

Power down under

Annual Report 2011

**SEL 26/2005 (Fifth Annual Report)
& SEL 45/2007 (Fourth Annual Report)**
8th July 2010 to the 7th July 2011

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KUTh
E N E R G Y

Summary

KUTh Exploration Pty Ltd (KUTh) currently holds four Special Exploration Licences in Tasmania for Category 6 minerals (geothermal substances). The principle target of KUTh's work on these tenements is the location of high-temperature Hot Rock geothermal resources suitable for development as Enhanced Geothermal System (EGS) power generators. This combined annual report covers work completed in the year 8/7/2010 – 7/7/2011 on tenements SEL 26/2005 and SEL 45/2007. This is the fifth Annual Report lodged for SEL 26/2005, which was granted on 7/8/2006 and the fourth for SEL 45/2007 which was granted on 19/12/2007. Both tenements are located in the eastern half of Tasmania and cover a combined area of 12843km². Previous work conducted on these tenements has identified two inferred geothermal resources at Charlton-Lemont (CL) in the central Midlands and Mt Nicholas Fingal (NF) in the northeast. A partial surrender of ~75% of the original extent of SEL 45/2007 was granted in January 2011.

Work commenced and/or completed on the tenements during the report period includes:

- 2D gravity modelling and interpretation at the CL resource
- Stress modelling work at the CL resource
- A seismic risk study of eastern Tasmania and resource areas
- Acquisition of additional rock property data from the Upper Parmeener Unit at NF
- Completion of the ARC-Linkage ambient seismic project (ASET) in the Midlands
- Data compilation, drill targeting and prioritisation at CL and NF
- Evaluation of potential deep slim-line drilling rig options
- Drill planning and engineering, permitting and site preparation

Work completed focuses upon the target areas at Charlton-Lemont and Mt Nicholas-Fingal. Results from successive MT surveys at the Charlton-Lemont (CL) resource (260,000PJ_{th}) indicate the presence of major electrically conductive features coinciding with fracture zones and heat flow anomalies and may imply permeability at depth. 3D geothermal modelling of the Mt Nicholas-Fingal (NF) area in SEL 26/2005 infers a contained heat resource of around 101,000PJ_{th} within a 384km³ granitic reservoir at 3 – 5km depth. This resource is considered to represent a potentially viable granite-hosted Hot Dry Rock target.

The end of the current reporting period represents the completion of the original 5 year licence term for SEL 26/2005. Following the success of the exploration program, and the significant investment in data acquisition, planning for deep drilling on SEL 26/2005 remains ongoing. An application will be made for the extension of licence SEL 26/2005 for a second five-year term. A partial surrender of non-prospective ground, amounting to ~30% of the original licence area, is proposed as part of this renewal.

Work planned for the first year of SEL 26/2005 renewal includes:

- Drill planning, engineering and site preparation at Charlton-Lemont (CL)
- Drill planning, engineering and site preparation at Nicholas-Fingal (NF)

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1 Introduction

KUTh Exploration Pty Ltd (KUTh) is a geothermal explorer based in Hobart, Tasmania, and is the holder of four current geothermal exploration licences in that State. The principle target of KUTh's work is the location of high-temperature Hot Rock geothermal resources suitable for development as Enhanced Geothermal Systems (EGS) power generators.

This combined annual report covers work completed in the period 8/7/2010 – 7/7/2011 on KUTh's tenements SEL 26/2005 and SEL 45/2007. This is the fifth Annual Report lodged for SEL 26/2005, and the fourth for SEL 45/2007.

1.1 Tenement Status

KUTh Exploration Pty Ltd (KUTh) is a subsidiary of KUTh Energy Ltd and is the sole holder and operator of SELs 26/2005, 45/2007, 57/2008 and 15/2010 (Figure 1). All four tenements are granted for periods of five years to search for geothermal substances (Category Type 6). Tenure details of SEL 26/2005 and SEL 45/2007 are provided in Table 1. A partial surrender of SEL 45/2007 was granted in January 2011.

Tenement Type	SEL	SEL
Number	26/2005	45/2007
Commodity	Geothermal	Geothermal
Licensee	KUTh Exploration P/L	KUTh Exploration P/L
Operator	KUTh Exploration P/L	KUTh Exploration P/L
Area	12,360km ²	483.2km ²
Date Granted	7/08/2006	19/12/2007
Renewal	07/08/2011	19/12/2012

Table 1: Tenure details for SEL 26/2005 and SEL 45/2007.

1.2 Location and access

SEL 26/2005 and SEL 45/2007 combined include much of Eastern Tasmania, extending from the mouth of the Tamar River in the north, south to Hobart and north-east to St Marys (Figure 1). The SEL 26/2005 includes metropolitan Launceston and part of Hobart. A number of highways traverse the area and provide access along with minor roads, farm and forestry tracks. Numerous areas are excluded from both SEL 26/2005 and 45/2007, including National Parks, Commonwealth land, a gas pipeline easement and various small historic and other features.

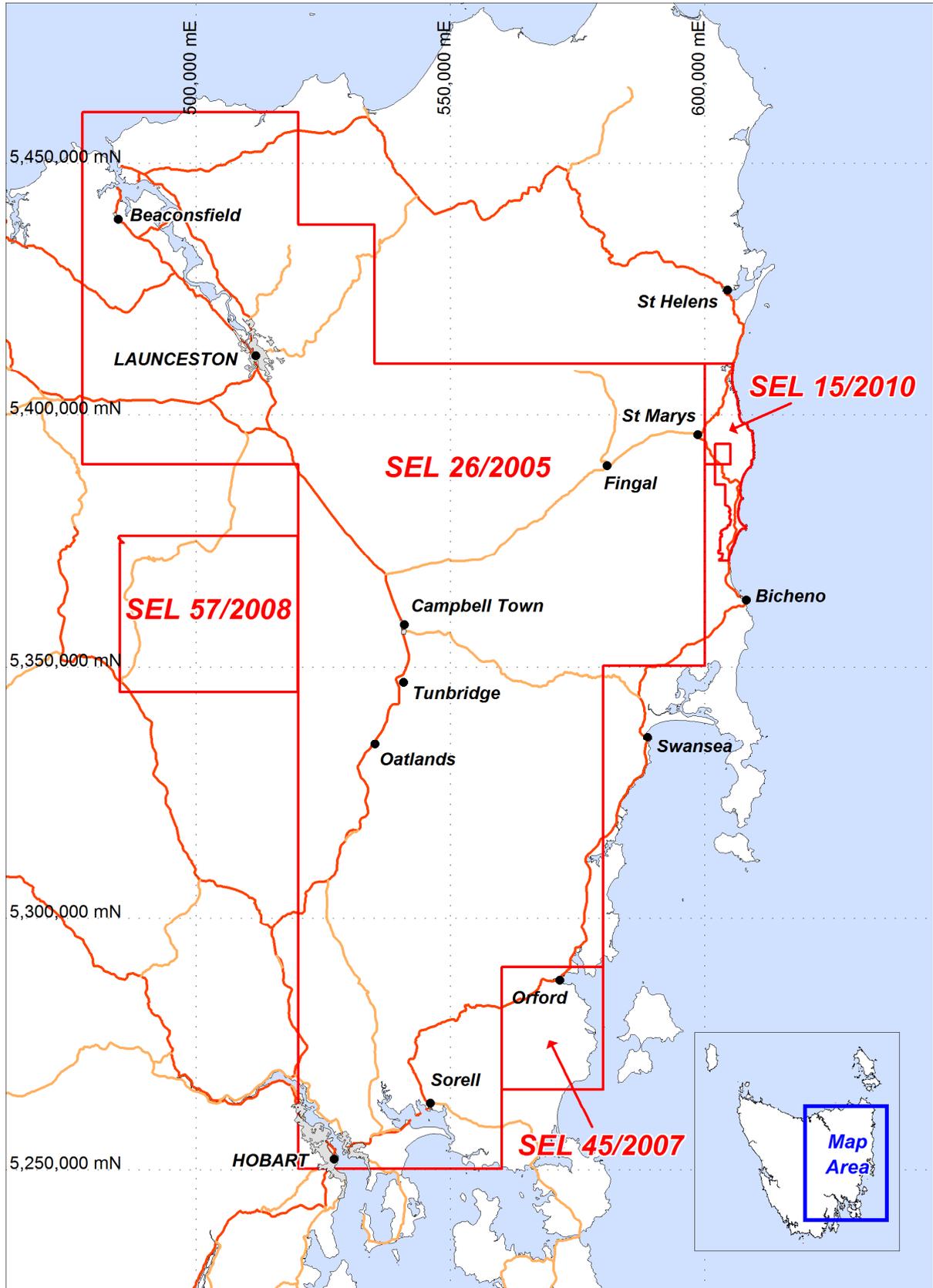


Figure 1: Location map of KUTH Energy Geothermal Special Exploration Licences in Tasmania (red) in relation to major roads (orange) and population centres. (Note this map does not indicate the location or extent of licence exclusions).

1.3 Topography and vegetation

Topography varies significantly across the tenement area and ranges from flat to undulating coastal and inland plains, to steep granite and dolerite ranges and tors. The maximum elevation range across the tenement area is greater than 1km, rising from sea level at the coast to peaks including Ben Lomond (1573m) in the north and Mt Wellington (1271m) in the south. Vegetation is dominated by dry eucalypt forest and developed pasture although considerable variation is present across the topographic range. Pockets of alpine moorland, wet eucalypt forest, native grassland and scrub, wetland and coastal scrub may be found at various locations across the tenements.

1.4 Geological setting

Tasmania is divided into two basement terrains located in the west and east of the State (Figure 2). Distinguished by age, lithology and deformation these two regions are 'believed to have been juxtaposed at a NNW trending dislocation' inferred to coincide with the Tamar Valley region in central Tasmania (Burrett & Martin, 1989). The Western Terrain comprises variably deformed and metamorphosed Pre-Cambrian basement, the now-deformed Cambrian volcanics and sediments of the Dundas Trough and Mt Read Volcanic Belt and the Ordovician-Silurian shelf sediments of the Wurrawina Supergroup. In the East, deformed low-grade meta-sediments of the Ordovician – Devonian Mathinna Supergroup comprise deep water turbidite deposits that are analogous to the ubiquitous Tasminide flysch of mainland eastern Australia. Similarities in the deformation and depositional style of the Mathinna Supergroup and mainland Tasminide units has led to numerous attempts to correlate the two, the Mathinna being compared variably to the Melbourne Trough and the Tabberabbera Zone of central and eastern Victoria (Powell & Baillie, 1992; Reed, 2001).

Across much of the state, basement is concealed by up to 1km of flat-lying Permian-Triassic sediments of the Tasmania Basin and the extensive thick (>300m) Jurassic dolerite sills which intruded these during Gondwana break-up. Mesozoic and Tertiary cover, including extensive dolerite, shale, silt and some coal formations, totally obscure the contact between the Pre-Cambrian Western and Palaeozoic Eastern terrains, which is inferred to underlie the tenement area.

Both Western and Eastern Terrains host Devonian granite, the most extensive intrusions being the slightly older batholiths in the East (Burrett & Martin, 1989). Exposures of Devonian-aged granite in the far north-east of the state are known to include highly-fractionated high-heat-producing (HHP) granites as part of three major suites (Figure 2; Burrett & Martin 1989). To the south and west of this area, the exposed granite plunges beneath cover which potentially provides the insulation necessary for a classic Hot Dry Rock or Enhanced Geothermal System (EGS) target. Complicating this picture is the presence of a known electrical conductivity anomaly initially observed in the northern Tamar Valley area and referred to as the Tamar Conductivity Zone (TCZ) (Figure 2; Hermanto, 1992). Coinciding broadly with the boundary of the East and West terrains, the TCZ has been interpreted an indicator of fluid in fractured permeable zones (Hermanto, 1992). Intersection between the TCZ and buried HHP granites may thus imply the presence of an existing fracture-permeable geothermal system in Eastern Tasmania.

2 Previous Exploration

KUTh Exploration is the first operator to undertake commercial geothermal exploration work in Tasmania. Legacy geothermal data available in this area are limited to a few early heat flow measurements recorded across the state in the 1950 – 1960s and early 1980s (Figure 2; Cull 1991). Although sparse and of variable quality, these data indicate the presence of high heat flows associated with Devonian granite in the north-east of the state. Heat production data from these granites are available from Collins et al, 1981, and include values of up to 60 $\mu\text{W}/\text{m}^3$ for granites at the Royal George Mine.

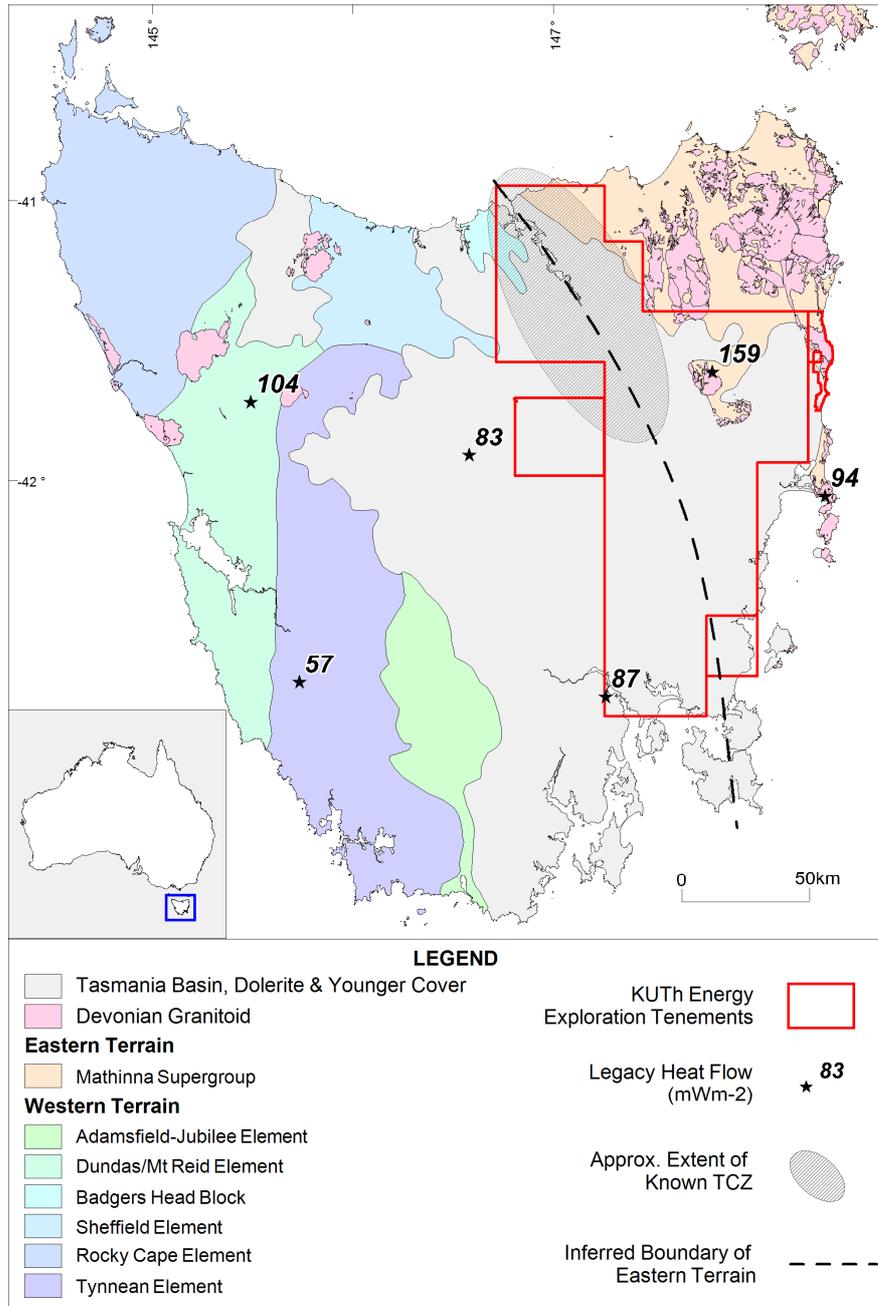


Figure 2: Regional geology of Tasmania showing the major crustal elements. Legacy heat flow data are as summarised by Cull (1991). Also shown is the approximate extent of the known TCZ prior to recent MT survey work.

