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GEL 559

# ANNUAL TECHNICAL REPORT

Mulgaria Project Area, SA

TERM 1, YEAR 4 REPORT, Period 27/07/2013 – 26/07/2014



John Canaris

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Friday 21 November 2014

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Dear Lee

**ANNUAL REPORT FOR GEL559,  
TERM 1, YEAR 4 REPORT, Period 27/07/2013 – 26/07/2014**

In accordance with Regulation 33 of the Petroleum and Geothermal Energy Act 2000, please find attached Torrens Energy Limited (Torrens Energy) Year 4 Annual Report for the GEL 559, Mulgaria Project SA.

As the Report is overdue it is subject to Regulation 33 & 47 of the Petroleum and Geothermal Energy Regulations 2000 requiring that non-compliance be listed and a reason stated for the lateness of the report; due to merger with Phoenix Oil & Gas Limited during the period activities were prioritised elsewhere and toward non-geothermal activities.

Yours sincerely



John Canaris  
Consulting Geologist  
**Torrens Energy Limited**

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## Introduction

Torrens Energy Ltd ("Torrens Energy") was listed on the ASX in 2008 to discover, quantify and develop geothermal energy opportunities "on-grid" in Australia and overseas. In March 2014 Torrens Energy successfully completed its takeover bid for Phoenix Oil & Gas Limited, to form a new company, High Peak Royalties Limited (ASX: HPR) listed on the ASX on the 5th of May 2014. HPR through its wholly owned subsidiary Torrens Energy (SA) Pty Ltd, continues to maintain its five geothermal permits and heat flow databases for some 20 exploration wells in South Australia:

Tenement No	Licensee	Granted / Expiry Date	Area Km2
GEL 559*	Torrens Energy (SA) Pty Ltd	27/07/2010 26/07/2015	1,775
GEL 571	Torrens Energy (SA) Pty Ltd	30/05/2012 26/07/2017	2,926
GEL 572	Torrens Energy (SA) Pty Ltd	30/05/2012 26/07/2017	2,805
GEL 573	Torrens Energy (SA) Pty Ltd	30/05/2012 26/07/2017	1,977
GEL 574	Torrens Energy (SA) Pty Ltd	30/05/2012 26/07/2017	1,764

\* The subject of this report.

The Company's activities in South Australia centre on the geological feature known as the Torrens Hinge Zone. The northern extent of Torrens Hinge Zone which is substantially captured by GEL 559 is geothermally anomalous, having both a heat producing basement of radiogenic granite, and thermally insulating met sedimentary cover.

The licence was granted in July 2010 for 5 years, and covers a total area of approximately 1,775 square kilometres (above), located on the north-east side of Lake Torrens, and the associated power infrastructure leading to Leigh Creek.

In March 2014 Torrens Energy successfully applied for the suspension of GELs 571-574 for 58 days, to align the Year 2 and 3 work program(s) [of GELs 571-574] with Year 4 and 5 of GEL 559 (Table 1). This report details the work conducted for the GEL during the Year 4 of its 5 year work program.

### Permit Summary - Table 1.

Licence Year	Minimum Work Program GEL 559
Year 1	Geological and geophysical studies
Year 2	Geological and geophysical studies
Year 3	Geological and geophysical studies
Year 4*	Geological and geophysical studies
Year 5*	Geological and geophysical studies

\* The Year 4 & 5 work program may be conducted anywhere within GELs 559, 571, 572, 573 and 574.

Maps and sections provided in this report are in Map Grid of Australia (GDA94) and information provided is taken from the Australian National Topographic Map Series.

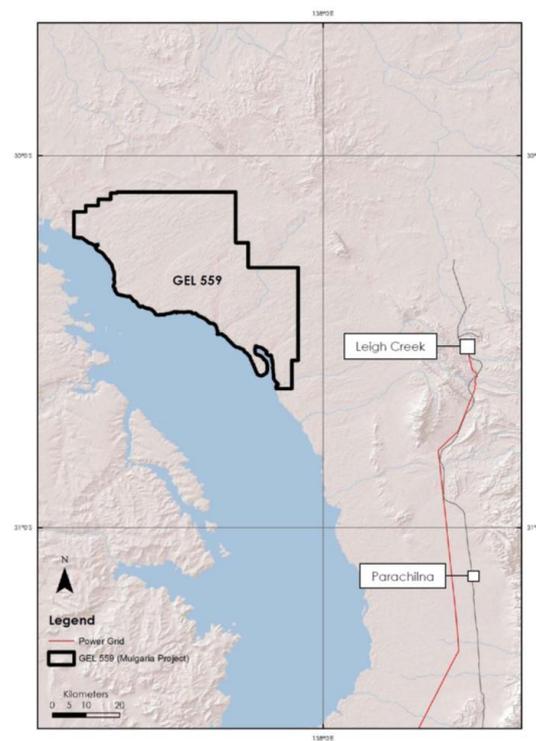


Figure 1: Location Map GEL 559

## Work Undertaken

In November 2013 mapped sites were visited via public access and camping trails, and sampled. As this activity is not considered a regulated activity as defined by the Petroleum and Geothermal Act (2000) it is excluded from this report.

