

# BLUE ENSIGN TECHNOLOGIES LIMITED



## OIL SHALE

### VAST RESOURCE

Global in-place resource of more than 2.8 trillion barrels of oil

### RENDALL PROCESS

New approach for converting oil shale to synthetic crude oil with higher efficiency and lower costs than any other available process

### BUSINESS PLAN

Design, build and operate demonstration plant

Acquire additional resources

Design, build and operate First Commercial Plant, followed by large scale plants

License technology to other resource owners

### INVESTMENT OPPORTUNITY

Unique opportunity to invest in a global industry at the ground-floor

## Early Investment Opportunity in Oil Shale Technology

### Overview of Blue Ensign

Blue Ensign holds two significant assets:

- The intellectual property of the Rendall Process, a patented process technology for the production of synthetic crude oil from oil shale;
- An oil shale deposit located near Julia Creek in Queensland Australia with an Indicated and Inferred Resource of 895 million barrels of oil based on Fischer Assay.

### Blue Ensign business plan

Blue Ensign's business plan involves the following components:

- Construction and operation of a 1 tonne per hour Rendall Process demonstration plant
- Acquisition of additional oil shale resources
- Establishment of a commercial oil shale mining and processing operations at Julia Creek and other sites
- Licensing of the Rendall Process to prospective developers of oil shale resources

### World oil shale resources

Oil Shale deposits are an abundant resource; independent industry estimates indicate that these deposits globally hold in-place resources of shale oil amounting to 2.8 trillion barrels. Approximately 3/4ths of these deposits are in the USA. Successful economic exploitation of these resources, in an environmentally acceptable way, represents a strategic opportunity on a global scale.

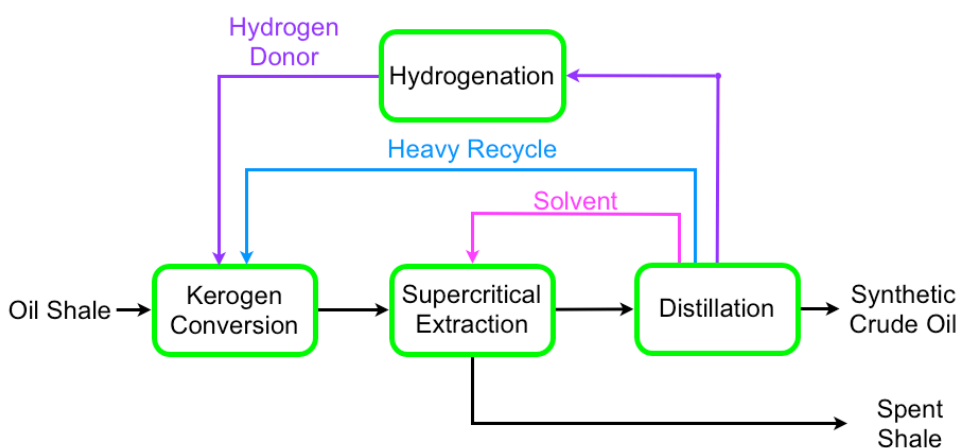
### Process chemistry

Since the early 1980s, hundreds of bench-scale tests have been performed on oil shales from around the world by various researchers to prove the process chemistry. This research has included work from Colorado School of Mines, Dalian University of Technology, and recently by Blue Ensign. The most recent tests, performed on Julia

## THE RENDALL PROCESS

### THERMAL SOLUTION APPROACH

Higher efficiencies and yields than any other technology available today



Creek shale, indicate an expected yield of 200% Fischer Assay. This significant improvement of yield reduces the cost per barrel of product by approximately 50%, compared to other approaches.

### Two key steps

The Rendall Process has two key steps that differentiate this approach from other technologies that have been applied to oil shale:

**Kerogen conversion:** the thermal conversion and hydrogenation of the organic matter (kerogen) in oil shale in a closed system at elevated temperature (~450°C) and pressure (~4200 kPag), utilizing two recycle streams. The heavy recycle is used for the shale slurry, and allows opportunity for additional upgrading. The hydrogen donor solvent provides the hydrogen to the conversion process, improving the quality of the oil. A liquid system provides efficient heat transfer and reaction control.

**Step 2 – Supercritical extraction:** utilizing a supercritical solvent to extract the oil from the shale residue allows for significant recovery of the converted oil and the extremely low viscosity provides easier separation of the solids.