The presence of the Jurassic dolerite across much of the tenement area has limited exploration for most commodities in this region. With the exception of small areas around Storeys Creek and Fingal in the north-east of the tenements, relatively few drill holes have been cut. Stratigraphical holes at Tunbridge, Ross and Glenorchy provide the deepest information from the central tenement area but are all <1km deep. Attempts by KUTH in 2006 – 2007 to undertake a surface heat flow measurement program in existing core holes failed due to a lack of suitable historic open holes.

2.1 Potential Field Geophysics

Available legacy geophysical data include aeromagnetic and gravity coverages. Data quality was patchy leading to an early decision by KUTH to undertake infill gravity and aeromagnetic survey work across the south-east of the tenement area (Ward *et al.*, 2008; Goh & Holgate 2009). Data derived from initial gravity survey work, which was completed in March 2007, was provided to Dr David Leaman who used it to update the Tasmanian mantle-source model of Leaman and Richardson (2003). This updated model was then used to refine predicted depth to top granite (Figure 3). Further infill gravity data acquisition was subsequently undertaken in the first half of 2010 to provide additional information on the predicted depth to granite bodies in the central midlands area (Holgate & Goh, 2010). At the time of reporting these data remain under investigation although preliminary interpretation results are presented in the following section.

An infill aeromagnetic survey was conducted in 2009 (Goh & Holgate, 2009). The results of this work are summarised in Figure 4 and are interpreted to indicate the presence of major crustal features (lineaments) within the Central Midlands area.

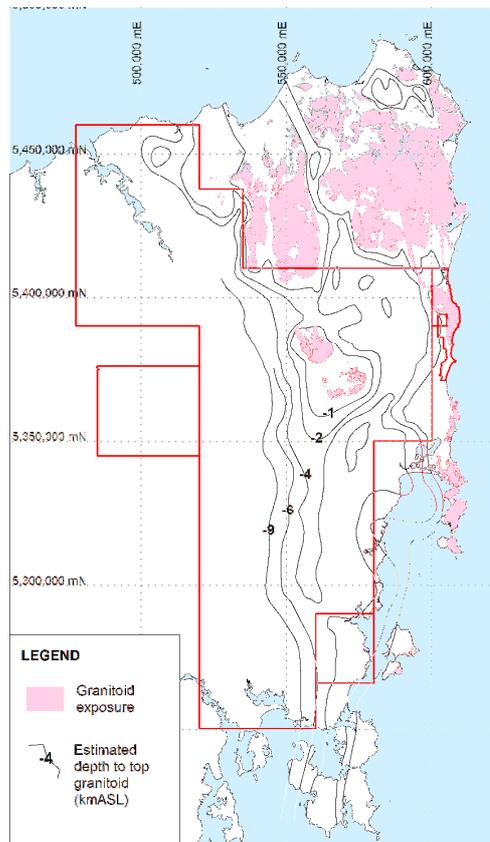


Figure 3: Map of granite outcrop with predicted depth (km above sea level) to top granitoid contours as interpreted by Leaman (2008).

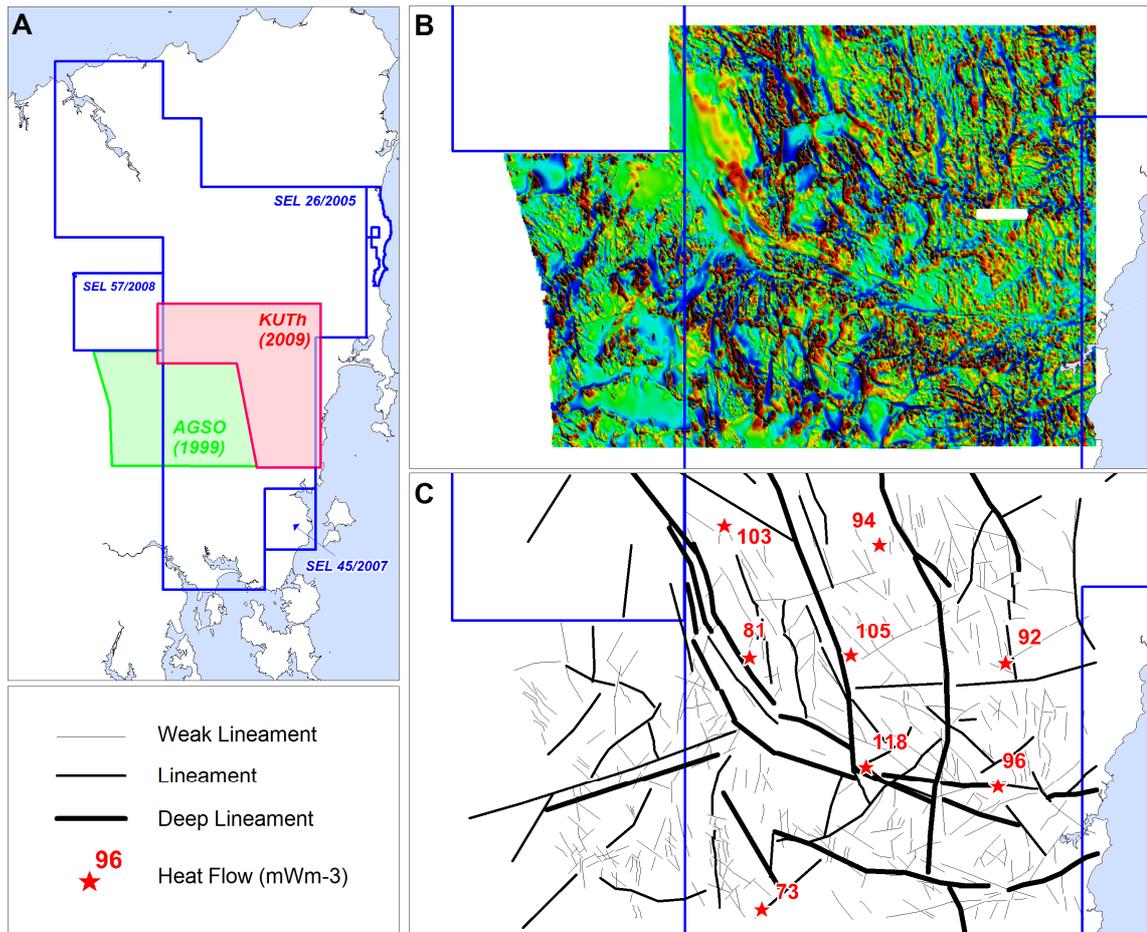


Figure 4: KUTh aeromagnetic data acquisition (a) location plan (b) Reduced-to-pole total magnetic intensity image and (c) interpreted lineaments.

The majority of magnetic lineaments identified under the survey area are interpreted as the signature of fault or fracture systems. Regionally, magnetic structure is dominated by a large, arcuate feature extending from the northwest to the eastern side of the survey area. This feature, which is interpreted to represent a major fracture zone, is also evident in gravity data and digital elevation models (Figure 5). The presence of this trend in both gravity and upward continued magnetic data supports the suggestion that it is a relatively major feature, penetrating to depth in basement. The fact that it is also strongly apparent in the DEM implies that it is likely to have been subject to post-Jurassic reactivation, most likely as part of a regional Tertiary rifting event that has been identified throughout much of this area (Burrett & Martin, 1989).

2.2 Heat Flow Determination and Resource Estimation

Between 2007 and 2009 KUTh undertook a program of shallow drilling to enable systematic estimation of surface heat flow across the tenement area (Figure 6; Goh & Holgate, 2009). This work resulted in the identification of several significant thermal anomalies (where heat flow is >90mWm⁻²) that display a good spatial correlation with the predicted location of buried granite (Figures 3 & 6). The largest observed anomaly extends ~4000km² across the central portion of SEL 26/2005 and includes three zones of very high heat flow (>100mWm⁻²) at Charlton-Lemont and Macquarie in the Midlands and at Mt Nicholas-Fingal in the far north-east. The largest and strongest of these thermal anomalies is that observed at Charlton-Lemont.

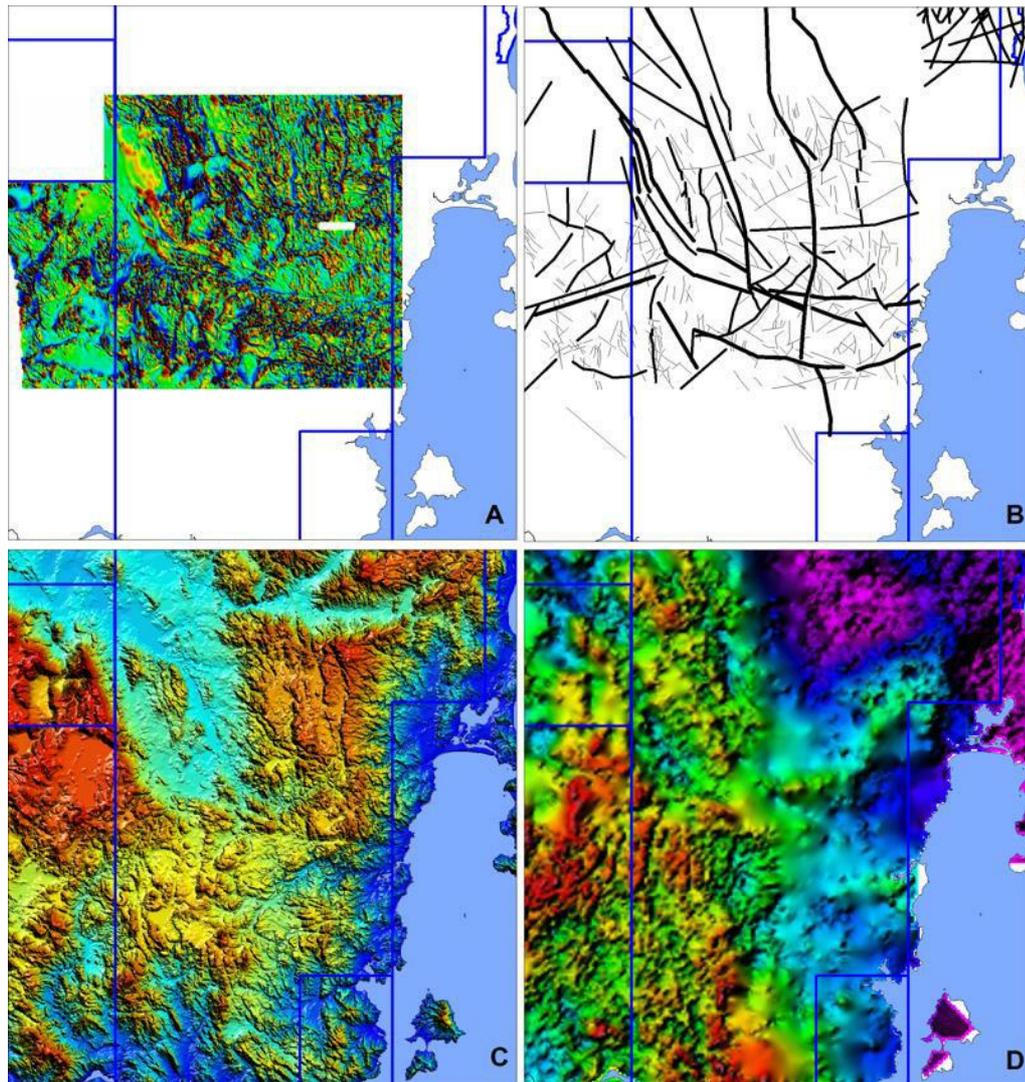


Figure 5: Map images of the Midlands area showing the KUTH tenement boundaries (blue) superimposed on (a) total magnetic intensity from combined KUTH/AGSO aeromagnetic surveys; (b) interpreted magnetic lineaments; (c) digital terrain image; and (d) residual Bouguer gravity anomaly (determined using the MANTLE07 model of Leaman, 2008).

Following on from this work three-dimensional (3D) conductive thermal modelling of the Charlton-Lemont area was undertaken in 2009 using a combination of legacy and new acquired geological and geophysical data. The results of this work (reported in Goh & Holgate 2009) inferred a contained heat resource of around 260,000PJ_{th} within a 1019km³ reservoir located between 3 – 5km depth in the Charlton-Lemont area (Figure 7). Temperatures predicted within the resource are up to 200°C at 5km depth. Geothermal Plays initially identified at Charlton-Lemont included a granite-related Hot Dry Rock target in the east and a less well defined but slightly hotter target in the west. Significantly, the conductive model inversion was found to be unable to account for the presence of extreme heat flow values in the western resource areas without the addition of a previously unrecognised geological unit. A non-unique conductive solution comprising an additional body of rock of either high heat production or high thermal conductivity (termed 'Unit A') was required in this area to enable model fit. This Unit may represent a previously unrecognised

lithology (e.g. granitoid) or structure (highly foliated sediment). Alternatively, the additional heat flow into the western resource area could be the result of the advective movement of heat by fluids along localised permeable pathways. One or more of these scenarios could significantly influence the geothermal play model envisioned for this area.

