys confidence of the international investment/mining communities

# Background

- Mineral Auction Rule 2015
  - All Mineral Blocks to be auctioned
  - ML: at least G2 Level Exploration (Indicated Resource)
  - CL: at least G3 Level Exploration (Inferred Resource)

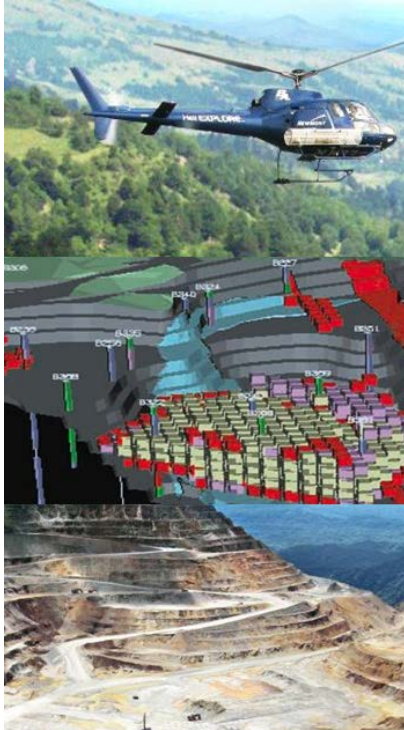
It is high time to review the existing resource and reserve reporting guideline

## Status of Mining Block Auction



As of 1 October 2016

# Content



Background

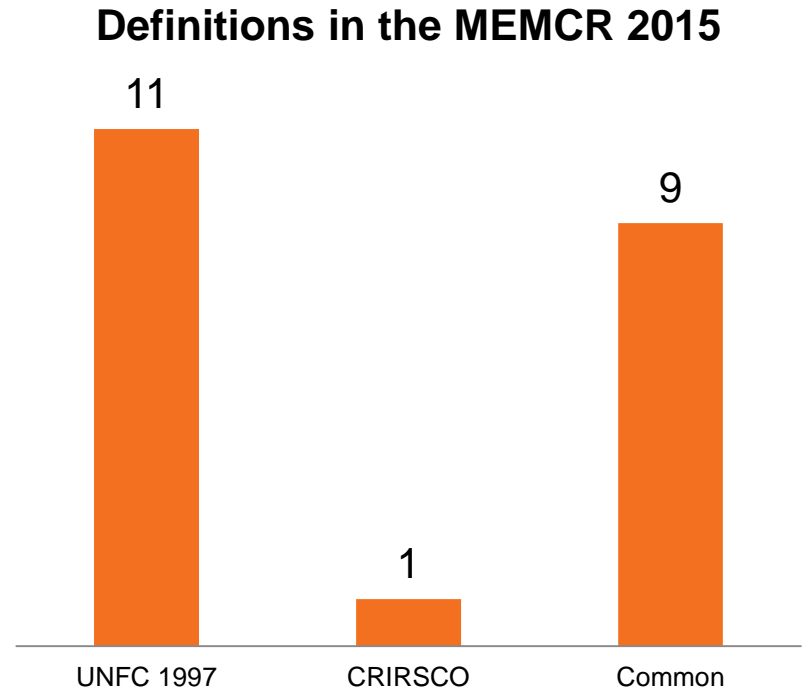
**Key Issues in the Existing Guideline**

Concluding Remarks



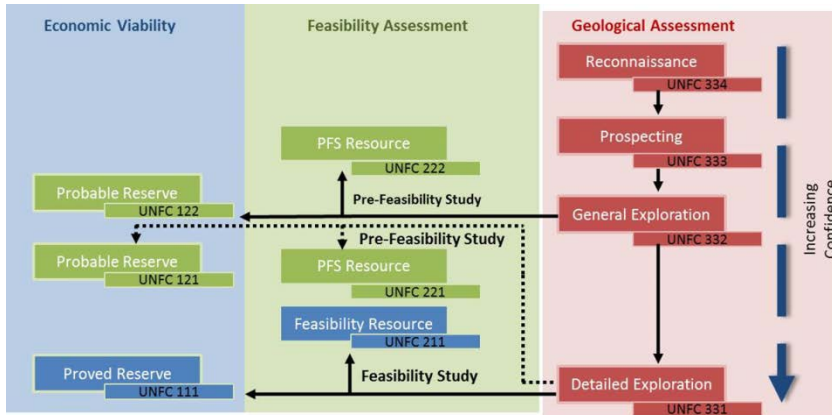
# Key Issues in MEMC: CRIRSCO vs UNFC1997

