



**EMPEROR ENERGY**  
LIMITED

26<sup>th</sup> September 2019

ASX Market Announcements  
ASX Limited  
20 Bridge Street  
Sydney NSW 2000

## **Judith Gas Field Farm-In Partner Progress**

### **Highlights**

- Strong interest shown by a significant number of upstream industry participants
- Data Room open and Management Presentations continuing under Confidentiality Agreements
- Emperor Energy pleased by the level of engagement and remains confident of attracting a suitable Farm-In Partner

### **Summary**

The Directors of Emperor Energy Limited (Emperor) wish to provide an update on the process for identifying a suitable Farm-In Partner for the exploration/appraisal and development of the Judith Gas Field in the Offshore Gippsland Basin (100% Emperor owned).

Ocean Reach Advisory were appointed in May 2019 to lead the Farm-In Partner selection process for the next phase of exploration/appraisal drilling and subsequent development of the Judith Gas Field. Strong interest has been shown by a range of quality upstream industry participants.

Discussions have commenced under confidentiality agreements with a significant number of parties who are now receiving Management and Technical Presentations and accessing the Data Room.

Emperor Energy is pleased by the level of industry response and engagement, and whilst no transaction can be guaranteed, remains confident that a suitable Farm-in Partner can be obtained to facilitate the drilling of a well to target the large Prospective Resources associated with the Judith Gas Field.

The well is planned to be located up-dip on the structure from the original Judith-1 discovery well drilled by Shell in 1989.



## Resource Statement Previously Released 11<sup>th</sup> July 2019

On 11<sup>th</sup> July 2019 Emperor Energy advised that an Independent Resource Statement had been completed for the Judith Gas Field within the 100% Emperor Energy owned VIC/P47 Exploration Permit located in the offshore Gippsland Basin, Victoria (Figure 1).

The Resource Statement Highlighted:

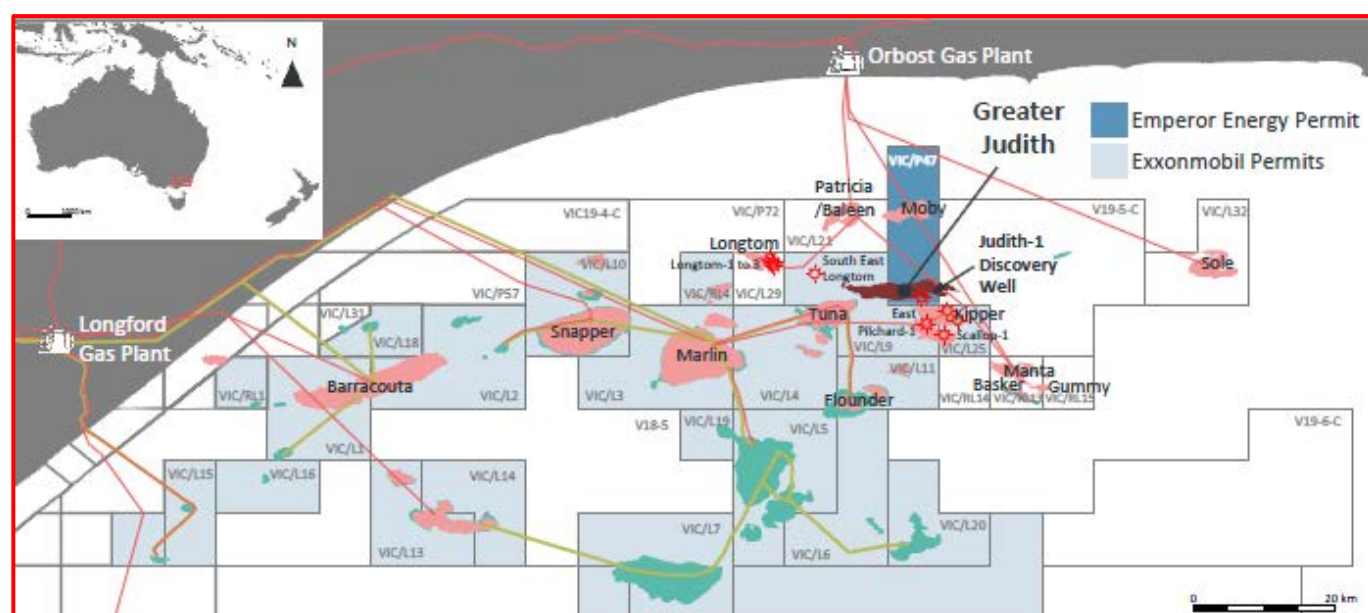
- **2C Contingent Gas Resource of 150 Bcf**
- **P50 Unrisked Prospective Gas Resource of 1.226 Tcf**

Consultants 3D-GEO Pty Ltd had assessed the gas-in-place and recoverable gas volumes in the Judith-1 gas discovery and Greater Judith Structure. This followed the merging and reprocessing of the Northern Fields and 3D seismic surveys in VIC/P47 conducted in 2016/17.

3D-GEO completed its assessment of Contingent and Prospective Resources for the Judith Field within VIC/P47 and conducted simulation flow modelling of the Greater Judith Structure. The resources presented are 100% attributable to VIC/P47. Emperor Energy holds 100% equity in VIC/P47.

An Independent Technical Specialist's Report comprising both Contingent and Prospective Resources was provided to Emperor on the 5<sup>th</sup> July 2019 by 3D-GEO Pty Ltd.