In 2010 a second inferred resource estimation was completed at Mt Nicholas-Fingal in the north-east of the State. Previously reported in Holgate & Goh (2010) this work inferred a contained heat resource of around 101,000PJ_{th} within a 384km³ reservoir located in granite between ~3 – 5km depth (Figure 7). Temperatures predicted within the resource are up to 220°C at 5km depth. The geothermal play identified at Mt Nicholas-Fingal is exclusively a granite-related Hot Dry Rock target.

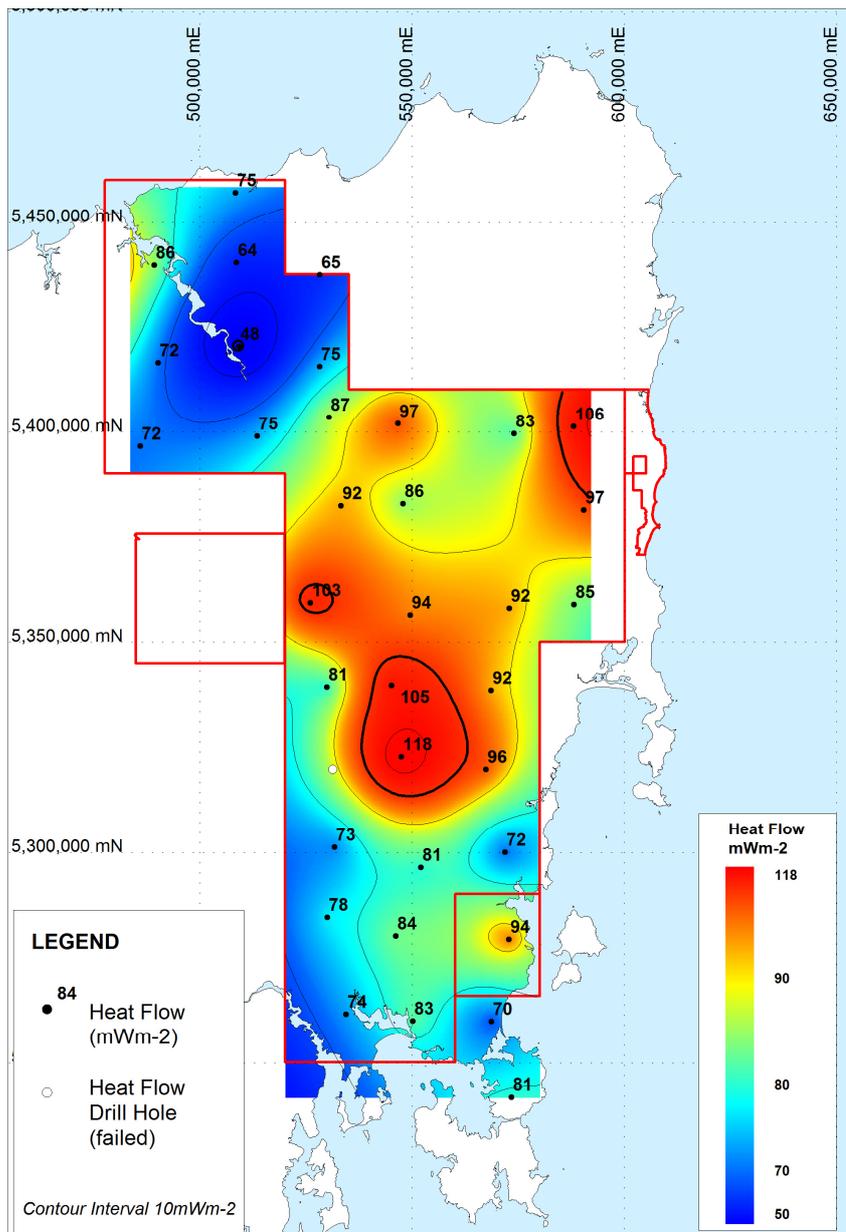


Figure 6: Results of KUTh Energy shallow heat flow drilling program across SEL 26/2005 and SEL 45/2007 (now partially surrendered).

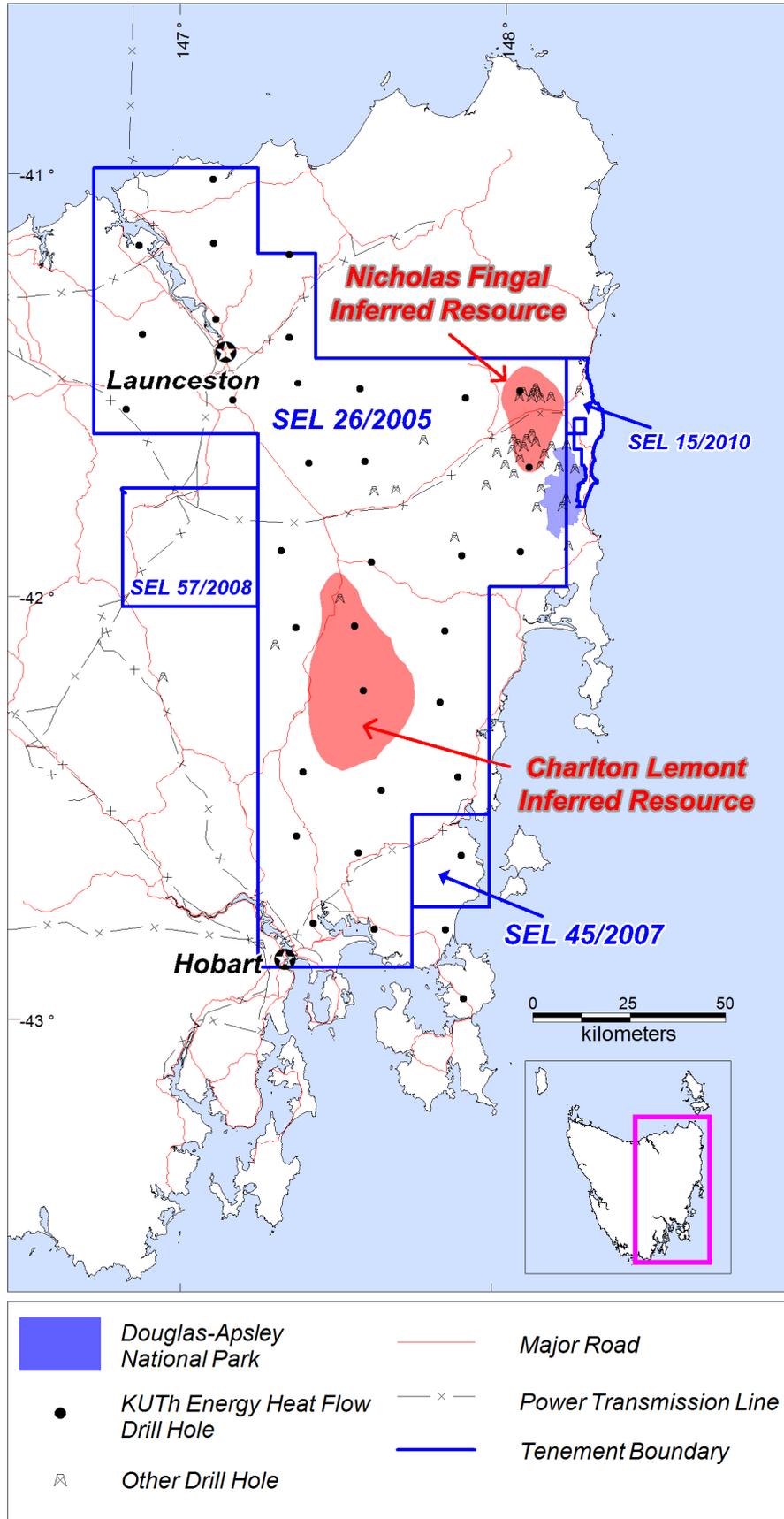


Figure 7: Location Map of Inferred Geothermal resource areas in SEL 26/2005 (red).

2.3 Magnetotelluric Studies

Studies of magnetotelluric (MT) field data identifying a possible conductive anomaly in Northern Tasmania date back to the mid-1970's and are summarised in Hermanto (1992). This work consistently indicated the presence of a broad zone of anomalously high electrical conductivity, the *Tamar Conductivity Zone* or *TCZ*, approximately parallel to the NW trending axis of the northern Tamar Valley, and extending for some distance to the south (Figure 2). The TCZ was observed at depth beneath Mesozoic cover but no direct information was available regarding the nature or detailed structure of the geology associated with it. However, it was concluded that 'the most likely cause of the high conductivity anomaly was a combination of the presence of high conducting fluids and graphite in pores, cracks, and or fractured rocks' implying the potential for fracture permeability associated with this feature (Hermanto, 1992).

Between 2008 and 2010 KUTh successfully completed three programs of new MT data acquisition across the TCZ. The first, in 2008/2009, was designed to test the existence of the anomaly and involved the acquisition of new MT data along two east – west profiles in the far north and central Midlands areas of SEL 26/2005 (Ward *et al.*, 2008; Goh & Holgate 2009). The results of this work are summarised as 2D models in Figure 8. Large east and west-dipping electrically-conductive basement features consistent with the known characteristics of the TCZ were successfully identified in the northern section line. Significantly, an equivalent east-dipping electrically conductive structure was also observed towards the western end of the southern line. This feature, which is interpreted as an extension of the TCZ, is open along strike immediately to the north of the high heat flow anomalies at Charlton-Lemont and is of considerable interest given its interpretation as a geophysical signature of fluid-bearing fracture-permeable rock.

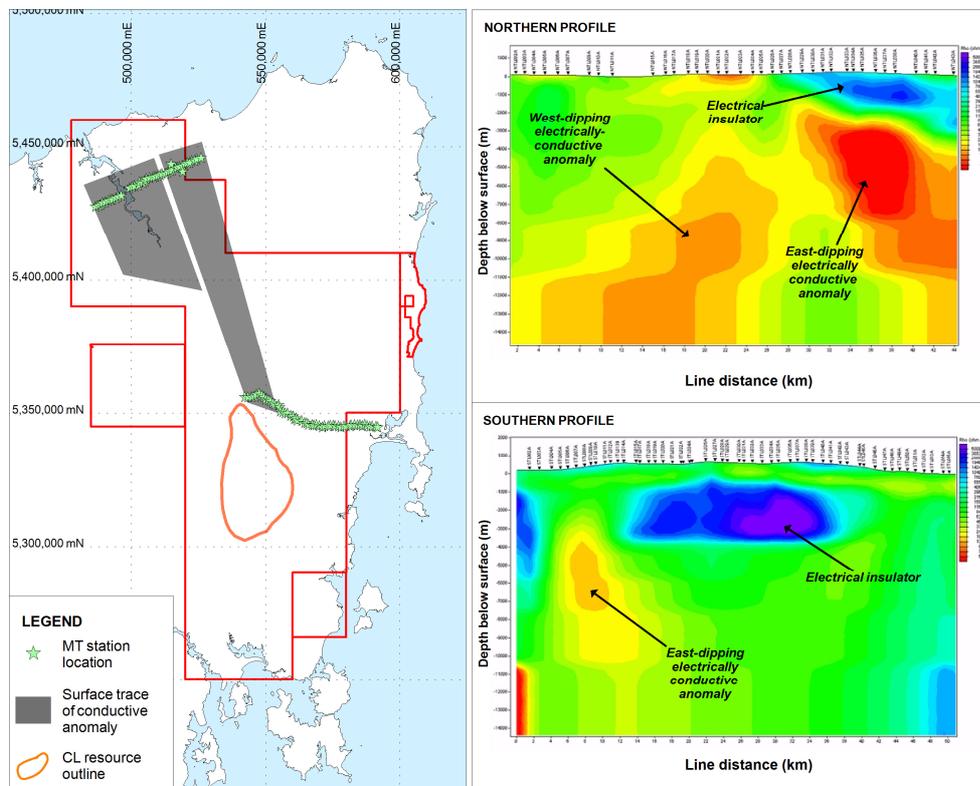


Figure 8: Results of the 2008 reconnaissance MT survey. Station locations (left) and 2D model results for northern (right, top) and southern lines (right, bottom). Models are inversions of TM and TE shifted data. Resistivity is range 5ohm.m (red) to 6000ohm.m (purple), maximum depth below surface is 14km, station spacings are ~1km, line distance northern line = 44km, southern line = 50km.

To further evaluate the southern extension of the TCZ, an expanded MT/TerraTEM survey was undertaken across SEL 26/2005 in 2009 and was followed by a third program of infill MT data acquisition in 2010. Data acquisition on the expanded array was designed to enable 3D MT modelling across the central Midlands area and resulted in the collection of 201 new stations arranged along three profile lines and a surrounding spaced grid (Figure 9). The results of this work were processed using 3D inversion modelling by WesternGeco EM (Geosystem). These data clearly indicate the presence of the TCZ within the resource area. Unexpectedly, the electrically conductive zone was observed to diverge in strike from NW/SE to EW immediately beneath the resource area (Figure 10).



Figure 9: Location map of the 2010 3D MT/TDEM survey array across KUTh Energy's Tasmanian tenements. Blue stars represent stage 3 (2010) MT stations, red stage 1 and 2 (2008/2009) MT stations. The white outline in the central tenement area indicates the surface extent of the Charlton-Lemont Inferred Geothermal Resource. Background Image ©Google Earth.

Visualised in 3D, the southern extension of the TCZ appears to be an east-dipping NW/SE striking planar structure in the NW of the infill survey area. To the south it diverges sharply to strike EW beneath the centre of the Charlton-Lemont resource area. Two planar EW striking structures are observed in this area, a shallowly north-dipping anomaly in the north and a moderately southerly-dipping anomaly in the south. Vertical sections through these features indicate an inverted v-shaped electrically-conductive anomaly is laterally extensive beneath this area. The apogee of this structure is projected to lie beneath the anomalously hot Lemont bore hole (surface heat flow 118mWm^2). In all cases areas of high electrical conductivity are found to be basement features, commencing around 2km depth.

