EMPEROR ENERGY
LIMITED

26 March 2018

ASX Market Announcements
Australian Stock Exchange Limited
10th Floor, 20 Bond Street
Sydney NSW 200

Emperor Energy Completes Judith 1 Well Log Interpretation and Petrophysical Comparison with Longtom Gas Field Wells

Highlights

- **Four (4) reservoirs with gas pay** defined in the Kipper Shale and Admiral formations of the Emperor Sub Group at Judith-1well between 2392 – 2843 m in a gross interval of 451 m
- **Net Reservoir Thickness** (gas + water sands) of 234m with **Net gas pay** (in gas sands) of 162m

- **Average Porosity** in gas pay reservoirs of 13 - 14.9%
- **Average Permeabilities** in gas pay reservoirs of 0.7 - 1.9 millidarcies (md)
- **Average Gas Saturations** for gas sands vary from 39.9 - 45.4%
- **Lowest-Known-Gas (LKG)** picked in four reservoirs suggesting that Gas-Water-Contacts are nearby down-dip from Judith-1

- **Judith-1 drilled through a major fault** 50 m above the upper gas sand
- **Fluid flow from the fault zone** accessing reservoirs has likely caused local diagenetic degradation in reservoir sands close to the fault lowering porosity and permeability

- **Gas Reservoirs in the Longtom wells** restricted to the lower part of the Admiral Formation
- **Gas Reservoirs at Judith-1** found in the Admiral Formation and the overlying Kipper shale

- **Well correlation between Longtom-2 and Judith-1** suggest potential for additional reservoir development below Total Depth (TD) of Judith-1
    - **This includes the interval that flowed at 13.6 MMscf/d from DST-1 at Longtom-2**

- **Evaluation suggests that Depth-of-Burial** is the major factor controlling reservoir degradation
- **Improved gas reservoir characteristics** *as good as, if not better than* the Longtom wells are expected to be developed up-dip of Judith

- **Longtom Analogue suggests that Judith-1 gas reservoirs are likely to be sufficiently developed over the Judith structure to be commercially productive particularly where horizontal drilling is employed in development wells as at the Longtom Gas Field.**

Background

Judith-1 was drilled and operated by Shell Company of Australia in 1989. Excellent gas shows were encountered while drilling through sandstones in the Kipper Shale and the Admiral Formation belonging to the Emperor Sub Group.

Judith-1 is contained within the Vic/P47 Permit held 100% by Emperor Energy and is located within close proximity of the Kipper Gas Field operated by Exxon Mobil.

On 10th 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.

The **P50 unrisked Gas-in-Place** within the Judith and Judith North structure were then estimated at **1.8 Trillion cubic feet (Tcf).** The **P50 unrisked Gas Recoverable** is estimated at **1.17 Tcf.**

On 22nd 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.