3D-GEO apportioned resources in accordance with the Society of Petroleum Engineers' internationally recognised Petroleum Resources Management System (SPE-PRMS 2018). The results are provided below in Table 1.



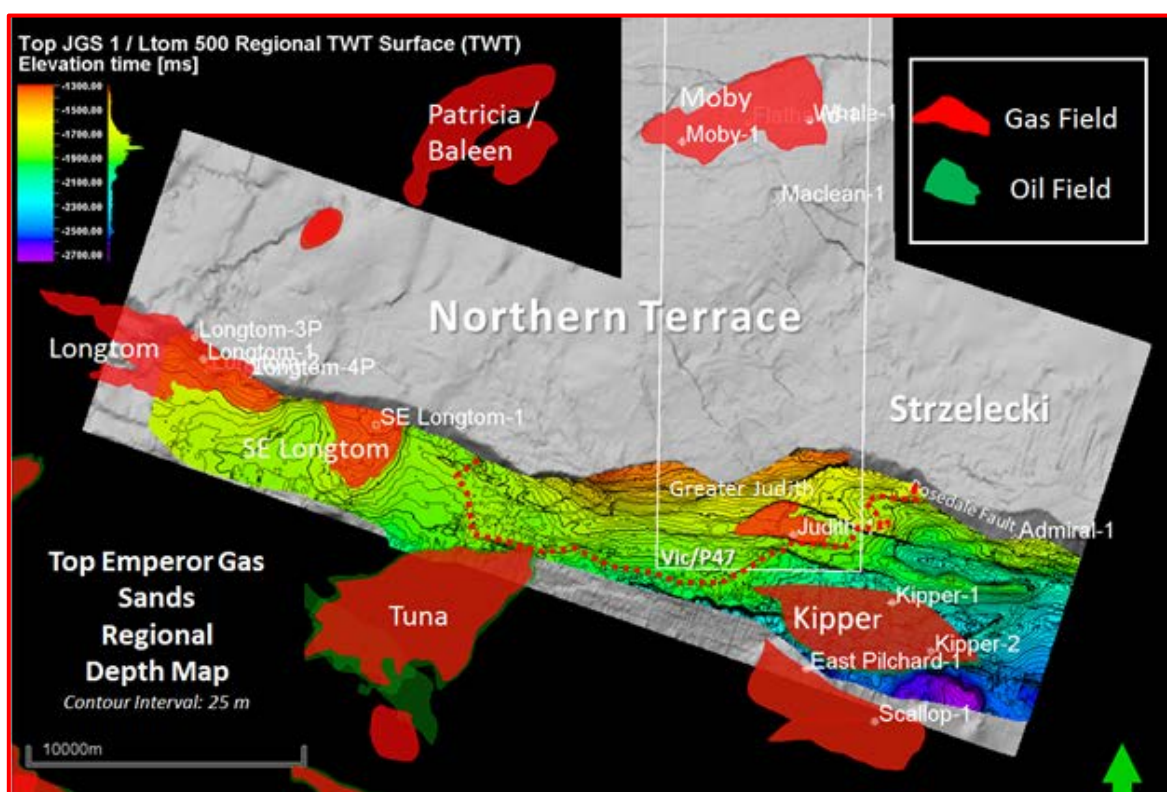
**Figure 1: Location of 100% Emperor Energy owned VIC/P47 offshore Gippsland Basin showing regional permits along with oil and gas fields**



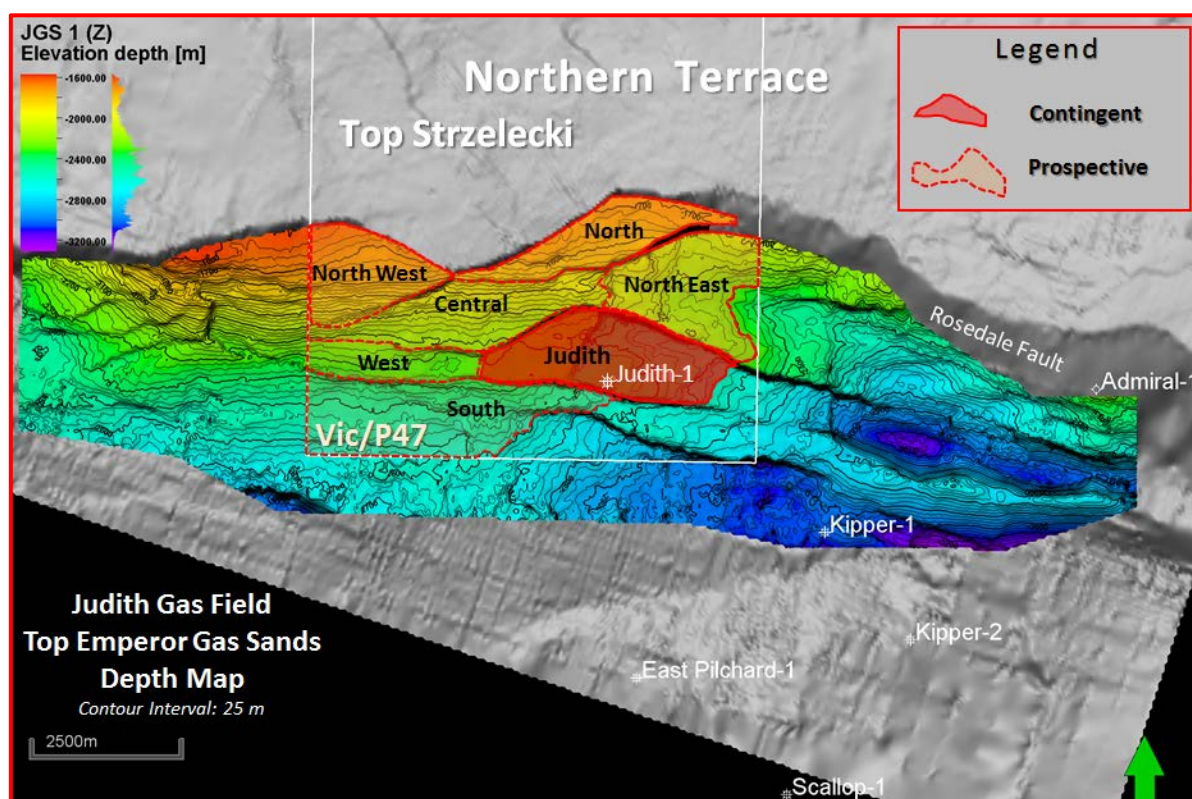
Judith Gas Discovery		Contingent Resources		
		Low Estimate 1C	Best Estimate 2C	High Estimate 3C
GIIP	Bcf	180	278	386
Sales gas	Bcf	97	150	209
Condensate	MMbbl	1.4	2.2	3.2