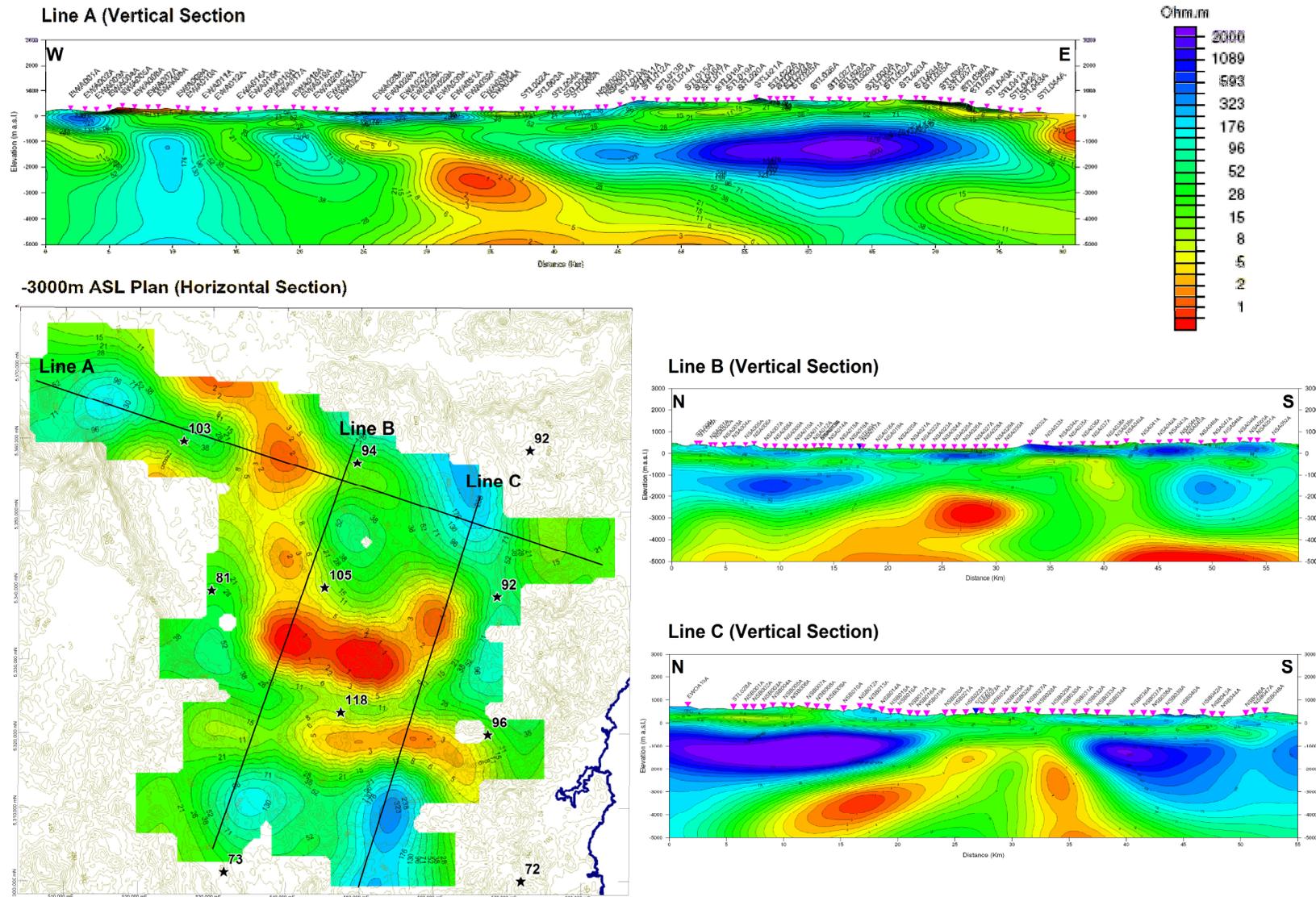


Figure 10: Selected results from the 2010 3D magnetotelluric survey presented as resistivity images. All images share the same scale (shown); warmer colours indicate increased electrical conductivity. Vertical section lines are as located on the -3000m ASL Plan. Vertical exaggeration of these sections is 2:1. The location of surface heat flow values (mWm^{-2}) from KUTH's shallow heat flow program are shown on the plan as black stars. Details of the modelling process are provided in Holgate & Goh (2010)

The striking spatial coincidence of apparently deep fractured zones (interpreted from gravity and aeromagnetic data), electrically conductive MT anomalies and anomalously high heat flow within the Charlton-Lemont (CL) region has led to the development of a new conceptual play model for this area. Originally conceived as a relatively high temperature, low permeability Hot Rock prospect, CL now appears to host what may be a Naturally Fractured Hot Rock play (Figure 11) with potential for warm/hot fluids at depth along zones of fracture permeability. Following completion of the geophysical acquisition programs it has been determined that further definitive testing of this play model will require deep drilling.

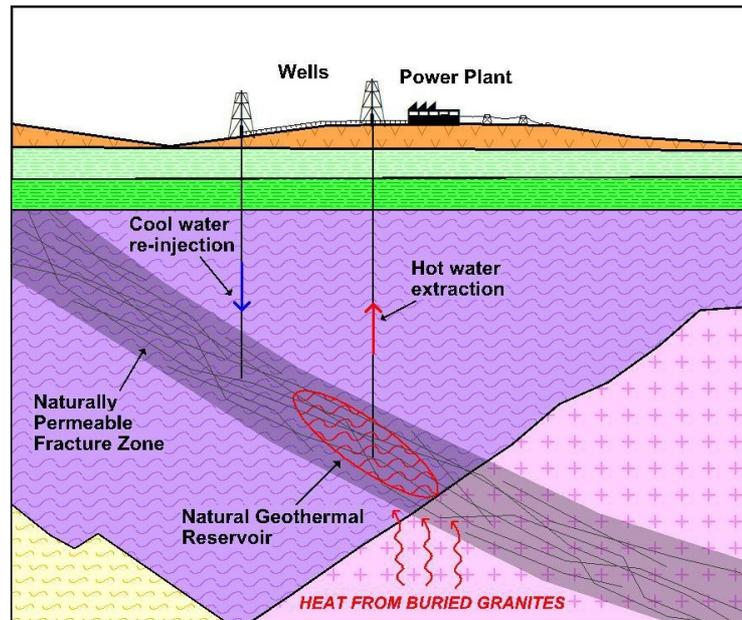


Figure 11: Diagrammatic illustration of Naturally Fractured Hot Rock play concept (Charlton-Lemont)

3 Work Completed

Work detailed in this section was undertaken on SEL 26/2005 and SEL 45/2007 during the 12 month period between July 2010 and July 2011. Geophysical work underway during this period comprises gravity data interpretation. Based upon these and other data, stress modelling and analysis were undertaken for a theoretical fault model across the Lemont area. An appraisal of the natural seismic hazard in Eastern Tasmania was completed ahead of proposed deep drilling and additional rock property data from the Upper Parmeener sequences were acquired. Field work and interpretation of the ARC-linkage ASET project was also completed and these results are detailed separately as part the Research & Collaboration section below.

3.1 Gravity Interpretation

Infill gravity data acquisition was undertaken in the first half of 2010 to provide additional information on the predicted depth to granite bodies in the vicinity of the Charlton-Lemont resource (Figure 12). Information derived from aeromagnetic data and the 3D MT modelling suggest a complex array of potentially permeable fracture zones within this region, including a major east-west structure which appears to extend eastwards into the vicinity of predicted granite subcrop. In light of these observations, and given the gaps in the previous gravity coverage, additional data were acquired to assist with planned drill targeting in this area.

The results of the new gravity data acquisition have been subject to 2D geophysical modelling to further refine the currently predicted depth to top granite of Leaman (2008). Preliminary results of this work are detailed in Leaman (2010) [Appendix 1].

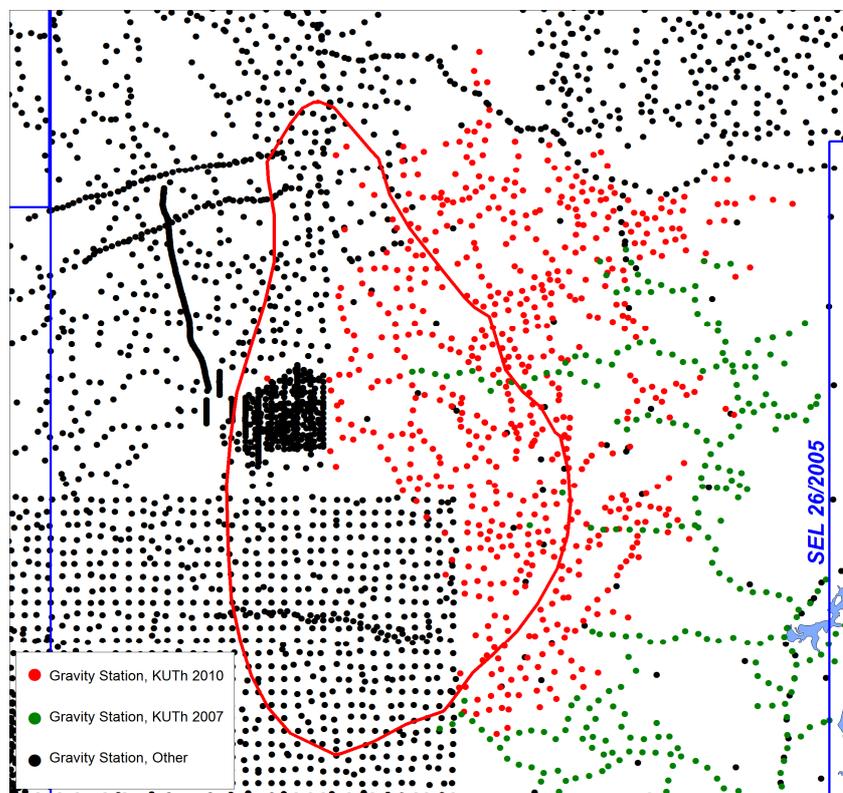


Figure 12: Map of 2010 KUTH Gravity station locations. Red outline indicates surface projection of the Charlton-Lemont resource area.

2D gravity interpretation was conducted using an updated mantle source model (MANTLE09) to filter long-wavelength anomalies from the data. Granite batholiths were then modelled based upon the observed negative gravity features of moderate scale. Modelling did not attempt to match the majority of short wavelength features which are attributed to surface stratigraphy and structure – much of which is unknown. The resulting predicted depth-to-top granite based upon the 2010 gravity dataset is illustrated in Figure 13. Comparison with Figure 3 confirms that the addition of new data has resulted in a number of changes to the predicted granite topography. Significant amongst these are:

1. Recognition of two batholith complexes (east and west; Blue Tier and Scottsdale).
2. The removal of the strong NS oriented “granite wall” feature which previously marked the western edge of the predicted batholith(s).
3. The observation of a ‘major sub-EW break’ which disrupts or partially controls the western margin. This trend may also be visible in the aeromagnetic data.
4. The general shallowing of predicted depth to granite in the vicinity of the Charlton-Lemont resource (now 3-4km ($\pm 25\%$) at Lemont and 5-6km ($\pm 25\%$) at Charlton).

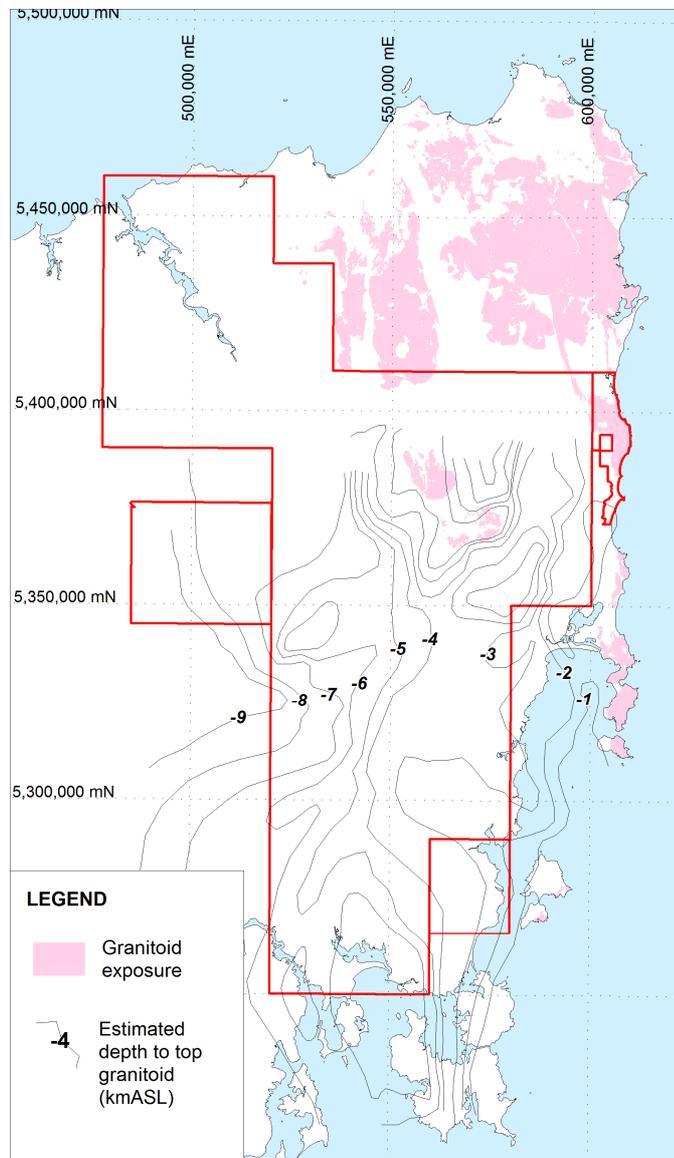


Figure 13: Revised map of granite outcrop with predicted depth (km above sea level) to top granitoid contours based on preliminary 2D interpretation of the 2010 gravity dataset (Appendix 1).

Significantly, the western batholith (Scottsdale) is modelled to extend much further to the west than previously thought. These western granites are predicted to be dominated by granodiorite, a composition which is typically expected to have a reduced heat production capacity.

Generally speaking there does not appear to be a strong correlation between the shape of the [newly predicted] granite surface and the existing heat flow and MT patterns (Figures 6, 10). Leaman (2010) suggests that this may imply that the 'origin of the observed electrical conductivity variations (and perhaps heat flow) are due to structures in the intruded rocks or local plutons in the batholiths'.

3.2 Fault Stress State Modelling

In 2010 KUTh commissioned Hot Dry Rocks PL to undertake preliminary 2D numerical fault stress state modelling at Charlton-Lemont. The purpose of this exercise was to investigate the potential stress state of a simplified fracture system to estimate its potential for permeability and NFHR geothermal plays. Fault zones used in the modelling were inferred from surface geophysical data and are thus largely hypothetical at depth. Stress data was based upon information derived from an earthquake focal mechanism determined on a recent Midlands earthquake for KUTh by the Australian Seismic Centre in 2010 (Holgate & Goh, 2010). Whilst non-unique, the results of this work, detailed in Appendix 2, provide a useful insight into the interpretation of local geophysical data and afford a theoretical basis for the assembly of future advective geothermal resource models, should these be required.

