

# **EXPLORATION DRILLING PROGRAM**

## **Lachish #1**

**Prepared for: Great South Land Minerals**

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## Drilling Program - Lachish #1

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## 1 INTRODUCTION

The Lachish #1 wellsite is located near the Valleyfield Road approximately 9 km west of Conara on the property named "Stockwell" belonging to Mr. James Ian Muirhead. The location is close to the intersection of two seismic lines TB01-PT and TB01-TE.

Further details on the wellsite location can be found in the 'Well Data Summary' below, under Section 1.2 - Location Map, and Section 3.2 - Site Access.

### 1.1 WELL DATA SUMMARY

State:	Tasmania
Location:	Longford Basin
Municipality:	North Midlands
Locality:	Campbelltown
License No:	SEL 13-98
Well Name:	Lachish #1
Coordinates:	527,000m E 5,368,000m N Universal Transverse Mercator Grid, Zone 55
Elevation Ground Level:	(Est.) 790 m ASL
Datum:	Rotary Table
Rotary Table to Ground Level:	5 m. (To be Confirmed)
Drill Rig:	Kremco K-600-T (tentative)
Spud Date:	Proposed early 2007
Planned Total Depth:	1550 m

## 1.2 LOCATION MAP:

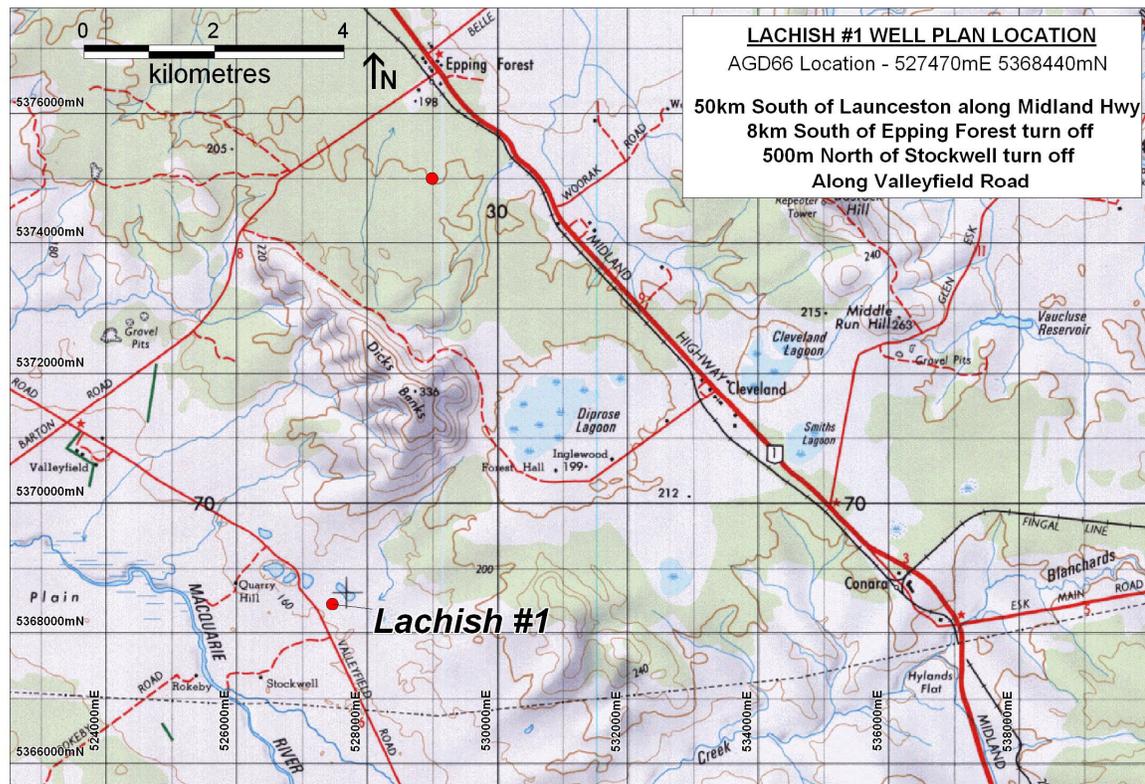


Figure 1. Lachish #1 drillsite, Tasmap 1:25,000 Conara Sheet 5236, Edition 1, 1985.

