

# Due Diligence Report

January 2011







# Due Diligence Report



CEO Malcolm Bendall on new GEFCO SS-1100 Rig





## EXECUTIVE SUMMARY

Empire Energy Corporation International (Empire) is an international oil and gas exploration company, focusing on developing assets in one of the world's last large virgin petroleum basins and intends to become a leading low-cost finder of hydrocarbons. The company is currently operating in Tasmania's centre and north through its wholly-owned subsidiary, Great South Land Minerals, Limited (GSLM). GSLM operates pursuant to licenses issued by the Tasmanian Government, to which all subterranean oil and gas deposit rights are reserved. Licenses are subject to minimum expenditures over their term as well as additional terms as determined by the Minister for Infrastructure, Energy and Resources.

Unlike traditional "wildcat" petroleum exploration companies, Empire and GSLM, have taken an alternate approach and incurred significant exploration/research costs to map the entirety of the Tasmanian basin. Operating under Special Exploration License SEL 13/1998 (covering 30,356km<sup>2</sup>), the Company has drilled seven stratigraphic boreholes, undertaken extensive gravity, magnetic and geophysical surveys and completed 1,350 line kilometers of 2D seismic, both on and off-shore. The direct cumulative result of which has been the discovery of three petroleum systems and the identification of at least twelve (12) previously unknown, significant, potential petroleum bearing structures.

In December 2009, RPS Energy, Ltd in London, England (RPS); one of the world's leading suppliers of independent oil and gas evaluations, prepared a Competent Persons Report detailing their year-long independent analysis of geological data obtained from GSLM's \$56 million research investment over the past 33 years. Their report dictates that the undiscovered prospective oil and gas resource contained within the dome structures identified by GSLM, within the Company's licensed area bears 668 million barrels.

WHK Denison (WHK), a major Australian accounting firm, valued these undiscovered prospective 668 million barrels, based on comparative acreage elsewhere in Australia at USD\$3.3 billion. This valuation was derived by discounting the then current USD\$70/barrel market price of oil down to USD\$5/barrel. The discount was based on the comparative value between the land within which GSLM's seismically defined structures lie and the sale price of land on the Australian mainland market containing similar potential for and quantities of undiscovered prospective resources.

With an estimated \$20/barrel production cost at today's world oil price of \$89/barrel, the Company's undiscovered prospective oil and gas resource represents a potential \$46.1 billion asset.

Pending a successful capital raise, the Company is poised to immediately re-commence drilling operations at "Bellevue," its largest and most prospective site, where a production-quality drill hole measuring 17 ½ inches wide and running 768 feet deep already exists. Based on the Company's geological research and according to its lodged drilling program the first petroleum target is believed to be less than 984 feet away. With a drilling team progressing on the order of



approximately 200 feet per day, the Company could reach its first expected payzone as soon as five days after the recommencement of drilling.

The Company is seeking to raise an initial USD\$200 million via a debt instrument carrying a low double-digit coupon and convertibility to an equity stake at a 20% discount to market at the time of conversion or an equity investment. The Company is furthermore willing to accept disbursement in staged drawdown tranches based on milestone achievements with an initial tranche of no less than \$25 million.

The initial \$25 million is necessary to cover drilling contractor mobilization fees and bonds to immediately re-mobilize a short-term drilling rig to site, purchase of a state-of-the-art GEFCO Speedstar SS-1100 rig and all required drilling equipment as well as administrative and contractor expenses to complete all 2,600 meters of the "Bellevue" site. Additionally, this first tranche will provide sufficient capital to also commence drilling operations at the "Thunderbolt" site.

The additional \$175 million is intended to be used over the next two years to drill numerous additional production wells, construct a sufficiently large oil refinery, establish a physical distribution chain and accelerate production.

Empire's ultimate goal is the full commercialization of oil and gas throughout the Tasmania Basin.

***\*\*Note: Contrary to American property laws, the Tasmania State Government reserves all rights to subterranean oil and gas deposits. Individual landholders have NO legal claim to any oil and/or gas under their property and furthermore lack standing to prevent oil and/or gas drilling on their property. The government transfers the rights to drill and extract oil and/or gas through the issuance of exploration licenses conditioned with a 12% State Royalty on all oil and/or gas extracted. Thus, Empire and GSLM are not obliged to negotiate with Tasmanian property owners. However, GSLM has aided landowners by drilling water wells or constructing access roads, at minimal cost, as a measure of good will and gratitude.***



## CHAIRMAN OF THE BOARD STATEMENT

*September 29<sup>th</sup> 2010*

It is with the utmost regard for the historical efforts of the Great South Land Minerals and Empire Energy management, executive teams and Board of Directors that I accept the honor of serving as the new Chairman of the Board. I believe that in today's marketplace within the oil exploration environment, Empire is positioned to extract qualities from its new Board of Directors makeup that will drive and facilitate the long awaited exploratory processes to become a reality.

While Empire's business road to this juncture has been one with potential and promise, a more defined and tactical approach complimented by broader business, legal and strategic planning experience may well be the defining step to realizing both the Company's mission and shareholders realization to uncover the oil resources in the Tasmanian Basin that Empire has diligently pursued.

Additionally, while the concerted focus and pursuit of Empire's core and primary commitment to oil exploration will be foremost, it is also the development potential in the recovering financial markets that present an opportunity for Empire to maximize its public trading vehicle by engaging in other business opportunities with capacity for success. One such enterprise is in the recovering financial services arena facilitating credit card opportunities to specialized markets. As another accessory to expanding and diversifying Empire's base of operations is the expanding global market for medical waste treatment currently under development within the recently acquired Grand Monarch Holdings, Inc. structure.

My interest is in the deployment of successful strategies and implementation of ideas and concepts that create results driven to satisfy the interests of all at Empire even with the full knowledge of its history of challenges and obstacles. An expression I heard and remembered many years ago said, "Encouraged people achieve the best; dominated people achieve second best; neglected people achieve the least." So with respect to its author, I suggest that we at Empire encourage all of our investors, shareholders and supporters, dominate those that challenge our mission and neglect those that would claim or attempt to take that which they have not worked for and disrupt our due success.

I welcome the challenge and task ahead to create new and broader opportunities and therewith a propensity for greater success with the Board of Directors leadership and insight for all at Empire Energy Corporation International.

Respectfully,

David Villarreal, Jr.

*Chairman and Director – Empire Energy Corporation International*



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## COMPANY DESCRIPTION

Empire Energy Corporation International (Empire) is an international oil and gas exploration company, focusing on developing assets in one of the world's last large virgin petroleum basins and intends to become a leading low-cost finder of hydrocarbons. The Company is currently operating in central and northern Tasmania through its wholly-owned subsidiary, Great South Land Minerals, Limited (GSLM). GSLM operates pursuant to licenses issued by the Tasmanian Minister for Infrastructure, Energy and Resources. These licenses are subject to minimum expenditures over their term as well as additional terms as determined by the Minister.

Under prior licenses GSLM has thus far invested \$50 million in the completion of 1,350 line kilometers of 2D seismic both on and off-shore, extensive gravity, magnetic and geophysical surveys and seven stratigraphic boreholes. This investment in mapping the entirety of the Tasmania Basin has directly led to the Company's discovery of three previously unknown petroleum systems, the finding of at least 12 previously unknown, significant, potential petroleum bearing structures and the identification of least 19 drilling targets.

On May 17, 2010 GSLM was issued Exploration License EL 14/2009 covering an area of 3,180 km<sup>2</sup> (785,000 acres). The license is currently active and the Company is poised to immediately re-commence drilling operations on the already present 17½ inch wide, 768-foot deep production-quality drill hole at the "Bellevue" site.



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<b>Ticker Symbol:</b>	<i>EEGC</i>
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<b>Website:</b>	<i><a href="http://www.empireenergy.com">http://www.empireenergy.com</a></i>



## INVESTMENT HIGHLIGHTS

### **A business model capitalizing on Tasmanian oil and gas potential**

Empire is pursuing oil and gas exploration and development projects in Tasmania. To date, there have been no commercial oil or gas discoveries in the Tasmania Basin although oil seeps have been found throughout Tasmania. Data from the Company's exploration program indicates that commercial quantities of hydrocarbons may be present in the Larapintine and Gondwanan Systems of the Tasmania Basin.

### **Onshore Tasmania may yield as much as 3 billion barrels of oil equivalent**

It is estimated that one square meter (10 square feet) of surface area of the Tasmania Basin may contain as much as nine barrels of oil. Taking into account source rock distribution, loss to the system due to leakage, faulting and metamorphism and recovery suggests there is a potential resource of as much as three billion barrels of oil. Using the Zeta Ware program, and conservative assumptions regarding source rock distribution and recovery factors, Empire estimates onshore Tasmania could yield as much as 346 million barrels of recoverable oil plus 6 trillion cubic feet of methane or a possible aggregate recoverable resource of 1.346 billion BOE.

### **Potential Revenue in Excess of US\$59.5 Billion**

RPS Energy, one of the world's leading independent experts on oil and gas resource/reserve evaluations, estimated the undiscovered prospective oil and gas resources contained within the structures identified by GSLM to be 668 million barrels. If verified and produced at today's world oil price of US\$89 per barrel, this could represent potential revenue of US\$59.56 billion. With Empire's production costs believed to be approximately \$20 per barrel the Company has the potential to commence oil production with an estimated 77% profit margin.

### **Rising oil demand and prices spurs exploration activity**

Despite slowed economic growth, worldwide oil consumption is forecast to continue to rise throughout 2011. In December 2010, the International Energy Agency (IEA) forecast worldwide oil consumption would rise by 2.5 million barrels per day, the second-highest annual increase in at least 30 years. For 2011, the agency forecast oil demand would rise by 1.3 million barrels per day, an upward revision of about 260,000 barrels per day above its previous forecast.

As of December 2010, OPEC secretary-general Abdalla El-Badri was quoted that crude oil prices were at "suitable levels" and described the market as "comfortable." These statements echo the cartel's December 2010 monthly report, which states that despite stronger-than-expect demand there was no need for additional production.

Spurred by increased global demand and OPEC capacity reduction, US investment bank Goldman Sachs published a December 12, 2010 report forecasting West Texas Intermediate crude would rise to \$89 a barrel within three months, \$100 within six months and \$105 within a year. Similarly, on December 03, 2010, US investment bank JPMorgan Chase & Co. predicted crude oil would advance to \$120 a barrel before the end of 2012 as consumption grows in emerging economies. Despite recent price volatility, the long-term outlook for oil suggests rising demand and higher prices.



### **Locally Based Company with Extensive Experience and Data Collection**

For more than 33 years the Company and many of its staff have been locally based in Tasmania researching and managing petroleum exploration throughout the Tasmania Basin. To date the Company has invested in excess of \$50 million completing 1,350 line kilometers of 2D seismic, extensive gravity, magnetic and geophysical surveys and seven stratigraphic boreholes. This aggregate of data has produced the most thorough mapping of the entirety of the Tasmania Basin. The direct result of which has been the Company's ability to find three previously unknown petroleum systems, discover at least 12 previously unknown, significant, potential petroleum bearing structures and the identification of 19 target drill sites.

Moreover, the Company and its staff have developed valuable established contacts with suppliers, contractors, and government officials and maintain a firm understanding of customs and laws.

### **Stable Politically Benign Government**

The country of Australia is a British commonwealth with a constitutional monarchy and a federal division of powers. As such, the state of Tasmania is a sovereign entity with a local State government subject to certain powers of the Commonwealth, as defined by the Constitution.

Business in Australia is conducted in a transparent, well-regulated and politically and economically stable environment. The World Bank Doing Business Report has judged Australia as the 2<sup>nd</sup> most straightforward and affordable country to start a business and in the top 10 countries in terms of overall ease and safety in doing business for 2009, 2010 and 2011.

The Government welcomes foreign investment with all levels of government keen to promoting business, economic development and employment growth. The judiciary is open, independent and accessible.

While the local Tasmanian government has been strongly supportive of the Company's project through a \$400,000 grant, the Government is not a participant in the project as either a working partner or infrastructure owner.

### **Competitive Corporate Taxation**

The Tasmanian government reserves all rights to subterranean oil and gas deposits. The Government transfers the right to drill and extract oil/gas through the issuances of exploration licenses conditioned with a 12% Royalty Tax on all oil/gas extracted. This Royalty Tax is deducted from the Company's gross sales when determining a corporation's tax liability. The current corporate taxation rate is 30%.



# TASMANIA BASIN CHARACTERISTICS

## Tasmania

Tasmania, the southern island state of Australia, is approximately the same size as Ireland or West Virginia and covers an area of 68,332 square kilometers or about 26,383 square miles. Australia is an advanced industrialized western democracy, a close ally of the USA and has a rapidly expanding population with a high standard of living. Tasmania has a population of about half a million people and has good road, industrial, rail, Internet, electricity, air and seaport infrastructure. The University of Tasmania is rated among the elite in Australia and the Tasmanian population is generally well educated and skilled.

## Duke Energy Gas Pipeline

In 2002, Duke Energy, a U.S. company, constructed a 445 mile pipeline to bring natural gas from petroleum fields offshore Australia to Tasmania. The section that crosses the Bass Strait cost US\$250 million to build and the entire pipeline cost US\$2.6 billion. Gas is now supplied to the industrial centers of northwest Tasmania and to the population centers of Launceston in the north, and Hobart in the south. This pipeline provides a built infrastructure that can connect newly discovered onshore Tasmanian gas to the entire eastern seaboard gas pipeline network. The Company is required to pay a 12% royalty on the well-head value to the state government and a 30% corporate tax rate on profits to the Australian federal government.



## Exploration Activities

Empire Energy and its predecessor companies have invested substantial amounts in exploration activities. Over 1,350 line km of 2D seismic have already been acquired, processed and interpreted. Magnetic, gravity and geochemical data have been acquired and down hole velocity tests have been conducted in deep stratigraphic wells. Seven stratigraphic wells were drilled in the south and center of the basin. As a result, the Company has a good understanding of the existing geotechnical and drilling environment.

Although Tasmania is regarded as a frontier basin, it is now geologically and geophysically well understood and progress has been made mapping the petroleum systems. Mineral Resources



Tasmania (MRT) has geologically mapped much of the state, and Empire and MRT have both drilled several stratigraphic wells. Many hundreds of studies, including numerous major theses and monographs, have been written on the geology of the Tasmania Basin rocks, including its stratigraphy, geochemistry, paleogeography, sedimentology and paleontology. In 2002, the Australian government (with \$300,000 of matching funds from the Company) awarded a \$400,000 grant to the University of Tasmania to study the petroleum systems onshore Tasmania. The results of that study have helped substantially reduce exploration risk in the Tasmania Basin.

### **Tasmania Basin Major Petroleum Systems**

Two major petroleum systems have been identified in the Tasmania Basin: the Larapintine Petroleum System and the Gondwanan Petroleum System. A third system, the Centralian Petroleum System, may exist in the Precambrian rocks which have been proven to be resources of dry gas and oil where exposed at surface both within and outside of the Tasmania Basin.

### **Gondwanan Petroleum System**

The Permian to Triassic Gondwanan Petroleum System is well studied and consists of: tasmanite (glacialmarine algal source and the world standard of type I kerogen); Triassic coals type II and III kerogen; Permian coals type II and III kerogen; Pelionite (fresh water algae) type I kerogen and Quamby Mudstone (200 meters thick) types I, II and III kerogens.

**Source** - Early Permian carbonaceous shales (Quamby Fm in the north and Woody Island Fm in the south) including tasmanite oil shale plus mid-and-late-Permian shales and coals. An oil seep at Lonnavele in southern Tasmania is derived from the oil shale and is a migrated low sulfur, heavy crude. The tasmanite was quarried in outcrop in northern Tasmania in the 1920s and 1930s and was distilled into a wide variety of petroleum products from 250,000 gallons of production.

It has been estimated that one square meter (10 square feet) of surface area of the Tasmania Basin could yield as much as nine barrels of oil. Given conservative estimates regarding source rock distribution, loss to the system due to leakage, faulting and metamorphism and recovery, this suggests a total undiscovered potential resource of about three billion barrels of oil.

Based on the widely-used Zeta Ware program, and conservative assumptions regarding source rock distribution and recovery factors, experts estimate that onshore Tasmania could contain as much as 346 million barrels of recoverable oil plus 6 trillion cubic feet of methane or a possible total recoverable potential resource of 1.346 billion BOE. Non-tasmanite-derived bitumen and oil occurs within Permian sandstones in western Tasmania and is geochemically similar to other sampled seeps found near Hobart, indicating generation from another, as yet unknown, source rock. Inclusions of oil are found in Permo-Triassic sandstones in western, central, and eastern parts of the Tasmania Basin.

**Maturation** - The Basin is immature for oil (0.5 vitrinite reflectance equivalence) in the north of the state where outcrops of oil shale were quarried in the 1920s to 1930s to mature over the remainder of the Basin (0.5 to 1.5 vitrinite reflectance equivalence).



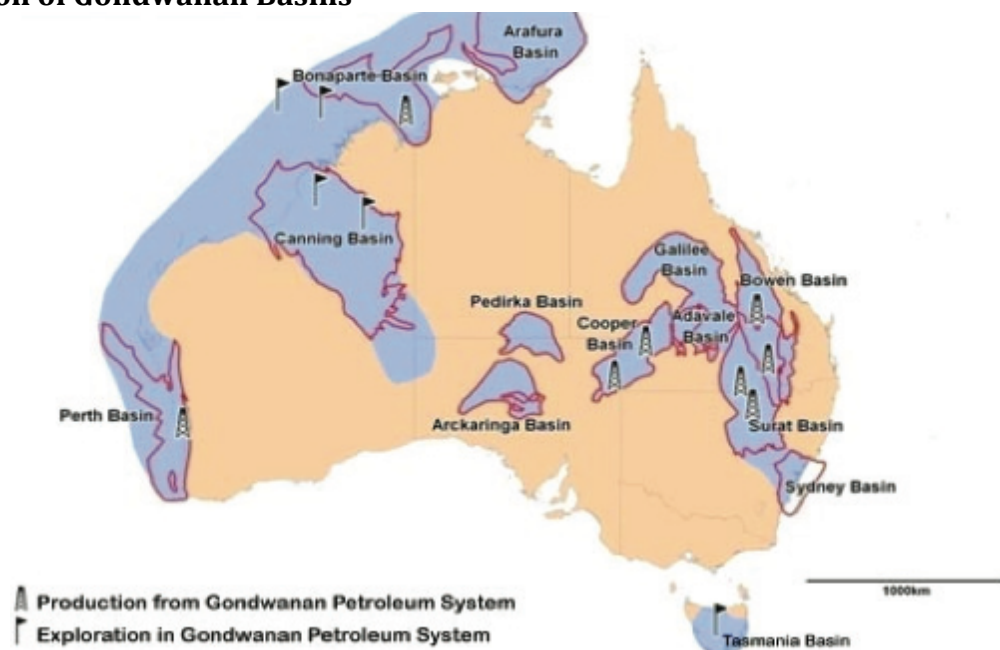
**Reservoir** - Consists of about 20 to 30 meters of mid-Permian terrestrial sandstones, some thinner late- Permian sandstones and 200 meters of early-Triassic terrestrial sandstones.

**Seals** - Fine grained mudstones of the late Permian Ferntree Fm and correlates are widespread and constitute a regional seal. Jurassic dolerite (diabase) intrusive sheets are also very effective seals as evidenced by their very high seismic velocities.

**Traps** - These consist of gentle domal structures draping over the Devonian domes within the fold-thrust belt, plus numerous flower structures, fault blocks and some anticlines. Many of the fault blocks were formed after the most likely time for migration. As a result, timing of traps and migration times remain a risk factor. Re-mobilization and secondary migration are possible scenarios. However, EEGC has recently identified several early Jurassic (pre- dolerite) age traps which were formed well before the peak oil generation in the Cretaceous/Early Tertiary.

**Analogues** - The Gondwanan Petroleum System of the Tasmania Basin resembles petroleum systems of the producing Australian onshore Cooper, Bowen and Perth Basins and the Middle Eastern, South Oman Basin.

### Distribution of Gondwanan Basins



### The Larapintine Petroleum System (Ordovician to Devonian):

Platform Ordovician to early Devonian formations shape the Larapintine Petroleum System. Essentially, onshore Tasmania consists of a Devonian fold-thrust belt containing thick tropical platform, Ordovician limestones overlain by Siluro-Devonian siliciclastic formations, unconformably overlain by glacial-marine Permian and terrestrial Triassic siliciclastics.

**Source** -The Larapintine Petroleum System of onshore Tasmania is less well-studied than the Gondwanan System. For many years, a petroliferous odor has been noted from the mile-thick Gordon Group limestones. Recently, wet gas has been extracted from the limestone in central



Tasmania. The limestone in central Tasmania is in the wet to dry gas windows whereas, in western Tasmania, association with Devonian granites has led to metamorphic temperatures of over 300 degrees centigrade. However, studies by mining companies in western Tasmania have shown that substantial oil was generated and reservoirized within the Ordovician limestone after Devonian orogeny. This oil is now represented by very abundant bitumen in good porosity in the Gordon Group limestone. Further away from the granites in central Tasmania, the Ordovician remains in the wet to dry gas windows.

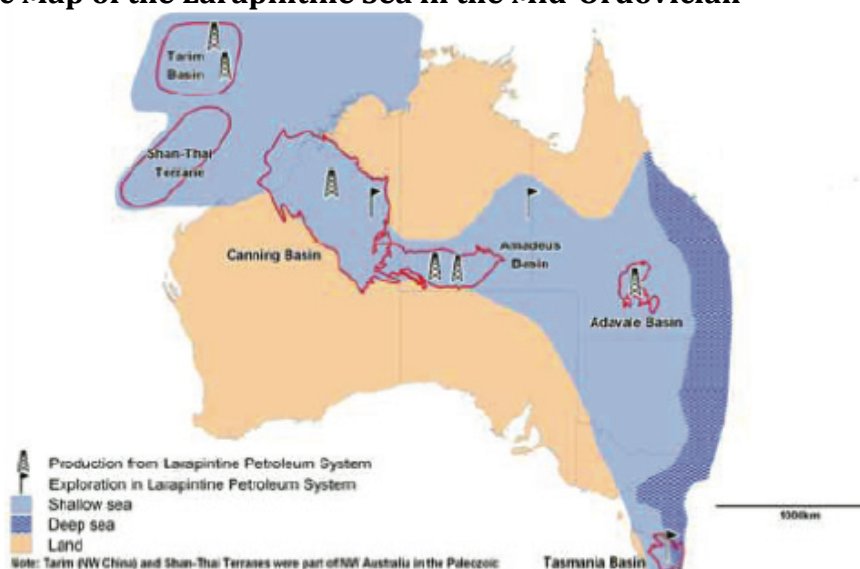
**Maturation of Reservoirs** - Good porosity may be found in coarse carbonate sands and within reef developments and within dolomitized zones. Devonian karsting (cave formation) of the Ordovician limestone has been demonstrated in several parts of Tasmania and may be detected on the seismic sections. Paleokarst is therefore a major drilling target for the Company. Sandstone formations within the overlying Siluro-Devonian Eldon and Tiger Range Groups may also have reservoir potential at depth.

**Seals** - Seals are developed as thick fine grained units within the Ordovician limestone and as shale formations within the Silurian and Devonian. Permian tillite constitutes a topseal for the paleokarst reservoirs of the Ordovician limestone.

**Traps** - Large anticlines have been identified seismically under the Permo-Triassic of the Tasmania Basin infill. These were formed by Devonian orogeny and constitute an Appalachian-style 'valley and ridge' province that merges eastwards into a more strongly thrust zone. The overlying Permian and Triassic and the intrusive Jurassic follow the same fold trends but with shallower dips than in the unconformably underlying Early Paleozoics. This allows both petroleum systems to be targeted by one drill hole.

**Analogues** - Productive, biologically similar sequences of Ordovician limestones are found in eastern North America such as the Trenton Limestone and the Viola Formation and in the Tarim Basin of NW China and both East and West Texas.

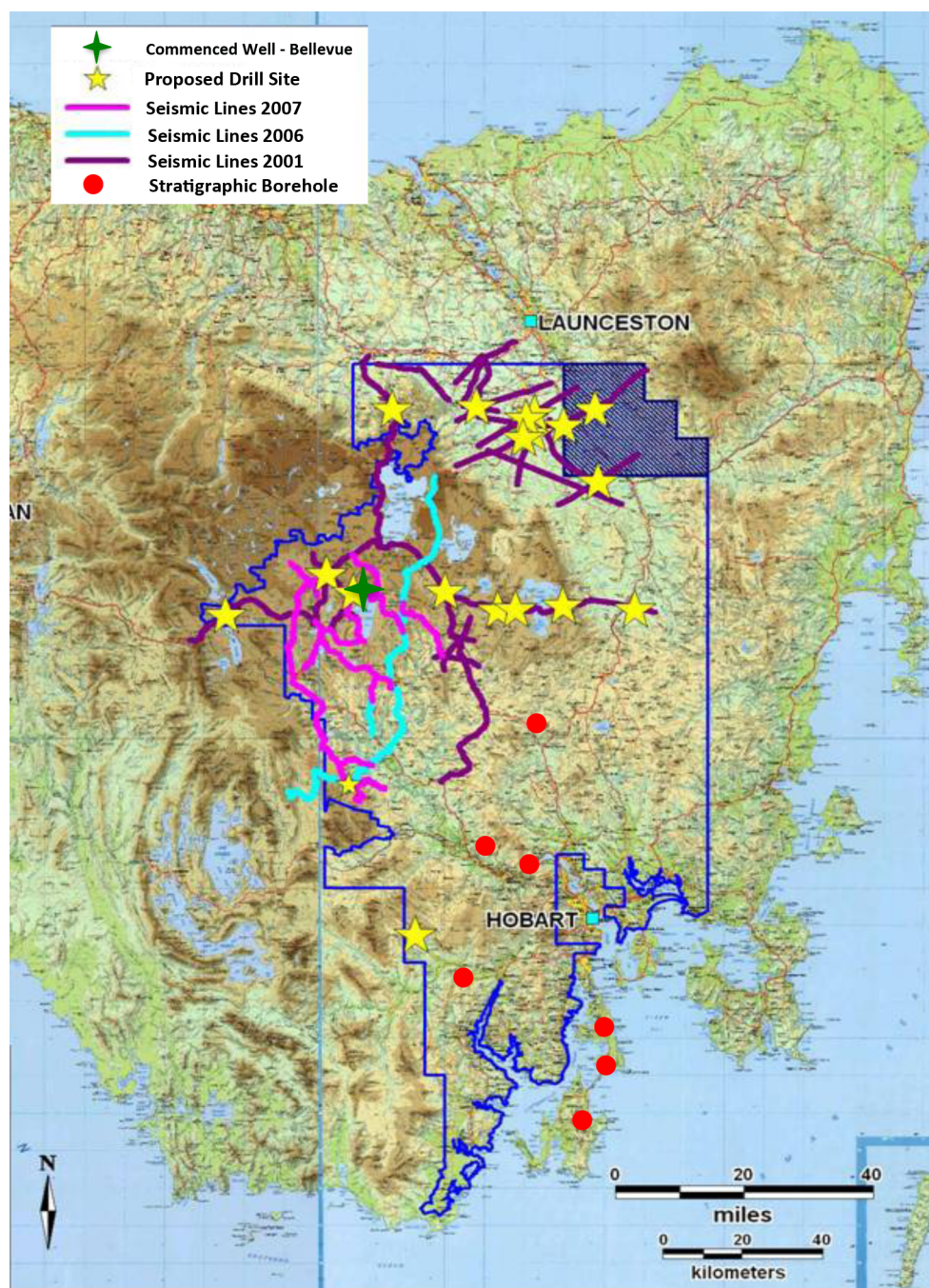
### Paleogeographic Map of the Larapintine Sea in the Mid-Ordovician





## OPERATIONAL & DRILLING PLAN

Currently, GSLM and Empire Energy have expended in excess of US\$50 million (AUD\$56 million) in exploration costs in Tasmania, Australia. The Company has completed 1,350 line kilometers of 2D seismic on and off-shore, extensive gravity, magnetic and geophysical surveys and seven stratigraphic boreholes. This seismic work was completed in 2007 with additional processing in 2008. GSLM identified 19 drilling targets and began exploratory drilling operations in 2008, beginning with the Bellevue #1 structure.

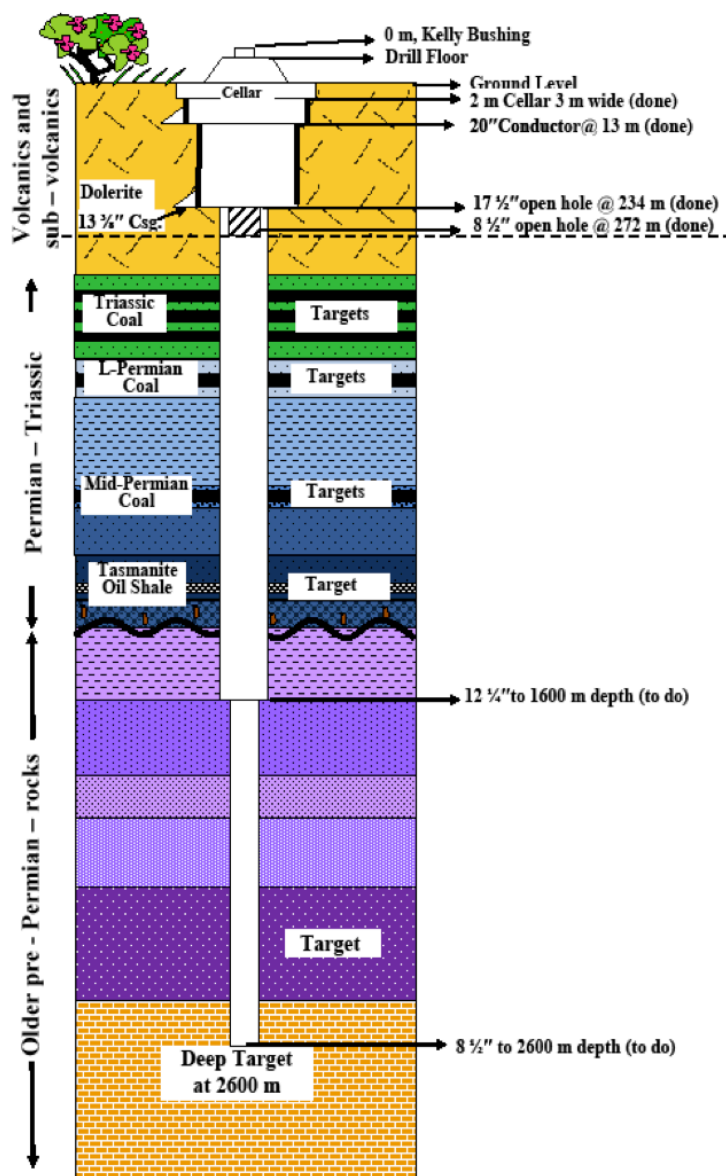




Drilling operations at “Bellevue” were put on hold when expected funding was interrupted. In September 2009 Special Exploration License SEL 13/1998 expired and drilling was suspended. On May 17<sup>th</sup> 2010, the Minister for Energy, Resources and Infrastructure issued GSLM Exploration License EL 14/2009 covering 3,180 km<sup>2</sup> including the “Bellevue” structure. The license is currently active and the Company maintains a day-rate contract with a drilling company in support of this license’s drilling program. The drilling company is on stand-by notice to immediately mobilize a short-term drilling rig and full crew to the “Bellevue” site to recommence drilling pending a successful capital raise.

A production-quality drill hole measuring 17 ½ inches wide and running 768 feet deep already exists at the “Bellevue” site per the Company’s prior drilling activities. Based on the Company’s geological research and according to its lodged drilling program the first petroleum target is believed to be less than 984 feet away. With a drilling team progressing on the order of approximately 200 feet per day, the Company could reach its first expected payzone as soon as five days after the recommencement of drilling.

Empire has entered into a conditional contract to purchase a new state-of-the-art 15,000 foot hydraulic drilling rig and auxiliary equipment (GEFCO SS-1100 Rig) and is readying transfer to the Australian mainland. Subject to further approvals and financial and personnel resources, the Company intends to resume drilling and complete all 12 seismically defined structures, beginning with the “Bellevue” and “Thunderbolt” structures, as soon as funding is available. The Company may enter into a joint venture type of arrangement with a driller/operator in addition to supplementary capital raising activities.



Bellevue Summary Drilling Diagram

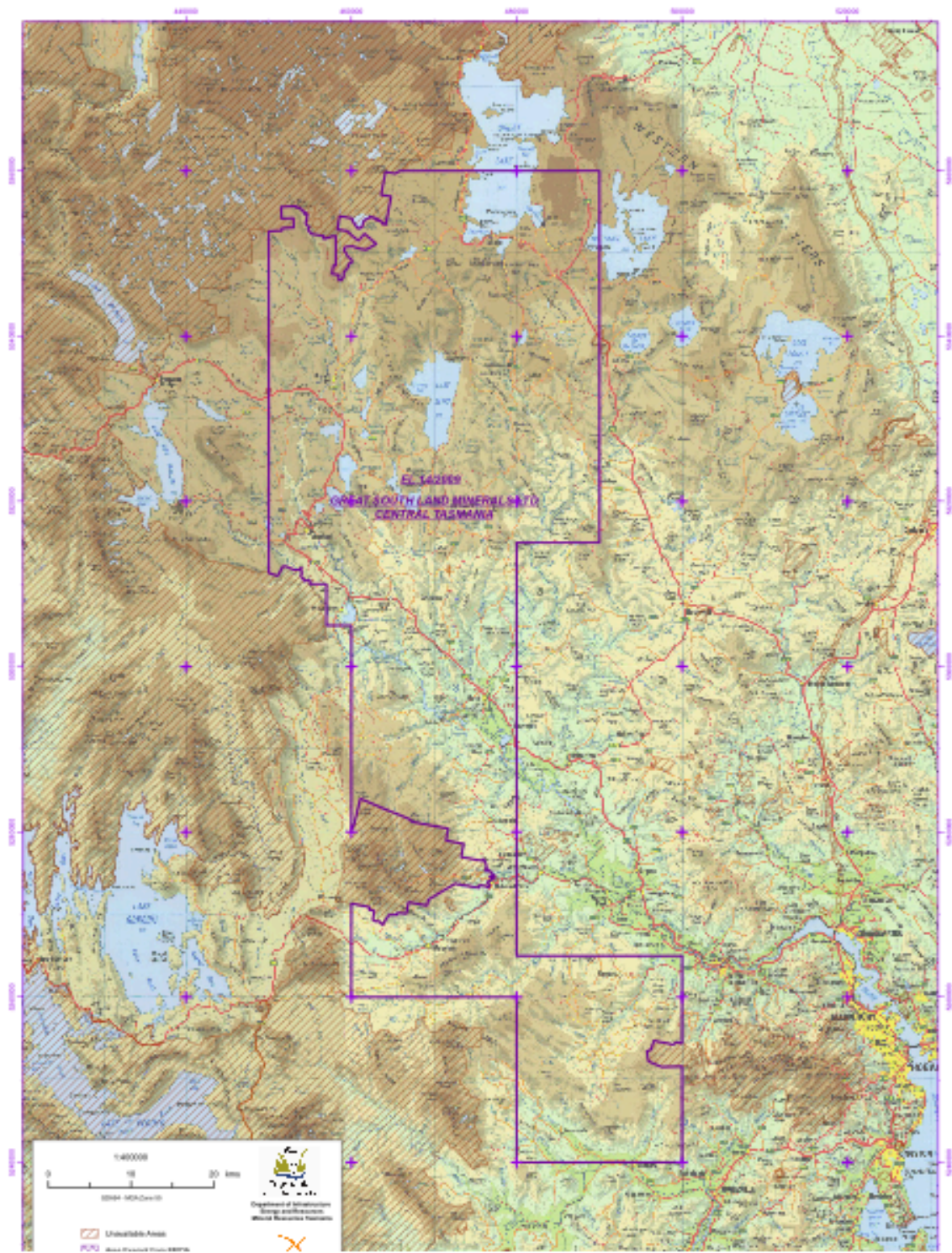
## Wellbore Estimates

Wellbore Name	Bellevue #1	Thunderbolt#1
Surface Co-Ordinates <sup>A</sup> (AMG 66, Zone 55)	465660E 5338904N	466,844 E 5287200 N
Total Depth <sup>A</sup>	2,800 meters	2,600 meters
Petroleum System/Age (source)#	GL*/Ordovician, Permian (450 Ma, 280Ma)	GL/Ord.Permian (450Ma,280 Ma)
Expected Hydrocarbon Type#	Oil/Gas/Condensate	Oil/Gas/Condensate
Trapping Mechanism/Closure <sup>A</sup>	Anticline/4 way	Anticline/4 way
Prospective STOOIP (MMbbls)– Mean Estimate#	1318 (Combined Upper & Lower Unit)	61

Source: #RPS Energy (August 2008), <sup>A</sup>GSLM Drill Applications (2008) \* G= Gondwanan L=Larapintine



Exploration License 14/2009 Area





Oil and gas resource estimates were obtained using a probabilistic method. Through this exercise, RPS Energy compiled the following estimates of unrisked oil and gas resources:

#### Unrisked oil volumes of Upper Unit of the Bellevue Prospect

	Low Estimate	Best Estimate	High Estimate	Mean
Prospective STOIP (MMbbls)	160	587	1732	808
Prospective Resource (MMbbls)	38	151	484	220

Source: RPS Energy Report

#### Unrisked oil volumes of Lower Unit of the Bellevue Prospect

	Low Estimate	Best Estimate	High Estimate	Mean
Prospective STOIP (MMbbls)	100	368	1094	510
Prospective Resource (MMbbls)	24	95	307	139

Source: RPS Energy Report

#### Unrisked oil volumes of Lower Unit of the Bellevue Prospect

	Low Estimate	Best Estimate	High Estimate	Mean
Prospective STOIP (MMbbls)	49	206	717	61
Prospective Resource (MMbbls)	12	53	198	88

Source: RPS Energy Report

An extensive drilling program to confirm these estimates is scheduled to commence after completion of a successful capital raise.

Typically, the hydrocarbon discovery will be either gas or oil but not both so it is not appropriate to add the prospective gas and oil resources. RPS Energy estimates unrisked prospective oil resources to include 668 million barrels and natural gas resources in the range of 347 to 799 billion cubic feet. Empire estimates, that, at current energy prices, the value of the Company's prospective resources could exceed US\$59.5 billion. Going forward, increasing worldwide energy demand and depleting fossil fuel resources should continue to push oil and gas prices higher and increase the value of Empire's energy resources.

For valuation purposes The Company estimates the gross value of its energy resources at \$3.3 billion. This is based on RPS Energy's Competent Persons Report of an estimated 668 million barrels of oil at WHK Denison's discounted price of US\$5/barrel for undiscovered prospective resources. Empire's current market capitalization represents nearly 1/400<sup>th</sup> of the estimated value of the Company's prospective oil and gas resource. As a result, The Company believes a higher valuation is warranted.



# FINANCIALS

## Empire Energy Corporation International (an exploration stage company) CONSOLIDATED BALANCE SHEETS

	September 30, 2010	December 31, 2009
<b>ASSETS</b>		
<b>CURRENT ASSETS</b>		
Cash and cash equivalents	\$ 3,998	\$ 14,976
Receivables	—	2,268
Prepayments and other current assets	11,638	11,844
<b>TOTAL CURRENT ASSETS</b>	<b>15,636</b>	<b>29,088</b>
Deposits	72,736	66,970
Deposits on technology acquisition	—	—
<b>PROPERTY AND EQUIPMENT, NET</b>	<b>77,396</b>	<b>94,512</b>
<b>TOTAL ASSETS</b>	<b>\$ 165,768</b>	<b>\$ 190,570</b>
<b>LIABILITIES AND STOCKHOLDERS' DEFICIT</b>		
<b>CURRENT LIABILITIES</b>		
Trade and other payables	\$ 4,965,571	\$ 4,904,636
Trade and other payables—related party	818,468	1,062,349
Notes payable	3,796,882	3,508,515
Short-term portion of convertible notes payable	1,372,961	—
Notes payable – related party	920,337	1,284,853
Accrued interest payable	405,000	337,500
<b>TOTAL CURRENT LIABILITIES</b>	<b>12,279,219</b>	<b>11,097,853</b>
Long-term portion of convertible notes payable	—	1,208,719
<b>TOTAL LIABILITIES</b>	<b>12,279,219</b>	<b>12,306,572</b>
<b>COMMITMENTS AND CONTINGENCIES</b>	<b>—</b>	<b>—</b>
<b>STOCKHOLDERS' DEFICIT</b>		
Class A Common stock, (599,000,000 authorized) issued with a par value of \$0.001, 412,372,917 and 278,544,366 shares issued and outstanding respectively	412,374	278,544
Class B Common stock, (1,000,000 authorized) issued with a par value of \$0.001, 97,301 and 99,431 shares issued and outstanding respectively	97	99
Additional paid-in capital	43,578,973	34,345,300
Deficit accumulated during the exploration stage	(55,167,286)	(46,221,225)
Accumulated other comprehensive income (loss)	(937,609)	(518,720)
<b>TOTAL STOCKHOLDERS' DEFICIT</b>	<b>(12,113,451)</b>	<b>(12,116,002)</b>
<b>TOTAL LIABILITIES AND STOCKHOLDERS' DEFICIT</b>	<b>\$ 165,768</b>	<b>\$ 190,570</b>



**Empire Energy Corporation International**  
(an exploration stage company)  
**STATEMENT OF CASH FLOWS**

			March 15, 1995 (Inception) to September 30, 2009
	2010	2009	
	\$	\$	\$
<b>CASH FLOWS FROM OPERATING ACTIVITIES</b>			
Net loss	(8,946,061)	(4,213,746)	(55,167,286)
Adjustments to reconcile net loss to net cash used in operating activities:			
Share based and non-cash payments	7,000,000	478,100	10,798,106
Discontinued operations	—	—	20,476
Depreciation	27,961	50,727	232,946
Amortization of debt discount	164,242	181,378	361,114
Loss on disposal of fixed assets	—	—	11,369
Loss on equity investment	—	100,000	829,000
Loss on extinguishments of debt	—	610,326	610,326
Realized gain on marketable securities and note receivable	—	(1,443,403)	(1,529,485)
Impairment of oil and gas property costs	—	—	8,271,190
Impairment loss on marketable securities	—	1,276,667	1,277,336
Foreign currency transaction loss (gain)	329,482	749,925	282,994
Changes in operating assets and liabilities:			
Receivables	2,268	10,546	—
Prepaid expenses and other assets	(5,560)	438,133	(84,374)
Trade payables and accrued expenses	544,994	1,110,292	5,163,701
<b>NET CASH USED IN OPERATING ACTIVITIES</b>	<b>(882,674)</b>	<b>(606,055)</b>	<b>(18,922,587)</b>
<b>CASH FLOWS FROM INVESTING ACTIVITIES</b>			
Proceeds from sale of equity investments	—	—	7,519,084
Investment in brands	—	—	(80,000)
Purchase of property and equipment	—	(2,398)	(2,034,678)
Proceeds from sale of property and equipment	—	29,126	1,755,446
Oil and gas properties under development	—	(1,622,794)	(4,479,789)
Proceeds (cost) of marketable securities	—	154,837	(33,199)
Proceeds from collection of note receivable	—	—	320,178
Deconsolidation of subsidiary, net of proceeds	—	25,000	(185,116)
<b>NET CASH PROVIDED BY (USED IN) INVESTING ACTIVITIES</b>	<b>—</b>	<b>(1,416,229)</b>	<b>2,781,926</b>
<b>CASH FLOWS FROM FINANCING ACTIVITIES</b>			
Proceeds from issuance of notes payable	1,256,438	644,642	13,543,446
Proceeds from issuance of common shares, net of \$328,142 of direct issuance costs	57,900	—	6,927,644



Principal payments on notes payable	(23,751)	(42,282)	(4,429,561)
Proceeds from the sale of non-controlling interests	—	—	1,140,741
NET CASH PROVIDED BY FINANCING ACTIVITIES	1,290,587	602,360	17,082,270
EFFECT OF EXCHANGE RATE CHANGES ON CASH	(418,891)	1,367,267	(937,611)
NET INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS	(10,978)	(52,658)	3,998
CASH AND CASH EQUIVALENTS – beginning of period	14,976	53,885	—
CASH AND CASH EQUIVALENTS – end of period	3,998	1,227	3,998
CASH PAID FOR:			
Taxes	—	—	—
Interest	17,326	9,509	541,827
NON-CASH INVESTING AND FINANCING TRANSACTIONS			
Debt settled with marketable securities	—	1945,555	
Fair value of warrants issued with debt	—	428,557	
Debt issued for purchase of technology	(7,000,000)	—	
Trade payables settled with stock	657,091	—	
Related party notes payable settled with stock	8,652,712	—	
Issuance of stock for Grand Monarch	—	125,000	
Accrued exploration costs	—	1,606,127	



## KEY MANAGEMENT

The directors of the Company are elected each year at the annual meeting of shareholders for a term of one year. Each director serves until the expiration of his term or until the earlier of his death, resignation, or removal, or until his successor has been qualified. Executive officers of the Company are appointed by the board of directors on an annual basis and serve until their successors are appointed by the board of directors. Currently, our directors are not compensated for their Board services, although their expenses in attending meetings are reimbursed.

NAME	POSITION
David Villarreal, Jr.	Chairman and Director
Malcolm Bendall	Chief Executive Officer and Director
Dr. Clive Burrett	Director and Chief Geologist
John Garrison	Chief Financial Officer, Secretary and Director
Tad Ballantyne	Director
William Keating	Director
James Leach	Director
John Essmyer	Director

### *David Villarreal, Jr.*

Mr. Villarreal of Pasadena, California was appointed as Chairman and Director of Empire in 2010. He was appointed to be a director, President, CEO and CFO of Grand Monarch Holdings beginning August 13, 2009. Mr. Villarreal has been the Chairman of American Union Financial Services, Inc. ("AUFS") since he founded it in April 2004. AUFS is a national financial service company providing comprehensive financial solutions primarily to organized labor. From April 2002 to December 2005 he was the COO for American Residential Funding, Inc. Also, since 2000, Mr. Villarreal has been President of Bravorealty.com, an online real estate transactional company designed for real estate professionals. Between 1998 and 2000, he was President and CEO of Solomon Trust Foundation, a philanthropic charitable organization providing direct financial assistance to low and moderate income families to facilitate home ownership opportunities. Mr. Villarreal attended California State University Los Angeles where he studied Business Administration and was a 1978 Trade Union Fellow at Harvard University - Graduate School of Business and John F. Kennedy School of Government.

### *Malcolm Bendall*

Mr. Malcolm Bendall of Hobart, Tasmania was a founding director of Great South Land Minerals Limited (GSLM) and was appointed CEO of Empire Energy on June 4, 2004. He has been involved in organizations investigating the viability of petroleum resources in Special Exploration License 13/98 since 1977. Mr. Bendall has worked as a mine manager and drill supervisor and has been published in four international petroleum and chemistry journals. He is a fellow of the Institute of Company Directors, Tasmania and was Tasmanian Businessman of the year in 1989. [See Appendix P for Complete Resume]



### ***Dr. Clive F. Burrett***

Dr. Clive Burrett of Hobart, Tasmania, was appointed to the board of directors in October 2005. Dr. Burrett was a founding member of the Board of Directors of Great South Land Minerals Limited. Dr. Burrett received his Bachelor of Science with honors from the University of London in 1970, and a PhD from the University of Tasmania in 1978. He was a Professor of Geology in the School of Earth Sciences in the University of Tasmania. He previously served as Chairman of the Department of Geology from 1998 to 2002. He has published over 100 scientific papers and edited the standard volume on the "Geology of Tasmania." He has also supervised many graduate studies focusing on basin evolution in Tasmania and Asia. Dr. Burrett has consulted on applied aspects of basin evolution, petroleum, lead and zinc deposits to companies such as Shell, CRA, Oxiana and BHP in Australia, Oman, Laos, China and Thailand.

### ***John C. Garrison***

Mr. John Garrison of Leawood, Kansas has been a director of Empire Energy since April 1999. Mr. Garrison is a certified public accountant with over thirty years of experience in accounting, auditing and financial management. He was CFO of ICOP Digital, Inc., a publicly traded technology company from 2004 until June 2007. He served as corporate secretary, director and chief accounting officer of Infinity, Inc., a publicly traded oilfield service and oil and gas exploration and development company from April 1995 to August 1999. He was a director of Quest Resource Corporation, a publicly traded energy company from 1999 until March 2010. He has been involved in an active practice of public accountancy since 1976. Mr. Garrison received a degree in business administration and accounting from Kansas State University in 1974.

### ***Tad M. Ballantyne***

Mr. Tad Ballantyne of Belgium, Wisconsin was appointed as an independent member of the board of directors in October 2005 and served as President of a former Empire Energy subsidiary Pacific Rim since March 2006. He has been CEO of Hoopeston Foods, Inc. since March of 2004, is a director and chairman of the audit committee of Life Partners Holdings, Inc., and is an officer and director of several private companies including BR Industries, Inc, Hoopeston Foods, Inc., L.C. Thomson Inc., Jilin Jimei Foods, Ltd., Pacific Rim, and other companies engaged in manufacturing and food processing industries as well as real estate acquisition. During the last 15 years, Mr. Ballantyne has been, on a global basis, in the business of acquiring and operating troubled companies or assets being divested by public and private companies. In addition, he has been both an officer and director of a public company, Amacan Resources Corporation, previously engaged in the oil and gas business on the production and refining side. He holds a Bachelor of Arts degree in business management from the University of Wisconsin.

### ***William Keating***

Mr. William Keating of Melbourne, Australia was appointed as director in 2010. He maintains a diverse wealth of experience in financial management and business development with unique familiarity of the energy industry. He commenced his professional career in 1981 as an auditing specialist at Price Waterhouse Coopers. From there, Mr. Keating spent nine years working for Royal Dutch Shell in a corporate accounting role and then later switching to downstream retail management for the oil company. He then spent two years working at AMCOR Limited in a national sales role followed by another two years in business development at Ernst & Young. Since 2000, Mr. Keating has worked as a management consultant specializing in corporate



recovery and business development for various consultancies and companies worldwide. Most recently including two year long roles as CEO for manufacturing businesses in Australia and New Zealand and for an autonomous software development company in the United Kingdom, Australia and the USA.

### **James Leach**

Mr. James Leach of Newport, Rhode Island was appointed to the board as a director in 2010. He currently serves as the Senior Managing Director of National Trust, LCC a subsidiary of the Leach Family Trust, one of New England's largest real estate developers with over 2.5 million square feet currently under development. Since his recognition in 1997 by the Environmental Protection Agency (EPA) as a pioneer in the reuse of Superfund Sites his ongoing work has been adopted by EPA and currently serves as the nationwide model for the Federal agency's billion-dollar Superfund Program. For nearly two decades, Mr. Leach has imparted corporate guidance to a wide array of companies. At present, he is serving his 18th year on the board of The Oster Group, a privately owned investment banking operation specializing in providing capital and business management to emerging companies and his 6th year on the board of Kenney Manufacturing Company, a leading manufacturer and distributor of household products established in 1914 and among Rhode Island's largest employers. Mr. Leach graduated from Nasson College in 1983 with a Bachelors of Science degree.

### **John Essmyer**

Mr. John Essmyer of South Orange, New Jersey joined the board as a director in 2010. He is an accomplished inventor and entrepreneur with more than thirty years experience in developing, manufacturing, and marketing his own designs for equipment and materials for the health and personal care markets. In 1982 he founded Alternative Design Systems Inc. (ADS). ADS focused on numerous unique products invented or extended by Mr. Essmyer, which were designed, tested, and moved through the FDA's 510K approval system. Of particular note, was Mr. Essmyer and the Company's development of three key patents (#4684558, #4706680, #5622168) for a groundbreaking hydrogel technology. Johnson & Johnson as well as Becton Dickinson are currently using this and some of Mr. Essmyer's other innovations.

#### **TASMANIA OFFICE PERSONNEL**

Paul Health – Chief Operations Officer  
Dr. Clive Burrett – Chief Geologist  
Diego Gonzalez – Fuel and Sedimentary Geologist  
Nicole Chesterman – Company Secretary, Operations  
Todd Goebel – Production Development Manager  
Dr. Mohammed Adabi – Ancient Carbonate Geologist  
Dr. Zohreh Amini – Recent Carbonate Geologist  
David Dunsby – Drilling Supervisor  
Gerard Murrell – Finance & Operations Officer  
Alan Barnett – Shareholder Liaison  
Graeme Devlin – Shareholder Liaison  
James Johnson – Company Counsel  
Timothy Messieh – Company Accountant



### **Paul Heath**

Mr Heath is the Chief Operations Officer and Executive Geologist of Great South Land Minerals Ltd. He has been responsible for the facilitation of the granting of Exploration Licence (EL) 14/2009 and any previous permits associated with Great South Land Minerals Ltd, Special Exploration Licence (SEL) 13/1998. Mr Heath is responsible for ensuring the implementation of best practice environmental management measures across its exploration tenements, and is the primary contact between the regulatory authorities and the company. From 2000 until 2007 Mr. Heath has been Mineral Resources Manager and Senior Project Geologist for Oceania Tasmania and Zeehan Zinc Ltd and has been instrumental in the development of the Comstock open-cut mine from preliminary exploration to pre-production stage between 2000- 2007. Mr Heath played a key role in the implementation and presentation team for the admission of Zeehan Zinc Limited to the AIM of the London Stock Exchange during 2007. Other responsibilities including ensuring the implementation of best practice environmental management measures across all mining tenements, and is the primary contact between the regulatory authorities and the Company and was previously assistant mine manager. Mr. Heath holds a Bachelor of Science with Honors from the University of Tasmania and a Bachelor of Science with a major in geology from the La Trobe University. He also coordinates graduate research projects with the University of Tasmania.

### **Diego Gonzalez**

Mr. Gonzalez is a geologist with a M.Sc. in Fuels and Sedimentology with work experience throughout Australia and South America. He has three years of professional experience in various geological and geophysical applications (2D and 3D geological reservoir modeling) within the oil industry, two years professional experience in RC, RAB & Diamond supervision and management, logging, grade control and exploration within the mining industry as well as six months professional experience in geotechnical engineering projects. Mr. Gonzalez has extensive experience working with the Landmark Platform (Geology/Seismic), Kingdom Suite Seismic software, and mapping applications and a working knowledge of Micromine, Surpac Vision, GIS and Remote Sensing.

### **Nicole Chesterman**

In 2007, Ms Chesterman has held positions of Director and Secretary of a Zinc Lead and Silver mining company listed on AIM of the London Stock Exchange for 2 years. Ms Chesterman currently holds position as Company Secretary for GSLM, and has previously been associated with and worked within the oil and gas industry, managing & supervising operations of frontier basin exploration within Tasmania. She possesses over 19 years combined experience in fields of banking finance, marketing and corporate administration, and is currently a Director of Bass Resources Limited and is also an Executive Director of a private renewable development company, Bass Energy Pty Ltd whose primary interests are developing wind farm assets in Australia.

### **Todd Goebel**

Mr. Goebel began his career in the petroleum industry in 1985 as a production and reservoir engineer at Bow Valley Industries Ltd. in Calgary, Canada where he monitored and optimized oil and gas production in Western Canada, Indonesia and throughout the Middle East. In 1991 Mr. Goebel worked evaluating oil and gas reserves and preparing economic forecasts for Western Canada properties at Coles Gilbert Associates Ltd. Petroleum Consultants. In 1992 he assisted



with well-site supervision for Halliburton in Western Australia. For the next five years Mr. Goebel worked at Talisman Ltd in Indonesia as a Senior Petroleum Engineer responsible for reservoir/production engineering and exploration/development oversight. In 1997 he relocated to Talisman Ltd.'s Calgary, Canada office as Senior Development Engineer in charge of exploitation and development of the Company's western Canada operations.

In 2001 Mr. Goebel began working as General Manager of Niko Resources Ltd. in Baroda, India where he oversaw drilling, completions, workovers and facilities for four oil and gas fields. Over his two years of employment he increased production from 60mmcf/d to 145mmcf/d.

For the last three years he has worked as a private petroleum consultant for both Empire Energy and RPS Energy in Australia in addition to lecturing at the University of Tasmania on oil and gas production handling and processing systems. He received his Bachelors of Science degree in Chemical Engineering from the University of Calgary in 1985 and his Petroleum Reservoir Engineering degree from the University of Alberta in 1988. He is a member of the Association of Professional Engineers, Geologists and Geophysicists of Alberta, the Indonesian Petroleum Association and the Society of Petroleum Engineers International.

#### ***Dr. Zohreh Amini***

Dr. Amini obtained her Bachelor of Geology from Mashhad University in Iran in 1985 and her PhD in carbonate petrology, geochemistry and mineralogy from the University of Tasmania, Australia in 2003. From 2003-2006 she worked as an honorary researcher at the University of Tasmania. During her tenure her research papers and abstracts won her publication in a variety of Australian and international petroleum and geology journals. After leaving the University of Tasmania in 2006 she began her career at Great South Land Minerals.

Dr. Amini specializes in sedimentology, microfacies, diagenesis and geochemistry of both recent and ancient carbonate rocks. Her professional experience includes drafting of comprehensive stratigraphic data banks, stratigraphic maps and mosaics and sedimentological descriptions of harvested cores and outcrops. Additionally she maintains a wealth of knowledge in evaluating petrography and paleontology of cores, outcrops and cuttings as well as petrophysics of core intervals based on Density, Sonic, Gravity and Neutron logs. She is well versed in preparing geological reports identifying different diagenetic trends, history and analyzing their impacts on reservoir quality.

#### ***David Dunsby***

Mr. Dunsby has diverse hands-on experience with petroleum exploration. Early in his career he worked as a roughneck, driller, toolpusher and tourpusher for a variety of companies including Transocean, Patra Drilling, Century Drilling, Petrodril and Dolphin Drilling. He has also worked as a rig superintendent and consultant charged with rig construction in Malaysia, Indonesia and USA where he received extensive training in Varco, Martin Decker, National and Shaffer automated drilling systems.

Since 2006 Mr. Dunsby has worked as a Senior Drilling Supervisor for a geologically diverse array of oil companies. These companies include, among others, BP's Russia Petroleum where he supervised commissioning and installation of new drilling equipment and training for more effective working practices onshore in Siberia; DNO International where he supervised DST's



and testing programs on wells in Northern Iraq, Mozambique and Dubai and Regal Petroleum in Ukraine where he commissioned new rigs for the Company's 15 hole drill program.

Mr. Dunsby holds a plethora of drilling qualifications including: well control (sub-sea/surface and supervisor), cement calculations (Baker UK), drilling calculations (Montrose UK), well completions (Camco UK), directional drilling (Anadril), rigging (Lloyds UK), huet (Aberdeen, Sale, Brunei), senior first aid (St. Johns Ambulance) and riggers and slinging (Strathclyde training services). While currently employed by GSLM and DNO International Mr. Dunsby is also presently undertaking a home study course in Petroleum Engineering at the University of Manchester.

### ***Gerard Murrell***

Mr. Murrell has worked for Great South Land Minerals Ltd. for three years as finance and operations officer. Prior to joining GSLM, Mr. Murrell worked primarily as an accounts payable officer at companies including: Kemp & Denning Warehouse Mitre 10, United Petroleum, Hydro Tasmania and Australian Antarctic Division. He holds advanced diplomas in Human Resources and Business Management, a diploma in Front Line Management and Certificates in: Information Technology; Workplace Training and Assessment; and Financial Services; all from TAFE Tasmania.

### ***Timothy Messieh***

Mr. Messieh has spent the past three years working in public accounting firms in Hobart, Tasmania, Australia. He spent a large portion of his time preparing financial reports and taxation returns for medium size businesses (ranging from 2 million to 20 million turn over). Whilst working at Collins SBA Mr. Messieh prepared extensive management reports for a client who owned seven Subway Stores. Mr. Messieh has implemented significant quality control changes at Great South Land Minerals Ltd to ensure the accounting department complies with Australian Auditing standards.



## CAPITAL RAISE

The Company is looking to raise \$200 million to recommence full-scale drilling operations in the Tasmania Basin via either a debt instrument carrying a low double-digit coupon and convertibility to an equity stake at a 20% discount to market at the time of conversion or an equity investment. The Company is furthermore willing to accept disbursement in staged drawdown tranches based on milestone achievements with an initial tranche of no less than \$25 million.

### INITIAL \$25 MILLION TRANCHE

Expense	Estimated
Completion of Bellevue Site	\$6,231,000
Completion of Thunderbolt Site	\$5,019,000
Mobilization/Demobilization	\$1,500,000
GEFCO SpeedStar 1100 Rig and Equipment	\$8,000,000
<i>Sub Total</i>	<i>\$20,250,000</i>
10% Contingency	\$2,025,000
Continued Seismic Program	\$1,125,000
Core Office & Analytics	\$1,125,000
<b>Grand Total</b>	<b>\$25,000,000</b>

### REMAINING \$175 MILLION

Expense
2 Years of Operations
Drilling Additional Targets
Drilling Additional Production Wells
Ongoing Seismic Program
Acceleration of Production
Refinery Construction
Establishment of Physical Distribution Chain
Strategic Acquisitions



## INVESTMENT RISKS

### *1. We may not be able to meet our substantial capital requirements*

Our business is capital intensive. We must invest a significant amount in development and exploration activities. We are currently making and intend to continue to make substantial capital expenditures to find, develop and produce natural gas and oil reserves. If our capital resources diminish, we may not be able to meet the exploration expenditure requirements of our petroleum licenses – thus voiding the licenses.

The Companies are prepared to employ a great variety of capital raising instruments including hypothecation, debt and/or equity financing, joint ventures etc. to meet our capital requirements.

### *2. We may not be able to effectively manage our growth, which may harm our profitability*

Our strategy envisions expanding our business. If we fail to effectively manage our growth, our financial results could be adversely affected. Growth may place a strain on our management systems and resources.

With the combination of financial, political as well as legal skills these two outstanding professionals harbor, Empire has never been more expertly equipped to undertake the development of the Tasmania Basin nor more well advised to manage the more vigorous requirements of corporate governance, finance and structure demanded by the size of the project the company is now undertaking.

### *3. A decline in natural gas and oil prices may adversely affect our financial results*

Revenues we generate from future operations are highly dependent on the price of, and demand for, natural gas and oil. Even relatively modest changes in oil and natural gas prices may significantly change those revenues, results of operations, and cash flows. Historically, the markets for natural gas and oil have been volatile and are likely to continue to be volatile in the future.



