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GEL 158 – Ferguson Hill

Annual Report Year 3

21 January 2006 – 20 January 2007

GEL 158 – Ferguson Hill
Annual Report Year 2
21 January 2006 – 20 January 2007

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1. Introduction

Ferguson Hill GEL158 was granted to MNGI Pty Ltd, a wholly owned subsidiary of Petratherm Ltd, on 20th January 2004. Petratherm Ltd listed on the Australian Stock Exchange on the 27th July 2004, following the successful completion of a \$4,000,000 public offering. Minotaur Resources Ltd is a substantial shareholder (42.1%) in the Company.

Ferguson Hill represents the informally known Radiogenic Iron Oxide (RIO) model for hot rock energy. This exploration model has its focus on areas where ancient volcanic and granitic rocks have released hot sub-surface fluids that have permeated through the surrounding rocks and consequently altered their composition. The Cu-Au-U-REE deposit at Olympic Dam is an example of this. The low-level radiogenic decay that occurs naturally in this environment results in extremely high heat production rates.

The measured heat production rates in RIO bodies may be as much as 50 times greater than those from average granite. Under favourable conditions, temperatures as high as 200°C may be generated at depths of around 3km. Petratherm Ltd has a number of techniques, developed by MNGI Pty Ltd, to delineate RIO bodies using detailed gravity and magnetic data.

2. Work Requirements

The work program negotiated for Year 3 by MNGI Pty Ltd with Primary Industries and Resources South Australia (PIRSA) for the Ferguson Hill GEL 158 was as follows.

Year of License	Work Program
3	<ul style="list-style-type: none">• Drill and complete 1 test hole• Down hole thermal analysis• Down hole stress analysis• Reservoir modelling

3. Work Conducted

Much of the work conducted in Year 3 of the license consisted of assessing the potential of the tenement, by modelling existing geophysical datasets, and negotiating funding which followed on from work specified for Year 2 of the work program. The Year 3 scheduled test well was unable to be drilled given that the progress of work in Year 2, designed to assist in siting the drilling target, was unable to be completed.

3.1 Commercial negotiations for funding

Petratherm continued discussions with a number of potential joint venture partners during Year 3 of its license. The Company was successful in negotiating an exploration joint venture agreement with Beach Petroleum on the Paralana Project.

The negotiations with Beach include an intent to develop an Exploration Alliance Agreement. If the Alliance is formalised, Ferguson Hill will be offered to Beach under the terms outlined in the agreement.

3.2 Magneto-telluric trial survey

A magneto-telluric study was originally scheduled for Year 2 of the work program but was unable to be undertaken due to a lack of available contractors. During Year 3 Petrathern engaged Zonge Engineering to undertake trail single line magneto-telluric surveys over the Callabonna and Paralana tenements in the Northern Flinders Range, with the expectation that given success at these two locations, Zonge would then replicate the method at Ferguson Hill.

Zonge Engineering duly carried out the MT surveys over Paralana (15/6/06 to 27/6/06) and Callabonna (27/6/06 to 30/6/06) with mixed results. The outcomes of the surveys were unfortunately less than satisfactory. The surveys at both locations were intended to map the depth of the basement however post processing of the data suggested that the magnetic coils used were not suitable for the low frequencies required to reach the basement depths. An alternative set of coils with greater dynamic range were substituted with greater success however the data continued to be noisy and of poor quality. In addition, severe storm activity during the Callabonna survey significantly damaged the electronic equipment such that the survey could not be completed and necessitating repairs to the system. Based on these outcomes, it was decided that this equipment was unsuitable for our purpose and the survey at Ferguson Hill was postponed pending the securing of an alternate contractor with more appropriate MT survey equipment. At this stage no suitable alternative contractor has been found, however the University of Adelaide's Geology and Geophysics Department has a current order in for new MT equipment which should be adequate. Petrathern is in communication with the University with regard to accessing this equipment once it has been delivered and commissioned.

3.3 Drilling of Test Hole

The postponement of the magneto-telluric survey meant that Petrathern did not have the necessary information pertaining to the depth to basement and the thermal conductivity of the cover, for robust thermal modelling of the system and to ensure selection of the most suitable drilling target in the tenement. As a result drilling of the scheduled test hole did not occur. In an attempt to progress target selection in the absence of the magneto-telluric data, two other options were pursued.

Firstly, modelling of the thermal regime was undertaken based on existing geophysical and drillhole data, using likely ranges of estimated thermal conductivity, heat production and/or geothermal gradient. The results of this modelling will be discussed further below.

In the absence of firm data, such a model is clearly poorly constrained therefore Petrathern sought advice from PIRSA on the possibility and appropriate protocol of re-entering one of the historical drill holes on the Ferguson Hill tenement by drilling out the cement plug and reaming the hole. The ability to conduct wireline logging and potentially collect thermal conductivity data within this hole would allow the sensitivity of our thermal modelling to be increased. Discussions with PIRSA

personnel however were discouraging due largely to the liability implications should the integrity hole be found to be compromised as a result of normal depreciation with time or through Petratherm's activities.