Greater Judith Area		Unrisked Prospective Resources		
		P90	P50	P10
Judith Deep	Bcf	38	62	92
West	Bcf	83	127	176
Central	Bcf	37	333	628
North	Bcf	29	166	315
North East	Bcf	49	279	494
North West	Bcf	15	102	226
South	Bcf	14	157	565
<b>Total</b>	Bcf	<b>265</b>	<b>1226</b>	<b>2496</b>

**Table 1: Summary of Contingent and Prospective Resources for Judith area of VIC/P47 (3D-GEO, July 2019)**



**Figure 2: Regional Map of Top Emperor Gas Sands showing oil and gas fields adjacent to VIC/P47**



**Figure 3: Judith Gas Field, and Greater Judith Compartments (3D-GEO, July 2019)**

## Background

Judith-1 was drilled and operated by Shell Company of Australia in 1989 and is contained within the VIC/P47 Permit held 100% by Emperor Energy and located within close proximity of the Kipper Gas Field operated by Esso (Exxon Mobil).

On 10<sup>th</sup> August 2017 Emperor Energy announced that the outcomes of seismic reprocessing and subsequent analysis completed during 2017 had resulted in a significant increase in the Gas-in-Place Estimate for the Judith Structure within VIC/P47.

On 22<sup>nd</sup> February 2018 Emperor Energy announced that the VIC/P47 permit had been renewed for 5 years with a work program including drilling of an exploration well in the Judith North Structure by early 2021.

On 26<sup>th</sup> March 2018 Emperor Energy announced that it had completed a thorough well log evaluation of the Judith-1 well and gas discovery. The Judith-1 results were then compared and contrasted with open file data not previously available from the four wells drilled on the Longtom Gas Field located some 22 km west of Judith-1 and the more recent South East Longtom-1 gas discovery by Esso in 2010. Like Judith-1 and the Longtom wells, the South East Longtom-1 discovered gas in multiple Emperor Reservoir sandstones in a structural closure sealed by the Rosedale Fault.





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On 7<sup>th</sup> June 2018 Emperor Energy Limited announced that it had engaged respected Independent Resource Certifier RISC to complete a Resource Statement in relation to the Judith Gas Field in the 100% Emperor Energy owned VIC/P47 Permit in the offshore Gippsland Basin, Victoria. RISC reviewed Static and Dynamic Modelling of the Judith Gas Reservoir Sands by Melbourne based Consultants 3D-GEO Pty Ltd and a Resource Statement was released on the 12<sup>th</sup> of November 2018.

3D-GEO further reviewed the November 2018 Resource Statement and conducted further technical assessments, leading to submission of a revised Resource Statement to Emperor Energy on the 5<sup>th</sup> July 2019.

## **Judith 1 Well Results**

Judith-1 was drilled and operated by Shell Company of Australia in 1989 and intersected gas in Turonian aged Emperor Group reservoirs over the interval 2,391.7 – 2,935 m located close to the Total Depth (TD) of the well at 2,958 m.