# CAPITAL TABLE

Preliminary Shares 12/31/07	Shares	Options	Total	Outstanding	Treasury
				206,046,456	
Additions Q1				14,765,843	
Q2				8,938,732	
Q3				25,511,111	
Q4				11,953,281	267,215,423
Q1				7,500,267	
Q2 April				12,677,500	
				<b>287,393,190</b>	278,543,190
Malcolm Bendall	33,639,434	11,400,000	45,039,434	287,393,190	
	-	-	-	287,393,190	
Mark Callaway	-	-	-	287,393,190	
John Garrison	2,022,288	2,000,000	4,022,288	287,393,190	
Tad Ballantyne	1,500,000		1,500,000	287,393,190	-
Clive Burrett	565,632	600,000	1,165,632	287,393,190	
13%	<b>37,727,354</b>	14,000,000	51,727,354	287,393,190	-
Other options		2,000,000	2,000,000	287,393,190	
Phil Simpson	6,984,579	7,400,000	14,384,579	287,393,190	
Kingdom Securities	8,050,000	-	8,050,000	287,393,190	
Graham Rogers		-	-	287,393,190	
18%	52,761,933	23,400,000	76,161,933	287,393,190	
Pacific Rim	-	-	-	287,393,190	-
RAB Special Situations	14,075,000	42,478,571	56,553,571	287,393,190	
Libertas	21,757,777	-	21,757,777	287,393,190	
Wind City		-	-	287,393,190	
31%	88,594,710	65,878,571	154,473,281	287,393,190	
				0	
				43,108,979	

				Max Case	Potential Proceeds \$
				Shares	
Total shares outstanding 6/30/09				287,393,190	R
Potential sale	2,000,000 BPS			-	-
				287,393,190	-
Reserved for rights issue, based on 1 for 2 rate		267,215,423		133,607,712	R
				421,000,902	9,352,540
Shares reserved for warrants and options					
RAB warrants and note				29,383,333	R 1,473,500
potential increase for repricing to \$.07				13,095,238	R
Simpson Options				7,000,000	R 490,000
Director options - Expired 12/31/09		9,000,000		-	-
				470,479,473	11,316,040
Shares held in escrow					
Spalding				3,000,000	R 450,000
Hunt, sent to First Global				20,000,000	R
Hunt reissued				24,000,000	1,680,000
Hunt additional				1,000,000	70,000
First Global 2/23/09				20,000,000	
Smart Win	Disputed			32,000,000	4,800,000
				570,479,473	18,316,040
Total shares committed				570,479,473	18,316,040
Debt recorded					
Bendall Registered	518,000	0.07		7,400,000	R
Garrison not registered	500,000	0.07		7,142,857	
				14,542,857	-
Total potential shares committed				585,022,330	18,316,040



## EXIT STRATEGY

After completion of drilling of both the Bellevue and Thunderbolt structures the Company intends to seek a joint venture partnership with a larger established oil company to complete the development and extraction of oil and gas in the Tasmania Basin.



## Issuance of Special Exploration License 13/1998 to GSLM Terms Entitle GSLM to Exploration License for Prospective Areas

**COPY**

561046

DEPUTY PREMIER



Tasmania

23 DEC 1998

Mr Henry Askin  
Chairman  
Great South Land Minerals Ltd  
Level 3, 65 Murray Street  
HOBART TAS 7000

Dear Mr Askin

### GRANTING OF SPECIAL EXPLORATION LICENCE 13/98

I have been advised by Mineral Resources Tasmania that you have agreed to a number of conditions which are a prerequisite to my granting of an application for a Special Exploration Licence over a large portion of the Tasmania Basin.

These conditions are:

-----Continued from Page 2-----

- the licence shall be issued for five years. At the end of the licence period, the more prospective areas must be converted to exploration licences with appropriate conditions, if continued tenure is required; *SL 13/98*
- rental to be paid at prescribed rates;
- written acknowledgment by Great South Land Minerals Ltd of these licence conditions.

It is my intention at the appropriate time, subject to due process, to grant the licence for a period of five years.


It is my understanding that the licence will be publicly advertised on Saturday, 9 January 1999.

Yours sincerely


A handwritten signature in dark ink, appearing to read 'P. Lennon'.

Paul Lennon  
Deputy Premier





## Public Notices

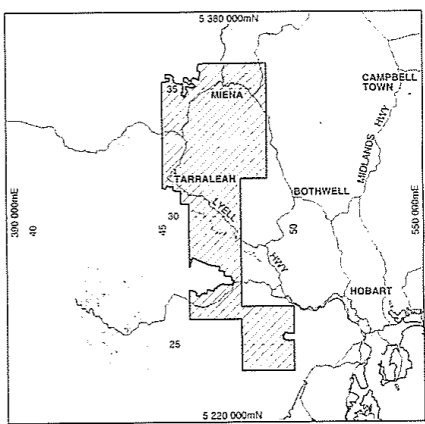


DEPARTMENT of INFRASTRUCTURE, ENERGY and RESOURCES

### Mineral Resources Development Act 1995

#### Notice of Application for Exploration Licence

Notice is given that I, Michael Leonard, Director of Mines, intend to recommend to the Minister for Energy and Resources that he grant the following exploration licence over the area shown hatched on the plan below:



Coordinate datum - GDA94 MGA Zone 55

0 25 50 75 100km

**Reference No:** EL14/2009 **Area:** 3180 km<sup>2</sup>  
**Category of Mineral:** 4 – Petroleum Products.  
**Applicant:** Great South Land Minerals Ltd.  
**ACN:** 068 650 386  
**Address:** 3/65 Murray Street, Hobart 7000.  
**Vicinity:** Central Tasmania

The application excludes existing mining leases, National Parks and reserved or other lands exempted from the *Mineral Resources Development Act 1995*.

Consent is required from the Director of Mines prior to any exploration activity. An explorer must provide 14 days notice prior to accessing private land. Security deposits are held against each licence in the event that the explorer fails to meet their rehabilitation obligations.

Any person who claims an estate or interest in any land within the application area may object to the granting of the application. Objections must be in writing and lodged with the Registrar of Mines, PO Box 56, Rosny Park 7018 within 28 days of advertisement and must be accompanied by the prescribed fee of \$26.60 for each objection.

For further information in relation to the application, including the effect on private land within an application area, please contact Mineral Resources Tasmania, Rosny Park at the above address or phone (03) 6233 8377.

**Michael Leonard**  
**Director of Mines**

[www.publicinfo.tas.gov.au](http://www.publicinfo.tas.gov.au)

Source: The Mercury Newspaper – 17 March 2010 – Pg. 41



Exploration License 14/2009 – Active and Issued May 17, 2010



Exploration Licence

Dated

17/5/2010

The Honourable Bryan Alexander Green MP ("Minister")

and

Great South Land Minerals Limited. ("Licensee")

The Crown Solicitor of Tasmania  
GPO Box 825  
Hobart 7001  
Phone: (03) 6233 3409  
Fax: (03) 6233 2874  
Email: crown.solicitor@justice.tas.gov.au

Signing page

Dated: 17/5/2010

Signed Sealed and Delivered for  
The Crown in Right of Tasmania  
by the Honourable Bryan  
Alexander Green MP being and as  
the Minister for Energy & Resources  
in the presence of:

*[Signature of Bryan Alexander Green MP]*

Signature of witness

Name of witness (block letters)

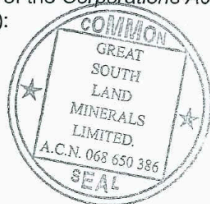
Address of witness

Occupation

Executed for and on behalf of  
Great South Land Minerals Limited.  
(ACN 068 650 386) under section  
127(1) of the Corporations Act 2001  
(Cwlth):

Director

Director/Secretary





# ASIC Company Statement

Inquiries 1300 300 630

Issue date 16 Mar 10

## Company Statement

Extract of particulars – s346A(1) Corporations Act 2001

CORPORATE KEY: 43907396

### Check this statement carefully

You are legally obligated to ensure that all your company details listed on this company statement are complete and correct. This is required under s346C(1) and/or s346B and s346C(2) of the Corporations Act 2001.

You must check this statement carefully and inform ASIC of any changes or corrections immediately. **Do not return this statement.** You must notify ASIC within 28 days after the date of change, and within 28 days after the date of issue of your annual company statement. Late lodgement of changes will result in late fees. These requirements do not apply to the **Additional company information.**

ACN 068 650 386

FOR GREAT SOUTH LAND MINERALS LTD.

REVIEW DATE: 15 March 10

### You must notify ASIC of any changes to company details — Do not return this statement



[www.asic.gov.au](http://www.asic.gov.au)  
Use your Corporate  
Key to log in.



Use Form 484 to make changes to  
company details or if any information is  
missing or incomplete.  
Use Form 492 to amend any incorrect  
information that you have previously  
lodged with us.



Phone if you've already  
notified ASIC of changes but  
they are not shown correctly  
in this statement.  
Ph: 1300 300 630



Use your agent.

## Company statement

These are the current company details held by ASIC. You must check this statement carefully and inform ASIC of any changes or corrections immediately. Late fees apply. **Do not return this statement.**

### 1 Registered office

LEVEL 3 65 MURRAY STREET HOBART TAS 7000

### 2 Principal place of business

LEVEL 3 65 MURRAY STREET HOBART TAS 7000

### 3 Officeholders

Name: MALCOLM ROY BENDALL  
Born: LAUNCESTON TAS  
Date of birth: 09/12/1958  
Address: 37 NICHOLAS DRIVE SANDY BAY TAS 7005  
Office(s) held: DIRECTOR, APPOINTED 31/03/2008

Name: JOHN GARRISON  
Born: ST LOUIS UNITED STATES  
Date of birth: 29/08/1951  
Address: 7211 HIGH DRIVE PRAIRIE VILLAGE KANSAS 66211 UNITED STATES  
Office(s) held: DIRECTOR, APPOINTED 31/03/2008

These details continued on the next page

Page 3 of 6

GREAT SOUTH LAND MINERALS LTD. ACN 068 650 386

009/34/009/34/1/007/04/5



## ASIC Company Statement (continued)

### Company Statement continued

#### 4 Company share structure

Share class	Share description	Number issued	Total amount paid	Total amount unpaid
ORD	ORDINARY	62426782	\$7313276.60	\$0.00

You must notify ASIC within 28 days of the date of change, and within 28 days of the issue date of the annual company statement. Late lodgement of changes will result in late fees.

### End of company statement

This concludes the information to which the company must respond (if incorrect) under s346C of the *Corporations Act 2001*.

### Additional company information

This information is optional under the *Corporations Act 2001*. Late lodgement fees or late review fees do not apply to this information. To add, remove or change a contact address, see [www.asic.gov.au/addresses](http://www.asic.gov.au/addresses).

#### 5 Contact address for ASIC use only

Address: GPO BOX 1603 HOBART TAS 7001



## Empire Energy & GSLM Certificate of Currency



CGU Insurance Limited ABN 27 004 478 371  
73-75 St. John St. Launceston, Po Box 867, Launceston 7250  
Telephone:(03) 6345 3500 Facsimile:(03) 6331 8933

RAF

24/09/09

LOGAN GROUP  
ATT: KELLIE WILLIAMS

### CERTIFICATE OF CURRENCY

The policy referred to is current as at the date of issue of this certificate and whilst a due date has been indicated it should be noted that the policy may be cancelled in the future. Accordingly, reliance should not be placed on the expiry date.

**Policy Number:** 15T 0857960 00  
**Type of Policy:** BUSINESS PACK  
**Expiry Date:** 24/09/10  
**Insured:** SEE BELOW

**Mortgagee/Interested  
Party:**


**Situation of Risk:** ANYWHERE IN AUSTALIA

050

### PROPERTY/SUM INSURED:

INSURED NAME: EMPIRE ENERGY CORPORATION INTERNATIONAL (EEGC.OB)  
&  
GREAT SOUTH LAND MINERALS LIMITED  
PUBLIC LIABILITY SUM INSURED: \$10,000,000

This is to certify cover has been granted in terms of the Company's Standard Policy, a copy of which is available on request. This certificate is not a substitute for the Policy of Insurance issued to you. The Policy, not this certificate, details your rights and obligations and the extent of your insurance cover.

  
ALICIA ASHLIN  
Authorised Official

REV4 11/07



GSLM Certificate of Registration

COPY

Form 251

GREAT SOUTH LAND MINERALS PTY LTD  
LVL 3  
65 MURRAY ST  
HOBART TAS 7000

remove this top section if desired before framing

## Certificate of Registration on Conversion to a Public Company

Corporations Law Sub-section 168 (3)

This is to certify that

**GREAT SOUTH LAND MINERALS PTY LTD**

**Australian Company Number 068 650 386**

on the twenty-seventh day of May 1998 converted to a **public** company.

The name of the company is now

**GREAT SOUTH LAND MINERALS LTD.**

**Australian Company Number 068 650 386**

The company is registered under the Corporations Law of  
Tasmania and the date of commencement of registration  
is the fifteenth day of March, 1995.



AUSTRALIAN  
SECURITIES  
COMMISSION

CERTIFICATE

Given under the seal of the  
Australian Securities Commission  
on this twenty-seventh day of May, 1998.



Alan Cameron  
Chairman



**Empire Energy Corporation International  
Certificate of Existence with Status in Good Standing**

SECRETARY OF STATE



**CERTIFICATE OF EXISTENCE  
WITH STATUS IN GOOD STANDING**

I, ROSS MILLER, the duly elected and qualified Nevada Secretary of State, do hereby certify that I am, by the laws of said State, the custodian of the records relating to filings by corporations, non-profit corporations, corporation soles, limited-liability companies, limited partnerships, limited-liability partnerships and business trusts pursuant to Title 7 of the Nevada Revised Statutes which are either presently in a status of good standing or were in good standing for a time period subsequent of 1976 and am the proper officer to execute this certificate.

I further certify that the records of the Nevada Secretary of State, at the date of this certificate, evidence, **EMPIRE ENERGY CORPORATION INTERNATIONAL**, as a corporation duly organized under the laws of Nevada and existing under and by virtue of the laws of the State of Nevada since August 26, 2002, and is in good standing in this state.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the Great Seal of State, at my office on January 2, 2011.



A handwritten signature in black ink, appearing to read "Ross Miller".

ROSS MILLER  
Secretary of State

Electronic Certificate  
Certificate Number: C20110102-0239  
You may verify this electronic certificate  
online at <http://www.nvsos.gov/>





## MARK D. COWAN

Partner

International Practice  
Public Policy and Lobbying  
Federal Marketing  
Latin America Practice  
China Practice  
Africa Practice

2550 M Street, NW  
Washington, DC 20037  
T: 202-457-6401 F: 202-457-6315  
mcowan@pattonboggs.com

### Education

- Catholic University of America, Columbus School of Law, J.D., 1977
- University of Minnesota, B.A., 1971

### Bar Admissions

- District of Columbia
- Virginia

As a partner at Patton Boggs, Mark Cowan draws on more than 35 years of experience working on complex domestic and international public policy issues to counsel a broad range of clients. He advises corporations, government entities, and foreign sovereigns on a wide array of business, regulatory, and trade issues. Mr. Cowan coordinates and oversees client growth and development for the firm.

Mr. Cowan joined Patton Boggs after a long and successful career in the Washington public affairs and government relations industry. He served as president of Columbus Public Affairs and as chief executive officer of Newmyer Associates, a public affairs and strategic intelligence firm. He was vice chairman of Cassidy & Associates, and a founder and chief executive officer of The Jefferson Group. Earlier, Mr. Cowan served at Gray & Company and Hill & Knowlton Public Relations, counseling numerous domestic and international clients.

Before entering the private sector, Mr. Cowan held presidential appointments in three administrations. During the first Reagan administration, he served as Deputy Assistant Secretary of Labor for Occupational Safety and Health until his appointment as Chief of Staff and Counselor to the Secretary of Labor in 1982. Later, President George H.W. Bush appointed him as a Commissioner on the National Commission on Employment Policy. More recently, President George W. Bush appointed him as a Member of the President's Council on the 21<sup>st</sup> Century Work Force.

In addition to his presidential appointments, Mr. Cowan has held several other government posts. He was Counsel to the Committee on Standards of Official Conduct (ethics) of the U.S. House of Representatives. He also served at the Central Intelligence Agency (CIA) as an operations officer, serving abroad and as a country desk chief in the agency's Directorate of Operations, and later held the position of Assistant Legislative Counsel to the Director of Central Intelligence. In the U.S. Air Force, Captain Cowan flew in the back seat of the F-101 fighter interceptor.

### Professional Affiliations:

- Board of Visitors, Catholic University of America, Columbus School of Law
- Member, Committee on the Future of the Workplace, President's Council on the 21st Century Work Force
- Vice-Chairman of the Board, Center on Congress, Indiana University
- Chairman, Board of Advisors, Virginia Military Institute's International Studies



## **APPENDIX B (continued)**

### Program

- Lecturer, University of Texas Executive MBA Program
- National Defense Executive Reserve, Department of Homeland Security
- Association of Former Intelligence Officers
- Board of Directors, America Scores, nationwide inner-city youth program
- Board of Advisors, Ideassociates, Pty, Ltd., Sydney, Australia
- Board of Advisors, Diligence, LLC
- Board of Directors, Duluth Metals Limited – Toronto, Canada
- Senior Advisor, Plainfield Asset Management, Wydown Associates, Greenwich, Connecticut
- Board Member, United for D.C.

### ARTICLES

#### Gulf Nations Are Open for Business

March 2005

#### Sales Training, Business Development and the Legal Profession

March 20, 2003

- Contributor, "Gulf Nations Are Open for Business," *Counsel to Counsel* (March 2005)
- "Patton Boggs' Rain Man," *Legal Times*, February 9, 2004 (Interview)
- Author, "Sales Training, Business Development and the Legal Profession," (March 20, 2003)

[www.pattonboggs.com](http://www.pattonboggs.com)



# APPENDIX B

## GSLM Seismic/Exploration Plan - Budget

		Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Drilling Exploratory Wells	Geological work	\$ 25,000	\$ 25,000	\$ 25,000	\$ 25,000	\$ 25,000	\$ 125,000
	Bellevue #1 & Bellevue #2	\$ 3,000,000	\$ 1,000,000	\$ -	\$ -	\$ 3,500,000	\$ 7,500,000
	Thunderbolt #1 & Thunderbolt #2	\$ -	\$ 3,000,000	\$ -	\$ -	\$ 3,500,000	\$ 6,500,000
	Lonnavele #1	\$ -	\$ -	\$ 3,000,000	\$ -	\$ -	\$ 3,000,000
	Stockwell #1	\$ -	\$ -	\$ 500,000	\$ 2,500,000	\$ -	\$ 2,500,000
Geophysics / Geochemistry	SUB-TOTAL	\$ 3,025,000	\$ 4,525,000	\$ 3,025,000	\$ 2,525,000	\$ 7,025,000	\$ 20,125,000

Onshore Seismic Survey Tasmania	Environmental	\$ -	\$ -	\$ 30,000	\$ -	\$ -	\$ 30,000
	Permitting	\$ -	\$ -	\$ 10,000	\$ -	\$ -	\$ 10,000
	Mobilization/Demob	\$ -	\$ -	\$ 500,000	\$ -	\$ -	\$ 500,000
	Surveying	\$ -	\$ -	\$ 200,000	\$ -	\$ -	\$ 200,000
	Traffic Management	\$ -	\$ -	\$ -	\$ 250,000	\$ -	\$ 250,000
	Recording	\$ -	\$ -	\$ -	\$ 2,500,000	\$ -	\$ 2,500,000
	Processing	\$ -	\$ -	\$ -	\$ -	\$ 200,000	\$ 200,000
	Terra Insight Services	\$ -	\$ -	\$ -	\$ -	\$ 300,000	\$ 300,000
	SUB-TOTAL	\$ -	\$ -	\$ 740,000	\$ 2,750,000	\$ 500,000	\$ 3,990,000
	Planning	\$ -	\$ -	\$ 10,000	\$ -	\$ -	\$ 10,000

GSLM / Empire Expenditure	TOTAL	\$ 3,025,000	\$ 4,525,000	\$ 3,765,000	\$ 5,275,000	\$ 7,525,000	\$ 24,115,000
Minimum Exploration Expenditure							
* Based on figures from an email from Mineral Resources Tasmania 28 September 2009 (Attachment G3)	7513 sq kms	\$ 1,502,600.00	\$ 2,253,900.00	\$ 3,756,500.00	\$ 5,259,100.00	\$ 7,513,000.00	\$ 20,285,100
TOTAL							

MRT Minimum Exploration Expenditure for first two years \$3,756,000

GSLM proposed Exploration Expenditure for first two years \$7,550,000



# APPENDIX C



## Two Year Cash Flow 2010 - 2011 (end)

Fiscal Year  
Begins Jan-10

(USD) - Exploration Expenditure converted USD/AUD 1:1163 rate	Q FWD from 16/08/09	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10	Total from EST YR 1	
		year 1	year 1	year 1	year 1	year 1	year 1	year 1	year 1	year 1	year 1	year 1	year 1		
Cash on Hand (beginning of month)		1,227	561,186	3,297,143	2,582,771	1,868,399	7,154,027	6,439,655	5,725,283	5,010,909	4,746,865	4,482,822	4,218,779	3,954,736	561,186
EMPIRE CASH RECEIPTS (consolidated)															
Cash Sales		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cash / cash equivalents, receivables and prepayments		19,491	0	0	0	0	0	0	0	0	0	0	0	0	0
Deposits		65,468	0	0	0	0	0	0	0	0	0	0	0	0	0
Loans / Line of Credit Facilities		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Registered shares - Interim capital (First Global & others)		500,000	0	0	0	0	0	0	0	0	0	0	0	0	0
Capital Raising from Rights Issue: TOTAL ANNUAL USD \$3,000,000 @ \$0.07, and USD \$1,900,000 @ \$0.07:		0	3,000,000	0	0	6,000,000	0	0	0	0	0	0	0	0	0
TOTAL CASH RECEIPTS		584,959	3,000,000	0	0	6,000,000	0	0	0	0	0	0	0	0	0
Total Cash Available (before cash out)		586,186	3,561,186	3,297,143	2,582,771	7,868,399	7,154,027	6,439,655	5,725,283	5,010,909	4,746,865	4,482,822	4,218,779	3,954,736	5,561,186

EMPIRE CASH PAID OUT (consolidated)														
*** Costs & Expenses, Selling General & Administrative		0	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	384,000
Payables (monthly av. Payments)***		25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	300,000
Employment expenses		0	0	0	0	0	0	0	0	0	0	0	0	0
GSLM EL160269 - Exploration Activities commencing 2010														
Drilling Exploratory Wells														
Geology		0	1,891	1,891	1,891	1,891	1,891	1,891	1,891	1,891	1,891	1,891	1,891	22,687
Bellevue #1 & Bellevue #2		0	0	450,329	450,329	450,329	450,329	450,329	450,329	450,329	450,329	450,329	450,329	2,701,972
Thunderbolt #1 & #2		0	0	0	0	0	0	0	0	0	0	0	0	0
Geophysics / Geochemistry		0	0	0	0	0	0	0	0	0	0	0	0	0
Wages Owed, Sundry Creditors		0	13,548	13,548	13,548	13,548	13,548	13,548	13,548	13,548	13,548	13,548	13,548	162,572
Wages, normal, monthly (avg)		0	36,026	36,026	36,026	36,026	36,026	36,026	36,026	36,026	36,026	36,026	36,026	432,316
Taxation Payable ATO		0	7,481	7,481	7,481	7,481	7,481	7,481	7,481	7,481	7,481	7,481	7,481	89,770
Superannuation Payable		0	7,304	7,304	7,304	7,304	7,304	7,304	7,304	7,304	7,304	7,304	7,304	87,652
Loan Westpac Mercedes		0	1,656	1,656	1,656	1,656	1,656	1,656	1,656	1,656	1,656	1,656	1,656	19,876
Loan Derek Randall		0	465	465	465	465	465	465	465	465	465	465	465	5,577
Non-current creditors		0	13,780	13,780	13,780	13,780	13,780	13,780	13,780	13,780	13,780	13,780	13,780	165,361
Total Creditors Monthly repayable recycling credit over 2 years		0	77,457	77,457	77,457	77,457	77,457	77,457	77,457	77,457	77,457	77,457	77,457	929,479
P&L (GSLM Overhead - 12 months avg)		0	47,435	47,435	47,435	47,435	47,435	47,435	47,435	47,435	47,435	47,435	47,435	569,219
													0	
SUBTOTAL		25,000	264,043	714,372	714,372	714,372	714,372	714,372	714,372	264,043	264,043	264,043	264,043	5,870,490
Loans, notes, lines of credit repayments		0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL CASH PAID OUT		25,000	264,043	714,372	714,372	714,372	714,372	714,372	714,372	264,043	264,043	264,043	264,043	5,870,490
Cash Position (end of month)		561,186	3,297,143	2,582,771	1,868,399	7,154,027	6,439,655	5,725,283	5,010,909	4,746,865	4,482,822	4,218,779	3,954,736	3,690,693
Minimum Exploration Expenditure 7,813 \$/Kilometre x \$268 1st year program		1,353,326												5,062,037

Applied USD/AUD exchange 0.1163

Rights Offering No of available shares @ USD \$0.07 each

133,607,712

TOTAL RIGHTS OFFERING PROCEEDS AVAILABLE (USD)

\$ 9,352,539.84

Less conversion of existing GSLM liabilities to shares

\$ 168,344.80

Less advances from rights issue to fund exploration program - yr 1

\$ 3,000,000.00

Less advances from rights issue to fund exploration program - yr 2

\$ 6,000,000.00

Less advances from rights issue to fund exploration program - yr 2

\$ 183,195.04

Lines of Credit - Abbey International - yr 2

\$ 3,500,000.00

Payable Projections

\*Payable to creditors payable, are approximately \$80,000, payable over the years 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 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(USD) - Exploration Expenditure converted USD/AUD 1.1103 rate

B/FWD	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Total Item EST YR 1
	year 2	year 2	year 2	year 2	year 2	year 2	year 2	year 2	year 2	year 2	year 2	year 2	
3,690,693	3,690,693	2,962,144	2,050,400	823,426	46,781	2,770,136	1,993,491	1,667,175	1,430,924	1,194,673	958,423	722,172	3,690,693

**EMPIRE CASH RECEIPTS**[illegible]

## EMPIRE CASH PAID OUT

[illegible]

Minimum Exploration Expenditure 7,513 Sq Km x \$300 2nd year p/sqkm









## Oil to Reach \$100 on OPEC Capacity Drop, Goldman Says

December 13, 2010, 10:17 PM EST



By Yee Kai Pin

(Updates with Nigeria busting quotas in fifth paragraph.)

Dec. 14 (Bloomberg) -- A drop in OPEC spare production capacity will signal a "second stage" in the oil market's recovery, lifting crude higher than \$100 a barrel by the second half of 2011, according to Goldman Sachs Group Inc.

The Organization of Petroleum Exporting Countries will supply more oil, reducing its spare capacity, as global inventory levels "normalize" from an overhang cause by the recession, the bank said in its 2011 commodities outlook dated yesterday. The 12-member group, which pumps about 40 percent of the world's crude, said at a Dec. 11 meeting it will maintain production targets at levels agreed in December 2008.

"Inventories have declined rapidly in recent months as global demand growth has accelerated to one of the highest levels on record," Goldman analysts led by London-based Jeffrey Currie said in the report. "We expect global demand growth to remain strong at over 2 million barrels a day."

Oil has risen 11 percent this year on speculation the global economic rebound will boost fuel consumption. The International Energy Agency, in its monthly report Dec. 10, upgraded its demand forecast for next year, citing gains in North America and China. Futures for January delivery on the New York Mercantile Exchange traded at \$90.76 a barrel on Dec. 7, the highest since October 2008, and were above \$88 today.

OPEC members with formal output quotas, which excludes Iraq, produced 26.7 million barrels a day last month, 1.9 million more than targeted, according to data compiled by Bloomberg. Nigeria, Iran and Angola exceeded their quotas the most in volume terms.

"As OPEC spare capacity is drawn down through the second half of 2011, we expect the market to begin to transition back to a structural bull market, with WTI crude oil prices rising back above \$100 a barrel," the analysts wrote.

### Price Forecasts

Goldman Sachs, in yesterday's report, predicted West Texas Intermediate crude, the benchmark grade traded in New York, will rise to \$89 a barrel within three months, \$100 within six months and \$105 within a year. Oil last traded above \$100 in October 2008 as commodities and equities fell following the collapse of Lehman Brothers Holdings Inc.

The first stage in the oil market's recovery started with the decline in inventories, the bank said. Crude stockpiles in the U.S., the largest oil-consuming nation, declined earlier this month to 355.9 million barrels, according to the Energy Department. That's 9.8 percent above the five-year average, down from more than 13 percent two months ago.

Supplies probably dropped 2.6 million barrels in the week ended Dec. 10, based on the median estimate from 11 analysts surveyed by Bloomberg News before the department's weekly report tomorrow.

--Editors: Alexander Kwiatkowski, Aaron Sheldrick

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## JPMorgan Says Crude Oil Price Will Reach \$120 a Barrel Before End of 2012



By Grant Smith and Raj Rajendran - Dec 3, 2010

Oil will advance to \$120 a barrel before the end of 2012 as consumption grows in emerging economies, according to JPMorgan Chase & Co.

The Organization of Petroleum Exporting Countries, which is responsible for about 40 percent of global supplies, is unlikely to increase production in the first half of next year unless prices surge through \$100 a barrel, the bank said in a report today. Futures traded around \$87 a barrel in New York today, near their highest price in two years.

“Strong emerging oil demand growth over the next 24 months is very likely to lift the call on OPEC production to levels last seen at the peak of the oil price spike in 2008,” analysts led by [Lawrence Eagles](#) in New York said. “We expect oil inventories to continue their drawing trend over the first quarter.”

JPMorgan boosted 2011 price forecasts for oil contracts in New York and London. West Texas Intermediate on the New York Mercantile Exchange will average \$93 a barrel next year, up 3.6 percent from a previous estimate of \$89.75, it said. Brent crude traded in London will average \$95 a barrel next year, up from an earlier assessment of \$91.75.

The bank said the North Sea benchmark, used to price two-thirds of global crude, will average \$105 in 2012. It expects futures to reach \$100 a barrel in the first half of 2011.

Brent crude for next month is trading at a 4-cent premium to the February future, a price situation known as backwardation that suggests immediate supplies are more in demand than later deliveries. This is a “structure that is likely to remain in place for much of 2011 and 2012,” JPMorgan said.

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# IEA raises forecast for global oil demand



By Javier Blas, Commodities Editor

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Global oil demand will grow more this year than previously expected, the International Energy Agency said on Friday, putting pressure on the Opec oil cartel to boost supplies and stop prices from hitting \$100 a barrel.

The western countries' oil watchdog said on its monthly markets report that "against a backdrop of much- stronger-than-expected global oil demand", Opec "may come under pressure to increase supplies to the market in the new year if prices continue their relentless rise".

Opec meets on Saturday on Quito, Ecuador, to discuss its production policy. The warning is the first clear indication that after two years restraining output to avoid a decline in oil prices during the global financial crisis, the cartel's next job will be to decide when to open the spigots and by how much to control rising oil prices.

But Opec, which also released on Friday its monthly report, disagreed with the western countries' agency, saying there was no need for more production.

"Given the existing level of excess inventories, ample crude oil spare production capacity and idle refinery capacity, the market is expected to have a robust cushion against any sudden surge in demand or disruption in supply," the cartel said in its report.

The IEA revised upwards its estimate for global oil demand for this year and 2011 on the back of stronger-than- expected demand in North America and China.

The Paris-based agency forecast consumption rising this year by 2.5m barrels a day, the second-highest annual increase in at least 30 years, and about 130,000 b/d more than the figure given in last month's update. For 2011, the IEA forecast oil demand would rise by 1.3m b/d, or about 260,000 b/d above its previous forecast.

"Although economic concerns remain skewed to the downside – not least if current high prices begin to act as a drag on growth –, more immediately demand could surprise to the upside," the IEA said in its monthly editorial comment. "Recent harsh northern hemisphere weather, allied to electric power rationing in China, if sustained, could push short-term demand higher and tighten market balances further," it added.

The warning of higher-than-expected oil demand growth comes as Opec, which controls about 40 per cent of the world's crude oil output and virtually all the spare capacity, meets this weekend to discuss its production policy.

The cartel's ministers have so far indicated that they see no need to increase output and most analysts expect the group to leave its production ceiling unchanged.

However, Ali Naimi, the powerful Saudi minister who is the group's de facto leader, has yet to speak in public about his country's position.

Mr Naimi has in the past indicated that Riyadh wants to keep oil prices between \$70 and \$80 a barrel, although more recently he widened the ceiling of the price band to about \$90 a barrel.

Mr Naimi has a long history of surprising the oil market by keeping his cards close to his chest until the last minute, only then to reveal a need for Opec action.

Oil prices on Friday rose after Chinese crude oil imports rose to their fourth-highest monthly figure on record, surprising commodities watchers. In early trading in London, Brent crude, the global benchmark, rose 55 cents to \$91.54 a barrel, near a 26-month high. West Texas Intermediate, the US benchmark, rose 47 cents to \$88.84 a barrel.

Oil traders and analysts believe that oil prices could jump to \$100 a barrel next year.

Abdalla El-Badri, Opec secretary-general, told reporters in Quito on Thursday that crude oil prices were at "suitable levels" and described the market as "comfortable", echoing recent comments by other oil ministers from the group.

The IEA said on Friday that the cartel would in 2011 need to pump about 29.5m barrels a day to keep the market balanced, against the cartel's production of 29.2m b/d last month. Opec has about 6m b/d of idle capacity that can meet higher demand. Close

The IEA also revised higher its forecast of non-Opec supply for this year, lifting production growth to 1.1m b/d, up from 900,000 b/d last month. But it cut its output growth forecast for 2011 by 100,000 b/d to 600,000 b/d.



## VIRGINIA ENERGY CONSULTANTS, LLC

Virginia Energy Consultants, LLC  
7831 Carters Run Drive  
Marshall, VA 20115  
June 14, 2010

### **Subject: Commercial Hydrocarbon Prospectivity of the SEL 13/1998 Tasmania, Australia**

Below is a high level review of the Commercial Hydrocarbon Prospectivity of the SEL 13/1998 Tasmania, Australia.

Over the past decade that Great South Land Minerals Ltd. (GSLM) has held SEL 13/1998 it has high-graded the initial 30,356 square kilometer block, retaining 15,035 square kilometers after 5 years. By the end of its 10 year tenancy, GSLM has generated multiple ready to drill prospects. This achievement was based on the early application of geophysical scoping tools including gravity and magnetic surveys that identified the basic architecture of the Tasmania Basin. Later, two-dimensional reflection seismic surveys were acquired over the thicker sedimentary sections of the basin. These surveys clearly revealed large complex structures that would be suitable traps for oil and gas. The seismic data also revealed coherent, continuous reflectors that are interpreted to be hydrocarbon source rocks which are buried to depths sufficient to convert the kerogen molecule to liquid hydrocarbon. A series of whole cores were cut from stratigraphic test holes. These rocks proved the existence of hydrocarbon source rock, porous reservoir rock and impermeable sealing rock formations. Thus the four elements of a generative Petroleum System are present in the Tasmania Basin.

A perceived risk in the Tasmania Basin is the presence of Jurassic aged intrusive and extrusive dolerites that were ubiquitous throughout the proposed drilling fairway and may degrade or destroy the petroleum potential of the area. To understand this risk component, the key data set was geochemical analysis of well cuttings from stratigraphic test holes drilled in the license area. This data clearly indicated that the oil source rocks still had significant petroleum generative potential and were not destroyed during the emplacement of the Jurassic dolerites. In addition, coal sections in outcrop were of bituminous grade supporting the thermal history indicated by the geochemical data set.

Other commercial opportunities include the proven presence of the element Helium in the Tasmania Basin. With the increased use of Helium in the medical field, the presence of 2-4% of helium can greatly enhance the economics of a project.

A simple risk calculation common in the oil industry is made by estimating the **probability** of the four elements of the Petroleum System being effective in contributing to a Geologic success. Below is my quick look estimation:

Example:

Probability of Active Oil Source Rock x Probability of Effective Reservoir Rock x Probability of Oil Trapping Structure x Probability of Effective Impermeable Seal Rock = Probability of Geologic Success



### **Estimate For The Probability Of Geologic Success Is:**

70% Probability of Oil Source x 80% Probability of porous Reservoir Rock x 90% Probability Of Structural Trap x 70% Probability of Effective Seal =

**35% Chance of Geologic Success**

In conclusion, this is a Frontier Exploration project with significant risk. But, it is reasonable to expect that oil has been generated and that commercial pools of oil may be present. A good analog to the Tasmania Basin are the East African Rift basins, where a number of significant oil discoveries have been recently made (see Tullow Oil). Similarities include the presence of intrusive and extrusive dolerites. Assuming the first wells encounter oil shows, if not pooled oil, porous reservoir rocks, and a suitable sealing formation, the license area will be very attractive to a larger industry player and upon sale create a significant return to investors.

Ramsay A. Barrett  
Petroleum Geologist



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**Competent Persons Report  
Assets of Great South Land Minerals Limited, Tasmania**

**Prepared for  
Empire Energy Corporation International (Leawood, Kansas, USA) and its wholly  
owned subsidiary Great South Land Minerals Limited of Hobart.**



**Date: 23<sup>rd</sup> October 2008**

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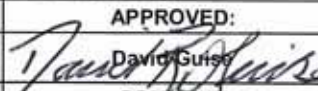
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		Assets Of Great South Land Minerals Limited, Tasmania	
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## 1. EXECUTIVE SUMMARY

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Great South Land Minerals Limited requested that RPS Energy (RPS) provide a Competent Persons Report on the Special Exploration License SEL 13/98, Tasmania. Great South Land Minerals Limited (GSLM) holds 100% interest in the Special Exploration License SEL 13/98 which covers a portion of the Tasmania Basin. The permit area is approximately 15,410 square kilometres and covers approximately 25% of the island of Tasmania. The permit will expire on 1 October, 2009. No petroleum wells have been drilled in the permit area to date.

Seismic coverage is approximately 1300 kilometres of 2D (TB01-2001; 775 km, TB02-2006; 175 km and TB02b-2007 345km). To date, only stratigraphic tests and mineral holes have been drilled in the Tasmania Basin. Drilling between 1997 and 2001 was conducted by GSLM using diamond coring mineral exploration rigs to establish stratigraphy.

Following the integration of the 2007 gravity and seismic data in to the existing database, GSLM have identified more than 15 potential drill sites targeting prospects and leads of various sizes. To date, the interpretation of all the acquired seismic data has identified several fault block traps and anticlines with shallow targets in the Gondwana Petroleum System, and deeper targets have been identified in the Larapintine Petroleum System. In the Central Highlands, these are mainly Devonian anticlinal structures, which contain Ordovician targets. Twelve of the located targets have been evaluated within this report. A drilling program of the primary targets is planned by GSLM. The first exploration well to test the Bellevue prospect was spudded on 17<sup>th</sup> Sept 2008, with the completion of a pilot hole through the basalt. The remaining well will be completed by the Hunt rig #3 expected on site in October 2008. Also permission has been given to drill the Thunderbolt prospect during 2008.

To date, there have been no oil or gas fields discovered in the Tasmania Basin although several oil seeps have been reported. Oil seeps can be valuable in signifying the occurrence of mature source rocks in frontier exploration. In order for a seep to be authentic and considered part of a petroleum system, it must be correlated to a source rock. Currently, the seeps reported in the Tasmania Basin have had limited correlations made to petroleum systems, however, there is a seep in a recently used quarry at Lonnavele, to the southwest of Hobart, that has been correlated with the Permian Tasmanite Oil Shale. The seep indicates that an active and significant petroleum system may exist in the Tasmania Basin. Two potential petroleum systems could be present in the Tasmania Basin. These are the Pre-Carboniferous System (Larapintine) and the Permian System (Gondwana).

The first petroleum system is referred to in this document as the Pre-Carboniferous System and is based on an Ordovician source. Structures formed in the Tabberabberan Orogeny have the potential to form large traps. Seismic coverage is not yet dense enough to fully define such traps. The Ordovician Limestone and Silurian Siliciclastic Formations are suggested reservoirs. The reservoir quality of these formations is not known.

The second possible petroleum system is the Permian System, the source of which is expected to be the Early Permian Woody Island Formation and its member the Tasmanite Oil Shale. The potential reservoir for the system is a relatively well understood fluvial formation called the Liffey/Faulkner Group. This formation has modest permeability in most locations (<10 mD). It is hoped that the intra-formational seals in the Liffey Group can either provide seal for structural traps or set up stratigraphic traps. The play has good source rock presence as evidenced by the Tasmanite Oil Shale, which has been typed to the Lonnavele seep. The maturity level and therefore the timing of expulsion is not well understood. The identification of potential source rocks is an encouraging aspect of this play.



The Prospective Resources for the seven primary prospects and leads within the SEL 13/98 block are summarised in Table 2. "Risk Factor" for Prospective Resources means the chance or probability of discovering hydrocarbons in a sufficient quantity for them to be tested to the surface.

Asset	Operator	% Interest	Status	Licence Expiry Date	Licence Area Km <sup>2</sup>	Comments
Tasmania SEL 13/98	GSLM	100%	Exploration	1st October 2009	15,410	Exploration interpretation and drilling

**Table 1 - Tasmania Assets of Great South Land Minerals**

Prospect / Lead	Gross Prospective Resources Oil (mmbbls)				Risk Factor	Operator
	Low Estimate	Best Estimate	High Estimate	Mean Estimate	COS %	
Bellevue Upper Unit	38	151	484	220	2.0	GSLM
Bellevue Lower Unit	24	95	307	139	2.0	GSLM
Bracknell Dome	3	18	90	37	1.2	GSLM
Butlers Rise	2	14	63	25	0.77	GSLM
Interlaken	2	10	40	17	0.47	GSLM
Cressy	3	12	48	21	1.2	GSLM
Hummocky Hills	5	30	138	58	1.2	GSLM
Thunderbolt	12	53	198	88	0.72	GSLM
Macquarie River	3.52	13.1	42.4	19.7	0.58	GSLM
Nile River	3.52	13.1	42.4	19.7	0.81	GSLM
Quamby	0.405	1.52	4.95	2.28	0.63	GSLM
Steppes	1.96	7.39	24	11.1	1.3	GSLM
Stockwell	2	7.4	23.6	11	0.75	GSLM

**Table 2 - Prospective Resources**

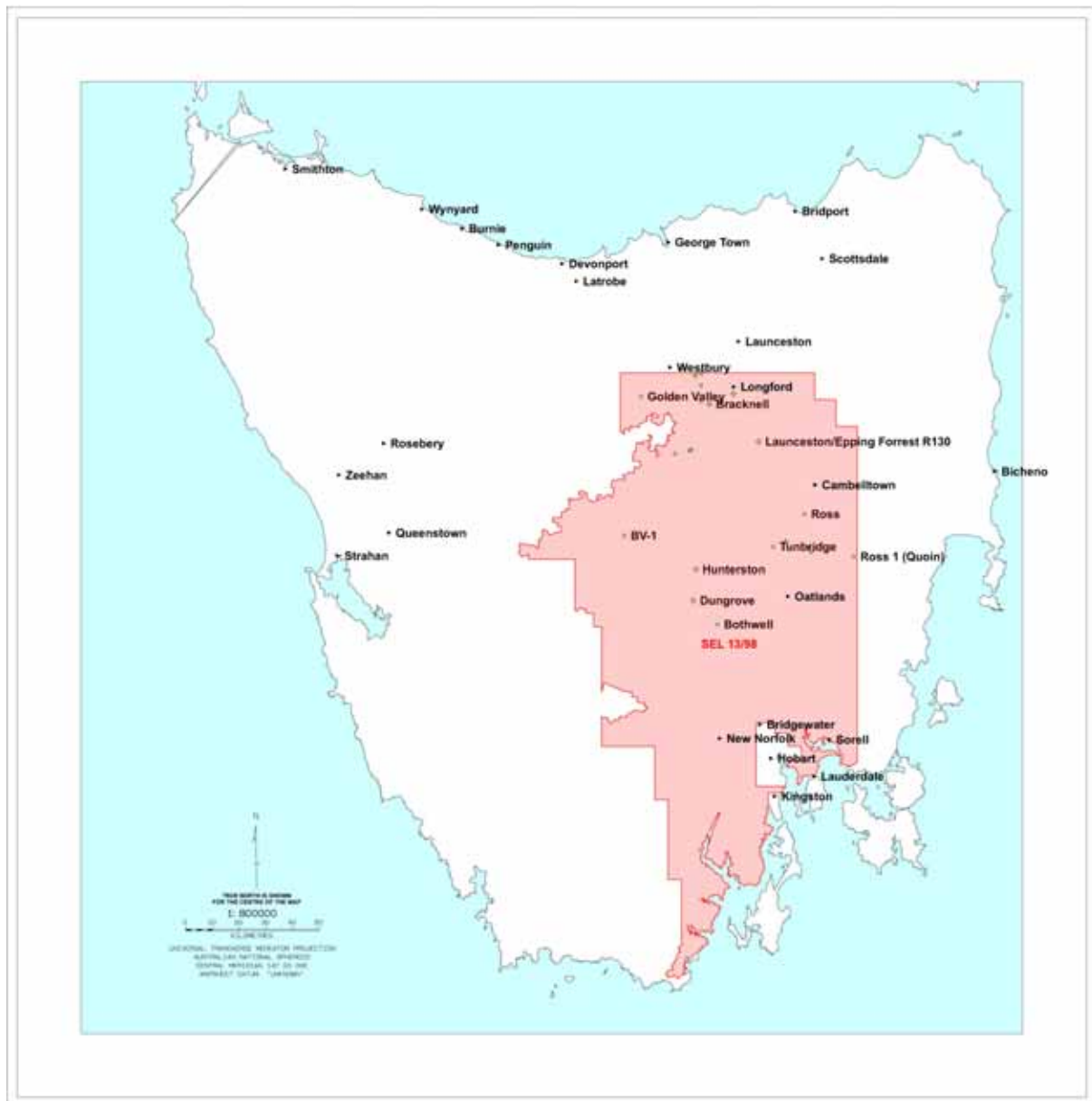
Source: RPS Energy

Chance of Success (COS): Chance or probability of discovering hydrocarbons in sufficient quantity for them to be tested to the surface



## 2. PERMIT DESCRIPTION

The Tasmania Basin is a frontier basin which covers around 25% of the island of Tasmania, a state of the Commonwealth of Australia. GSLM holds 100% interest in the Special Exploration License SEL 13/98 which covers the potential prospective portion of the basin. The permit expires on 1 October, 2009. The permit area is 15,410 square kilometres and covers most of the basin as illustrated in Figure 1.



**Figure 1 - Permit location and major boreholes**

Onshore petroleum permits in Australia are administered by the relevant state government. In general, Australian petroleum permits of any jurisdiction are governed by an agreed work programme system with terms of five “permit” years. The anniversary of the permit year is usually the formal award date. The Tasmanian State Government has chosen to define the agreed work programme for Special Exploration Licence SEL 13/98 in terms of mandatory



expenditure targets. The proposed and mandatory expenditure per year is shown in Table 3 and the respective activities in Table 4.

<b>Permit Year Ending</b>	<b>Expenditure Proposed by GSLM</b>	<b>Cumulative Expenditure Proposed by GSLM</b>	<b>Mandatory Expenditure (80%)* (AUD)</b>
1/10/2005	\$5,341,000	\$5,341,000	\$4,272,800
1/10/2006	\$3,020,000	\$8,361,000	\$2,416,000
1/10/2007	\$4,799,000	\$13,160,000	\$3,839,200
1/10/2008	\$6,530,000	\$19,630,000	\$5,224,000
1/10/2009	\$1,810,000	\$21,500,000	\$1,448,000

\*The mandatory spend is 80% of the value of the programme proposed by the operator

**Table 3 - SEL 13/98 expenditure-based programme agreed with regulator**

<b>Year Ending</b>	<b>Activity</b>	<b>Status</b>
1/10/2005	2D seismic survey TB02, seismic interpretation, and drilling	TB02 suspended (175 km acquired and processed)
1/10/2006	152 km 2D seismic	Completed
1/10/2007	270.5 km 2D seismic. Interpretation and integration of seismic. Extensive gravity survey.	Completed
1/10/2008	1 Well	Bellevue#1 Spudded, Top hole drilled and cased to 274 metres
1/10/2009	7 wells 400km 2D Seismic	Planned

**Table 4 - SEL 13/98 planned activities**



### 3. REGIONAL OVERVIEW, TASMANIA BASIN

#### 3.1 Exploration Drilling History

No petroleum wells have been drilled in the permit area. To date, only stratigraphic tests and mineral holes have been drilled in the Tasmania Basin. Between 1997 and 2002, GSLM drilled five stratigraphic tests, all with hard rock diamond core rigs. None of these wells were drilled on a defined structure. The results of these wells are summarised in Table 5.

Borehole	Operator	Type	Spud Year	Total Depth (mKB)	Purpose	Hydrocarbon Indications (gas % corrected for air, nitrogen and CO <sub>2</sub> contamination) <sup>2</sup>	Formation at TD	Age
Shittim-1	GSLM	Diamond core	1997	1751	Stratigraphic Test	Methane max. 31%, ethane max. 2.12% traces C3-C6. Helium up to 4.8%.	Phyllite and quartzite	Proterozoic
Jericho-1 <sup>1</sup>	GSLM	Diamond core	1997	640	Stratigraphic Test	Methane max. 10%, ethane max 1.26% traces C3-C6. Helium detected.	Bundella Fm	Permian
Lonnavale-1	GSLM	Diamond core	1997	557	Stratigraphic Test	Methane max. 1.8% ethane max. 0.35 % traces C3-C6.	Ferntree Fm	Permian
Pelham-1	GSLM	Diamond core	1997	503	Stratigraphic Test	Methane max. 1%	Bundella Fm	Permian
Hunterston-1 <sup>3</sup>	GSLM	Diamond core	2002	1324	Stratigraphic Test	Methane and ethane and traces C3-C6.	Dolomitic siltstone	Proterozoic

**Table 5 - GSLM stratigraphic boreholes**

- <sup>1</sup> Isotopic analysis of the methane at Jericho-1 showed it to be thermogenic in origin.
- <sup>2</sup> All gas measurements are air, nitrogen and CO<sub>2</sub> corrected. The estimation of CO<sub>2</sub> content may result in error. Samples were collected in various ways and sent to a laboratory for gas chromatograph analysis. The amounts above are subject to error and should be treated as qualitative.
- <sup>3</sup> All the wells were drilled with a mineral rig with BOP attached, all were mud logged.



### **3.2 Seismic and Gravity Data**

GSLM acquired 659 kilometres of seismic reflection data in 2001 across the Central Highlands and in the Northern Midland and Southern Midland areas of Tasmania. In 2006, GSLM recorded 152 kilometres of 2D seismic data across the Central Highlands and in 2007 a further 345 kilometres of 2D seismic data was acquired across the Central Highlands and was interpreted and integrated into the seismic database.

GSLM also acquired a ground gravity survey in the Tasmanian Central Highlands. This data was incorporated with the state gravity database to produce the Bouger Anomaly and Residual Bouger Anomaly maps over the permit.

The current seismic basemap overlying the residual Bouger Anomaly map is shown in Figure 2, and the Seismic basemap with the borehole locations is shown in Figure 3.

The quality of the seismic data set is highly variable and coherent events across sections are rare. The line spacing and geometry is also problematic for defining individual structures and prospect mapping. The spatial geometry of the surveys is currently dictated by being mainly restricted to main roads. This is due to seismic acquisition logistics.

Generally the Permian to present day section on most seismic lines are of reasonable quality. The Pre-carboniferous sections tend to be particularly difficult to interpret due to complex structural styles and poor imaging on most lines.



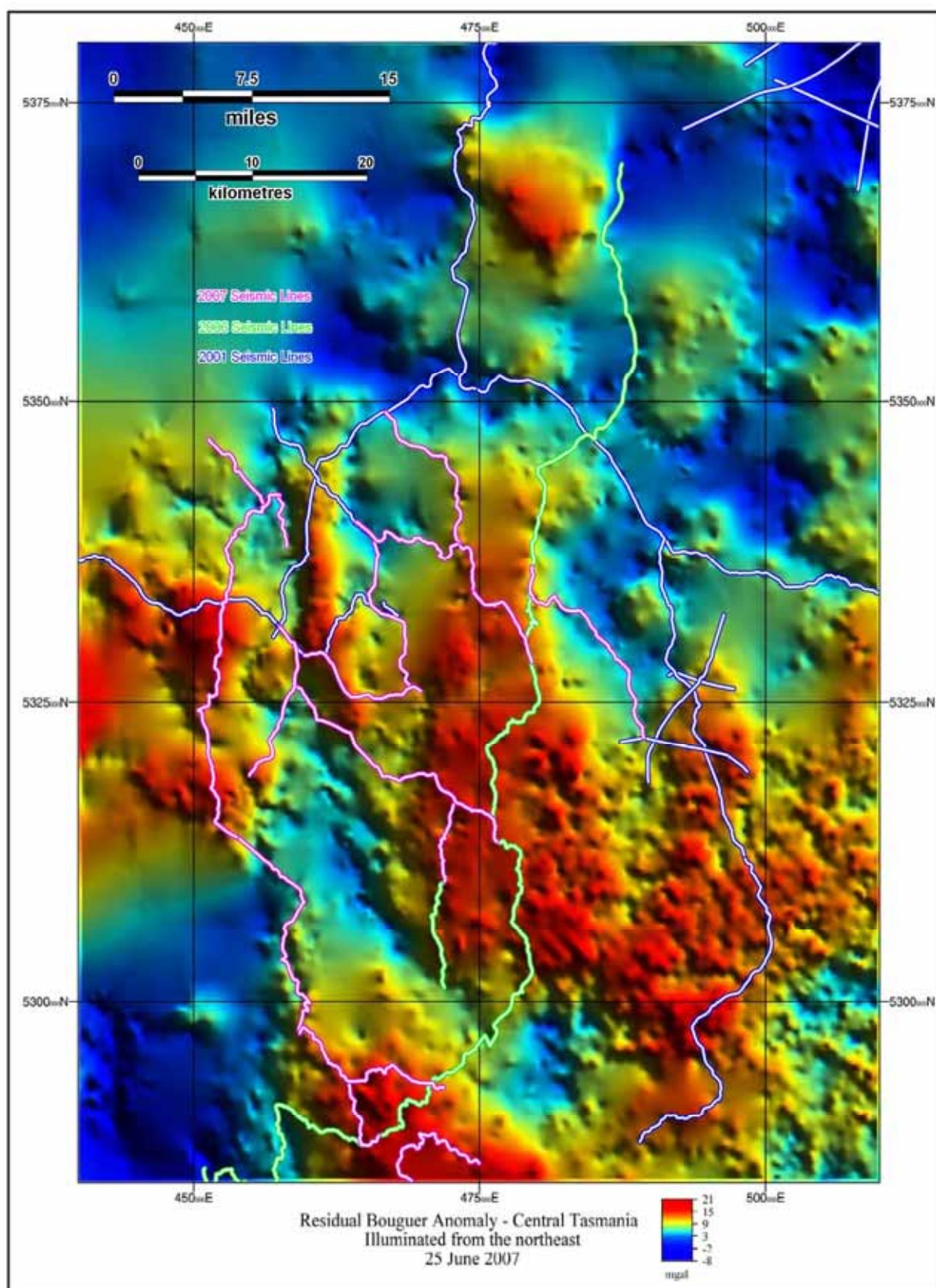


Figure 2 - Seismic Coverage Block SEL 13/98



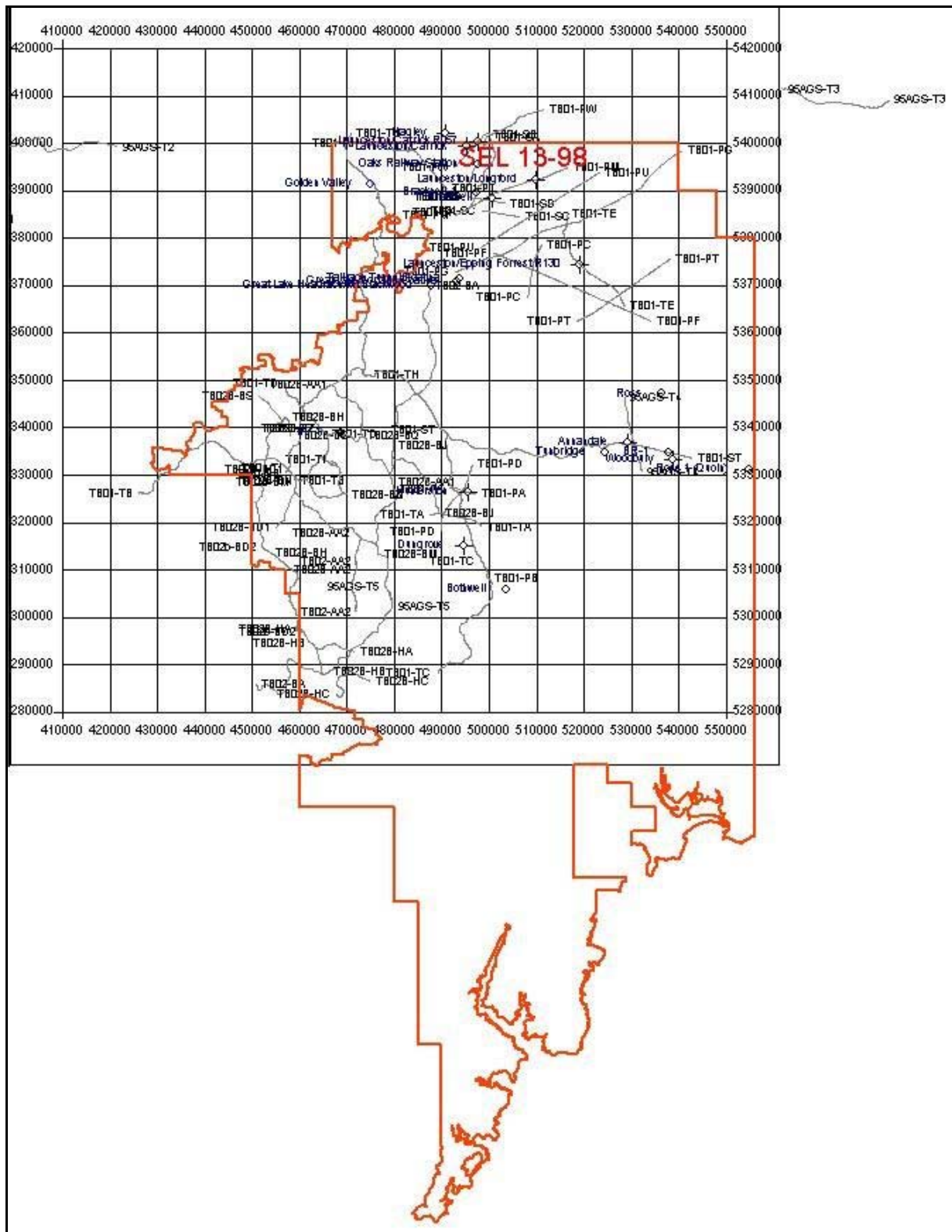


Figure 3 – SEL 13/98 Permit Map showing Seismic Lines and Wells



### 3.3 Structural Setting

The island of Tasmania is situated off the southeast coast of the Australian continent. The Tasmania Basin is an erosional remnant of a foreland basin (Collinson *et al*, 1987) that covers most of central and eastern Tasmania. A regional seismic line through the central part of the Tasmania Basin is shown in Figure 5.

The oldest basement consists of Proterozoic rocks which are exposed on the western half of Tasmania. Later basement rocks of Cambrian to Early Devonian age are known as the Wurawina Supergroup. All of these rocks were deformed by the mid Devonian tectonic event called the Tabberabberan Orogeny, which was a major Australian event.

Following a long hiatus, a succession of predominantly flat lying sedimentary rocks of Carboniferous to Late Triassic age were deposited (Bacon *et al*, 2000). In the Jurassic, dolerite intruded this succession as thick sheets, resulting in bodies with thicknesses of up to 600 metres. The total known maximum thickness of the Carboniferous to Late Triassic succession (excluding the dolerite) is 1.7 kilometres (Bacon *et al*, 2000). This is assumed that this estimate is based on the integration of drilling and outcrop data. The present boundaries of the basin are erosional and the original basin extent was probably much greater (Bacon *et al*, 2000).

Today there is no strongly defined depocentre in the epicratonic sediment layer, which makes up the basin. The basin was uplifted at the end of the Cretaceous, probably associated with the Australian-Antarctic plate margin break-up. Erosion of approximately two kilometres of sediment is interpreted to have occurred. No further sediment was deposited until the Cenozoic. Cenozoic deposits are only a few hundred metres thick.

The Tasmania Basin can be divided into three major structural elements (Figure 6). The Longford Sub-basin (onshore extension of the Bass Basin) effectively divides the rest of the basin into a large western half called the Central Lakes-Huon Block, and an eastern half called the Douglas River Block (block names modified after Wakefield, 2000). All of these areas are underlain by folded Palaeozoic rocks of Cambrian to Devonian age.

Over much of the basin, the Earlier Palaeozoic is covered by generally flat-lying Jurassic Dolerite and Permian to Triassic sediments. The Longford Sub-basin is evident at the surface in a region called the "Lowlands". It formed due to extension in the Latest Cretaceous to Early Cenozoic (Stacey and Berry, 2004) but contains only a few hundred metres of Cenozoic sediments. A densely faulted zone, which may be a wrench zone, lies between the Longford Sub-basin and the Highlands (Blackburn, 2004). The Tiers Fault is an obvious cliff at the present day and it delineates the western edge of this zone (Figure 6).