### Expected benefits

**High quality oil:** The principal product will be a high quality, high value, synthetic crude oil, low in sulfur and nitrogen, of approximately 30°API, which will be readily transportable by pipeline and suitable for sale to conventional oil refineries.

**High oil yield:** About 90% of the kerogen in the oil shale will be converted to synthetic crude oil. This is approximately double the yield experienced by conventional retort processing (Fischer Assay).

**Low operating costs:** Operating costs for Large-Scale Plants (50,000 bpd) are expected to be in a range of US\$13 to 21/bbl, with a mean estimate of US\$17/bbl.

**Self-sufficiency:** In normal operations, all the energy required for process heat and process power generation, the process water and the solvents will be derived from the process itself.

**Scale-up:** All the process equipment and unit operations required for the Rendall Process are in services elsewhere in well proven commercial applications and in some cases much harsher environments.

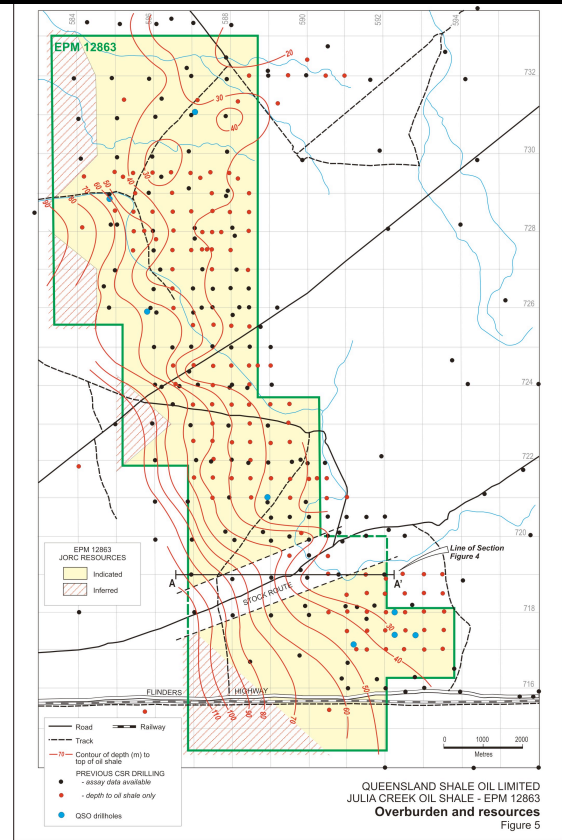
**Environmental:** Minimal impact through sealed operation, producing only oil, CO<sub>2</sub> and benign land fill. No toxic emissions or water consumption is expected.

# JULIA CREEK RESOURCE:

## 895 MILLION BARRELS OF OIL

Blue Ensign's Julia Creek oil shale resource is located near the township of Julia Creek in northwest Queensland, about 650 km west of the coastal city of Townsville and 250 km east of the major mining centre of Mt Isa. The permits held by Blue Ensign (MDLs 379 and 380 of 87 km<sup>2</sup> and EPM 12863 of 6 km<sup>2</sup>) contain a total Indicated and Inferred Resource estimated at 895 million barrels of oil at an average grade of 70 litres/tonne, with a cut off grade of 40 litres/tonne. The estimate is derived from the drill holes and Fischer Assay database of prior explorers (mainly CSR) who between 1968 and 1998 spent nearly \$20 million on exploration in the Julia Creek district.

Blue Ensign's permits cover most of the core area of the Julia Creek deposit where oil shale grades are highest and overburden thickness lowest. The deposit is shallow, underlying a flat terrain and well suited to open pit mining. Average overburden stripping ratio is initially projected to be approximately 3:1.



