Mineral project Generation and management

Risk management

SUMMARY

The core business of GEOTASK Pty Ltd is mineral project generation, evaluation and management, focused upon brown fields exploration and project development.

Project definitions are:

- Green-fields exploration
  - Exploration remote from known resource
  - Time and cost consuming
  - Does not work in conjunction with known resource information

- Brown-fields exploration and project development
  - Historical exploration information will be compiled, on 2 stages
    - 1. On tenement
    - 2. Off tenement, within adjacent 50k map sheet
  - Exploration adjacent to known resources
  - Working towards a "cash low"
  - Uses known resource information
  - Reduction in project development time

The process of Project Selection is summarised in Tables 1 and 2.

Table 1 outlines the unpegged/pegged status (pending and granted applications) versus the Stage of Evaluation of a given project..

Table 2 outlines the Stage of Evaluation and the reporting requirements of that givens stage, with the report subject content requirements summarised in Appendix.

The KEY issue is conformity of documentation to the Australasian Institute of Mining and Metallurgy, in particular the JORC and Valmin Codes of practice.

The JORC Code

The JORC Code, Australasian Code for Reporting of Identified Mineral Resources and Ore Reserves, was established as a joint initiative of The AusIMM, the Minerals Council of Australia and the Australian Institute of Geoscientists through the Joint Ore Reserves Committee. The JORC code is available through the JORC website or in hard copy from The AusIMM.

http://www.ausimm.com/codes/jorc.asp

The Valmin Code 2005

"Code for the Technical Assessment and Valuation of Mineral and Petroleum Assets and Securities for Independent Expert Reports." Dated 20 April 2005

Following the recommendations of an AusIMM Task Force, a Joint Committee of The AusIMM, the AIG and MICA with the participation of the Australian Stock Exchange Limited (ASX), the Australian Securities and Investment Commission

(ASIC), the Minerals Council of Australia (MCA), the Petroleum Exploration Society of Australia (PESA), the Securities Institute of Australia (SIA) and representatives from the Australian Finance Sector, was set up to propose a new Code. The Valmin Code 2005 was approved by The AusIMM Board on Friday 29 April 2005 and this Code is now binding on all members of The Institute.

http://www.ausimm.com/codes/valmin.asp

TABLE 1 – PROSPECTOR/COMPANY AND TENEMENT STATUS, STAGE OF EVALUATION

[redacted]	[redacted]	STAGE1	STAGE2	STAGE3	STAGE4	STAGE5	STAGE6	STAGE7	STAGE8	STAGE9	STAGE10
UNPEGGED	VACANT	*	*	*	*						
PEGGED, PENDING	PROSPECTORS	*	*	*	*						
[redacted]	PTY CO.	*	*	*	*						
[redacted]	IPO	*	*	*	*						
[redacted]	JUNIOR EXPLORER	*	*	*	*						
[redacted]	JUNIOR MINER	*	*	*	*	*					
[redacted]	SENIOR MINER	*	*	*	*	*					
PEGGED, GRANTED	PROSPECTORS	*	*	*	*						
[redacted]	PTY CO.	*	*	*	*						
[redacted]	IPO	*	*	*	*						
[redacted]	JUNIOR EXPLORER	*	*	*	*	*					
[redacted]	JUNIOR MINER	*	*	*	*	*	*	*	*	*	*
[redacted]	SENIOR MINER	*	*	*	*	*	*	*	*	*	*