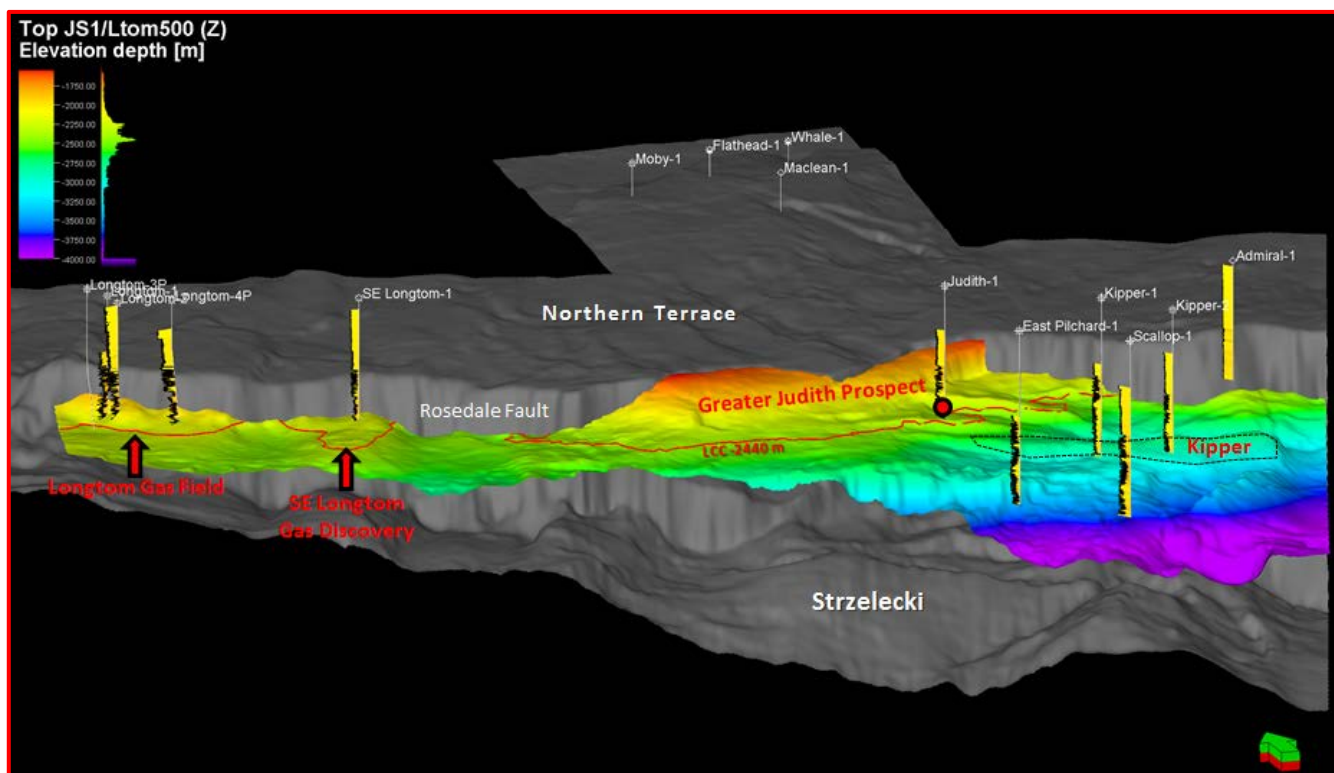
A gross thickness of 543.3 m was intersected in four discrete gas sands (JGS1 – JGS4) defined by separate Lowest Known Gas (LKG) limits, with highest known water and interpreted gas-water-contacts in three of the reservoir units (JGS2 – JGS4). The net gas pay is interpreted to be 160m of gas bearing sands.

Reservoir quality is generally modest in the gas column due to the presence of abundant argillaceous clasts in a lithic sandstone lithology which reduce permeability. Although RFT pressure surveys were acquired, no sampling was attempted or DST's run. Judith-1 is interpreted to have discovered moveable gas based on the wireline log interpretation, permeability interpreted from the RFT pressure data and comparison to the Longtom Gas Field which provides an analogue to the Judith reservoirs.

Interpretation of reprocessed data from the G01a Northern field and GA04 Moby 3D seismic surveys shows the Greater Judith Structure to be a hanging wall fault terrace on the Rosedale fault system of the northern Gippsland Basin.

The Judith trap was initially interpreted by Shell as a rotated fault block as determined on 2D seismic at the time of drilling. The Judith-1 gas accumulation is situated on the southeast flank of the Greater Judith structural nose with Judith-1 over 750m deeper than the structural crest.

The up-dip culminations of the Greater Judith closure are considered analogous to the Judith, Longtom and Southeast Longtom gas accumulations, but with potentially shallower and more favourable reservoir depths with respect to reservoir properties (Figure 5).