3.4 Geophysical and Thermal Modelling

Well logs from historical drillholes provide some control on the expected stratigraphy of the Ferguson Hill tenement, and thermal modelling was undertaken using a range of likely thermal conductivities for this stratigraphy, in concert with a range of potential heat production values from the RIO body. The stratigraphy of the area is not particularly favourable having a relatively high inferred thermal conductivity, therefore the depth and heat production value of the basement is of critical importance for any geothermal resource to be of commercial viability. An estimated optimal depth to basement, based on the thermal modelling, is on the order of 3.5 km or deeper.

Modelling of aeromagnetic and gravity data from Ferguson Hill, has indicated that the inferred RIO body is at a likely depth of about 2.5km, however this depth is not well constrained in the absence of either supporting seismic or magneto-telluric data. With the body at this depth, thermal modelling indicates that the 200°C isotherm is below 4.5 km, and thus likely to be uneconomic to develop given the costs of drilling and the distance of transmission to market.

4. Year 3 Expenditure

Expenditure for Year 3 was \$13,016. The shortfall in planned expenditure was due to the inability to drill an exploration test hole given the inability of contractors to conduct the scheduled magneto-telluric survey.

Expenditure for the period 21/01/06 to 20/01/07

Commercial in Confidence

5. Operations Proposed for Year 4

The work program for Year 4 of Ferguson Hill will be aimed at assessing and drilling potential targets, as per the scheduled Year 3 work program, and examining the commercial feasibility of any resource. Petratherm aims to complete the magneto-telluric study over the Ferguson Hill tenement (provided a geophysical contractor can be found to do the survey) to strengthen the assumptions made during the thermal modelling study discussed above and, if the results are favourable, finalise a geothermal gradient target for drill testing.

Despite the disappointing outcome of the thermal modelling, the recent announcement of a proposed new transmission line between Olympic Dam and Prominent Hill, has warranted a second look at the commercial viability of Ferguson Hill, given that the costs associated with connection of the site to the proposed new transmission line is significantly reduced compared with connecting to Olympic Dam directly. The reduction in transmission infrastructure costs may offset the efficiency losses imposed by the limitations of the sedimentary insulator such that a lower enthalpy target is still viable in this instance.

Petratherm has recently commissioned the development of an economic feasibility model which can 'back engineer' a resource from the transmission network end, thus assisting in assessing the economic viability of a geothermal resource by providing critical technical cut-off parameters from the market end back to the project. This modelling software will be available in the near future, and Petratherm intends to re-test the viability of the Ferguson Hill tenement using the model.

6. Compliance with the Petroleum Act 2000 (Reg. 33)

a) Summary of the regulated activities conducted during the license year

Petratherm did not undertake any regulated activities defined under the Petroleum Act in GEL158 during this license year.

b) Report for the year on compliance with the Act, these regulations, the license and any relevant statement of environmental objectives

As no regulated activities were undertaken during this license year, many of the regulations are inapplicable at this stage. An instance of non-compliance has been noted whereby;

1) the magneto telluric survey was not completed as proposed in Year 2 of the Work Program. This was due to the failure of the engaged Contractor's equipment. Petratherm has been unable to engage alternative contractors with equipment suitable to carry out the required survey work.

2) an exploratory hole was not drilled as per the Year 3 Work Program due to insufficient data hindering target selection (i.e. the failure of the magneto-telluric survey to provide robust estimates on the basement depth).

c) Actions taken to rectify non-compliance with obligations imposed by the Act, these regulations or the license, and to minimise the likelihood of recurrence of any such non-compliance; and d) summarise any management system audits undertaken during the relevant license year including and information on any

failure or deficiency identified by the audit and any corrective actions that has, or will be, taken

To rectify the non-compliance noted previously, the magnetotelluric survey will be completed in the fourth year of license as has been proposed in Section 5 above, if a contractor with suitable equipment can be located.

In the absence of additional technical data, if modelling indicates that use of the proposed new Prominent Hill transmission line will enable a lower enthalpy resource at Ferguson Hill to remain economically viable, then Petratherm will undertake to select a target for test drilling in Year 4.

Petratherm recognises the importance of achieving regulatory compliance and is committed to applying best practice in its management strategies, work practices and procedures, in an environmentally and socially responsible manner. As part of Petratherm's commitment to applying best practice, a Legislative Compliance Register is maintained and all management systems and procedures are under continual review and improvement.

e) List all reports and data relevant to the operation of the Act generated by the licensee during the license year

Much of the work conducted in Year 3 of the work program has been focused on commercial negotiations for funding, and modelling the thermal resource based on existing data. No new surveys or datasets relating to the tenement have been acquired or generated during the license year. As discussed above, a delay in drilling the schedule test hole results from the inability to secure a geophysical contractor with appropriate equipment to conduct the magneto-telluric study, which will aid in drilling target selection. Petratherm is in communication with the University of Adelaide regarding the potential use of a new system due to be commissioned this year.

f) Report on any incidents reportable to the Minister under the Act and regulations during the relevant license year

No reportable incidents occurred during this license year.

g) Report on any reasonably foreseeable threats that reasonably present, or may present, a hazard to facilities or activities under the license, and report on any corrective action that has, or will be, taken

No threats have been identified.

h) Operations imposed for the ensuing year

A discussion of the proposed work program for Year 4 of Ferguson Hill is presented in Section 5 above.