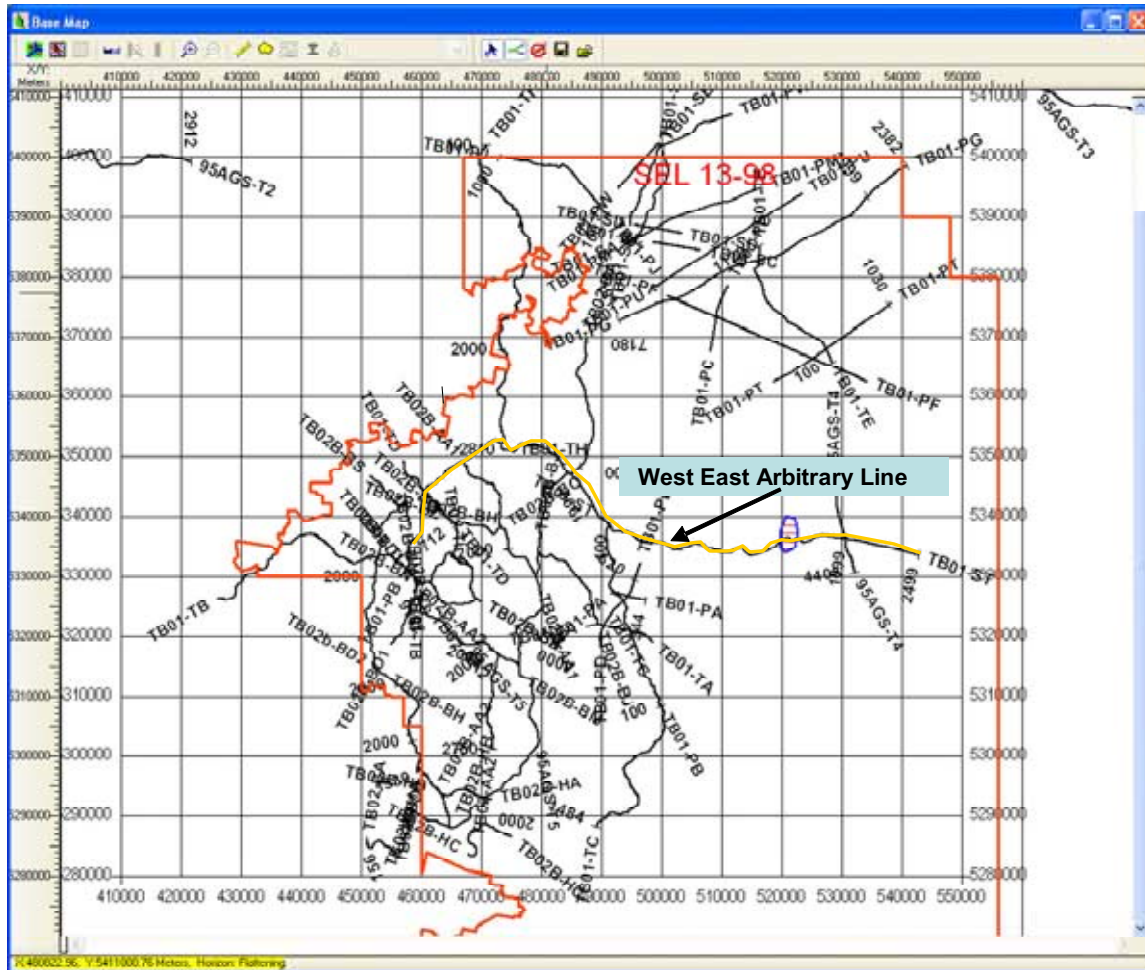


Figure 4 - West - East arbitrary line location map



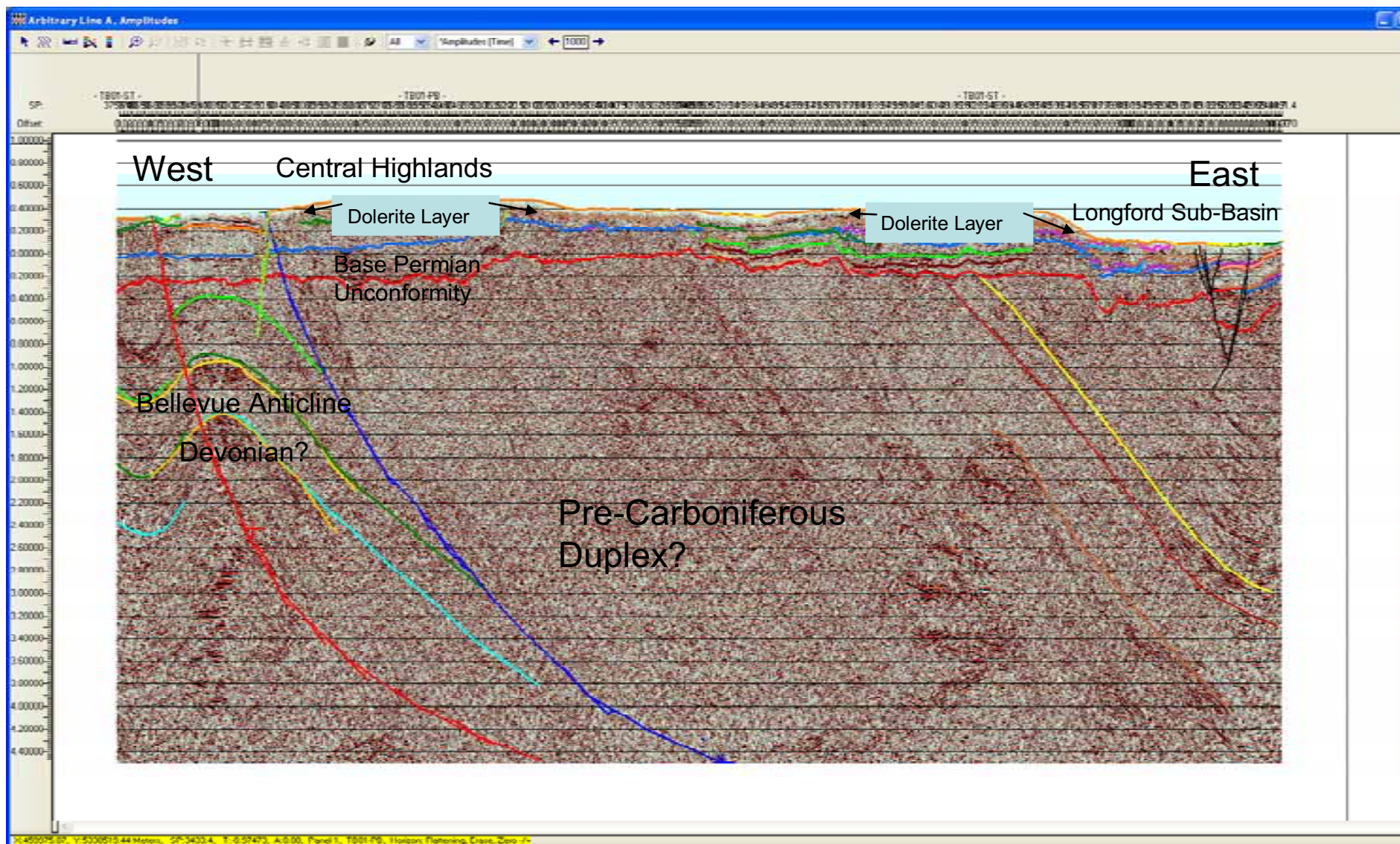


Figure 5 - Arbitrary seismic line through the central part of the Tasmania Basin. For line location, see Figure 4



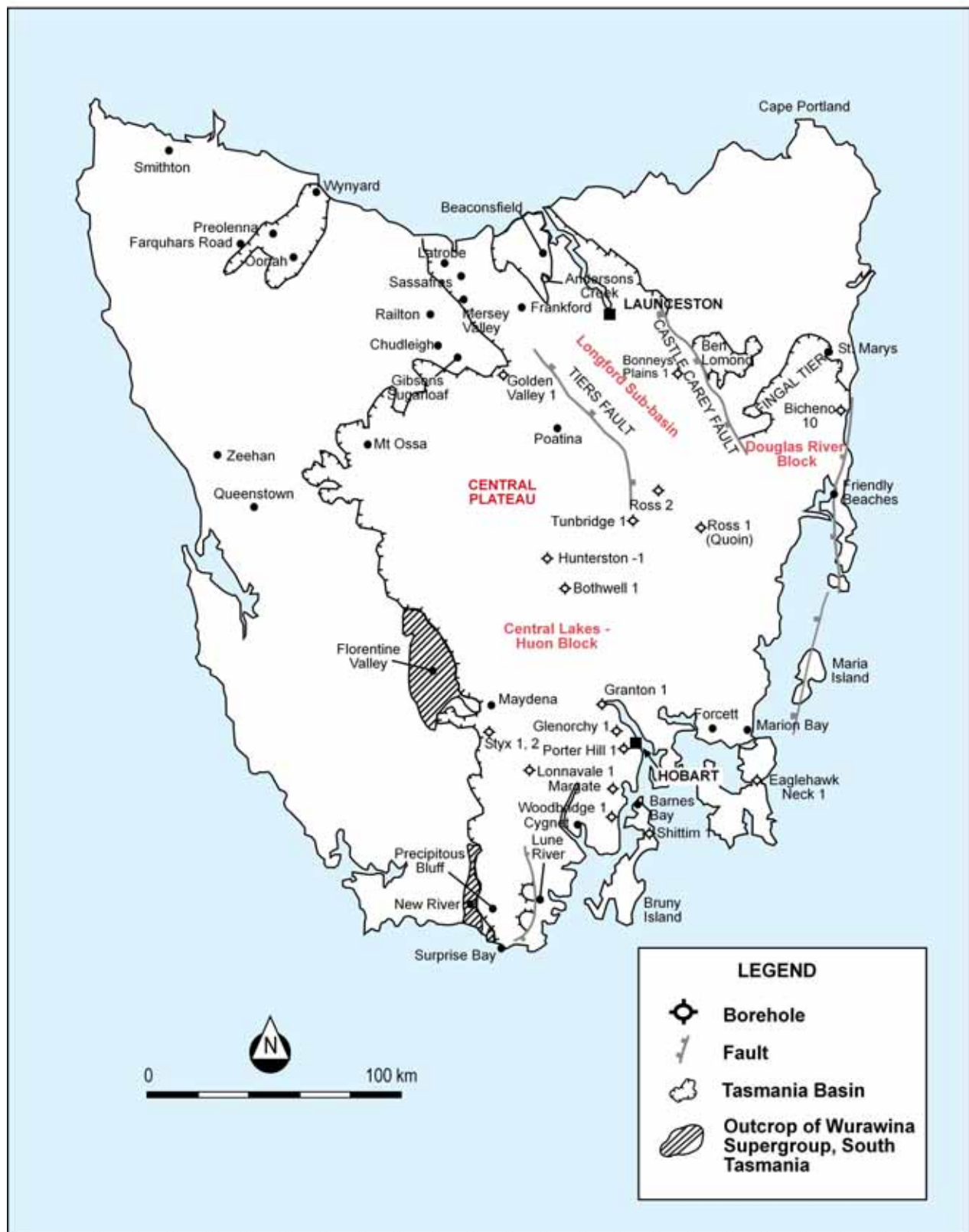


Figure 6 - Tasmania Basin major structural elements (modified from Seymour and Calver 1995a, and Wakefield, 2000)



### 3.4 Stratigraphy

The generalised stratigraphy of the Tasmania Basin is summarised in Figure 7. The stratigraphy of the basin is understood mainly as a result of the outcrop and the stratigraphic diamond bore holes (Table 5). The following stratigraphic summary is based on Bacon *et al*, (2000). A more detailed discussion can be found in Clarke and Forsyth (1989).

The sediments are separated into two supergroups; the Wurawina Supergroup of Early Palaeozoic age and the Parmeener Supergroup of Late Palaeozoic to Early Mesozoic age. These are separated by a major angular unconformity, associated with the Tabberabberan Orogeny. Each of the supergroups are sub-divided into a number of lower rank lithostratigraphic units (Figure 7).

The Wurawina Supergroup is a Late Cambrian to Early Devonian shelf carbonate and clastic succession (Bacon *et al*, 2000). The supergroup consists of Late Cambrian to Early Ordovician, shallow marine to fluvial siliciclastic rocks (Denison Group) overlain by 1.5 kilometres of predominantly micritic, shallow marine, warm water Ordovician limestone (Gordon Group), then up to 5 kilometres of shallow marine Silurian to Early Devonian siliciclastic rocks (Tiger Range Group) (Bacon *et al*, 2000).

Results from a regional conodont alteration index (CAI) study on the Gordon Group carbonates, performed by Burrett, (1992), indicate that these rocks are mature for hydrocarbon generation in southern Tasmania, showing a CAI typically between 1.5 and 4 (Bacon *et al*, 2000). The results of this work are summarised in Figure 8.

A major orogenic event occurred in the Devonian. This resulted in considerable folding of the Early Palaeozoic strata and was followed by a long hiatus, lasting approximately 80 million years (Figure 7).



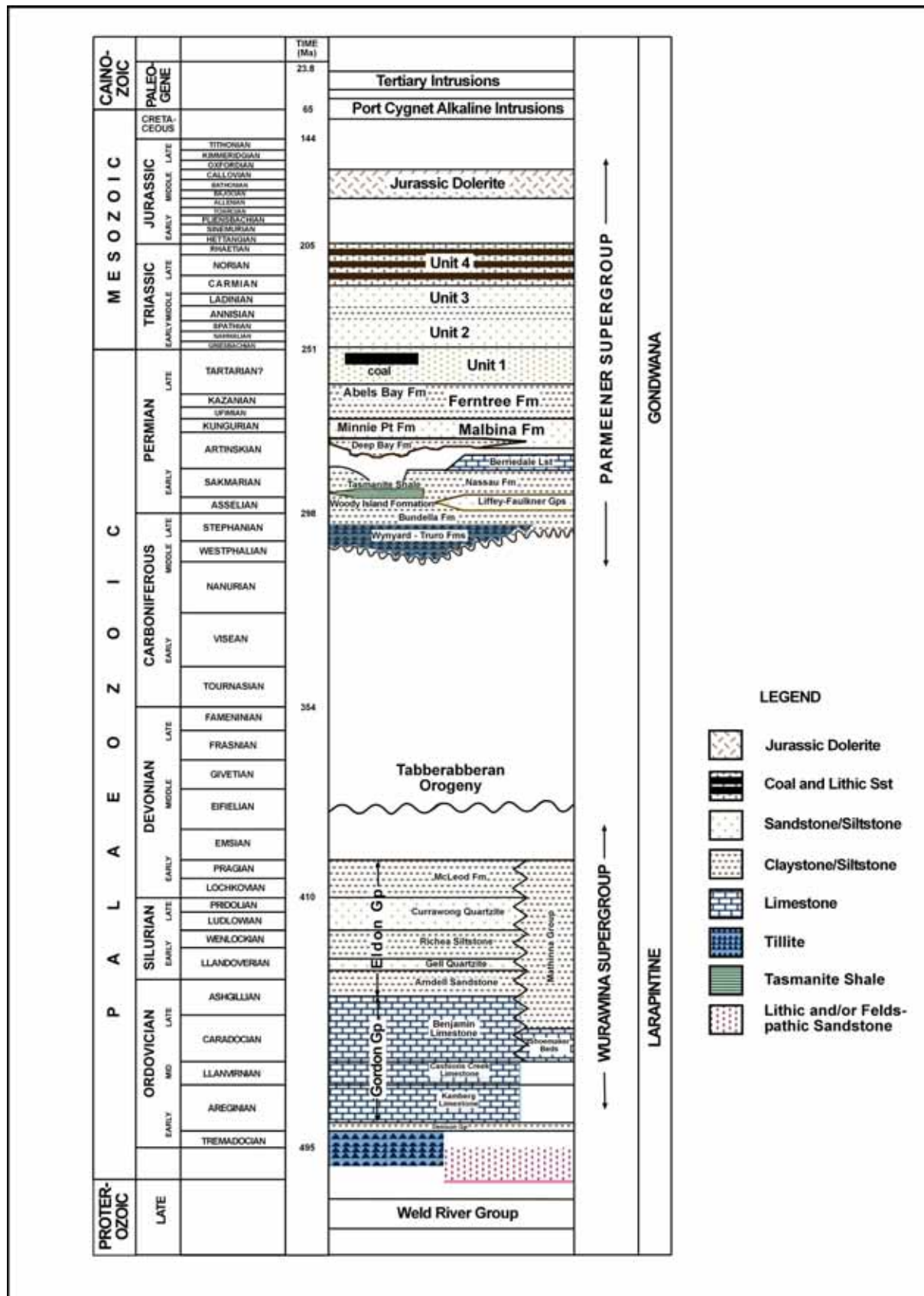
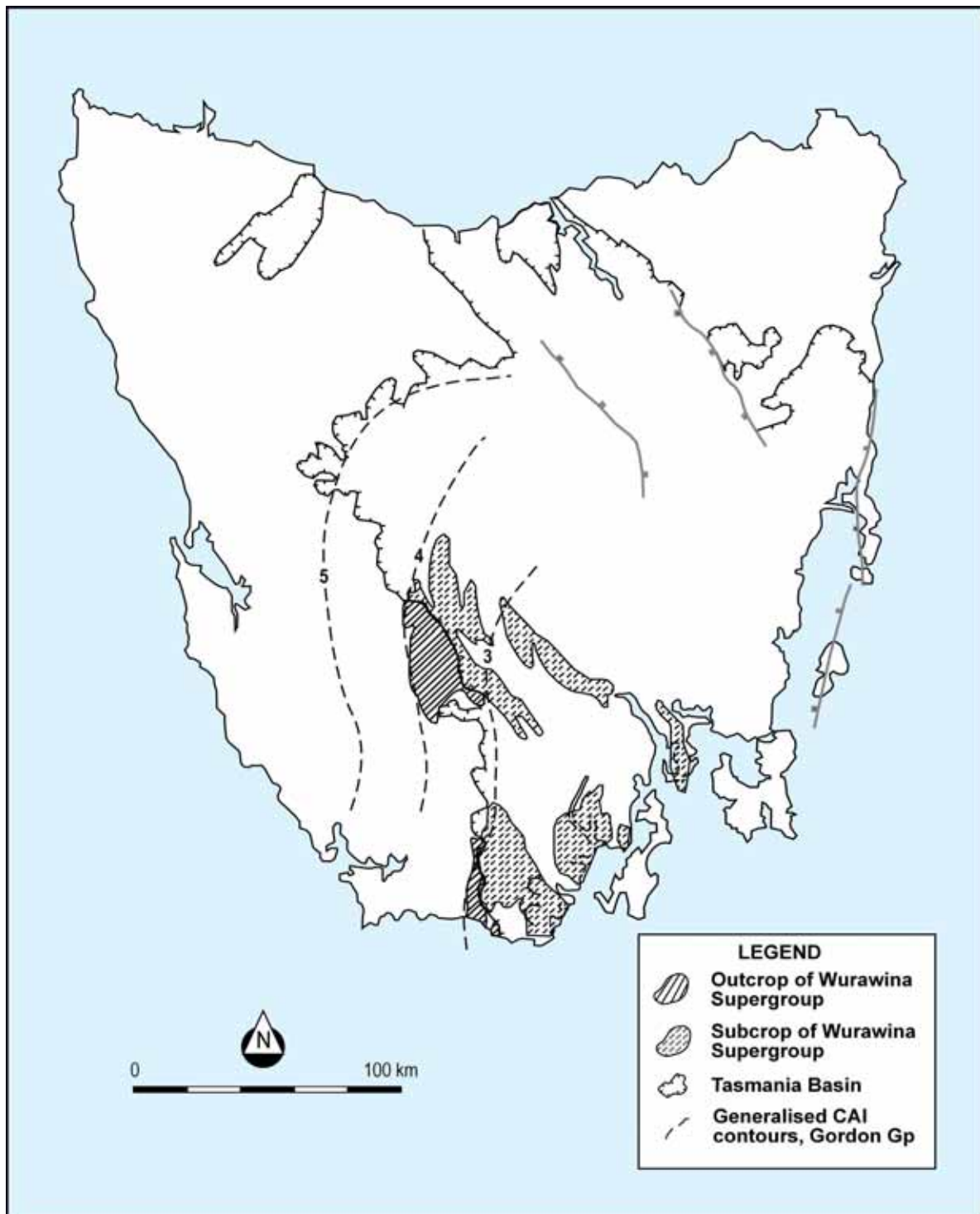


Figure 7 - Stratigraphy detail of the Tasmania Basin (modified from Seymour and Calver 1995b)





**Figure 8 - Generalised CAI contours (modified from Burrett, 1992) with outcrop and inferred subsurface extent of Ordovician - Devonian basement rocks that may be mature for oil and gas generation (Leaman, 1996)**



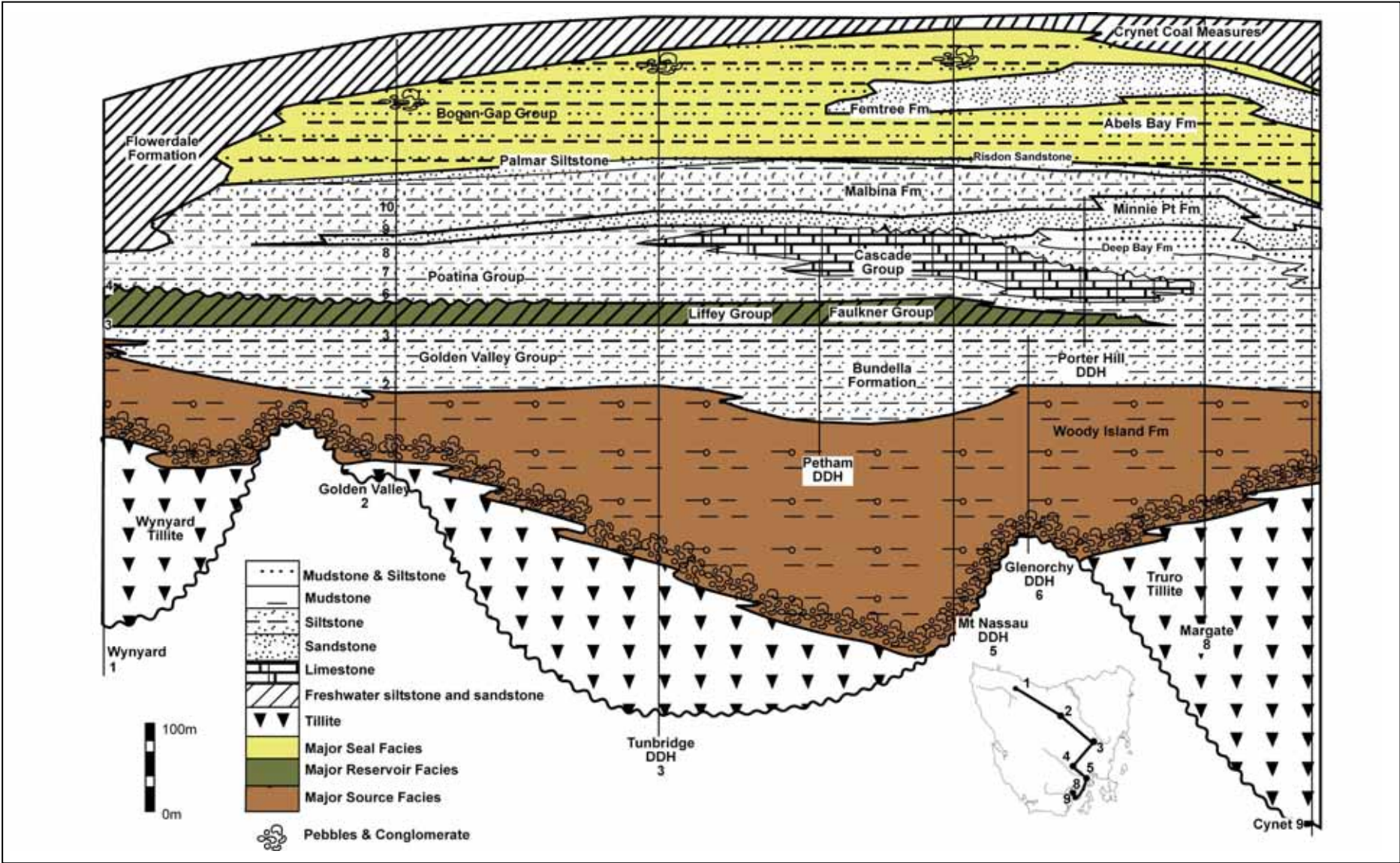


Figure 9 - Time-space diagram of the Lower Parmeener Supergroup (modified from Reid, 2004)



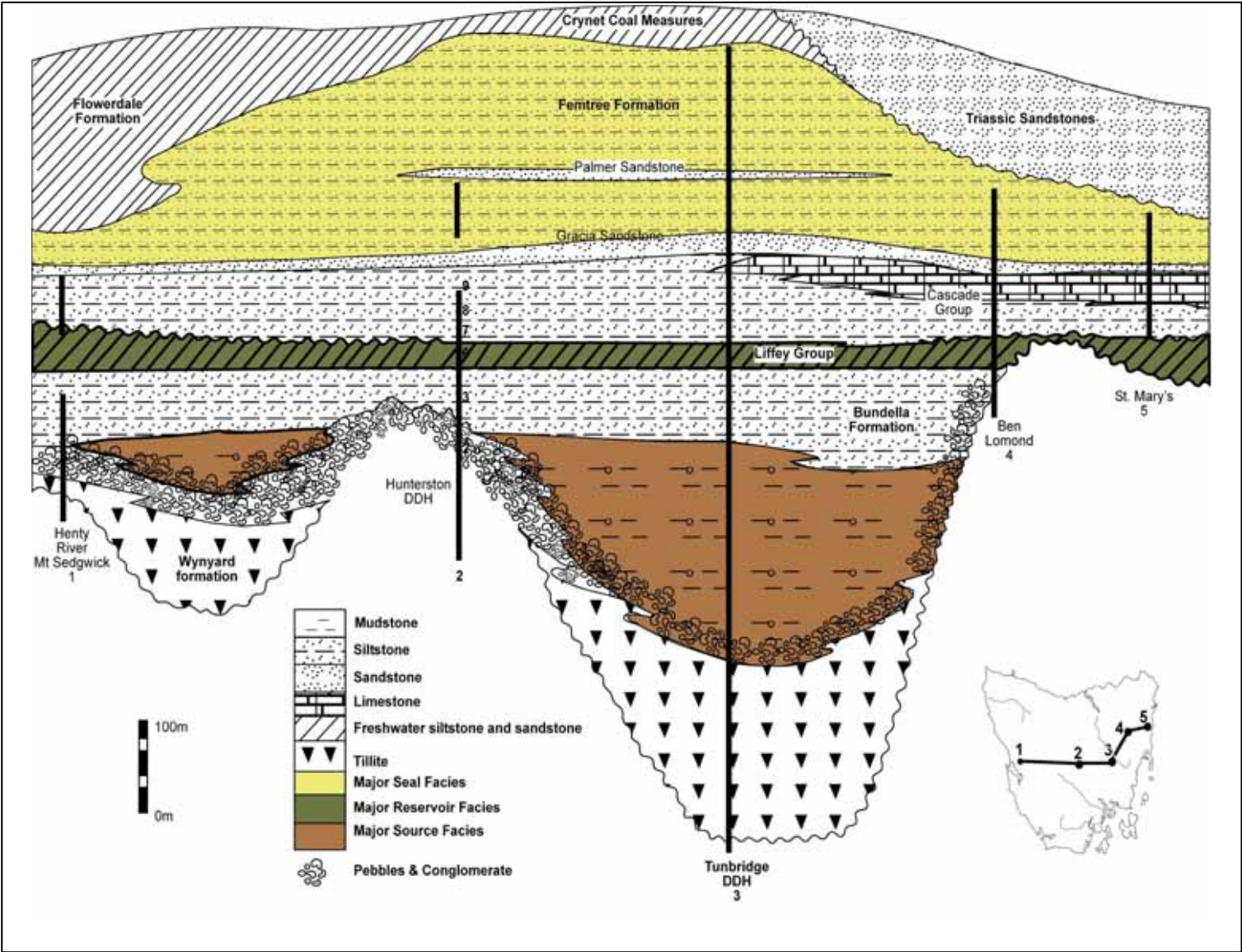


Figure 10 - Time-space diagram of the Lower Parmeener Supergroup (modified from Reid, 2004)



Deposition recommenced in the Carboniferous and the sediments of the Parmeener Supergroup were accumulated (Figure 7, Figure 9 and Figure 10). A flattened stratigraphic section comprised of well and outcrop data, provides an indication of formation thicknesses and depths (Figure 11).

Carboniferous to Permian tillite deposits occur at the base of the supergroup and are widespread throughout the entire basin (Stockers, Wynyard and Truro Tillites, see Figure 7). These are followed by the Woody Island Formation, a 100 to 200 metre thick dark grey monotonous siltstone. In the base of this formation, beds of the alga *Tasmanites punctatus* occur. The Woody Island Formation and the Tasmanite Oil Shale beds are the main potential source rocks and are discussed in Section 3. The distribution of the Woody Island Formation source facies and Tasmanite Oil Shale distribution is shown in Figure 12.

The Woody Island Formation is overlain by the Bundella Formation, a muddy siltstone with little potential as a source rock. These are overlain by the Faulkner Group, consisting of well sorted, laminated, fine to medium sands (Reid and Burrett, 2004). The sandstone beds are generally 6-50 metres thick and modally 21-25 metres and are interbedded with carbonaceous siltstones.

Permian palaeogeography of the Tasmania Basin is presented in Figure 13, and has been modified from Clarke, (1989). The thickness and distribution of the Liffey-Faulkner Group is shown in Figure 14. The facies become more marine to the south, suggesting regression in that direction. Recent work has identified a zero edge near Cygnet, which was established by Mineral Resources Tasmania (MRT) from outcrop and several stratigraphic diamond core holes.

The Liffey-Faulkner Group is overlain by silt/clay marginal marine to marine formations, namely the Malbina and Ferntree Formations.

The terrestrial environment of deposition becomes dominant around the end of the Permian. The Lower Parmeener Supergroup was deposited from the Late Carboniferous to Late Permian. The Upper Parmeener Supergroup was deposited from the Late Permian to Late Triassic, in a non marine environment (Bacon *et al*, 2000). Within the Late Permian to Late Triassic sequence, four stratigraphic units have been defined (Leaman, 1971, and Forsyth, 1989). The following summary is derived from Bacon *et al*, (2000).

Unit 1 is dominantly felspathic with micaceous sandstones. Thin coal is seen in the south on Bruny Island and at Cygnet and is known as the Cygnet Coal Measures. The entire section is generally 20-108 metres thick and is very thin or absent across the northeast of Tasmania.

Unit 2 is 200 to 300 metres thick and was deposited by a fluvial system which flowed from the north-west to the south-east.

Unit 3 is generally 80 metres thick and consists mainly of sandstones with minor conglomerates and rare thin coals.

Unit 4 is mainly lithic sandstone with minor claystone and contains most of Tasmania's economic coal reserves, located mainly in the north-east.

The Upper Parmeener Supergroup (mainly Triassic in age) appears to be a series of fluvial deposition cycles. There is no major marine influence on this group or in the time following, so a widespread regional seal for these sediments seems unlikely.

In the Early Jurassic, 400 to 600 metre thick intrusions of dolerite were emplaced into the existing Permo-Triassic sequences, essentially parallel to bedding. In any given section of the basin, one to three of these bodies may be present. Outcrop observations indicate that each of these bodies is a composite emplacement consisting of several sheets (Burrett, 1992).



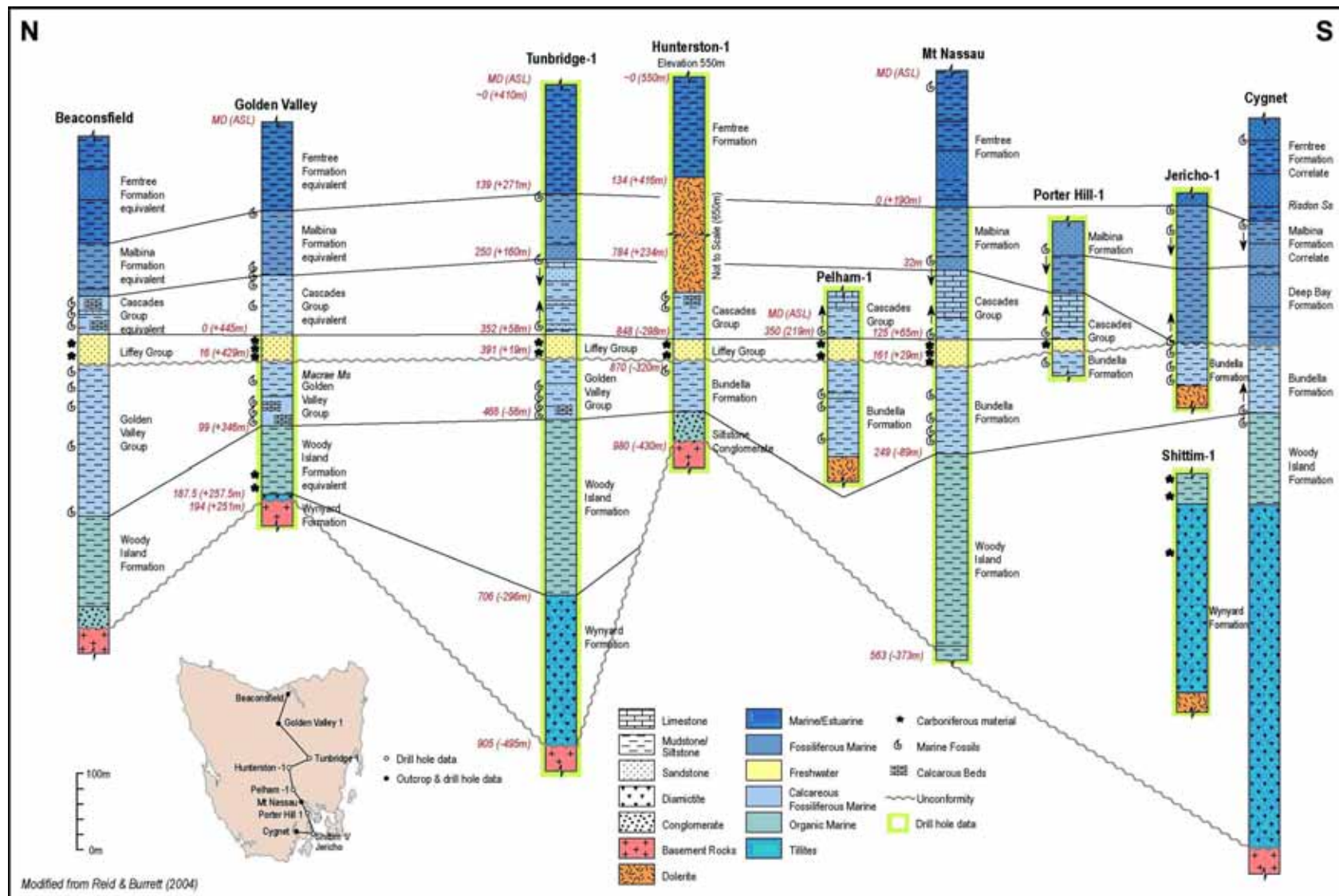
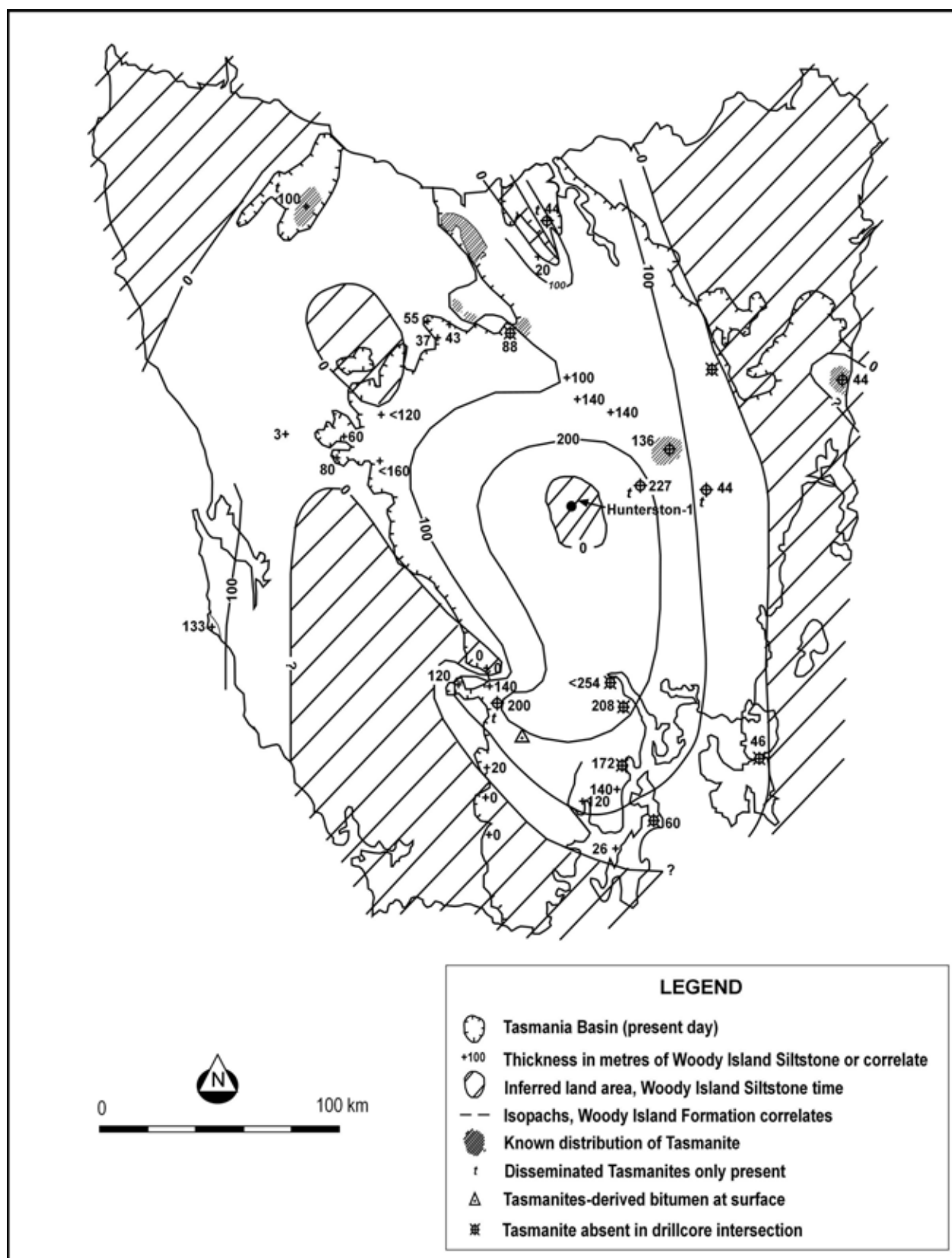


Figure 11 - Stratigraphic cross-section of the Tasmania Basin (modified from Reid and Burrett, 2004)





**Figure 12 - Known distribution of the Tasmanite Oil Shale with an isopach of the Woody Island Formation (modified from Bacon *et al*, 2000)**



The dolerite presents several challenges for petroleum exploration, including the reduction of seismic signal, variations in seismic velocity, hard drilling, localised over-maturation of vitrinite and source rocks and possibly the reduction of reservoir quality.

At the present day, there are no Cretaceous sedimentary rocks in the basin. An apatite fission track study (O'Sullivan and Kohn, 1995) suggests that the basin was uplifted somewhere between 100 and 50 Ma (Late Cretaceous to Early Tertiary) and approximately three to four kilometres of previously deposited Jurassic to Middle Cretaceous rocks were completely eroded. Bacon *et al* (2000) suggests two kilometres of section is more likely, and points out the work of Sutherland (1977) who suggested that zeolites within the Jurassic dolerite indicated a possible burial depth of two kilometres.

Bacon *et al* (2000) suggest that the Mesozoic sediments of the Tasmania Basin were once more widespread. The western margin of the basin is defined by Permian formations truncated by outcrop. This erosion and reduction in basin sediments is inferred to have occurred between Late Cretaceous and Middle Tertiary time.



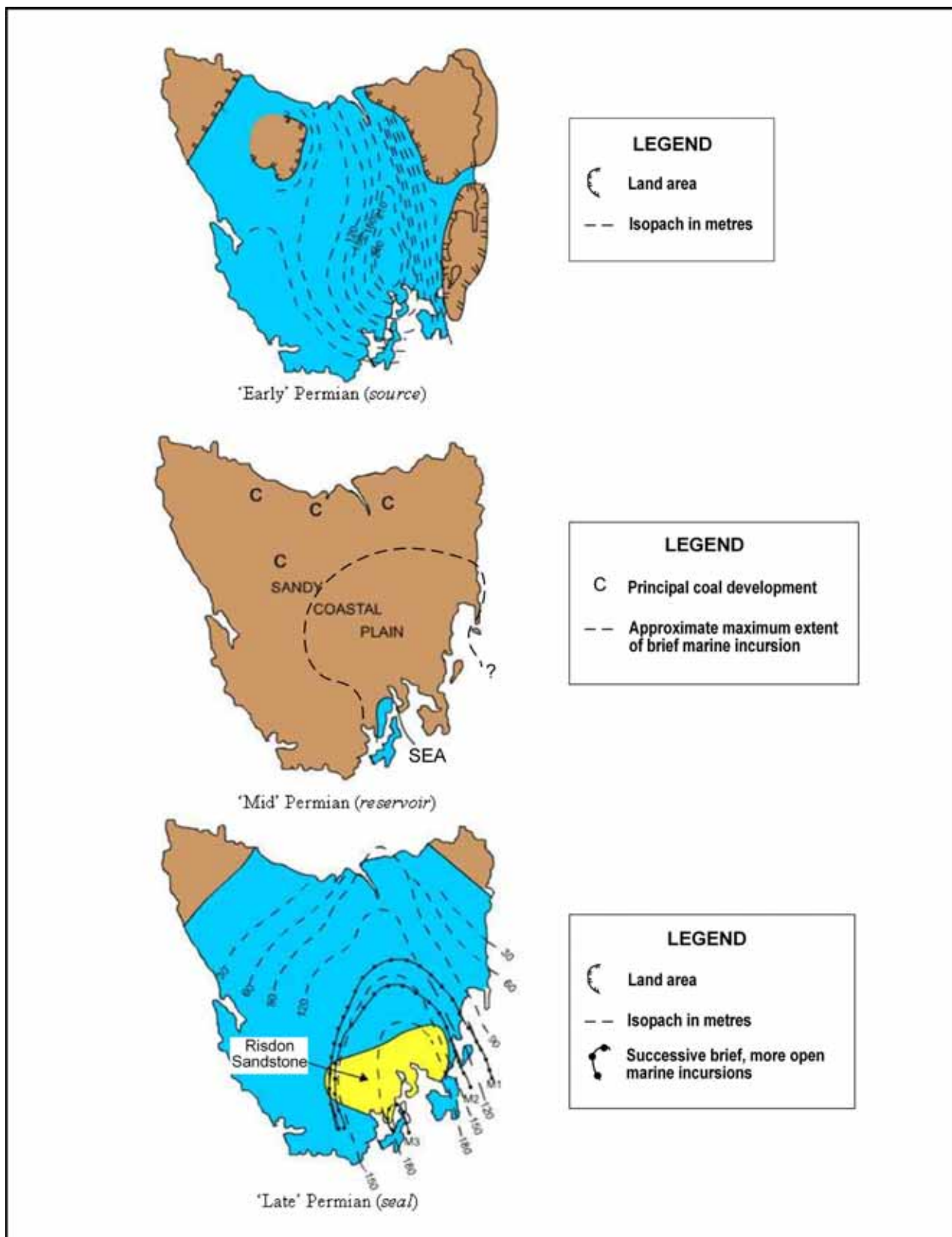
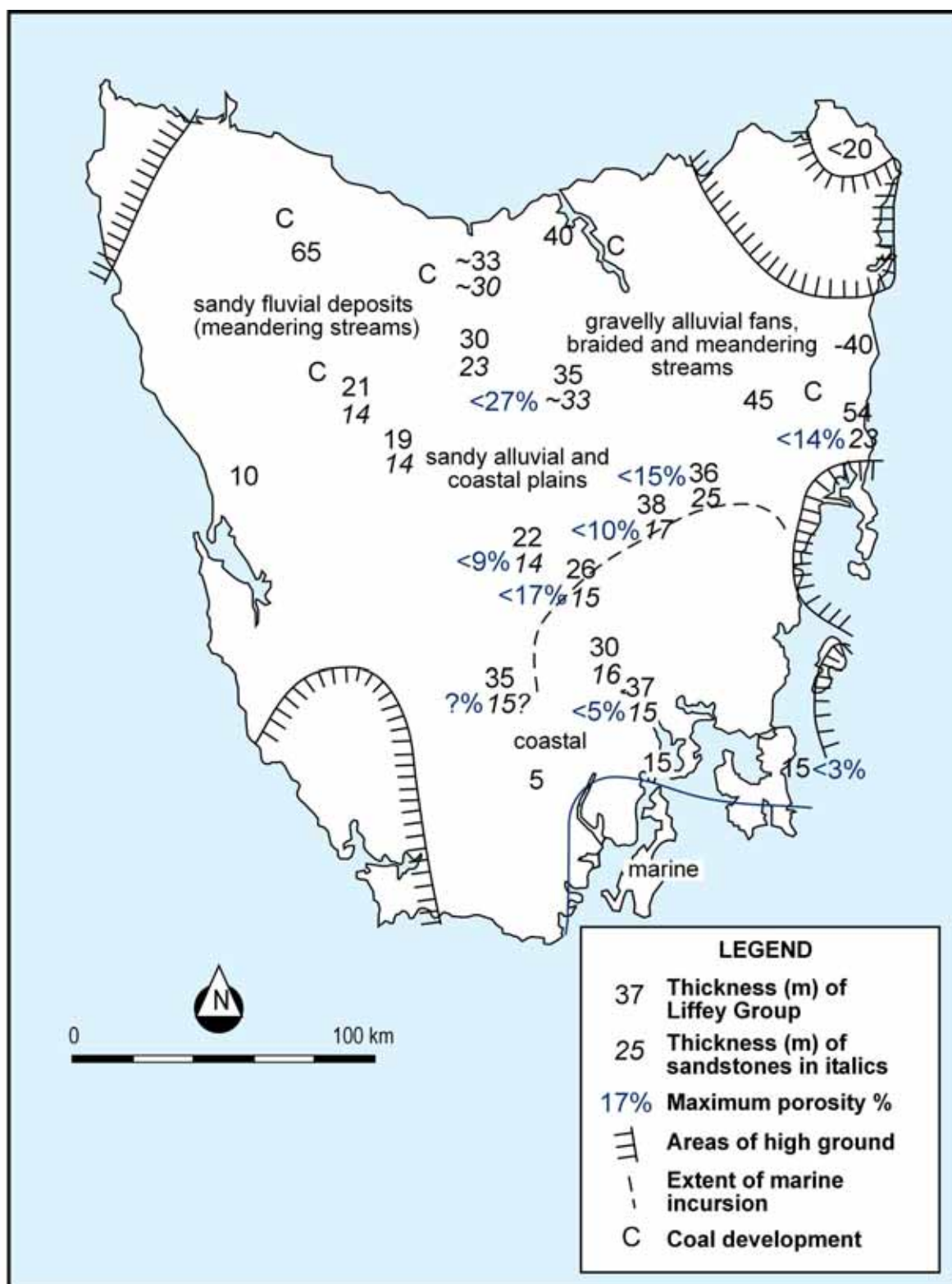


Figure 13 - Permian palaeogeography development of the Tasmania Basin (modified from Clarke, 1989)





**Figure 14 - Thickness and distribution of the Liffey-Faulkner Group. Total thickness of sandstone beds and cycles (black) and some upper porosity values (blue) are also shown (modified from Reid and Burrett, 2004, after Clarke 1989 and Martin and Banks, 1989).**



## 4. PETROLEUM SYSTEM ANALYSIS

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To date, there have been no oil or gas fields discovered in the Tasmania Basin although several oil seeps have been reported in Tasmania. Oil seeps can be valuable in signifying the occurrence of mature source rocks in frontier exploration. Currently, the seeps reported in the Tasmania Basin have had limited correlations made to petroleum systems, however, there is a seep in a recently active quarry at Lonnavele, to the southwest of Hobart, that has been correlated with the Permian Tasmanite Oil Shale and is the best indication yet that a significant petroleum system possibly exists in the basin. Two potential petroleum systems could be present. These are the Pre-Carboniferous System (Larapintine) and the Permian System (Gondwana). These two systems are discussed below and schematics are provided in Figure 15 and Figure 16.

### 4.1 Hydrocarbon Occurrences

Hydrocarbon indications have been reported to the Tasmanian government over the past century. A tabulation of all of these shows and their assessments are provided in Bacon *et al* (2000).

According to Wakefield (2000), over 130 reports of oil and gas seeps have been registered with Mineral Resources Tasmania (MRT). Approximately 10% of these reports have confirmed the presence of naturally occurring hydrocarbons in the form of seeps, tars and bitumens. To date, no bore hole has ever yielded core or cuttings that contained macroscopic hydrocarbon fluorescence although very few wells have been drilled to specifically explore for oil and gas. Of these wells, including those drilled since 1997 by GSLM, none have been drilled on a trap defined by modern seismic.

Mud gas was detected in several of the GSLM wells. Most samples were contaminated with significant amounts of air but, after adjusting for this, levels of C6 up to 50 ppm were detected in Shittim-1 and Jericho-1. Isotopic analysis of the gas at Jericho-1 shows it is thermogenic. Results at Shittim-1 range from biogenic to possible mixed biogenic/thermogenic. However, traces of C3-C9 are encouraging and indicate that there are rocks with the capacity to produce wet gas in the basin.

Low yields of hydrocarbon extracted from a Proterozoic core sample from 1,676 metres in Shittim-1 on Bruny Island and a hydrocarbon extract from a Gordon Group limestone from a quarry were compared by Burrett (1997). The Gordon Group traces are similar in the dominance of n-C18 alkane. The pristane to phytane ratios are reported to be approximately 1 in both (Bacon *et al*, 2000). The Shittim-1 sample seems biodegraded or water washed but, surprisingly, the quarry sample does not appear biodegraded. It has been interpreted that this extracted hydrocarbon probably originated in Ordovician rocks down dip.

Oil and bitumen in Permian sandstone outcrops near Zeehan, Tasmania, have been reported by Cook (2003), who examined samples from these Permian outcrops. One sample of a carbonaceous shale grading to a shaly coal and two sandy samples were thought to have contained possible bitumens. The silty sandstone contained prominent oil inclusions within the sand grains and abundant brightly fluorescing oil, presumably being originally part of the same petroleum system as the bitumens (Cook, 2003).

Cook (2003) also observed that the presence of gas bubbles indicates that the oil to gas ratio of the system was originally relatively high. The Permian sandstones' maturation level is best estimated at 0.7% and may be as high as 0.8% (Cook, 2003) which is consistent with the findings from the previous geochemical reports. Another study by Revill *et al*, (1994), which represented the first organic geochemical comparison of thermally mature and immature Tasmanite Oil Shale samples in relation with a geological evaluation of the sedimentary setting, concluded that at least some deposits of the Tasmanite Oil Shale in Tasmania are near the "oil window".



Rare (< 0.1%) microscopic oil inclusions, in fractures in samples from Hunterston-1, were also observed by Cook (2003). These inclusions apparently appear on fractures through cements in the Liffey Group. They could have emplaced at any point post deposition (i.e. post-Permian). No inclusions have been extracted to determine their source (Reid 2004). An occurrence of oil inclusions < 0.1% does not indicate a breached oil column or migration.

This assessment is based on empirical limits developed by CSIRO in their oil inclusion counting studies GOI™ (Eadington *et al*, 1996). The very low occurrence of inclusions (<0.1%) and the proximity to an intrusion suggests localised maturation of a very small amount of organic matter to the point of expulsion. Oil inclusions of <2% were also observed in the samples of the Liffey Group from Ross-1 where maturity is VR% 0.57 (Reid, 2004).

Rare oil inclusions were also observed in the Liffey Group samples from the Douglas River with a mean maturity of VR% 0.55 (range VR% 0.48-0.64), just barely at the oil window.

#### 4.1.1 The Lonnavele Seep

The hydrocarbon show at the Lonnavele quarry is a bitumen found within joints, in the Jurassic Dolerite. The quarry is based on Jurassic dolerite which has a possible contact with a Permian mudstone, exposed in a nearby quarry, and is known, in other areas of Tasmania, to contain the Tasmanite Oil Shale (Revill, 1996). Geochemical studies were undertaken at the request of Tasmanian Development and Resources (TDR) in 1996. Two samples of possible hydrocarbons were studied. One sample was a swab of what appeared to be hydrocarbon staining and the second was a bitumen from within a fracture in the dolerite.

Seeps were examined at a quarry in Lonnavele (personal observation by P. Vytopil, 2007). The rock is a fractured dolerite, with one section of the quarry showing good oil shows with strong petroliferous odour along the fracture planes. The oil effortlessly smeared when samples were handled and left a dark reddish streak. In areas where samples were not fresh, there was a dark bituminous stain and some samples had a faint odour of H<sub>2</sub>S.

The presence of oil shows at Lonnavele has been previously recorded by numerous authors. Bottrill (1996) provides a detailed description of oil shows along two generations of fractures within the dolerite. These fractures were filled with calcite and minor globules and flecks of bitumen. The bitumen was dark brown to black, vitreous, soft and sticky on fresh surfaces, as well as hardened and dark on exposed surfaces.

Geochemical analysis indicates that the n-alkane profile from the swab sample is characteristic of a light oil or a petroleum fraction such as diesel. The sample was a stain and had a more liquid character than the bitumen sample taken (Revill, 1996). There are maturity differences between the liquid (oil) and solid (bitumen) although hydrocarbons in both samples share a similar source (Revill, 1996).

Conclusions from the geochemical reports indicate that the seep appears to have been subjected to light biodegradation and the samples taken are likely to have undergone some migration since generation from the source rock. Aromatic maturity indicators indicate that the seep was generated and expelled from a moderately mature source interval (Vitrinite Reflectance (VR<sub>equiv</sub> = 0.80%) and saturated biomarker maturity indicators support this level of maturity (Wythe and Watson, 1996). Revill (1996) classifies maturity of between 0.57–0.62% for the swab sample and 0.61–0.70% for the bitumen sample.

Revill (1996) states that the source is likely to be a Permian mudstone containing Tasmanite Oil Shale and Wythe and Watson (1996) indicate that the oil seep is likely to have been derived from a mixed algal/terrestrial source containing abundant *Tasmanites* alga that was deposited in an anoxic, marine environment.

The value of VR<sub>equiv</sub> = 0.80% given by Wythe and Watson (1996) is not anomalous and does fit the regional maturity trend. However, it is still difficult to assess whether this hydrocarbon was expelled as a result of localised heat from dolerite emplacement or from a more widespread burial maturation.



The models put forward by Wythe and Watson (1996) and Revill (1996) suggest that the oil seep consisted of a low sulphur oil derived from a moderately mature *Tasmanite*-rich source rock. The oil then migrated into the late stage dolerite joints when they were open. This can be supported by the data.



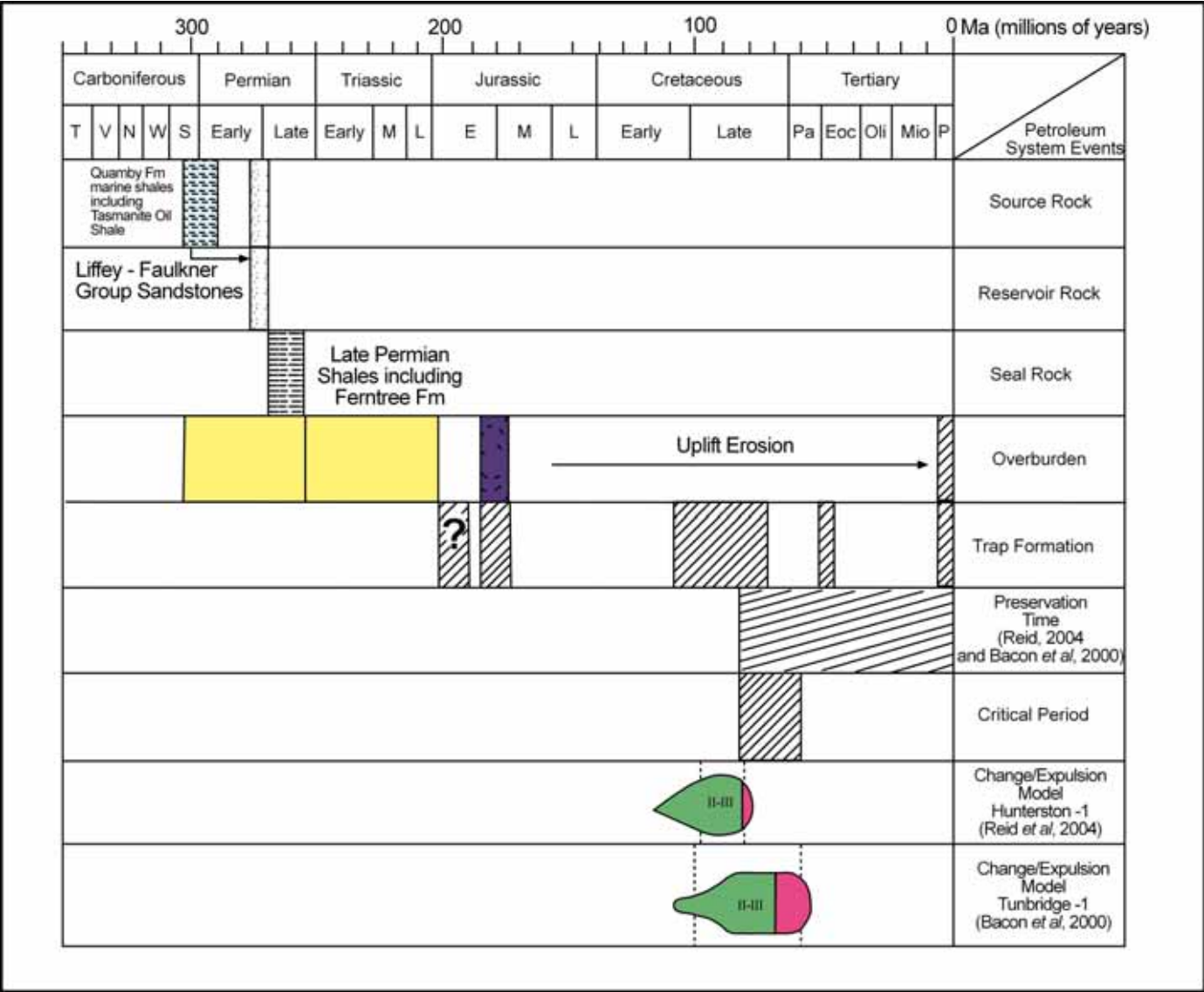


Figure 15 - Hypothetical Permian Petroleum System (modified from Wakefield, 2000)



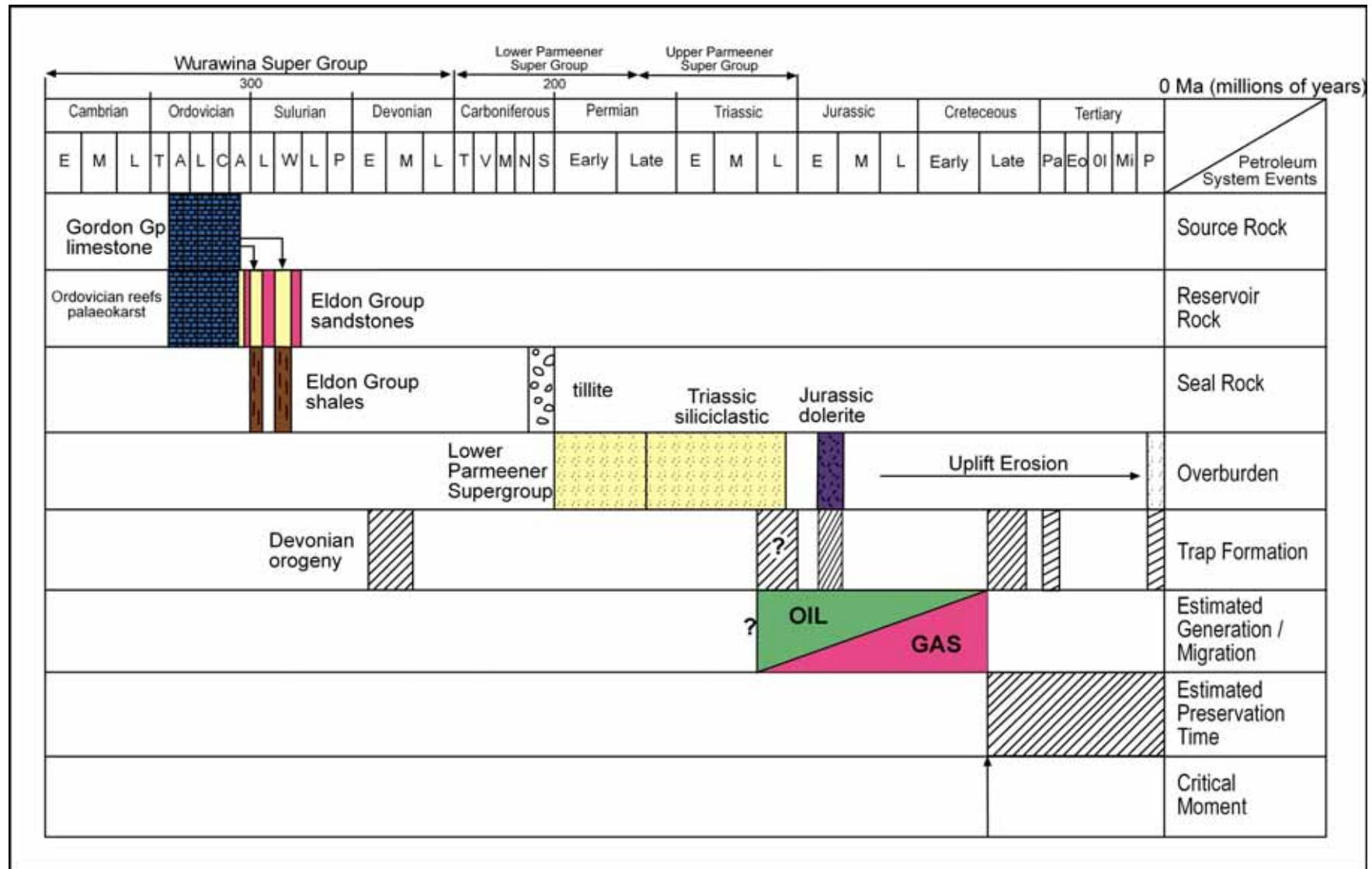


Figure 16 - Hypothetical Pre-Carboniferous Petroleum System (modified from Wakefield, 2000)



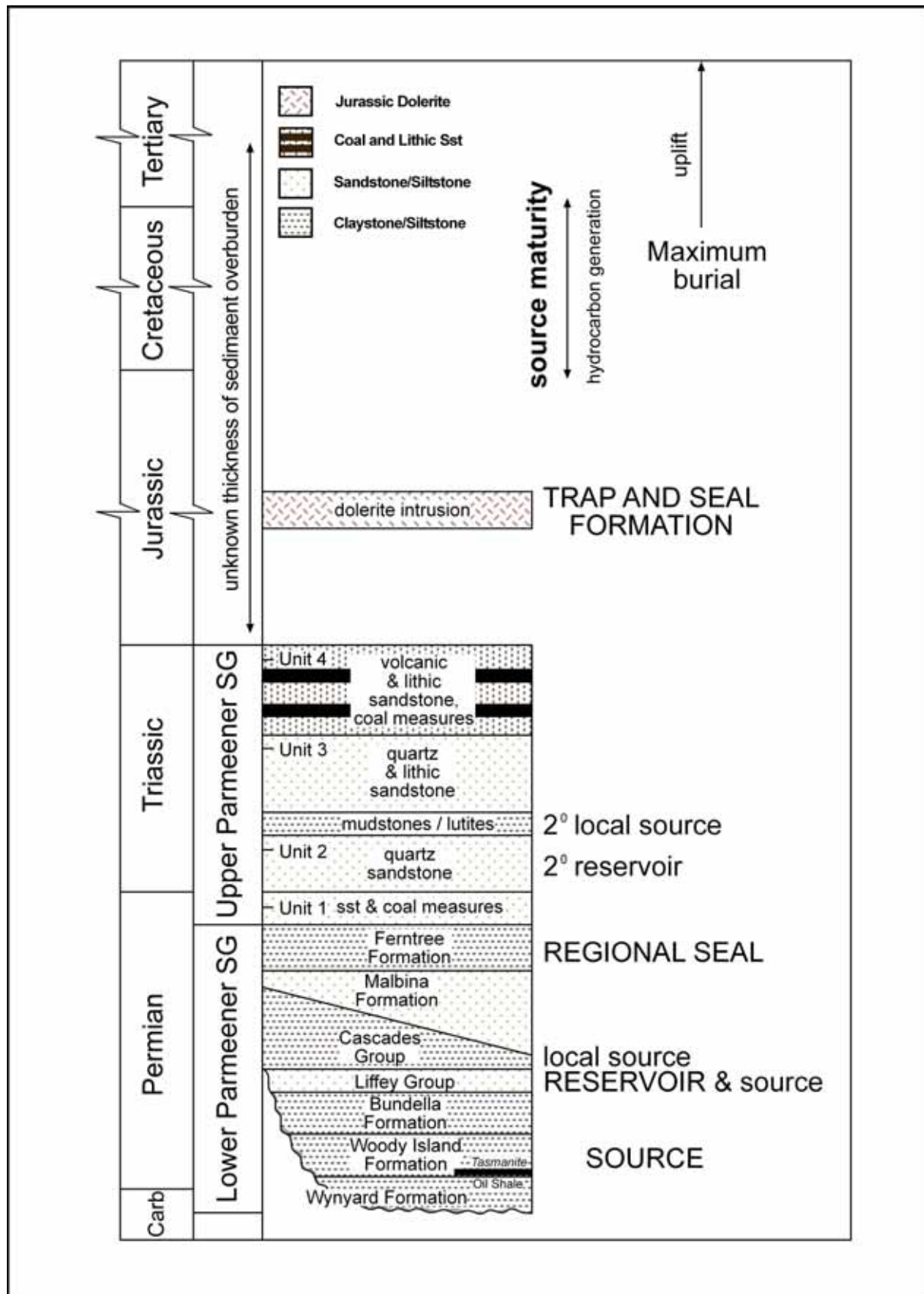


Figure 17 - Stratigraphic model of Permian plays (modified from Reid and Burrett, 2004)



## 4.2 Source Rocks

### 4.2.1 Pre-Carboniferous (Larapintine) Source Rocks

The oldest potential source in the Tasmania Basin is Ordovician, however, organic richness data has yet to be adequately verified. Measurements of total organic carbon (TOC) and Rock-Eval (RE) have previously been made on a few samples of limestones within the Gordon Group but these data do not indicate that these limestones have any viable source potential (Reed and Beauchamp, 2001). However, more recent analyses of the shalier Gordon Group facies indicates higher TOC values, some above 1.0%, suggesting the possibility of source rocks in this interval.

