I7 - Southern Isa Valley 3D Model

I7 - Work in Progress

INTRODUCTION

The Southern Isa Valley 3D model presents an interpretation of the structural and lithological architecture of the South-Western Mt Isa region. The 3D modelling aspect of the project aims to deliver comprehensive 3D coverage of the entire Mt Isa region, integrating geophysical, structural and lithological datasets using the GOCAD 3D modelling package.

The key aims of the I7 3D model are:

- to provide an architectural template to aid and inform the numerical modelling within the region
- illustrate lithological and structural correlations between the Eastern and Western successions
- integrate current multi-scale and multidisciplinary data sets into one seamless interactive 3D map, while incorporating previous 3D modelling work carried out during the I1, I2, I4 and G14 projects.

This poster presents a brief outline of the current and ongoing work being undertaken in the creation of the I7 3D map

STUDY AREA

The current I7 3D model is located in the southern Mt Isa Valley and covers approximately 100km^2 of area (Figure 1, Figure 5.). The intended regional model will extend a further 200km north along the Western succession, and extend into the Eastern succession of the Isa region, as illustrated in Figure 1. Further work is similarly being undertaken further north-west in the McArther Basin region of the Northern Territory.

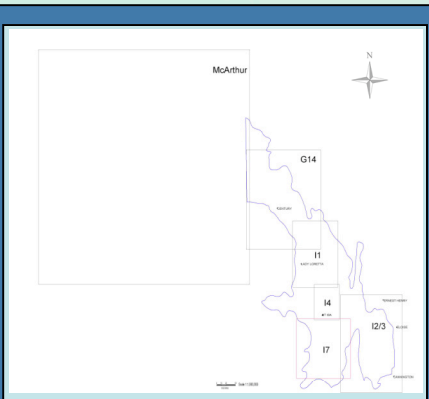

Figure 1: Map of the Mt Isa region sub-divided into project model areas.

CURRENT AND FUTURE WORK

The I7 Mt Isa 3D model consists of compilation of structural, geophysical and solid geology datasets which have been gathered by industry, universities as well as federal and state government agencies.

The construction of the map has followed the standardized pmd*CRC modelling workflow procedure. The current work to date is summarized below.

- Serial E-W cross sections at 1:100000 scale on 10km intervals have been constructed along the western succession (Figure 3)
- Solid geology using interpretations under cover using standard legend and major groupings (e.g. super-sequences)
- A standard grouping of stratigraphic units and sequences have been constructed in order allow for correlation of the Western and Eastern successions. Potential aquifers and shale seals have been highlighted (Figure 3). Ten major surfaces are being modeled based on these groupings, e.g. ECV surface (Figure 6).
- The fault coverage has been simplified to only model the major faults in 3D (>10000m), in order to limit the model size. Fault length images have been created in order to help define the major breaks.
- Sub-surface fault orientations and major unit boundaries have been interpreted using magnetic and gravitational worming techniques (Figure 5).
- Verification of subsurface geometries is being undertaken using 2.5D forward modelling.

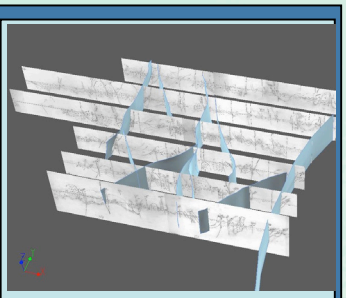

Figure 2: GOCAD image of the I7 serial cross sections including major faults.

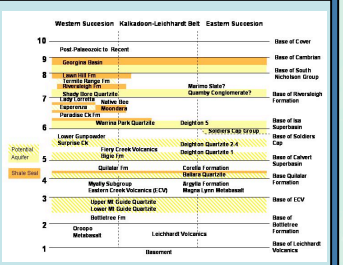

Figure 3: Standard grouping of stratigraphic units and sequences to be modelled.

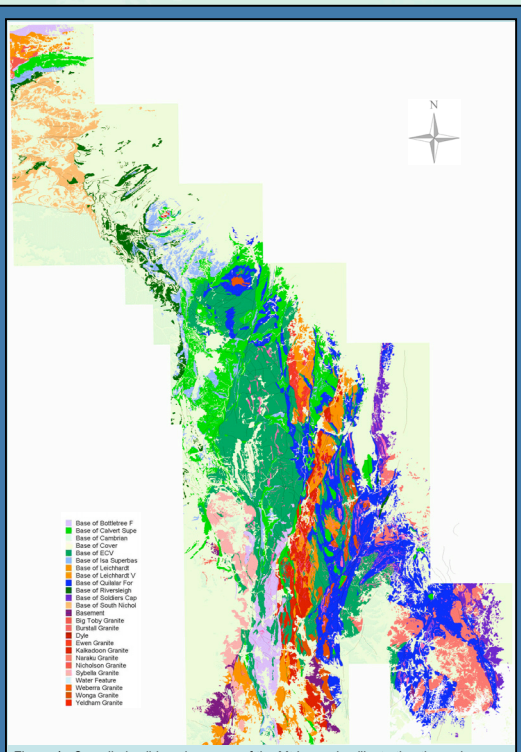

Figure 4: Compiled solid geology map of the Mt Isa region illustrating the major stratigraphic units and sequences groupings to be modelled in the I7 model.

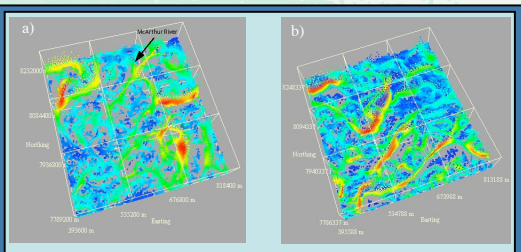

Figure 5: a) Gravity worm image of the McArtur Basin region.
b) Magnetic worm image of the McArthur Basin region NW of Mt Isa.

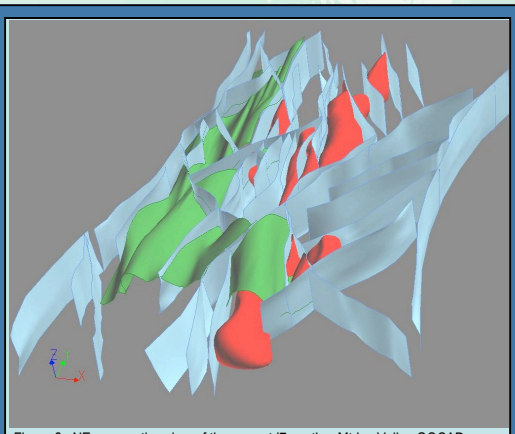

Figure 6: NE perspective view of the current I7 souther Mt Isa Valley GOCAD model, illustrating major faults (blue), Eastern Creek Volcanics (green), and the Kalkadoon Granite (red).

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Ben Jupp[1], Barry Murphy (MU), Laurent Ailleres[1], Indrajit Roy (GA)
Monash University[1]
School of Geosciences, Monash, Vic
Phone: 9909 51532
Email: ben.jupp@sci.monash.edu.au
www.pmdcrc.com.au