Whittle Consulting Mining & Mineral Processing Optimisation Short Course

Attention Business Leaders – Don't make another business decision until you have considered these perspectives!

***Zimi Meka**, CEO of Ausenco Limited – "Whittle Consulting is recognised as the world leader in the field of optimisation for mining companies – this seminar is of relevance to all decision makers in the industry"*

***Cindy Tonkin**, Technical Product Manager, Gemcom Software – "This seminar introduces the concepts of simultaneous optimisation – of significant value for mining and mineral process business planning"*

COURSE OUTLINE DAY ONE

8.00 am Registration and Coffee

8.25 am Opening Remarks

8.30 am **1.** INTRODUCTION

- Introductions/Objectives/Agenda
- The planning framework
- What is optimisation? Definition of NPV
- Creating value and robustness through optimised planning decisions
- Pros and cons of NPV as a measure of value
- Introducing the case study

10.00 am Refreshments and Coffee

10.15 am **2.** THE 10 OPTIMISATION MECHANISMS – CASE STUDY

1 Pit optimisation (Lerchs-Grossman)
2 Phase selection
3 Mine schedule optimisation
4 Cut-off grade optimisation (Ken Lane)
5 Stockpiles
6 Simultaneous/global optimisation
7 Process plant calibration
8 Product specification
9 Logistics
10 Capital sizing optimisation
- Summary of NPV waterfall
- Other considerations

12.00 pm Networking Lunch

13.00 pm **3.** ASSET PORTFOLIO OPTIMISATION

Examples of large scale optimisation:
- Multiple pit and underground mines
- Multiple/alternative processing paths
- Downstream plant alternatives
- Multiple/alternative product alternatives
- Data compaction
- Managing the model/data
- Lessons learned

14.30 pm Refreshments and Coffee

14.45 pm **4.** RISK AND UNCERTAINTY

- Source of risk – focus on geological and market risk
- Modeling and measuring the impact of uncertainty
- Managing uncertainty through optimisation/simulation
- The risk free discount rate
- The case for flexibility

16.15 pm DISCUSSION

16.30 pm End Day 1

COURSE OUTLINE DAY TWO

8.00 am Coffee

8.25 am Opening Remarks

8.30 am **5.** COST MODELING: A MAJOR VALUE DRIVER

- Fixed vs variable costs?
- Activity based costing principles
- Step costs
- Treatment of period/fixed costs

10.00 am Refreshments and Coffee

10.15 am **6.** STRATEGIC OPTIMISATION AND MODELING TECHNIQUES

- Blending into plant/product
- Blending for a ratio of two grades
- Maximising flexibility for blending
- Non linear recovery models
- Trade-off: Recovery vs throughput
- Trade-off: Recovery vs cost
- Trade-off: Recovery vs concentration
- Optimisation model design and data flow

12.00 pm Networking Lunch

13.00 pm **7.** CONSTRAINTS AND BOTTLENECKS

- Theory of constraints – general implications
- Identifying the bottleneck
- How it applies to mining
- What is the significance to strategic optimisation?
- Allocation of costs
- Grade bins and grade control
- Example case study
- Value chain design implications

8. CASE VARIATIONS

- Coal
- Laterite deposits
- Applicability to other commodities: Iron Ore, Lead, Zinc, Rare Earths, Phosphates, Manganese, Diamonds, Precious Metals, others.

14.30 pm Refreshments and coffee

14.45 pm **9.** DEVELOPING AN OPTIMISATION CAPABILITY

- Technical barriers – data, software
- Organisational barriers
- The ideal planning process
- Gap analysis
- Implementation strategy
- Personal action plan

16.15 pm DISCUSSION AND COURSE EVALUATION FORMS

16.30 pm End of Course