- Total 21 definitions and terminologies in MEMC
- Unambiguous definition drawn from CRIRSCO – 1
- Definitions and terminologies are drawn both in UNFC 1997 and CRIRSCO – 9
  - UNFC 1997 and CRIRSCO are not directly mappable
  - Connotations and applications of these terms are different



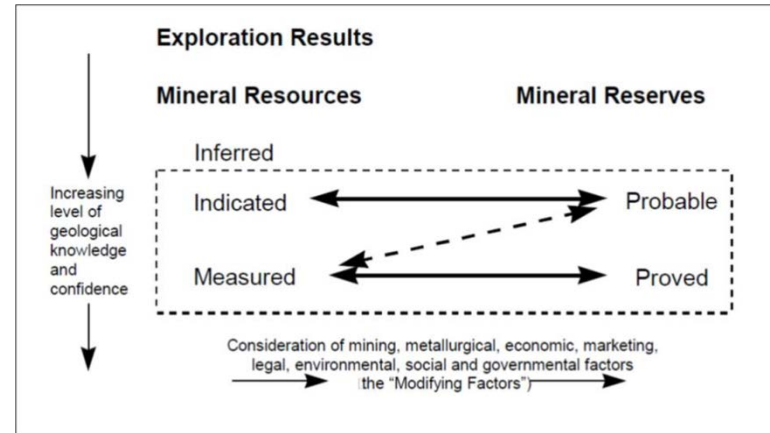
# Key Issues in MEMC: CRIRSCO vs UNFC1997

## UNFC-1997



Source: UNFC-1997

## CRIRSCO



Source: CRIRSCO Template 2013

# Key Issues in MEMC : Mineral Resource Definition

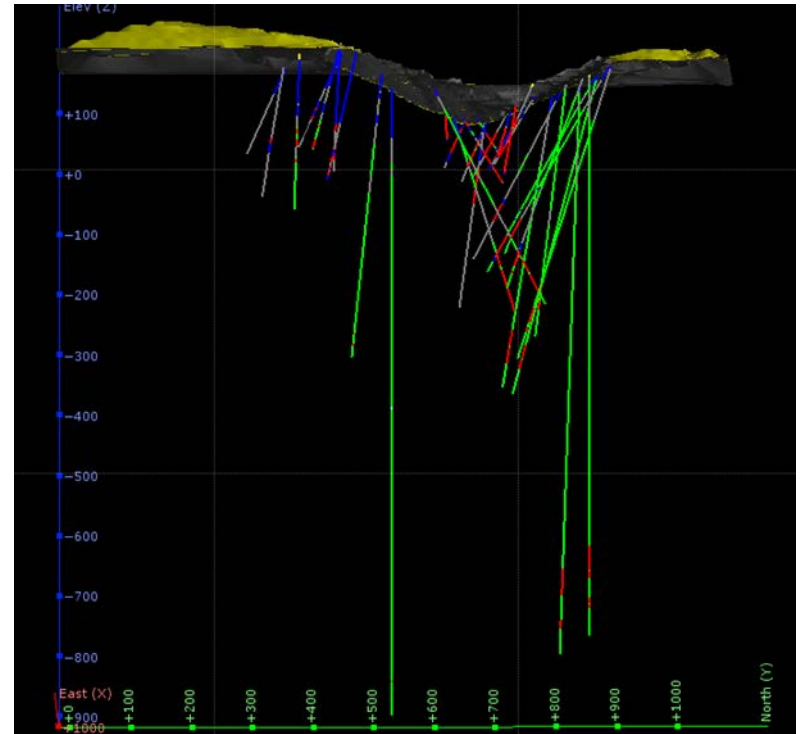
- According to the MEMC and the CRIRSCO Template, Mineral Resource must have “reasonable prospects for eventual economic extraction”
  - *“It implies an assessment (albeit preliminary) in respect of all matters likely to influence the prospect of economic extraction including the approximate mining parameters.”* (CRIRSCO Template)
- According to the MEMC : “The resource quantities estimated may indicate that the deposit is of intrinsic economic interest, i.e. in the range of economic to **potentially economic**” (MEMC – Definition of Geological Study, drawn from UNFC 1997)
  - **Potentially economic:** *“Quantities, reported in tonnes/volume with grade/quality, demonstrated by means of a Prefeasibility Study or Feasibility Study in order of increasing accuracy, **not justifying** extraction under the technological economic, environmental and other relevant conditions, realistically assumed at the time of the determination, but possibly so in the future.”* (MEMC – Definition of Potentially Economic, drawn from UNFC 1997 )