Table 2 – Stage Evaluation Activities

Phase	Stage	Description	Evaluation Methods	Report
Exploration	1	Regional Surveys	Commodity. Regional reconnaissance surveys; geological, geochemical, geophysical. Mineral inventories. Geographical Information System, data compilation	Preliminary Mineral Location Report Mineral Asset Valuation
	2	Anomaly Definition	Ground surveys; geological, geochemical, geophysical. Pegging	Mineral Asset Valuation
	3	Anomaly Verification	Detailed infill surveys. Trenching, selective Aircore / Rab drilling	
	4	Discovery, Delimitation	Selective RC & diamond drilling	INFERRED RESOURCE
Development	5	Deposit Definition	Detailed mapping, drilling on surface or underground	MEASURED INDICATED RESOURCE
	6	Project Engineering	Engineering studies. Pilot tests, mine and plant design.	Reserve Valuation Open Pit Design Underground Mine Design
	7	Project Economics	Extract policy, metallurgical testing, market price and cost surveys, social and environmental impacts	
Production	8	Feasibility, Decision	Review of all information. Evaluation and decision. Notice of Intent	Independent Technical Report
	9	Mine Development	Construction of mine/mill, infrastructures; pit/mine development	
	10	Mine Production	Mine planning, development and production.. Sales	Reconciliation Due Diligence

MINERAL LOCATION REPORT

When carrying out a mineral asset valuation the expert will usually need to conduct a site visit and will need to obtain the above information, The list is intended to act only as a guide to the information required for a valuation report, and is not intended to cover all issues

ITEM	MINERAL LOCATION REPORT
1	access to previous geological or mining reports including statutory reports
2	copies of all previous valuations
3	the status of the tenements and security of tenure
4	the location and availability of services and infrastructure
5	issues related to obstacles (such as environmental, land access, rehabilitation, native title, employee relations and work practice issues)
6	past and recent exploration history and results
7	resources and reserves (in accordance with JORC or equivalent code) estimates
8	maps, plans, interpretations and location of relevant features
9	all agreements, contracts, joint ventures etc that impact on the project
10	tax, royalties and vendor consideration details
11	current share market and economic conditions (normally source independently)
12	production history and proposed production volumes and schedules
13	actual and forecast capital and operating costs
14	market opportunities and sales contracts
15	product quality, forecast sales volumes and prices
16	any financial models and sensitivity analysis

MINERAL ASSET VALUATION

A valuation is usually undertaken by independent experts in order to estimate the value that a project or property may change hands at in a willing buyer-willing seller transaction. When reviewing a valuation of a mining project one should consider at least the above issues. The list is intended to act only as a guide to in the review of a valuation report.

ITEM	MINERAL ASSET VALUATION REPORT
1	does the valuation conform to VALMIN and ASIC standards
2	has the report been prepared independently
3	have all previous valuations been declared
4	what is the experience of the valuer in that commodity and geographical region
5	what is the date of the valuation and how current is the report
6	what was the purpose for which the valuation was obtained
7	what is the source of the information used and has any information not been used
8	has the status of the tenements and security of tenure been
9	determined
10	have share market and economic conditions been taken into account
11	did the expert make a site visit and the observations made
12	were there any restrictions to the depth of analysis (eg time
13	and cost)
14	does the availability of services and infrastructure impact on the valuation
15	are there any related obstacles (such as environmental, land access, rehabilitation, employee relations and work practice issues)
16	are resources and reserves treated in accordance with JORC code
17	have maps, plans, or other pictures been provided to illustrate relevant features,including the location of tenements.
18	what are the valuation methods applied by the valuer and are they appropriate
19	the high low range of values and the most likely value estimated by the expert

20	did the valuer consider all agreements, contracts, jv agreements
21	has sufficient information been provided to see how the valuation was arrived at
22	how have tax, royalties and vendor considerations been handled
23	does proposed production volume reconcile with market opportunities/available reserves.
24	how appropriate are assumptions on product quality, forecast sales volumes and prices and the escalation and exchange rates used.
25	has a sensitivity analysis been carried out showing the effect of changing any significant assumptions
26	how do actual and forecast capital and operating costs compare
	the report should include the name, registered address and company number of the expert
	the name of the expert responsible for the report must be included and he must sign the report.