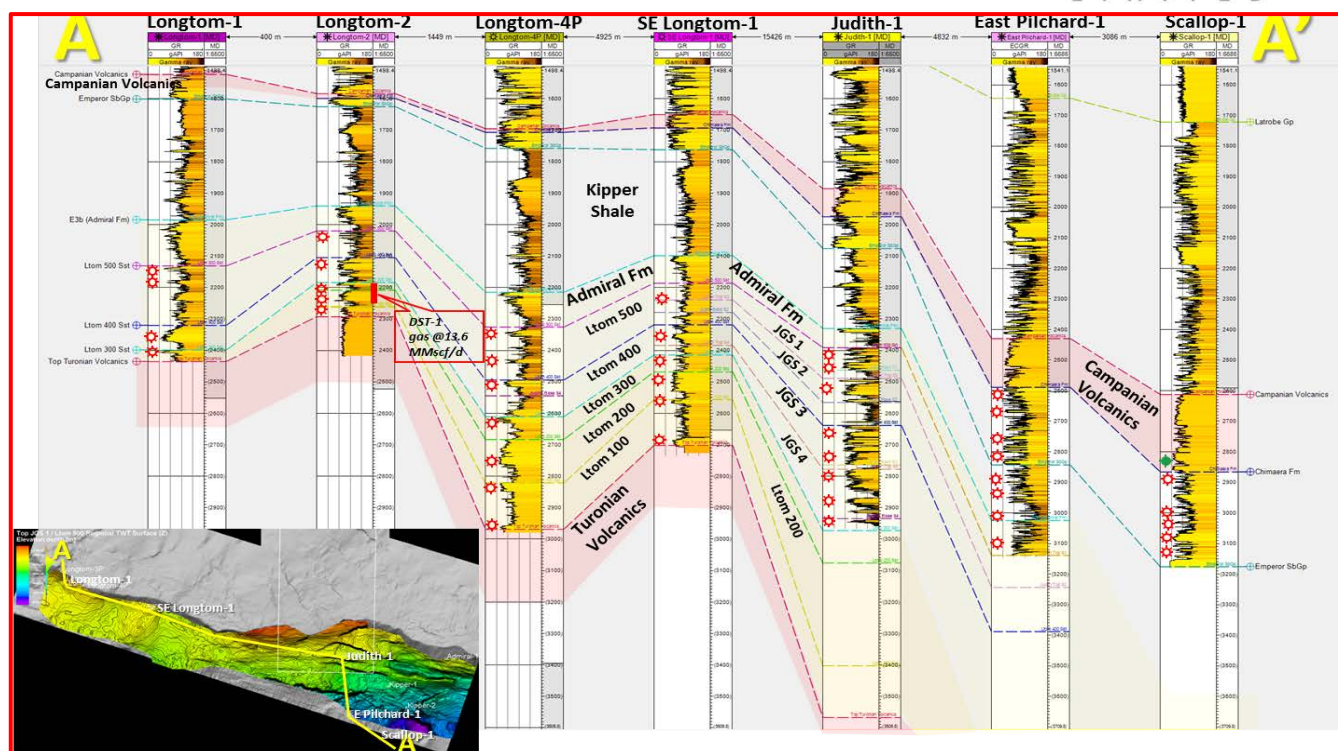
**Figure 5: Judith Gas Sand 1 Depth Model from Longtom Gas Field to the Greater Judith Structure**

### 3D-GEO Resource Assessment

The review of the Judith contingent resources and nearby prospective resources is based on:

- Judith-1 well data
- Merged and reprocessed 3D seismic data completed by 3D-GEO in 2016/17
- Offset well data, particularly the Longtom and Longtom SE wells
- Longtom gas field analogue
- Public domain 3D seismic volumes including the G01 Northern Fields 3D seismic surveys

The Judith gas reservoir is subdivided into four main units being Gas Sands S1 to S4. Each of these sandstone units are separated by lacustrine shales that appear to act as effective top seals. As figure 6 illustrates, the primary gas sands in the Longtom Gas Field and Southeast Longtom gas discovery extend below the Judith-1 well total depth and add additional prospective resources.



**Figure 6: Reservoir correlation from Longtom Gas Field to Judith-1 to Scallop-1**

3D-GEO conducted detailed petrophysical analysis of the Judith-1 well, available Longtom wells, Southeast Longtom-1, East Pilchard-1 and Scallop-1. Gas/Water saturations were analysed and porosity vs depth plots were generated and used to distribute reservoir parameters across the Greater Judith Structure.

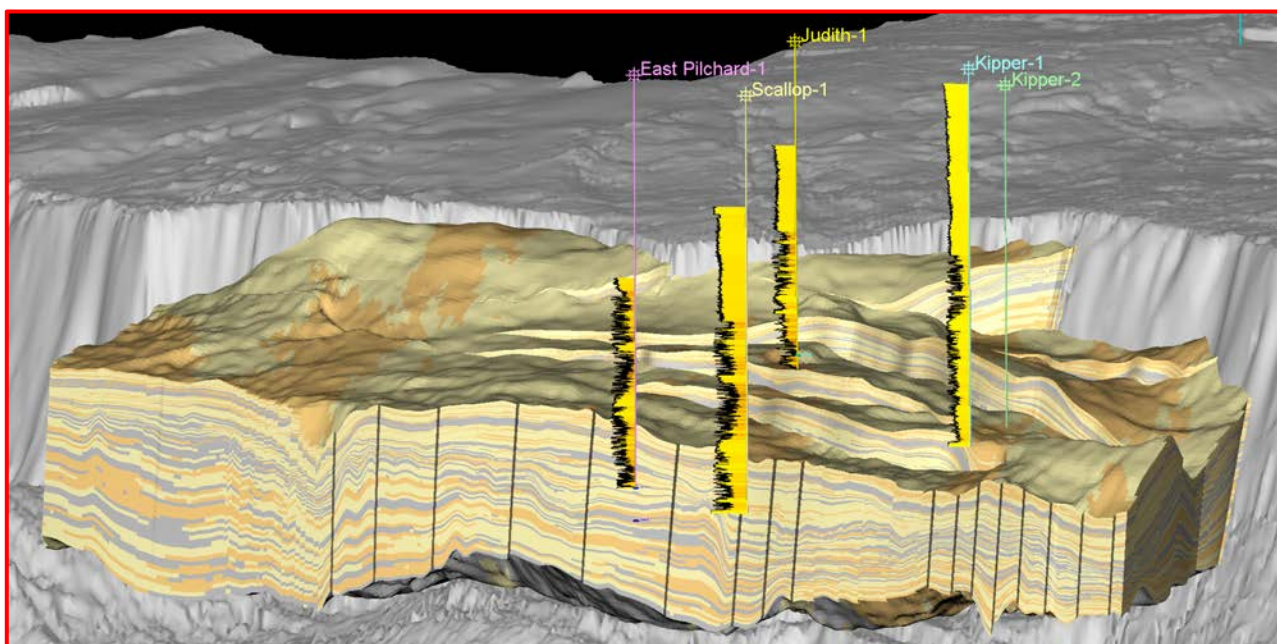
Interpretation of the reprocessed seismic data was undertaken by 3D GEO Pty Ltd. This seismic interpretation extends beyond the permit area to the key South East Longtom-1 and Longtom Gas Field wells. This extended interpretation was undertaken on the G01 Northern Fields 3D seismic data.