## 2 GEOLOGY

### 2.1 Well Prognosis

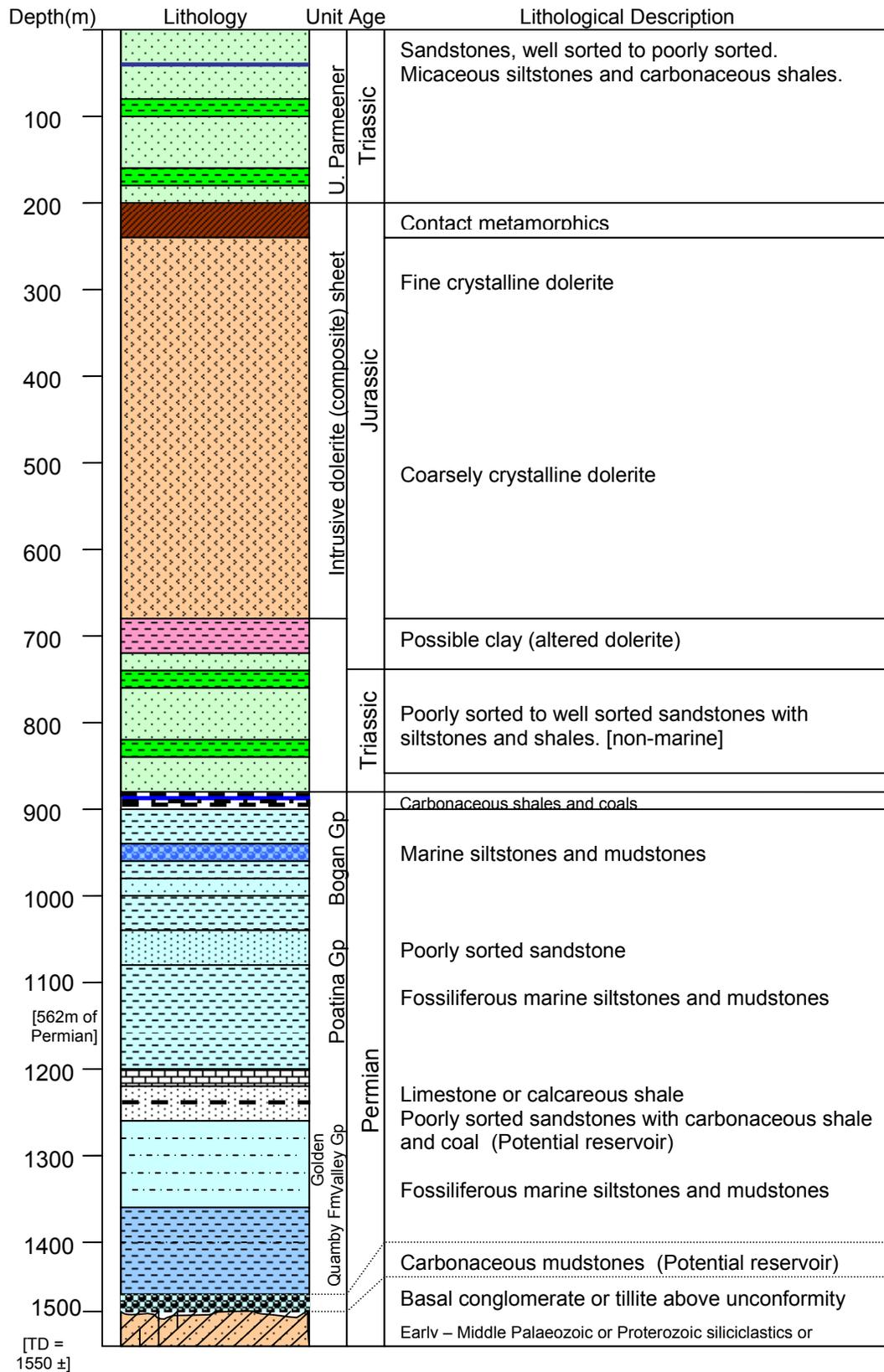
Stratigraphic structural and economic aspects of this program may be found in Burrett C and Martin E., 1989 (Eds) *Geology and Mineral Resources of Tasmania*, Geological Society of Australia Special Publication v.15 pages 1-574 and in Bendall et al 2000 Petroleum Systems in Tasmania's Frontier Onshore basins, *APPEA Journal* 2000, 26-36.

A stratigraphic drill hole is proposed in the Tertiary Longford Basin at the intersections of seismic lines TBO1-PT and TBO1-TE. The purposes of this hole are to

- Test the previously untested pre-Tertiary succession of the Longford Basin.
- Assess the stratigraphy of the Upper Parmeener Supergroup and Lower Parmeener Supergroup.
- Assess all aspects of potential systems in the Upper Parmeener (Gondwana 2 Petroleum System) and Lower Parmeener (Gondwana 1 Petroleum System) particularly potential source, reservoir and seal qualities.
- Assess the nature and thickness of the Jurassic dolerite sill or sills.
- Assess the thermal maturity of all successions and the thermal effect of the dolerite sill.
- To core the pre-Parmeener and establish its structure, lithostratigraphy and economic attributes if hydrocarbons are indicated to be present in commercial quantities.
- Compare the thicknesses with the tentative seismic interpretations.



2.2 Predicted Lithological Section



All thicknesses are at least +/- 20% based on preliminary interpretations of seismic data  
**Figure 2. Lachish #1 predicted lithological section**