RESOURCE EVALUATION

Resource evaluation is the foundation for the mine planning process and accurate estimates are critical to the financial success of a mining operation. A good evaluation process should ensure that the database is of high quality and that the geological framework is sound. The following steps are integral to achieving a good resource estimate.

ITEM	MINERAL RESOURCE EVALUATION REPORT
1	Grade / tonnage relationship is critical in predicting selective mining outcomes
2	Understand the geological controls on mineralisation.
3	Consider mining and metallurgical issues that may impact on resource estimation.
4	Validate the database and develop a geological model.
5	Investigate the statistical behaviour and spatial continuity of the mineralisation.
6	Determine appropriate block size and adequacy of the drilling grid.
7	Choose an appropriate estimation method and parameters.
8	Estimate block grades and other relevant variables (eg density, recovery).
9	Validate the block model.
10	Classify the grade model according to JORC guidelines.
11	Report the grade model at a relevant cut-off.
12	Interface with mine planning and the reserve estimation process.

RESERVE ESTIMATION

The development of reserve estimates should consider the above. The list is intended to act only as a guide to assist the design engineer in the consideration of design parameters for a safe and productive mining layout, and is not intended to cover all aspects of the design process.

ITEM	RESERVE ESTIMATION REPORT
1	A resource model with clearly defined resource categories.
2	Determination of mining method based on orebody geometry and rock mass characteristics.
3	Calculation of cut-off grades based on the operating economics of the mine and the mining methods utilised.
4	Geotechnical considerations for slope angles, maximum unsupported spans, pillar requirements and the calculation of extraction ratios.
5	Determination of pit / stope outlines based on mining economics using Indicated and Measured Resources.
6	Determination of ore loss and dilution based on the relative geometry of the orebody in relation to the pit or stope outline.
7	Detailed pit or stope design and modelling to allow the calculation of tonnes and grade from the resource model accounting for ore loss and dilution.
8	Engineering aspects of reserve estimation can be accurately determined to ±10%, however the majority of project risk will revolve around the resource.

OPEN PIT MINE DESIGN

ITEM	OPEN PIT DESIGN
1	Topography, climate and other physical factors.
2	Geological structure and geotechnical considerations for pit slope geometry, groundwater inflow, dam locations and other infrastructure requiring engineering design.
3	Rock types from overburden and ore to determine density, hardness, degree of weathering, milling characteristics (ore), drillability and suitability for road base.
4	Mine and mill location, haul road design (amount of cut and/or fill) and distances.
5	Waste dump locations, haul distances and profiles, and amenability of low grade dump leaching in the future.
6	Operating cost estimation for milling, drill and blast, haulage (ore and waste), ground reinforcement, dewatering, administration and other ancillary costs.
7	Metal price and discount rate selection based on the degree of risk, hedging, current spot prices and price forecasting.
8	Initial pit optimisation and cut-off grade determination.
9	Initial designs, cutbacks, and ore / waste scheduling.
10	Cut-off grade optimisation, detailed design, scheduling and financial analysis.

The list is intended to act only as a guide to assist the design engineer in the consideration of design parameters for a safe and productive mining layout, and is not intended to cover all aspects of the design process.

UNDERGROUND MINE DESIGN

The list is intended to act only as a guide to assist the design engineer in the consideration of design parameters for a safe and productive mining layout, and is not intended to cover all aspects of the design process.

ITEM	UNDERGROUND MINE DESIGN
1	Underground access and materials handling systems.
2	Production rate requirements and restrictions; stope geometry and the number of working levels needed to meet production requirements.
3	Geological structure and geotechnical consideration on maximum permissible spans intravel ways and stopes, groundwater inflow and infrastructure requiring engineering design.
4	Distribution of waste and ore rock types and the density, hardness, milling characteristics(ore), drillability, blastability and suitability for road base.
5	Waste disposal – backfill or trucked to surface.
6	Mine and mill location, haul road design (amount of cut and/or fill) and trucking distances.
7	Operating cost estimation for milling, drill and blast, haulage (ore and waste), ground reinforcement, dewatering, administration and other ancillary costs.
8	Metal price and discount rate selection based on the degree of risk, hedging, current spot prices and price forecasting.
9	Cut-off grade determination.
10	Initial layout of decline, shaft and levels.
11	Layout and stope optimisation, detailed design, scheduling and financial analysis.