Two samples, one from Queenstown and one from Ida Bay (Volkman, 1989; Bendall *et al*, 1991), were analysed and the distribution of n-alkanes was typical of mature hydrocarbons (Bacon *et al*, 2000). Ordovician aged rocks provide a source in other parts of Australia (Amadeus and Canning Basins) and other parts of the world.

Sediments in the Gordon Group are reported to have a petroliferous odour when struck by a hammer, and bituminous films have been seen along stylolites, providing evidence of generation and migration (Chester, 2003). Further occurrences of pyrobitumen have been sighted at road cuttings within and proximal to the limestones east of Queenstown. A sample of upper Gordon Limestone from the Florentine Valley liberated gas on crushing.

Black shales of the Benjamin Formation have poor to good source potential. TOC in these rocks ranged from 0.43 to 1.83 (poor to fair), averaging 0.78%, with 80% of the samples below 1%.  $T_{max}$  ranged from 439° to 546° and averaged 490°. Most of these samples (66%) were in the oil window and the remainder were in the gas generation window (Chester, 2003).

### 4.2.2 Permian (Gondwana) Source Rocks

#### 4.2.3 Early Permian Tasmanite Oil Shale (Basal Woody Island Formation)

The Permian aged Tasmanite Oil Shale is the best known source rock in Tasmania. It has been previously documented as having TOC content ranges from good to very good, containing from 2.5% to over 30% (Burrett and Reid, 2004) and a hydrogen index between 700-1000mgHC/gTOC. These high measurements come from thermally immature sediments and represent the hydrocarbon potential of Tasmanites-rich source rock within Tasmania.

S<sub>1</sub>+S<sub>2</sub> levels are high (from 10 to 900 mg/gm of rock) and although these bands are thin they can produce up to 3.7 bbls/m<sup>2</sup> (Demaision and Huizinga, 1991).

The distribution of the Tasmanite Oil Shale, as known at present, is shown in Figure 12. It is only known to occur in the north and eastern areas of the basin. The Tasmanite Oil Shale was not present in several wells in the south of the Tasmania Basin. It appears that several parts of the basin were sufficiently low in oxygen for some algal beds to be preserved.

The Tasmanite Oil Shale is a rich concentration of alga type kerogens present in the lower part of the Woody Island Formation. The individual algal bands range from 3 to 30 centimetres thick. The Tasmanite Shale was mined in the 1920's and 1930's from immature outcrops in the north of the basin. Various petroleum products were distilled, with a total production of over 1000 bbls of heavy crude with an API averaging 20°.

#### 4.2.4 Early Permian Woody Island Formation Siltstone

The Woody Island Formation is present over a wide area as shown in Figure 12. Most of the Woody Island Formation is a carbonaceous siltstone, deposited in the proximity of retreating glaciers and contains glacial pebble dropstones. The formation has poor to fair source potential with TOC values of 0.5 to 2% and contains Type III gas prone kerogens. Most of the siltstones have a low to fair S<sub>1</sub>+S<sub>2</sub> (0.2 to 2) (Reid, 2004).



Organic rich shale show a higher TOC of >2 to over 10, with HI correspondingly higher (Reid and Burrett, 2004).

In Bicheno 10, ten source rock quality samples have been tested. Of the ten samples, three rank as good potential (TOC 1-2 %) Type III source rock, one ranks as good potential Type II/III (TOC 1.72%, HI 300) and one ranks as very good potential Type II (TOC 2.42%, HI 433). Another four samples rank as fair (0.5 -1% TOC) Type III. This implies a mixed gas/oil source with a generally higher proportion of gas-prone source.

It is clear that the basin produced marine organic matter and it was preserved in thin highly concentrated beds, eg. Tasmanite Oil Shale beds. The quality of the Woody Island siltstone at Bicheno 10 and other locations suggest that the basin had favourable conditions for the preservation of other organic matter.

T<sub>max</sub> for the majority of the Woody Island Formation samples analysed varies from approximately 430°, which is below the oil window, and up to 465° which is well within the oil window. Similarly, vitrinite reflectance is shown to range from Ro=0.55% (marginal) in the north east at Bicheno, to Ro=0.8% at Lonnavele and Ro=1.3% (gas and condensates) at Styx Valley in the southwest (Reid, 2004).

#### **4.2.5 Permian Liffey-Faulkner Group**

The Liffey-Faulkner Group is a non marine sequence within the overall marine sequences of the Lower Parmeener Supergroup. It consists of carbonaceous siltstone and sandstones and also includes coal horizons in northern Tasmania.

The carbonaceous siltstones have less than 5% TOC, whereas the coal horizons have up to 65% TOC. The majority of the disseminated organic matter contains Type III kerogens. The disseminated carbonaceous material shows a similar characteristic and level of maturity to the underlying Woody Island Formation. However, the calculated yield from this potential source is three times lower at 0.87 bbls/m<sup>2</sup>, primarily due to the thinner interval (Reid and Burrett, 2004).

A study of the Liffey-Faulkner Group samples from Hunterston-1 showed the presence of total organic matter of 0.22 to 2.9%. Some coal is present. The HI (hydrogen index) is < 78 in all cases, indicating that there is gas potential. As the Liffey-Faulkner Group at Hunterston-1 has been over matured by contact metamorphism and perhaps burial maturation, the full potential of these rocks may not be indicated by these results.

#### **4.2.6 Late Permian to Triassic Coal Measures**

The Upper Parmeener Subgroup contains up to 600 metres of fluvial sandstone, including significant coal measures. These include the Cygnet Coal Measures in the northeast, and equivalents (Unit 1), and the Late Triassic lithic sandstones and coal measures (Unit 4).

The Cygnet interval comprises carbonaceous sandstones with interbedded cross-bedded and ripple-laminated channel sands that lie between the underlying Lower Parmeener Supergroup and the overlying massive sandstones of Triassic age. In southern Tasmania, the sandstones are feldspathic and grade into mudstones and thin coal seams. The interval varies in thickness and is restricted in extent, but is reported to be up to 100 metres thick.

The upper most Triassic coal measures are up to 300 metres thick and are dominated by volcanic lithic sandstones and minor claystones. These also contain commercial coal reserves in north-eastern Tasmania.

The following results are extracts from Bedi (2003). Five samples were taken from drill cores from Unit 4. Three were from the northeast of which one was a carbonaceous sandstone (Dalmayne); two were from 2 metre thick coal seams (Mt. Nicholas and Dalmayne) and two samples were of carbonaceous sandstone and siltstone from the south (Catamaran).



The TOC values are good to high ranging from 1.28 and 3.70 to 27.40 in the clastics and 25 and 63 in the coal seams. HI values are generally very low, below 100, but with one of the samples it is up to 188. This indicates Type III kerogens with a dominance of inertinite.

Vitrinite Reflectance from Catamaran, in the south, is in the wet gas to dry gas window ranging from 1.18% to 1.41%.  $T_{\max}$  values of 523°C and 535°C show that these are over-mature for oil generation.

Vitrinite Reflectance from the samples taken in the northeast have  $R_{v_{\max}}$  ranging from 0.59 to 0.93 and the corresponding  $T_{\max}$  values from 438°C to 491°C. The high values are from one of the coal samples and represent maturity within the transition from the oil to wet gas window.

### 4.3 Maturity Indicators and Burial History

In summary, understanding the maturity and expulsion timing of the basin is difficult due to the influence of dolerite on vitrinite maturity, the scarcity of easily identified vitrinite, the mixture of maturity indicators and the apparent major uplift and erosion or “unroofing” across the basin.

### 4.4 Permian Maturity Indicators

Bacon *et al*, 2000, observe an obvious bimodal distribution in VR data due to the over maturity of many samples due to heat from Jurassic intrusions. Reid (2004) produced a basin-wide maturity map (Figure 18). The main feature of this map is the lower maturity in the north of the basin and the very reliable low maturity in the east at Douglas River. Confidence in the maturity of samples at Hunterston-1 and Styx Valley is qualified due the presence of dolerite at these locations.

### 4.5 Timing of Maturity

Bacon *et al* (2000), following on from the apatite fission track (AFT) work of O’Sullivan and Kohn (1997) and Sutherland (1977), suggest the maximum burial of the basin occurred just before 100 Ma. This puts useful constraints on any attempt to model the burial history and the maturity of the source rocks.

The burial history was modelled at Tunbridge-1 and Douglas River (Bacon *et al*, 2000) and at Hunterston-1 and the Styx Valley (Reid, 2004). In the Tunbridge-1, Hunterston-1 and Styx Valley models, it was suggested that a peak maturity of 1.2 to 1.3 VR% was reached during the second half of the Cretaceous. In all models, a constant 35 degrees C/km has been assumed from the Permian to the present, for useful simplification. Models presented in Reid *et al* (2004) were described by the author as “best case” and were similar to those in Bacon *et al*, (2000) but indicated a charge later in the Cretaceous. The timing of both models is illustrated in Figure 16.

The fundamental feature of these models is the maximum burial in the Cretaceous, which is constrained by the AFT data. This implies expulsion at around the Middle Cretaceous just before the entire basin began to uplift and perhaps tilt in various directions while expulsion was occurring. This timing implies the risk that hydrocarbons were formed before traps, or before traps were stabilised. However, the uplift may have been very gentle, preserving the existing traps. The very limited structuring of the Carboniferous to Jurassic seems to give support to this idea. Extension in the Middle Tertiary and compression at the close of the Tertiary presents some trap preservation risk. Long preservation times are of course possible in Palaeozoic basins (e.g. Amadeus Basin in Central Australia, and the Appalachian Basin in the USA).

Recent surface heat flow data released from the Tasmanian Geothermal tenement to the east of the SEL13/98 block, suggests that a higher than previously modelled geothermal gradient could exist in Tasmania. Whilst this data may not be directly indicative of the thermal history expected within the central part of Tasmania. It does throw some doubt on the timing



of Permian source rock maturity, and could be encouraging for any late maturation and expulsion. For example Cenozoic deposition in the order of hundreds of metres occurred in the Longford Sub-basin. This deposition combined with the recent high heat flows recorded in eastern Tasmania, could place any immature Permian source rocks back in the oil window.

#### 4.6 Pre-Carboniferous

Not all of the Pre-Carboniferous section in southern Tasmania is over matured at the present day (Burrett, 1992) (Figure 8). However, there is still a risk that Pre-Carboniferous rocks were expelled before the stabilisation of traps during the Tabberabberan Orogeny.

No models of this concept have been made because there was not enough constraining data available. However, we can infer from the burial models of Bacon *et al* (2000) in Figure 19 and Reid (2004) that these rocks (lying some kilometres deeper than the Permian) could have re-entered the oil gas window in the Mesozoic to Cenozoic.

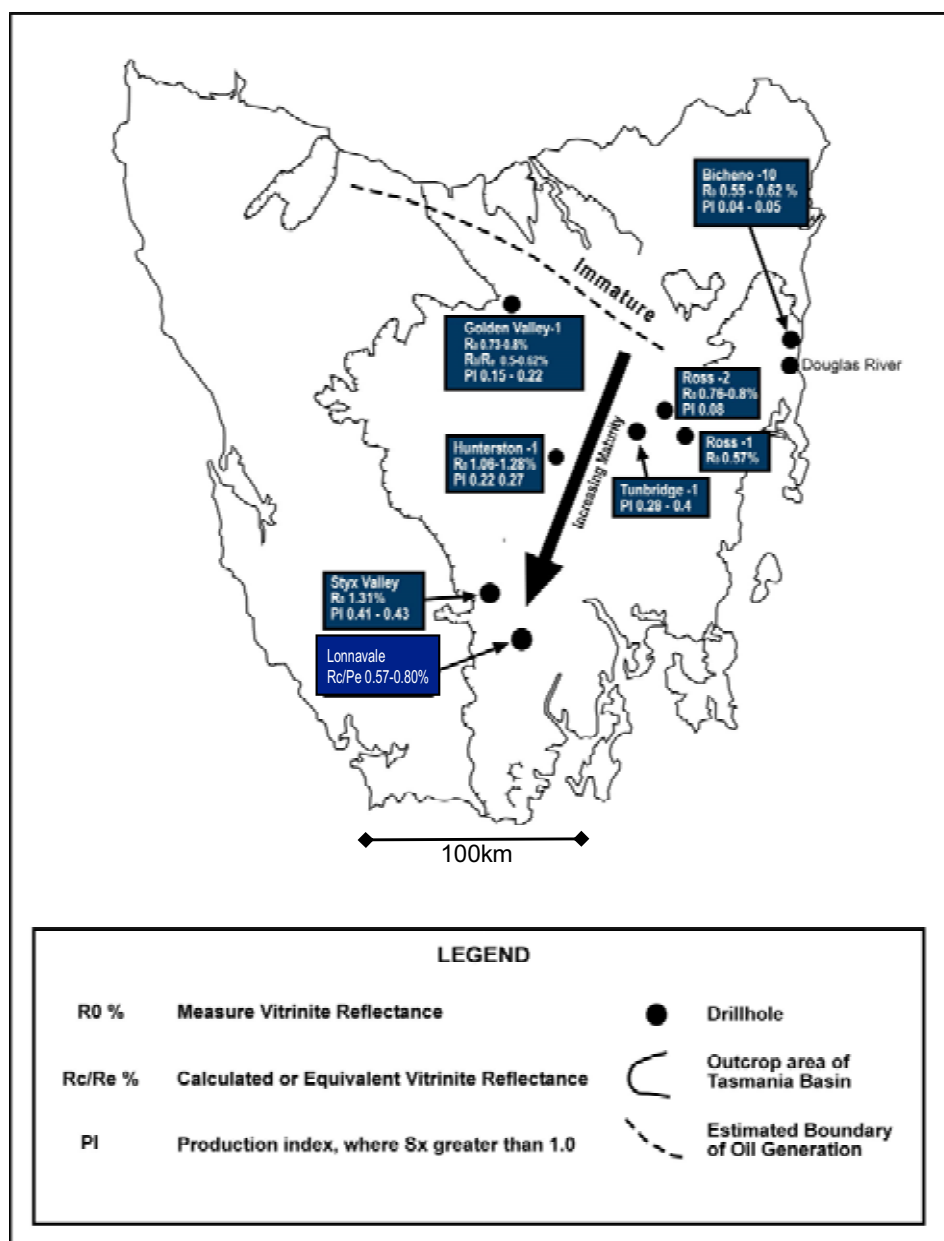


Figure 18 - Maturity of the Lower Permian Super-group (modified from Reid, 2004)



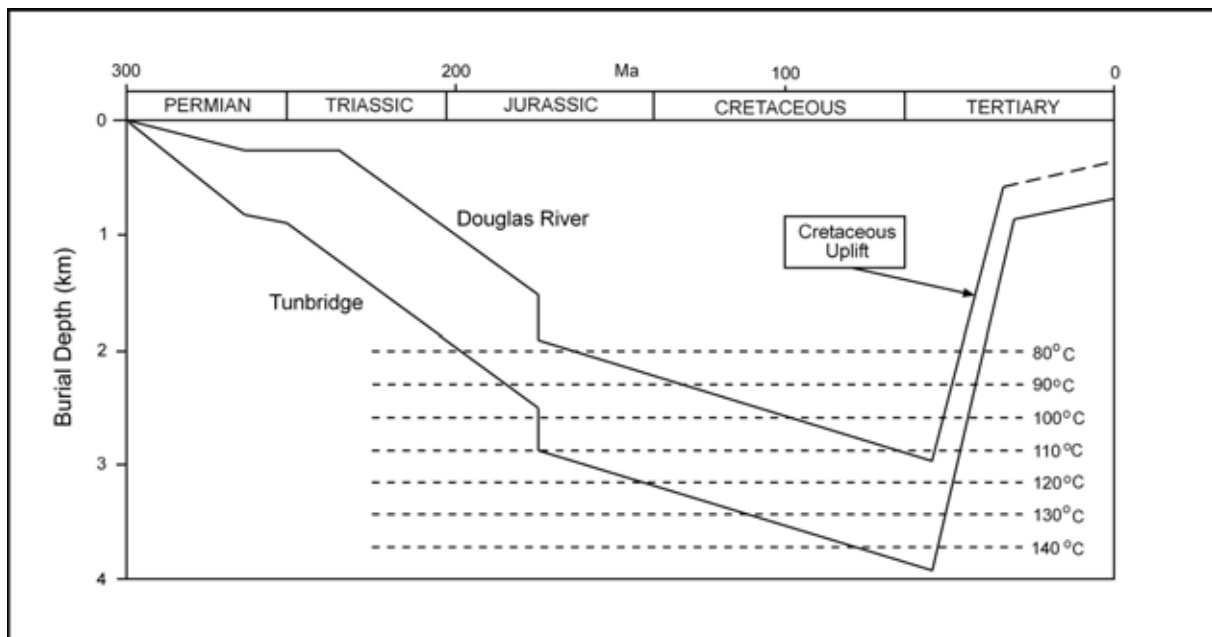


Figure 19 - Burial model modified (from Bacon *et al*, 2000)

## 4.7 Reservoirs

### 4.8 Pre-Carboniferous (Larapintine) Reservoirs

The primary reservoirs within the Larapintine Petroleum System are carbonates of the Gordon Group and the Arndell Sandstones of the Tiger Range Group. Leached and dolomitised limestones, as well as reefal and fractured reservoirs could be anticipated but not much is known about these sequences. Likewise, the overlying sandstones of lower Eldon Group are potential reservoirs but to date, no accurately documented information is available (Chester, 2003. P159-160).

Palaeokarst features have been reported within the Gordon Group at various locations including Eugenana, Florentine Valley, Tyenna, Ida Bay, Lake Sydney and Moina. This implies that any Gordon Group limestone sub-aerially exposed before Parmeener Supergroup deposition may also have developed karst features. An Ordovician carbonate reservoir perhaps karstified with cavernous porosity and enhanced with fractures is also a Pre-Carboniferous reservoir possibility. There is no porosity/permeability data on such a rock in the Tasmania Basin. The notion of a karst reservoir preserved “at depth” is speculative at this stage. However, GSLM is proposing to drill one or two wells in 2008 to target the Gordon limestones, which could greatly improve the knowledge of the Pre-Carboniferous.

The Arndell Sandstone conformably overlies the Gordon Group limestone, in the Tiger Range area. The sandstone sequence is approximately 250 metres thick, but is a very fine-grained sandstone with a poor porosity of only 5%.

The expected depths of burial and temperatures in the Pre-Carboniferous section would severely reduce porosity and permeability in any siliciclastic reservoir (e.g. Eldon Group). Given the deformation of the section during the Devonian, it is reasonable to postulate that fractures are present and could enhance reservoir quality and aid hydrocarbon recovery. Recovery from such a reservoir, typically will be less than 25%. Gas recovery would be



much higher. To date, there is no core or log from these intervals “at depth” to support these ideas.

## 4.9 Permian to Triassic (Gondwana) Reservoirs

### 4.10 Lower Parmeener Supergroup “Freshwater Facies”

Within the Lower Parmeener Supergroup, there are a number of sandstone intervals with good reservoir characteristics. These sandstones are considered to be extensive and porosities vary, but can be over 20%.

The potential reservoirs in the Lower Parmeener Supergroup are summarised in Table 6.

<b>Lower Parmeener Supergroup</b>	<b>Formation</b>	<b>Porosity (%)</b>	<b>Thickness (m)</b>	<b>Environment</b>
	Risdon Sandstone	13.7- 14.7	4 - 8	barrier complex shallow marine shelf.
	Minnie Point Formation	14.1- 16.6	5 – 180	shallow marine shelf
	Rayner Sandstone	3.97	30 – 100	? basal conglomerate
	Liffey / Faulkner Group	12.8 - 27	6 – 50	coastal channel
	Bundella Formation	7.4- 22.3	70 - 135	shallow, marine shelf

**Table 6 - Porosity of sandstone units within the Lower Parmeener Supergroup (modified from Woods, 1995)**

The Risdon Sandstone is prevalent throughout the study area, with a thickness of usually 4 metres to 8 metres. The Rayner Sandstone and Malbina Formation samples exhibit a relatively immature mineralogy compared to the more porous samples. The Rayner Sandstone is highly bioturbated and poorly sorted in comparison to the very well sorted, channel facies of the Faulkner Group.

The Minnie Point and Malbina Formations are also extensive throughout the south east of the study area, but become much thinner further to the south. Well to moderately sorted sandstone units occur at the base and top of the formation. Porosity varies markedly between sandstone units, which are up to several metres in thickness.

The Permian Liffey/Faulkner Group reservoirs are widespread. The depositional environment of the Liffey/Faulkner Group (Maynard, 1996) includes glacial, fluvial, coastal and marine depositional environments. The section is about 30 metres thick within the basin. In southern Tasmania around Granton, it exceeds 40 metres. In central Tasmania, it is divided into 7 units with a total thickness of 20-35 metres, with varying reservoir porosity (Table 7). Continuity is undetermined and the reservoir potential is poorer for the deeper parts of the basin.

The mature mineralogy of the high energy channel sand facies occurs with coastal plain facies and consists primarily of very well sorted, fine to medium-grained sandstone. Good primary porosity and permeability may be expected. Reid and Burrett (2004) report that porosity for the Liffey Group ranges up to 27%. The sandstones are often laterally extensive



point bars within a braided stream environment. These facies often grade or pinch-out into well consolidated siltstone and shale, thus providing stratigraphic traps for the accumulation of hydrocarbons (North, 1985).

The available permeability data (Reid, 2004), suggests Permian formations are marginal oil reservoirs. In several wells, namely Hunterston-1 and Shittim-1 this may be attributed (in some part) to the influence of intrusions. Petrography at Hunterston-1 indicates the presence of silica overgrowth and secondary carbonate cement. Wells without obvious influence from intrusions on reservoir quality are Ross-1 and Tunbridge-1 (Reid, 2004 and Maynard, 1996). These wells do not show very high permeability. It is very likely that the reservoir is generally poor to fair quality and the presence of dolerite can reduce it even further. The best permeability by far, of 166 mD, is from the far eastern side of the onshore basin at a shallow depth in the Douglas River area. The next highest permeability is 8.8 mD at Ross-1. This suggests that low permeability (1 to 10 mD) is quite likely. Data from Hunterston-1 suggests the presence of intrusions can cause permeability to be below 1 mD. The Permian sequence as sampled does not represent a very effective oil reservoir.

This poor reservoir quality is consistent with the explanation for the AFT measurements that suggest kilometres of overburden were eroded between 100 and 50 Ma. The models of Reid (2004) and Bacon *et al* (2000) suggest the Permian reservoirs were buried to a depth of 4,000 plus kilometres and exposed to temperatures over 100 degrees C for almost 100 Ma. Silica overgrowth occurs at temperatures over 100 degrees C. This aside, there is the risk of direct and/or indirect reduction of reservoir quality by intrusions. There may be a higher risk in areas where carbonates are present in the Ordovician, as a thin section examination of the Liffey Group from Hunterston-1 indicated carbonate cements. The source of this carbonate is thought to be the carbonates intersected in the Precambrian section of the well.



	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
<b>Lithology</b>	white-grey sandstone	interbedded white-grey sandstone, dark grey mudstone	white-grey sandstone	heavily bioturbated sandstone to mudstone	white-grey sandstone	interbedded white-grey sandstone, and dk grey mudstone	heavily bioturbated sandstone
<b>Composition</b>	qtz (75%), feldspar, mica, clay		qtz (>75%), feldspar mica, clay	qtz (70%), feldspar mica, clay	qtz (>70%), feldspar mica, clay		qtz (70%), feldspar mica, clay
<b>Grain Size</b>	medium to very fine	medium to silt	fine to very fine	medium to very fine	coarse to very fine	medium to silt	medium to very fine
<b>Grain Morphology</b>	sub-angular to sub-rounded		sub-angular to sub-rounded	sub-angular to sub-rounded	sub-angular to sub-rounded		sub-angular to sub-rounded
<b>Sorting</b>	well sorted		well sorted	Mod-poorly sorted	well sorted		Mod-poorly sorted
<b>Framework</b>	close packed		close packed	relatively open	close packed		relatively open
<b>Cement</b>	minor silica		minor silica	minor silica (mainly clay matrix)	minor silica & some carbonate		minor silica (mainly clay 1 matrix)
<b>Porosity</b>	10 -15% (1-5% at Poatina)	variable	2 -5% at Poatina, up to 25% at Ross	9 -27%	10 -25%	variable	5-7%
<b>Thickness</b>	10m (Golden V.) to 1m	1 to 11m	5 to 11 m	3 to 9m	ave 11 m	1 to 3m	3 to >7m

**Table 7 - Summary of the characteristics of units in the Liffey/Faulker Group reservoirs (modified from Maynard, 1996)**

In central Tasmania, the Liffey/Faulker Group was intersected in several drill holes around central Tasmania near the axis of the Tiers Fault including Golden Valley, Great Lake Tail Race Tunnel, Great Lake Penstock at Poatina, Ross, Tunbridge Tier and Bothwell.

Fissile and non-fissile siltstones comprise the Bundella Formation. These have a consistent thicknesses and the sandstones exhibit fair to good porosity. The Bundella Formation was deposited on a shallow, low energy marine shelf.

#### 4.11 Upper Parmeener Supergroup “Fluvial Sequences”

The Upper Parmeener Supergroup contains up to 600 metres of terrestrial fluvial sandstones. Substantial coal measures occur within Upper Triassic sandstones in the northeast of the basin and the Cygnet Coal Measure of late Permian age.

The Upper Parmeener Supergroup has been divided into four potential reservoir units. The Upper Permian carbonaceous sandstone, Unit 1 (equivalent to Cygnet Coal Measures), is up to 50 metres thick and has poor to moderate porosity (10%) (Bedi, 2003).

The Triassic quartzose sandstone, Unit 2, has the best potential reservoir. It is up to 250 metres thick and has excellent porosity (23%) but only fair permeability (9.8 mD). These quartzose sandstones are characterized by authigenic quartz overgrowths with reduced porosity and lowered permeabilities. The sandstones were deposited in a braid plain environment resulting in thickly bedded clean sandstones, largely free of heterogeneities (Bedi, 2003).

The volcanic lithic sandstones with coal measures, Units 3 and 4 have poor porosity and permeability (0.08mD). Sandstones in these units are characterized by mechanical



compaction and alteration of lithic grains to a clay matrix. The volcanic lithic sandstones were deposited in a meandering fluvial environment resulting in abundant lutite intervals, which may act as seals (Bedi, 2003).

## 4.12 Seals

### 4.12.1 Jurassic

By the early Jurassic the Parmeener Supergroup formed in a shallow basin, plunging towards the south-southeast, with some gentle folding in an otherwise sub-horizontal succession (Hergt *et al*, 1989). Large volumes of tholeiitic dolerite intruded as sills into the Tasmanian crust during the Early Jurassic.

The dolerite is exposed over an area of 30,000 square kilometres and has an estimated average thickness of 500 metres (Hergt *et al*, 1989). Most dolerite intrusions have the form of a flattened cone connected to a source or sources at the deepest point. The limbs are concordant or approximately concordant with abrupt transgressions when rising to higher levels (Leaman, 1976). The metamorphic effects resulting from dolerite intrusion are usually confined to within a few metres of the intrusion margin, with the effect being more severe at the roof of the intrusions.

In the Hobart area, two or three dolerite sheets are commonly present. These sheets range from less than one metre to 300-400 metres thick. The thicker sheets in the middle or lower Permian rocks are typically 30 square kilometres in area, while in Triassic rocks, they are more extensive (Leaman, 1975). In contrast, only a single sheet, intruding the Upper Parmeener Supergroup, has been recognized in the northern part of the basin (Central Plateau, Ben Lomond and the Fingal Tier) (Bacon *et al*, 2000). A composite, 650 metre thick dolerite sheet was intersected near the Upper-Lower Parmeener Supergroup boundary in Hunterston-1 (Reid *et al*, 2003). From the interpreted seismic this sheet appears to cover many hundreds of square kilometres.

There is limited well data, fault and fracture information at depth to ascertain whether the dolerite can be classed as a regional seal. At depth, in areas away from major faults where significant fractures are not expected and the dolerite is tight, it would be considered to be a reasonable seal. Jurassic dolerite intrusive sheets can also be classed as effective seals based on their very high velocity of approximately 6500 m/s.

### 4.12.2 Permian

There is no quantitative seal data, such as Mercury Capillary Injection Pressure (MCIP), for any formation. Bacon *et al* (2000) observed that “muddy lithologies” dominate the Lower Parmeener Group. The Liffey Group is generally described as a non-marine sand in a dominantly muddy marine section. This implies a basin-wide low stand event. In a study of Liffey Group cores, Maynard (1996) interpreted inter-bedded sandstone and silt/mudstone.

Intra-formational seals are likely to be present. Like any intra-formational seal in a fluvial section, it is moderately high-risk due to limited lateral extent. The Malbina and Cascades Group Formations are also marine mudstone formations (Figure 7 and Figure 17). Potential seal units occur above the Liffey Group sandstones as siltstone in the lower part of the Cascades Group as 1-5 centimetre thick volcanic ash layers within this group (Burrett and Reid, 2004).

These Permian formations are not homogeneous and there is the possibility they are waste zones (non-commercial, extremely low permeability reservoirs). The potential for waste zones could not be assessed from the current data available. The Ferntree Formation is the result of widespread marine conditions that mark the top of the Lower Parmeener Group. It is not composed of a highly plastic clay but it seems to be a reasonable candidate for a regional seal. Unfortunately, it does not directly overlie the targeted Liffey Group (Figure 17).



#### 4.12.3 Pre-Carboniferous

Currently, there is no quantitative data on seal quality. In deformed Palaeozoic rocks such as these, it is expected that permeability will be quite low in general.

Effective fine-grained seal lithologies are possible in the marine Gordon Group limestones. As discussed previously, some form of intra-formational seal would need to be invoked in the Tiger Range Group for the Eldon Formation.

Early Permian Tillites were widely deposited on the Devonian unconformity of the Tabberabberan Orogeny. If a Mesozoic to Cenozoic charge from hypothetical Ordovician sources is supposed, the Stockers Tillite could provide a seal to sub unconformity traps.

#### 4.13 Play Types

Two main plays have been identified in the Tasmania Basin. These are the Permian/Triassic/ Cenozoic sections and the Pre-Carboniferous.

The Pre-Carboniferous Play is an untested concept. There are few boreholes that have intersected more than a few hundred metres past the Base Permian Unconformity. The seismic resolution is poor and the structural styles are complex at this level. Reservoirs would probably rely on fracture porosity to be present to enhance either the Eldon Group sandstone or karstified Ordovician limestones. The potential source rocks would be Ordovician algal-rich sediments, capable of producing oil and gas, however depth of burial and subsequent erosion is unclear.

The play elements of the Permian Play are better defined. The section seems to be quite unstructured in a regional sense and bedding has quite low dips. This lack of structure supports the idea that the regional Cretaceous uplift was gentle, thus preserving any hydrocarbon accumulations existing at the time. However, the basin is quite flat-lying, so identifying the location of a high confidence closure on the existing sparse 2D seismic data in the post unconformity sections is quite difficult.

Normal faults are more prominent in the Longford Sub-basin. These could represent Cenozoic extension which post dates the expected Mid Cretaceous charge event. Regardless of this issue, the visible faults run right to the surface, indicating recent movement, and suggesting that the fault dependent closures have a risk of being breached. These sections have a high percentage of shales, so shale smear is possible to create a fault seal. Some of these normal faults have undergone a reverse re-activation during Late Cenozoic wrench movement. However, the timing of trap formation and possible hydrocarbon expulsion would still be an issue.

A potential Triassic play has been proposed by Reid (2004) (Figure 17). There is no porosity, permeability or seal integrity data published. Coals are proposed as the source. There is minor coal which is stratigraphically low in the Upper Parmeener Group (Cygnet and Adventure Bay Coal Measures) occurring in the south-eastern, western and northern edges of the basin (Anon, 2005). The Coal Measures generally contain two seals less than 1 metre thick, with ash contents of 25 to 30% (Anon, 2005). The invoking of a wide spread "lutite" seal in the Mid Upper Parmeener (Figure 16) seems to be difficult to justify in a supergroup which consists of four cycles of fluvial to minor swamp deposition.

The best developed coal by far is at the top of the Triassic (Anon, 2005 and Bacon *et al*, 2000), making charge and seal problematic (Figure 16). As noted earlier, if the Ferntree Formation is an effective regional seal, then Permian charge will not reach the Triassic. A Triassic play would rely on fluvial intra-formational seals with their intrinsic risk.

Stratigraphic plays and traps are a theoretical possibility at any level but pursuit of them is impractical, given the limited 2D seismic coverage and variable seismic image quality.

Larger scale stratigraphic plays/traps (i.e. zero edge traps) are limited. The southern zero edge of the Liffey/Faulkner Group has been defined by MRT to be in the Cygnet area. It appears that no indications of hydrocarbons were located in any of the several bore holes



drilled. The zero edge of the Liffey Group is eroded in the west and probably in the east. The proximal portion of the Liffey Group in the north of the basin does not present a viable zero edge play, being very likely to have poor top seal. Once again, such plays are inherently high risk, and require a very sharp transition from reservoir to good seal rock. Helium was detected in the Jericho-1 and Shittim-1 wells. There is no known structure at either of these wells. It is assumed this gas has made its way, along with hydrocarbon gases, from Pre-Carboniferous rocks down dip.



#### 4.14 Petroleum Prospectivity

Seismic coverage is approximately 1300 kilometres of 2D data (TB01-2001; 775 km, TB02-2006; 175 km and TB02-2007 345km). To date, only stratigraphic tests and mineral holes have been drilled in the Tasmania Basin. Drilling between 1997 and 2001 was conducted by GSLM using diamond coring mineral exploration rigs to establish stratigraphy. No borehole has been drilled on a seismically defined structure.

Following integration of the 2007 gravity and seismic data into the existing database, GSLM have identified more than 15 potential drill sites targeting prospects and leads of various sizes. To date, interpretation of all the acquired seismic data has identified several fault block traps and anticlines with shallow targets in the Gondwana Petroleum System and deeper targets have been identified in the Larapintine Petroleum System. These are mainly Ordovician anticlinal structures in the Central Highlands. A total of twelve targets have been selected and evaluated within this report and are shown in Figure 20. A drilling program of the primary targets is planned by GSLM.



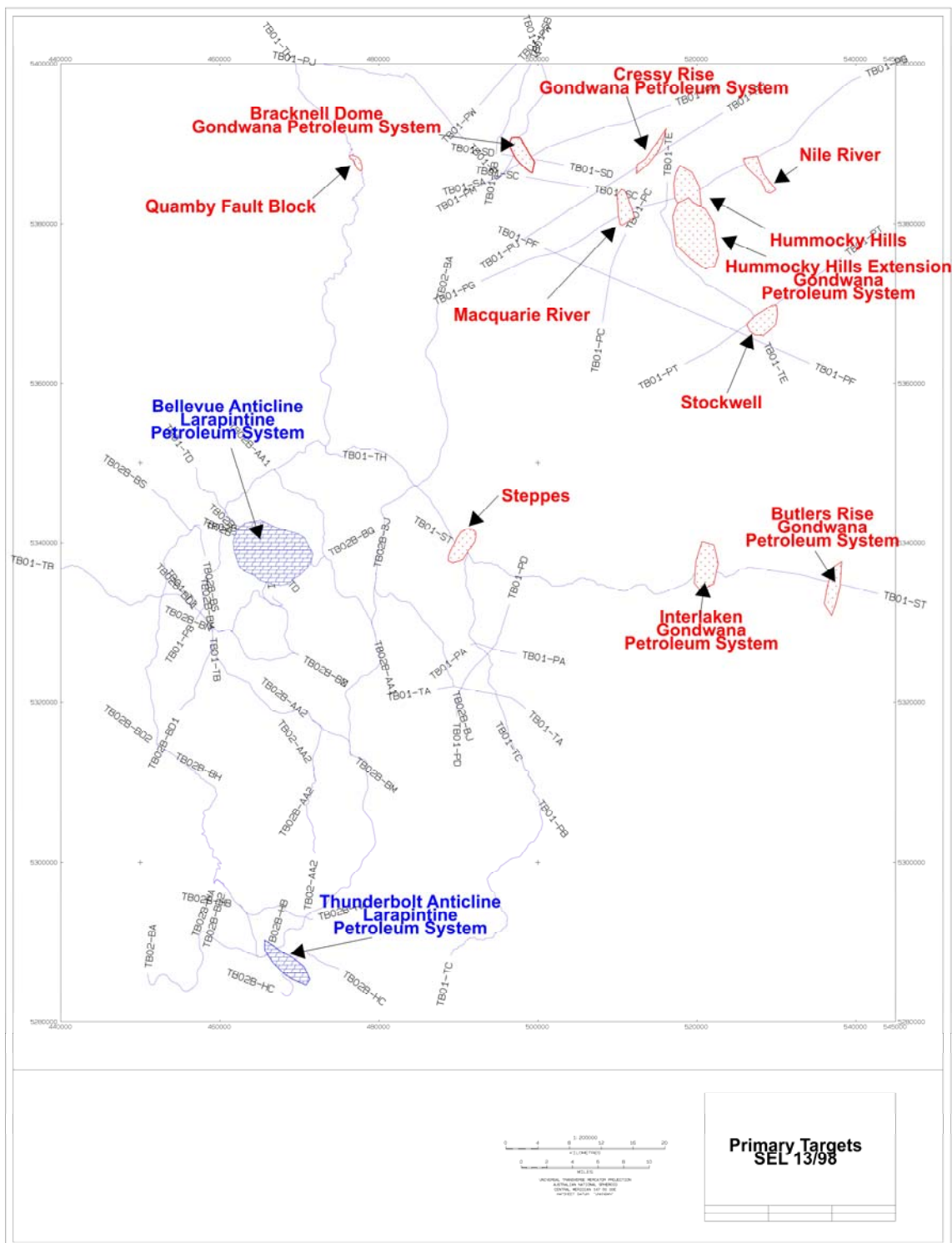


Figure 20 - Primary Targets Block SEL98



All resources are classified as Prospective Resources under the SPE/WPC/AAPG/SPEE resources classification system (Figure 21) taken from the Petroleum Resources Management System document (2007).

The risking has been calculated using a play risk and a prospect specific risk.

The play risk pertains to essential conditions (Reservoir, Seal, and source/maturity/migration timing) existing within the basin as a whole. Two play type risks have been calculated. These are the Pre-Carboniferous and the Post-Permian unconformity sequences.

The prospect specific risk is based on individual risks pertaining to the specific trap definition, reservoir, charge/migration and seal competence and is dependent on the play working.

The overall geological Chance of Success (COS) is the product of the play and the prospect specific risk.

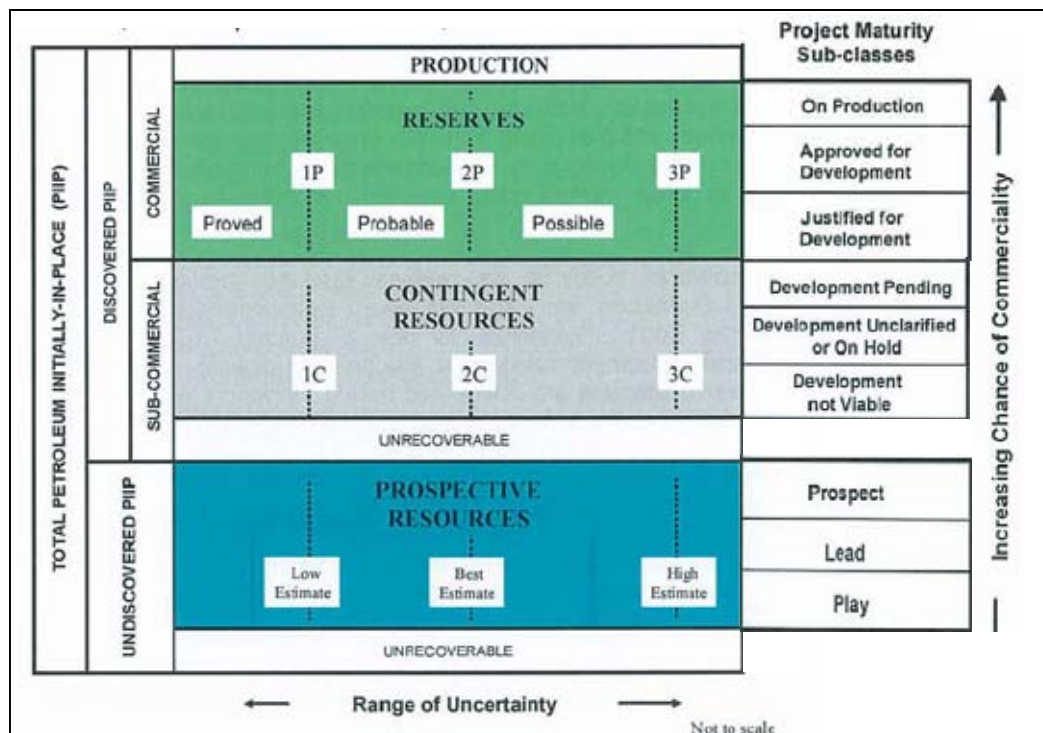


Figure 21 - SPE/WPC/AAPG/SPEE Resources Classification System



## 5. SEL 13/98 PROSPECT AND LEAD VOLUMETRICS AND RISK ANALYSIS

### 5.1 Bellevue Prospect

The Bellevue Prospect is located in the Central Plateau in central Tasmania (Figure 22). It is constrained by five 2D lines. Mapping of the upper and lower limestone units is shown in Figure 23 and Figure 24, respectively.

The approximate depth from the surface to the crest of the upper limestone unit is 2,200 metres with the lower unit crest at approximately 3,350 metres.

The gross structure is interpreted as a large compressional fold caused by a deep seated detachment. Figure 25, Figure 26 and Figure 27 show seismic examples through the Bellevue anticline.

Two potential reservoirs have been mapped with 4-way closure. As no well control exists at these levels, the interpretation of the potential reservoirs are based on seismic character.

Silurian-Devonian, Triassic and Permian reservoirs are also possible at this location and should be considered as an upside potential, however, mapping of the structural closure at these shallower levels is not possible on the current data set.

The volumes of unrisked oil for each level are presented in Table 8 and Table 9, with the full volumetric inputs presented in Appendix B

The chances of success for each level of the Bellevue Feature is presented in Table 10.

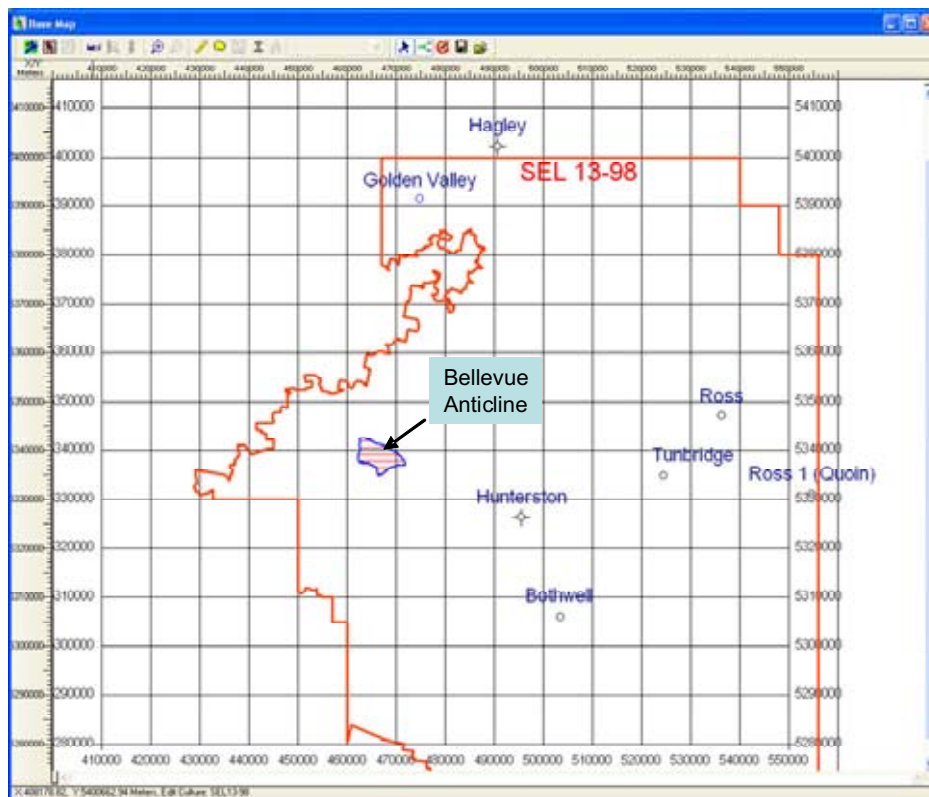


Figure 22 - Bellevue Anticline Location



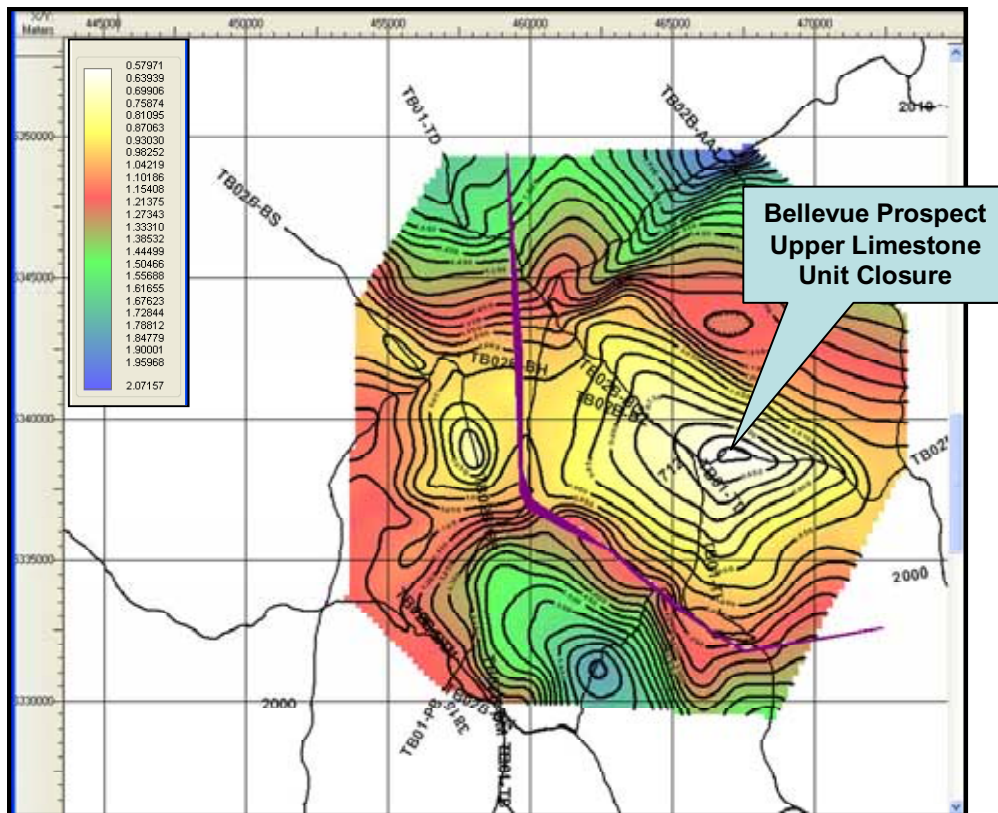


Figure 23 – Bellevue Prospect : Upper Limestone Unit Two way Time Map

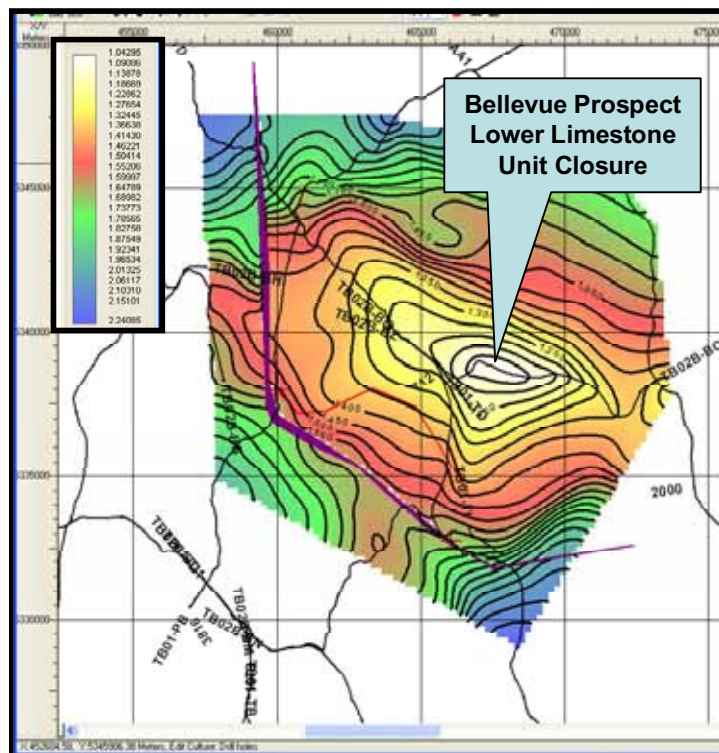


Figure 24 - Bellevue Prospect : Lower Limestone Unit Two way Time Map



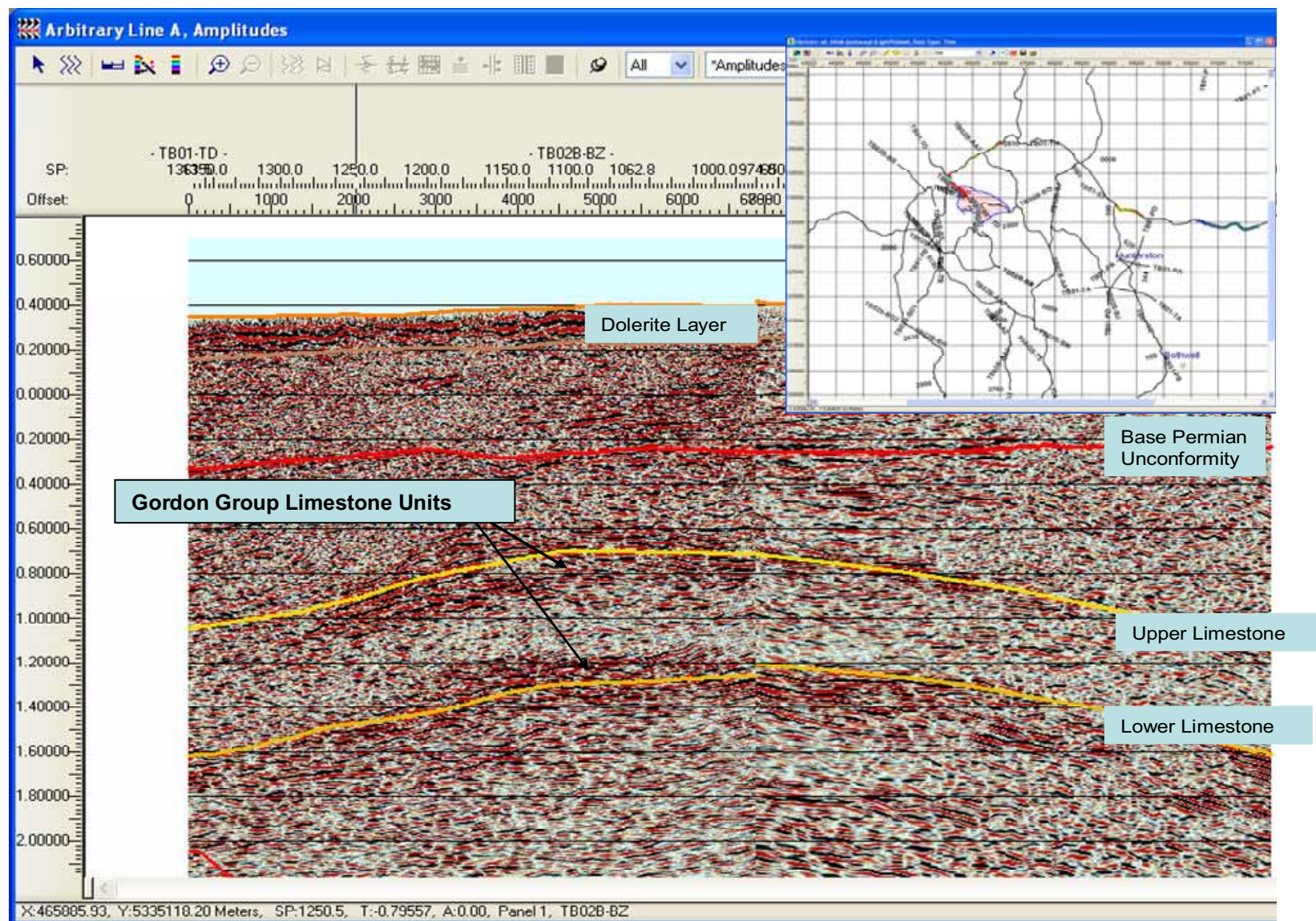


Figure 25 – Arbitrary Line North-South through Bellevue anticline



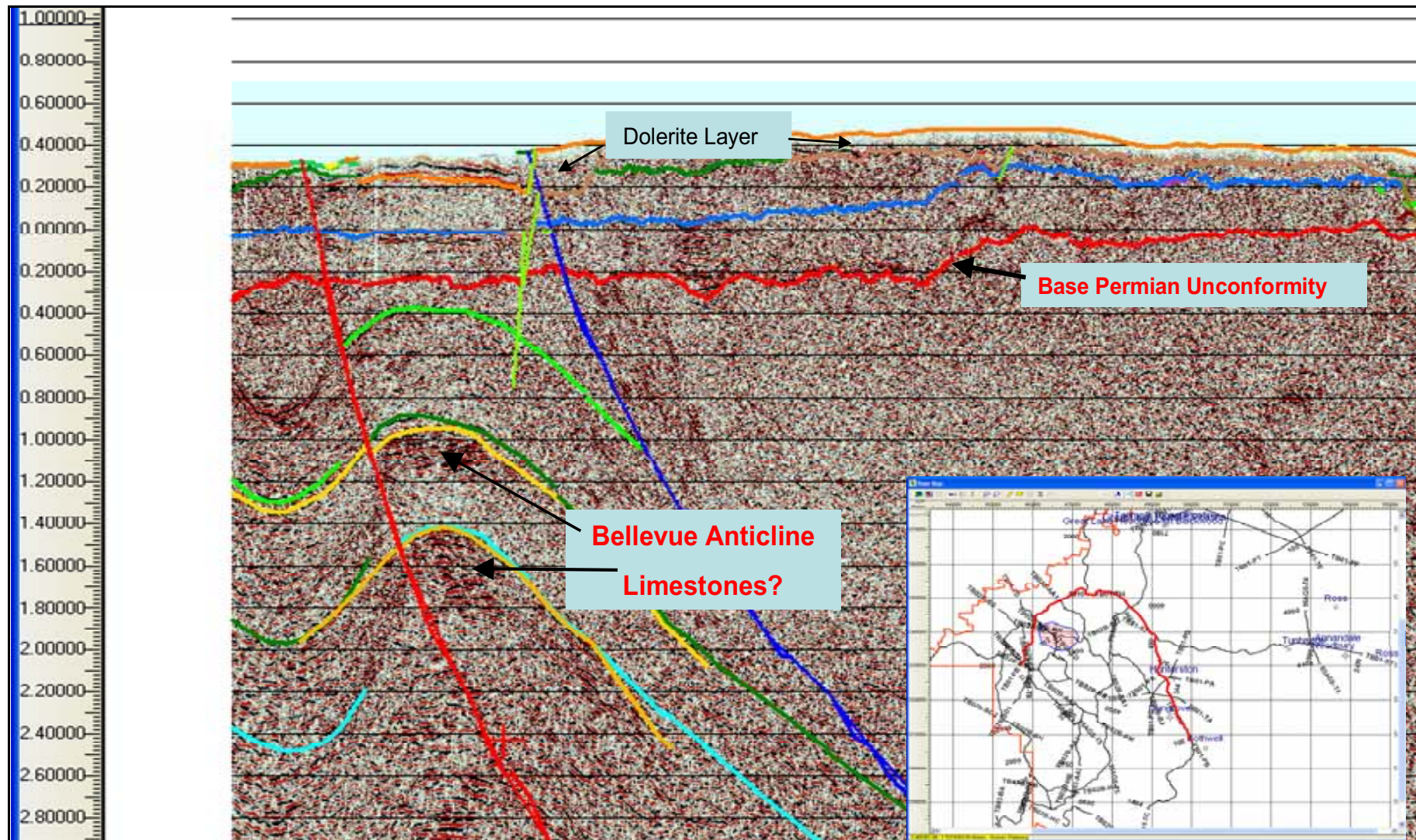


Figure 26 - Seismic line TB01-PB through the Bellevue anticline, North of Closure



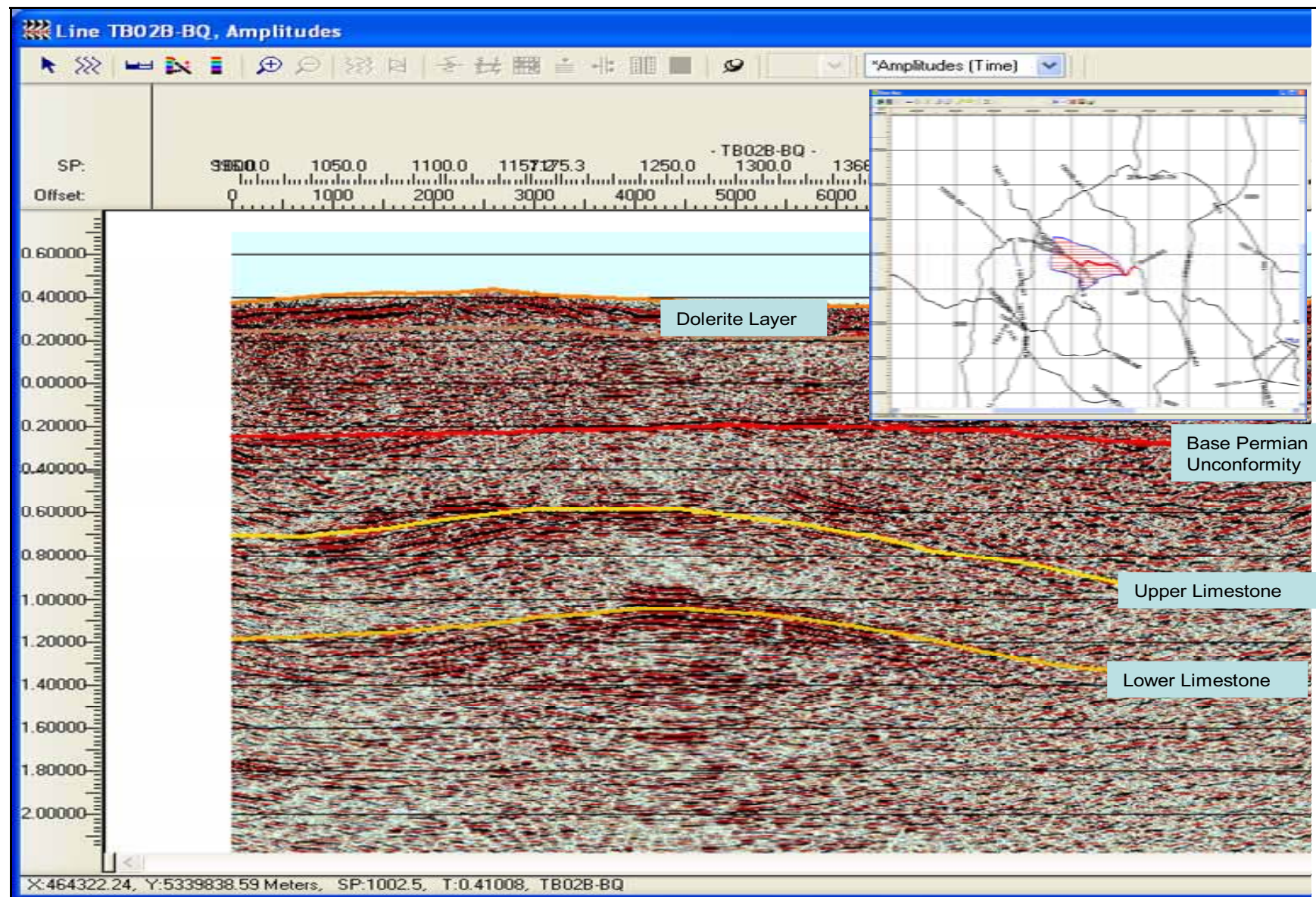


Figure 27 – Seismic line TB02b-BQ through the Bellevue Anticline



	Low Estimate	Best Estimate	High Estimate	Mean
<b>Prospective STOIP (MMbbls)</b>	160	587	1732	808
<b>Prospective Resource (MMbbls)</b>	38	151	484	220

Table 8 - Unrisked oil volumes of Upper Unit of the Bellevue Prospect

	Low Estimate	Best Estimate	High Estimate	Mean
<b>Prospective STOIP (MMbbls)</b>	100	368	1094	510
<b>Prospective Resource (MMbbls)</b>	24	95	307	139

Table 9 - Unrisked oil volumes of Lower Unit of the Bellevue Prospect

<b>Play Chance</b>	<b>Percent</b>
<b>Reservoir</b>	<b>48</b>
<b>Seal</b>	<b>100</b>
<b>Source / Migration</b>	<b>25</b>
<b>Play Chance Total</b>	<b>12</b>
<b>Prospect Specific Chance</b>	<b>Percent</b>
<b>Trap</b>	<b>70</b>
<b>Charge</b>	<b>80</b>
<b>Reservoir</b>	<b>60</b>
<b>Seal</b>	<b>50</b>
<b>Prospect Specific Chance Total</b>	<b>17</b>
<b>Overall Chance of Success</b>	<b>2.0</b>

Table 10 - Chance of success of the Bellevue Prospect

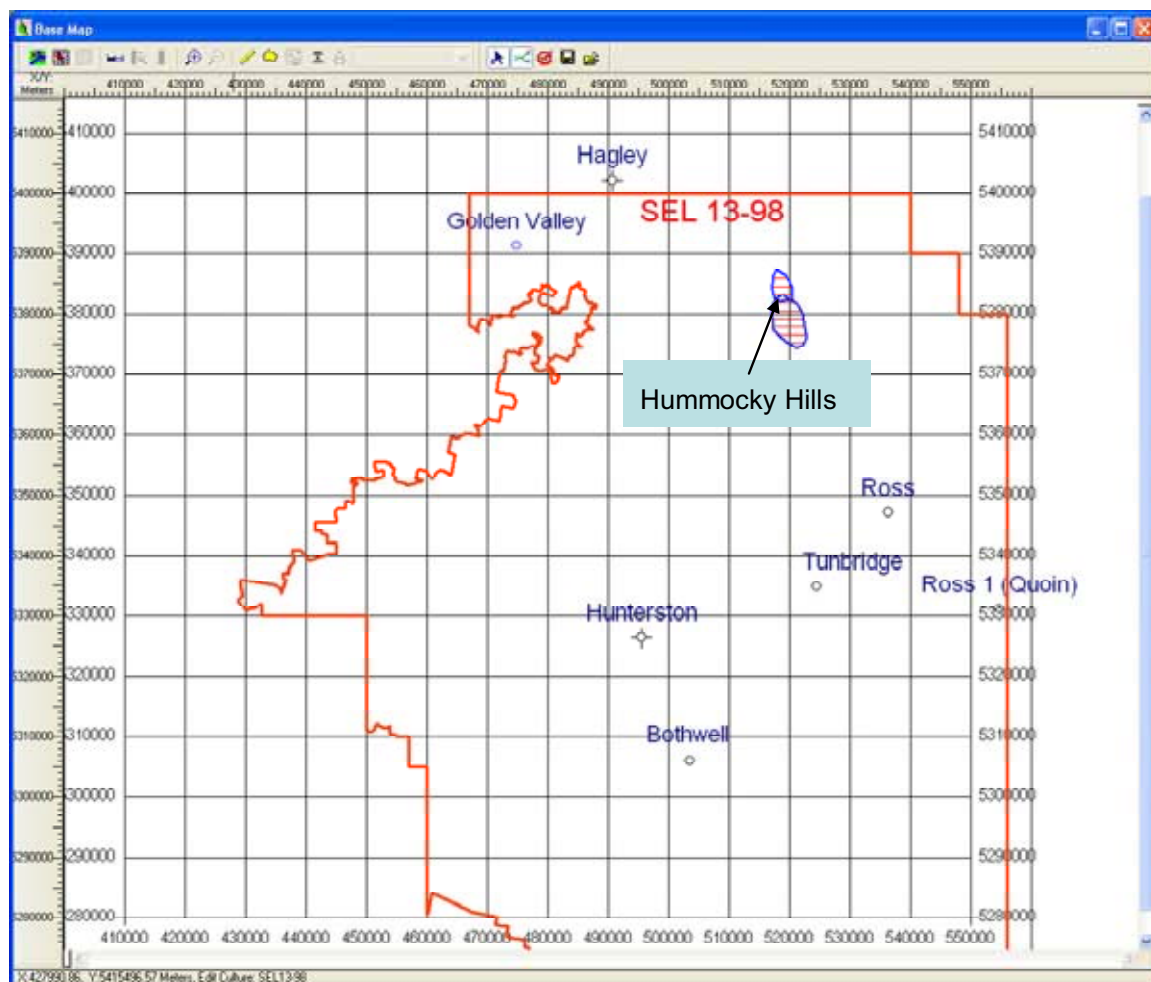


## 5.2 Hummocky Hills Lead

The Hummocky Hills Lead is located in the northern part of the block (Figure 28). The lead is defined on one 2D seismic line, (Figure 29). This line depicts an Early Cenozoic rotated fault block, possibly forming an up-thrown fault closure. The potential reservoirs are within the Triassic and Permian, namely Unit2, Unit1, Palmer Sandstone, Garcia Sandstone and Liffey Group. The surface geology suggests that the rotated fault block may also be present below the outcropping dolerites of the Hummocky Hills, (Figure 30). It is unclear if the Dolerite section thickens towards the Hummocky Hills outcrop or is conformal to the underlying reservoir units. If the dolerite is a consistent thickness then the crest of the lead could be under the present day topographical high and make the structure relatively large. It is likely that forward modeling of the gravity data or further seismic acquisition over the main outcrop could refine the structure.