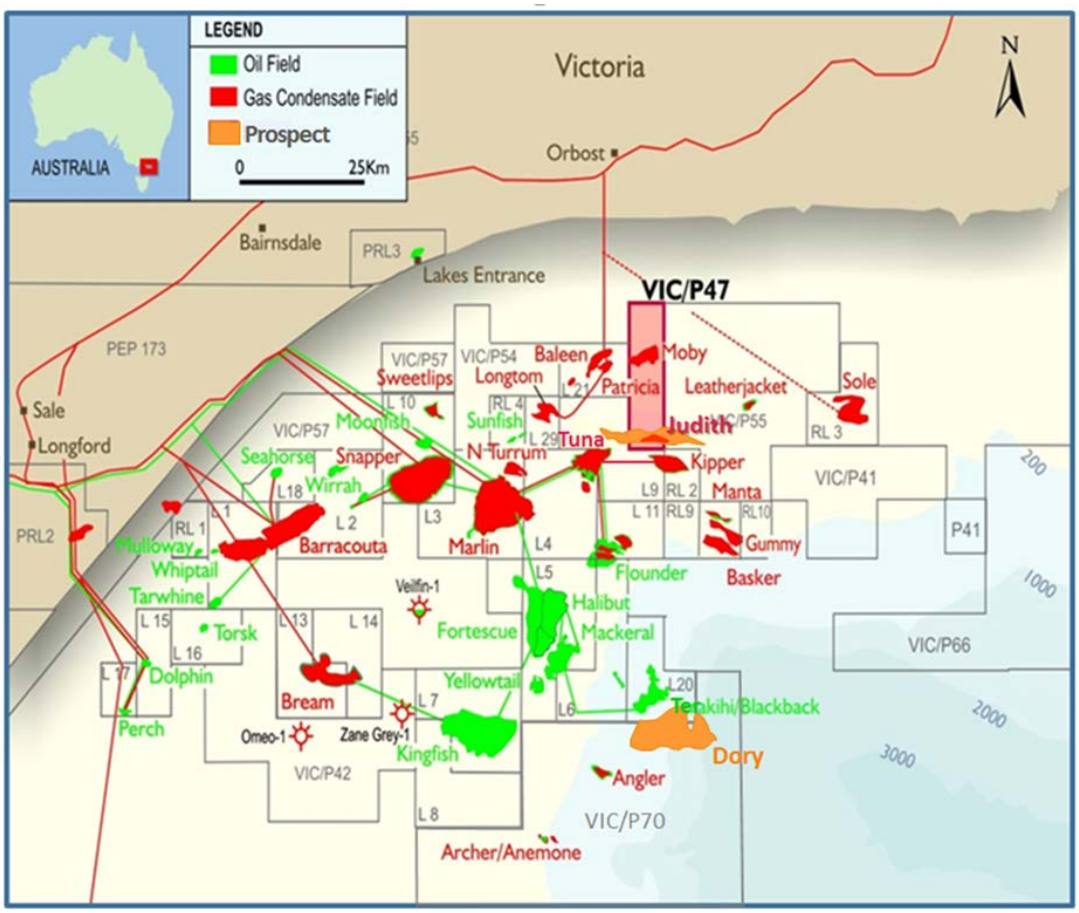

Figure 1: Location of Vic/P47 offshore Gippsland Basin showing permits and oil and gas fields