## Regulated Activities

Pursuant to Regulation 33(2) (a) under the Act, an annual report must include ....“A summary of the regulated activities conducted under the licence during the [current reporting] year.”

- a. Drilling and related activities  
No drilling and related activities were undertaken during the reporting period.
- b. Seismic data acquisition  
None undertaken
- c. Seismic Data Processing and Reprocessing  
None undertaken
- d. Geochemical, gravity, Magnetic and other surveys  
None undertaken
- e. Preliminary survey activities  
None undertaken

## **Compliance Issues**

Pursuant to Regulations 33(2) (b) & (c), an annual report must include:....."A report for the year on compliance with the Act, these regulations, the licence and any relevant statement of environmental objectives;" and; "A statement concerning any action to rectify non-compliance with obligations imposed by the Act, these regulations or the licence, and to minimise the likelihood of recurrence of any such non-compliances."

This Year 4 Annual Report was submitted after the reporting period close date for GEL559 (due 26 September 2014); given the low level of activity other higher priority activities have had to take precedence during the period. With the exception of the lateness of the report there were no compliance issues.

During the Year the Company transferred GEL 559 [from Torrens Energy Pty Ltd] to its wholly owned subsidiary Torrens Energy (SA) Pty Ltd, for the purpose of amalgamating its future reporting and work programs with its other licence holdings in SA. In line with this the Company now seeks to rectify with DMITRE by applying for a work program variation for the GEL.

## **Management System Audits**

Pursuant to Regulation 33(2) (d) under the Act, an annual report must include:....."A summary of any management system audits undertaken during the relevant licence year including information on any failure or deficiency identified by the audit and any corrective actions that has, or will be taken".

There were no management systems audits undertaken during the reporting period.

## **Report and Data Submissions**

Pursuant to Regulation 33(2) (e) under the Act, an annual report must include:....."A list of all reports and data relevant to the operation of the Act generated by the licensee during the licence year".

There are no further reports.

## **Incidents**

Pursuant to Regulation 33(2) (f), an annual report must include:....."In relation to any incidents reported to the Minister under the Act and these Regulations during the relevant licence year:

- I. an overall assessment and analysis of the incidents, including the identification and analysis of any trends that have emerged; and

- II. an overall assessment of the effectiveness of any action taken to rectify non-compliance with obligations imposed by the Act, these regulations or the licence, or to minimise the risk of recurrence of any such non-compliance".

No reportable incidents occurred during the reporting period.

### **Threat Prevention**

Pursuant to Regulation 33(2) (g) under the Act, an annual report must include:....“A report on any reasonably foreseeable threats (other than threats previously reported on) that reasonably presents, or may present, a hazard to facilities or activities under the licence, and a report on any corrective action that has, or will be taken”.

No new threats were identified during the reporting period.

### **Future Work Programs**

Pursuant to Regulation 33(2) (h) under the Act, an annual report must include:....“Unless the relevant licence year is the last year in which the licence is to remain in force – a statement outlining operations proposed for the ensuing year”.

Please refer to Table 1 (above) for future work programs, planned to include assay testing of sampled material.

## **Interpretation and Summary**

The GEL covers over 1,700 square kilometres of the thermally anomalous South Australian Heat Flow Anomaly (SAHFA) – a “corridor” of known heat producing basement geology. The interpretation of the Nilpena seismic line [south] confirmed the continuation of target basement rocks overlain by thick sub-horizontal insulating Tertiary, Cambrian and Pre-Cambrian sediments, forming an effective insulator over the geothermal prospect.

A reliable geomechanical model (in situ stress field and rock properties) is critical for all geothermal developments. Applications of the model include wellbore stability during drilling and development, hydraulic fracture design, natural fracture permeability and sub-surface fluid flow. Optimising the sub-surface circulation system requires detailed knowledge of the interaction between the in situ stress field, the pre-existing fracture network and the likelihood of creation of new fractures. The ultimate goal of the circulation system is to maximise the amount of heat recovered in the production wells.

The Licence is located approximately 70 kilometres northwest of the Parachilna Geothermal Play, containing one of Australia's largest geothermal resource estimates and [high] modelled temperatures of ~220°C at 4,100m. Despite the paucity of information available for assessment, due to the generally high surface heat flows encountered to the south, encouraging thermal conductivity results & low degree of deformation of the Cambrian and Pre-Cambrian sediments interpreted for the area, prospectivity has been upgraded.

Further testing of outcropping geology as a cost effective method for gaining information relating to basement and reservoir conditions in the licence areas is warranted.