### 2.3 Geological Map

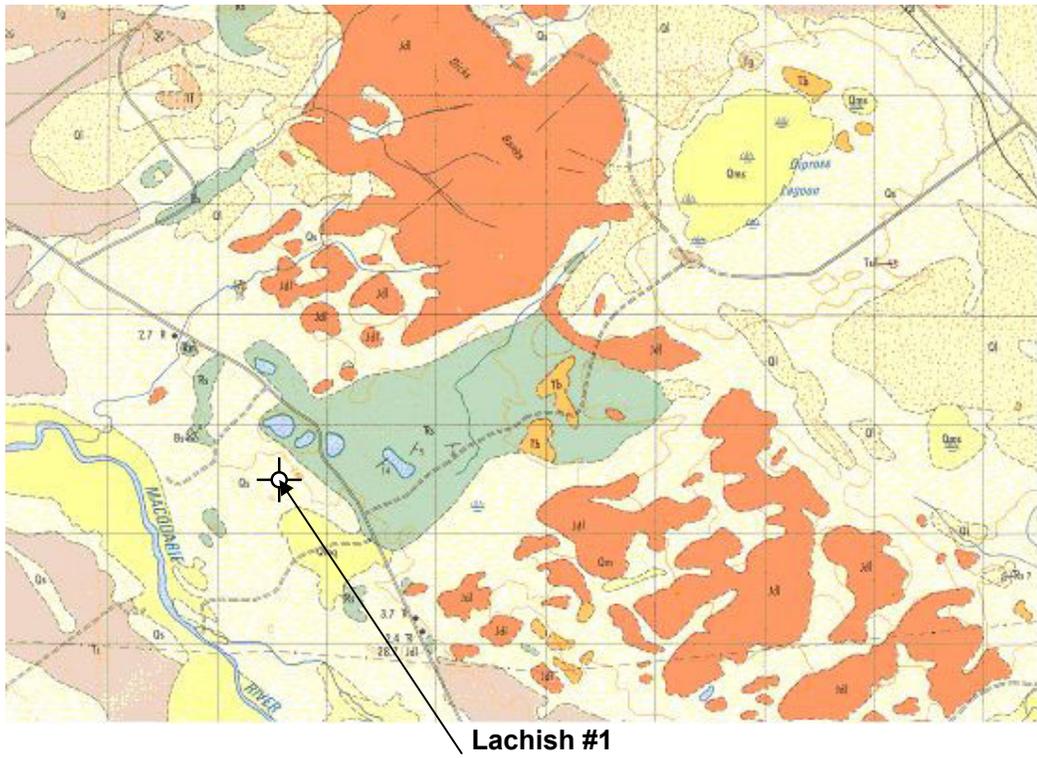


Figure 3. Lachish #1 geological setting.

### 2.4 Geological Cross Sections

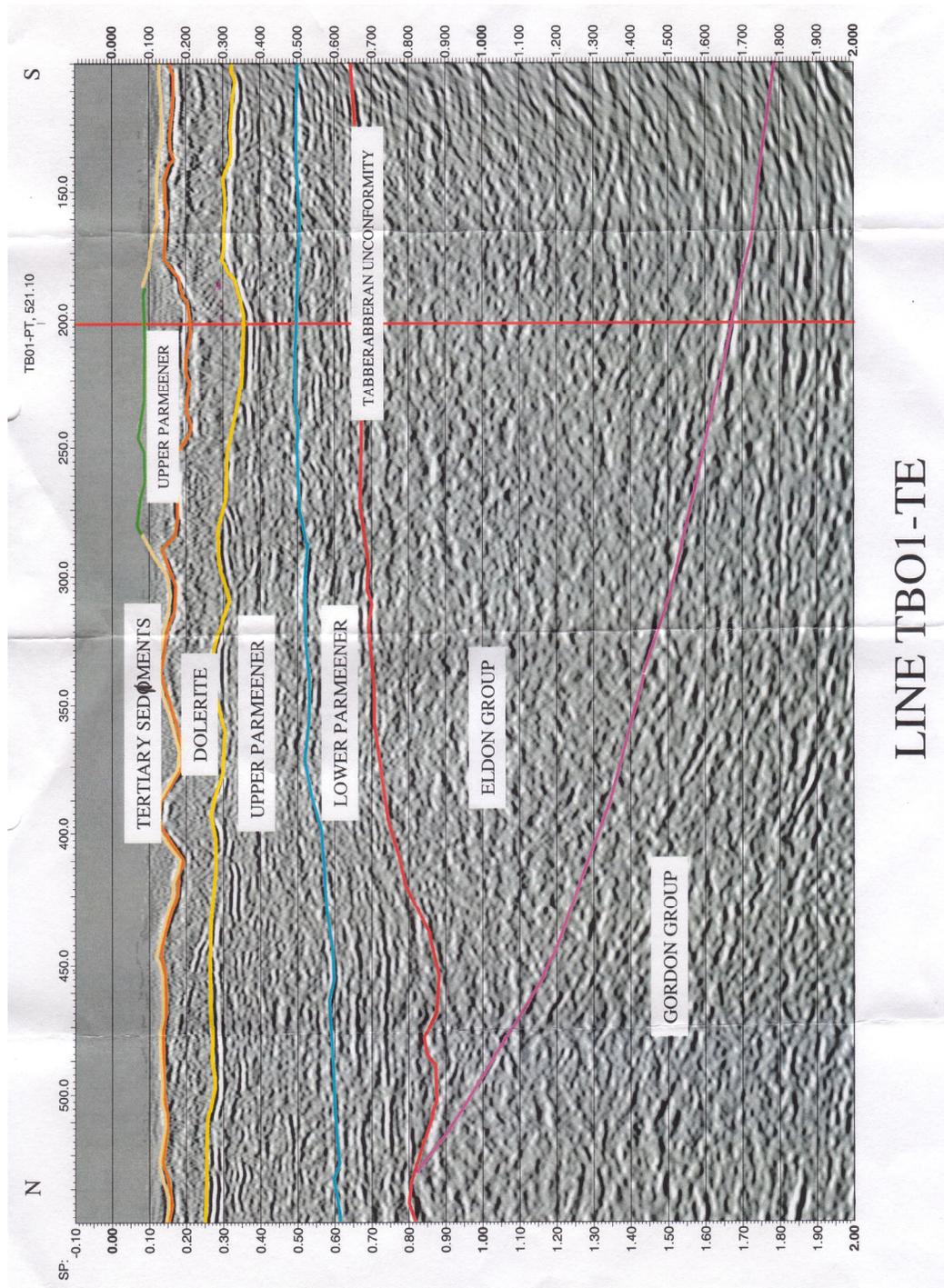


Figure 4. Cross section along seismic line TB01-TE (in a direction approx North to South)