The fracture patterns and simplified geology input into the stress models are illustrated in Figure 14. Modelling was undertaken using UDEC (Universal Distinct Element Code) to produce a 2D discontinuum combining rock, fracture and fluid property data with the 3D *in situ* stress field to interpolate the hydro-mechanical interaction between a deformable rock mass and its fractures. Fault structures are explicitly incorporated into the model whilst rock masses are treated as impermeable.

The results of the modelling are provided in Appendix 2 and indicate that, for an apparent EW oriented thrust fault stress regime, the shallow to moderately dipping faults are potentially critically stressed. This implies that there is potential for favourable fault play targets in this region. Notably, deep fault intersections (ca. 5000m) adjacent to the granite body were modelled as critically stressed and are viewed as sites of potential interest. The presence of a hypothetical ENE trending structure in this area (as suggested by Leaman (2010)) appears to accentuate the likelihood of this scenario.

3.3 Earthquake Hazard in Northeast Tasmania

The identification of geothermal plays in eastern Tasmania implies the potential for eventual development and extraction of heat energy from these areas. It is well established that engineering required to exploit non-conventional geothermal plays such as HDR or NFHR may necessitate the injection of water under pressure into fracture systems at depth in the crust. Such injection is typically accompanied by the generation of seismic events. Whilst generally of relatively minor magnitude these events do present a risk to areas adjacent to the development and following on from this, ultimately, to the success of the project itself. Any geothermal development plan must therefore include provision to manage the local seismic hazard and to minimise the risk of an adverse outcome wherever possible. The first step in the assembly of such a plan is to build an understanding of the natural or *in situ* seismic hazard of the target location.

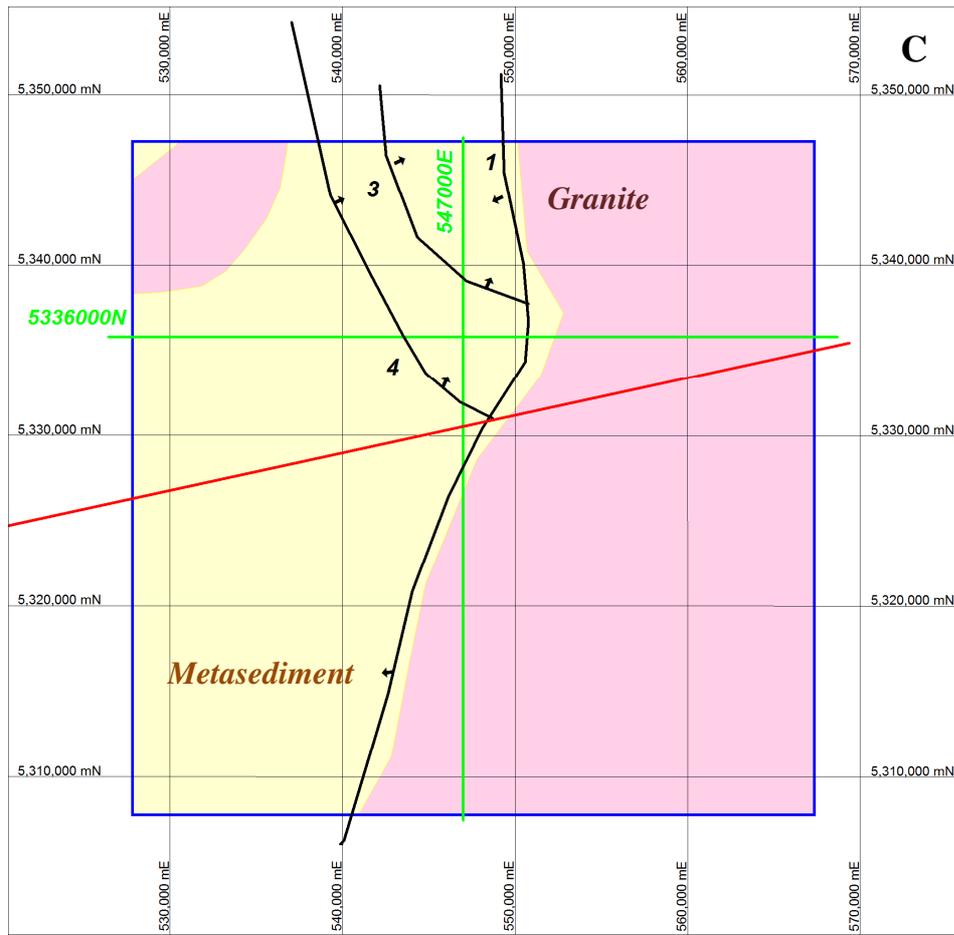


Figure 14: Simplified geological models of the Charlton-Lemont area presented as plan sections at (a) surface (b) 2000m and (c) 5000m depth. Black lines and arrows indicate inferred fractures and their dip directions. Individual structures are identified by number. The red line indicates a highly uncertain fault structure that was excluded from some modelling runs. Green lines indicate the location of model sections. Model dimensions are 39 x 39km (blue outline in (a)), total depth of model sections was 6400m. Refer to Appendix 2 for more details.

In light of these requirements, and with a long-term view towards drilling and ultimately project development, KUTh commissioned an overview of existing data on the natural seismic hazard in Eastern Tasmania by Dr Kevin McCue of the Australian Seismological Centre. The main aims of this work were to:

1. Identify and appraise relevant crustal stress and legacy seismic data and comment upon their implication for hazard in the vicinity of the identified resource areas at Charlton-Lemont and Nicholas Fingal,
2. Identify the best available seismic parameters for Eastern Tasmania, and;
3. Identify key data gaps and provide recommendations for future data acquisition.

Dr McCue’s report is provided in Appendix 3 of this document.

Existing data generally points to a relatively low natural seismic hazard in Eastern Tasmania although the random and unpredictable nature of intra-plate earthquakes is noted. An example of these kind of events are provided by the Bream Creek earthquake swarm in the late-1980’s. Relatively few reliable indications of free-field crustal stress are available in Tasmania with most measurements being shallow or near surface and therefore likely to be

influenced by local structure. Two available focal mechanism and recent fault movement studies concur to suggest the Tasmanian crust is currently experiencing EW directed compression.

The probability of induced earthquakes brought about through geothermal engineering is considered to be quite high. Such events are typically expected to range up to M3.5 or slightly larger. Significantly, there are no precedents or guidelines as to the level of risk which is considered acceptable for a project of this kind. As such a new standard is required.

Dr McCue's recommendations for future work ahead of or coinciding with any project development include:

1. Collection of local near-surface stress measurements,
2. Installation and continuous monitoring of a local seismograph network,
3. Community outreach and education,
4. A detailed local felt intensity survey,
5. A microzonation study in any suspected soft-soil areas where buildings or infrastructure may be at risk within the diameter of any expected hydrofracking, and;
6. Determination of a recommended level of acceptable risk [in conjunction with relevant local authorities].

3.4 Thermal Conductivity of Upper Parmeener Rocks

Following resource estimation work at Nicholas-Fingal it was concluded that additional thermal conductivity data for Upper Parmeener rock units would improve confidence in the model result as values used in the NF resource assessment were derived from a reliable but somewhat limited dataset. The availability of significant legacy core samples from coal drilling in the Fingal region implied that collection of a stratigraphically representative sample set should be possible.

A total of 41 samples were collected for non-destructive analysis from six legacy core holes (Figure 15). As far as possible, sampling was designed to provide wide representation across both Upper Parmeener stratigraphy and lithology. Unfortunately, in most cases it was found that the fine-grained lithologies (mudstone and black shale) were poorly preserved, the core often highly friable and consequently unsuitable for divided bar analysis. As a result, the new analysis has been biased toward more competent, coarse-grained sandstone units.

Determinations of thermal conductivities were made using the divided bar instrument at the University of Tasmania and following the method of Goh (2008). Results of the analyses are provided in Table 2.

Values determined for the various Upper Parmeener lithologies are found to be consistent with previous determinations from KUTh shallow drill holes (Goh & Holgate, 2009). Values measured for equivalent lithologies are similar and minor differences between the two datasets are most likely to be the result of natural population variance and possibly the sampling bias towards competent coarse-grained rocks in the legacy core sampling program (discussed above). Such a sampling bias would be expected to discriminate against the identification of very low thermal conductivities expected from friable mudstones and shales.

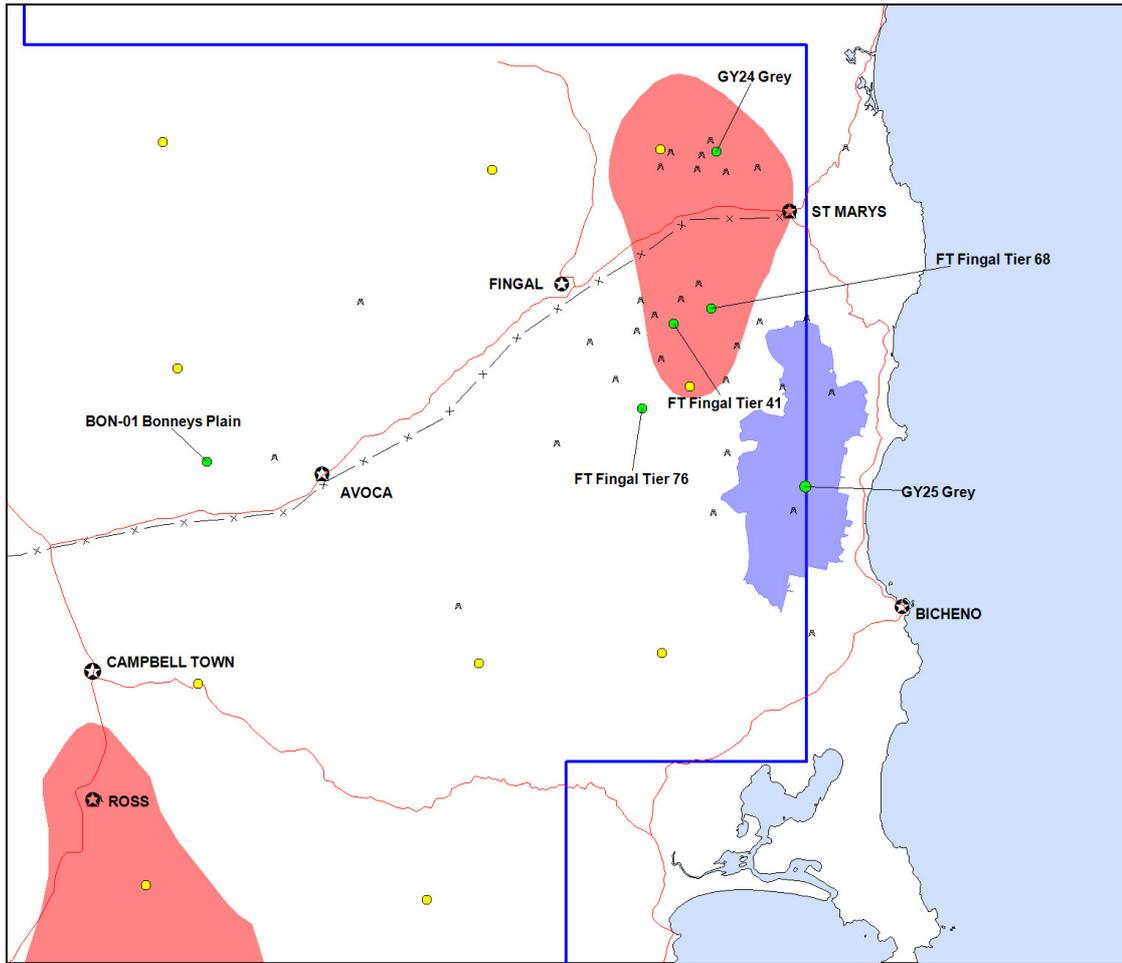


Figure 15: Location map of legacy core holes (green dots, labelled) sampled for Upper Parmeener thermal conductivity determination. Red shaded areas are the surface projections of inferred geothermal resources. The blue area is Douglas Apsley National Park. Yellow dots locate KUTH shallow HF holes.