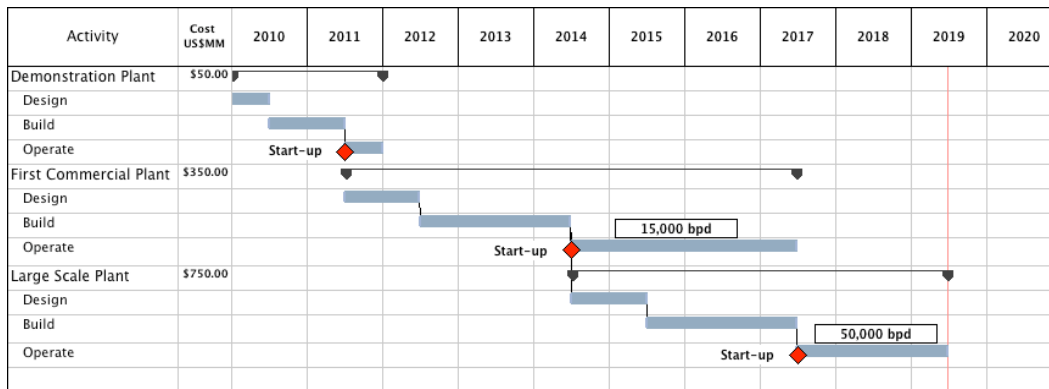
## Queensland oil shale policy

On 24 August 2008, The Queensland Government issued a statement that declared it would take two years to research whether oil shale deposits can be used in an environmentally acceptable way, and that no new oil shale mines will be permitted during this period. Blue Ensign expects that successful completion of the Demonstration Plant will position the Rendall Process as the leading environmentally responsible process option.

## Development plan

The development plan is shown below:

Each phase includes, basic and detailed engineering design, environmental permitting, cost estimation,



procurement, construction, and operation. The commercial phases include funding arrangements and product off-take agreements. The estimated costs are indicative in US\$2008.

## Corporate history

Blue Ensign was floated in 1999 as an information technology company. It is listed on the ASX but its shares have been suspended from quotation since July 2001.

In June 2006, Blue Ensign acquired Australian Thermal Solutions Pty Limited (“ATS”) in a backdoor listing. The consideration for the acquisition was 83,000,020 Blue Ensign shares and 83,000,020 (50 cent, 30.4.11) options. As part of that transaction, Colonial First State Investments subscribed \$3 million to Blue Ensign for 30,000,000 shares at 10 cents per share.

Prior to the backdoor listing, ATS had acquired the Julia Creek tenement (for a total cost of \$800,000) and an exclusive license for Australia for the Rendall Process. In addition, ATS was appointed the marketing agent for the Rendall Process outside Australia for which it was to receive 30% of net revenues derived from licensing outside Australia.

In June 2007, Blue Ensign acquired ownership of the Rendall Process intellectual property for no further consideration. As part of the acquisition, it was agreed that Blue Ensign would continue to receive 30% of net revenues from Rendall Process licensing outside Australia and that the IP vendors would be paid a royalty of 70% of these net revenues.

Additional working capital has been raised by various stock and options issues since June 2006.

## Funding plan

In July 2008, Blue Ensign appointed Cavendish Capital Partners LLP (“CCP”) of London as its financial adviser with a mandate to seek investors for the funding of the demonstration plant program.

The contact at CCP is Siddarth Amin:

Cavendish Capital Partners LLP  
 342 Shakespeare Tower  
 Barbican  
 London EC2Y 8NJ  
 +44(0) 207 374 8577  
 +44(0) 7801 064 399  
[sid.amin@cavendishcapital.com](mailto:sid.amin@cavendishcapital.com)

### Registered Office:

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 ABN 91 086 332 836  
 Suite 202, Angela House  
 30-36 Bay Street  
 Double Bay NSW 2028  
 Australia  
 Telephone: +612 9363 5088  
 Facsimile: +612 9363 5488

### Directors:

John Blumer  
 (Non-executive chairman)  
 Colin Thomas  
 Frank Ciotti  
 (Non-executive directors)

### Secretary:

Grahame Clegg

### Operations:

Cole Nelson  
 (Chief operating officer)  
 Val Vaughn  
 Sandy Rintoul

### ASX Code:

BLE (quotation suspended)

### Issued Capital:

127,532,628 FP ord shares  
 86,067,020 opts – 50c, 30/4/11  
 200,000 opts – 30c, 30/6/12  
 1,000,000 employee opts  
 – 30c, 30/6/12

### Substantial Shareholders:

JSG-A (Rendall family)– 41.2%  
 Colonial First State Investments  
 funds – 23.5%  
 Frank and Shari Ciotti – 9.4%

### ASX quotation:

The Company intends to meet the requirements for re-quotation of its shares on ASX as soon as practicable.

[www.blueensigntech.com.au](http://www.blueensigntech.com.au)