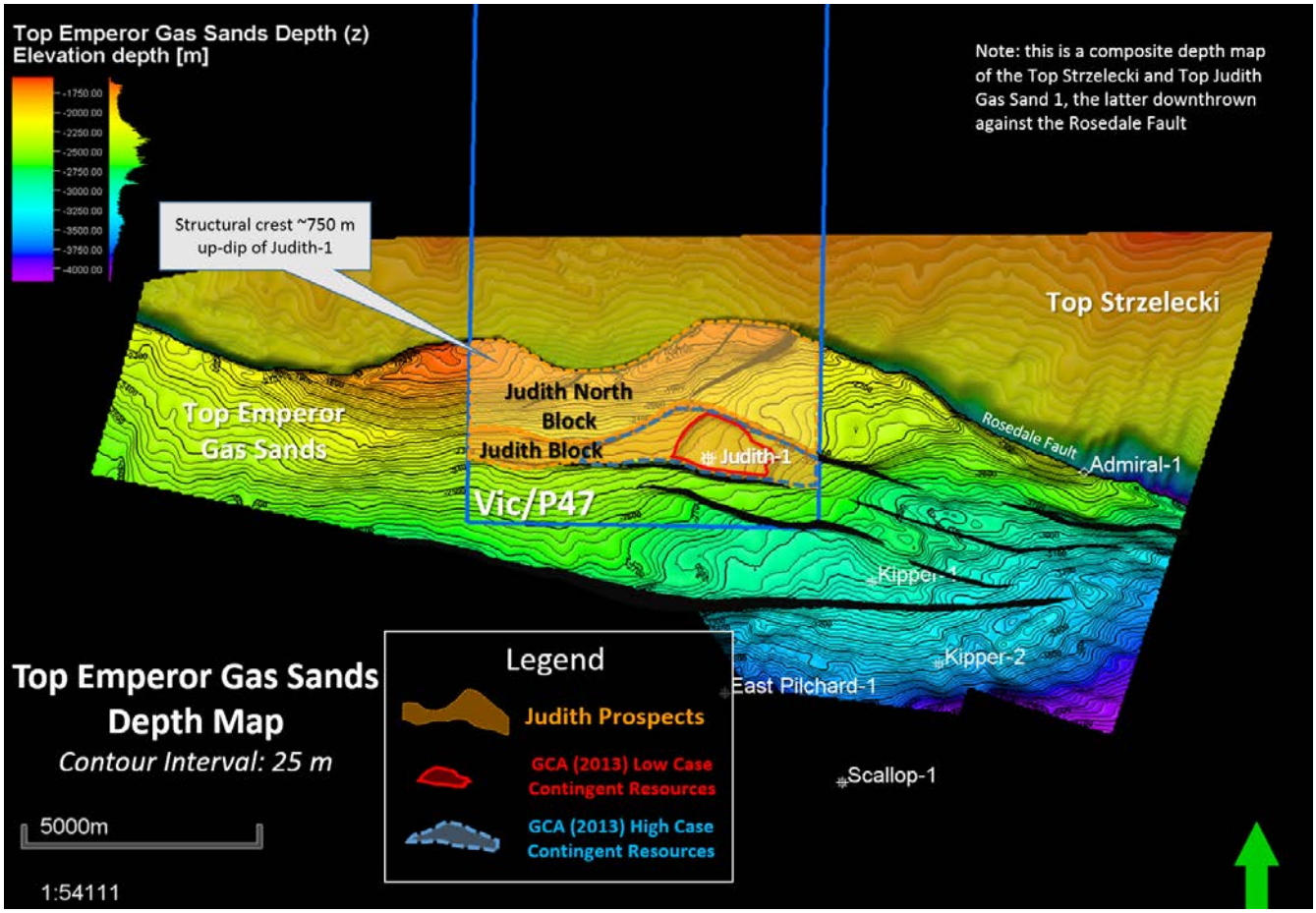

Figure 2: Top Emperor Gas Sands from reprocessed 3D seismic data showing location of Judith 1 drilled structurally down-dip close to or at gas – water contact. The Judith North Block structural crest is shown 750m up-dip of Judith 1

As part of the ongoing detail analysis of the Judith and Judith North structure Emperor Energy has now completed a thorough well log evaluation of the Judith-1 well and gas discovery.

The second part of the well log evaluation study was to compare and contrast the Judith-1 results 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.

The evaluation was conducted by Principal Consultant Petrophysicist Angie Cernovskis (BSc, Member SPWLA, SPE and Associate Member AAPG) with over 30 years of experience working in a variety of basins both in Australia and Internationally. She has extensive experience working for a number of companies on exploration and development projects in the Gippsland Basin. Angie has also conducted a number of petrophysical courses instructing in basic to advanced petrophysics.

The **attached report** has been compiled by Geological Consultant Geoff Geary for Emperor Energy using reports and outputs from the study by Angie Cernovskis.

Report on Judith-1 Well Log Interpretation and Comparison with Longtom Gas Field Wells along with East Pilchard-1 and Scallop-1 by Angie Cernovskis

Author: Geoff Geary – Geological Consultant **Report for Emperor Energy Limited.** **Date: 22 March 2018**

Emperor Energy Limited has completed a well log evaluation of the Judith-1 gas discovery located in the company's exploration permit Vic/P47 in the Gippsland Basin.

The evaluation was conducted by Principal Consultant Petrophysicist Angie Cernovskis (BSc, Member SPWLA, SPE and Associate Member AAPG) with over 30 years of experience working in a variety of basins both in Australia and Internationally. She has extensive experience working for a number of companies on exploration and development projects in the Gippsland Basin. Angie has also conducted a number of petrophysical courses instructing in basic to advanced petrophysics.

Judith-1 was drilled and operated by Shell Company of Australia in 1989. Excellent gas shows were encountered while drilling through sandstones in the Kipper Shale and the Admiral Formation belonging to the Emperor Sub Group. These reservoir sandstones were evaluated by wireline logs and Repeat Formation Tests (**RFT**'s). Log evaluation indicated the presence of gas saturation in several, low permeability, lithologically complex reservoirs characterised by low resistivity values and low calculated gas saturations (Sg = 100-Sw). RFT's at Judith-1 recorded permeability and formation pressure data indicative of reservoired gas. However as formation fluids were not recovered by the RFT's and no flow tests (i.e. Drill Stem Tests or **DST**'s) were conducted, the question has always remained as to whether the gas, mobile and capable of flowing is actually present in the Judith-1 reservoirs.

The first part of the evaluation was to reinterpret the Judith-1 well data and report on the reservoir properties and fluid characteristics of reservoir sandstones at the well.

The second part of the study was to compare and contrast the Judith-1 results 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. A location map showing the Vic/P47 permit, key mapped horizons (**TWT**) and wells is included as **Figure 1**. A well cross-section is shown as **Figure 2**.

Like Judith-1, Longtom contains gas in several Emperor Sub Group reservoirs, but unlike Judith-1, at Longtom the gas has been flow tested and produced. The three most recent Longtom wells (Longtom-2, -3 and -4) and their side-tracks have modern well logs (including Log While Drilling, **LWD** logs) and a much greater density of data including Modular Dynamic Testing (**MDT**) including pressure, permeability and reservoir fluid recovery along with whole core from which accurate porosities and permeabilities were measured.

Two additional wells, East Pilchard-1 drilled in 2001 and located 4.8 km south of Judith-1 and Scallop-1 drilled in 2003 and located 7.3 km SSE of Judith-1 **(Figure 1)** were also examined to see whether their well results were applicable to Judith-1 and could help with interpretation. East Pilchard-1 discovered gas in younger Emperor Sub Group (Kipper Shale) sandstones than were discovered at Judith-1 while Scallop-1 discovered gas in younger again Chimaera Formation reservoirs. The sandstones in both wells were found to have a complex mineralogy and to be lithologically similar to the Emperor sandstones at the Longtom wells and at Judith-1.