Sample No	Hole	Depth From (m)	Depth To (m)	Lithology	Strat. Unit	Conductivity
HGF01	FT Fingal Tier 41	275.21	275.34	Medium grained, grey sandstone, dark bands	UPSG	2.31 ± 3.5%
HGF02	FT Fingal Tier 41	341.77	341.89	Medium grained lithic sandstone, pale grey	UPSG	2.39 ± 3.5%
HGF03	FT Fingal Tier 41	409.53	406.66	Fine grained lithic sandstone, grey	UPSG	2.30 ± 3.5%
HGF04	FT Fingal Tier 41	414.19	414.31	Coarse grained lithic sandstone, pale grey	UPSG	2.16 ± 3.5%
HGF05	FT Fingal Tier 41	519.26	519.33	Fine grained mudstone, brown, laminated, fragile	UPSG	1.84 ± 3.5%
HGF06	FT Fingal Tier 41	553.06	553.2	Coarse grained quartz sandstone, white, massive, some dark bands	UPSG (Unit2)	3.94 ± 3.5%
HGF07	FT Fingal Tier 41	570.9	571.02	Pebbly mudstone, brown, massive	UPSG (Unit 1?)	2.07 ± 3.5%
HGF08	FT Fingal Tier 68	496.13	496.24	Medium lithic grained sandstone, grey, massive	UPSG	2.11 ± 3.5%
HGF09	FT Fingal Tier 68	518.39	518.49	Fine grained sandstone, grey, massive, some dark bands	UPSG	2.13 ± 3.5%
HGF10	FT Fingal Tier 68	566.36	566.47	Medium lithic grained sandstone, grey, massive	UPSG	2.52 ± 3.5%
HGF11	FT Fingal Tier 68	605.58	605.7	Medium grained quartz sandstone, white, massive, some dark bands	UPSG (Unit2)	4.07 ± 5%
HGF12	FT Fingal Tier 76	330.1	330.23	Coarse grained lithic sandstone, dark grey, massive	UPSG	2.29 ± 3.5%
HGF13	FT Fingal Tier 76	412.6	412.69	Fine grained thinly interbedded mudstones and siltstones	UPSG	2.10 ± 3.5%
HGF14	FT Fingal Tier 76	483.22	483.34	Fine grained lithic sandstone, grey, massive, some dark bands	UPSG	2.85 ± 3.5%
HGF15	FT Fingal Tier 76	522.79	522.9	Fine grained quartz sandstone, white, massive, some dark bands	UPSG (Unit2)	4.11 ± 3.5%
HGF16	FT Fingal Tier 76	536.73	536.86	Coarse grained quartz sandstone, white, massive, dark bands	UPSG (Unit2)	4.24 ± 3.5%
HGF17	FT Fingal Tier 76	540.96	541.07	Coarse grained quartz sandstone, white, massive	UPSG (Unit2)	4.38 ± 3.5%
HGF18	GY24 Grey	142.64	142.74	Fine grained lithic sandstone, thin dark bands	UPSG	2.60 ± 3.5%
HGF19	GY24 Grey	195.02	195.14	Medium grained lithic sandstone, massive	UPSG	1.79 ± 3.5%
HGF20	GY24 Grey	210.59	210.7	Coarse grained lithic sandstone, massive	UPSG	2.13 ± 3.5%
HGF21	GY24 Grey	311.16	311.26	Fine grained lithic sandstone, thin dark bands	UPSG	2.30 ± 3.5%
HGF22	GY24 Grey	316.74	316.84	Fine grained lithic sandstone, massive	UPSG	2.44 ± 3.5%
HGF23	GY25 Grey	240.3	240.42	Medium grained lithic sandstone, contact metamorphism?	UPSG	1.76 ± 3.5%
HGF24	GY25 Grey	301.48	301.57	Fine grained thinly interbedded mudstones and siltstones, grey	UPSG	2.46 ± 3.5%
HGF25	GY25 Grey	376.09	376.18	Medium grained lithic sandstone, grey, massive	UPSG	2.80 ± 3.5%
HGF26	GY25 Grey	485.91	486.03	Coarse grained lithic sandstone, grey, massive	UPSG	2.23 ± 3.5%
HGF27	GY25 Grey	568.9	569.04	Very fine grained sandstone, brown, laminated, some mudstone	UPSG	2.78 ± 3.5%
HGF28	GY25 Grey	574.06	574.17	Medium grained quartz sandstone, massive, some dark bands	UPSG (Unit2)	3.89 ± 3.5%
HGF29	GY25 Grey	578.16	578.3	Coarse grained quartz sandstone, white, massive, some dark bands	UPSG (Unit2)	4.49 ± 5%
HGF30	BON-01	57.48	57.62	Medium grained lithic sandstone, grey, massive, soft	Rkq Unit 4	n/a
HGF31	BON-01	69.95	70.06	Fine grained interbedded siltstone and mudstone	Rk	1.75 ± 3.5%
HGF32	BON-01	89.39	89.51	Fine to medium grained lithic sandstone, white, thin dark bands	Rksq	3.08 ± 3.5%
HGF33	BON-01	113.65	113.74	Fine grained interbedded sandstone and mudstones	Rksl Unit 3	1.86 ± 3.5%
HGF34	BON-01	143.49	143.61	Very coarse grained lithic sandstone, white, massive	Rh	3.57 ± 3.5%
HGF35	BON-01	163.59	163.67	Medium grained quartz sandstone, green grey, thin dark bands	Rp Unit 2	3.49 ± 3.5%
HGF36	BON-01	193.93	194.02	Medium grained quartz sandstone, green grey, thin dark bands	Rp Unit 2	3.77 ± 3.5%
HGF37	BON-01	235.08	235.2	Fine grained interbedded sandstone and mudstone, x bedding, mica	Rp Unit 2	2.40 ± 3.5%
HGF38	BON-01	255.47	255.58	Medium grained quartz sandstone, white, massive	Rp Unit 2	3.21 ± 3.5%
HGF39	BON-01	278.14	278.25	Medium grained quartz sandstone, white, massive	Rp Unit 2	3.62 ± 3.5%
HGF40	BON-01	303.42	303.52	Fine grained sandstone, white, some dark bands, x bedding, mica	Rp Unit 2	2.56 ± 3.5%
HGF41	BON-01	311	311.14	Black/brown mudstone with small clasts	Unit 1?	2.24 ± 3.5%

Table 2: Thermal conductivity values determined for Upper Parmeener core samples

4 Research & Collaboration

Research and collaborative projects with KUTh support completed during the reporting period are:

4.1 Ambient Seismic Energy Technique 2 (ASET1)

Dr Anya Reading, Senior Lecturer in Geophysics at the UTAS, is leader and co-ordinator for this project which is a collaborative ARC-linkage partnership between KUTh and the UTAS. The project is entitled ‘3D Seismic Velocity Structure for Geothermal Exploration’ and commenced in the Midlands in October 2009 following some delays due to local flooding. The aim of the project is to further investigate the ways in which ambient seismic energy may be used to determine structure in the upper 10 km of the crust and follows the success of an initial pilot project (ASET1) deployed in 2009.

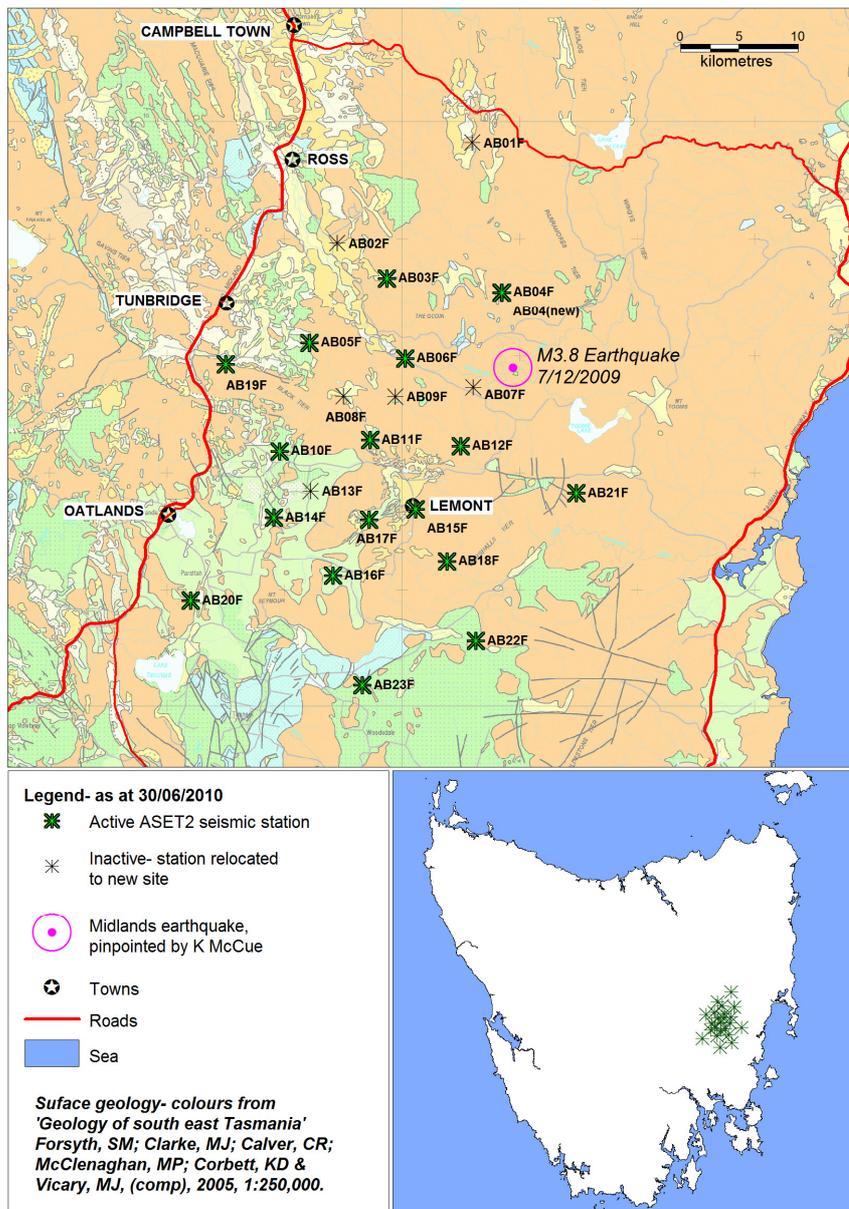


Figure 16: Location map for the ASET2 project deployment.

A total of 16 seismic stations were deployed in October 2009, requiring the installation of solar panels and Orion recording units (Figure 16). Six stations were redeployed in early 2010 to widen the seismic array and one other was moved to higher ground due to flooding at the site. All sites were located on private land between Ross and Wooddale, and were emplaced with the permission of the landowners. Data were collected from the stations once a month and all installations were uplifted at the end the field project in late 2010. At the time of reporting, data processing and interpretation were nearing completion. Dr Reading intends to submit the results of her work for publication in the second half of 2011.

An example of preliminary results from the ASET2 project is provided in Figure 17 as maps of s-wave velocity at depth. Structure visible in the seismic images indicates that areas of low seismic velocity exist at varying depths within the vicinity of the Charlton-Lemont resource. Variations between maximum and minimum seismic velocity are subtle ($<0.5\text{ms}^{-2}$) and patterns identified in the tomography generally do not reflect patterns detected in other geophysical techniques (e.g. MT, aeromagnetics). The reason for this discrepancy is currently uncertain, however, it may indicate that the seismic technique is mapping lithological rather than structural variations.

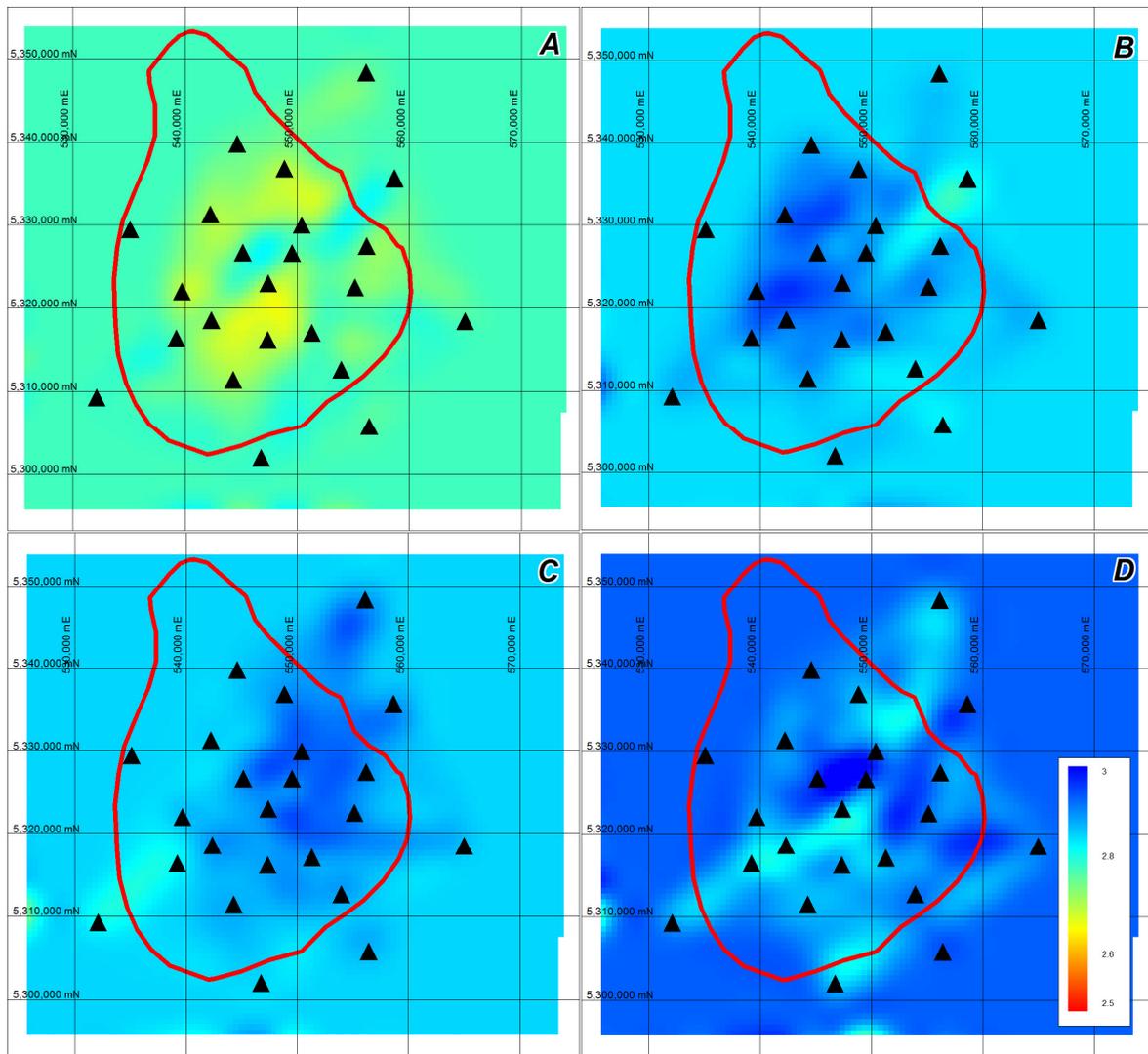


Figure 17: Preliminary interpretation of ASET2 ambient seismic data presented as depth slice s-wave speed images, scale as shown. Black triangles indicate the location of seismic stations; the red outline is the CL resource boundary. A = 1000m, B = 2000m, C = 3000m & D = 4000m. [Note: seismic structure is constrained in areas between seismic stations only].

5 Discussion

At the completion of 2009 a total of six geothermal targets had been identified across 26/2005 and 45/2007 as a result of KUTh's ongoing exploration program (Figure 18). Of these, two have now been subject to successful resource analysis exercises (Charlton-Lemont and Nicholas-Fingal), two appear from geophysical data as likely extensions of the Charlton-Lemont system (Tooms-Leake, Macquarie) and two remain largely unknown (Ben Lomond, Rheban).