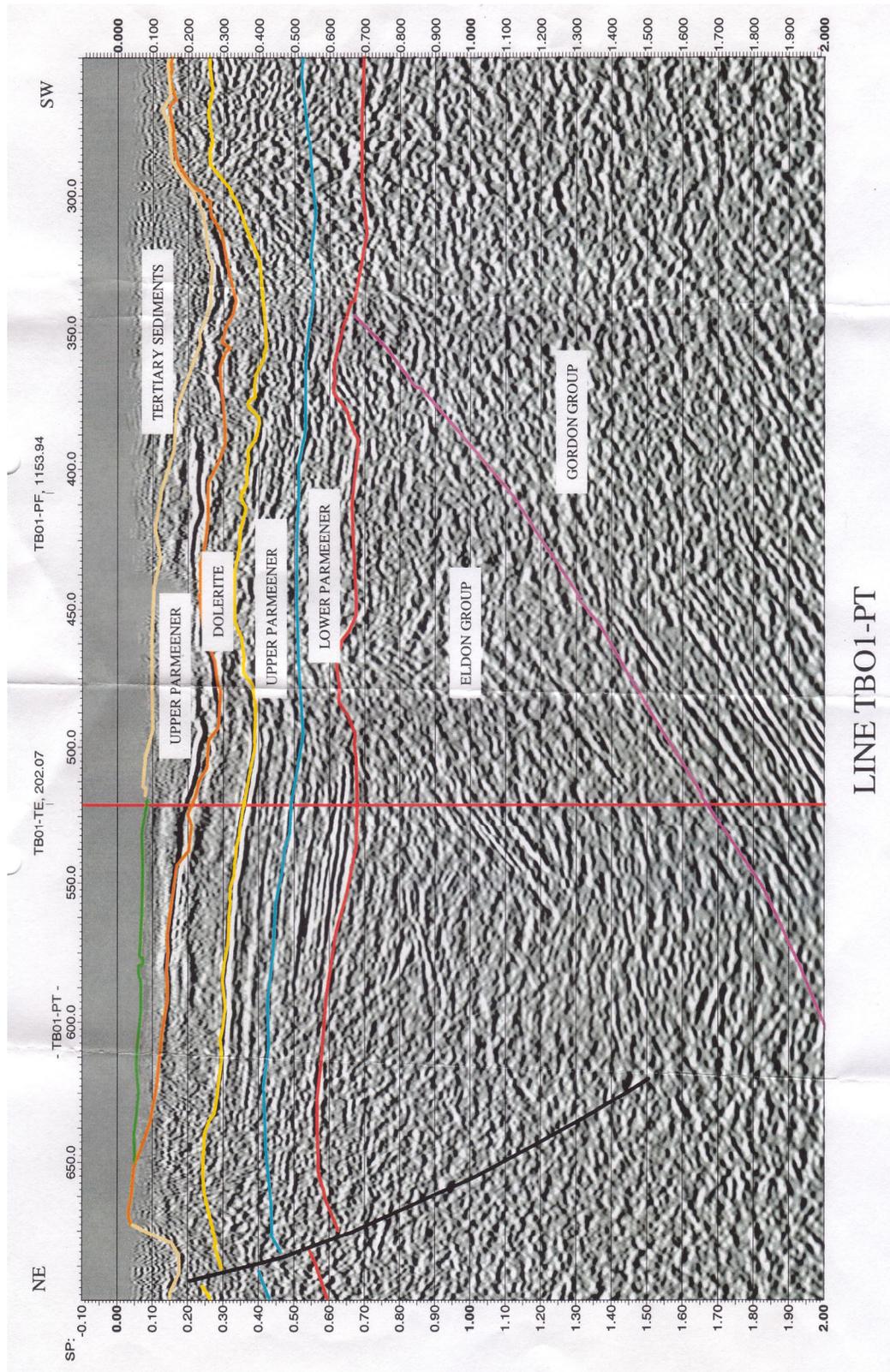


Figure 5. Cross section along Seismic Line TB01-PT

### **3 WELLSITE and ENVIRONMENTAL MANAGEMENT**

Great South Land Minerals is dedicated to conducting its business with the commitment to protect the natural environment. The company plans and manages its operations to ensure minimum impact on the environment. We are committed to meet all industry environmental standards and obligations. In applying this policy, activities will be governed by the APPEA Code of Practice. An environmental impact and native cultural survey will be conducted prior to commencement of the drilling program and this report will be submitted to the relevant authorities for review and approval.

The Company will undertake a rehabilitation program to restore land disturbed by exploration activities and will respond quickly and effectively if accidental pollution or environmental damage occurs.

#### **3.1 Landowner**

Lachish #1 is situated on the property called 'Stockwell', belonging to Mr James Ian Muirhead. Discussions have been held with Mr Muirhead and agreement has been reached for the carrying out of drilling operations on the property.

#### **3.2 Site Access**

The drillsite is less than 1 km off the Valleyfield Road alongside an existing private gravel track that branches off Valleyfield Road. No vegetation needs to be cleared, and the existing access road is adequate for the expected loads during this exploration program.