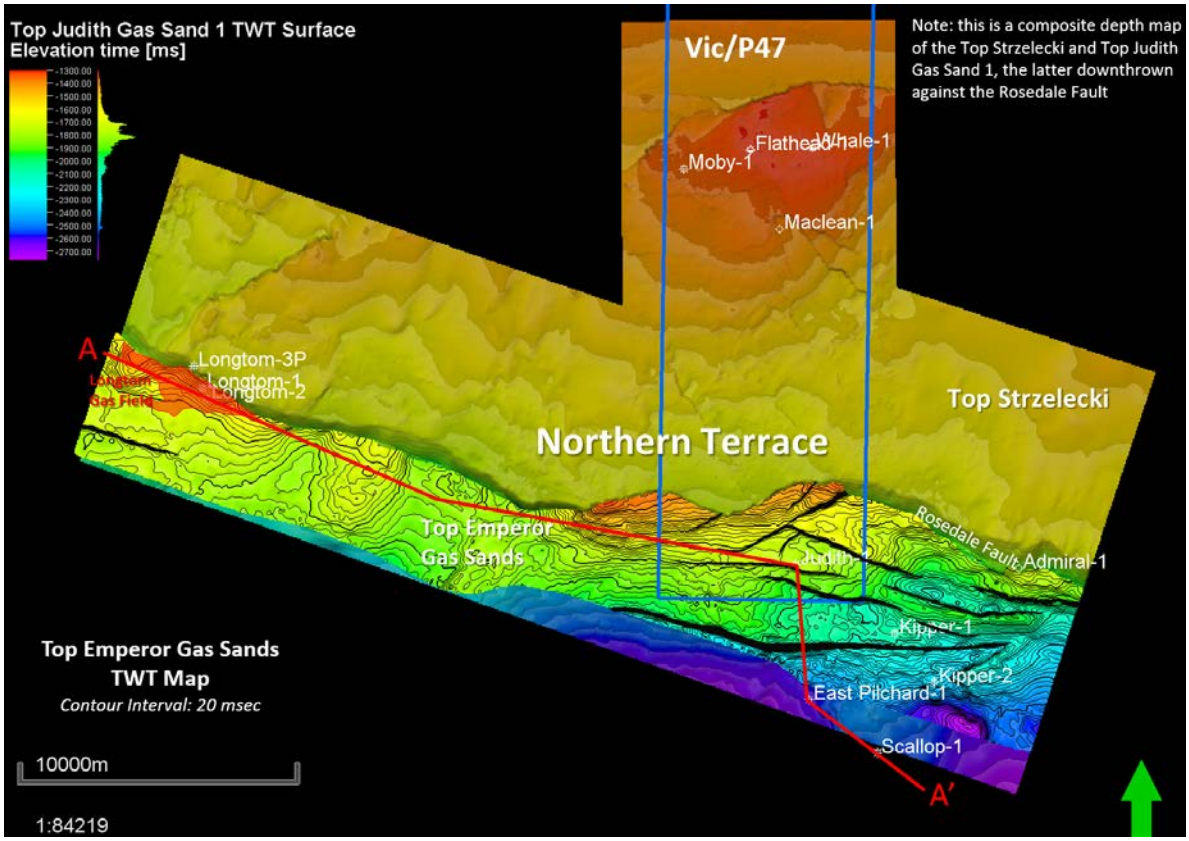

Figure 1. Vic/P47 location map showing regional 'Top Emperor Gas Sands' interpretation