# Key Issues in MEMC: Definition of Mineral Resource

- MEMC excludes certain important parameters for reporting Mineral Resources, including:
  - *Mining Factors or Assumptions*
  - *Metallurgical Factors or Assumptions*
  - *Discussion on relative accuracy or confidence*
- According to the CRIRSCO Template:
  - *“a Mineral Resource is not an inventory of all mineralisation drilled or sampled, regardless of cut-off grade, **likely mining dimensions**, location or continuity. It is a realistic inventory of mineralisation which, under assumed and justifiable technical and economic conditions, might, in whole or in part, become economically extractable.”*

# Key Issues in MEMC: Definition of Mineral Resource

- The term “threshold values” is still retained in the MEMC,
- This may not fulfill the criteria of having “reasonable prospect for eventual economic extraction”
- Example:
  - *Threshold Value for Chromite is 10% Cr<sub>2</sub>O<sub>3</sub>*
  - *Part of a steeply dipping chromite body, occurring at 500m depth and comprise of 10% Cr<sub>2</sub>O<sub>3</sub> may not qualify for reporting “Mineral Resource”.*



# Key Issues in MEMC: Absence of Competent Person

- MEMC 2015 does not promote “Competency”
- No one could be hold accountable for Resource-Reserve estimate presented by any entity
- According to CRIRSCO - Competent Person is a minerals industry professional with enforceable disciplinary processes including the powers to suspend or expel a member.
  - five years relevant experience in the style of mineralisation or type of deposit under consideration and in the activity which that person is undertaking
  - Brings accountability in the reporting

# Key Issues in MEMC: Mineral Resource Classification

- Mineral Resource Classification has several implications
- In case of auctioning
  - Inferred Resource: Composite License
  - Indicated Resource: Mining Lease
- Such classification is mostly guided by the Exploration Norm
  - Any prescriptive rule is undesirable – each deposit is unique
- Exploration Norms are meant to be guideline
  - Yet both the regulators and mining companies treat this as rule
- Categorisation of deposit type – Primary Diamond and Shear Zone hosted gold has been put under the same category!

# Key Issues in MEMC: Mineral Resource Classification

- Drilling at a G2 level spacing does not always ensure Indicated Resource
  - Example: in a shear zone hosted gold deposit drilling at 50m spacing, but non-oriented core drilling with poor core recovery, imprecise downhole survey, lack of accuracy and precision of assay results probably would not support indicated resource classification
  - Data Quality is a big deal!
- Key difference between Indicated and Inferred
  - Indicated Resource are estimated with sufficient confidence to allow the application of **Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit**
- Data spacing is important – but not the only factor for resource classification