3D-GEO constructed and populated a static geological model in Schlumberger's Petrel software with which they extracted the Gross Rock Volumes to be used across the Greater Judith Structure.

Although the seismic interpretation and 3D modelling does not indicate clear compartmentalization between the Judith-1 well and the northern culminations, 3D-GEO has taken a conservative approach to the resource assessment and generated a series of separate fault blocks, with individual reservoir gas water contacts.

The November 2018 Resource Statement took a similar approach in the assessment however 3D-GEO have utilized the Longtom 200 sandstone gas column height (estimated to be 465m) as an analogue for selecting a P50 gas column of 450m in the up-dip culminations. The previous Resource Statement applied a more conservative column height of 350m to each compartment.





**Figure 6: Greater Judith Static Model**

3D-GEO then built a dynamic simulation model using the compartments and a gas column height of 450m in each compartment. This model was used to estimate potential well deliverability, potential production history and estimate recovery factors. The unconstrained gas flow rate for a single well with multiple gas sands producing was approximately 44 MMcf/d.

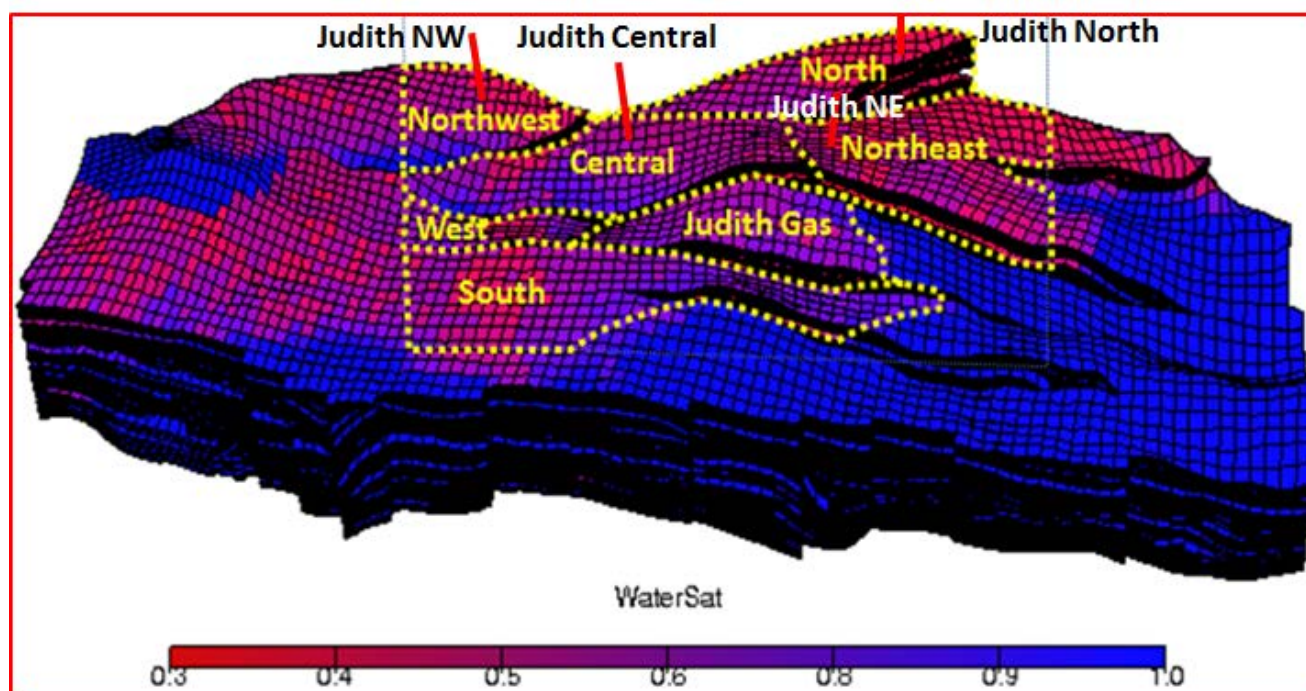
A four well development was modelled over a 35-year production life with gas production limited to 80 MMscf/d. This production constraint was applied to provide an analogue comparison with the capacity of current onshore gas processing infrastructure at Orbost owned and operated by others.

The 80 MMscf/d production plateau was maintained for 32 years with a gas production of 29Bcf /year. Total gas production over the 32-year plateau period was 934 Bcf of Raw Gas.

The field production rate declined to 68 MMscf/d at the end of the 35-year model simulation. Total production was 1.01 Tcf across the 35-year period with a recovery factor of approximately 40% of contacted gas in place.

A full field development of 16 wells over all compartments was simulated and resulted in a 6-year plateau of 400 MMscf/d and total production in the 35-year simulation of over 2.6 Tcf from the overall Judith Structure, resulting in a recovery factor of 58%. These recovery factors were used to guide the resource estimation.