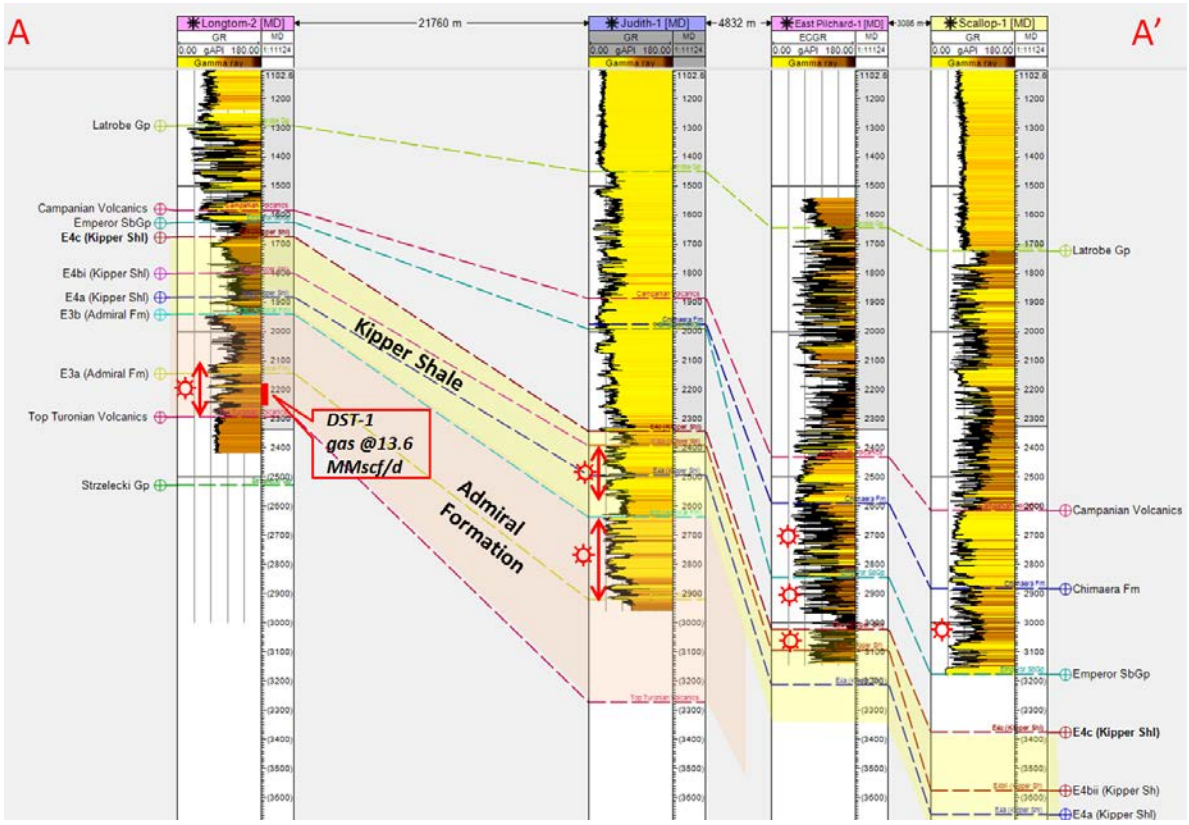

Figure 2. Well cross-section A – A': Longtom-2, Judith 1, East Pilchard-1 and Scallop-1

For log analysis at Judith-1, a three-mineral model was constructed to solve the bulk volume components of reservoir units, necessary because of the complex lithologies encountered in the sandstone reservoirs. The model and well logs were then used to solve for clay volume (**Vclay**), total porosity (**PHIT**), effective water saturation (**SWE**) and permeability (**Klog**).

The results of the Judith-1 well log interpretation are shown in the petrophysical log interpretation plot presented in **Figure 3**. Four sandstone reservoirs were defined that closely approximate the four Judith Gas Sand units established by the previous permit operator Bass Strait Oil Company. These intervals also correspond to the reservoir units used by Gaffney Cline & Associates in their 2008 contingent resource certification and also for their updated 2013 resource assessment for the Judith Gas Field.

The reservoir summations presented in **Table 1** are in accordance with the base case presented by Kennedy (2007) who used cut-off criteria for Vclay of less than 50% and porosity (PHIE) greater than 5%. Due to the uncertainty with the water saturations, a cut-off for net pay has not been applied. The reservoir summation differentiates interpreted gas sands from water sands separated by Lowest Known Gas (**LKG**) boundaries. **Table 1** shows reservoir properties for both gas and water sands and includes total reservoir summation for each reservoir interval.

Although an RFT program was run in at Judith-1 (35 pressures were attempted with 17 reported as being valid), there is a large amount of scatter in the data and less than an optimal number of pressure points in each reservoir unit to establish or interpret formation fluid type in these over-pressured reservoirs. Consequently gas gradients or gas-water contacts could not be established using these data.

The reservoir section at Judith-1 extends from 2392 – 2843 m MD, a gross thickness of 451 m **(Figure 3 and Table 1)**. Net reservoir (for both gas and water sandstones) was evaluated in four separate intervals amounting to 234 m for a net/gross of 51.8%. Within the four reservoirs, net gas pay was estimated at 161.8 m. Average porosities for the four sands vary from 10.8 – 14.9% with average log derived permeabilities varying from 0.2 - 1.9 md. Average water saturations (SWE) for the gas sands vary from 54.6 – 68.1%. Calculated reservoir properties closely approximate previous work by Locke (2004), Kennedy (2007) and those calculated and used by Gaffney Cline & Associates in their 2008 and 2013 resource assessments.

The study also noted that the poorer reservoir properties than expected developed in the Judith Sand 1 reservoir and possibly the other reservoir sands also, could be caused by the influence of increased diagenesis by fluid flow due to its proximity on the high-side of the major down-to-basement, syn-depositional fault that cuts the Judith-1 well some 50 m above the top of Judith Gas Sand 1. This explanation is supported by petrology; the sandstone is described as “compact carbonate-cemented lithic sandstone”.

