

Desmond FitzGerald & Associates Pty Ltd trading as



**Final Report
to the AGEg tied grant 2008
Steering Committee:**

**Forward Prediction Of Spatial Temperature
Variation From 3D Geology Models**

11 December 2008

Report Prepared for:

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Table of Contents

Final Report

Pages 2-3

Forward prediction of spatial temperature variation from 3D geology models

Printed Supporting Documents

Pages 4-15

Agenda: Geothermal Modelling Workshop: Wed 5th – Thursday 6th November 2008
(Presented by Intrepid Geophysics, sanctioned by the Australian Geothermal Energy Group and incorporating meetings for AGE G Technical Interest Groups 9 and 10)

PowerPoint: Mt Painter geology and temperature modelling: A Case Study. Presented at the TIG-10 meeting of AGE G, GSNSW – Maitland, 27th November 2008.

Extended Abstract: The Cooper Basin 3D Geological Model: A Test-Bed for thermal modelling, Tony Meixner and Fiona Holgate, 2008.

Extended Abstract: Gibson, H., Stüwe, K., Seikel, R., FitzGerald, D., Calcagno, P., Argast, D., McInerney, P. and Budd, A. 2008. Forward prediction of spatial temperature variation from 3D geology models. PESA Eastern Australian Basins Symposium III. Sydney 14-17 September, 2008.

plus

Handout Volume: Geothermal Modelling Workshop: 5th and 6th November 2008.

CD in the back: i) abstracts of presentations; ii) software: GeoModeller software v1.3.707 (Licenced to 14th January 2009); iii) A tutorial: HotRox geology model building and geothermal tutorial (written instructions and files).

Final report on key deliverables under the AGEG tied-grant funding

This final report lists our deliverable activities, and fulfils our requirements for the 12-month research project entitled: 'Forward prediction of spatial temperature variation from 3D geology models'.

1. Summary of now finalised deliverables and activities

- a. A software module has been developed for calculation of 3D temperature directly from a 3D geology model. 3D temperature prediction incorporates heat flow contributions from conductive and insitu heat production sources, and honours known boundary conditions.
- b. Additionally, a simple case of heat advection, and the honouring of a known internal boundary condition (e.g., an observed down hole temperature) has been proven in unit testing, but is yet to be implemented in the graphical user interface.
- c. The capacity to compare outcomes of model-generated temperatures, with observed temperatures and heat flows has been demonstrated on real-world 3D geology models: namely Mt Painter (Paralana) and the Cooper Basin.
- d. The ability to commence a forward 3D temperature run, starting with a non-GeoModeller 3D geology model (a GoCad geology voxet model) has been demonstrated for the Cooper Basin. This work was done in successful collaboration with Geoscience Australia (Tony Meixner) and will be on-going.
- e. Three extended abstracts (peer reviewed) were accepted for publication at three Australian Conferences. (See below, and the Printed Supporting Documents.)
- f. A Geothermal Modelling Workshop for the open communication of project outcomes was held at the University of Adelaide on 5-6th November 2008. (See 'Agenda' in the Printed Supporting Documents.)

2. Australian Conferences ('08 and '09)

The results of this 12 month research project have been accepted in oral and written formats, at three Australian Conferences:

- AGEC, Melbourne, 19-22 August 2008
- EABSIII, Sydney, 14-17 September 2008
- ASEG, Adelaide, 22-26 February 2009

3. Geothermal Modelling Workshop

39 people registered to attend the Geothermal Modelling Workshop, (excluding staff from Intrepid Geophysics, BRGM and Uni of Graz, Austria (expert advisor: Kurt Stüwe). Many attendees also contributed.

The represented organisations of the attendees included: Geoscience Australia, GSV, Global Ore Discovery, Geothermal Advisory P/L, Stuart Petroleum, NSW DPI, Petrathem, University of Adelaide, GS QLD, Clean Energy Australasia, PIRSA, Torrens Energy, Schlumberger, Australian School of Petroleum, Green Rock Energy, Granite Power, Uni of SA, Uni of Auckland, and IESE.

Amongst other materials, the Workshop Handout Volume (see Printed Supporting Documents) provided attendees with GeoModeller software including the Geothermal Module (a 2 month trial licence), a written Tutorial and Tutorial files.

Open public access of Geothermal Workshop material (All Power Points from 5th and 6th of November, 2008):

All PowerPoint presentations presented on the 5-6 th November 2008 in Adelaide at the **Geothermal Modelling Workshop** are now publicly available on our ftp site. (Also shortly be available via the AGE G website <http://www.pir.sa.gov.au/geothermal/ageg> and via the geomodeller website <http://www.geomodeller.com>)

The ftp address is:

ftp://ftp2.dfa.com.au/public/geomodeller/userMeetingsandWorkshops/0811_GeothermalWorkshop_Adelaide_Powerpoints/

Use an Explorer Window (type the ftp address over the "C:\"), DON'T use an Internet Browser. Initially type: <ftp://ftp2.dfa.com.au>. Then progressively enter the deeper folders to get to: "Nov5-6_08_All workshop_presentations"

4. European engagement

Intrepid Geophysics have a long-term relationship with the BRGM, and thus readily engaged assistance from Philippe Calcagno and others (Antonio Guillen and Gabi Courrioux) from the BRGM to provide part of the Geothermal Workshop Material. (See 'Handout Volume' in the Printed Supporting Documents.)

As the former secretariat of ENGINE (the European equivalent of AGE G), Philippe Calcagno notably presented results from ENGINE, and from other case studies (Limagne and Soultz).

Helen Gibson, 11 December 2008

on behalf of the management and development teams at Intrepid Geophysics

Printed Supporting Documents

Accompanying the:

Final Report to the AGE G tied grant 2008
Steering Committee

Funded Project: Forward Prediction Of Spatial Temperature
Variation From 3D Geology Models

Prepared by Helen Gibson, 11 December 2008
on behalf of the management and development teams at Intrepid Geophysics

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