**Figure 7: Greater Judith Dynamic Model with Compartments and Four Well Model**

Reservoir parameter averages were extracted for each compartment and fluid contact scenario of the Greater Judith Static Model and input into a Monte Carlo statistics package by 3D-GEO from which probabilistic Gas-Initially-In-Place (GIIP) and Recoverable Resources (gas and condensate) were calculated.

### **Judith Contingent Resources**

The Judith Contingent Resources are defined by the Judith-1 well penetration. There are four gas sands penetrated, with separate gas accumulations. There are no clear Gas/Water contacts (GWC), only “gas down to” and some “water up to” interpretations on the well log data.

Therefore 3D-GEO has used a narrow range of plus 25m (P10) and minus 25m (P90) around the most likely interpreted GWC. These contact levels then define the Gross Rock Volumes used to derive the 1C, 2C and 3C volume estimates.

Unlike the previous Resource Statement (November 2018) that used different areas to define the 1C, 2C, and 3C extent of resources, 3D-GEO cannot see justification for isolating the Judith-1 discovered gas to a very small area. Seismic interpretation/mapping, including amplitude and attribute analysis does not support this limitation and there are no well tests to indicate that a pressure barrier is in close proximity to the well.

Although both methods are valid evaluations, 3D-GEO has modelled the Judith contingent resources to extend throughout the Judith compartment, and 1C, 2C and 3C resources are estimated using a probabilistic assessment with a small range on input parameters, such as GWC, Gross Rock Value, net to gross ratio, porosity and gas saturation. The Contingent Resources identified in the Judith Gas compartment are provided in Table 1.



## Judith Prospective Resources

The detailed seismic interpretation and 3D modelling conducted by 3D-GEO identifies numerous faults within the Greater Judith structure. Although it is not clear that these faults create isolated compartments, for the purpose of estimating a most likely prospective resource, a series of fault compartments have been generated. Most of these fault compartments are updip of the Judith Gas Contingent Resource, and in a structural position analogous to the Longtom Gas Field and Southeast Longtom gas discovery.

Utilising the 3D Static model, 3D GEO extracted reservoir parameter inputs for conducting a probabilistic assessment for each of the prospective compartments. Gross Rock Volume, which has the greatest effect on resource volumes, was derived by using a range of gas column heights in each compartment; 150m (P90), 450m (P50) and 750m (P10). The Prospective Resources identified on the Greater Judith Structure within VIC/P47 are provided in Table 2. The cumulative P50 Prospective Resource is estimated as **1.226 Tcf**.

	Judith Central		Judith Northeast		Judith North		Judith South		Judith West		Judith Northwest		Judith Deep		TOTALS	
	GIP	Recov	GIP	Recov	GIP	Recov	GIP	Recov	GIP	Recov	GIP	Recov	GIP	Recov	GIP	Recov
P90	60	37	90	49	54	29	29	14	153	83	26	15	69	38	480	264
P50	607	333	511	279	303	166	286	157	232	127	186	102	112	62	2236	1226
P10	1137	628	895	494	572	315	1026	565	317	176	411	226	167	92	4525	2496
	Mean	334	Mean	279	Mean	171	Mean	233	Mean	129	Mean	113	Mean	64	Mean	1323

**Table 2: Prospective Resources for Judith area of VIC/P47 (3D-GEO, June 2019)**

## Exploration, Appraisal and Development

Future exploration, appraisal and development plans of the Judith gas accumulation remains to be determined. Emperor is developing an appraisal and exploration program for the Greater Judith Structure of which further evaluation of the Judith gas discovery will be considered. Development pathways for Judith gas are potentially available through existing nearby infrastructure.

Although oil production in the Gippsland Basin is in the late stages of decline, the Gippsland fields remain a major source of gas for the eastern Australia domestic market and currently produce around 1,000 terajoules (1,000 MMscf) per day.

The nearby Esso-operated petroleum infrastructure is well developed with a network of pipelines transporting hydrocarbons produced offshore to onshore petroleum processing facilities at Longford.

Further infrastructure exists at the onshore gas plant owned by APA Limited at Orbost and the associated Patricia/Baleen pipeline infrastructure owned by Cooper Energy.

Gas from these facilities is delivered across the inter-connected South Eastern Australia pipeline network to Sydney, Adelaide and Tasmania.



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## **Competent Persons Statement**

### **Consents**

The Resources information in this ASX release is based on, and fairly represents, data and supporting documentation supplied in an Independent Technical Specialist's Report (ITSR) prepared by 3D-GEO Pty Ltd. The preparation of this report has been managed by Mr Keven Asquith who is Chairman and Director of 3D-GEO Pty Ltd.

Mr Asquith holds an Honours BSc. Geological Sciences – University of Western Ontario, Canada, 1978, and a Diploma in Project Management from the University of New England, Australia - 2000. Mr Asquith has over 30 years' experience in the sector and is a long-time member of the American Association of Petroleum Geologists (AAPG).

Mr Asquith is a qualified Petroleum Reserves and Resources Evaluator as defined by ASX listing rules. The Resources information in this ASX announcement was issued with the prior written consent of Mr Asquith in the form and context in which it appears.

3D-GEO Pty Ltd is an independent oil and gas consultancy firm. All the 3D-GEO staff engaged in this assignment are professionally qualified engineers, geoscientists or analysts, each with many years of relevant experience and most have in excess of 25 years of industry experience.

3D-GEO was founded in 2001 to provide geotechnical evaluations to companies associated with the oil and gas industry. 3D-GEO services domestic and international clients with offices in Melbourne and Santa Cruz, Bolivia.