The volumes of unrisked oil based on the likely size and geometry of the trap are presented in Table 11, with the full volumetric inputs presented in Appendix B

The chances of success for the Hummocky Hills Lead is presented in Table 12.



**Figure 28 - Hummocky Hills Location**



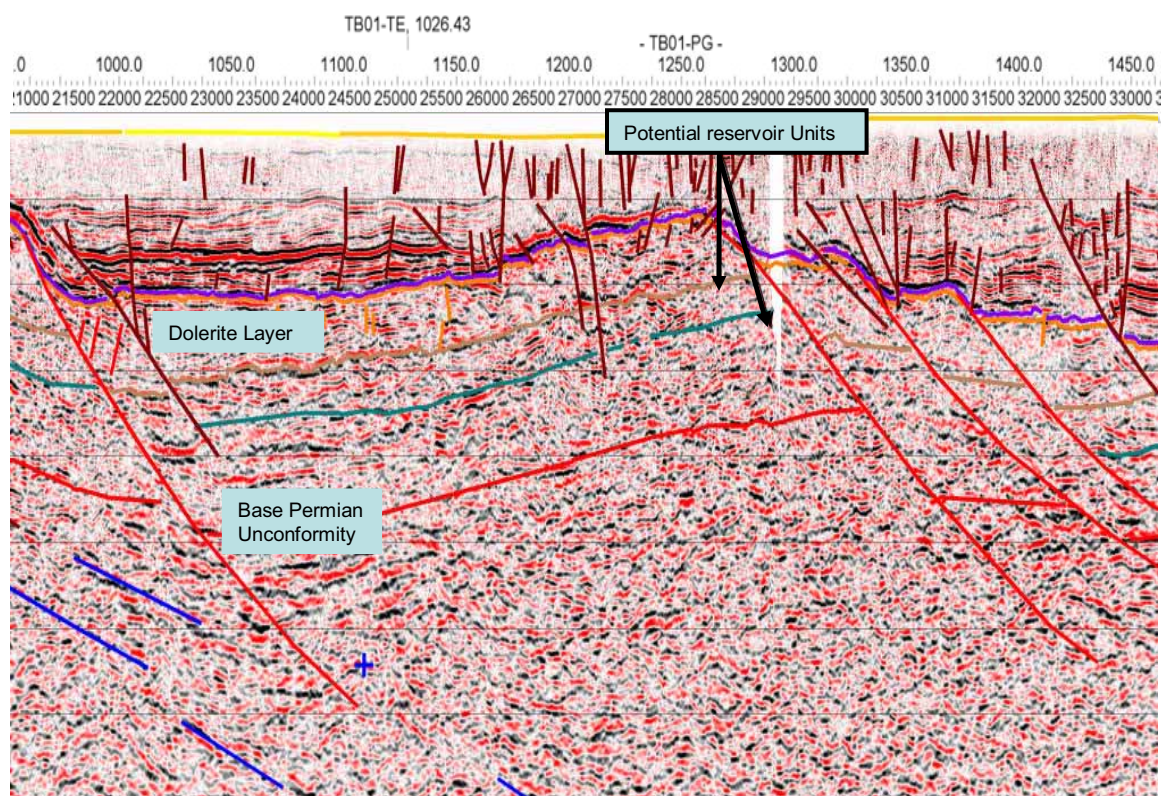


Figure 29 - Seismic Line TB01-PG, Hummocky Hills

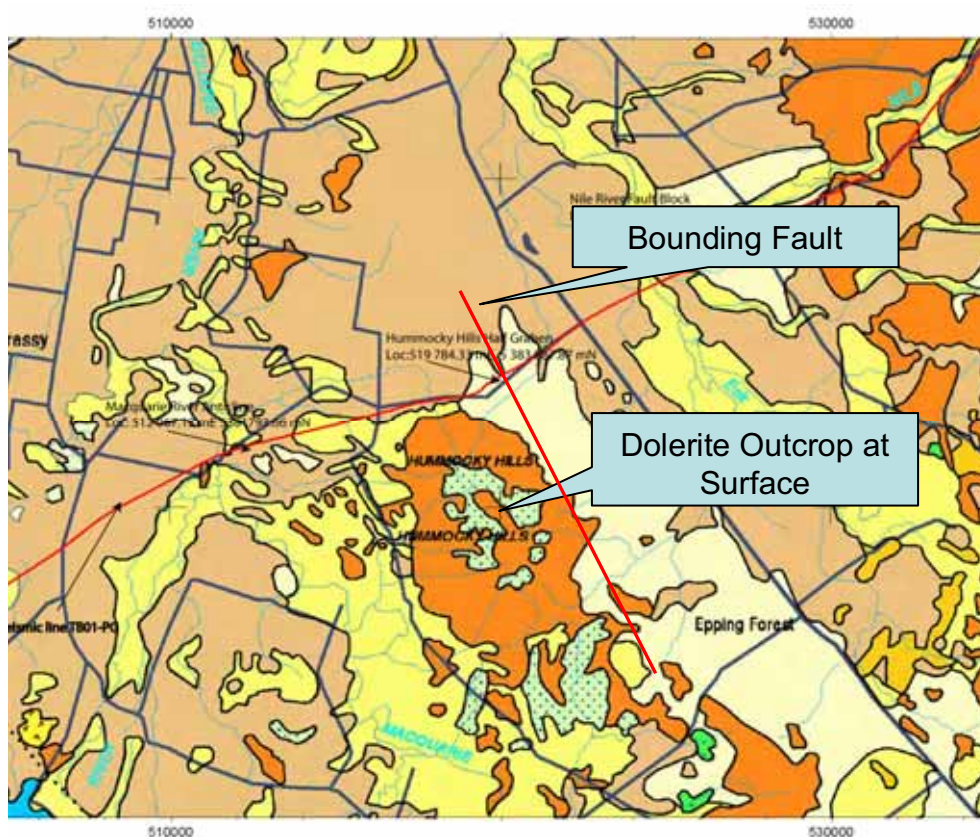


Figure 30 - Surface Geology at Hummocky Hills



	Low Estimate	Best Estimate	High Estimate	Mean
<b>Prospective STOIP (MMbbls)</b>	22	115	501	213
<b>Prospective Resource (MMbbls)</b>	5	30	138	58

Table 11 - Unrisked oil volumes of Hummocky Hills Lead

<b>Play Chance</b>	<b>Percent</b>
Reservoir	64
Seal	100
Source / Migration	25
<b>Play Chance Total</b>	<b>16</b>
<b>Prospect Specific Chance</b>	<b>Percent</b>
Trap	40
Charge	80
Reservoir	48
Seal	40
<b>Prospect Specific Chance Total</b>	<b>7.7</b>
<b>Overall Chance of Success</b>	<b>1.2</b>

Table 12 - Chance of success of the Hummocky Hills Lead



### 5.3 Thunderbolt Lead

The Thunderbolt Lead is located in central Tasmania (Figure 31). It is constrained by two 2D lines. The gross structure is interpreted as a large compressional fold similar to the Bellevue structure and is also caused by a deep seated detachment. The area immediately to the west appears very complex with possible back-thrusting and duplexing of the Ordovician and older rocks to such an extent that the Ordovician section is outcropping.

In general the feature is poorly defined with potential limestones based solely on limited seismic character as the target reservoirs. Figure 32 - Seismic line TB02-BA through Thunderbolt Lead shows the potential structure.

The volumes of unrisks oil for each level are presented in Table 13, with the full volumetric inputs presented in Appendix B.

The chances of success for each level of the Thunderbolt lead is presented in Table 14.

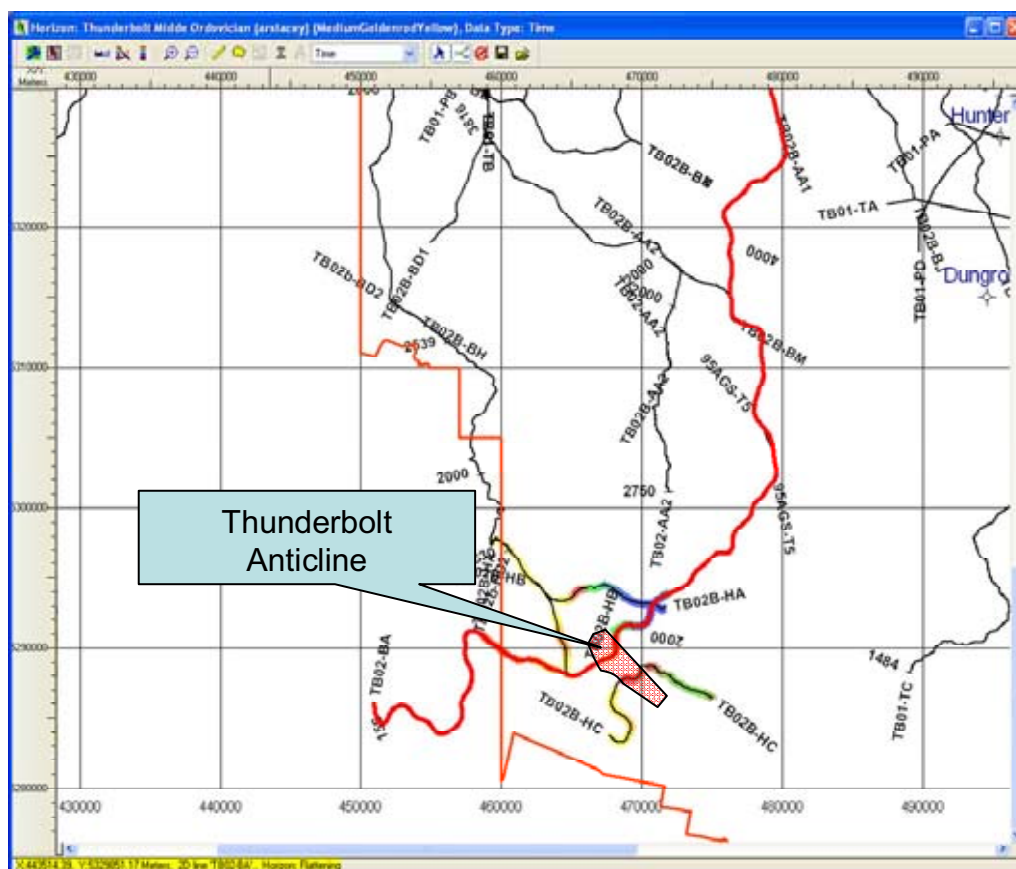


Figure 31 - Thunderbolt anticline location



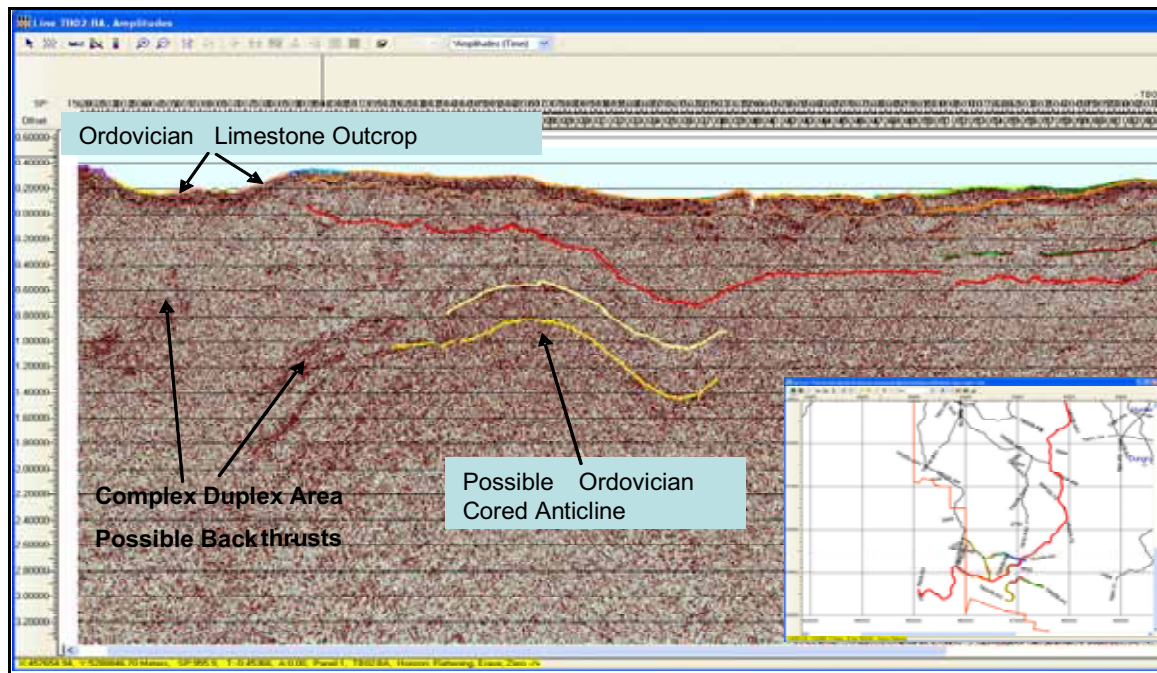


Figure 32 - Seismic line TB02-BA through Thunderbolt Lead

	Low Estimate	Best Estimate	High Estimate	Mean
<b>Prospective STOIP (MMbbls)</b>	49	206	717	61
<b>Prospective Resource (MMbbls)</b>	12	53	198	88

Table 13 – Unrisked oil volumes of Thunderbolt Lead

<b>Play Chance</b>	<b>Percent</b>
Reservoir	48
Seal	100
Source / Migration	25
Play Chance Total	12
<b>Prospect Specific Chance</b>	<b>Percent</b>
Trap	50
Charge	80
Reservoir	60
Seal	25
Prospect Specific Chance Total	6
<b>Overall Chance of Success</b>	<b>0.72</b>

Table 14 - Chance of success of the Thunderbolt Lead



## 5.4 Bracknell Dome Lead

The Bracknell Dome Lead is located in the north-eastern part of the block, (Figure 33) and features a Late Cenozoic inversion of an Early Cenozoic faulted graben (Figure 34). Possible reservoir targets are Mid-Tertiary clastic units and earlier Triassic and Permian units. Structural closure has been mapped at the Mid-Tertiary level and closure is likely at deeper levels, See Figure 35.

The volumes of unrisked oil based on a likely size and geometry of the trap are presented in Table 15, with the full volumetric inputs presented in Appendix B.

The chances of success for the Bracknell Dome Lead is presented in Table 16.

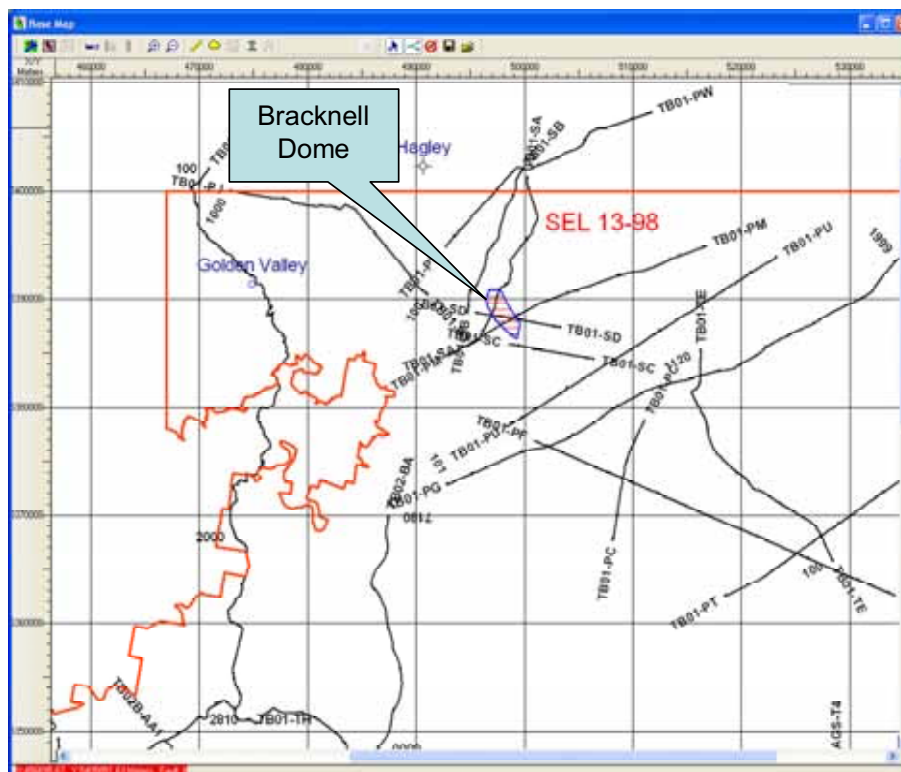


Figure 33 - Bracknell Dome Lead Location map



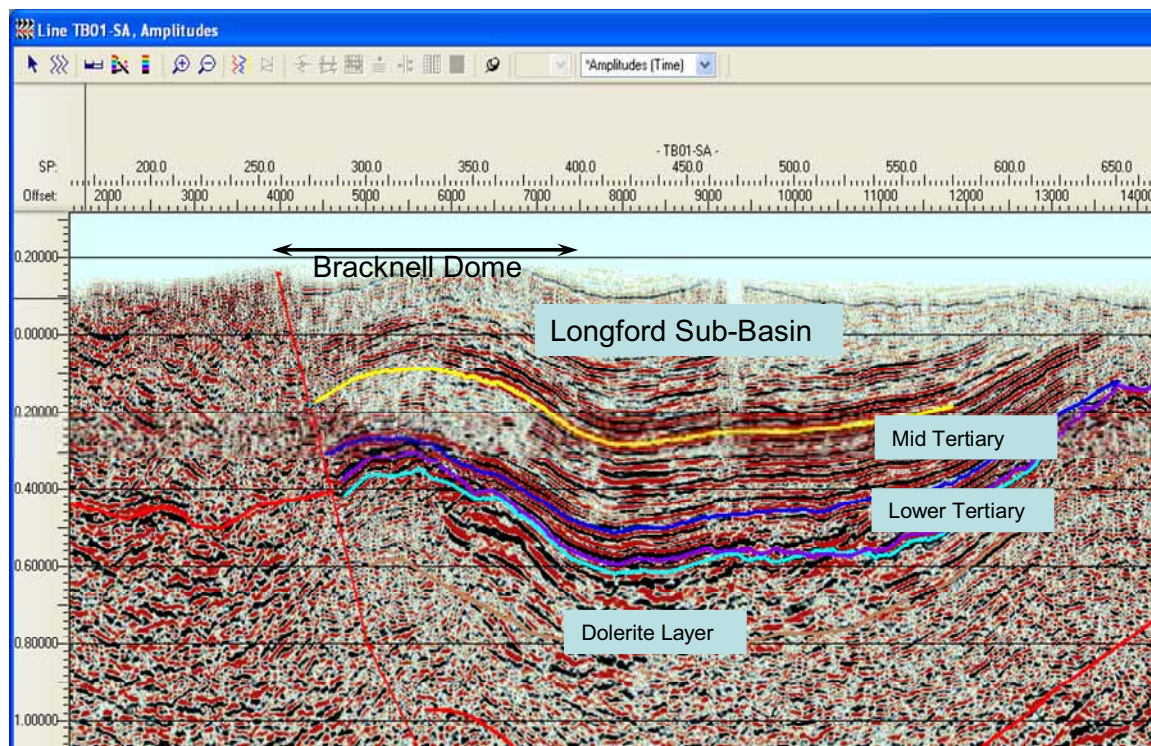
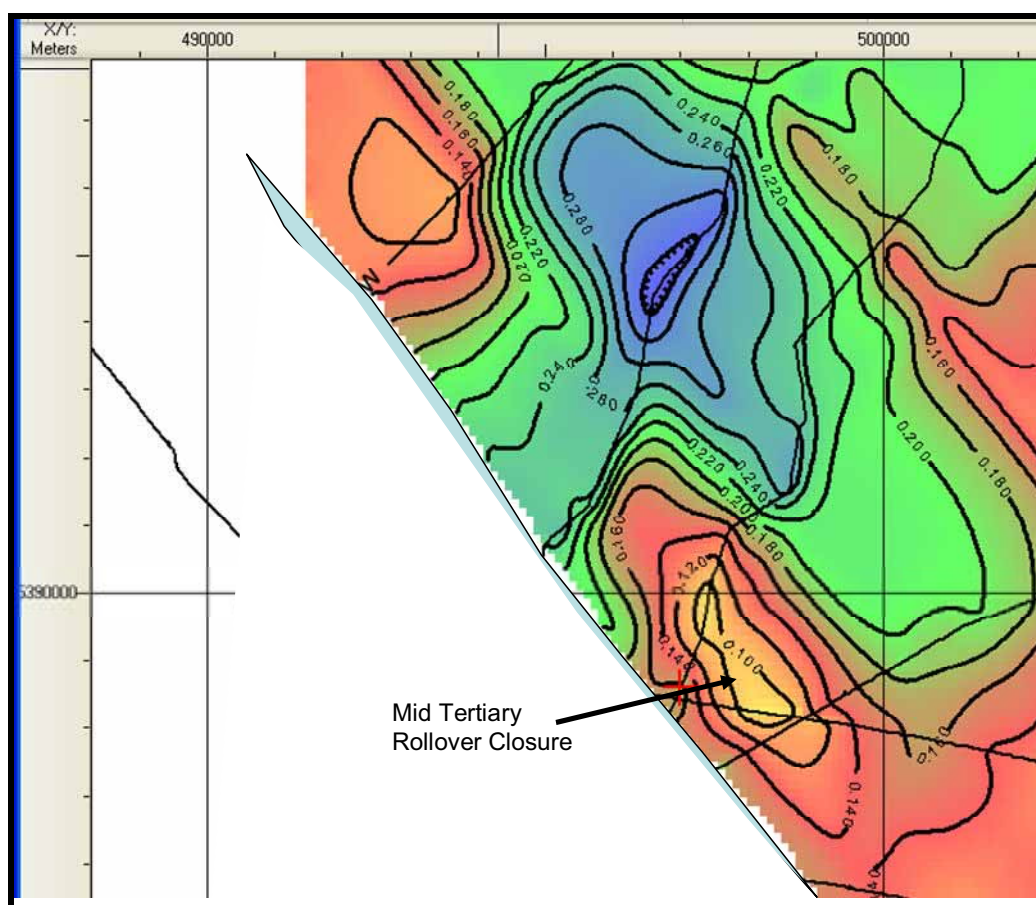


Figure 34 - Seismic Line TB01-SA through the Bracknell Dome Lead





	<b>Low Estimate</b>	<b>Best Estimate</b>	<b>High Estimate</b>	<b>Mean</b>
<b>Prospective STOIP (MMbbls)</b>	11	67	328	137
<b>Prospective Resource (MMbbls)</b>	3	18	90	37

Table 15 - Unrisked oil volumes of Bracknell Dome Lead

<b>Play Chance</b>	<b>Percent</b>
Reservoir	64
Seal	100
Source / Migration	25
<b>Play Chance Total</b>	<b>16</b>
<b>Prospect Specific Chance</b>	<b>Percent</b>
Trap	50
Charge	80
Reservoir	60
Seal	30
<b>Prospect Specific Chance Total</b>	<b>7.2</b>
<b>Overall Chance of Success</b>	<b>1.2</b>

Table 16 - Chance of success of the Bracknell Dome Lead



## 5.5 Butlers Rise Lead

The Butlers Rise Lead is located in the Central Eastern part of the block, (Figure 36). The lead is identified only on a single west–east seismic line, and is therefore poorly defined. The seismic cross section is shown in Figure 37. The lead is interpreted to be a wrench controlled inverted flower structure forming a potential closure along the eastern fault. Potential reservoirs are expected in the Triassic and Permian sections.

The volumes of unrisked oil based on a likely size and geometry of the trap are presented in Table 17, with the full volumetric inputs presented in Appendix B.

The chance of success for the Butlers Rise Lead is presented in Table 18.

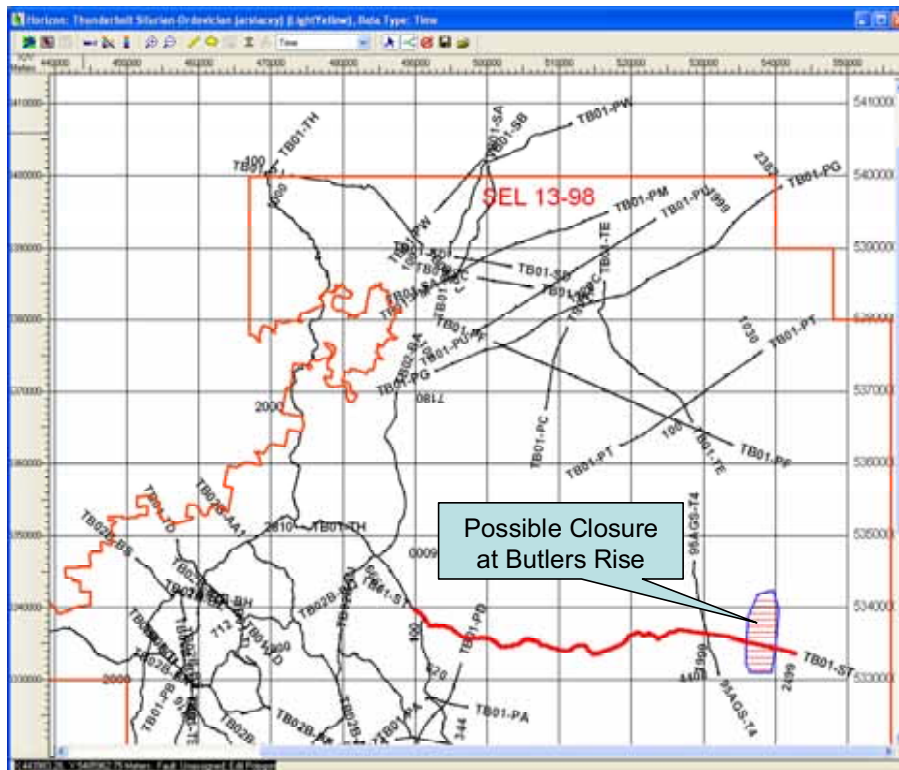


Figure 36 - Butlers Rise Lead Location



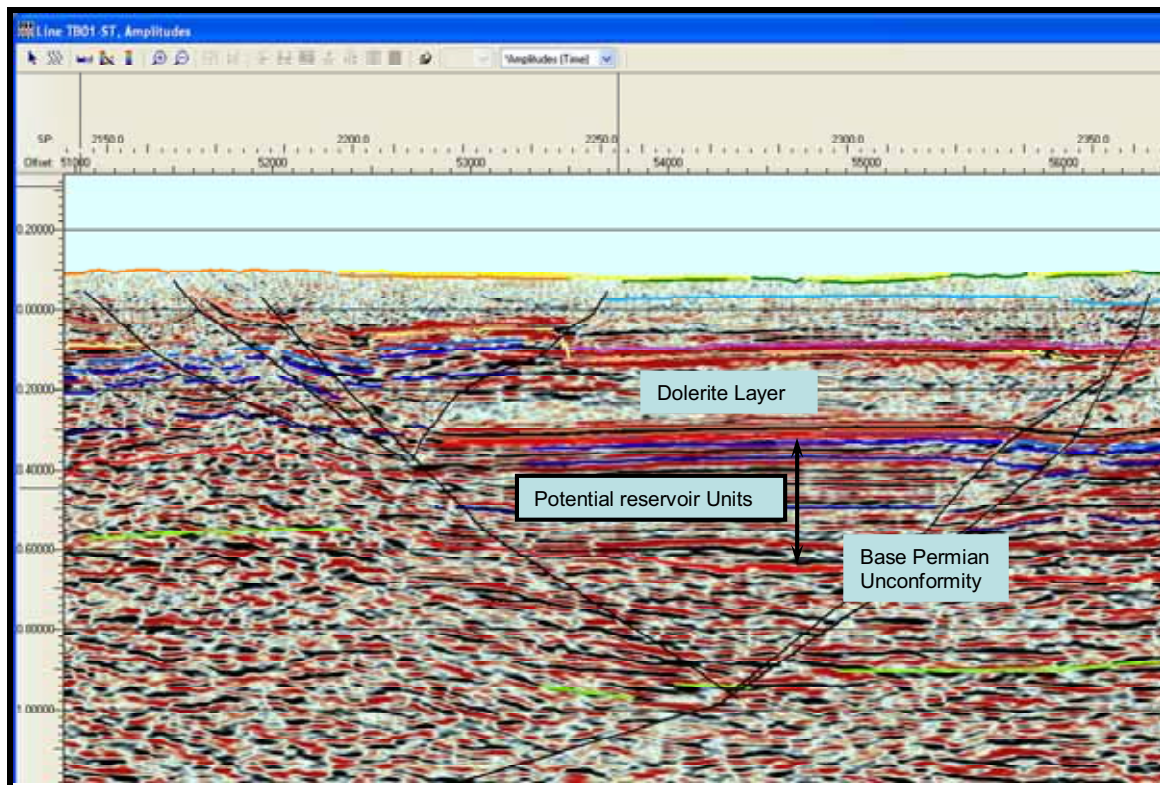


Figure 37 - Seismic Line TB01-ST through Butlers Rise Lead

	Low Estimate	Best Estimate	High Estimate	Mean
<b>Prospective STOIP (MMbbls)</b>	8	55	229	93
<b>Prospective Resource (MMbbls)</b>	2	14	63	25

Table 17 - Unrisked oil volumes of Butlers Rise Lead

<b>Play Chance Reservoir</b>	<b>Percent</b>
Seal	100
Source / Migration	25
<b>Play Chance Total</b>	<b>16</b>
<b>Prospect Specific Chance</b>	<b>Percent</b>
Trap	50
Charge	80
Reservoir	48
Seal	25
<b>Prospect Specific Chance Total</b>	<b>4.8</b>
<b>Overall Chance of Success</b>	<b>0.77</b>

Table 18 - Chance of success of the Butlers Rise Lead

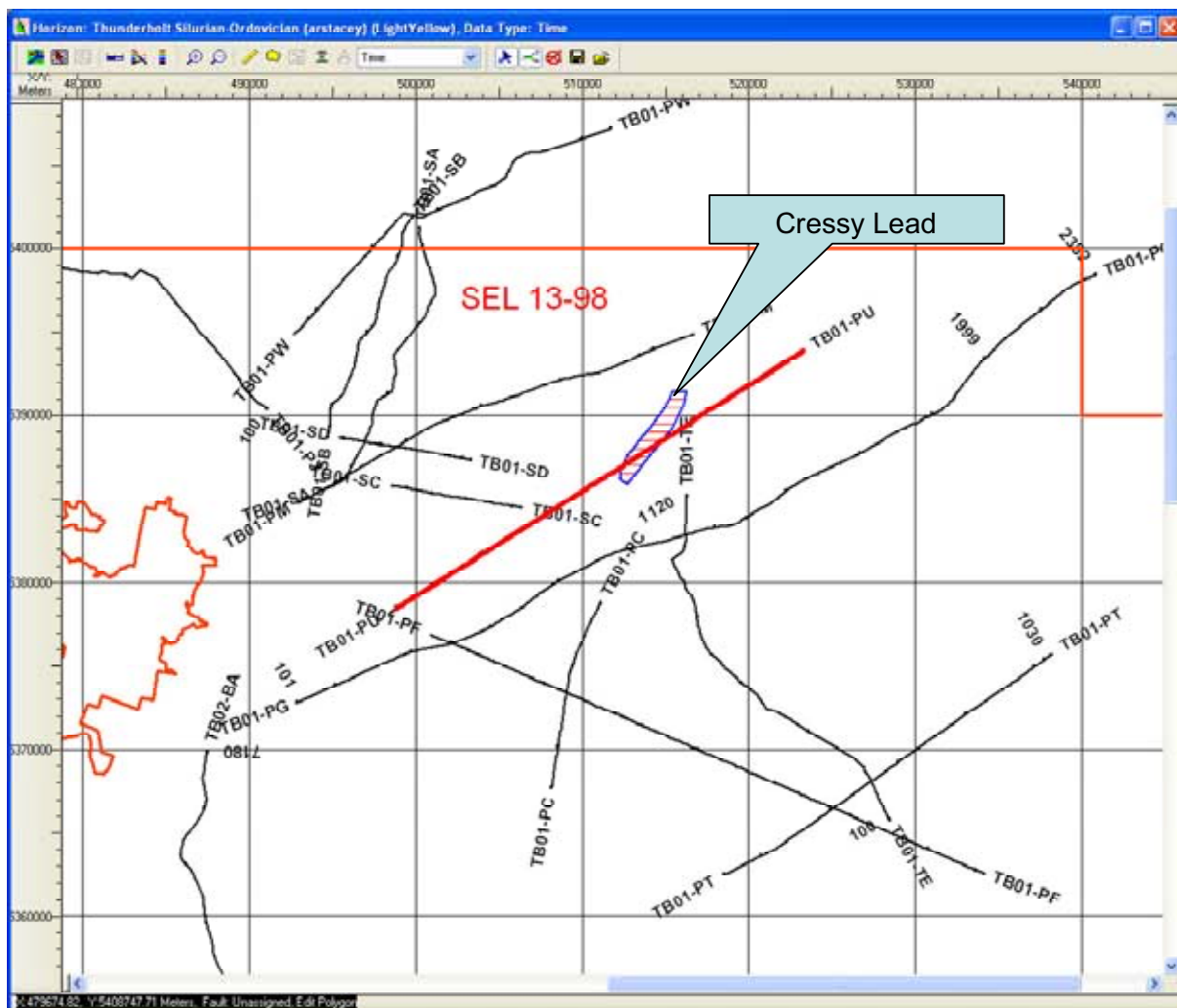


## 5.6 Cressy Lead

The Cressy anticlinal lead is located in the northern part of the block, (Figure 38) and is based on a single seismic line shown in Figure 39. This line shows a deep seated flower structure with a central anticline. The potential target reservoirs are within the Triassic and Permian sections. Although poorly defined seismically, the general structure and geometry can be inferred from the surface geology map, (Figure 40). This shows that the inverted dolerite section now outcropping probably gives a reliable indication of the crestal structure trend.

The volumes of unriskened oil, based on a likely size and geometry of the trap are presented in Table 19, with the full volumetric inputs presented in Appendix B.

The chances of success for the Cressy anticline Lead is presented in Table 20.



### Figure 38 - Location Map Cressy Lead



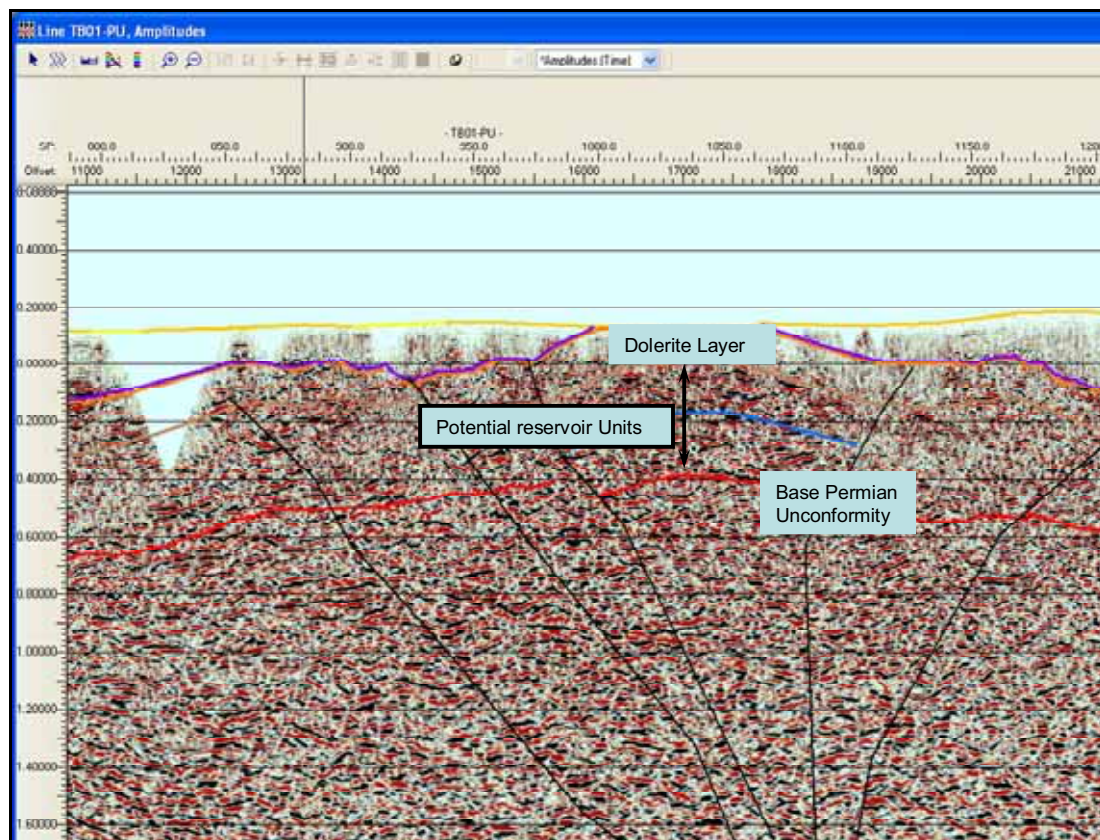


Figure 39 - Seismic line TB01-PU

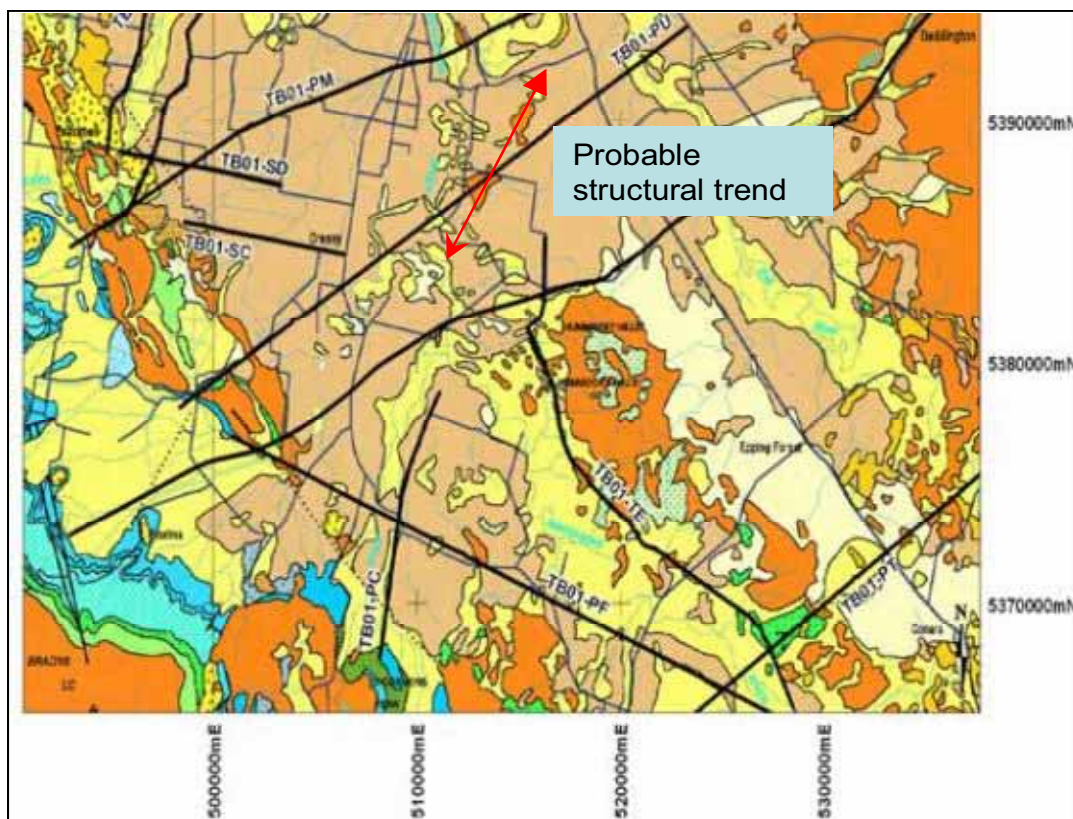


Figure 40 - Surface Geology at Cressy anticline



	Low Estimate	Best Estimate	High Estimate	Mean
<b>Prospective STOIP (MMbbls)</b>	12	48	172	78
<b>Prospective Resource (MMbbls)</b>	3	12	48	21

Table 19 - Unrisked oil volumes of Cressy Lead

<b>Play Chance</b>	<b>Percent</b>
<b>Reservoir</b>	<b>64</b>
<b>Seal</b>	<b>100</b>
<b>Source / Migration</b>	<b>25</b>
<b>Play Chance Total</b>	<b>16</b>
<b>Prospect Specific Chance</b>	<b>Percent</b>
<b>Trap</b>	<b>50</b>
<b>Charge</b>	<b>80</b>
<b>Reservoir</b>	<b>60</b>
<b>Seal</b>	<b>30</b>
<b>Prospect Specific Chance Total</b>	<b>7.2</b>
<b>Overall Chance of Success</b>	<b>1.2</b>

Table 20 - Chance of success of the Cressy Lead

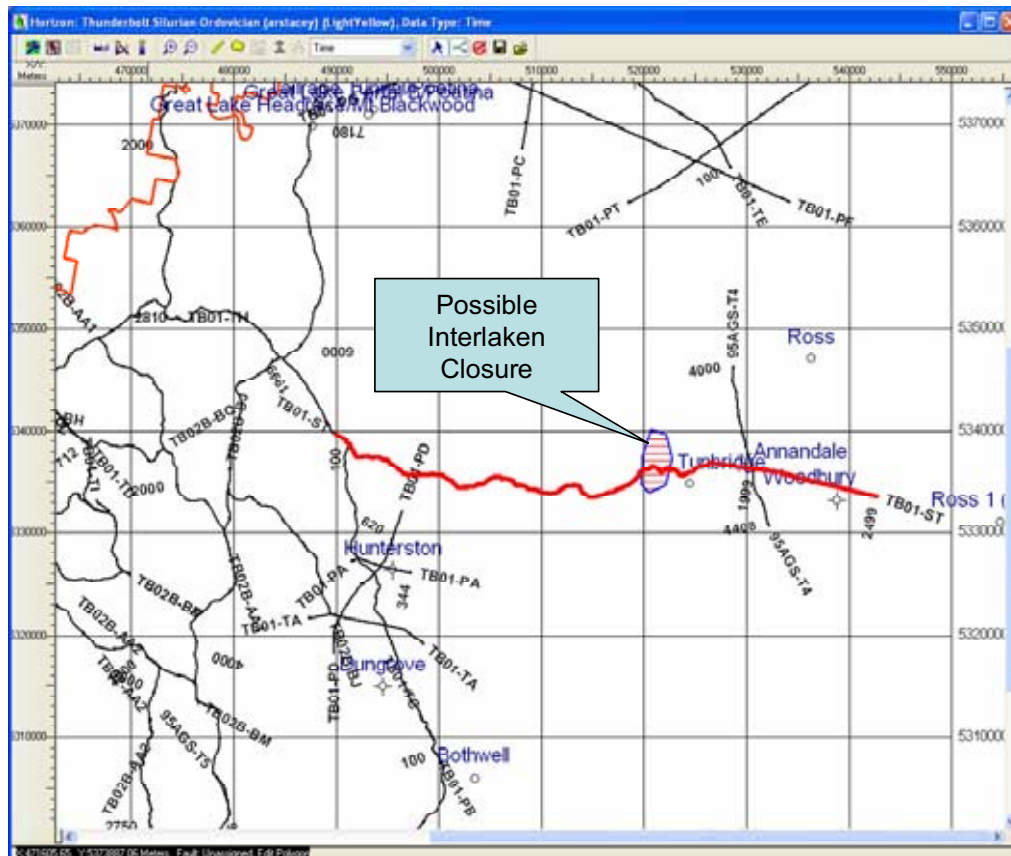


## 5.7 Interlaken Lead

The Interlaken Feature is located to the east of the permit area (Figure 41). It is a tilted fault block intruded by dolerite, probably above the Liffey Group reservoir. The feature is poorly defined on a single seismic line which crosses the feature (Figure 42).

The unrisks volumes of oil and gas are tabulated in Table 21, with the full volumetric inputs presented in Appendix B.

The chances of success of the Interlaken Feature are presented in Table 22.



### Figure 41 - Interlaken Lead Location



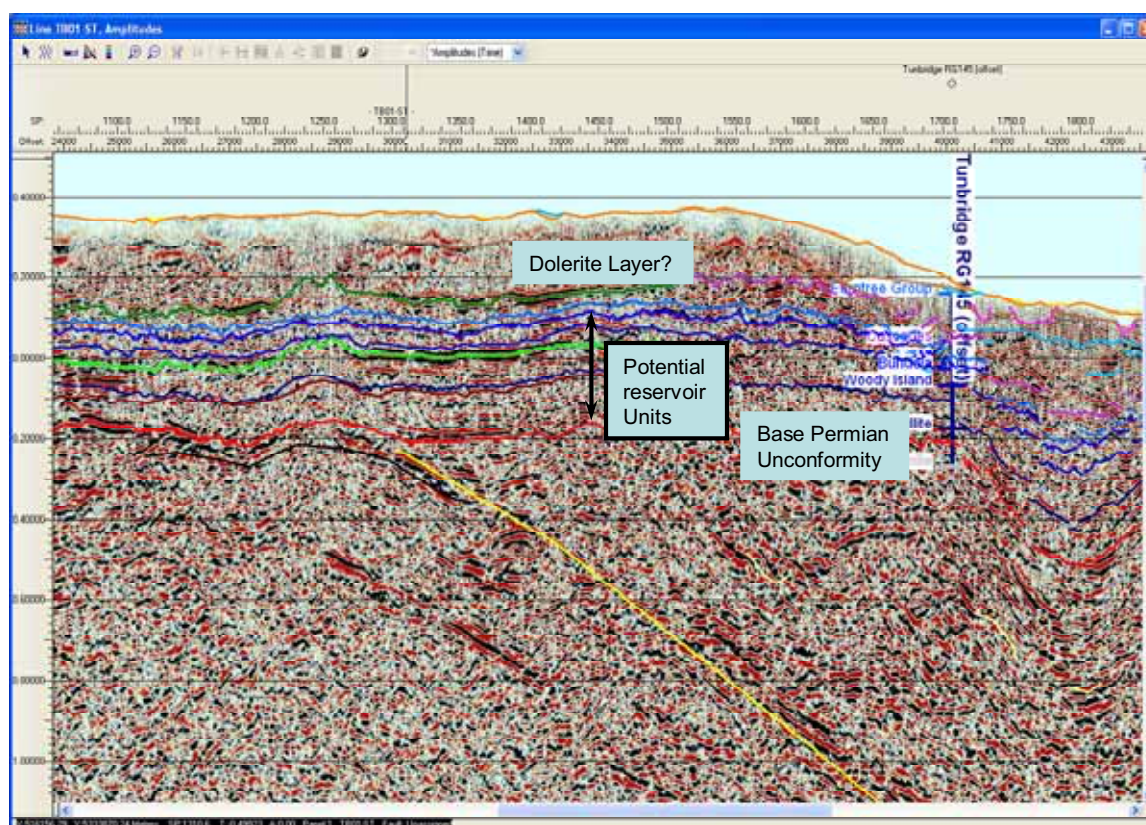


Figure 42 - Seismic line TB01-ST through the Interlaken Lead.

	Low Estimate	Best Estimate	High Estimate	Mean
Undiscovered Oil Initially-in-Place (MMbbls)	7	40	144	61
Prospective Resource (MMbbls)	2	10	40	17

Table 21 – Unrisked oil volumes of the Interlaken Lead

Play Chance Reservoir	Percent
Seal	64
Source / Migration	100
Play Chance Total	25
Prospect Specific Chance	16
Trap	Percent
Charge	28
Reservoir	80
Seal	48
Prospect Specific Chance Total	28
Overall Chance of Success	3
	0.47

Table 22 - Chance of success of the Interlaken Lead



## 5.8 Macquarie River Lead

The Macquarie River Lead is located in the northern part of the block (Figure 43). The lead is depicted by only one southwest–northeast seismic line, and is therefore poorly defined. The seismic cross section is shown in Figure 44. The lead is interpreted to be an Cenozoic anticline bounded to the NE by an Early Cenozoic Fault and to the SE by a Later Cenozoic Fault. The Bouguer Anomaly map depicts clearly the eastern closure of the anticline where the transition from green to blue colour indicates the limit between the Macquarie River anticline and its adjacent syncline (Figure 43). West of the lead the gravity data reflects the slight thinning of the sedimentary column interpreted also in the seismic line.

Multiple potential reservoirs are expected in the Triassic and Permian sections.

The volumes of unrisked oil based on a likely size and geometry of the trap are presented in Table 23, with the full volumetric inputs presented in Appendix B.

The chance of success for the Macquarie River Lead is presented in Table 24.

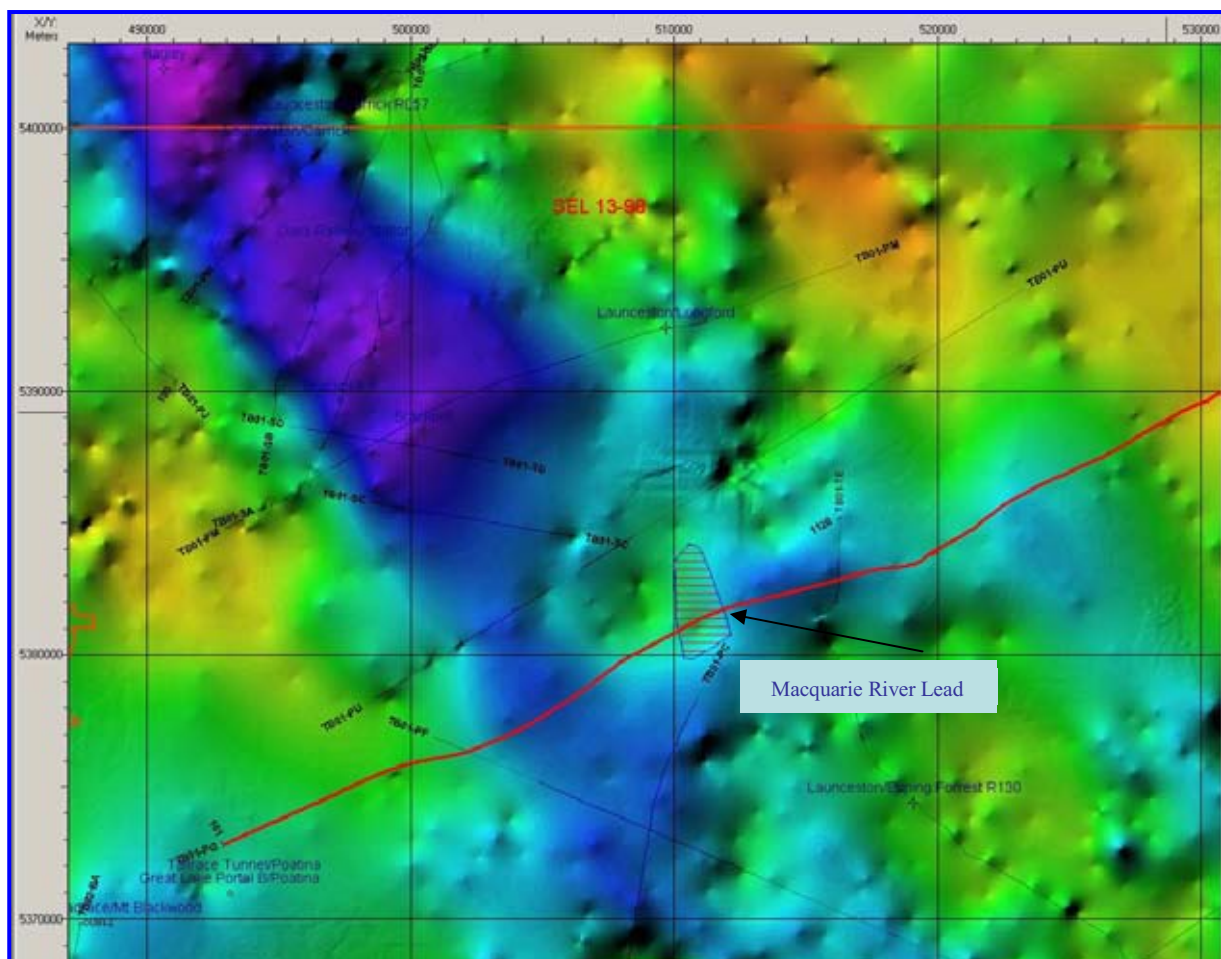


Figure 43 - Macquarie River Lead Location



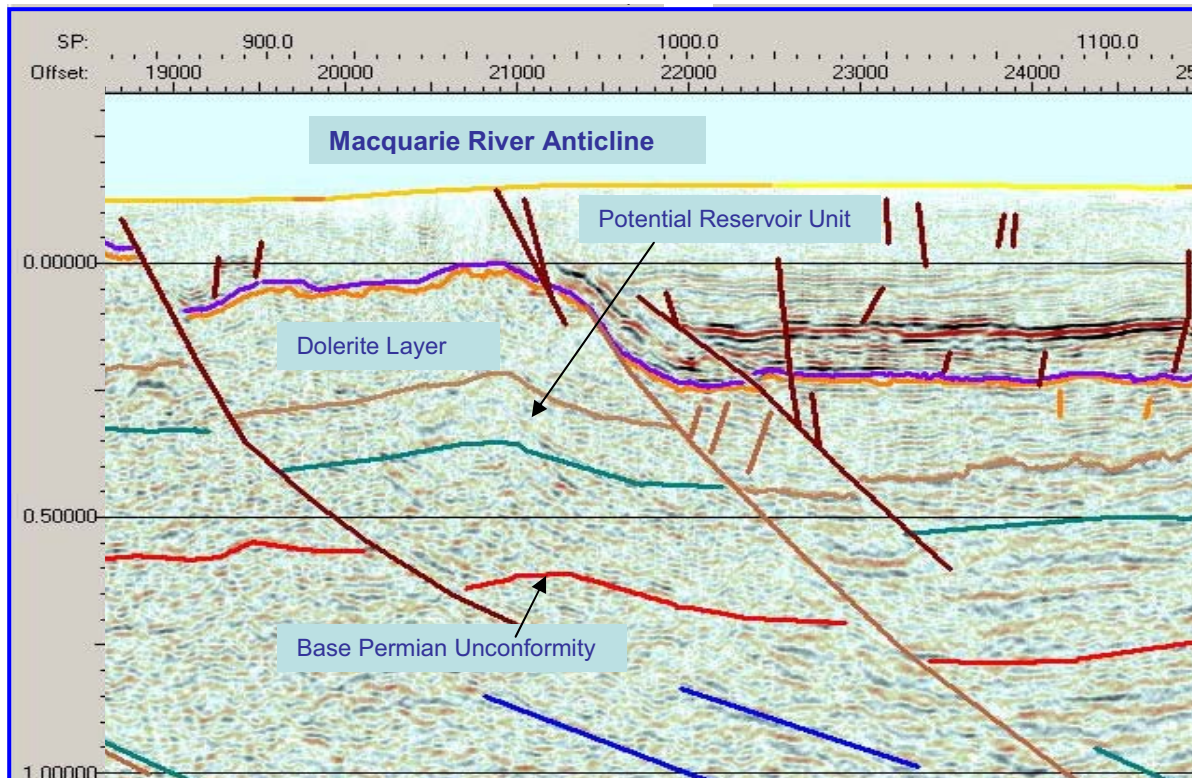


Figure 44 - Seismic Line TB01-PG through Macquarie River Lead

	Low Estimate	Best Estimate	High Estimate	Mean
Undiscovered Oil Initially-in-Place (MMbbls)	17.6	56	157	75.7
Prospective Resource (MMbbls)	3.52	13.1	42.4	19.7

Table 23 - Unrisked oil volumes of the Macquarie River Lead

Play Chance	Percent
Reservoir	64
Seal	100
Source / Migration	25
Play Chance Total	16
Prospect Specific Chance	Percent
Trap	30
Charge	60
Reservoir	50
Seal	40
Prospect Specific Chance Total	3.6
Overall Chance of Success	0.58

Table 24 - Chance of success of the Macquarie River Lead



## 5.9 Nile River Lead

The Nile River Lead is located in the northern part of the block (Figure 45). The lead was interpreted on the same southwest–northeast seismic line that crosses the Macquarie River Lead. This seismic cross section is shown in (Figure 46). The Nile River Lead was interpreted as a fault wedge block located east to the edge of the half graben and involves potential Permian reservoirs. However the quality of the seismic line is poor in that area and this lead was interpreted in base of an only one seismic line, implying that the risk associated in the lead is high. The Bouguer Anomaly map depicts the presence and the northwest-southeast trend of this structure but does not illustrate the exact extension of it (Figure 45).