#### **3.3 Wellsite Preparation**

Mobilisation of the drilling equipment to the site will require the construction of a drill pad on which to install the drilling rig and equipment. An area around the proposed site will be cleared of topsoil which will be piled nearby for later rehabilitation. The drill pad will be of earth construction with a thin gravel surface compacted to a standard to support the drilling rig loads. The rig pad will be provided of sufficient size to position all support equipment, buildings and containers. A steel beam substructure will provide an elevated drill floor with space below to install the BOP stack.

Drilling mud used in the active mud system will be stored in steel tanks which will be part of the rig package; the active mud system will be fully contained in these steel tanks. A mud pit will be constructed alongside the drill rig pad for accumulation of drill cuttings and waste drilling mud; this mud pit will be lined with a water-proof PVC or rubber liner to prevent discharge of mud or chemicals to the environment.

A flare pit will be excavated near the wellsite in the event that near surface gas needs to be diverted to a flare for disposal. A steel flare line will be laid from the BOP to the flare pit.

A shallow trench will be constructed around the wellsite to ensure that inadvertent spills are collected; the trench will be directed through silt traps and then on towards Blanchard's creek.

### 3.4 Water Supply

Water for drilling operations will be sourced from a small lagoon or the creek that feeds into Blanchards Creek, about 200m east of the proposed drillsite.

### 3.5 Chemicals and Oil / Fuels Storage on Site

A water based mud system will be utilized during the drilling program (see Section 4.4 for a brief description of the mud system); all chemicals consumed during the drilling program will meet the APPEA Code of Environmental Practice. Mud chemicals will be stored on site, either in weather-proof bulk containers or in smaller sacks. Lost circulation material, either in the form of cellulose, mica or similar material, will also be held on site to treat any lost circulation zones. Weight material in the form of barites will be stored on site as a contingency in case over-pressured zones are encountered during the drilling program. All mud additives will be handled with care to reduce the risk of spillage.

Diesel fuel will be stored on site in a bunded storage site, with fuel pumped into day tanks at the rig prime movers. Minimal quantities of other lubricants will be stored in secure steel containers, with waste oils being removed from site and disposed in accordance with environmental regulations.

All other general wastes and rubbish will be transported to the local municipal disposal area.

### 3.6 Clean-up and Rehabilitation

On abandonment of the drill site, the site will be reconditioned to the pre-existing condition. The gravel used for the drill pad and the wastes in the mud pit will be removed and disposed in accordance with the requirements of the environmental authorities. The flare pit and silt traps will be backfilled and all other rubbish removed from the site. The topsoil which was initially removed from the site will be replaced over the entire site.

The entire site will be rehabilitated and the area will be re-seeded with grass in agreement with the landowner's requirements. A final inspection will be carried out with the landowner to confirm acceptance.

## 4 DRILLING PLAN

### 4.1 Rig Description

Great South Land Minerals (GSLM) are currently negotiating to purchase a conventional drilling rig for use on their exploration acreage in Tasmania; this rig is provided in this rig description. In the event that this negotiation is not successful, it is anticipated that a similar although not identical rig will be leased.

The proposed GSLM rig has the following equipment specifications:

Drawworks:	Kremco K-600-T, 600 hp.
Drawworks Engine:	GM 12V-71 diesel, 620 BHP at 2300 rpm.
Mast:	Tri-Ocean Engineering, 300,000 lb capacity
Rotary Table:	Oilwell SA 17 1/2" A, rated to 7,500 ft-lbs torque
Mud Pumps:	1 x Skytop Brewster B-750, 750 hp. 1 x Oilwell A-600, 600 hp.
BOPs:	1 x 13 5/8" x 3000 psi Cameron Type 'F' 1 x 13 5/8" x 3000 psi Cameron Annular

	1 x 11" x 3000 psi Hydril Annular
	1 x 11" x 3000 psi Schaffer Ram Type
	1 x 9" x 3000 psi Hydril Annular
	1 x 9" x 3000 psi Schaffer Ram Type
	1 x 7 1/16" x 5000 psi Cameron Type "QRC"
Choke Manifold:	3" x 5000 psi WKM manifold
Chokes:	1 x Willis manual 5000 psi.
	1 x Swaco Superchoke 10,000 psi.

#### 4.2 Outline Drilling Plan (In order in which operations are to be undertaken)

- 1) Survey well location to coordinates provided in this program.
- 2) In advance of drill rig arrival, drill surface hole with 40 to 46 cm rotary drill or earth auger to 10 metres below ground level. Run one joint of 340 mm OD (13 3/8") casing conductor, 81.1 kgf/m (54.5 lb/ft) grade K-55 or better; top of casing to be set at 1 meter above ground level (to be confirmed when rig dimensions known). Cement casing with construction cement, accelerated with 2 to 2 1/2% calcium chloride. See Section 4.3, note (b) regarding conductor setting depth.
- 3) Prepare wellsite after conductor in place and in advance of rig arrival, in accordance with rig layout requirements. A mud pit will be excavated alongside the rig mud tanks and will be lined with impermeable liner, a flare pit will be constructed downwind from the prevailing winds and at a safe distance from rig equipment and vegetation. The thinly gravelled wellsite surface will be compacted to withstand maximum rig and equipment loads.
- 4) Rig up over well, assemble mud circulating system, generators and ancillary equipment. A BOP / diverter will not be used in this section of hole as the next casing will be set at a relatively shallow depth.
- 5) Attach the circulating head riser pipe and bell nipple to facilitate use of a closed mud circulating system. Prepare mud for drilling (see mud specs, section 4.4).
- 6) Drill 311 mm (12 1/4") hole to 260 metres. See Section 4.3 note (c) regarding selection of casing setting depth.
- 7) Run 244 mm x 53.6 kgf/m (9 5/8" x 36 lb/ft) grade K-55 (or better) casing to 257 meters, cement casing in place as per cementing program (Section 4.6).
- 8) Install 20.7 MPa (3000 psi) BOP stack, function and pressure test in accordance with industry standards. BOP stack to include annular, blind and one pipe ram combination.
- 9) Drill out casing shoe with 216 mm (8 1/2") bit and drill 2 metres of new hole. Circulate and condition mud system to ensure mud weight is even throughout system. Carry out pressure integrity test of casing shoe (see section 6.2).
- 10) Drill 216 mm (8 1/2") hole to total depth of 1550 metres. See Section 4.3 note (g) for basis of determination of total depth.
- 11) Condition hole, POOH, run wireline logs as per logging program (Section 5.3) from TD to previous casing shoe. Evaluate logs.