Table 1. Judith-1 reservoir summation

Judith-1 Well Log Evaluation: Reservoir Summation

Well Location	Offshore Vic/P47
Well Trajectory	Vertical
Well Spud Date	1989
Analysis Date	Feb-18
RT	21m
Water Depth	76.4m
Total Depth	2958mMD
Depth Reference	GR
Vclay estimate from	N-D crossplot & GR
Porosity estimated from	Neutron, Density, Sonic
Water Saturation Equation	Simandoux (Fm water Salinity 25kppm, a=1, m= 1.8 n=2)
Formation Tops	by reservoir unit

Net Reservoir is based on the following cut-off criteria:

Vclay	< = 50%
PHIE	> = 5%
SWE	not applied for net reservoir

Judith-1 Reservoir Summation

		Interval				Net to Gross			Average Reservoir Properties				
		Top	Base	Top	Base	GROSS	NET Reservoir	NET/GROSS	Vclay	PHIE	SWE	Klogs	
		mMD	mMD	mTVSS	mTVSS	mMD	mMD	%	%	%	%		Comments
JGS 1 Total Reservoir	**Total Reservoir**	**2392**	**2489**	**2371**	**2468.0**	**97.3**	**38.9**	**0.40**	**35.6**	**14.2**	**68.8**	**1.3**	
	JUDITH GAS SAND 1	2391.7	2457.0	2370.7	2436.0	65.3	36.6	0.6	34.9	14.3	68.1	1.3	**GAS** interpretations are based on the mud log GAS shows recorded during drilling operations.
	Water saturated	2457.0	2489.0	2436.0	2468.0	32.0	2.3	0.1	44.5	13.0	79.7	0.5	**High SWE** result across the gas zones are due to low resistivity values as consequence of complex lithologies.
JGS 2 Total Reservoir	**Total Reservoir**	**2489.0**	**2638.0**	**2468.0**	**2617.0**	**149.0**	**39.2**	**0.3**	**34.5**	**14.3**	**62.0**	**1.6**	
	JUDITH GAS SAND 2	2489.0	2545.0	2468.0	2524.0	56.0	38.2	0.7	33.8	14.9	54.6	1.9	**High Vclay** due to complex lithology in reservoir units
	Water saturated	2545.0	2638.0	2524.0	2617.0	93.0	10.0	0.1	37.1	12.0	90.8	0.6	**Interpreted** as most likely water saturated
JGS 3 Total Reservoir	**Total Reservoir**	**2638.2**	**2777.6**	**2617.2**	**2756.6**	**139.4**	**85.4**	**0.6**	**36.7**	**13.3**	**62.7**	**1.1**	
	JUDITH GAS SAND 3	2638.2	2723.0	2617.2	2702.0	84.8	60.4	0.7	34.5	14.0	56.0	1.5	**RFT formation pressures** are scattered and do not exhibit good pressure/depth gradient to confirm gas column
	Water saturated	2723.0	2777.6	2702.0	2756.6	54.6	25.0	0.5	42.1	11.5	79.0	0.2	**Interpreted** as most likely water saturated
JGS 4 Total Reservoir	**Total reservoir**	**2777.7**	**2935.0**	**2756.7**	**2914.0**	**157.3**	**70.3**	**0.4**	**39.0**	**11.7**	**70.4**	**0.4**	
	JUDITH GAS SAND 4	2777.7	2809.0	2756.7	2788.0	31.3	26.6	0.8	36.2	13.0	56.5	0.7	**Formation fluids** were not recovered or produced to confirm GAS interpretations
	Water saturated	2809.0	2843.0	2788.0	2822.0	34.0	20.9	0.6	40.9	10.9	82.3	0.2	**Interpreted** as most likely water saturated
	Water saturated	2843.0	2935.0	2822.0	2914.0	92.0	22.8	0.2	40.6	10.8	75.4	0.3	**Interpreted** as most likely water saturated