The volumes of unrisked oil based on a likely size and geometry of the trap are the same as for the Macquarie River Lead and are presented in Table 25 with the full volumetric inputs presented in Appendix B.

The chance of success for the Nile River Lead is presented in Table 26.

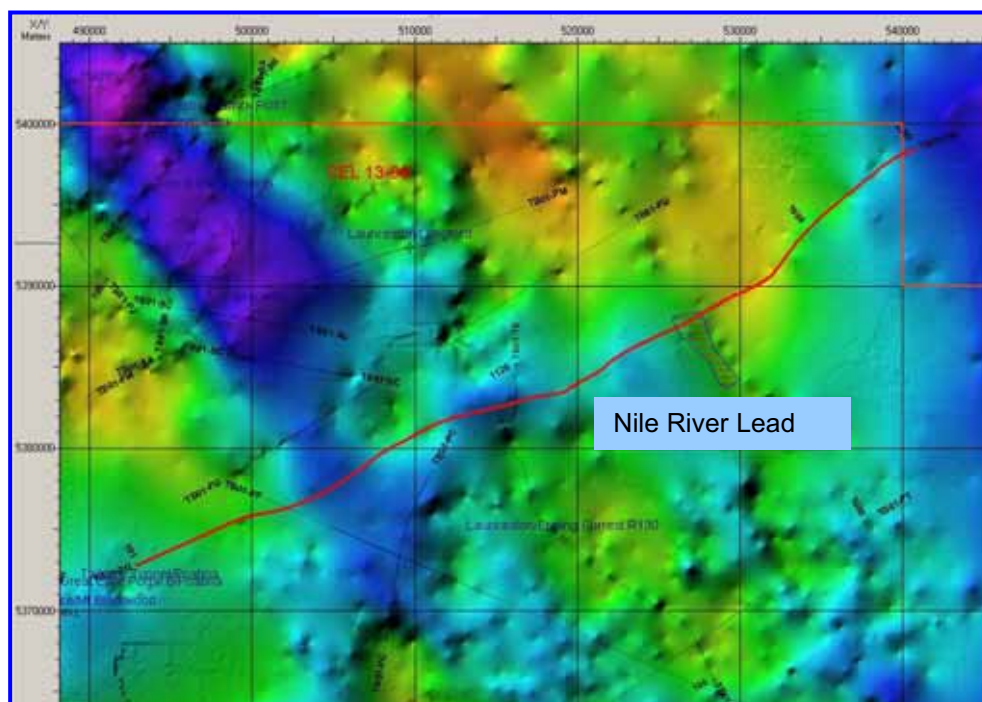


Figure 45 - Nile River Lead Location



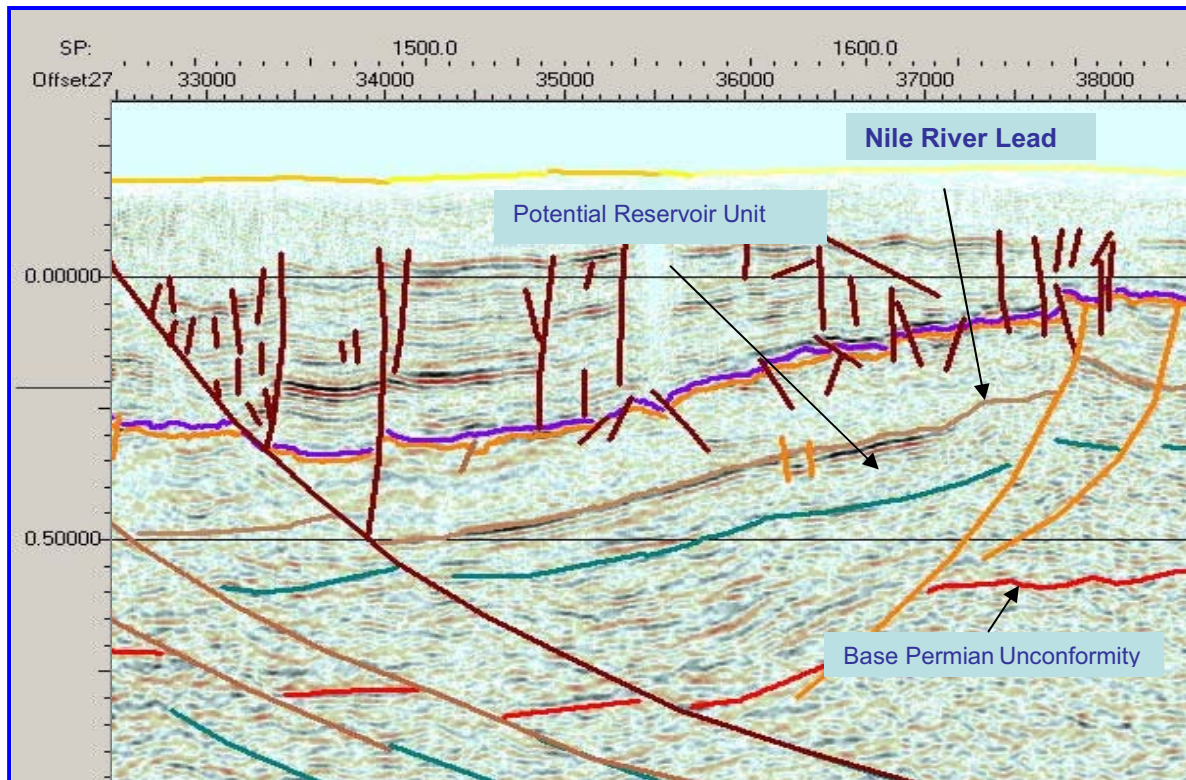


Figure 46 - Seismic Line TB01-PG through Nile River Lead

	Low Estimate	Best Estimate	High Estimate	Mean
Undiscovered Oil Initially-in-Place (MMbbls)	17.6	56	157	75.7
Prospective Resource (MMbbls)	3.52	13.1	42.4	19.7

Table 25 - Unrisked oil volumes of the Nile River Lead

Play Chance	Percent
Reservoir	64
Seal	100
Source / Migration	25
Play Chance Total	16
Prospect Specific Chance	Percent
Trap	33
Charge	60
Reservoir	50
Seal	52
Prospect Specific Chance Total	5.1
Overall Chance of Success	0.81

Table 26 - Chance of success of the Nile River Lead

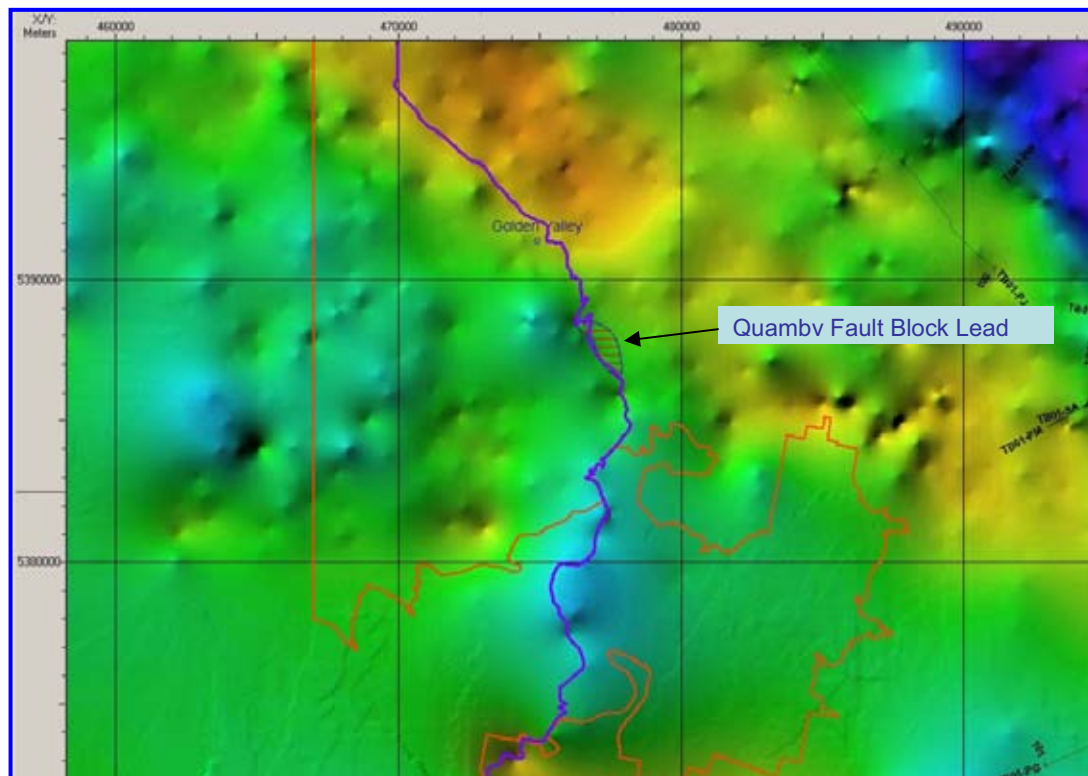


### 5.10 Quamby Fault Block Lead

The Quamby fault block Lead is located in the north-west part of the block (Figure 47). The lead was interpreted in one north-south seismic line as a drag fold over a reverse fault (Figure 48). The presence of this small anticline is depicted by the Bouguer Anomaly map (Figure 47).

The volumes of unrisks oil based on a likely size and geometry of the trap are presented in Table 27 with the full volumetric inputs presented in Appendix B.

The chance of success for the Nile River Lead is presented in Table 28.



**Figure 47 - Quamby Fault Block Lead Location**



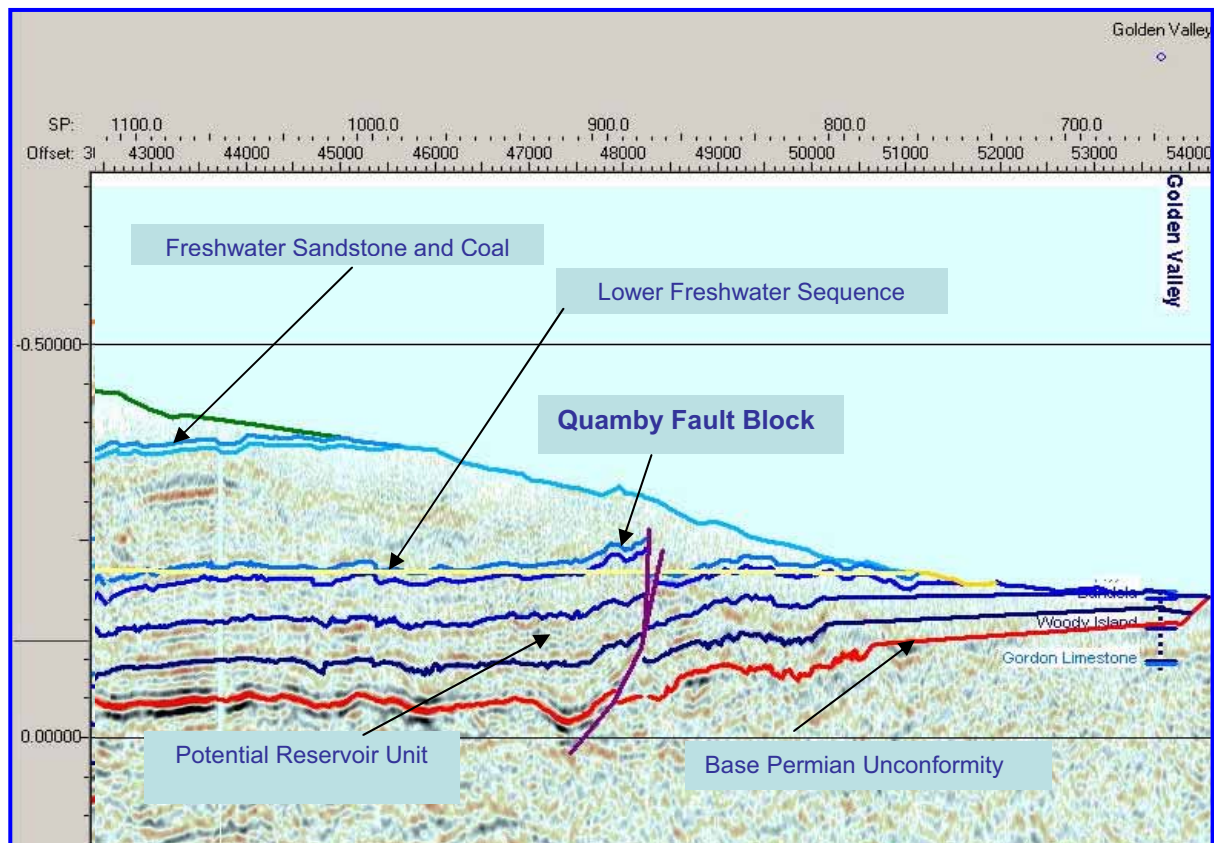


Figure 48 - Seismic Line TB01-TH through Quamby Fault Block Lead

	Low Estimate	Best Estimate	High Estimate	Mean
Undiscovered Oil Initially-in-Place (MMbbls)	2.01	6.45	18.3	8.78
Prospective Resource (MMbbls)	0.405	1.52	4.95	2.28

Table 27 - Unrisked oil volumes of the Quamby Fault Block Lead

Play Chance	Percent
Reservoir	64
Seal	100
Source / Migration	25
Play Chance Total	16
Prospect Specific Chance	Percent
Trap	30
Charge	60
Reservoir	50
Seal	44
Prospect Specific Chance Total	4
Overall Chance of Success	0.63

Table 28 - Chance of success of the Quamby Fault Block Lead



### 5.11 Steppes Lead

The Steppes Lead is an anticline located in the central part of the block (Figure 49). The anticline is poorly illustrated by only one seismic line and the structure may not be real, see Figure 50. Also the north-south extent of the anticline is not depicted by the Bouguer Anomaly Gravity map. The base of the dolerite is not parallel to Parmeener Supergroup indicating folding prior to the intrusion of the dolerite. Early Permian reservoir is expected to be present in this area.

The volumes of unrisks oil based on a likely size and geometry of the trap are presented in Table 29 with the full volumetric inputs presented in Appendix B.

The chance of success for the Steppes Lead is presented in Table 30.

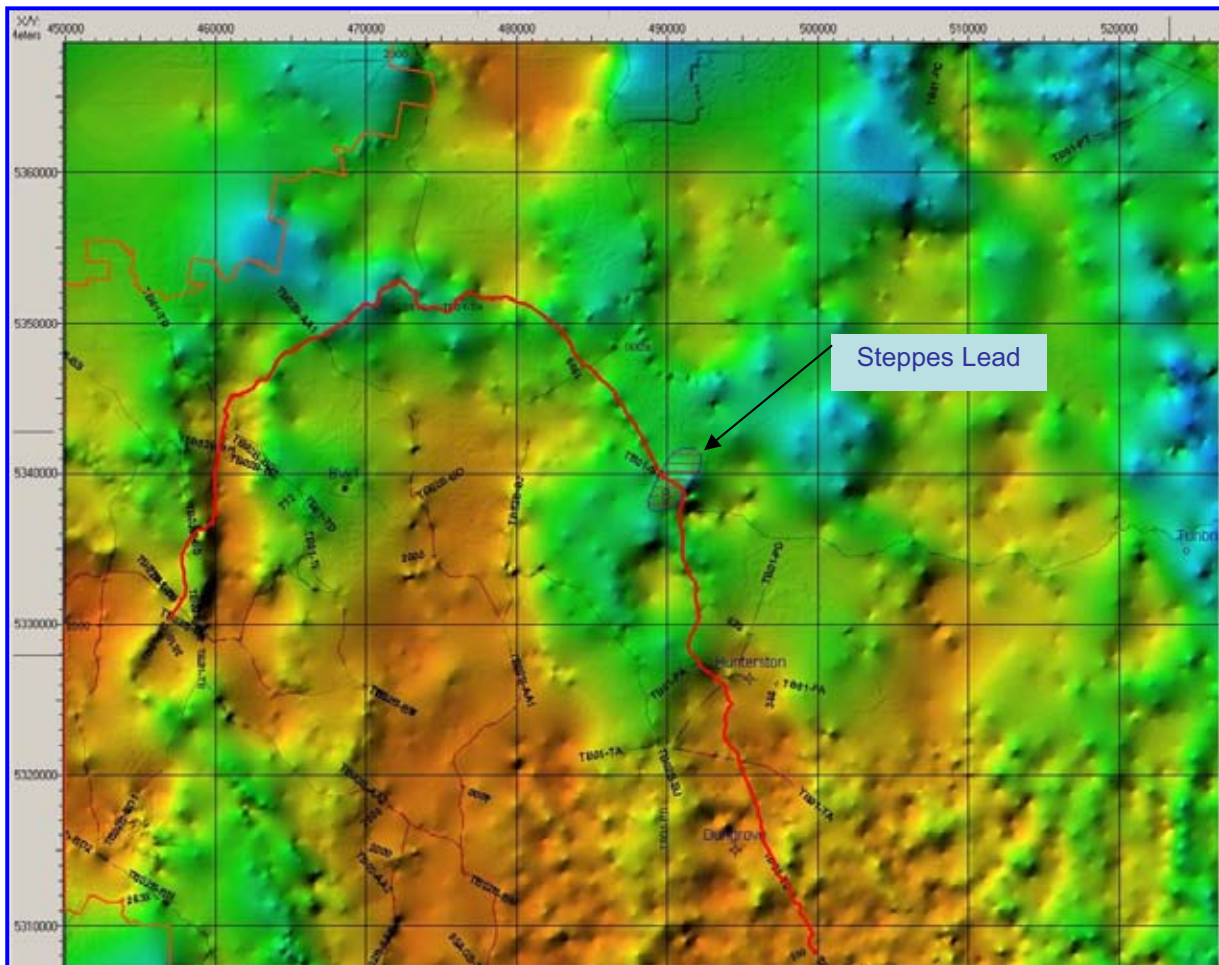


Figure 49 - Steppes Lead Location



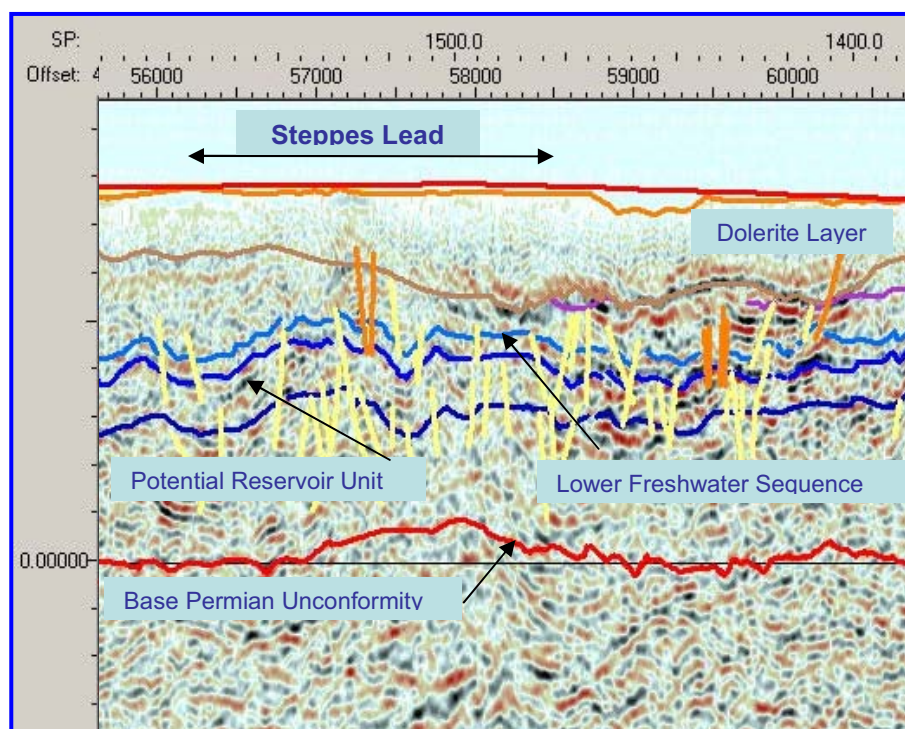


Figure 50 - Seismic Line TB01-PB through Steppes Lead

	Low Estimate	Best Estimate	High Estimate	Mean
Undiscovered Oil Initially-in-Place (MMbbls)	9.74	31.3	89.2	42.6
Prospective Resource (MMbbls)	1.96	7.39	24	11.1

Table 29 - Unrisked oil volumes of the Steppes Lead

Play Chance	Percent
Reservoir	64
Seal	100
Source / Migration	25
Play Chance Total	16
Prospect Specific Chance	Percent
Trap	45
Charge	60
Reservoir	50
Seal	60
Prospect Specific Chance Total	8
Overall Chance of Success	1.3

Table 30 - Chance of success of the Steppes Lead



## 5.12 Stockwell Lead

The Stockwell Lead is defined by two seismic lines and is located in the northeast part of the block (Figure 51). The lead is a fault block bounded to the northeast by an Early Cenozoic Fault and to the southwest by a Later Cenozoic Fault (Figure 52). Multiple Triassic and Permian reservoirs are expected to be involved in this structure.

The volumes of unrisks oil based on a likely size and geometry of the trap are presented in the Table 31 with the full volumetric inputs presented in Appendix B.

The chance of success for the Stockwell Lead is presented in Table 32.

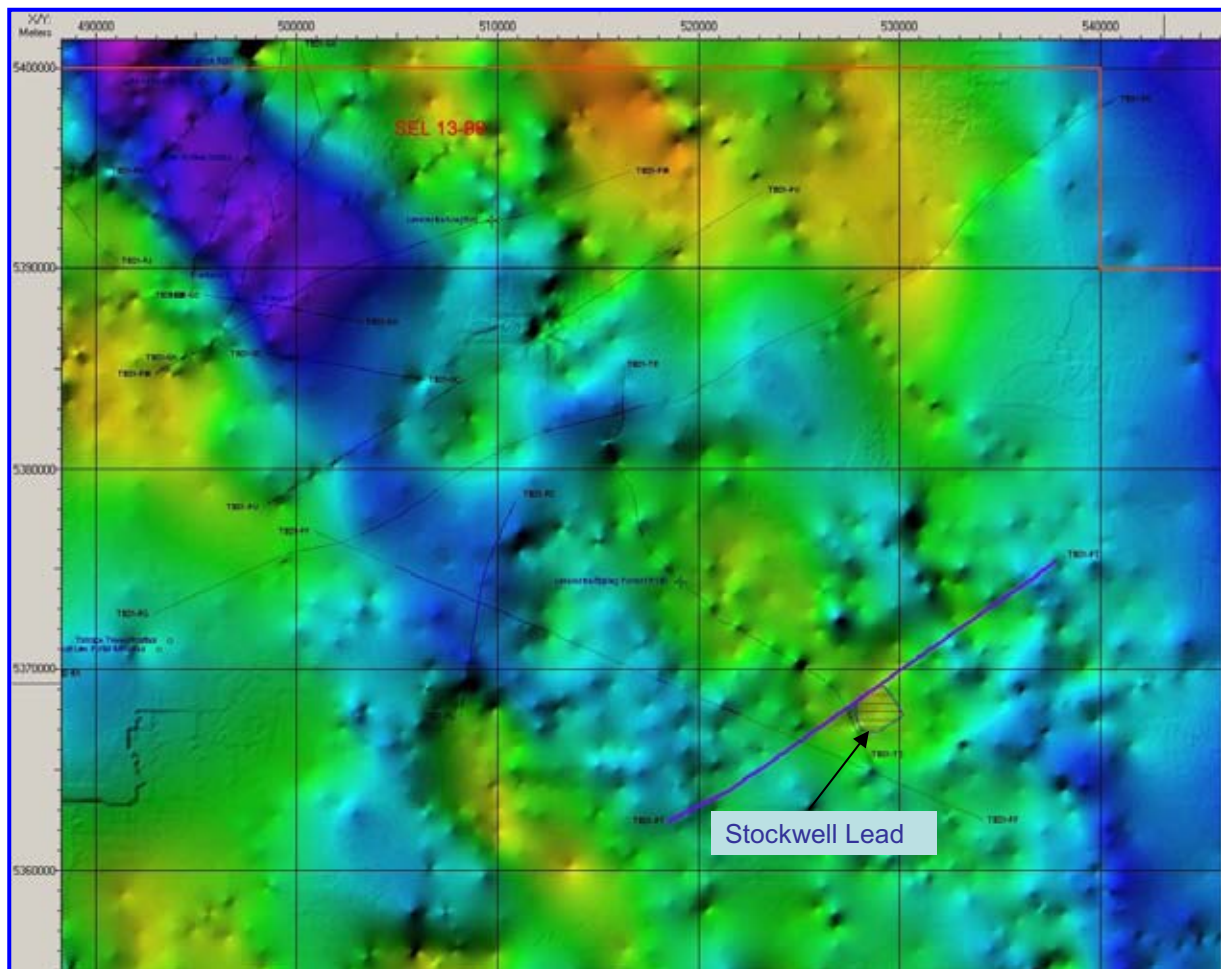


Figure 51 - Stockwell Lead Location



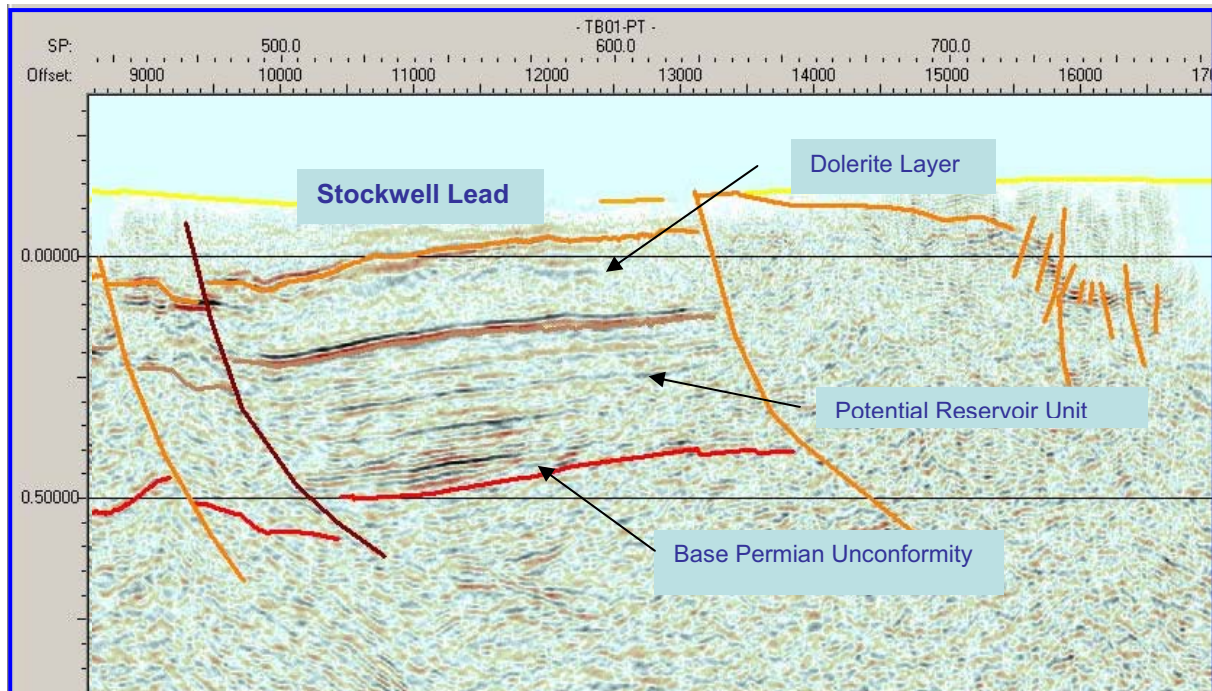


Figure 52 - Seismic Line TB01-PT through Stockwell Lead

	Low Estimate	Best Estimate	High Estimate	Mean
Undiscovered Oil Initially-in-Place (MMbbls)	9.97	31.5	87.6	42.3
Prospective Resource (MMbbls)	2	7.4	23.6	11

Table 31 - Unrisked oil volumes of the Stockwell Lead

Play Chance Reservoir	Percent
Seal	64
Source / Migration	100
Play Chance Total	25
Prospect Specific Chance	Percent
Trap	49
Charge	60
Reservoir	50
Seal	32
Prospect Specific Chance Total	4.7
Overall Chance of Success	0.75

Table 32 - Chance of success of the Stockwell Lead



## 6. QUALIFICATIONS

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RPS Energy is an independent consultancy specialising in petroleum reservoir evaluation and petroleum geology. Except for the provision of professional services on a fee basis, RPS Energy does not have a commercial arrangement with any other person or company involved in the interests that are the subject of this report. David R. Guise, Managing Director - Consulting Australia/ S.E. Asia at RPS Energy, has supervised the evaluation.

David is a registered Professional Engineer with over 30 years of domestic and international experience in both onshore and offshore operating environments. He has substantial experience and knowledge of field development planning, optimization and reserve estimating as well as new venture identification and evaluation. David has also acquired significant commercial and team management skills in an operating production environment. Operating companies that he has worked for as an employee include Nexen Australia, Gulf Indonesia, Energy Equity, Asamera Oil, Delhi Petroleum and Texaco Canada. He also worked in a consulting role as an independent consultant for several companies in Australia and Indonesia prior to joining RPS Energy as Petroleum Engineering Manager in January, 2006. He was appointed to the position of Managing Director – Consulting, Australia and South East Asia in 2007.



## 7. BASIS OF OPINION

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The evaluation presented in this report reflects our informed judgement based on accepted standards of professional investigation but is subject to generally recognised uncertainties associated with the interpretation of geological, geophysical and engineering data. The evaluation has been conducted within our understanding of petroleum legislation, taxation and other regulations that currently apply to these interests. However, RPS Energy is not in a position to attest to the property title, financial interest relationships or encumbrances related to the property.

It should be understood that any evaluation, particularly one involving exploration and future petroleum developments, may be subject to significant variations over short periods of time as new information becomes available.



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## 9. APPENDIX A: GLOSSARY OF TERMS AND ABBREVIATIONS

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AAPG	American Association of Petroleum Geologists
AFT	apatite fission track
API	American Petroleum Institute
asl	above sea level
B	billion
bbl(s)	barrels
bbls/d	barrels per day
Bcm	billion cubic metres
B <sub>g</sub>	gas formation volume factor
B <sub>gi</sub>	gas formation volume factor (initial)
B <sub>o</sub>	oil formation volume factor
B <sub>oi</sub>	oil formation volume factor (initial)
B <sub>w</sub>	water volume factor
bopd	barrels of oil per day
Bscf	billions of standard cubic feet
bwpd	barrels of water per day
CO <sub>2</sub>	Carbon dioxide
condensate	liquid hydrocarbons which are sometimes produced with natural gas and liquids derived from natural gas
ft	feet
ftSS	depth in feet below sea level
GRV	gross rock volume
H <sub>2</sub> S	hydrogen sulphide
KB	Kelly Bushing
km	kilometres
km <sup>2</sup>	square kilometres
LNG	liquefied natural gases
LPG	liquefied petroleum gases
Ma	Million years ago
M	thousand
MM	million
MD	measured depth
mD	permeability in millidarcies
m <sup>3</sup>	cubic metres
m <sup>3</sup> /d	cubic metres per day
MMscf/d	millions of standard cubic feet per day



m/s	metres per second
msec	milliseconds
NTG	net to gross ratio
$P_c$	capillary pressure
Petroleum	A naturally occurring mixture consisting of hydrocarbons in the gaseous, liquid or solid phase. Petroleum may also contain non-hydrocarbon compounds, common examples of which are carbon dioxide, nitrogen, hydrogen sulphide and sulphur. In rare cases, non-hydrocarbon content could be greater than 50%.
phi	porosity fraction
ppm	parts per million
Prospective Resources	Those quantities of petroleum which are estimated, as of a given date, to be potentially recoverable from undiscovered accumulations by application of future development projects. Prospective resources have both an associated chance of discovery and a chance of development. Prospective resources are further subdivided in accordance with the level of certainty associated with recoverable estimates assuming their discovery and development and may be sub-classified based on project maturity.
PVT	pressure volume temperature
rb	barrel(s) of oil at reservoir conditions
rcf	reservoir cubic feet
RFT	repeat formation tester
RKB	relative to Kelly Bushing
$rm^3$	reservoir cubic metres
SCAL	special core analysis
scf	standard cubic feet measured at 14.7 pounds per square inch and 60° F
scf/d	standard cubic feet per day
scf/stb	standard cubic feet per stock tank barrel
SPE	Society of Petroleum Engineers
SPEE	Society of Petroleum Evaluation Engineers
stb	stock tank barrels measured at 14.7 pounds per square inch and 60° F
stb/d	stock tank barrels per day
STOIIP	stock tank oil initially-in-place
$S_w$	water saturation
t	tonnes
Tscf	trillion standard cubic feet
TVDSS	true vertical depth (sub-sea)
TVT	true vertical thickness



TWT	two-way time
Undiscovered Petroleum initially-in-place	That quantity of petroleum which is estimated, as of a given date, to be contained in accumulations yet to be discovered. The estimated potentially recoverable portion of Undiscovered Petroleum initially-in-place is classified as Prospective Resources, as defined below.
$V_{sh}$	shale volume
WPC	World Petroleum Council
$\phi$	porosity



## 10. APPENDIX B: PROBABILISTIC RESERVES INPUT DATA

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# BellevueUpper\_OIL\_DLS



Country:	Australia	Prospect/Field:	BellevueUpper_OIL_DLS
State:		Reservoir:	
Block:	SEL 13/1998	Hydrocarbons:	Oil
Basin:	XXX	Prospect class:	
Play:	XXX	Reserve class:	Unspecified
Licence:	XXX	On/offshore:	
Production		Depth datum:	
Interest:	100.00	Terrain:	
Exploration		Facilities @:	km
Interest:	100.00	Target depth:	m
Operator:			



## Summary of Results

	GRV	Oil-in-Place	Total Rec. Oil	
	Whole Trap	Whole Trap	Whole Trap	NRI
	acre-ft	mmstb	mmstb	mmstb
<b>Technically successful</b>				
P90:	4545420	160	38.0	38.0
P50:	7399917	587	151	151
P10:	0.117E+08	1732	484	484
Mean:	7845211	808	220	220
Riskd mean:			4.44	4.44

Chance of Geological Success GPOS: 2.0%

Overall Chance of Success EPOS 2.0%

## Comments:



# BellevueUpper\_OIL\_DLS



Country: **Australia**  
 Block: **SEL 13/1998**  
 Basin: **XXX**  
 Play: **XXX**

Name: **BellevueUpper\_OIL\_DLS**  
 Segment: **4-way closure**  
 Hydrocarbons: **Oil**

## Input Data

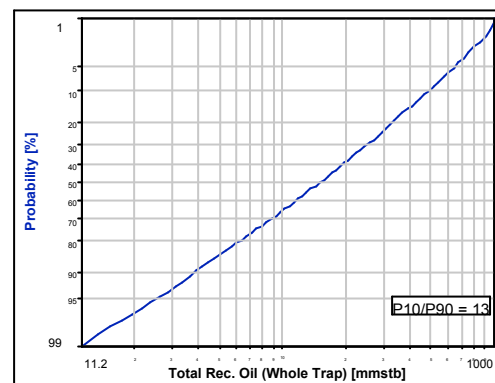
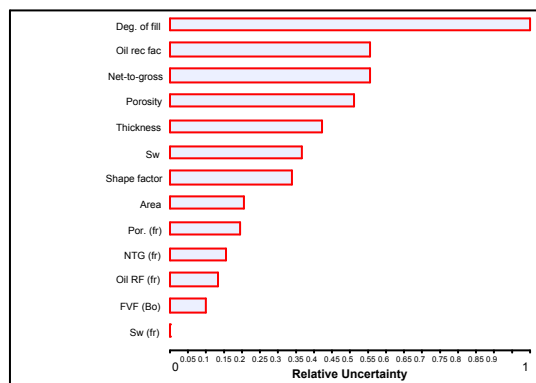
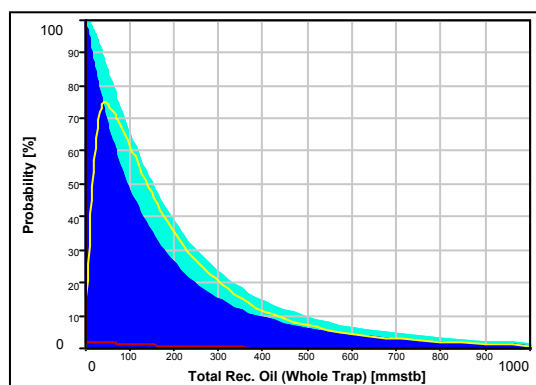
Variable	Unit	Shape	min	P90	P50	P10	max	mode
Area	km2	Lognor	39.9	50.0	59.2	70.0	87.7	58.2
Thickness	m	Lognor	126	200	283	400	637	263
Shape factor	%	Normal	19.9	40.0	55.0	70.0	90.1	55.0
Deg. of fill	%	Rect	10.0	19.0	55.0	91.0	100	55.0
Net-to-gross	%	Normal	[0 ]	20.0	50.0	80.0	[100 ]	50.0
Porosity	%	Normal	[0 ]	4.00	9.00	14.0	20.7	9.00
Sw	%	Normal	3.18	30.0	50.0	70.0	96.8	50.0
NTG (fr)	%	Normal	[0 ]	26.0	50.0	74.0	[100 ]	50.0
Por. (fr)	%	Normal	[0 ]	0.500	1.25	2.00	3.01	1.25
Sw (fr)	%	Normal	0.566	0.700	0.800	0.900	1.03	0.800
FVF (Bo)	vol/vol	Normal	0.966	1.10	1.20	1.30	1.43	1.20
Oil rec fac	%	Normal	[0 ]	10.0	25.0	40.0	60.1	25.0
Oil RF (fr)	%	Triang	10.0	20.0	32.6	47.8	60.0	30.0

## Risk Factors

Play Chance: **12%**      Prospect Specific Chance: **17%**  
 Reservoir: **48%**      Trap: **70%**  
 Source: **25%**      Reservoir: **60%**  
 Regional Seal: **100%**      Seal: **50%**  
    Charge: **80%**  
 Chance of Geological Success GPOS: **2.0%**

## Economic Criteria

No economic minima applied





# Bellevue\_LOwer\_OIL\_DLS



Country:	Australia	Prospect/Field:	Bellevue_LOwer_OIL_DLS
State:		Reservoir:	
Block:	SEL 13/1998	Hydrocarbons:	Oil
Basin:	XXX	Prospect class:	
Play:	XXX	Reserve class:	Unspecified
Licence:	XXX	On/offshore:	
Production		Depth datum:	
Interest:	100.00	Terrain:	
Exploration		Facilities @:	km
Interest:	100.00	Target depth:	m
Operator:			



## Summary of Results

	GRV	Oil-in-Place	Total Rec. Oil	
	Whole Trap	Whole Trap	Whole Trap	NRI
	acre-ft	mmstb	mmstb	mmstb
<b>Technically successful</b>				
P90:	2800974	99.5	23.6	23.6
P50:	4640503	368	94.9	94.9
P10:	7473712	1094	307	307
Mean:	4951547	510	139	139
Riskd mean:			2.80	2.80

Chance of Geological Success GPOS: 2.0%

Overall Chance of Success EPOS 2.0%

## Comments:



# Bellevue\_LOwer\_OIL\_DLS



Country: Australia  
Block: SEL 13/1998  
Basin: XXX  
Play: XXX

Name: Bellevue\_LOwer\_OIL\_DLS  
Segment: 4-way closure  
Hydrocarbons: Oil

## Input Data

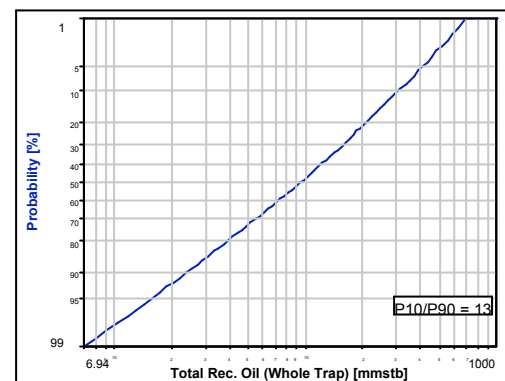
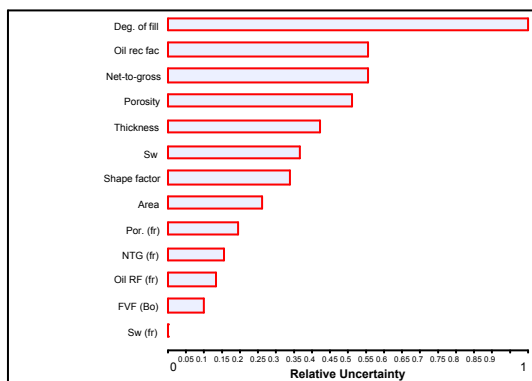
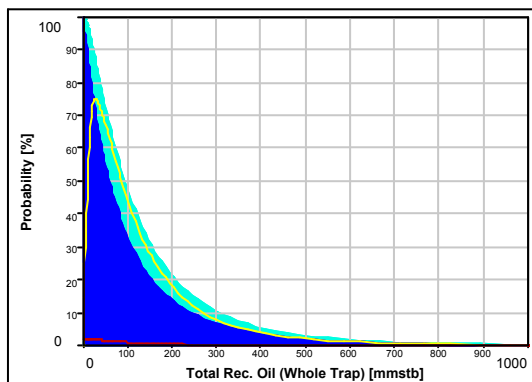
Variable	Unit	Shape	min	P90	P50	P10	max	mode
Area	km2	Lognor	22.5	30.0	37.1	46.0	61.3	36.1
Thickness	m	Lognor	126	200	283	400	637	263
Shape factor	%	Normal	19.9	40.0	55.0	70.0	90.1	55.0
Deg. of fill	%	Rect	10.0	19.0	55.0	91.0	100	55.0
Net-to-gross	%	Normal	[0 ]	20.0	50.0	80.0	[100 ]	50.0
Porosity	%	Normal	[0 ]	4.00	9.00	14.0	20.7	9.00
Sw	%	Normal	3.18	30.0	50.0	70.0	96.8	50.0
NTG (fr)	%	Normal	[0 ]	26.0	50.0	74.0	[100 ]	50.0
Por. (fr)	%	Normal	[0 ]	0.500	1.25	2.00	3.01	1.25
Sw (fr)	%	Normal	0.566	0.700	0.800	0.900	1.03	0.800
FVF (Bo)	vol/vol	Normal	0.966	1.10	1.20	1.30	1.43	1.20
Oil rec fac	%	Normal	[0 ]	10.0	25.0	40.0	60.1	25.0
Oil RF (fr)	%	Triang	10.0	20.0	32.6	47.8	60.0	30.0

## Risk Factors

Play Chance: 12% Prospect Specific Chance: 17%  
Reservoir: 48% Trap: 70%  
Source: 25% Reservoir: 60%  
Regional Seal: 100% Seal: 50%  
Charge: 80%  
Chance of Geological Success GPOS: 2.0%

## Economic Criteria

No economic minima applied





# Bracknell\_OIL



Country:	Australia	Prospect/Field:	Bracknell_OIL
State:		Reservoir:	
Block:	SEL 13/1998	Hydrocarbons:	Oil
Basin:	XXX	Prospect class:	
Play:	XXX	Reserve class:	Unspecified
Licence:	XXX	On/offshore:	
Production		Depth datum:	
Interest:	100.00	Terrain:	
Exploration		Facilities @:	km
Interest:	100.00	Target depth:	m
Operator:			



## Summary of Results

	GRV	Oil-in-Place	Total Rec. Oil	
	Whole Trap	Whole Trap	Whole Trap	NRI
	acre-ft	mmstb	mmstb	mmstb
<b>Technically successful</b>				
P90:	84812	11.6	2.84	2.84
P50:	430975	67.4	17.5	17.5
P10:	1839732	328	89.6	89.6
Mean:	771737	137	37.4	37.4
Riskd mean:			0.431	0.431

Chance of Geological Success GPOS: 1.2%

Overall Chance of Success EPOS 1.2%

## Comments:



# Bracknell\_OIL



Country: **Australia**  
 Block: **SEL 13/1998**  
 Basin: **XXX**  
 Play: **XXX**

Name: **Bracknell\_OIL**  
 Segment: **4-way closure**  
 Hydrocarbons: **Oil**

## Input Data

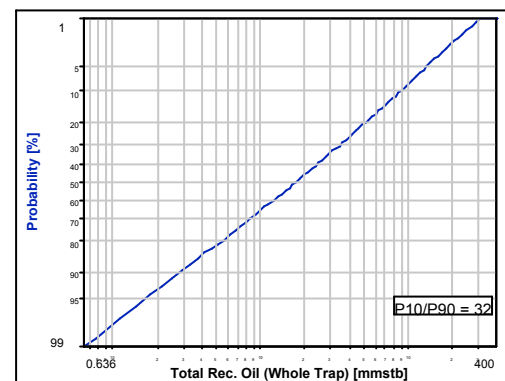
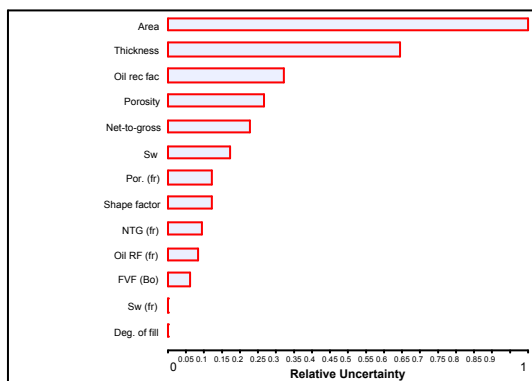
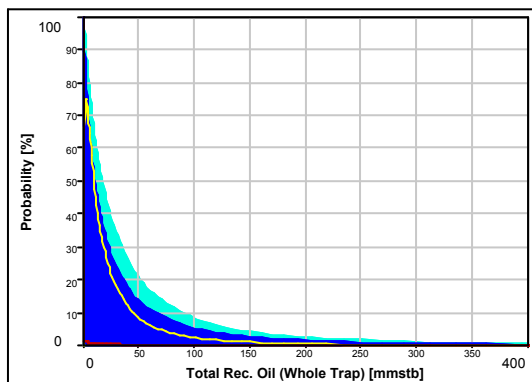
Variable	Unit	Shape	min	P90	P50	P10	max	mode
Area	km2	Lognor	0.312	2.00	8.00	32.0	[40.0 ]	2.48
Thickness	m	Lognor	15.0	50.0	122	300	997	75.1
Shape factor	%	Normal	36.6	50.0	60.0	70.0	83.4	60.0
Deg. of fill	%	Rect	100	100	100	100	100	100
Net-to-gross	%	Normal	[0 ]	20.0	35.0	50.0	70.1	35.0
Porosity	%	Normal	[0 ]	5.00	10.0	15.0	21.7	10.0
Sw	%	Normal	[0 ]	20.0	40.0	60.0	86.8	40.0
NTG (fr)	%	Normal	[0 ]	26.0	50.0	74.0	[100 ]	50.0
Por. (fr)	%	Normal	[0 ]	0.500	1.25	2.00	3.01	1.25
Sw (fr)	%	Normal	0.566	0.700	0.800	0.900	1.03	0.800
FVF (Bo)	vol/vol	Normal	0.966	1.10	1.20	1.30	1.43	1.20
Oil rec fac	%	Normal	[0 ]	10.0	25.0	40.0	60.1	25.0
Oil RF (fr)	%	Triang	10.0	20.0	32.6	47.8	60.0	30.0

## Risk Factors

Play Chance: **16%**      Prospect Specific Chance: **7.2%**  
 Reservoir: **64%**      Trap: **50%**  
 Source: **25%**      Reservoir: **60%**  
 Regional Seal: **100%**      Seal: **30%**  
    Charge: **80%**  
 Chance of Geological Success GPOS: **1.2%**

## Economic Criteria

No economic minima applied





# Hummocky\_OIL



Country: **Australia**  
 State:  
 Block: **SEL 13/1998**  
 Basin: **XXX**  
 Play: **XXX**  
 Licence: **XXX**  
 Production  
     Interest: **100.00**  
 Exploration  
     Interest: **100.00**  
 Operator:

Prospect/Field: **Hummocky\_OIL**  
 Reservoir:  
 Hydrocarbons: **Oil**  
 Prospect class:  
 Reserve class: **Unspecified**  
 On/offshore:  
 Depth datum:  
 Terrain:  
 Facilities @: km  
 Target depth: m



## Summary of Results

	GRV	Oil-in-Place	Total Rec. Oil	
	Whole Trap	Whole Trap	Whole Trap	NRI
	acre-ft	mmstb	mmstb	mmstb
<b>Technically successful</b>				
P90:	<b>162606</b>	<b>22.4</b>	<b>5.40</b>	<b>5.40</b>
P50:	<b>733675</b>	<b>115</b>	<b>29.8</b>	<b>29.8</b>
P10:	<b>2774329</b>	<b>501</b>	<b>138</b>	<b>138</b>
Mean:	<b>1201071</b>	<b>213</b>	<b>58.4</b>	<b>58.4</b>
Riskd mean:			<b>0.717</b>	<b>0.717</b>

Chance of Geological Success GPOS: 1.2%  
 Overall Chance of Success EPOS 1.2%

## Comments:



# Hummocky\_OIL



Country: **Australia**  
 Block: **SEL 13/1998**  
 Basin: **XXX**  
 Play: **XXX**

Name: **Hummocky\_OIL**  
 Segment: **4-way closure**  
 Hydrocarbons: **Oil**

## Input Data

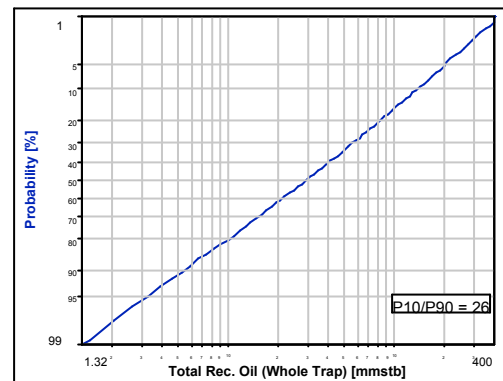
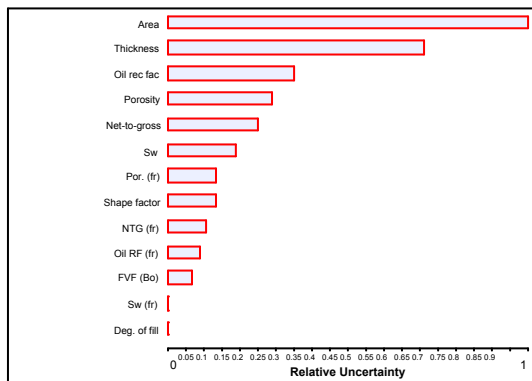
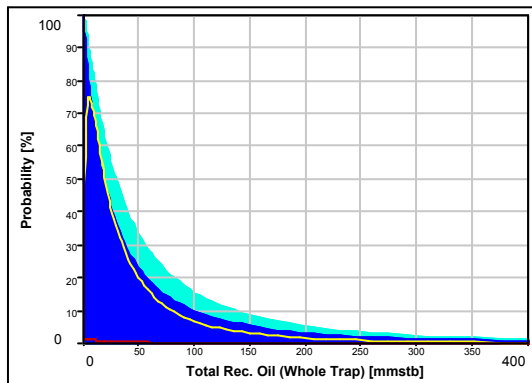
Variable	Unit	Shape	min	P90	P50	P10	max	mode
Area	km2	Lognor	0.736	4.00	14.1	50.0	[50.0 ]	5.36
Thickness	m	Lognor	15.0	50.0	122	300	997	75.1
Shape factor	%	Normal	36.6	50.0	60.0	70.0	83.4	60.0
Deg. of fill	%	Rect	100	100	100	100	100	100
Net-to-gross	%	Normal	[0 ]	20.0	35.0	50.0	70.1	35.0
Porosity	%	Normal	[0 ]	5.00	10.0	15.0	21.7	10.0
Sw	%	Normal	[0 ]	20.0	40.0	60.0	86.8	40.0
NTG (fr)	%	Normal	[0 ]	26.0	50.0	74.0	[100 ]	50.0
Por. (fr)	%	Normal	[0 ]	0.500	1.25	2.00	3.01	1.25
Sw (fr)	%	Normal	0.566	0.700	0.800	0.900	1.03	0.800
FVF (Bo)	vol/vol	Normal	0.966	1.10	1.20	1.30	1.43	1.20
Oil rec fac	%	Normal	[0 ]	10.0	25.0	40.0	60.1	25.0
Oil RF (fr)	%	Triang	10.0	20.0	32.6	47.8	60.0	30.0

## Risk Factors

Play Chance: **16%**      Prospect Specific Chance: **7.7%**  
 Reservoir: **64%**      Trap: **40%**  
 Source: **25%**      Reservoir: **60%**  
 Regional Seal: **100%**      Seal: **40%**  
    Charge: **80%**  
 Chance of Geological Success GPOS: **1.2%**

## Economic Criteria

No economic minima applied





# Cressy\_OIL



Country:	Australia	Prospect/Field:	Cressy_OIL
State:		Reservoir:	
Block:	SEL 13/1998	Hydrocarbons:	Oil
Basin:	XXX	Prospect class:	
Play:	XXX	Reserve class:	Unspecified
Licence:	XXX	On/offshore:	
Production		Depth datum:	
Interest:	100.00	Terrain:	
Exploration		Facilities @:	km
Interest:	100.00	Target depth:	m
Operator:			



## Summary of Results

	GRV	Oil-in-Place	Total Rec. Oil	
	Whole Trap acre-ft	Whole Trap mmstb	Whole Trap mmstb	NRI mmstb
<b>Technically successful</b>				
P90:	95920	12.5	2.97	2.97
P50:	299686	47.9	12.3	12.3
P10:	929492	172	47.5	47.5
Mean:	440961	78.1	21.4	21.4
Riskd mean:			0.247	0.247

Chance of Geological Success GPOS: 1.2%  
Overall Chance of Success EPOS 1.2%

## Comments:



# Cressy\_OIL



Country: **Australia**  
Block: **SEL 13/1998**  
Basin: **XXX**  
Play: **XXX**

Name: **Cressy\_OIL**  
Segment: **4-way closure**  
Hydrocarbons: **Oil**

## Input Data

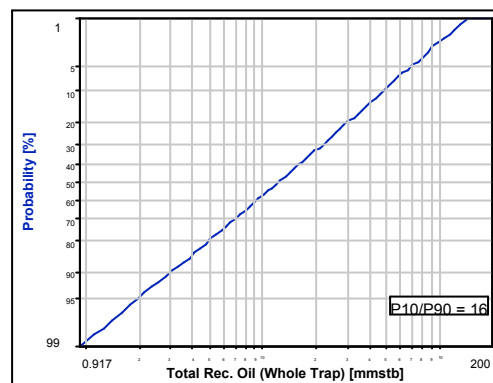
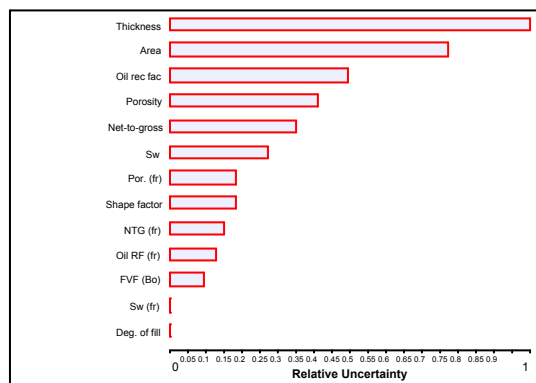
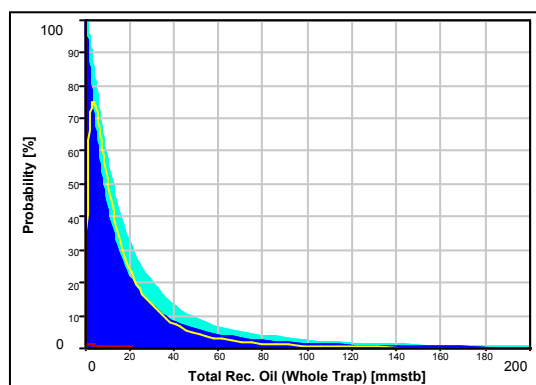
Variable	Unit	Shape	min	P90	P50	P10	max	mode
Area	km2	Lognor	0.987	2.50	5.00	10.0	25.3	3.73
Thickness	m	Lognor	15.0	50.0	122	300	997	75.1
Shape factor	%	Normal	36.6	50.0	60.0	70.0	83.4	60.0
Deg. of fill	%	Rect	100	100	100	100	100	100
Net-to-gross	%	Normal	[0 ]	20.0	35.0	50.0	70.1	35.0
Porosity	%	Normal	[0 ]	5.00	10.0	15.0	21.7	10.0
Sw	%	Normal	[0 ]	20.0	40.0	60.0	86.8	40.0
NTG (fr)	%	Normal	[0 ]	26.0	50.0	74.0	[100 ]	50.0
Por. (fr)	%	Normal	[0 ]	0.500	1.25	2.00	3.01	1.25
Sw (fr)	%	Normal	0.566	0.700	0.800	0.900	1.03	0.800
FVF (Bo)	vol/vol	Normal	0.966	1.10	1.20	1.30	1.43	1.20
Oil rec fac	%	Normal	[0 ]	10.0	25.0	40.0	60.1	25.0
Oil RF (fr)	%	Triang	10.0	20.0	32.6	47.8	60.0	30.0

## Risk Factors

Play Chance: **16%** Prospect Specific Chance: **7.2%**  
Reservoir: **64%** Trap: **50%**  
Source: **25%** Reservoir: **60%**  
Regional Seal: **100%** Seal: **30%**  
Charge: **80%**  
Chance of Geological Success GPOS: **1.2%**

## Economic Criteria

No economic minima applied





# Butlers\_Rise\_OIL



Country:	Australia	Prospect/Field:	Butlers_Rise_OIL
State:		Reservoir:	
Block:	SEL 13/1998	Hydrocarbons:	Oil
Basin:	XXX	Prospect class:	
Play:	XXX	Reserve class:	Unspecified
Licence:	XXX	On/offshore:	
Production		Depth datum:	
Interest:	100.00	Terrain:	
Exploration		Facilities @:	km
Interest:	100.00	Target depth:	m
Operator:			



## Summary of Results

	GRV	Oil-in-Place	Total Rec. Oil	
	Whole Trap	Whole Trap	Whole Trap	NRI
	acre-ft	mmstb	mmstb	mmstb
<b>Technically successful</b>				
P90:	39079	8.62	1.83	1.83
P50:	273015	55.1	13.7	13.7
P10:	947977	229	62.6	62.6
Mean:	397178	93.6	25.0	25.0
Riskd mean:			0.192	0.192

Chance of Geological Success GPOS: 0.77%

Overall Chance of Success EPOS 0.77%

## Comments:



# Butlers\_Rise\_OIL



Country: **Australia**  
 Block: **SEL 13/1998**  
 Basin: **XXX**  
 Play: **XXX**

Name: **Butlers\_Rise\_OIL**  
 Segment: **4-way closure**  
 Hydrocarbons: **Oil**

## Input Data

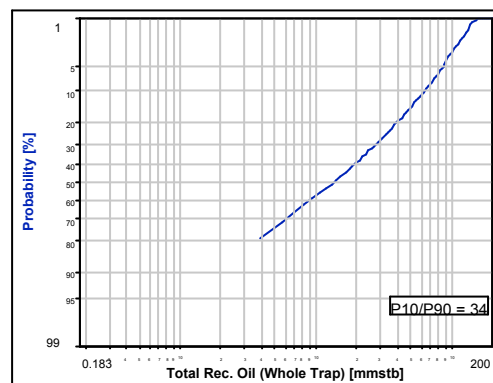
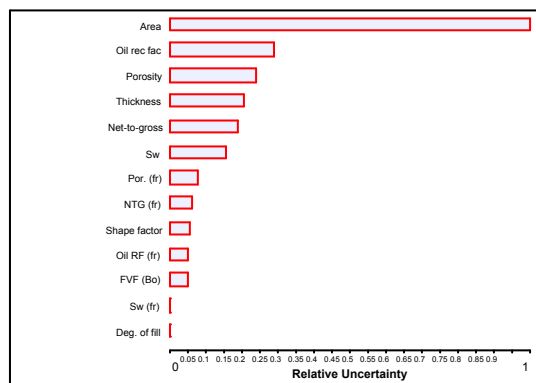
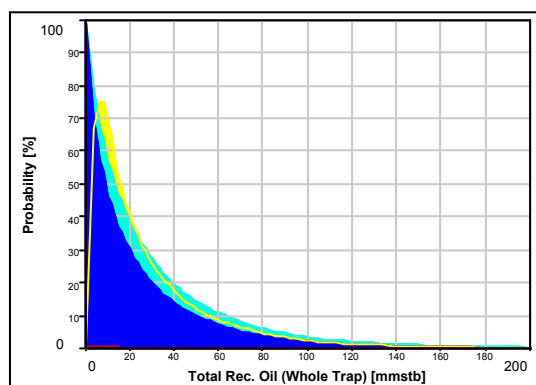
Variable	Unit	Shape	min	P90	P50	P10	max	mode
Area	km2	Lognor	0.0912	2.00	20.0	200	[40.0 ]	0.793
Thickness	m	Lognor	31.4	50.0	70.7	100	159	65.7
Shape factor	%	Normal	43.3	50.0	55.0	60.0	66.7	55.0
Deg. of fill	%	Rect	100	100	100	100	100	100
Net-to-gross	%	Normal	3.18	30.0	50.0	70.0	96.8	50.0
Porosity	%	Normal	[0 ]	5.00	10.0	15.0	21.7	10.0
Sw	%	Normal	[0 ]	20.0	40.0	60.0	86.8	40.0
NTG (fr)	%	Normal	[0 ]	26.0	50.0	74.0	[100 ]	50.0
Por. (fr)	%	Normal	[0 ]	0.500	1.25	2.00	3.01	1.25
Sw (fr)	%	Normal	0.566	0.700	0.800	0.900	1.03	0.800
FVF (Bo)	vol/vol	Normal	0.966	1.10	1.20	1.30	1.43	1.20
Oil rec fac	%	Normal	[0 ]	10.0	25.0	40.0	60.1	25.0
Oil RF (fr)	%	Triang	10.0	20.0	32.6	47.8	60.0	30.0