12) Depending on results of interpretation of wireline logs, additional services such as RFT, MEST and / or DST may be considered.

13) If no hydrocarbons are encountered and further evaluation not deemed economic, then plug and abandon as per Section 9.

[ If hydrocarbons are encountered and further evaluation or production is contemplated, then run and cement 178 mm (7") casing (separate program to be issued) ].

14) Move rig off location and rehabilitate site in accordance with Section 3.

#### 4.3 Drilling Conditions and Precautions:

a) The geological prognosis is based primarily on seismic interpretation, outcrops and the information gained from shallow, mostly water source wells drilled in the basin. The small amount of information on this basin leads to a lower level of confidence in prediction of the lithology and depth of formations. Hence, drilling conditions may be unpredictable and caution is advisable for all drilling operations.

b) A 40 to 46 cm surface hole will be drilled to 10 m below ground level with a separately contracted earth auger or small rotary drill assembly. The 340 mm OD (13 3/8") casing conductor will be run and cemented in place with this same contractor. In the event that rock formation is encountered prior to the 10 m planned depth, then consideration will be given to setting the conductor shallower as necessary. As the 311 mm (12 1/4") hole will be set at approximately 260m, it is not considered necessary to set the conductor deeper.

c) The 244 mm (9 5/8") casing is to be set at least 30 meters into the unaltered Jurassic dolerite section. That is, the casing shall be set at least 30 meters past the metamorphosed interval expected to be present below the Triassic as this interval may be fractured and result in a low formation pressure integrity. A qualified wellsite geologist is to be present at the wellsite to assist in correctly picking this setting depth.

e) The dolerite section in this well is expected to extend from about 195 to 675 metres depth. This section can be expected to contain some minor background gas in fractured zones; however, no significant gas is expected. The dolerite is expected to be hard and abrasive, and relatively slow drilling can be expected.

f) The Jurassic, Triassic and Permian sections of the 216 mm (8 1/2") hole are expected to be normally pressured; however, hole conditions are to be monitored very carefully as this is a wildcat well and conditions may not necessarily be as predicated. Assuming the section is indicated to be normally pressured, the mud system in this well is to be maintained at minimum density for borehole stability to ensure that gas and oil indications are not masked. Lost circulation in the Triassic and Permian sections is probable, most likely in fractured zones.

g) Total depth will be determined by clear identification of an expected unconformity below the Quamby formation of the Permian at or near 1550 meters. A section of basal conglomerite or tillite may be present between the Quamby and the unconformity. The unconformity is expected to indicate passage into the Middle Palaeozoic or Proterozoic siliciclastics or limestones.

#### 4.4 Drilling Fluid Program

A mud engineering program will be available to guide wellsite personnel in controlling mud quality and rheology; this program will be provided by the selected mud engineering contractor in advance of commencement of the work program. Mud chemicals will be provided by this contractor. As the dolerite section is expected to be non-reactive, a basic fresh water gel composition will be utilized. The lower Triassic and Permian sections are expected to require a lightly inhibited mud system with good rheology control to optimize hydraulics. The following outline characteristics are anticipated:

Hole Size (mm)	Hole Interval (m)	Mud Type	Density (S.G.)
311	10 - 260	Viscous fresh water gel	1.02 - 1.05
216	260 - 1550	Mildly Inhibited, water based KCL polymer	1.03 - 1.2

Stocks of mud chemicals and weighting materials will be maintained on the wellsite for possible well control requirements.

Stocks of loss circulation material will be maintained on site for possible lost circulation in the Tertiary, Triassic and Permian sections.

Mud quality is to be monitored continuously and standard industry mud reports prepared by an on-site mud engineer.

#### 4.5 Casing Program

Depth Interval (m)	Casing OD (mm)	Casing Wt (kgf/m)	Casing Grade	Conn.	Burst (psi)	Collapse (psi)	Tension (lbs)	Burst SF	Collapse SF	Tension SF
10	340	81.1	K-55	BT&C	2,730	1,130	853,000	7.1	V. High	V High
260	244	53.5	K-55	BT&C	3,520	2,020	564,000	1.28	5.26	18.3

Note: All casing will meet API - 6C specifications and will be supplied in range 3 lengths. All threaded connections will be made up to the manufacturers recommended torque. A float shoe and float collar (two joints higher) will be used for the 244 mm casing; the bottom 3 joints will be thread-locked. Centralizers will be used on every third joint.

The 244mm (9 5/8") casing will be pressure tested to 13,800 kPa (2000 psi) after displacement of the cement plug to the shoe during the cementation process.