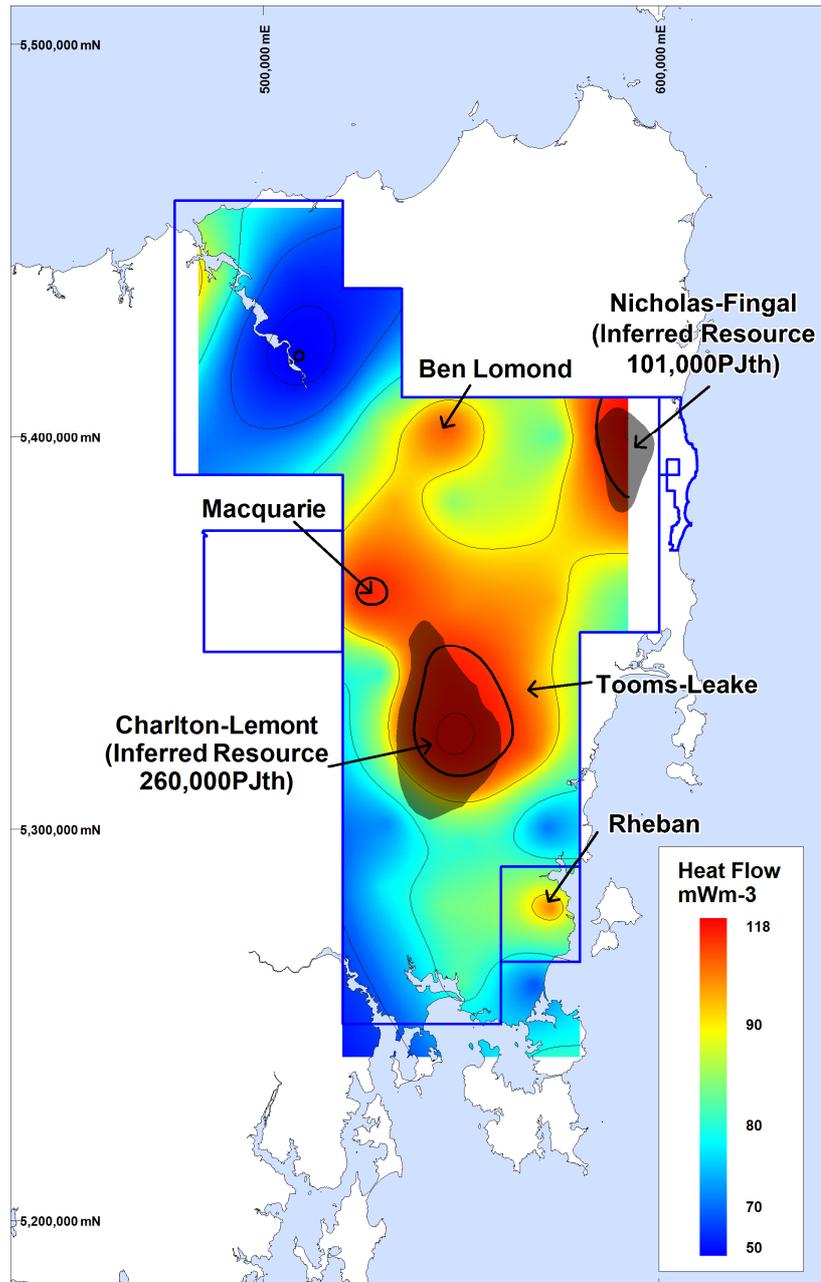


Figure 18: EGS targets in KUTh's tenements (as originally delineated in 2008/2009). Targets are named according to their geographic region. Dark shading indicates the surface projection of the now established resource areas.

5.1 Charlton-Lemont

Ongoing modelling and appraisal work support the concept of a Naturally Fractured Hot Rock play at the Charlton-Lemont resource area. Stress modelling based upon simplified earth models and local earthquake focal mechanism data substantiate the theory that fracture permeability may exist at depth. Preliminary 2D gravity data interpretation is also encouraging, implying that granite subcrop may be both more extensive and shallower than previously estimated in the Lemont area.

Results received to date indicate that the new gravity data at CL will alter the predicted geological relations at depth sufficiently to warrant the reappraisal of the inferred resource model for this area. Following completion of 3D gravity modelling it is anticipated that the existing modelled area, which currently incorporates both the CL and Tooms-Leake targets, will be revisited and expanded slightly to include the Macquarie anomaly to the north-west. This target, which was originally excluded on the basis of its anomalous location (west of predicted granite occurrence), is now considered likely be part of the same fracture-related system that is observed at CL.

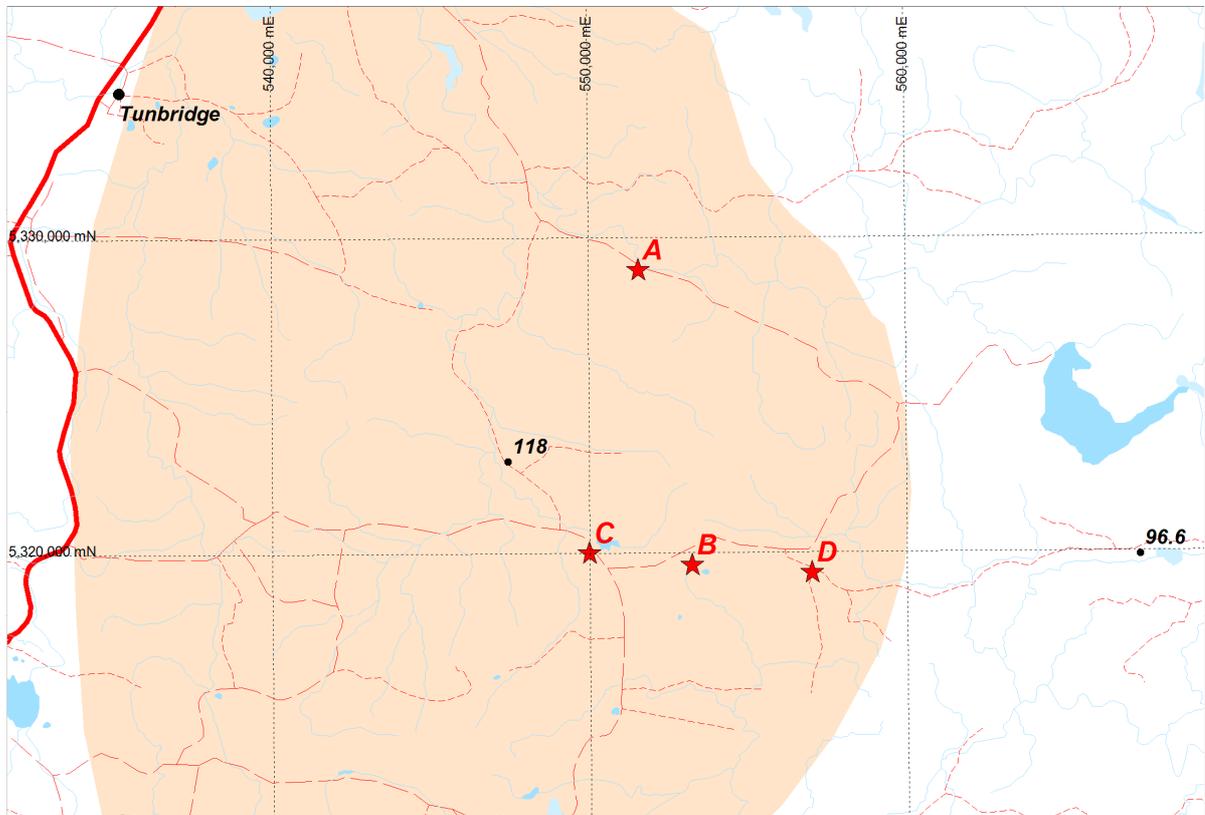


Figure 19: Optional drill target sites identified at Charlton Lemont. Proposed options are shown as red stars, labelled A – D. The orange region is the surface projection of the CL resource area. Existing shallow heat flow holes are shown as black dots with heat flow labelled in mWm^{-2} . Note: the location of the deep drilling site has yet to be finalised, variations in the final target site location may yet occur in response to landholder, engineering or other regulatory concerns.

Further progress of exploration at the Charlton-Lemont target is now largely dependent upon the application of deep drilling to validate the NFHR play model. To this end four optional exploration drill site locations have now been identified in the Lemont area (Figure 19). At present it is expected that one of these options will be selected for the drilling of a single deep “slim-hole” to a target depth of 4km. The major aims of this drilling will be to:

1. Measure formation temperature at depth

2. Intersect and test the nature of the high conductivity MT anomaly
3. Investigate the nature of the deep geology and,
4. If possible, to confirm the depth of granite subcrop.

Further information on the progress of this drilling project is detailed in section 5.5 below.

5.2 Nicholas-Fingal

Following the completion of additional thermal conductivity data collection in the Upper Parmeener, the Nicholas Fingal (NF) resource is now considered also to be drill-ready. The resource at NF is believed to be a Hot Rock play and is significantly simpler geologically than that at CL. A geological drill target zone has been identified for this area (Figure 20). The intended drilling is similar in nature to that planned for CL and is a single deep exploratory “slim-hole” targeting depths of up to 4km. The major aims of this drilling will be to:

1. Measure formation temperature at depth, and
2. Confirm the depth of granite subcrop.

It is hoped that drilling at NF may follow immediately any work conducted at CL. However, this will depend upon a number of factors including project funding. At present, the CL resource area is considered to be the first drilling priority. It is expected that any ongoing regional stress and seismic risk studies undertaken in advance of work at CL will also incorporate the NF area.

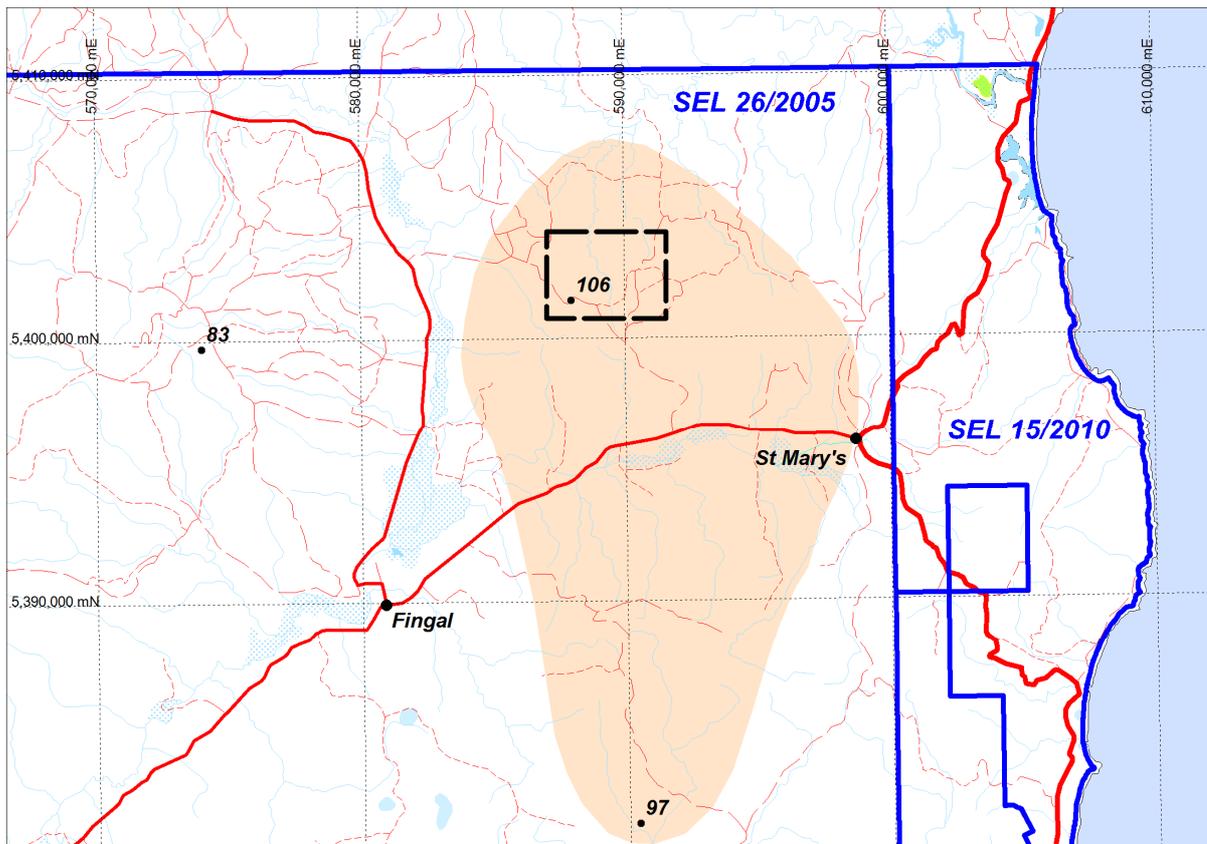


Figure 20: Geological drill target zone identified at Nicholas Fingal (black dashed area). The specific location of the deep drilling site has yet to be finalised within this zone and will be based on landholder, engineering and other regulatory considerations. The orange region is the surface projection of the NF resource area. Existing shallow heat flow holes are shown as black dots with heat flow labelled in mWm^{-2} .

5.3 Rheban

The Rheban thermal anomaly is a small single-hole anomaly (94mWm^{-2}) located in the north-east of SEL 45/2007. The location of this anomaly, offset to the south and east of the main CL anomaly is suggestive of a possible link to the geology in this area. The major east-west structure currently observed at CL coincides spatially with an east-west termination of the main heat flow anomaly with areas immediately to the south recording significantly reduced heat flows ($<80\text{mWm}^{-2}$). In this instance the anomaly at Rheban could be interpreted as an offset of the main heat flow anomaly. It is anticipated that data derived from ongoing gravity modelling of granite distribution at CL may improve the current understanding of the geological relationships in these areas.

The nature of the Rheban anomaly is thus of interest to the broader understanding of crustal architecture in this region. Geological review of this area reveals relatively little available data, however, with sparse geophysical coverage. In 2010 a sponsored honours project was proposed to the University of Tasmania to collect geophysical profiles (gravity and magnetic) across the heat flow anomaly and enable more detailed modelling of granite at depth. This offer was not taken up by the University and no further field work has been undertaken on this area.

5.4 Ben Lomond

To date no project specific work has been completed in this area beyond the existing shallow heat flow hole (97mWm^{-2}). This target remains on hold as a relatively low priority and no project specific work is anticipated for 2011/2012.

5.5 Project Drill Planning

The identification of drilling targets at the CL and NF inferred resources and the near-completion of surface geophysical exploration programs has now brought both plays to a drill-ready stage. Target prioritisation has favoured the Lemont area and this will be the first area to be drill tested.

The depth of drill target at Lemont (between 2-3km) combined with the inherent project risk and the cost of conventional petroleum drilling has led the company to seek alternatives for deep "slim-hole" drilling. Such drilling projects are not commonly undertaken and, in 2010, KUTh identified two novel drill rigs as potentially suitable to the task. The company has since narrowed the field to one rig. Unfortunately deep drilling initially anticipated to commence in 2011 has not eventuated. This has come about as a combination of impact from the Global Financial Crisis, ongoing investor uncertainty about Federal carbon-pricing and climate change policy and increasingly risk-adverse capital markets have resulted in an extremely difficult funding environment for renewable energy technologies.