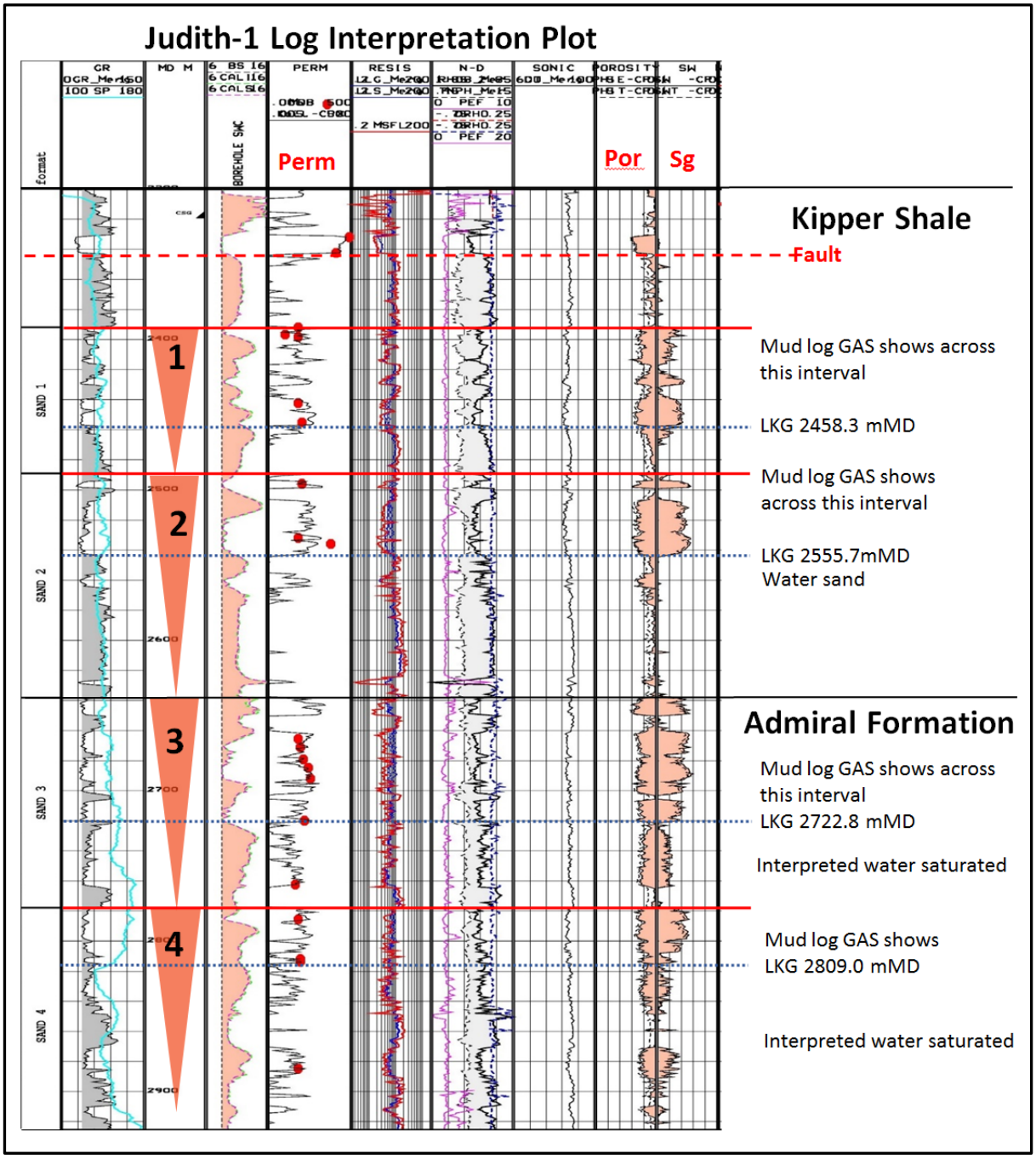

Figure 3. Judith 1 Petrophysics interpretation plot

Like Judith-1, Longtom contains gas in several Emperor Sub Group reservoirs; but unlike Judith-1, at Longtom the gas has been flow tested and produced. The three most recent Longtom wells and their side-tracks have modern well logs (including LWD logs) and a much greater density of data including MDT (pressure, permeability and reservoir fluid recovery) and whole core from which real porosities and permeabilities could be measured.

There is good agreement between the log-derived permeability (Klogs) and the RFT permeability at Judith-1. A surprisingly good regional correlation for porosities and permeabilities for Emperor Sub Group reservoirs was also obtained when comparing Judith-1 data with core-derived data from Longtom-2 and Longtom-4P as shown in the porosity – permeability cross-plot in **Figure 4.**

The Judith-1 log-derived porosities and permeabilities lie in the midpoint between core-derived data from the two Longtom wells. This suggests that Judith-1 gas reservoirs are sufficiently developed to be commercially productive where horizontal drilling is employed in development wells as at the Longtom Gas Field.