## 4.6 Cementing Program

A cementing program will be available to guide wellsite personnel in controlling cement quality and rheology; this program will be provided by the cementing contractor in advance of the commencement of the work program. The cement used for the 244 mm (9 5/8") casing will be Class 'G' oilfield cement, with both cement and chemicals supplied by the cementing contractor. The outline cementing program will be as follows:

Casing Size (mm)	Casing Shoe Depth (m)	Cement Type	Density (S.G.)	Sacks	Additives
340	10	C	1.89	90	2% Calcium Chloride
244	257	G	1.89	340	TBA

### Notes:

- a) The volumes of cement slurry to be used in all cementations shall be sufficient to bring cement slurry in the annulus back to surface.
- b) The cement slurry shall be displaced so as to leave approx 2 metres cement slurry inside the 340 mm OD casing. Pressure shall be held on the casing for a minimum of 6 hours, or until surface samples have set firmly.
- c) The 340 mm casing cementation shall include 25% excess slurry to account for losses and washouts (included in the table volume). The calculation of sack volume was based on the assumption of a 44.5 cm (17 1/2") drilled hole.
- d) The 244 mm casing cementation shall be based on the caliper log calculation of annular volume plus a minimum of 15% excess slurry to account for unidentified washouts, losses during circulation and hole collapse (as included in table volume).
- e) Additives for the 244 mm OD casing cementation shall be confirmed by the cementing contractor after the bottom hole temperature is measured during the logging program.
- f) All cementations are calculated based on 15.8 ppg cement slurry; if severe losses are experienced in the 311mm (12 1/4") hole section, then a partial column of lighter slurry may be considered.

## 5.0 FORMATION EVALUATION

### 5.1 Drill Cuttings Recovery / Analysis & Coring Program

Rock cuttings will be recovered from the shale shakers continuously from the bottom of the 340 mm OD casing (from 10 m depth) through to total depth. All cuttings samples will be gathered based on representative samples of 10 meter intervals, unless otherwise specifically requested by the Company representative on site. Cuttings will be stored in bags clearly numbered and marked for well name, depth and date, and then cuttings description will be recorded in detail by the mudlogging contractor before the cuttings are transported to storage. Two complete sets of cuttings will be provided; one for GSLM and one for Mineral Resources Tasmania.

As this is an exploration well, coring will only be undertaken if significant hydrocarbons are encountered.

## 5.2 Mudlogging Services

Mudlogging services will be provided throughout the drilling of the hole; this will include provision for monitoring and recording the following data:

- a) Gas Detection
  - total gas
  - chromatographic analyses
  - running of calibration gas
  
- b) Drilling Parameters
  - depth
  - rate of penetration
  - weight on bit
  - standpipe pressure
  - drillstring RPM
  - pump SPM and cu m/hr
  - calculation of lag time
  - pit level monitoring
  - mud rheological properties

The mud logging contractor will be responsible for collection, bagging and drying of all drill cuttings, suitably lagged for depth, and provision of a full description of all drill cuttings. The cuttings description will be completed at the wellsite by a suitably qualified wellsite geologist.

## 5.3 Wireline Logging

The following wireline logging will be performed by a competent wireline logging contractor:

- a) 311 mm Hole (10m to 260m):                      None
  
- b) 216 mm Hole (260m to TD):                      Neutron/Density/Gamma  
Ray/Sonic/Resistivity/SP/Caliper

Digital and paper copies of the logs will be provided for GSLM and Mineral Resources Tasmania.

## 6 TESTING AND SAFETY PROCEDURES

All drilling operations will be under the direct control of qualified personnel holding current BOP and Well Control Certificates.

### 6.1 BOP Testing Procedures

- a) Following nipping up of the BOP, the annular preventer, choke manifold, kill valves, stand pipe and swivel will be pressure tested to 17,240 kPa (2,500 psi) in 3450 kPa (500 psi) increments for the 216mm (8 1/2") hole.
  
- b) At intervals not exceeding 7 days after drilling below the 244 mm casing a pressure test of BOPs and manifold equipment will be carried out using a cup tester.
  
- c) The annular BOP and accumulator will be function tested daily.
  
- d) Safety drills will be carried out periodically at the discretion of the Drilling Supervisor, but at periods not exceeding one week.

e) All BOP and choke manifold pressure and function testing shall be recorded on the daily reports and AIDC reports.

## 6.2 Pressure Integrity Test

A pressure integrity test shall be conducted when the 244 mm (9 5/8") casing is drilled out; the test shall be in accordance with the following procedure:

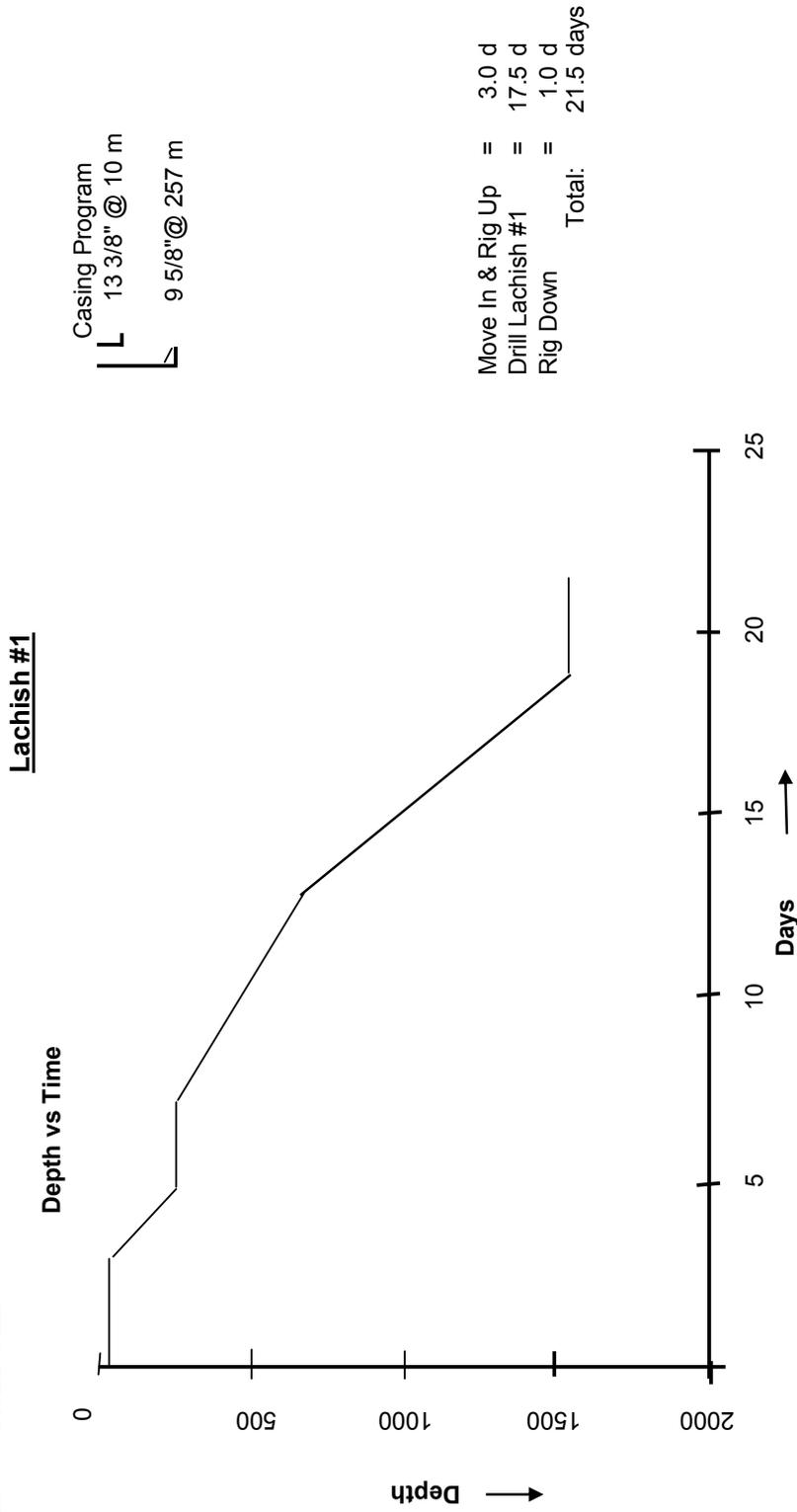
- a) Drill out the casing shoe and drill 2 meters of new hole.
- b) Circulate the hole to provide an even mud weight throughout the entire mud circulation volume.
- c) Pull the drillbit back inside the casing shoe and refill the hole. Close the annular preventer and kelly cock.
- d) Using a small output pump, an accurate pressure gauge and a calibrated source tank, pump down the annulus at less than 30 l/min (0.2 bpm). Record pump pressure versus volume pumped and plot same on a graph.
- e) Terminate the test when either a pressure of 13790 kPa (2000 psi) is reached, or when the pressure versus volume plot ceases to be a straight line.
- f) Record instantaneous shut-in pressure and trapped pressure at 1 minute intervals for a 15 minute shut-in period, or until it levels off.
- g) Bleed off the pressured annulus into a calibrated tank and record the fluid volume recovered. Then open the annular preventer.

The equivalent mud weight will be calculated to determine the maximum mud weight which can be tolerated in the wellbore without fracturing the formation and losing returns.

## 7 COMMUNICATION AND REPORTING

Daily operations reports shall be issued by the Drilling Supervisor and forwarded to the offices of Great South Land Minerals. GSLM will issue a daily report to Mineral Resources Tasmania.

8 DRILLING SCHEDULE



Predicted drilling schedule based on the following:

- 1) Lithology encountered is in accordance with lithology predictions of Section 2.
- 2) Drilling rig and mud pumps meet minimum industry standards for efficient operation.
- 3) Drill bit selection is optimized for all formations, with special consideration of the unpredictable dolerite interval.
- 4) This drilling schedule is provided to assist in preparation of the budget; as this is a wildcat exploration well time estimates have been generous, variations in actual schedule can be expected.

Figure 6. Lachish #1 Drill Depth vs Time

## 9 ABANDONMENT PROCEDURE

If a decision is taken to abandon the well, a program shall be prepared in accordance with the following guidelines:

- a) In uncased portions of the hole, cement plugs will be placed to provide a minimum of 30 meters of cement above and 30 meters of cement below any significant oil, gas or fresh water zones.
- b) A cement plug will be placed at the bottom casing shoe so as to extend at least 30 meters above and 30 meters below the casing shoe.
- c) A cement plug will be placed extending from the surface to at least 15 meters below the surface.
- d) The casing head adapter and other wellhead equipment will be removed and a steel pole and well marker plate will be welded to the casing. The marker plate will extend at least one meter above the ground level and use weld bead to mark the well name and number and date of abandonment.

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