## Risk Factors

Play Chance: **16%**      Prospect Specific Chance: **4.8%**  
 Reservoir: **64%**      Trap: **50%**  
 Source: **25%**      Reservoir: **48%**  
 Regional Seal: **100%**      Seal: **25%**  
    Charge: **80%**  
 Chance of Geological Success GPOS: **0.77%**

## Economic Criteria

No economic minima applied





# Interlaken\_OIL



Country:	Australia	Prospect/Field:	Interlaken_OIL
State:		Reservoir:	
Block:	SEL 13/1998	Hydrocarbons:	Oil
Basin:	XXX	Prospect class:	
Play:	XXX	Reserve class:	Unspecified
Licence:	XXX	On/offshore:	
Production		Depth datum:	
Interest:	100.00	Terrain:	
Exploration		Facilities @:	km
Interest:	100.00	Target depth:	m
Operator:			



## Summary of Results

	GRV	Oil-in-Place	Total Rec. Oil	
	Whole Trap acre-ft	Whole Trap mmstb	Whole Trap mmstb	NRI mmstb
<b>Technically successful</b>				
P90:	49902	7.17	1.85	1.85
P50:	229077	39.7	10.0	10.0
P10:	697383	144	39.6	39.6
Mean:	311465	61.2	16.6	16.6
Risked mean:			0.0786	0.0786

Chance of Geological Success GPOS: 0.47%

Overall Chance of Success EPOS 0.47%

## Comments:



# Interlaken\_OIL



Country: **Australia**  
Block: **SEL 13/1998**  
Basin: **XXX**  
Play: **XXX**

Name: **Interlaken\_OIL**  
Segment: **4-way closure**  
Hydrocarbons: **Oil**

## Input Data

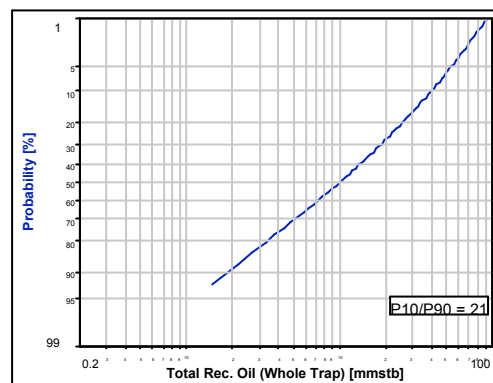
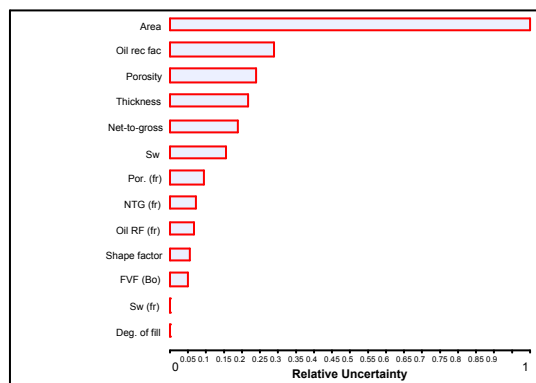
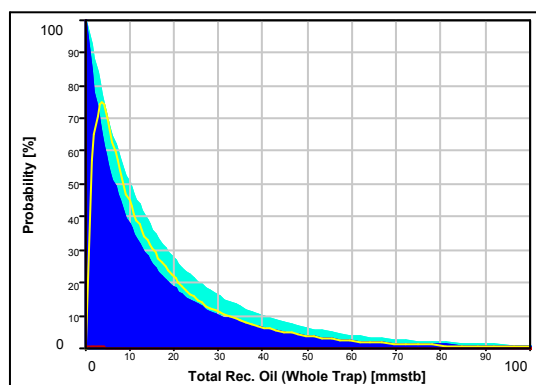
Variable	Unit	Shape	min	P90	P50	P10	max	mode
Area	km2	Lognor	0.231	2.00	10.0	50.0	[30.0 ]	2.07
Thickness	m	Lognor	31.4	50.0	70.7	100	159	65.7
Shape factor	%	Normal	43.3	50.0	55.0	60.0	66.7	55.0
Deg. of fill	%	Rect	100	100	100	100	100	100
Net-to-gross	%	Normal	3.18	30.0	50.0	70.0	96.8	50.0
Porosity	%	Normal	[0 ]	4.00	8.00	12.0	17.4	8.00
Sw	%	Normal	[0 ]	20.0	40.0	60.0	86.8	40.0
NTG (fr)	%	Normal	[0 ]	26.0	50.0	74.0	[100 ]	50.0
Por. (fr)	%	Normal	[0 ]	0.500	1.25	2.00	3.01	1.25
Sw (fr)	%	Normal	0.566	0.700	0.800	0.900	1.03	0.800
FVF (Bo)	vol/vol	Normal	0.966	1.10	1.20	1.30	1.43	1.20
Oil rec fac	%	Normal	[0 ]	10.0	25.0	40.0	60.1	25.0
Oil RF (fr)	%	Triang	10.0	20.0	32.6	47.8	60.0	30.0

## Risk Factors

Play Chance: **16%** Prospect Specific Chance: **3.0%**  
Reservoir: **64%** Trap: **28%**  
Source: **25%** Reservoir: **48%**  
Regional Seal: **100%** Seal: **28%**  
Charge: **80%**  
Chance of Geological Success GPOS: **0.47%**

## Economic Criteria

No economic minima applied





# Thunderbolt\_OIL\_DLS



Country:	Australia	Prospect/Field:	Thunderbolt_OIL_DLS
State:		Reservoir:	
Block:	SEL 13/1998	Hydrocarbons:	Oil
Basin:	XXX	Prospect class:	
Play:	XXX	Reserve class:	Unspecified
Licence:	XXX	On/offshore:	
Production		Depth datum:	
Interest:	100.00	Terrain:	
Exploration		Facilities @:	km
Interest:	100.00	Target depth:	m
Operator:			



## Summary of Results

	GRV	Oil-in-Place	Total Rec. Oil	
	Whole Trap	Whole Trap	Whole Trap	NRI
	acre-ft	mmstb	mmstb	mmstb
<b>Technically successful</b>				
P90:	1211099	49.5	12.0	12.0
P50:	2630954	206	53.4	53.4
P10:	5625606	717	198	198
Mean:	3125457	322	88.1	88.1
Riskd mean:			0.634	0.634

Chance of Geological Success GPOS: 0.72%

Overall Chance of Success EPOS 0.72%

## Comments:



# Thunderbolt\_OIL\_DLS



Country: **Australia**  
 Block: **SEL 13/1998**  
 Basin: **XXX**  
 Play: **XXX**

Name: **Thunderbolt\_OIL\_DLS**  
 Segment: **4-way closure**  
 Hydrocarbons: **Oil**

## Input Data

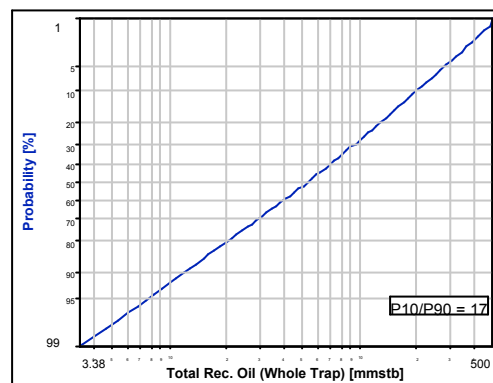
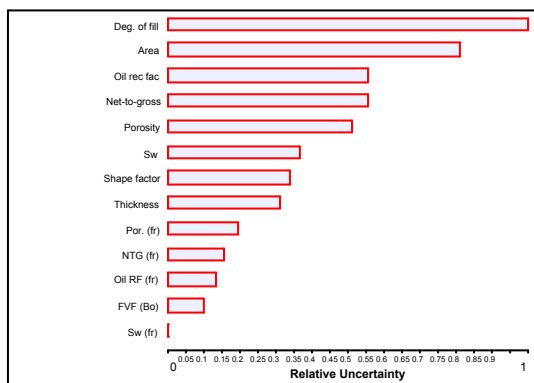
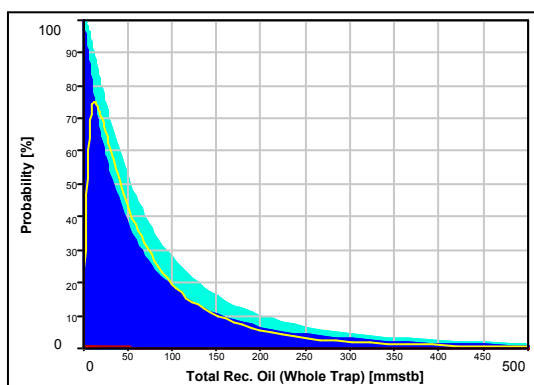
Variable	Unit	Shape	min	P90	P50	P10	max	mode
Area	km2	Lognor	3.30	8.00	15.5	30.0	72.8	11.9
Thickness	m	Lognor	213	300	387	500	704	372
Shape factor	%	Normal	19.9	40.0	55.0	70.0	90.1	55.0
Deg. of fill	%	Rect	10.0	19.0	55.0	91.0	100	55.0
Net-to-gross	%	Normal	[0 ]	20.0	50.0	80.0	[100 ]	50.0
Porosity	%	Normal	[0 ]	4.00	9.00	14.0	20.7	9.00
Sw	%	Normal	3.18	30.0	50.0	70.0	96.8	50.0
NTG (fr)	%	Normal	[0 ]	26.0	50.0	74.0	[100 ]	50.0
Por. (fr)	%	Normal	[0 ]	0.500	1.25	2.00	3.01	1.25
Sw (fr)	%	Normal	0.566	0.700	0.800	0.900	1.03	0.800
FVF (Bo)	vol/vol	Normal	0.966	1.10	1.20	1.30	1.43	1.20
Oil rec fac	%	Normal	[0 ]	10.0	25.0	40.0	60.1	25.0
Oil RF (fr)	%	Triang	10.0	20.0	32.6	47.8	60.0	30.0

## Risk Factors

Play Chance: **12%**      Prospect Specific Chance: **6.0%**  
 Reservoir: **48%**      Trap: **50%**  
 Source: **25%**      Reservoir: **60%**  
 Regional Seal: **100%**      Seal: **25%**  
    Charge: **80%**  
 Chance of Geological Success GPOS: **0.72%**

## Economic Criteria

No economic minima applied





# Stockwell



Country:	Australia	Prospect/Field:	Stockwell
State:	Tasmania	Reservoir:	Post Permian
Block:	SEL 13/98	Hydrocarbons:	Oil
Basin:	Tasmania	Prospect class:	Frontier
Play:	Post Permian	Reserve class:	Lead
Licence:	SEL 13/98	On/offshore:	
Production		Depth datum:	
Interest:	100.00	Terrain:	Mountainous
Exploration		Facilities @:	km
Interest:	100.00	Target depth:	m
Operator:	GSLM		



## Summary of Results

	GRV	Oil-in-Place	Total Rec. Oil	
	Whole Trap	Whole Trap	Whole Trap	NRI
	acre-ft	mmstb	mmstb	mmstb
<b>Technically successful</b>				
P90:	118853	9.97	2.00	2.00
P50:	250228	31.5	7.40	7.40
P10:	516177	87.6	23.6	23.6
Mean:	292920	42.3	11.0	11.0
Riskd mean:			0.0827	0.0827

Chance of Geological Success GPOS: 0.75%

Overall Chance of Success EPOS 0.75%

## Comments:



# Stockwell



Country: **Australia**  
Block: **SEL 13/98**  
Basin: **Tasmania**  
Play: **Post Permian**

Name: **Stockwell**  
Segment:  
Hydrocarbons: **Oil**

## Input Data

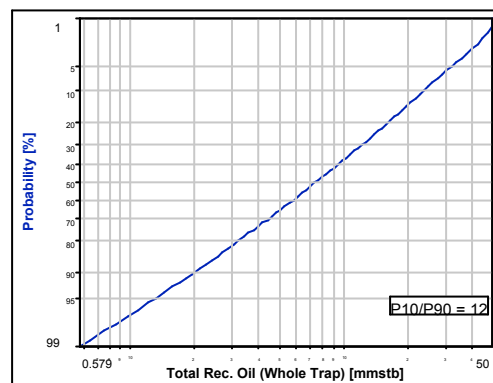
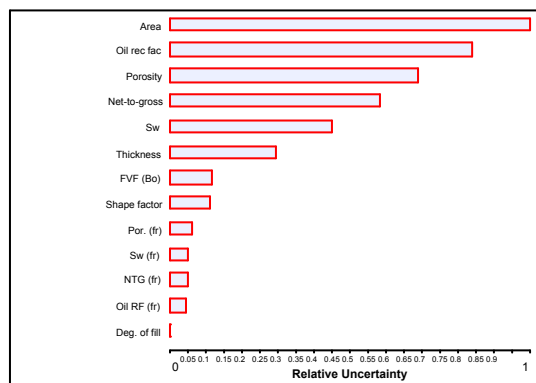
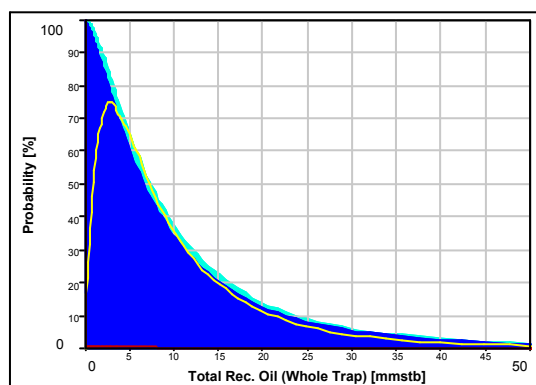
Variable	Unit	Shape	min	P90	P50	P10	max	mode
Area	km2	Lognor	0.711	1.80	3.60	7.20	18.2	2.69
Thickness	m	Lognor	75.2	99.2	122	150	198	119
Shape factor	%	Triang	60.0	64.5	70.0	75.5	80.0	70.0
Deg. of fill	%	Single	100	100	100	100	100	100
Net-to-gross	%	Normal	[0 ]	20.0	35.0	50.0	70.1	35.0
Porosity	%	Normal	[0 ]	5.00	10.0	15.0	21.7	10.0
Sw	%	Normal	[0 ]	20.0	40.0	60.0	86.8	40.0
NTG (fr)	%	Normal	[0 ]	26.0	50.0	74.0	[100 ]	50.0
Por. (fr)	%	Normal	[0 ]	0.500	1.25	2.00	3.01	1.25
Sw (fr)	%	Normal	56.6	70.0	80.0	90.0	[100 ]	80.0
FVF (Bo)	vol/vol	Triang	1.02	1.10	1.20	1.30	1.38	1.20
Oil rec fac	%	Normal	[0 ]	10.0	25.0	40.0	60.1	25.0
Oil RF (fr)	%	Triang	10.0	20.0	32.6	47.8	60.0	30.0

## Risk Factors

Play Chance: **16%** Prospect Specific Chance: **4.7%**  
Reservoir: 64% Trap: 49%  
Source: 25% Reservoir: 50%  
Regional Seal: 100% Seal: 32%  
Charge: 60%  
Chance of Geological Success GPOS: **0.75%**

## Economic Criteria

No economic minima applied

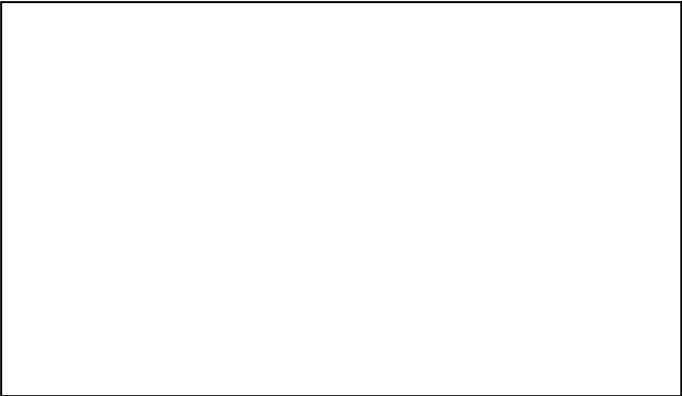
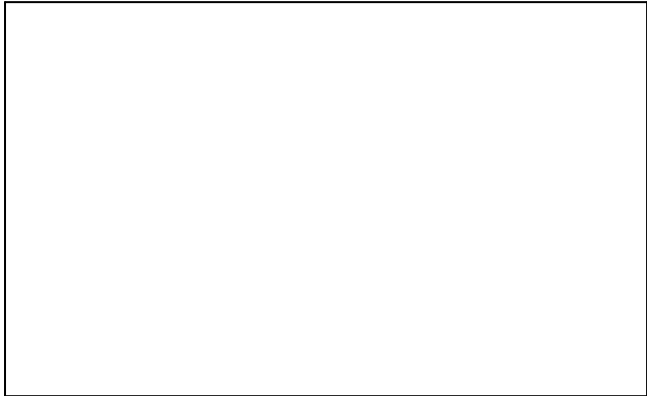




Steppes



Country:	Australia	Prospect/Field:	Steppes
State:	Tasmania	Reservoir:	Post Permian
Block:	SEL 13/98	Hydrocarbons:	Oil
Basin:	Tasmania	Prospect class:	Frontier
Play:	Post Permian	Reserve class:	Lead
Licence:	SEL 13/98	On/offshore:	
Production		Depth datum:	
Interest:	100.00	Terrain:	Mountainous
Exploration		Facilities @:	km
Interest:	100.00	Target depth:	m
Operator:	GSLM		



Summary of Results

	GRV	Oil-in-Place	Total Rec. Oil	
	Whole Trap	Whole Trap	Whole Trap	NRI
	acre-ft	mmstb	mmstb	mmstb
Technically successful				
P90:	115238	9.74	1.96	1.96
P50:	249478	31.3	7.39	7.39
P10:	528192	89.2	24.0	24.0
Mean:	295314	42.6	11.1	11.1
Riskd mean:			0.142	0.142

Chance of Geological Success GPOS: 1.3%  
Overall Chance of Success EPOS 1.3%

Comments:



# Steppes



Country: **Australia**  
Block: **SEL 13/98**  
Basin: **Tasmania**  
Play: **Post Permian**

Name: **Steppes**  
Segment:  
Hydrocarbons: **Oil**

## Input Data

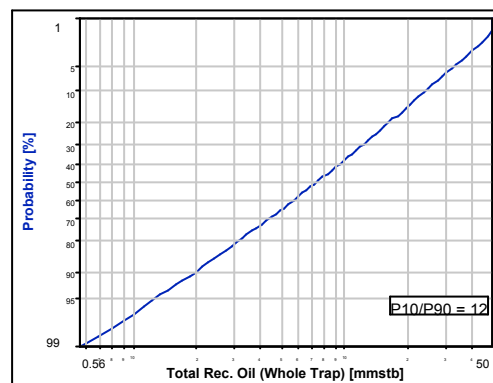
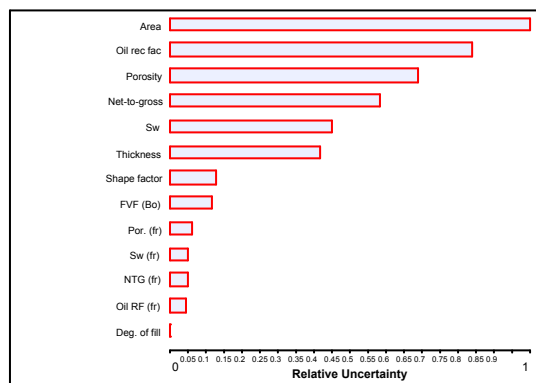
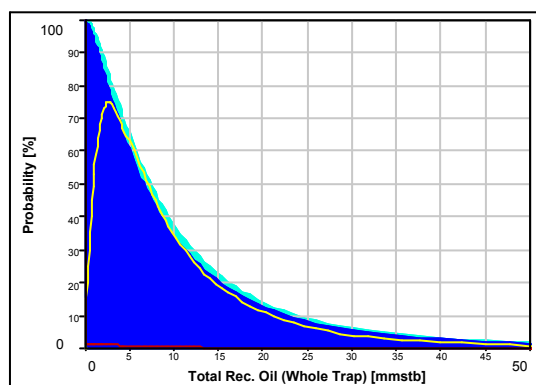
Variable	Unit	Shape	min	P90	P50	P10	max	mode
Area	km2	Lognor	1.68	4.25	8.50	17.0	43.1	6.34
Thickness	m	Lognor	30.6	45.0	60.0	80.0	118	57.1
Shape factor	%	Triang	50.0	54.5	60.0	65.5	70.0	60.0
Deg. of fill	%	Single	100	100	100	100	100	100
Net-to-gross	%	Normal	[0 ]	20.0	35.0	50.0	70.1	35.0
Porosity	%	Normal	[0 ]	5.00	10.0	15.0	21.7	10.0
Sw	%	Normal	[0 ]	20.0	40.0	60.0	86.8	40.0
NTG (fr)	%	Normal	[0 ]	26.0	50.0	74.0	[100 ]	50.0
Por. (fr)	%	Normal	[0 ]	0.500	1.25	2.00	3.01	1.25
Sw (fr)	%	Normal	56.6	70.0	80.0	90.0	[100 ]	80.0
FVF (Bo)	vol/vol	Triang	1.02	1.10	1.20	1.30	1.38	1.20
Oil rec fac	%	Normal	[0 ]	10.0	25.0	40.0	60.1	25.0
Oil RF (fr)	%	Triang	10.0	20.0	32.6	47.8	60.0	30.0

## Risk Factors


Play Chance: **16%** Prospect Specific Chance: **8.0%**  
Reservoir: 64% Trap: 45%  
Source: 25% Reservoir: 50%  
Regional Seal: 100% Seal: 60%  
Charge: 60%  
Chance of Geological Success GPOS: **1.3%**

## Economic Criteria

No economic minima applied





	Quamby Fault Block																																																					
Country:	Australia	Prospect/Field:	Quamby Fault Block																																																			
State:	Tasmania	Reservoir:	Post Permian																																																			
Block:	SEL 13/98	Hydrocarbons:	Oil																																																			
Basin:	Tasmania	Prospect class:	Frontier																																																			
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Licence:	SEL 13/98	On/offshore:																																																				
Production		Depth datum:																																																				
Interest:	100.00	Terrain:	Mountainous																																																			
Exploration		Facilities @:	km																																																			
Interest:	100.00	Target depth:	m																																																			
Operator:	GSLM																																																					
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<h3>Summary of Results</h3> <table><thead><tr><th></th><th>GRV</th><th>Oil-in-Place</th><th>Total Rec. Oil</th><th></th></tr><tr><th></th><th>Whole Trap</th><th>Whole Trap</th><th>Whole Trap</th><th>NRI</th></tr><tr><th></th><th>acre-ft</th><th>mmstb</th><th>mmstb</th><th>mmstb</th></tr></thead><tbody><tr><td colspan="5"><b>Technically successful</b></td></tr><tr><td>P90:</td><td>23787</td><td>2.01</td><td>0.405</td><td>0.405</td></tr><tr><td>P50:</td><td>51396</td><td>6.45</td><td>1.52</td><td>1.52</td></tr><tr><td>P10:</td><td>108720</td><td>18.3</td><td>4.95</td><td>4.95</td></tr><tr><td>Mean:</td><td>60798</td><td>8.78</td><td>2.28</td><td>2.28</td></tr><tr><td>Riskd mean:</td><td></td><td></td><td>0.0144</td><td>0.0144</td></tr></tbody></table> <table><tbody><tr><td>Chance of Geological Success GPOS:</td><td>0.63%</td></tr><tr><td>Overall Chance of Success EPOS</td><td>0.63%</td></tr></tbody></table>							GRV	Oil-in-Place	Total Rec. Oil			Whole Trap	Whole Trap	Whole Trap	NRI		acre-ft	mmstb	mmstb	mmstb	<b>Technically successful</b>					P90:	23787	2.01	0.405	0.405	P50:	51396	6.45	1.52	1.52	P10:	108720	18.3	4.95	4.95	Mean:	60798	8.78	2.28	2.28	Riskd mean:			0.0144	0.0144	Chance of Geological Success GPOS:	0.63%	Overall Chance of Success EPOS	0.63%
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Author: User Name		Date: 12/08/08		Appraiser:																																																		
				Reference:																																																		
5.12d																																																						



# Quamby Fault Block



Country: **Australia**  
Block: **SEL 13/98**  
Basin: **Tasmania**  
Play: **Post Permian**

Name: **Quamby Fault Block**  
Segment:  
Hydrocarbons: **Oil**

## Input Data

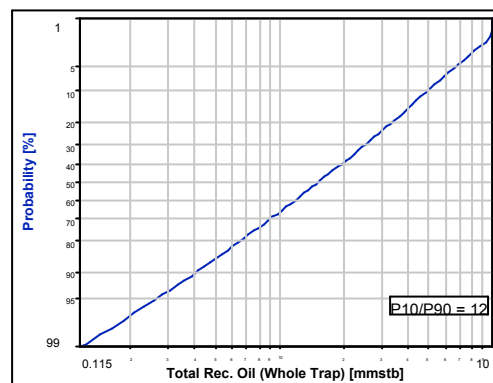
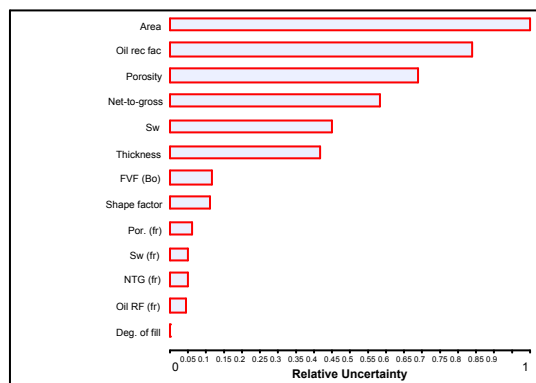
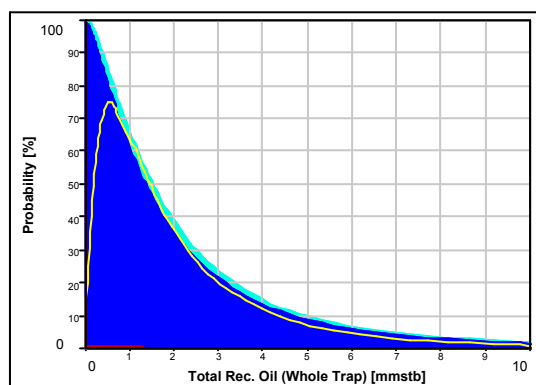
Variable	Unit	Shape	min	P90	P50	P10	max	mode
Area	km2	Lognor	0.296	0.750	1.50	3.00	7.60	1.12
Thickness	m	Lognor	30.6	45.0	60.0	80.0	118	57.1
Shape factor	%	Triang	60.0	64.5	70.0	75.5	80.0	70.0
Deg. of fill	%	Single	100	100	100	100	100	100
Net-to-gross	%	Normal	[0 ]	20.0	35.0	50.0	70.1	35.0
Porosity	%	Normal	[0 ]	5.00	10.0	15.0	21.7	10.0
Sw	%	Normal	[0 ]	20.0	40.0	60.0	86.8	40.0
NTG (fr)	%	Normal	[0 ]	26.0	50.0	74.0	[100 ]	50.0
Por. (fr)	%	Normal	[0 ]	0.500	1.25	2.00	3.01	1.25
Sw (fr)	%	Normal	56.6	70.0	80.0	90.0	[100 ]	80.0
FVF (Bo)	vol/vol	Triang	1.02	1.10	1.20	1.30	1.38	1.20
Oil rec fac	%	Normal	[0 ]	10.0	25.0	40.0	60.1	25.0
Oil RF (fr)	%	Triang	10.0	20.0	32.6	47.8	60.0	30.0

## Risk Factors

Play Chance: **16%** Prospect Specific Chance: **4.0%**  
Reservoir: 64% Trap: 30%  
Source: 25% Reservoir: 50%  
Regional Seal: 100% Seal: 44%  
Charge: 60%  
Chance of Geological Success GPOS: **0.63%**

## Economic Criteria

No economic minima applied





# Nile River



Country:	Australia	Prospect/Field:	Nile River
State:	Tasmania	Reservoir:	Post Permian
Block:	SEL 13/98	Hydrocarbons:	Oil
Basin:	Tasmania	Prospect class:	Frontier
Play:	Post Permian	Reserve class:	Lead
Licence:	SEL 13/98	On/offshore:	
Production		Depth datum:	
Interest:	100.00	Terrain:	Mountainous
Exploration		Facilities @:	km
Interest:	100.00	Target depth:	m
Operator:	GSLM		



## Summary of Results

	GRV	Oil-in-Place	Total Rec. Oil	
	Whole Trap	Whole Trap	Whole Trap	NRI
	acre-ft	mmstb	mmstb	mmstb
<b>Technically successful</b>				
P90:	208121	17.6	3.52	3.52
P50:	445118	56.0	13.1	13.1
P10:	931294	157	42.4	42.4
Mean:	524174	75.7	19.7	19.7
Riskd mean:			0.159	0.159

Chance of Geological Success GPOS: 0.81%

Overall Chance of Success EPOS 0.81%

## Comments:



# Nile River



Country: **Australia**  
Block: **SEL 13/98**  
Basin: **Tasmania**  
Play: **Post Permian**

Name: **Nile River**  
Segment:  
Hydrocarbons: **Oil**

## Input Data

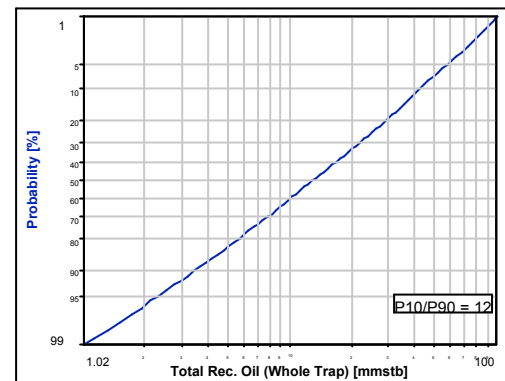
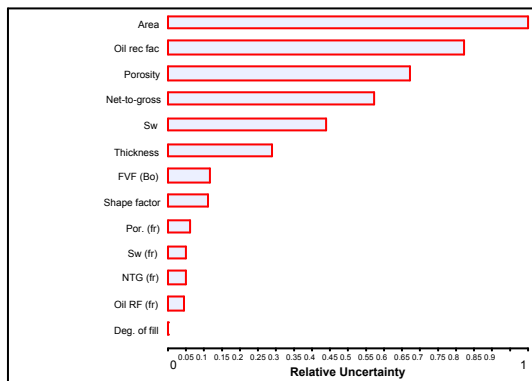
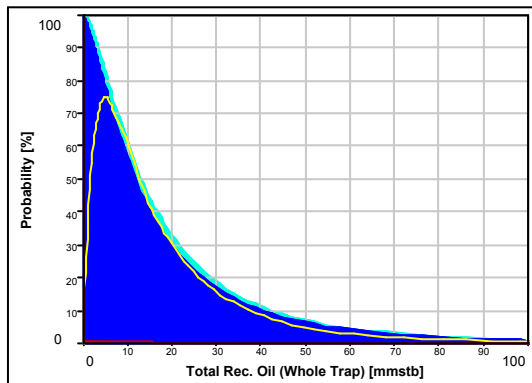
Variable	Unit	Shape	min	P90	P50	P10	max	mode
Area	km2	Lognor	1.22	3.15	6.40	13.0	33.6	4.71
Thickness	m	Lognor	75.2	99.2	122	150	198	119
Shape factor	%	Triang	60.0	64.5	70.0	75.5	80.0	70.0
Deg. of fill	%	Single	100	100	100	100	100	100
Net-to-gross	%	Normal	[0 ]	20.0	35.0	50.0	70.1	35.0
Porosity	%	Normal	[0 ]	5.00	10.0	15.0	21.7	10.0
Sw	%	Normal	[0 ]	20.0	40.0	60.0	86.8	40.0
NTG (fr)	%	Normal	[0 ]	26.0	50.0	74.0	[100 ]	50.0
Por. (fr)	%	Normal	[0 ]	0.500	1.25	2.00	3.01	1.25
Sw (fr)	%	Normal	56.6	70.0	80.0	90.0	[100 ]	80.0
FVF (Bo)	vol/vol	Triang	1.02	1.10	1.20	1.30	1.38	1.20
Oil rec fac	%	Normal	[0 ]	10.0	25.0	40.0	60.1	25.0
Oil RF (fr)	%	Triang	10.0	20.0	32.6	47.8	60.0	30.0

## Risk Factors

Play Chance: **16%** Prospect Specific Chance: **5.1%**  
Reservoir: 64% Trap: 33%  
Source: 25% Reservoir: 50%  
Regional Seal: 100% Seal: 52%  
Charge: 60%  
Chance of Geological Success GPOS: **0.81%**

## Economic Criteria

No economic minima applied





# Macquarie River



Country:	Australia	Prospect/Field:	Macquarie River
State:	Tasmania	Reservoir:	Post Permian
Block:	SEL 13/98	Hydrocarbons:	Oil
Basin:	Tasmania	Prospect class:	Frontier
Play:	Post Permian	Reserve class:	Lead
Licence:	SEL 13/98	On/offshore:	
Production		Depth datum:	
Interest:	100.00	Terrain:	Mountainous
Exploration		Facilities @:	km
Interest:	100.00	Target depth:	m
Operator:	GSLM		



## Summary of Results

	GRV	Oil-in-Place	Total Rec. Oil	
	Whole Trap	Whole Trap	Whole Trap	NRI
	acre-ft	mmstb	mmstb	mmstb
<b>Technically successful</b>				
P90:	208121	17.6	3.52	3.52
P50:	445118	56.0	13.1	13.1
P10:	931294	157	42.4	42.4
Mean:	524174	75.7	19.7	19.7
Riskd mean:			0.113	0.113

Chance of Geological Success GPOS: 0.58%

Overall Chance of Success EPOS 0.58%

## Comments:



# Macquarie River



Country: **Australia**  
Block: **SEL 13/98**  
Basin: **Tasmania**  
Play: **Post Permian**

Name: **Macquarie River**  
Segment:  
Hydrocarbons: **Oil**

## Input Data

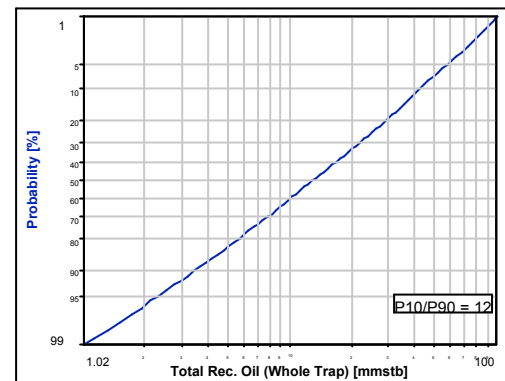
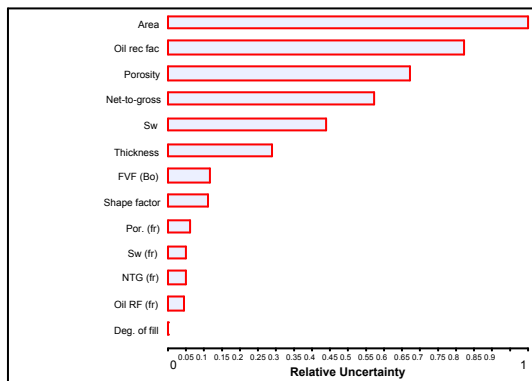
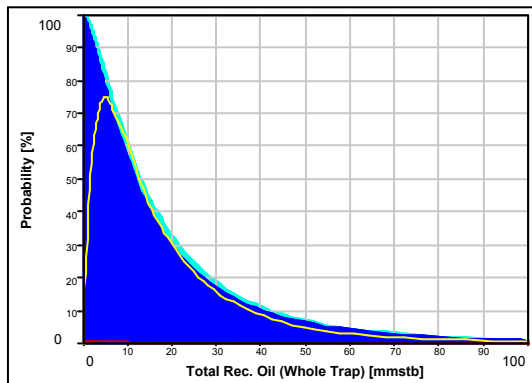
Variable	Unit	Shape	min	P90	P50	P10	max	mode
Area	km2	Lognor	1.22	3.15	6.40	13.0	33.6	4.71
Thickness	m	Lognor	75.2	99.2	122	150	198	119
Shape factor	%	Triang	60.0	64.5	70.0	75.5	80.0	70.0
Deg. of fill	%	Single	100	100	100	100	100	100
Net-to-gross	%	Normal	[0 ]	20.0	35.0	50.0	70.1	35.0
Porosity	%	Normal	[0 ]	5.00	10.0	15.0	21.7	10.0
Sw	%	Normal	[0 ]	20.0	40.0	60.0	86.8	40.0
NTG (fr)	%	Normal	[0 ]	26.0	50.0	74.0	[100 ]	50.0
Por. (fr)	%	Normal	[0 ]	0.500	1.25	2.00	3.01	1.25
Sw (fr)	%	Normal	56.6	70.0	80.0	90.0	[100 ]	80.0
FVF (Bo)	vol/vol	Triang	1.02	1.10	1.20	1.30	1.38	1.20
Oil rec fac	%	Normal	[0 ]	10.0	25.0	40.0	60.1	25.0
Oil RF (fr)	%	Triang	10.0	20.0	32.6	47.8	60.0	30.0

## Risk Factors

Play Chance: **16%** Prospect Specific Chance: **3.6%**  
Reservoir: 64% Trap: 30%  
Source: 25% Reservoir: 50%  
Regional Seal: 100% Seal: 40%  
Charge: 60%  
Chance of Geological Success GPOS: **0.58%**

## Economic Criteria

No economic minima applied





# **Economic Evaluation of the Bellevue and Thunderbolt Prospects in SEL-13/98, Australia**

**Prepared for  
Great South Land Minerals Limited**



**Date: Dec 2009**

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# Economic Evaluation of the Bellevue and Thunderbolt Prospects in SEL-13/98, Australia

Prepared for  
Great South Land Minerals Limited

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## DISCLAIMER

The opinions and interpretations presented in this report represent our best technical interpretation of the data made available to us. However, due to the uncertainty inherent in the estimation of all sub-surface parameters, we cannot, and do not guarantee the accuracy or correctness of any interpretation and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, cost damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees.

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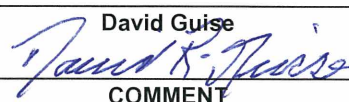
This report relates specifically and solely to the subject assets and is conditional upon various assumptions that are described herein. This report must, therefore, be read in its entirety.

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Our estimates of potential reserves, resources, un-risked and risked values are based on data provided by Great South Land Minerals Limited. We have accepted, without independent verification, the accuracy and completeness of these data.

All interpretations and conclusions presented herein are opinions based on inferences from geological, geophysical, engineering or other data. The report represents RPS's best professional judgment and should not be considered a guarantee of results. Our liability is limited solely to Great South Land Minerals Limited.

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	REPORT TITLE: Economic Evaluation of the Bellevue and Thunderbolt Prospects in SEL-13/98, Australia		
DATE	22 Dec 2009	PROJECT REFERENCE:	ACI02813
	PREPARED:	CHECKED:	APPROVED:
NAME	Otto Aristeguieta	Prady Chaliha	David Guise 
SENT	EDITION	DESCRIPTION	COMMENT
22/12/2009	Rev. 0	Final	For Issue to Client
18/12/2009	Rev. C	Draft	For Client Review
14/12/2009	Rev. B	Draft	For Internal Review



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## 1. EXECUTIVE SUMMARY

Great South Land Minerals Limited (GSLM), a wholly owned subsidiary of Empire Energy Corporation, requested that RPS Energy (RPS) provide an economic valuation of the Bellevue and Thunderbolt Prospects located in Special Exploration Licence SEL 13/98, Tasmania.

GSLM holds 100% interest in the Special Exploration Licence SEL 13/98 which covers a portion of the Tasmania Basin. The permit area is approximately 15,410 square kilometres and covers approximately 25% of the island of Tasmania. SEL 13/98 expired on the 30<sup>th</sup> of September 2009. GSLM have advised RPS that a five year renewal of the exploration licence has been submitted and is likely to be granted. The new exploration licence will be called EL 14/2009. No petroleum wells have been drilled in the permit area to date.

The valuation presented in this report adopts an Expected Monetary Value (EMV) approach using a probability tree methodology to model the range of possible outcomes for the assumed developments. The conceptual development plan and corresponding production forecast were generated by GSLM based on the mean case Prospective Resource volumes reported by RPS in "Competent Persons Report on Assets of Great South Land Minerals Limited, Tasmania" dated 23<sup>rd</sup> October 2008<sup>1,2</sup>. RPS has reviewed these profiles and believes they are reasonable based on the un-risked mean Prospective Resource volumes.

The capital and operating cost were generated by RPS using "QUESTOR"<sup>TM</sup>, a cost and technical database covering all the producing regions of the world. When available, cost data specific to the asset in question was used. The calculated base case and commodity price sensitivities with corresponding EMV's for Special Exploration Licence SEL 13/98 is presented in Table 1.

Special Exploration Licence SEL 13/98	
Bellevue and Thunderbolt Prospects	EMV10 (US\$ million)
Base Case Oil: US\$83.75/bbl	50.9
Oil Price Sensitivities: EMV10 (US\$ million)	
Low Case Oil: US\$65/bbl	24.5
High Case Oil: US\$110/bbl	87.7

**Table 1 – Calculated EMV10 of the Bellevue and Thunderbolt Prospects, as of 1 December 2009**

<sup>1</sup> Great South Land Minerals Limited, 22<sup>nd</sup> December 2009; "Bellevue Prospect PoD Rev1"

<sup>2</sup> Great South Land Minerals Limited, 22<sup>nd</sup> December 2009; "Thunderbolt Prospect PoD Rev1"



## 2. ECONOMIC VALUATION

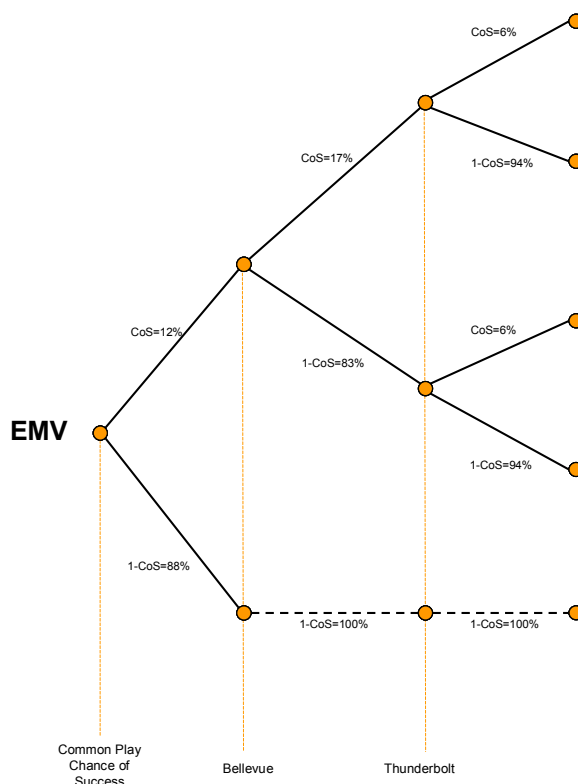
### 2.1 Methodology

The valuation presented in this report adopts an Expected Monetary Value (EMV) approach using a probability tree methodology to model the range of possible outcomes for the assumed developments.

Each prospect has two initial possible outcomes, success or failure. The chance of success (COS) is equal to the prospect specific Geological Probability of Success (GPoS). In PRMS this is referred to as the Chance of Discovery. The chance of failure (dry hole) is therefore always equal to  $(1 - \text{COS})$ .

Discrete production and cost profiles were generated for the mean success case resources for each of the prospects evaluated. These discrete cases were then used to estimate the value of the success case of each prospect. This value is assumed to be the Net Present Value of the cash flow associated with each prospect using a ten percent discount rate. The evaluation includes failure cases that are represented by the discounted value of total exploration commitment related to each of the prospects evaluated.

Additionally, the probability tree approach allows the inclusion of partial dependencies between prospects within the same basin. As a result, in addition to the prospect specific chance of success, an overall “play” chance of success that represents the existence of an oil play in the area under study has been also included in the evaluation. Figure 1 displays the probability used to estimate the value of the Bellevue and Thunderbolt Prospects.



**Figure 1 – Probability Tree Used to Estimate the EMV of the Bellevue and Thunderbolt Prospects**



## 2.2 General Economic Assumptions

### 2.2.1 Evaluation date and discount rate

All net cash flows have been discounted at a rate of 10% (nominal) per year. The valuation date is 1 December 2009.

### 2.2.2 Pricing Assumptions

The valuation is based on RPS's view of the long term forecast for Brent Crude as shown in Figure 2. It is assumed that all crude is sold with no discount to the Brent Price. The base price case assumes a six year forward curve and US\$83.75 per barrel flat real thereafter. The low price case and high price case assume a five year forward curves, US\$65 per barrel and US\$110 per barrel flat real thereafter, respectively. All crude price estimates had been escalated at 2% per annum (Figure 3).

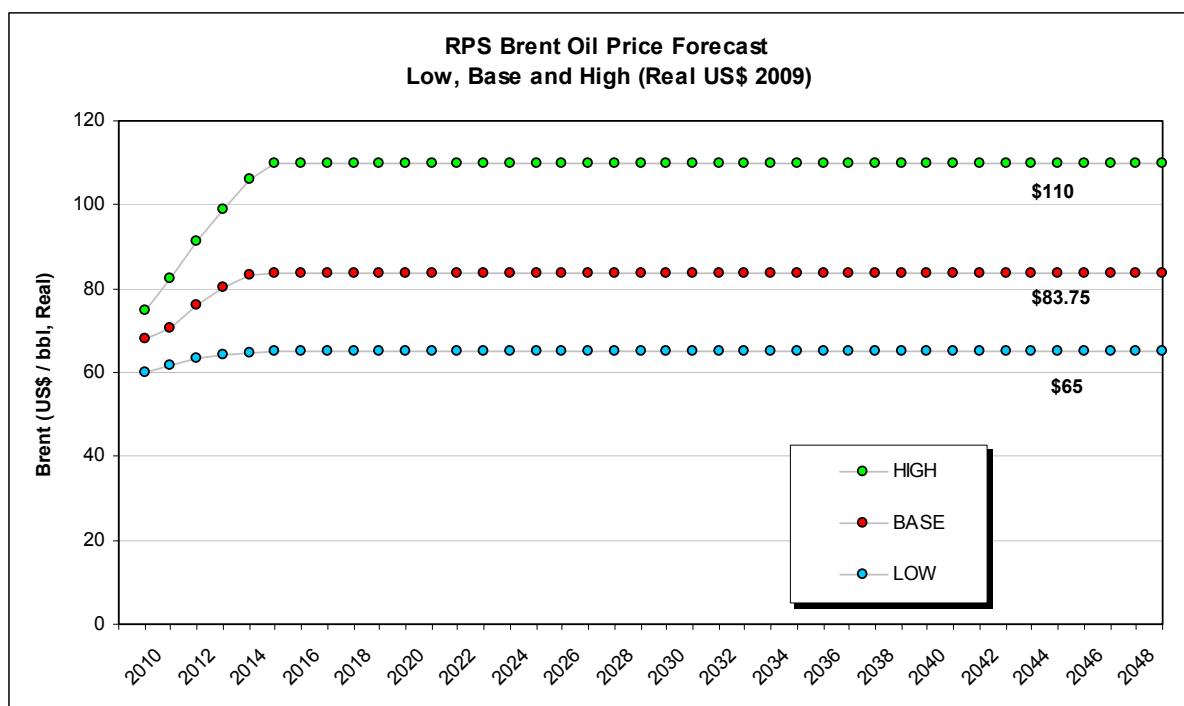
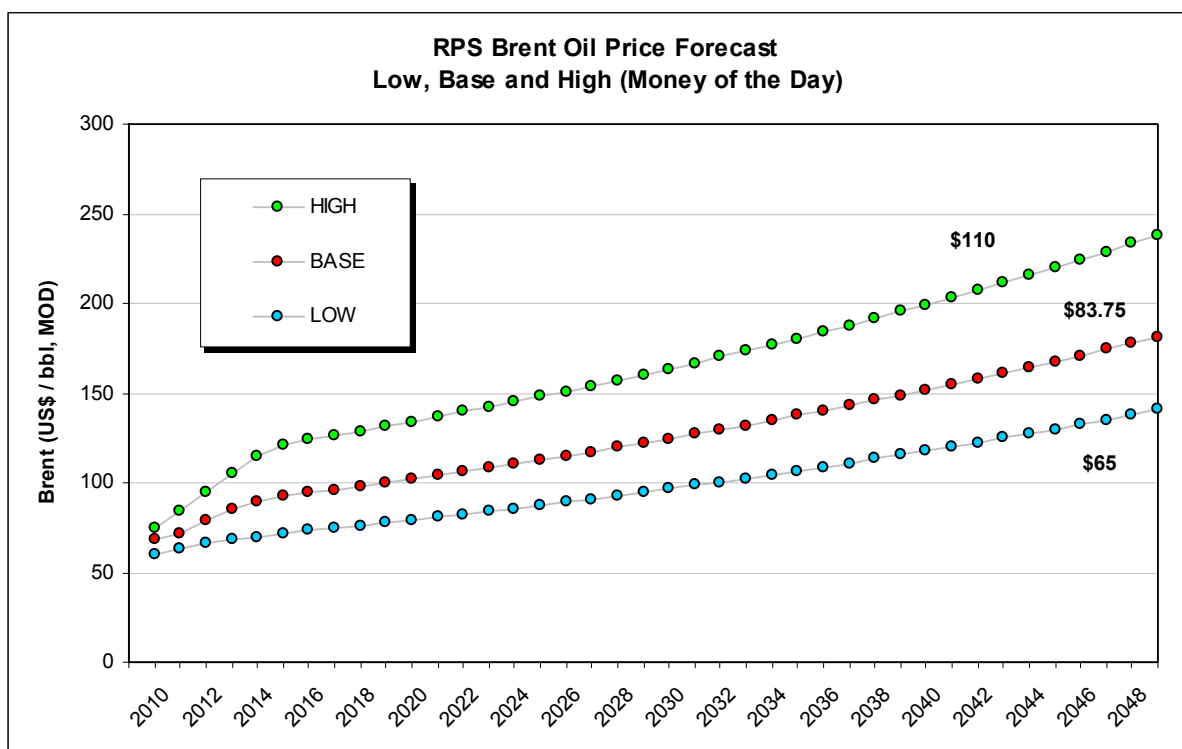


Figure 2 – RPS Brent Crude Price Forecast in Real Terms





**Figure 3 – RPS Brent Crude Price Forecast in Nominal Terms**

### 2.2.3 Inflation

An annual inflation of 2.5% has been built into the valuation. This inflation rate has been applied to all cost estimates to adjust them to Money of the Day (MOD) terms.

### 2.2.4 Fiscal terms

The fiscal terms included in the evaluation are as follows:

#### Royalty:

- 12% of gross revenue.

#### Corporate Tax:

- 30% of taxable income.
- Taxable income assumes 15 year straight line depreciation for capital costs.
- It is assumed that excise tax is deducted from the corporate tax taxable income.

#### Excise Tax:

- Applicable on a field basis.
- First 30 MMstb of crude oil exempt from excise tax.
- Excise Rate applicable to gross revenue on an incremental sliding scale basis as shown in Table 2.



Annual Production			Excise Rate
MMstb			
0.000	to	0.315	0%
0.315	to	0.629	0%
0.629	to	1.259	0%
1.259	to	1.888	0%
1.888	to	2.517	0%
2.517	to	3.146	0%
3.146	to	3.776	10%
3.776	to	4.405	15%
4.405	to	5.034	20%
	>	5.034	30%

**Table 2 – Excise Tax Rates**

## **2.3 Development Assumptions**

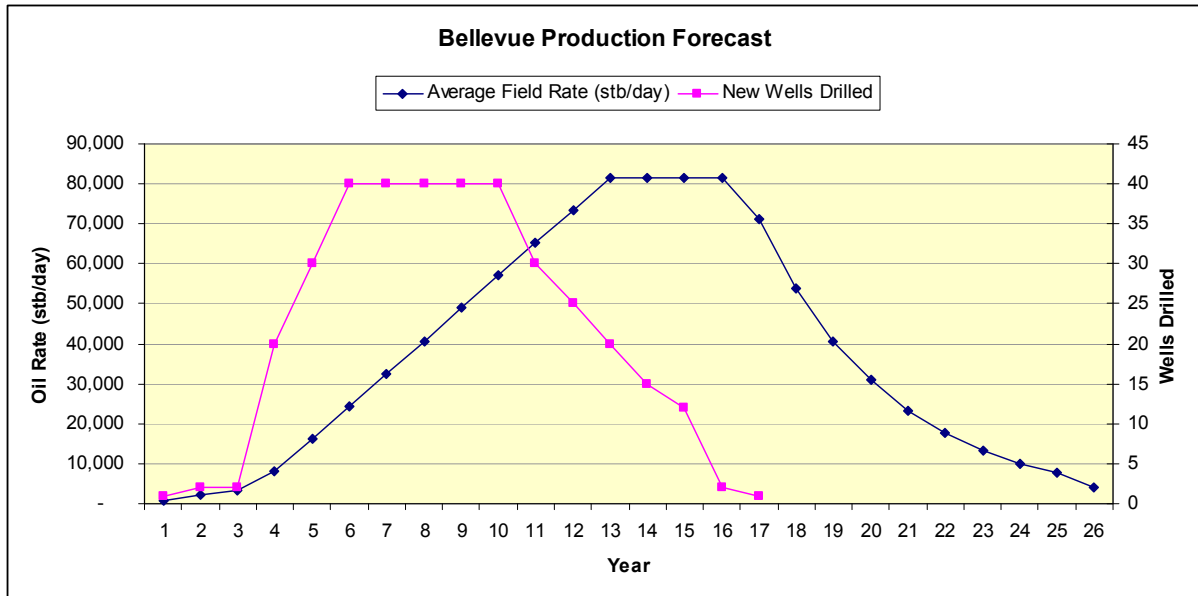
The conceptual development plan and corresponding production forecast were generated by Great South Land Minerals Limited based on the mean case Prospective Resource volumes reported by RPS in “Competent Persons Report on Assets of Great South Land Minerals Limited, Tasmania” dated 23<sup>rd</sup> October 2008. RPS has reviewed these profiles and believes they are reasonable based on the un-risked mean Prospective Resource volumes.

### **2.3.1 Bellevue Assumptions**

The Bellevue Prospect contains a Mean Case Prospective Resource volume of 359 MMstb (un-risked) in the Upper and Lower Units of the Gordon Limestone. Assuming the Bellevue Prospect contains a medium gravity crude of approximately 30 deg API with a moderate water drive, an average drainage area per well is expected to be 40 acres. Therefore, using the mean area of the reservoir of 58 sq km, 360 vertical wells are required to drain the reservoir, equivalent to 1.0 MMstb per well.

Initial production rate per well is expected to be 910 stb/day declining at 30% per annum with a 10% downtime. This will recover the Prospective Resource volume in less than 30 years. An average gas-oil ratio of 200 scf/stb is assumed over the life of the project. This gas will be utilised as fuel gas to power facilities and artificial lift and remain cash neutral over the life of the project. The average field production rate and wells drilled is illustrated in Figure 4.



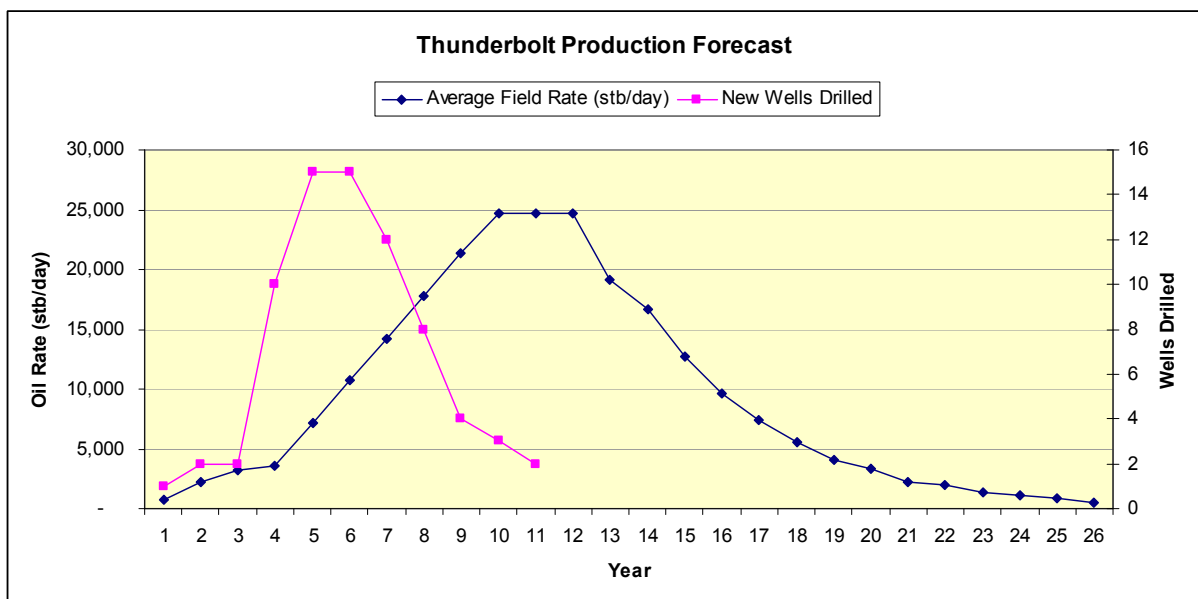


**Figure 4 – Bellevue Production Forecast**

### 2.3.2 Thunderbolt Assumptions

The Thunderbolt Prospect contains a Mean Case Prospective Resource volume of 88 MMstb in the Gordon Limestone. Assuming the Thunderbolt Prospect contains a medium gravity crude of approximately 30 deg API with a moderate water drive, an average drainage area per well is expected to be 40 acres. Therefore, using the mean area of the reservoir of 12 sq km, 74 vertical wells are required to drain the reservoir, equivalent to 1.2 MMstb per well.

Initial production rate per well is expected to be 875 stb/day declining at 24% per annum with a 10% downtime. This will recover the Prospective Resource volume in less than 30 years. An average gas-oil ratio of 200 scf/stb is assumed over the life of the project. This gas will be utilised as fuel gas to power facilities and artificial lift and remain cash neutral over the life of the project. The average field production rate and wells drilled is illustrated in Figure 5.



**Figure 5 – Thunderbolt Production Forecast**



## 2.4 Project Expenditures

The capital and operating cost were generated using “QUESTOR”™, a cost and technical database covering all the producing regions of the world (when available, cost data specific to the asset in question was used). These databases are updated every six months with costs gathered from actual projects, fabricators, vendors, and service companies. A summary of exploration, development, operating and abandonment costs are provided in Table 3. All costs are in United States Dollars (US\$) and are pre-inflation.

<b>Cost</b>	<b>Bellevue Prospect</b>	<b>Thunderbolt Prospect</b>
	<b>US\$ million</b>	<b>US\$ million</b>
Exploration Well	4.0	4.8
Appraisal Wells	31.4	18.8
Other G&G	13.5	8.1
<b>Total Exploration/Appraisal Costs</b>	<b>48.8</b>	<b>31.7</b>
Development Drilling	2292.6	512.6
Facilities	445.5	183.6
Pipelines	391.5	206.6
<b>Total Development Expenditures</b>	<b>3129.6</b>	<b>902.7</b>
<b>Total Operating</b>	<b>2653.1</b>	<b>1091.4</b>
<b>Total Abandonment</b>	<b>380.6</b>	<b>133.8</b>

**Table 3 - Exploration, Development, Operating and Abandonment Costs**

Projected exploration costs at Bellevue include seven exploration/appraisal wells and five wells for Thunderbolt. Other exploration costs include Geology and Geophysical (G and G) for sample analysis, G and G studies, environmental studies and if permitted, 3D seismic.

The Bellevue and Thunderbolt Prospects are located relatively close to infrastructure such as sealed roads, deep water ports and shipping lanes while transport distances or pipeline lengths are approximately 150km to the north coast of Tasmania. RPS has included an 18 inch pipeline for Bellevue and a 12 inch pipeline for Thunderbolt which will transport the oil 150km to a custody transfer terminal in northern Tasmania, near Devonport, for tanker transport to refinery.

Facilities required for gathering, testing, processing and handling gas, oil and water are designed and costed using the QUESTOR model and database.

Operating costs include the cost of consumables like chemicals, utilities (power and water), salaries and wages, administrative overheads, repairs and maintenance. The QUESTOR model was used to estimate the total operating costs which are made up of Fixed and Variable costs. The operating costs established by QUESTOR were used for the initial, peak production and initial decline years, however, for the later years of decline the costs were adjusted down to better reflect the decline of the operation. QUESTOR did not reduce the costs in later years resulting in unreasonably high costs that would not be maintained under normal operation. These costs were adjusted to reflect “most likely” cost reductions to maintain operations.

The abandonment costs include well abandonment, land reclamation, facilities decommissioning and salvage.



### 3. RESULTS

The NPV and EMV results of the valuation, based on RPS's long term base price forecast for Brent Crude, is presented in Table 4. Each row of Table 4 represents a different outcome of the probability tree for the assumed developments. The EMV is the sum of the risked NPV's.