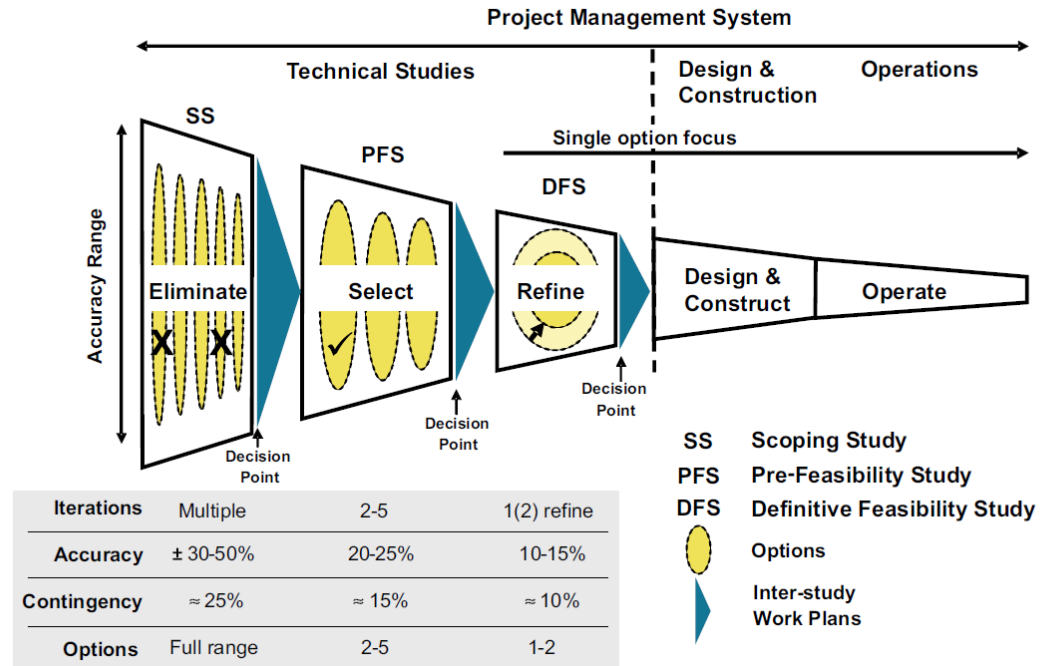


## Key Issues in MEMC: No Provision for Scoping Study

- A Scoping Study is an order of magnitude technical and economic study of the potential viability of Mineral Resources that includes appropriate assessments of realistically assumed Modifying Factors together with any other relevant operational factors that are necessary to demonstrate at the time of reporting that progress to a Pre-Feasibility Study can be reasonably justified
  - Integral part of any international reporting code, but no such provision in MEMC

# Key Issues in MEMC: No Provision for Scoping Study

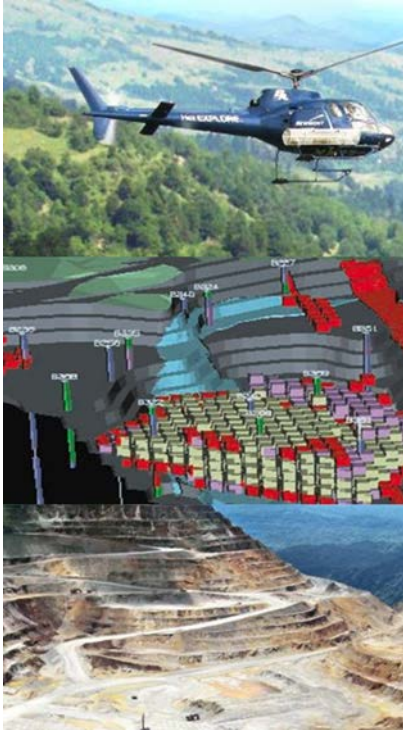
- All potential operating scenarios be considered to avoid rework or delays in later study phases
- Justification for PFS



## Key Issues in MEMC: Other

- Part V of MEMCR 2015 provides Table of Content for reporting Prefeasibility Report
  - Follows CRIRSCO Table 1, but excludes certain part
  - Silent on Feasibility Report – No Proved Reserve?
- Obligation to the Selected Bidder – bring the entire deposit into G1 level of exploration and Measured Resource and to Proved Reserve
  - Some deposits (e.g primary diamond, high nuggety gold) may not be possible to classify as Measured due to inherent uncertainties

# Content



Background

Key Issues in the Existing Guideline

**Concluding Remarks**

## Concluding Remarks

- Selective inclusion of CRIRSCO definitions mixing same with UNFC 1997 adds to much ambiguity, poor Reporting resulting in lower Investor confidence
- Government MUST consider adopting a reporting code fully aligned with the CRIRSCO template
  - Resource Reporting for Auctioning of Mining Blocks should be based on CRIRSCO template
  - NCC is working on Indian Mineral Industry Guide (IMIG)
- For maintaining National Inventory
  - adaptation of UNFC 2009 is now imperative
  - CRIRSCO is directly mapable with UNFC 2009

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**Thank You**