Reserves and resources are reported in accordance with the definitions of reserves, contingent resources and prospective resources and guidelines set out in the Petroleum Resources Management System (PRMS) approved by the Board of the Society of Petroleum Engineers in 2018.

The Independent Technical Specialist's Report (ITSR) has been prepared in accordance with the Code for the Technical Assessment and Valuation of Mineral and Petroleum Assets and Securities for Independent Expert Reports 2005 Edition ("The VALMIN Code") as well as the Australian Securities and Investment Commission (ASIC) Regulatory Guides 111 and 112.

SPE-PRMS Society of Petroleum Engineer's Petroleum Resource Management System - Petroleum resources are the estimated quantities of hydrocarbons naturally occurring on or within the Earth's crust. Resource assessments estimate total quantities in known and yet-to-be discovered accumulations, resources evaluations are focused on those quantities that can potentially be recovered and marketed by commercial projects. A petroleum resources management system provides a consistent approach to estimating petroleum quantities, evaluating development projects, and presenting results within a comprehensive classification framework. PRMS provides guidelines for the evaluation and reporting of petroleum reserves and resources.





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Under PRMS “**Reserves**” are those quantities of petroleum which are anticipated to be commercially recoverable from known accumulations from a given date forward. All reserve estimates involve some degree of uncertainty. The uncertainty depends chiefly on the amount of reliable geologic and engineering data available at the time of the estimate and the interpretation of these data. The relative degree of uncertainty may be conveyed by placing reserves into one of two principal classifications, either proved or unproved. Unproved reserves are less certain to be recovered than proved reserves and may be further sub-classified as probable and possible reserves to denote progressively increasing uncertainty in their recoverability.

“**Contingent Resources**” are those quantities of petroleum estimated, as of a given date, to be potentially recoverable from known accumulations, but the applied project(s) are not yet considered mature enough for commercial development due to one or more contingencies. Contingent Resources may include, for example, projects for which there are currently no viable markets, or where commercial recovery is dependent on technology under development or gaining access to existing infrastructure or where evaluation of the accumulation is insufficient to clearly assess commerciality. Contingent Resources are further categorized in accordance with the level of certainty associated with the estimates and may be sub-classified based on project maturity and/or characterized by their economic status.

“**Prospective Resources**” are those quantities of petroleum estimated, as of a given date, to be potentially recoverable from undiscovered accumulations by application of future development projects. Prospective Resources have both a 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.

The estimated quantities of petroleum that may potentially be recovered by the application of future development project(s) relate to undiscovered accumulations. These estimates have both an associated risk of discovery and a risk of development. Further exploration appraisal and evaluation is required to determine the existence of a significant quantity of potentially moveable hydrocarbons.

Yours faithfully

**Carl Dumbrell**  
**Company Secretary**

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## **Corporate Directory**

### **Board of Directors**

Carl Dumbrell

Phil McNamara

Nigel Harvey

Malcolm King

### **Company Secretary**

Carl Dumbrell

## **Geological Consultant**

Geoff Geary

## **Registered office & Principle place of business**

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Sydney NSW 2000

## **Mailing Address**

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Sydney NSW 2001

## **Auditors**

Deloitte

550 Bourke Street

Melbourne Vic 3000

## **Lawyers**

Hopgood Ganim

Level 27, Allendale Square

77 St Georges Tce, Perth WA 6000

## **Share Registry**

Automic Pty Ltd ACN 152 260 814 Trading as Automic Group

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Sydney NSW 2000

Phone: 1300 288 664 Overseas callers: +61 2 9698 5414

Email: [hello@automicgroup.com.au](mailto:hello@automicgroup.com.au)

## **Capital Structure**

The company currently has issued capital (as at 26 September 2019) of:

Ordinary fully paid shares	(ASX: EMP)	75,630,927
Options expiring 31 March 2020 (Ex \$0.075)	(ASX: EMPOC)	42,310,165



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**Top 20 Shareholders – 26 September 2019**

<b>Position</b>	<b>Holder Name</b>	<b>Holding</b>	<b>%</b>
1	Citicorp Nominees Pty Ltd	6,924,243	9.16%
2	Scintilla Strategic Investments Limited	5,985,851	7.91%
3	Martin Rowney	3,600,000	4.76%
4	Sama Zarah Pty Ltd	3,257,000	4.31%
5	Daniel Peters.	3,064,197	4.05%
6	Bond Street Custodians Limited	2,916,474	3.86%
7	Craig Chapman	2,266,667	3.00%
8	The Australian Special Opportunity Fund LP	1,888,890	2.50%
9	Slade Technologies Pty Ltd	1,833,334	2.42%
10	Littlejohn Embrey Engineering Pty Ltd	1,798,973	2.38%
11	Carl Dumbrell	1,466,667	1.94%
12	Tomlin Sales Pty Ltd	1,430,000	1.89%
13	Harness Pty Ltd	1,341,667	1.77%
14	Buduci Fond Pty Ltd.	1,271,175	1.68%
15	Mark O’Leary	1,200,000	1.59%
16	Nishant Misra	1,144,445	1.51%
17	Craig Pontey	1,111,112	1.47%
18	Paul Evans	1,100,000	1.45%
19	Gavin Dunhill	1,066,667	1.41%
20	ACEC Superannuation Fund Pty Ltd	1,006,667	1.33%