Results based on commodity price sensitivities are presented in Table 5 (RPS Low Brent Forecast) and Table 6 (RPS High Brent Forecast)

				NPV10 (MM US\$)			Risked NPV
Play Chance	Well 1	Well 2	Branch Probability	Bellevue	Thunderbolt	Total	
12%	17%	6%	0.12%	2972.9	990.6	3963.5	4.9
12%	17%	94%	1.92%	2972.9	-8.6	2964.3	56.8
12%	83%	6%	0.60%	-8.6	990.6	982.0	5.9
12%	83%	94%	9.36%	-8.6	-8.6	-17.1	-1.6
88%	100%	100%	88.00%	-8.6	-8.6	-17.1	-15.1
<b>EMV</b>							<b>50.9</b>

**Table 4 – RPS Base Price Case Valuation Results, as at 1 December 2009**

				NPV10 (MM US\$)			Risked NPV
Play Chance	Well 1	Well 2	Branch Probability	Bellevue	Thunderbolt	Total	
12%	17%	6%	0.12%	1824.1	583.4	2407.5	2.9
12%	17%	94%	1.92%	1824.1	-8.6	1815.5	34.8
12%	83%	6%	0.60%	-8.6	583.4	574.8	3.4
12%	83%	94%	9.36%	-8.6	-8.6	-17.1	-1.6
88%	100%	100%	88.00%	-8.6	-8.6	-17.1	-15.1
<b>EMV</b>							<b>24.5</b>

**Table 5 – RPS Low Price Case Valuation Results, as at 1 December 2009**

				NPV10 (MM US\$)			Risked NPV
Play Chance	Well 1	Well 2	Branch Probability	Bellevue	Thunderbolt	Total	
12%	17%	6%	0.12%	4577.4	1555.3	6132.7	7.5
12%	17%	94%	1.92%	4577.4	-8.6	4568.9	87.6
12%	83%	6%	0.60%	-8.6	1555.3	1546.7	9.2
12%	83%	94%	9.36%	-8.6	-8.6	-17.1	-1.6
88%	100%	100%	88.00%	-8.6	-8.6	-17.1	-15.1
<b>EMV</b>							<b>87.7</b>

**Table 6 – RPS High Price Case Valuation Results, as at 1 December 2009**



## APPENDIX A: GLOSSARY OF TERMS AND ABBREVIATIONS

---

B	Billion
bbl(s)	Barrels
bbls/d	barrels per day
bopd	barrels of oil per day
BTU	British Thermal Unit
Bscf	billions of standard cubic feet
condensate	liquid hydrocarbons which are sometimes produced with natural gas and liquids derived from natural gas
EMV	Expected Monetary Value
ft	Feet
G and G	Geology and Geophysical
GIP	Gas in Place
GIIP	Gas Initially in Place
LNG	Liquefied Natural Gases
LPG	Liquefied Petroleum Gases
M	Thousand
MM	Million
M\$	thousand US dollars
MM\$	million US dollars
MMscf/d	millions of standard cubic feet per day
Mt	thousands of tonnes
MMt	millions of tonnes
NGL	Natural Gas Liquids
NPV	Net Present Value
petroleum	deposits of oil and/or gas
scf	standard cubic feet measured at 14.7 pounds per square inch and 60° F
scf/d	standard cubic feet per day
scf/stb	standard cubic feet per stock tank barrel
stb	stock tank barrels measured at 14.7 pounds per square inch and 60° F
stb/d	stock tank barrels per day
STOIIP	stock tank oil initially in place
US\$	United States Dollars
Tscf	trillion standard cubic feet





## *APPENDIX L*

### QUALIFICATIONS

WHK is the **5<sup>th</sup> largest accounting business in Australasia** (source: BRW) and is the **largest provider of accounting and related services to small medium enterprises** and high net worth clients. The firm and its more than **3,000 employees** services in excess of **200,000 clients** in its network of more than **100 offices** located throughout **six Australian states** and both islands of **New Zealand**. WHK is a member of **Crowe Horwath International**, one of the **top 10 global accounting affiliations**.



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ABN 84 006 466 351

F:\BS\Hbt\G\GREAT SOUTH LAND MINERALS LIMITED\Accountants Confirmation Letter to Director of Mines 30.09.09 UPDATED 2nd License.doc  
30 September 2009

Director of Mines  
Mineral Resources Tasmania  
PO Box 56  
ROSNY TAS 7018

To Whom It May Concern:

**Re: Great South Land Minerals Ltd –  
Application for an Oil and Gas exploration license – Onshore & Offshore  
Eastern Tasmania**

We are writing after meeting with representatives of Great South Land Minerals Ltd on the 28<sup>th</sup> September 2009 and the 30<sup>th</sup> September 2009, and receipt of subsequent information. We have been requested to review your records and make the following representations.

**OWNERSHIP OF GREAT SOUTH LAND MINERALS LIMITED**

After review of the draft prospectus of Empire Energy Corporation International (a reporting company in the USA under the Securities Exchange Act 1934), and the websites of both Great South Land Minerals Ltd and Empire Energy Corporation International, we can confirm those documents indicate that Great South Land Minerals Ltd is a wholly-owned subsidiary of Empire Energy Corporation International. We were unable to confirm the shareholding on the Australian Securities and Investment Commission database, as the website did not provide these details.

**ABILITY TO RAISE FUNDS**

We understand that the initial commitment under this license will be approximately \$10 million in the first twenty four months.

**Shareholder Rights Offer**

The first source of fund raising is a Shareholder Rights Offer for US\$9,352,240 (AUD\$10,682,170 on the 29<sup>th</sup> September 2009 Exchange Rate). We reviewed a draft prospectus for Empire Energy Corporation International on the U.S Securities and Exchange Commission (SEC) website, lodged on the 3<sup>rd</sup> September 2009. The draft prospectus details a Shareholder Rights Offer of 133,607,712 shares at 7 cents per share (approximately 1 share for every 2 shares on issue), totalling US\$9,352,540. This prospectus is not yet complete and has not been approved by the SEC, but we have been advised that this will occur shortly.



## **ABILITY TO RAISE FUNDS CONT.**

### *Shareholder Rights Offer cont.*

We have been advised that in the event the Rights Offer is approved by the SEC that the vast majority, if not all rights will be taken up. This includes Mr Malcolm Bendall, the CEO of Empire Energy Corporation International, taking up his full entitlement of shares under the Rights Offer. Mr Bendall's intention to take up all of his shares is also detailed in a press release issued on the 2<sup>nd</sup> September 2009 listed on the Great South Land Minerals Limited website and various other financial websites.

Further, it was indicated in an earlier press release issued on the 12<sup>th</sup> June 2009 that Mr Bendall had received written notice of approval to provide him with US\$50 million for the purpose of providing finance to Empire Energy Corporation International. This release indicated that these funds were to be initially applied to finance Mr Bendall's share acquisitions under this particular Rights Offer. We also sighted a letter offering the US\$50 Million funding from Abbey International Holdings Limited.

Please note that from our review of the documentation available on the SEC website that all such documents had been lodged within the last six months.

We have been advised by Mr Paul Heath, the Chief Operations Manager of Great Southern Land Minerals Limited that the majority of the funds raised from the issue of shares under the Rights Offer will be spent on the Bellevue # 1 Exploration Well and the Thunderbolt Exploration Well drilling programs that the application relates to.

This is consistent with press releases from Empire Energy Corporation International that we reviewed on the Yahoo Finance website, and further releases on the Empire Energy Corporation International website itself.

### *Value of Assets*

After discussions with Mr Malcolm Bendall – CEO of Empire Energy Corporation International and various other representatives on the 30<sup>th</sup> September 2009, we make the following observations and comments with regards to the Asset Values of Great South Land Minerals Limited:



## ***RPS Energy Competent Persons Report***

We reviewed a Competent Persons Report completed by RPS Energy on the 23<sup>rd</sup> October 2008. RPS Energy is described on their website as follows:

*"RPS Energy is a global multi-disciplinary consultancy, providing integrated technical, commercial and project management support services in the fields of geoscience, engineering and HS&E to the energy sector. We operate from regional offices in Europe, North America, Australia and Asia."*

This report is extremely detailed, including a Regional Overview of the Tasmanian Basin, a Petroleum Systems Analysis, and an Prospect and Lead Volumetrics and Risk Analysis. It was supervised by Mr David R Guise, the Managing Director – Consulting Australia/S.E Asia. The following table summarises the findings, which were extracted from the Executive Summary of this report:

### **RPS ENERGY FINDINGS**

<b>Prospect/ Lead</b>	<b>Gross Productive Resources Oil (millions of Barrels)</b>				<b>Risk Factor</b>	<b>Operator</b>
	<b>Low Estimate</b>	<b>Best Estimate</b>	<b>High Estimate</b>	<b>Mean Estimate</b>	<b>COS % a)</b>	
Bellevue Upper Unit	38	151	484	220	2.0%	GSLM
Bellevue Lower Unit	24	95	307	139	2.0%	GSLM
Bracknell Dome	3	18	90	37	1.2%	GSLM
Butlers Rise	2	14	63	25	.77%	GSLM
Interlaken	2	10	40	17	.47%	GSLM
Cressy	3	12	48	21	1.2%	GSLM
Hummocky Hills	5	30	138	58	1.2%	GSLM
Thunderbolt	12	53	198	88	.72%	
Macquarie River	3.52	13.1	42.4	19.7	.58%	GSLM
Nile River	3.52	13.1	42.4	19.7	.81%	GSLM
Quamby	.405	1.52	4.95	2.28	.63%	GSLM
Steppes	1.96	7.39	24	11.1	1.3%	GSLM
Stockwell	2	7.4	23.6	11	.75%	GSLM
<b>TOTALS</b>	<b>100.405</b>	<b>425.51</b>	<b>1505.35</b>	<b>668.78</b>		GSLM

a) *Chance of Success (COS): Chance of probability of discovering hydrocarbons in sufficient quantity for them to be tested to the surface.*

For example, based on the low estimate of 100,405,000 barrels at \$70 per barrel, this would result in \$7,028,350,000 (\$7.02835 billion) in oil in the prospect areas. This value is also mentioned in a Beacon Equity Research Analysis completed on the 29<sup>th</sup> October 2008.



***RPS Energy Competent Persons Report cont.***

We spoke to Mr David Guise in an attempt to gain indicative value of the barrels. He advised that approximately \$5 per barrel was a figure from a recent transaction. Based on this, the value would be:

Low Estimate - \$502,025,000 (\$502.025 million)

Mean Estimate - \$3,343,900,000 (\$3.3439 billion)

***SEL 13/98 Expenditure thus far***

Per a press release on the 20<sup>th</sup> August 2009 and discussions with Mr Peter Woodhouse, the accountant for Great South Land Minerals Limited, expenditure exceeding AUD \$50 million has been incurred thus far on SEL 13/98. So far the exploratory work has lead to at least 15 identifiable domes being discovered (per the RPS Energy report above). The executives of Great South Land Minerals believe the valuation prepared by RBS Energy is conservative, and are confident that the value of the domes, in terms of future potential revenue, may be in fact far greater than what has been outlined in the report.

***Other Factors***

The following assertions have been made by Mr Malcolm Bendall:

- Mirabaud, an international stockbroker, has agreed to act as stockbroker for the Group;
- Various other joint venture and investment negotiations are currently underway, all for significant terms. Further details could not be given due to confidentiality, but from we have seen and have been told, these parties would not be discussing these figures if the projects were not likely to be profitable.



## CONCLUSION

The executive strongly believe due to numerous factors, many detailed above, that the assets of Great South Land Mining based on potential future earnings would far exceed the \$50 million minimum required for non-verification of assets. This is indicated by the low estimate of \$7,028,350,000 in the RPS Energy Report outlined above. Additionally, also outlined above, the value of the barrels would be \$502,025,000 using the low estimate or \$3,343,900,000 using the mean estimate.

From the documentations and discussions our firm has had with the executive of Great South Land Minerals Limited, this would certainly appear to be a reasonable conclusion.

Please do not hesitate to contact this office should you wish to discuss this matter further.

Yours sincerely,  
**WHK**



*for* **Peter Muckridge**  
Principal



**Review and Valuation of the Petroleum Assets**  
**of**  
**Great South Land Minerals Limited**

Prepared for  
**PKF Corporate Advisory Services (Vic) Pty Ltd**  
by  
**Anderson & Schwab Australia Limited**

This report has been prepared at the request of PKF Corporate Advisory Services (Vic) Pty Ltd. The purpose of this report is to provide information to PKF Corporate Advisory Services (Vic) Pty Ltd to assist it in providing an analysis and view to the Directors, management and ordinary shareholders of Great South Land Minerals Limited relating to that Company's in principle decision to accept an all-stock tender offer from Empire Energy Corporation International, Inc., a United States company that is listed on the NASDAQ exchange. The report prepared by Anderson & Schwab Australia Limited, has determined a range of values for the petroleum assets of Great South Land Minerals Limited. The value range is based on information supplied by management, directors and staff of, and consultants to, the company; consultants reports based on investigations into the assets belonging to the company; publicly available information and reviews of data collected, collated and assessed by consultants to the company. This report may accompany commentary provided by PKF Corporate Advisory Services (Vic) Pty Ltd on their opinions with regard to the transaction. The report has been completed in accordance with the terms and conditions described herein and set forth in our agreement with PKF Corporate Advisory Services (Vic) Pty Ltd.

9 November 2004



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## 1. INTRODUCTION

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### 1.1. BACKGROUND AND PURPOSE OF THE REPORT

Great South Land Minerals Limited ("GSLM") is an unlisted public company. The principal activities and assets of GSLM are the evaluation and potential development of Special Exploration Licence 13/1998 located entirely onshore, Tasmania, Australia.

GSLM has agreed in principle, subject to documentation and shareholder approval, to sell the company to Empire Energy Corporation International ("Empire"), a NASDAQ-listed company. The deal would result in the shareholders of GSLM acquiring 95% of Empire and allow GSLM to access the funds needed to continue its work to confirm and exploit the oil and gas potential of Tasmania.

An extension to the Special Exploration Licence 13/1998 is being sought by GSLM in exchange for a commitment to the Government to spend a minimum of \$21.5 million over five years on an accelerated exploration program.

Empire has secured a US\$380 million equity line of credit to allow this program to commence once the merger of the two companies has been achieved. While the Boards of directors of both companies have approved the transaction, the renewal of the exploration licence is a condition to closing the acquisition of GSLM.

GSLM has engaged PKF Corporate Finance (Aust) Pty Ltd ("PKF") to prepare an Independent Expert's Report ("IER") in relation to the proposed transaction with Empire. PKF does not possess the scientific or technical knowledge necessary to competently evaluate the petroleum assets of GSLM. PKF has therefore requested that Anderson & Schwab Australia Limited ("A&S") act as a Specialist and undertake an independent review of these petroleum assets for attachment to its report to GSLM.



## 2. SUMMARY AND VALUATION

### 2.1. EXECUTIVE SUMMARY

- We have assessed the value of GSLM's Special Exploration Licence, SEL 13/98, to be in the range \$23.763 million to \$30.100 million.
- The Tasmanian Basin is by petroleum exploration standards a "frontier basin". Despite having been explored in one manner or another for over 120+ years it is only during the last twenty years, since GSLM and its predecessor companies acquired leases in the basin, that a systematic programme of exploration discovery has been carried out in an attempt to discover commercial accumulations of hydrocarbons.
- Since GSLM and its predecessor companies acquired exploration leases to explore for hydrocarbons in excess of A\$22 million has been spent on exploration activities. These activities have so far established the presence two petroleum systems, which they have named; the Larapintine Petroleum System and the Gondwana Petroleum System.
- In identifying these petroleum systems GSLM has proved the presence of good quality source rocks that are thermally mature for the generation of gaseous and liquid hydrocarbons. It has determined that hydrocarbons have been generated, expelled and migrated into potential reservoir units and established the presence of reservoir and seal units within the basin. In recent years reflection seismic data has been acquired to complement earlier gravity and magnetics data with the ultimate aim being to determine the presence of petroleum trapping mechanisms.
- This seismic data has shown that potential exists to discover trapping mechanisms but that significantly more seismic acquisition and interpretation work needs to be undertaken to enable the company to identify potential drill targets.
- The renewal of SEL 13/1998 is critical to the value of the company. The application for the extension was made on 6 May, 2004 and contained an extensive programme of exploration for the next five years that included committed expenditures amounting to some A\$21.5 million.
- Company management is very competent and has the ability to continue to develop the exploration programme going forward. A greater number of specialist technical staff will be required to undertake the proposed work programmes but given the proximity of the exploration licences to major commercial and residential areas and the lifestyle opportunities available in Tasmania we do not envisage that the company will have any difficulties in recruiting competent staff.

### 2.2 VALUATION

We have undertaken an assessment of GSLM's special petroleum licence and reviewed, in as much detail as was practical, the value of this asset. Our valuation, as at the date of this report, is estimated to be between \$23.763 million and \$30.100 million.

Table 2.2-1 provides our valuation estimates and valuation method for SEL 13/1998. Each of the valuation methods is discussed in detail in Section 3.2.

Table 2.2-1: Valuation of GSLM Tenement – Summary

Asset	Valuation Method	Value	
		Low	High
SEL 13/98	Multiple of Exploration Expenditure	\$23.763m	\$30.100m
	Joint Venture Method	\$22.5m	\$22.5m
Preferred Value		\$23.763m	\$30.100m



### **3. METHODOLOGY AND APPROACH**

#### **3.1. INTRODUCTION**

The purpose of this report is to provide a technical assessment and valuation of GSLM's SEL 13/98 petroleum asset. In providing our valuation we have complied with the provisions of the Valmin Code of the Australasian Institute of Mining and Metallurgy ("The AusIMM") in undertaking our assessment.

In general, a valuation is derived by considering a technical value, reflecting the assessed future net economic benefit of the project, which can be adjusted by way of premium or discount for given market and other conditions presently applicable to determine a fair market value. With this in mind, the application of standard valuation methodologies, while possible, may not indicate a realisable value, as the ability of a potential purchaser to utilise the asset for commercial advantage or otherwise gain from its ownership, may not be achievable.

All references to dollars within this report are to Australian Dollars except where specifically identified.

A&S has not been engaged to provide independent verification of any Resources figures that may be quoted in relation to this tenement. Instead, for the purposes of this report and in considering that the GSLM SEL 13/98 asset has been known and documented for some considerable time within the public realm it was determined that a site visit was not necessary. GSLM has supplied us with considerable information for which we express our gratitude.

#### **3.2. VALUATION METHODS**

##### **3.2.1. SUMMARY**

The commonly used valuation methods for mineral assets that we have considered, and/or adopted where considered appropriate, to determine the value of SEL 13/98, include:

- The Orderly Realisation Of Assets method
- The Net Present Value Of Future Cash Flows method
- The Multiple Of Exploration Expenditure method
- Joint Venture Terms
- In Situ Values Method
- Comparable Transactions method
- The Alternative Acquirer method
- The Capitalisation Of Future Maintainable Earnings method

##### **3.2.2. ORDERLY REALISATION OF ASSETS METHOD**

The value achievable in an orderly realisation of assets is based on an assessment of the net realisable value of a business or asset, assuming its orderly realisation. Costs associated with the sale of the business or assets are included in the assessment. This technique is appropriate for minerals and petroleum businesses, which typically have individually definable assets, with relatively high values compared to earnings and cash flows and in which individual properties and interests in individual properties are frequently bought and sold. We considered that this method is inappropriate for GSLM as: the company only holds one property and this property is held as a "Special" Exploration Licence which does not allow the property to be transferred to another party other than by the method currently proposed by the company. As such, the capacity to realise a value in an orderly manner is not appropriate.



### **3.2.3. NET PRESENT VALUE OF FUTURE CASH FLOWS METHOD**

The Discounted Cash Flow (DCF) valuation method is based on the premise that the value of a business is the net present value of its future cash flows. In the mining business, this method requires assessment of:

- mineral reserves and resources;
- the appropriate mining and processing methods to exploit and market those reserves; and
- an analysis of future production, production costs, market prices, cash flows, capital requirements and capital costs for the life of the potential reserves.

This technique is particularly appropriate for a minerals investment with defined reserves and is the most common approach to valuation in the minerals industry. A&S regard this methodology as being inappropriate for valuing SEL 13/98 as the development of the asset is not yet at the stage where a definable Resources figure can be provided.

### **3.2.4. MULTIPLE OF EXPLORATION EXPENDITURE METHOD**

We have used the "Multiple of Exploration Expenditure" method to estimate the realisable (market) value of GSLM's SEL 13/98 exploration property. This method is most often used to assess value for a "grass-roots" exploration property. In this method, the total historical costs of acquiring and exploring the property up to the present point in time, plus committed and approved future exploration expenditure, is taken as the base. To this is applied an "exploration effectiveness multiplier", a measure of the usefulness of the expenditure to the development of future exploration programmes and the effective equity interest.

The result is adjusted by applying a "prospectivity enhancement multiplier" (PEM) representing the valuer's opinion of the company's potential success (or otherwise) in upgrading the prospectivity of the property. This factor would normally lie in the range of 0 to 3, with zero representing a complete write-off, and a value greater than one applying where exploration had successfully upgraded the property. The selection of the appropriate enhancement factor is subjective and dependent on the valuer's experience and judgement.

### **3.2.5 JOINT VENTURE TERMS**

The terms of a joint venture agreement or proposed agreement indicate the value placed on a property by a (usually) knowledgeable incoming partner who is prepared to invest in the property to earn an interest and the value placed on the property by the vendor. This method has to take into consideration the full details of the agreement, particularly the terms under which the incoming partner can withdraw.

### **3.2.6 IN SITU VALUES METHOD**

Where some data on Resources and Reserves exists, a discounted subjective profit margin per unit of production is sometimes used based on the valuer's experience and judgement. This works best for simple situations such as gold or petroleum deposits. With deposits such as coal and iron ore, which may have several process options and for which there is likely to be a very heavy capital influence to project economics this method is of doubtful validity. A&S has determined that this method is inappropriate in this instance as no petroleum Resource figures of any credibility have been provided and so this method has not been used.



### **3.2.7 COMPARABLE TRANSACTIONS METHOD**

Comparable transactions relate to the values of reasonably recent transactions for other properties that are judged to be similar and / or in the same region as the property in question. As such transactions are often of a joint-venture nature, it is necessary to discount the apparent value for time and for the probability of the earning expenditure being completed or adjust them for other payments such as royalties to be triggered by successful exploration.

Since no recent or even modern transactions involving the sale or trade of petroleum properties have taken place in this basin we have not used this methodology.

### **3.2.8 ALTERNATIVE ACQUIRER METHOD**

The "Alternative Acquirer" valuation method considers the premium price that an alternative acquirer is prepared to pay for a business to gain entry into a business, or to achieve economies of scale, reductions in competition and synergies with existing operations, or other factors. We have not applied this method to SEL 13/98 as we are unaware of any other potential acquirers and the value of the property is specific to an individual acquirer.

### **3.2.9 CAPITALISATION OF FUTURE MAINTAINABLE EARNINGS METHOD**

The "Capitalisation of Maintainable Earnings" methodology, which values an entity based on an empirically derived multiple of maintainable earnings, is appropriate where the earnings of a business are stable and sufficient to justify a value exceeding the value of the underlying assets. A&S has not used this method to provide a value for SEL 13/98 as it is purely an exploration company and has no stable earnings profile.

## **3.3 MATERIAL ISSUES**

The following issues have been considered by A&S during the valuation process as they are regarded as being material to this assessment.

They are GSLM's :-

- reliance on being granted a renewal of SEL 13/98 by Mineral Resources of Tasmania;
- financial and technical ability to continue to successfully appraise its exploration property;
- proven ability to extract value from its exploration programmes and the knowledge gained from these works;
- knowledge of the industry in which it operates;
- access to future capital that will enable them to undertake the proposed work programmes.

## **3.4 OTHER MATTERS**

This report has been prepared in accordance with the principles outlined in ASIC Policy Statement 74, "Independent Expert Reports to Shareholders". It also conforms to the requirements of the Australasian Institute of Mining and Metallurgy's VALMIN Code.



## **4. GREAT SOUTH LAND MINERALS LIMITED**

### **4.1 DESCRIPTION**

Great South Land Minerals Limited (GSLM) is an unlisted public company incorporated in Tasmania in 1995 for the specific purpose of exploring for oil and gas onshore Tasmania.

GSLM holds one exploration licence SEL 13/98, which currently covers almost half of the onshore Tasmania Basin. The licence covers an area of 15,035 square kilometres and GSLM holds the exploration rights for all gas and liquid petroleum.

The exploration objective of GSLM is to find and extract commercial quantities of oil and/or gas from onshore Tasmania.

### **4.2 SPECIAL EXPLORATION LICENCE 13/1998**

Special Exploration Licence 13/1998 (SEL 13/98) was granted to GSLM on 18 May 1999. The licence covered an area of 30,356 square kilometres and replaced three licences held by GSLM. These licences EL 1/88, EL 9/95 and EL 21/95 were originally held by GSLM's predecessor companies.

Modern exploration in the Tasmanian Basin commenced when the Broken Hill Proprietary Company (BHP) was awarded Exploration Licence 30/1980 (EL 30/80) on April 15, 1981, to explore for coal. The licence was granted for a period of 12 months and consisted of an area of 12,900 square kilometres, which was reduced to 2,480 square kilometres in four parts on April 15, 1983. Mobil Energy Australia then farmed in and worked the licence until April 15, 1984 at which time the licence was relinquished as the area was regarded as not appearing to contain any coal measure lithologies.

In June 1984, the recent phase of oil and gas exploration commenced when Conga Oil Pty Ltd, the earliest predecessor of GSLM acquired part of the D'Entrecasteaux Region of Southern Tasmania in order to verify old hydrocarbon reports. This licence was designated EL 10/84 and covered an original area of 50 square kilometres. During the following years up until 1988 it continued to acquire exploration rights to a large part of Southern Tasmania. During 1987 Condor Oil Investments joined Conga Oil as a joint venture partner.

In 1988, EL 10/84 was incorporated into a new permit EL 1/88, which covered an area of 3500 square kilometres. Conga Oil continued to explore this area until 1995 when it formed Great South Land Minerals Pty Ltd. Exploration Licence 1/88 was assigned to GSLM Pty Ltd and two other licences, Exploration Licence 9/1995 (EL 9/95) covering an area of 3700 square kilometres and Exploration Licence 21/ 1995 (EL 21/95) covering an area of 6000 square kilometres, were granted. GSLM Pty Ltd now held a total area of 13,200 square kilometres. All licences expired in 2001. In March 1998 GSLM Pty Limited changed from a private to a public company, GSLM Limited, by way of a special resolution approved by shareholders. A new, enlarged exploration licence SEL 13/98 was formed from these three exploration licences and GSLM continued to explore these areas until the permit officially expired on 18 May 2004.

The submission to the Minister to renew SEL 13/98 was dated 6 May 2004. The submission requested the new area to be approximately 15,000 square kilometres centred dominantly on the central and northern parts of the Tasmanian Basin. A work programme covering full five years, detailed and costed was included in the application for the licence renewal. The work programme will be modified to take into account exploration results as they become available.



#### 4.3 EXPLORATION RESULTS AND PROSPECTIVITY

No information on the work programme undertaken by the Broken Hill Proprietary Company (BHP) has been made available to A&S although we are aware that it was primarily focused on the coal potential of the basin. We have reviewed the results of work carried out by Mobil Energy Australia, which comprised an initial, extensive literature research followed by field mapping in numerous isolated areas within the Licence. The literature studies indicated that a great deal was still unknown regarding the coal potential over much of the central Tasmanian Basin and it was, in effect, relatively poorly explored. Additional aims of the field-mapping programme were to enable a ready identification of Permian strata to be made for future drilling operations and to assist in the selection of drill hole locations.

Mobil's drilling operations, preceded by a ground based magnetics survey, commenced on October 2, 1983 and consisted of five cored holes totalling 987.75 metres, 814.19 metres of which was cored. The drilling targeted two horizons in the Permian sequence:

- Cygnet Coal Measures equivalents
- Faulkner Group containing the Mersey Coal Measures equivalents

Sedimentological studies were also undertaken to enable, in conjunction with the additional stratigraphic information, an environmental map of the Permian to be drawn and to make recommendations on future drilling.

Conga Oil Pty Ltd began work in 1984 and during the period to 1987 focused most of its work on undertaking reviews of the basin. During 1987, after a reported seepage was relocated and analysed, the company began a systematic exploration programme in the region. Recognising the need to be able to map sub-dolerite structure, Conga Oil firstly attempted to extend the gravity and magnetics databases in the Tasmanian Basin. Whilst this has helped in defining regional trends and lineations, the lack of subsurface control and the limitations of the methods themselves limited the usefulness of these techniques for the purpose of identifying potential hydrocarbon traps. Good quality seismic imaging of structure beneath the dolerite still remained an essential but difficult to achieve exploration tool.

The work completed by Conga Oil established that: -

- Oil had definitely been generated and that active seeps were observed in certain areas;
- Source rock studies of vitrinite reflectance and conodont alteration index confirmed that Ordovician carbonates exposed around the region were within the oil window;
- Permian and younger rocks blanket most of the region and obscure distribution;
- Basin development began in the late Precambrian, was most active in the Cambrian, but continued up to Middle Devonian times.

After 1988 exploration continued in the newly incorporated and expanded area of EL 1/88. Despite earlier discouraging seismic acquisition data results, due dominantly to the widespread coverage of dolerites onshore Tasmania, Conga Oil elected to attempt the acquisition of additional seismic data both on the main island and North Bruny Island in the vicinity of Johnson's seep. Additional data was acquired offshore in Storm Bay utilising AGSO's Rig seismic vessel. The seismic acquired was disappointing with data quality of the records very poor to the point that none of the sections are adequate for the purposes of identifying and mapping a petroleum traps.

During 1990, several scientific and exploration focused papers were produced and in 1991 Shell Australia reprocessed some marine and land seismic data. In 1991, Dr David Leaman produced a progress report on the interpretation of gravity and magnetics data in EL 1/88.



In 1992, Condor Oil took over responsibility for exploration and during this period up to and including 1994 produced several consultants' reports. During 1994 the stratigraphic wells, Shittim #1 (1751m) and Gilgal #1 (50m), were drilled on Bruny Island.

During 1995, Conga Oil incorporated GSLM Pty Ltd and assigned to it the title to EL 1/88 and gave over the role of exploration project manager Condor Oil became an equity holder in GSLM Pty Ltd. Two further ELs were then added to the portfolio and GSLM Pty Ltd increased its exploration efforts. Collaborative studies with a number of individual consultants and agencies were initiated and a considerable amount of data and an improvement in the company's understanding of the basin achieved. The Bureau of Mineral Resources undertook Rock Evaluation studies, Honours students at the University of Tasmania provided basin studies, Shell Development Australia reprocessed some earlier seismic data, BHP provided analyses in oil geochemistry, the State Mines Department acquired gravity and seismic data, CSIRO provided analyses of seep studies and geochemistry and Eugene Domack completed studies on the maturation and depositional environment of the Tasmanite oil shale.

At the request of the Mines Department an independent consultant was employed to assess the significance of the gas encountered at Shittim#1. The consultant, Mr Mulready (14 September 1995) concluded that the hole had established that a seal, reservoir and gas were present and that the results encouraged further investigation of the basin depocentre located in central Tasmania. On the basis of this report, GSLM then focussed its exploration activities in this area of the basin. Concurrent with this work, Trent J. Woods, University of Tasmania, investigated the timing of potential hydrocarbon generation from Palaeozoic sediments and the characterisation of potential reservoirs of the Lower Parmeener Supergroup. Financial support was provided by GSLM.

During late 1995 the Australian Geological Survey Organisation (AGSO) undertook a land based seismic survey over parts of the basin.

During 1996, a third stratigraphic well, Jericho #1 was pre-collared and drilled to a depth of 640m on Bruny Island.

The stratigraphic holes were located for the following reasons:

- Onshore and offshore seismic existed in the area and needed velocity control, which was only obtainable by a downhole shot so that previous processing could be repeated with actual real velocities.
- Historic records indicated that the area had numerous seeps of both oil and gas and that at least five shallow wildcat holes had been drilled but were depth limited because of previous technology.
- Results of gravity and magnetics surveys indicated that North Bruny Island is located on a basement high, with a good potential regional trap for oil and gas.
- Modern geochemical oil exploration methods indicated that there were crude oil seeps in creeks and around old drill sites that warranted investigation.
- A recent Mines Department hole on the neck of Bruny Island had discovered oil in loose sand at 30m depth.

All three holes recorded petroleum hydrocarbons in a gaseous state.

- Shittim#1 recorded tar with zeolites in the fractured dolerite and gas from 810 metres depth. The hole was drilled onto 1021 metres without reaching the unconformity due, according to reports, to over pressured gas.
- Gilgal#1 recorded gas at its total depth of 51 metres.
- Jericho#1 recorded gas from 15 metres to the bottom of the hole at 228 metres.



During 1996, GSLM contracted Robert S Young, a U.S.A. based consulting Petroleum Geologist, to review the potential of oil and gas in the Tasmanian onshore Basin. The primary focus of Young's review involved analysing the work undertaken up to that date from a Petroleum Systems perspective. In this sense, he set about identifying whether the basic building blocks for the potential commercial production of hydrocarbons existed within the Tasmanian Basin.

Young concluded that:

- With some 270 seeps and shows, which have been studied geochemically and have identified at least four mature oils, that it was very probable there are several possible hydrocarbon sources in the Tasmanian Basin. Geochemical comparisons of seeps show that the most likely source would be the Ordovician of the Gordon Group Limestones. Ratios of C27:C28:C29 Steranes are identical between seeps of the Bruny Island Johnson well and the Ordovician Gordon Limestone and the predominance of C27 Steranes and the abundant diasteranes in Tasmanian bitumens suggests a widespread algae and clay rich source rock.
- Conodonts colour indicates that much of the Gordon Limestone, particularly in central and southern Tasmania, is in the oil and gas windows. This limestone is expected to underlay Permian and Triassic sediments in much of the Tasmanian Basin. He also included the Permian Quamby Mudstone, "Freshwater Sequence" and Preolenna coal Measures as other potential source rocks. In all three rock units of which the total organic carbon may reach 25%, vitrinite reflectance data and fossil pollen colours show that these source rocks are within the oil window over large areas of the basin.
- Reservoirs are very easily envisioned in the shallow marine Ordovician Limestones as palaeokarsts, reefal or fractural. Since limestones are considered source material, migration would be minimal. Additional potential reservoirs are within the Siluro-Devonian sandstones of the Eldon and Tiger Range Groups and within sandstones of the Permian Bundella Formation, Faulkner Group and Liffey Sandstone of the Lower Parameener Super Group. Measured porosities in the Faulkner and Liffey are 13% and 12% respectively, while other Permian sandstones in the northern area of the licence have porosities averaging 16% and horizontal permeabilities ranging up to 386 millidarcies.
- Evaporites are most efficient seals mainly because they offer very little or no pore space; however, the long-term sealing properties of very fine grained, water wet porous rocks such as shales are also remarkably efficient in the absence of open fractures. This is due to the displacement pressure barrier effect created by capillary pressure between oil and water in rock pores. It is anticipated that the Ordovician Limestones reservoirs would be sealed by additional limestone within the Gordon Group or by the Turo Tillite above the unconformity. Good seals of shale and silts are found throughout the Permian-Triassic sedimentary sequence. The Jurassic dolerite sills also make excellent cap rock for the Permian-Triassic reservoirs.
- Defining traps and structural features within the basin is very difficult to impossible without good reflection seismic records. To date, there has been very little reflection seismic data and most of the data is poor quality due to the extensive dolerite cover over a large part of the basinal sediments. Relatively good quality seismic data has been obtained in areas where the dolerite cover is thin or absent. The results of the seismic work on the TASGO project show that an improvement in data quality and penetration of recordings through the dolerite can be achieved and this will aid in better defining structural traps. The present gravity and magnetics, which have been extensively used to date, have been able to define regional structural elements of mostly Palaeozoic. Structures in the Permian, or younger, are probably going to be faulted, and of low relief.



- Except in unusual circumstances, most untrapped oil in sedimentary basins originates from synclinal drainage areas that surround the trap itself. Thus, migration distances commonly range in tens rather than hundreds of miles, particularly on strongly structured or faulted basins.

During 1997, several reports on various aspects of the petroleum potential of the basin were produced. Four stratigraphic wells were planned and drilled. Lonnavele #1 was pre-collared and drilled to 557m; Hunterston #1 was pre-collared and drilled to 336m; Bridgewater #1 was pre-collared and drilled to 252m and Pelham 31 was pre-collared and drilled to 503m. Reports on all these wells were provided to Mineral Resources Tasmania.

1998 saw the conclusion and release of results of TASGO Project, a joint Federal and State Government project initiated to expand understanding of Tasmanian mineral and petroleum potential. G.E. Carne produced a report on "An Evaluation of the Oil and Gas Potential of Tasmania and during 1999, Dr. L. Wakefield produced a report titled "Independent Geologist's Report on the Exploration prospectivity of the Onshore Tasmanian Basin. GSLM produced a paper for the 2000 APEA Journal titled, "Petroleum Systems in Tasmania's Frontier Onshore Basins".

During 2001, GSLM completed 660 line kilometres of regional seismic survey TB01 over part of the area of SEL 13/98. At the conclusion of the seismic programme an environmental report was submitted to the Department of Primary Industry, Water and the Environment's Threatened Species Unit. Robertson Research Australia Pty Ltd processed the data with final and migrated stacks completed for all lines. The preliminary results of the interpretation identified several potential anticlinal/domal traps. Two small anticlinal structures were identified in the Parmeener Supergroup beneath the Longford basin and one in the Tertiary infill of the Longford Basin. Six potential traps were recognised in the Central Highlands area where gently dipping anticlines in the Parmeener almost directly overlie and reflect more steeply dipping anticlines beneath the Devonian unconformity. These Devonian structures are probably mainly within the Wurawina Supergroup and contained within the Devonian fold-thrust belt. Based on these seismic results GSLM planned the next regional seismic survey, TB02 a 1075 line kilometre programme designed to acquire further regional data, to define structures identified during the TB01 survey and to place lines close to wells that were drilled and pre-collared in 1997. GSLM continued its relationship with the University of Tasmania through the ARC-SPIRIT joint research program with the appointment of three PhD students.

During 2002 and 2003 GSLM continued to work on the 2D seismic data acquired during 2001 and a report on an analysis of the Longford Sub-basin was also completed. Approval was obtained to re-enter and deepen (1700m) the stratigraphic well, Hunterston#1. The well was eventually terminated at a depth of 1324m, which was carried out as part of a farm-in process whereby OME Resources Australia Pty Ltd was to earn a 5% interest in the licence. Hydrocarbon gas was noted at various depths while coring and analyses of gas samples confirmed the presence of Helium gas (>1.0%) from the formations below the Tasmania Basin. Further details on the joint venture with OMERA are contained below in Section 4.5.2.

#### 4.4 FUTURE EXPLORATION PROGRAM

As part of its submission to the Minister regarding renewal of Permit SEL 13/98, dated 10 September 2004, the company submitted a detailed and costed programme of works covering the full five years of the renewed licence. Stated in the application was the company's acknowledgement that the work programme would be modified to take into account exploration results as they became available.

As the MEE method allows committed and approved expenditures for future exploration programmes to be included in the base A&S has included the next twelve months proposed expenditures in its valuation of the property.



The Exploration Philosophy supporting this programme is based on the research carried out mainly in the last five years during which the company has identified the two petroleum systems referred to earlier. The company considers the mainly oil prone Gondwana Petroleum System (GPS) in the northern section of the basin to be more prospective than the mainly gas prone Larapintine Petroleum System (LPS) to the south. Furthermore, they have established that faulting is much more intense in the southern half of the basin thereby reducing trap size and increasing the risk of seal breaching. Additionally, the centre of the basin has not been uplifted to the extent of areas in the Central Highlands and in the south, suggesting that the source rocks were/have been in the generating kitchen for much longer than in the highlands.

They therefore propose to implement an exploration programme that concentrates seismic exploration in the central parts of the Tasmanian Basin but one that also explores the potential of the LPS under the Central Highlands.

To date, GSLM has not drilled seismically defined targets and the aims of this programme will be to define accurately as many targets as possible before drilling exploration holes. Stratigraphic wells will also be drilled in order to increase geological and petrophysical knowledge of what is still a frontier basin. Additional to this field work, GSLM plans to continue with research and development work in conjunction with the University of Tasmania. Research work will include lithological, petrographic, geochemical and palaeontological data gathering from the field and from cores, data plotting and syntheses. All data will be included on a three-dimensional computer model of Tasmania.

#### 4.4.1 Seismic Acquisition

Over the next five years a total of approximately 2000 line kilometres of seismic data acquisition is planned with 1600km to expand the regional coverage and 400km to more closely define discovered structures. As was the case with the survey TB01, the lines have been located wherever possible along roads in order to minimise the impact of the survey on private land and on environmentally sensitive areas.

During the next twelve months three Stages of acquisition are planned.

Stage 1	Will build on the initial interpretation of the seismic survey TB01 that indicated the presence of a number of anticlinal structures. Approximately 145 line km of seismic survey is planned starting late december 2004 to further define identified structures.
Stage 2	<p>The initial interpretation of the seismic survey TB01 indicated the presence of a large anticlinal structure. To further define this structure it is planned to acquire approximately 52 line km of seismic as soon as possible after the acquisition of Stage 1.</p> <p>A number of wells were drilled and collared in 1997. It is planned to acquire approximately 108 line km of seismic data in the immediate vicinity of the wells, Lonnavele#1, Pelham#1 and Bridgewater#1 in order to evaluate the potential for drilling ahead on these wells.</p>
Stage 3	Will involve continuing the regional grid over the Tasmanian Basin. 704 line km will be acquired to expand seismic coverage to the South, Southeast and East parts of the Tasmanian Basin. A long regional line is planned to extend to Cockle Creek in the far south of the basin and shorter lines are planned towards the Florentine Valley in the west and to the eastern limit of the lease area. The western line will allow a tie of the Ordovician geology of the Florentine Valley to TB01 profiles and the eastern line is expected to show progressive thinning of Permian units eastwards. The southern line should yield important information concerning both petroleum systems.



Environmental, heritage and indigenous approvals have been given in the past for a programmes similar to TB02 and a renewal of these approvals will be sought from DPIWE and others during Q4 '04. Similarly, the existing approvals to operate vibroseis trucks on Tasmanian roads have expired; an application for renewal will be sought for DIER. Permission to operate the vibroseis trucks on council or on private property will be sought in a similar fashion to the approvals obtained for the TB01 survey.

Interpretation will be carried out either in-house, in conjunction with the Earth Sciences School of the University of Tasmania or by contractors. The 660 line kilometres of seismic survey acquired during the TB01 survey were processed by Robertson Research in Perth with final and migrated stacks produced for all lines. Various preliminary interpretations have been made as part of the SPIRT programme and GSLM will commission an independent expert to prepare a report to consolidate these interpretations. This consolidated interpretation report will be submitted to Mineral Resources Tasmania by 1 December 2004.

#### 4.4.2 Drilling Program

During the course of the five-year work programme four Stratigraphic wells have been budgeted; although GSLM has indicated that it is possible that one or more of these will be replaced by exploration wells depending on the success of the seismic programme. During the first twelve months it is proposed to drill a stratigraphic well in the Longford Sub-basin, which will be designed to test Gondwana Petroleum System beneath the Tertiary. This well (Lachish#1) will provide information on the Tertiary of the Longford Basin and on the petrophysical, seal, reservoir and source rock characteristics of the Parmeener Supergroup under the Longford Sub-Basin. Down hole seismic will allow a re-interpretation of the seismic profiles of the Permo-Triassic beneath the Longford Basin obtained in TB01. Lachish#1 is planned at a location near the Valleyfield Road, approximately 9km west of Conara on the "Stockwell" property. Lachish#1 is situated close to the intersection of two seismic lines TB01-PT and TB01-TE and is planned to be drilled and cored to a depth of about 2000m. Approvals for Lachish#1 have been granted by MRT. The approvals have expired and well programmes will be re-submitted.

**Table 4.4-1:- Annual Budget for period 1 October 2004 to 30 September 2005.**

Activity	Q4 '04	Q1 '05	Q2 '05	Q3 '05
Planning & Supervision	40	40	40	40
R&D	40	40	40	40
Seismic Interpretation	30			
Stage 1 Seismic	95	600		
Stage 2 Seismic	80	1100	100	
Stage 3 Seismic		100	2686	30
Lachish#1 well				200
Quarterly Total	285	1880	2866	310
Annual Total				5341

Figures expressed in \$'000.



#### **4.5 VALUATION OF EXPLORATION INTEREST**

A range of values has been placed on GSLM's exploration licence using the Multiple of Exploration Expenditure Method and the Joint Venture Method.

##### ***4.5.1 Multiple of Exploration Expenditure Method***

Records of exploration expenditure for the area have been reviewed for the period commencing April 1980 through to 30 June 2004. In our review and calculations, no allowance has been made for any exploration expenditures incurred since 30 June 2004. A&S has determined that a total of \$21.874 million has been spent on exploration activities during this period.

SEL 13/98 has, since 1984, in one form or another been explored as intensively as practical given the limited resources of GSLM and its predecessor companies. Exploration expenditures in the early years have been focused on early stage exploration activities including such things as seep sampling and analysis, field mapping, desk top studies and research activities aimed at developing a greater understanding of the sedimentological and hydrocarbon generative aspects of the basin however, as this knowledge base developed and their understanding increased the company's exploration efforts have, in more recent years, been focused on acquiring reflection seismic data and in drilling stratigraphic wells in an attempt to resolve the structural complexities of the basin. Indications of hydrocarbons have been encountered in many of these stratigraphic wells. At this stage, it is reasonable to state that the earlier seismic data has provided some insight into the structural styles developed in the basin and that several leads have been identified. None of these features could be described at this stage as being of prospect status but the planned seismic during late 2004 and 2005 should provide more information and provide the company with greater comfort on the integrity of one of the features that they are planning to drill towards the end of 2005.

As we have seen, considerable geologic knowledge of the petroleum prospectivity of the Tasmanian Basin has been gained during this period and despite its current status as a frontier basin, a great deal of technical data has been recorded, collated, synthesised and published, to the extent that its prospectivity for the discovery of commercial hydrocarbons is significantly greater than previously believed. Based on the information that has been presented to A&S and our own investigations we have assumed that Effective Exploration Expenditures to be in the order of \$15.842 million. See Table 4.5-1 for a review of this data.



Table 4.5-1: Exploration Expenditures and Effective Expenditures Review of Area Covered by SEL 13/98.

Date	EL	Item	Actual Expenditure	EEM	Effective Expenditure
5/1981 to 6/1988	EL 30/80	BHP, Mobil – no break up available	\$3.357m	50%	\$1.679m
6/1984 to 6/1988	EL 10/84	Conga – no break up available			
7/1989 to 6/1989	EL 1/88	no break up available	\$0.420m	40%	\$0.168m
7/1989 to 6/1990	EL 1/88	no break up available	\$0.037m	40%	\$0.015m
7/1990 to 6/1991	EL 1/88	no break up available	\$0.037m	40%	\$0.015m
7/1991 to 6/1992	EL 1/88	no break up available	\$0.074m	40%	\$0.030m
7/1992 to 6/1993	EL 1/88	no break up available	\$0.157m	40%	\$0.063m
7/1993 to 6/1994	EL 1/88	Geology, admin,	\$0.086m	40%	\$0.034m
7/1994 to 6/1995	EL 1/88	Geology, drilling, admin.	\$0.331m	70%	\$0.232m
7/1995 to 6/1996	EL 1/88	GSLM – no expenditures	\$0.000m		\$0.000m
7/1996 to 6/1997	EL 1/88	Geology, geochem., drilling, admin.	\$0.905m	70%	\$0.633m
	EL 9/95	Geology, geochem, drilling, admin	\$0.078m	50%	\$0.039m
	EL 21/95	No expenditures	\$0.000m		\$0.000m
7/1997 to 6/1998	EL 1/88	Geol, geophy, geochem, drill, admin.	\$0.348m	70%	\$0.243m
	EL 9/95	Geol, geochem, drilling, admin.	\$0.453m	70%	\$0.317m
	EL 21/95	Geol, geophy, drilling, admin.	\$0.097m	50%	\$0.048m
7/1998 to 6/1999	EL 1/88	Admin.	\$0.089m	70%	\$0.062m
	EL 9/95	Geol, admin.	\$0.090m	50%	\$0.045m
	EL 21/95	Admin.	\$0.089m	50%	\$0.045m
7/1999 to 6/2001	SEL 13/98	Geophysics, admin.	\$2.729m	80%	\$2.183m
7/2001 to 6/2002	SEL 13/98	Geology, geophy, drilling, admin.	\$1.283m	90%	\$1.155m
7/2002 to 6/2003	SEL 13/98	Geology, geophy, drilling, admin.	\$2.027m	90%	\$1.824m
7/2003 to 6/2004	SEL 13/98	Geoph, drilling, admin.	\$0.376m	80%	\$0.301m
9/2004 to 9/2005	SEL 13/98	Geophysics, drilling, admin.	\$5.311m	100%	\$5.311m
	New Appl.				
Total			\$21.874m		\$15.842m

EEM - is the Exploration Expenditure Multiplier that is derived from an evaluation of the value added to a property from the exploration activities that have been undertaken.



We have applied a Prospectivity Multiplier range of 1.5 to 1.9 on the basis that the exploration activities have identified the presence of two separate Petroleum Systems within the Tasmanian Basin. Source, maturation, expulsion and migration have been proved, reservoir and seals identified and some preliminary indications of trapping mechanisms shown to exist. Accordingly, it is our opinion that GSLM and its predecessors have demonstrated that all of the basic prerequisites required for the potential accumulation of commercial volumes of hydrocarbons have been proved to be present within the basin and the area of the tenement.

GSLM holds a 100% interest in the oil and gas exploration rights of this permit. A value has been placed on GSLM's exploration interests using the Multiples of Exploration Expenditure Method in the range \$23.763 million to \$30.100 million.

**Table 4.5-2:- Valuation of SEL 13/98 Using Multiples of Exploration Expenditure Method**

Item	Low Value	High Value
Permit Exploration Expenditure	\$21.874m	\$21.874m
Effective Exploration Expenditure	15.842m	\$15.842m
Prospectivity Enhancement Multiplier	1.5	1.9
Equity holding (%)	100%	100%
<b>Value</b>	<b>\$23.763m</b>	<b>\$30.100m</b>

#### **4.5.2 Joint Venture Method**

On 10 May 2002 GSLM entered into a joint venture agreement with OME Resources Australia Pty Ltd (OMERA) by which OMEIRA was able to earn a joint venture interest in SEL 13/98 by conducting drilling and related work. The agreement between GSLM and OMEIRA established the Tasmanian Exploration Joint venture (TEJV). Stage 1 of this work related to the expenditure of \$1,000,000 to complete the deepening drilling/coring of Hunterston#1 well and other activities for a 5% interest in the licence. As at 30 September 2002 GSLM recognised that OMEIRA had expended \$663,536 on on-ground exploration. OMEIRA contended that expenditure incurred to 30 September 2002 had amounted to approximately \$1,216,956.

Following an application from GSLM and OMEIRA, Mineral Resources Tasmania published details of changes to SEL 13/98 for public comment. The coal bed methane rights associated with SEL 13/98 were removed and awarded to OMEIRA. GSLM retained 100% interest in the remaining oil and gas exploration rights of SEL 13/98.

There was an optional Stage 2 where an expenditure of a further \$2,000,000 on on-ground exploration would earn a further 10% interest in the licence. The TEJV agreement also allowed OMEIRA to earn 50% interest in the coal bed methane resources of SEL 13/98 by funding and carrying out an exploration program that includes the drilling of at least six test wells before 1 June 2004. This agreement was terminated when the coal bed methane rights were severed from SEL 13/98.

On the basis of Stage 1 of the original agreement, OMEIRA was to earn 5% interest by expending \$1 million on exploration activities. This implies a value for 100% interest of \$20 million at the time of the agreement, i.e., 10 May 2002. As this was an agreement to joint venture, it can be safely assumed that GSLM accepted that a reasonable value for the licence was \$20 million and that the farm-in party, OMEIRA, believed that the value was also acceptable. The exploration work funded by OMEIRA proved successful in that further knowledge was gained from the Hunterston#1 well and natural gas containing a significantly high helium gas analysis obtained. As a consequence, it can be safely assumed that the value of the SEL 13/98 Licence has been upgraded by this work.



Since that agreement was signed, a further \$2.403 million has been expended on exploration. Therefore, it can be reasonably assumed that the value of this licence, as at the date of this valuation, was at least \$22.5 million.

While this value is close to the lower end of the valuation range obtained using the Multiples of Exploration Expenditure method we have strong reservations about the validity of using this method given; the time frame since the joint venture agreement was signed, and the expenditures that would have added to the value of the asset. In this instance, A&S has decided that the valuation range determined using the Multiples of Exploration Expenditure method represent a more reasonable assessment of the value of the SEL 13/98 asset.

**Table 4.5-3:- Valuation of SEL 13/98 Using Joint Venture Terms Method**

Item	Value
Cost for 5% interest	\$1.000m
Cost for 100% interest	\$20.000m
Value of Asset at Agreement Date	\$20.000m
Expenditure since Agreement Date	\$2.403m
<b>Current Value</b>	<b>\$22.403m</b>



## **5 REFERENCES**

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### **5.1 ACCESS TO SENIOR MANAGEMENT**

In undertaking the review and valuations A&S received good cooperation from officers and directors of Great South Land Minerals. We are satisfied that we obtained sufficient information to be confident that our observations reasonably reflect the current situation at Great South Land Minerals.

### **5.2 SOURCES OF INFORMATION**

A&S possessed some prior knowledge about the assets of Great South Land Minerals although we had not personally visited the property. The knowledge that we did possess came from a variety of sources, including discussions with previous and current consultants to Great South Land Minerals, consulting assignments on similar exploration projects, specialist industry intelligence reports, competitive analyses and acquisition intelligence.

Great South Land Minerals supplied detailed technical, commercial and financial information and a list of these references is to be found in Appendix I.

### **5.3 BUSINESS AND TECHNICAL PLANNING SYSTEMS**

The principal source of reliability in future projections is the quality of technical and business planning that goes into developing the projections themselves. A&S believes that Great South Land Minerals has the technical and business planning resources and processes capable of providing reasonable projections.



## 6 GENERAL

### 6.1 QUALIFICATIONS

#### 6.1.1 *Anderson & Schwab*

Anderson & Schwab is a management and financial consulting firm that has specialised in providing its services to the minerals industry for the past thirty-seven years. Its Australian subsidiary (Anderson & Schwab Australia Limited) was established in 1997.

Anderson & Schwab was the technical specialist to Morgan Stanley Australia Ltd when that firm provided the Specialist's opinion concerning the dual listing of RTZ-CRA in 1995. The company reviewed all of the global operations of both companies and assessed the value of their respective exploration interests. In 1996, it was the lead consultant in advising Australian Diamond Exploration NL in response to a takeover offer by Ashton Mining Limited. A&S has provided Specialist's advice to Grant Samuel when that company provided an Independent Expert's Report to Aberfoyle Limited in relation to the takeover offer by Western Metals NL. It also provided Specialist's advice to Grant Samuel and to KPMG Corporate Finance when both of those organisations provided the Expert's Reports on the takeover offer by Rio Tinto for North Limited and Ashton Mining Limited respectively. Anderson & Schwab formed part of the project team that undertook a review of the mining, environmental, legal and economic issues associated with the Ok Tedi Mine, PNG; reviewed and valued the coal assets of PT Kideco, a 12 million tonne per annum Indonesian based coal mining and exporting company, formed part of the strategic review team that evaluated and valued the WMC Corridor Sands Project, and recently reviewed and valued the minerals assets and Stuart Oil Shale Project of Southern Pacific Petroleum and valued the South Australian coal assets of Kumagai Australia Pty Ltd.

Ian Buckingham, Managing Director of Anderson & Schwab Australia, is the firm's lead consultant in preparation of this opinion for PKF. Mr Buckingham was the leader of A&S' teams that worked on the Aberfoyle, North's, Ashton, WMC, Ok Tedi, PT Kideco, Corridor Sands, Southern Pacific Petroleum and Kumagai valuation assignments. He has also undertaken a number of strategic development assignments on behalf of global mining groups.

#### 6.1.2 *Ian D. Buckingham*

Ian Buckingham, is the Managing Director of Anderson & Schwab Australia, and holds an MBA from RMIT University, Bachelor of Applied Science (Applied Geology) from the Victorian Institute of Colleges and Fellowship and Associateship Diplomas in Geology. Mr. Buckingham is a Member PESA and AAPG.

Commencing his career as a base metals, gold and diamonds exploration geologist he moved into gas engineering and petroleum exploration and development before establishing himself as a resources analyst in stock broking and investment banking. As an analyst he analysed, evaluated and developed financial models for major mining and energy companies. Since joining Anderson & Schwab he has worked on many projects where his knowledge and expertise in areas such as due diligence, valuation, commercial and technical analyses, concept and strategic development, financial modelling and general management have been required.

### 6.2 FEES

A&S will be paid a professional fee plus reasonable expenses for the preparation of this report. The fee is not contingent on the conclusions set out in the report, or the conclusion of the proposed transaction.



### **6.3 COMPLIANCE**

This report has been prepared in compliance with the requirements of the "Code and Guidelines for Technical Assessment and/or Valuation of Mineral and Petroleum Assets and Mineral and Petroleum Securities for independent Expert Reports" (The VALMIN Code).

### **6.4 DECLARATION**

A&S has not previously worked on any assignment associated with Great South Land Minerals.

Neither A&S nor Ian D Buckingham have any business relationship with Great South land Minerals Limited or with any companies associated with those companies that could reasonably be regarded as being prejudicial to their ability to give an unbiased and independent assessment.

There is no present agreement, arrangement or understanding that A&S will at any time in the future undertake any assignment for Great South Land Minerals Limited or any company or organisation associated with them.

Other than as set out herein, neither A&S nor Ian D Buckingham nor any other person who contributed to this report has any interest in the company that is the subject of this report.

### **6.5 INDEMNITY**

A&S and their associates have been indemnified by Great South Land Minerals Limited as to damages, losses and liabilities relating to or arising out of their engagement that do not arise from the fault of A&S or their associates.

### **6.6 CONSENT**

A&S has given its written consent to the inclusion of this letter in PKF's IER to be provided to Great South land Minerals Limited's shareholders, pursuant to Australian regulatory requirements. As of this date, A&S has not withdrawn its consent. A&S has not been involved in the preparation of, or authorised or caused the issue of any other part of the documentation to be provided to Great South Land Minerals Limited's shareholders, other than this report.

Neither the whole, nor any part of this report, nor any reference thereto, may be included in or with, or attached to any document or used for any other purpose without the prior written consent of A&S to the form and context in which it appears and the purpose of its use.

All of the persons involved in the preparation of this report have consented to the use of this assessment report, for the purpose stated above and in the form and context in which it appears.

### **6.7 LIMITATION**

The statements and opinions contained in this report are given in good faith and, to a considerable extent; reliance has been placed on the information provided by Great South land Minerals Limited. All such information has been presented in a professional manner and A&S believes, on reasonable grounds, that it is true, complete as to material details, and not misleading. The work undertaken for the purpose of this report in no way constitutes a technical audit of any of the assets or records reviewed, and A&S does not warrant that its inquiries have realised all of the matters that an audit might disclose. A&S in no way guarantees or otherwise warrants the achievability of any forecasts used in this report.

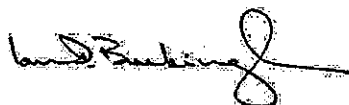


## 6.8 FACTUAL AND CONFIDENTIALITY REVIEW

A draft copy of this report was provided to officers of Great South Land Minerals Limited for comments as to confidentiality issues, errors of fact or misinterpretation, or substantive disagreements on the assumptions that A&S has adopted. While A&S has withheld certain information deemed by Great South Land Minerals Limited to be confidential and included minor corrections and amendments in this final report as a result of comments received, neither the methodology nor conclusions were amended.

A&S gratefully acknowledge the assistance provided by the Directors and officers of Great South Land Minerals Limited in facilitating the preparation of this report.

### ANDERSON & SCHWAB AUSTRALIA LIMITED



**Ian Buckingham**  
Managing Director



## APPENDIX I— REFERENCES

### I.a COMPANY REPORTS AND PUBLICATIONS

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## **I.b ARTICLES**

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**VALMIN Code.** (1998). *Australasian Institute of Mining and Metallurgy (AusIMM)*

## **I.c WEB SITES**

GSLM Web site – [www.gslm.com.au](http://www.gslm.com.au)

Australian Stock Exchange – [www.asx.com](http://www.asx.com).





## Australian Worldwide Reports 'Initial Success' in Exploration



By James Paton

Jan. 29 (Bloomberg) -- **Australian Worldwide Exploration Ltd.**, the oil and gas producer that's embarked on its largest drilling campaign, has achieved "initial success" in exploration off Tasmania, Managing Director **Bruce Wood** said.

The Sydney-based company and its partners, including operator **Origin Energy Ltd.**, have found oil and gas at the Rockhopper well in the Bass Basin off Tasmania, Wood said in an interview. The companies have yet to determine the commercial potential of the resource, he said.

"We were looking at that as a gas prospect," Wood said in Sydney on Jan. 27. "Now it's a mixture of oil and gas."

The A\$175 million (\$157 million) drilling program will expand this year to include Indonesia. Exploration in New Zealand's Taranaki Basin may prove "transformational" should Australian Worldwide deliver further discoveries, said **John Young**, a resources analyst at Wilson HTM Investment Group.

"If unsuccessful, there will be some disappointment and the share price would probably respond accordingly," Young said yesterday by telephone from Melbourne.

**Australian Worldwide** has gained 12 percent in the last year compared with an advance of 34 percent for the benchmark S&P/ASX 200 Index. Analysts have 11 "buy" ratings on the stock and 1 "sell," data compiled by Bloomberg show.

Australian Worldwide plans "sustained" exploration during the next 12 months in Indonesia, aiming to sink its first well in the Asian country by the end of June, Wood said Jan. 27.

A gas discovery was made at the Redback South well in Western Australia, the company said in September. Proved and probable reserves reached 68.9 million barrels of oil equivalent at the end of June, Australian Worldwide said on its Web site.

While the exploration effort is in line with expectations, it is too early to gauge the commercial significance of the resources, Wood said. "We simply don't know."

To contact the reporter on this story: **James Paton** in Sydney [jpaton4@bloomberg.net](mailto:jpaton4@bloomberg.net).

*Last Updated: January 28, 2010 16:27 EST*



GE Commercial Finance  
Energy Financial Services

Leanne M. Bell  
Managing Director

July 30, 2004

Board of Directors  
Empire Energy Corporation International  
11011 King Street, Suite 260  
Overland Park, KS 66210

Att: Malcolm Bendall, CEO

Gentlemen:

This letter will confirm our interest in structuring certain financing related to the Tasmanian Pipeline described to us by Mr. Tad Ballantyne acting as advisor to Mr. Bendall. In an exploratory phone conversation, Mr. Ballantyne related the circumstances surrounding the potential benefits of acquiring the pipeline at this stage of development.

We understand the interest level and once your firm could obtain a Letter of Intent or an Option Agreement relating to the purchase of the pipeline, and we could obtain additional information regarding the specifics of this transaction, we would be able to propose a structure under which we could potentially provide capital for this investment. The capitalization structure would be determined by a number of factors, which would include the initial purchase price and revenue assumptions, among others. Once you have identified the price and terms under which the seller agrees please contact us and we would propose terms under which we could proceed.

Regards,



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