INDEPENDENT TECHNUCAL EXPERT REPORTS

When producing an independent technical expert report for a project the expert will usually need to conduct a site visit and will need to obtain this information. The list is intended to act only as a guide to the information required for an independent technical expert report, and is not intended to cover all aspects of the independent technical report preparation process.

ITEM	INDEPENDENT TECHNICAL REPORT
1	access to all previous geological or mining reports including statutory reports
2	the status of the tenements and security of tenure
3	the location and availability of services and infrastructure
4	issues related to obstacles (such as environmental, land access, rehabilitation, native title, employee relations and work practice issues)
5	recent exploration history and results
6	future exploration programs and estimated expenditure
7	resources and reserves (in accordance with JORC or equivalent code) estimates
8	maps, plans, interpretations and location of relevant features
9	all agreements, contracts, joint ventures etc that impact on the project
10	tax, royalties and vendor consideration details
11	current share market and economic conditions (normally source independently)
12	production history and proposed production volumes and schedules
13	actual and forecast capital and operating costs
14	market opportunities and sales contracts
15	product quality, forecast sales volumes and prices used
16	any financial models and sensitivity analysis

RECONCILIATION

Reconciliation systems compare resource, reserve and grade control model predictions of tonnage and grade with mined, stockpiled and milled production recorded and voids surveyed. A successful reconciliation system should consider all aspects and this list is intended to act as a guide to assist the in the consideration of issues relating to certain aspects of the mining cycle, and is not intended to cover all processes.

ITEM	RECONCILIATION
1	Comparisons between the grade control model, the resource / reserve model and mill data.
2	Tonnes, grade and metal should each be reconciled separately.
3	The system should differentiate break, hoist, claimed, and delivered figures.
4	All stockpiles should be monitored and included in the system.
5	Detailed production tracking, especially from multiple ore sources.
6	Reconcile over as short a timeframe as practical.
7	Reconcile using the appropriate production unit and the correct level of precision.
8	Reconciliation results should be free of subjective factors.
9	The contained metal in low-grade and non-ore stockpiles should be considered.
10	Personnel in all relevant disciplines should be aware of reconciliation data.
11	Note that mine call factors can mask poor performance and practice.
12	A good orebody can hide poor practices.

MINING DUE DILIGENECE

Due Diligence is usually undertaken by independent experts in order to analyse and evaluate all aspects of a project being considered for purchase, merger, public listing, etc. Due diligence of a mining project should consider at least the above issues. The list is intended to act only as a guide to assist consideration of what could be reviewed during due diligence, and is not intended to cover all aspects of the due diligence process.

ITEM	MINING PROJECT DUE DILIGENCE
1	legal ownership/rights to the projects tenements and any governing agreements
2	existence of native title claims or other caveats
3	existence of royalties or other payments to any other party
4	the geological setting
5	appropriateness of drilling methods and practices
6	appropriateness of sampling practices and protocols
7	the sample density and coverage
8	the assaying methods and practices
9	quality of the geological interpretation of the nature, style and geometry of the mineralisation
10	the potential for the identification of additional mineralisation
11	validation of all data sets and models
12	appropriateness of mineral resource and ore reserve estimation methods
13	independent or check estimation of resource and reserve estimates
14	metallurgical factors such as the nature of the process, the recovery and operating costs
15	mine design and geotechnical parameters and appropriateness of mining methods
16	comparison of actual production and capital costs to forecast costs
17	production and capital schedules
18	commodity price forecasts and revenue estimates
19	cash flow schedules and estimates of net present value