Despite these setbacks, KUTh remains optimistic about the potential for funding the deep drilling projects and is continuing to work towards the goal of commencement, now scheduled for 2012. It is hoped that recent political developments towards setting a price on carbon may assist in this process. In the meantime, considerable work has been completed towards the planning and engineering of the first Lemont drill hole.

Landholders, Environment and Permitting

Following the initial drill targeting exercise at CL approaches were made to several private landholders on whose land one or more potential sites had been identified. These very preliminary discussions proved useful and resulted in minor adjustments to the location of some of the proposed sites. KUTh will continue to work constructively with its landholders and the wider community as it proceeds further through the planning and drilling process.

KUTh has commissioned and received a comprehensive report by environmental and engineering consultants SEMF Ltd outlining the range of applicable legislative and permitting requirements for deep exploratory drilling. The review encompasses logistical issues relating to the certification of the drilling rig, its transport to site and workplace operations as well as the permits required for potential environmental and heritage impact, water usage and waste disposal. The company is now actively addressing these issues to ensure the safety of the drilling operation, the protection of environmental and heritage values, and community awareness of the project. This work represents the first stage of the permitting process and will be an important checklist document moving through the drilling planning and evaluation process.

An adjunct to this work is the report completed by the Australian Seismic Centre investigating the natural seismic hazard in Eastern Tasmania, and detailed in Section 3 above. In the absence of a clear regulatory environment for seismic hazard and geothermal development this work provides the company with a starting point for addressing issues of induced seismicity. The recommendations made in this report will form the basis for KUTh's intended best-practise approach to Hot Rock geothermal development.

Rig Evaluation and Well Engineering

Following initial inquiries last year, KUTh has been considering options for drilling on its Tasmania tenements. It is recognised that the objective of the initial drilling will be exploratory, that is, to obtain early information regarding the deep geological and thermal conditions in order to increase confidence in the eventual drilling of successful EGS production pairs (two or more wells connected by an induced fracture zone to form an in-ground heat exchanger). It was therefore proposed to investigate a rig capable of drilling an "enhanced slim hole" into the granites at full depth of 4000 m. Such a hole would need a finished open-hole diameter of approximately 6" (150 mm) to permit the passing of a formation imaging tool, plus other down-hole logging equipment. This would require a rig with greater capacity than a conventional mineral exploration rig, but not as much as that required to drill a full diameter conventional hole (8-1/2" open hole with 7" perforated liner).

Initial indications were that the Globe Drill GT3000 rig could be suitable for this application. This rig is a prototype which has been developed in Australia to meet the demand for reduced-cost drilling on the various Australian EGS and HSA geothermal systems. It utilises a down-hole air hammer for faster drilling of hard rock compared with conventional rotary drilling, although it also has the ability to drill using a conventional rotary bit in situations which are unsuitable for the air hammer (certain geological formations and/or a flooded hole). The rig is much smaller than conventional rigs, thus reducing mobilisation costs, and has reduced operating costs, resulting potentially in an overall reduced cost of drilling. However, the rig as first offered did not include a number of the ancillary systems and equipment required for safe drilling of a geothermal reservoir.

KUTh therefore prepared a draft contract for drilling in Tasmania including a statement of contractor/operator responsibilities and a rig inventory, and has used that draft contract as a basis for working with Globe Drill to bring the rig to a condition suitable for the purposes envisaged. Within the acknowledged limitations of the actual rig, negotiations have now proceeded to a point where commercial aspects of the proposed contract can be developed.

Well Evaluation

Quotations have been sought from an experienced well logging company for a range of support services, primarily for well logging but also including stuck pipe recovery. Aside from conventional PTS (pressure, temperature, spinner) logging, the requested services have included open-hole services for acoustic formation imaging and full spectral gamma ray evaluation.

Care has been taken in specifying the logging equipment to ensure that it is capable of meeting the high down hole temperature conditions that are expected, particularly in the Tasmanian EGS environment.

It is likely that KUTh will need to invest in the purchase of its own wire line winch plus a “memory” PTS tool.

The process of drill rig evaluation, site evaluation, permitting, drill planning and drill engineering at the Lemont site remains ongoing. The cost of drilling itself has not yet been finalised but is certain that, if successful, expenditure will significantly exceed >\$1M. At present it is anticipated that drilling will commence in 2012.

5.6 Tenement Renewal

The end of the current reporting period represents the completion of the original 5 year term for licence SEL 26/2005. Following the success of the exploration program, and the significant investment in data acquisition, planning for deep drilling on SEL 26/2005 remains ongoing. At present it is anticipated that, at earliest, drilling of this tenement would commence in 2012.

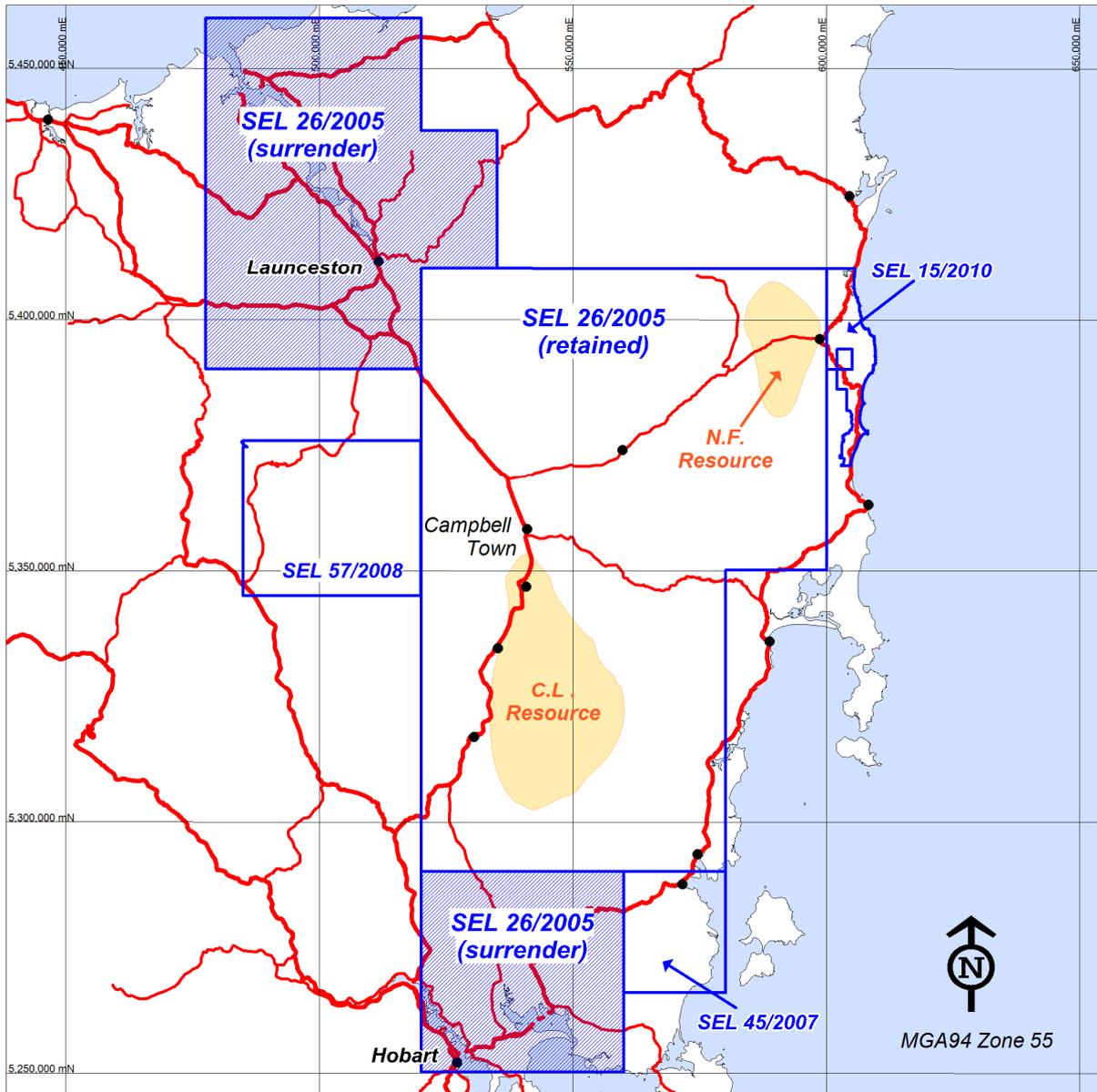
Exploration completed to date on SEL 26/2005 has met the significant expenditure commitments made on the tenement with greater than \$3.7M outlaid over the initial five-year term of the licence. Work completed to date has produced palpable results with the identification of two novel inferred geothermal resources along with at least three additional potential geothermal plays. As a result of this work a significant body of exploration data has been assembled for eastern Tasmania, an area that had previously been notably under-explored for all commodities.

Forward work programs planned for the licence area include deep drilling at the Charlton-Lemont and Nicholas-Fingal resource areas (see Section 6 below). Deep drilling and subsequent well evaluation is a significant undertaking, requiring considerable capital investment and months to years in planning and execution. For these reasons an application will be made for the extension of licence SEL 26/2005 for a second **five-year** term. A renewal term of less than five years is insufficient to enable execution of the planned program and would decrease confidence in the security of the tenure, creating difficulties for the management of ongoing project funding.

As part of the process of renewal a partial surrender of non-prospective ground identified in the extreme north and south of the existing tenement area is proposed. Surrender areas are those in which no significant geothermal play has been identified and include both metropolitan Launceston and Hobart. In total, the proposed surrender amounts to just over 30% (~5000km²) of the original licence area (Figure 21). Full details of the proposed relinquishment are included in a separate partial surrender report.

KUTh
ENERGY

LOCATION MAP
SEL 26/2005 Renewal Application
July 2011



AREAL EXTENTS

- NORTH:** 5410183mN [original boundary SEL 26/2005 continued west to intersect directly with western boundary]
- SOUTH:** 5290182mN [contiguous with north boundary of SEL 45/2007 extending west to intersect original west boundary]
- WEST:** 520112mE [original Western boundary now extends north to intersect new northern boundary]
- EAST:** Unchanged

Figure 21: Map of proposed partial surrender of SEL 26/2005. ***Note: original tenement boundaries were defined relative to datum AGD66. Coordinates provided here in MGA94 are therefore approximate and are rounded to nearest 1m.***

6 Conclusion and Recommendations

Work completed to date has successfully defined a number of significant geothermal targets for geothermal development in Eastern Tasmania. 3D geothermal modelling infers an aggregated Geothermal Resource of >350,000PJ_{th} at two sites at Charlton-Lemont in the Midlands and Nicholas-Fingal in the northeast. Drill targeting and prioritisation has identified an initial site near Lemont in the central Midlands and a second area of interest at Mt Nicolas in the northeast. Detailed planning is now underway for deep drilling in these areas.

The proposed forward work program for the five-year renewal of tenement SEL 26/2005 is:

Year	Activities	Expenditure
1	<ul style="list-style-type: none"> • Drill planning, engineering and site preparation at Charlton-Lemont (CL) • Drill planning, engineering and site preparation at Nicholas-Fingal (NF) 	\$500,000
2	<ul style="list-style-type: none"> • Completion of deep drilling at CL (enhanced slimhole) • Contingent on encouraging results at CL, reservoir characterisation testing, installation of seismic monitoring array, planning and engineering of deep appraisal wells • Contingent on encouraging results at CL, reappraisal of initial resource estimation to Indicated status; expansion of model to include Tooms-Leake and Macquarie areas. • Deep drilling at NF (enhanced slimhole) 	\$3,000,000
3	<ul style="list-style-type: none"> • Completion of deep drilling at NF (enhanced slimhole) • Contingent on encouraging results at NF, reservoir characterisation testing, installation of seismic monitoring array, planning and engineering of deep appraisal wells • Contingent on encouraging results at NF, reappraisal of initial resource estimation to Indicated status. • Contingent on encouraging results, planning & design of deep proof-of-concept (appraisal) wells at primary target (CL or NF) 	\$3,000,000
4	<ul style="list-style-type: none"> • Contingent on encouraging results, drilling of deep proof-of-concept (appraisal) well #1 at primary target (CL or NF) • Contingent on encouraging results, commence drilling of deep proof-of-concept (appraisal) well #2 at primary target (CL or NF) 	\$15,000,000
5	<ul style="list-style-type: none"> • Complete drilling of deep proof-of-concept (appraisal) well #2 at primary target (CL or NF) • Contingent on encouraging results, reservoir characterisation and flow testing for proof-of-concept at primary target (CL or NF) • Contingent on encouraging results, feasibility studies for power development at primary target 	\$6,000,000

It is anticipated that, in addition to the work outlined above, successful deep exploration at Charlton-Lemont may trigger further surface exploration activity at areas currently considered as potential resource extensions. These include the Macquarie and Tooms-Lemont plays (above) as well as areas at Rheban (currently under SEL 45/2007) and areas to the north-west under SEL 57/2008.

7 Environment

Work conducted on the tenements in 2010/2011 resulted in no ground disturbances and hence no environmental or rehabilitation work has been required.

8 Expenditure

Details of expenditure on SEL 26/2005 across the 12-month period 7/7/2010 – 6/7/2011 are captured in Table 11 below. Financial reporting for SEL 45/2007 is separate and will be detailed at anniversary in November 2011.

Delays in the onset of deep drilling have resulted in the total annual expenditure on SEL 26/2005 falling below that previously programmed for 2010/2011 (>\$1.6M). However, it should be noted that the total 5-year expenditure on SEL 26/2005 now exceeds the original commitment undertaken for this licence.

	SEL 26/2005
Geoscience Costs	\$
Geology	77384
Geochemistry	-
Geophysics	44380
Remote Sensing	-
Drilling & Gridding	
Gridding	-
Drilling	45770
Land Access Costs	-
Rehabilitation Costs	-
Feasibility Study Costs	-
Other Costs	87608
Administrative Costs	46196
TOTAL 10/11	301338
Total Expenditure (5 years)	3,707,610

Table 3: Expenditure on KUTh tenements SEL 26/2005 in the 12-month period 7/7/2010 – 6/7/2011.

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10 Keywords

Geothermal exploration

Geothermal resource

East Tasmania

HDR (Hot Dry Rock)

HFR (Hot Fractured Rock)

EGS (Enhanced Geothermal System)

High Heat Producing (HHP) granite

Tamar Conductivity Zone (TCZ)

Magnetotelluric

Gravity