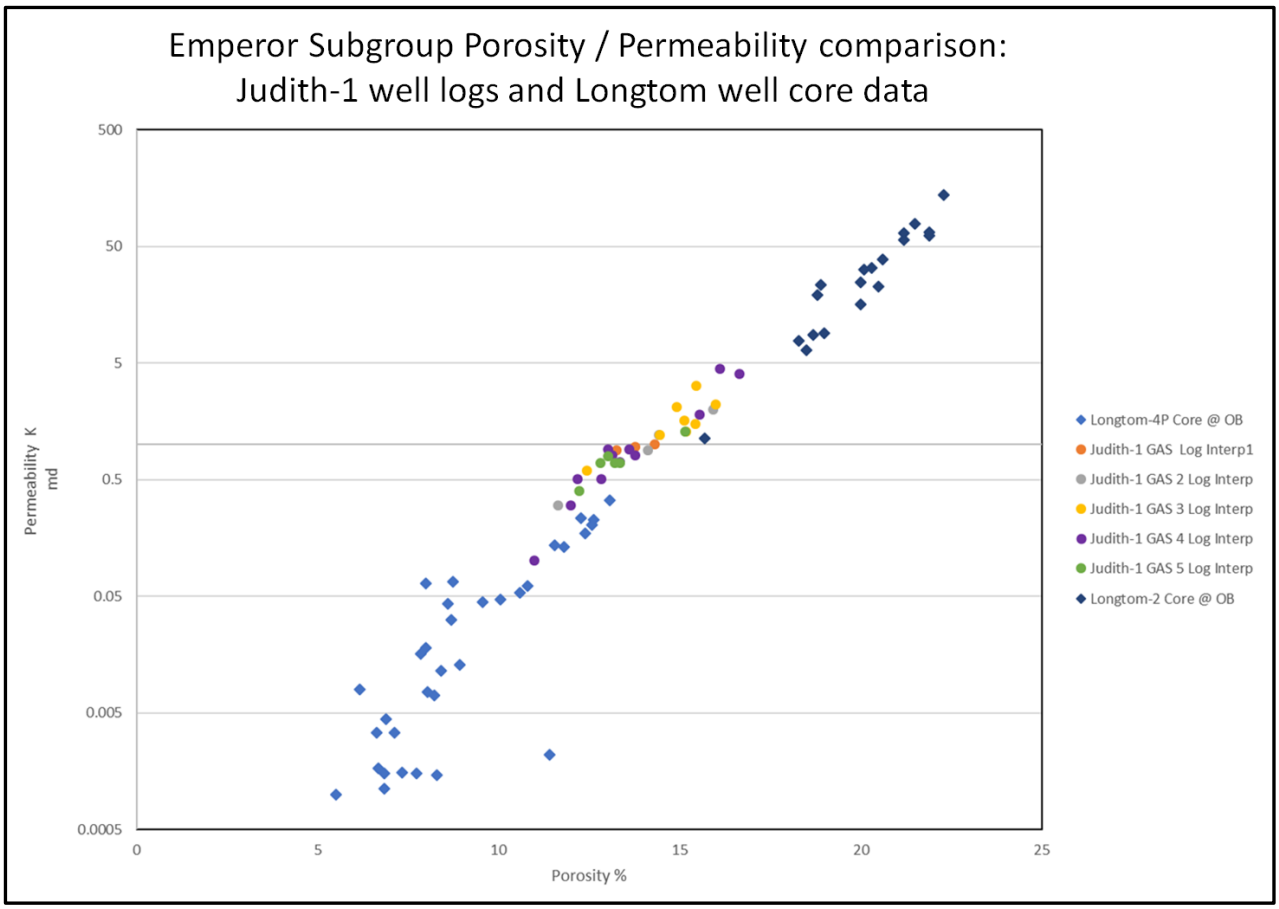

Figure 4. Emperor Sub Group porosity and permeability plot showing Judith-1 data calculated from well logs and Longtom-2 and Longtom-4P data from whole core measurements.

It may be noted that for each of the gas sand interpretations, the calculated water saturations are relatively high for potentially productive gas sands. These low gas saturations are due to the low resistivity values recorded by the older generation of wireline logs run at Judith-1 with Deep Laterolog (**LLD)** recording less than 10 ohmm and the relatively fresh formation water salinity of 25 Kppm (established from the interpreted water sand at 2545 - 2638 mMD in Judith-1) used in the log interpretation.

Low resistivity values in interpreted gas-bearing reservoir sandstones are not uncommon in Latrobe Group oil and gas reservoirs in the Gippsland Basin, even when logged by LWD and a new generation of wireline logs. Low resistivity gas pay is also present in the Longtom wells where it was successfully tested by DST-1 at Longtom-2. A comparison of low resistivity gas pay at Longtom-2 and Judith-1 is shown in **Figure 5**.

Reservoir development (porosity, permeability and gas saturation) was found to be of poorer quality in the more deeply buried low porosity / low permeability Emperor sandstones at East Pilchard-1 and the Chimaera sandstones at Scallop-1, than at either Judith-1 or the Longtom wells. Of particular note was that these gas sands were also associated with low resistivities (as low as 7 – 10 ohmm) and consequently gave relatively low calculated gas saturations (high water

saturations for a gas sand). But both East Pilchard-1 and Scallop-1 (similar to the Longtom wells), have been the subject of extensive MDT pressure and formation sampling programs where the presence of mobile gas in these low resistivity and high SWE reservoirs, was verified.

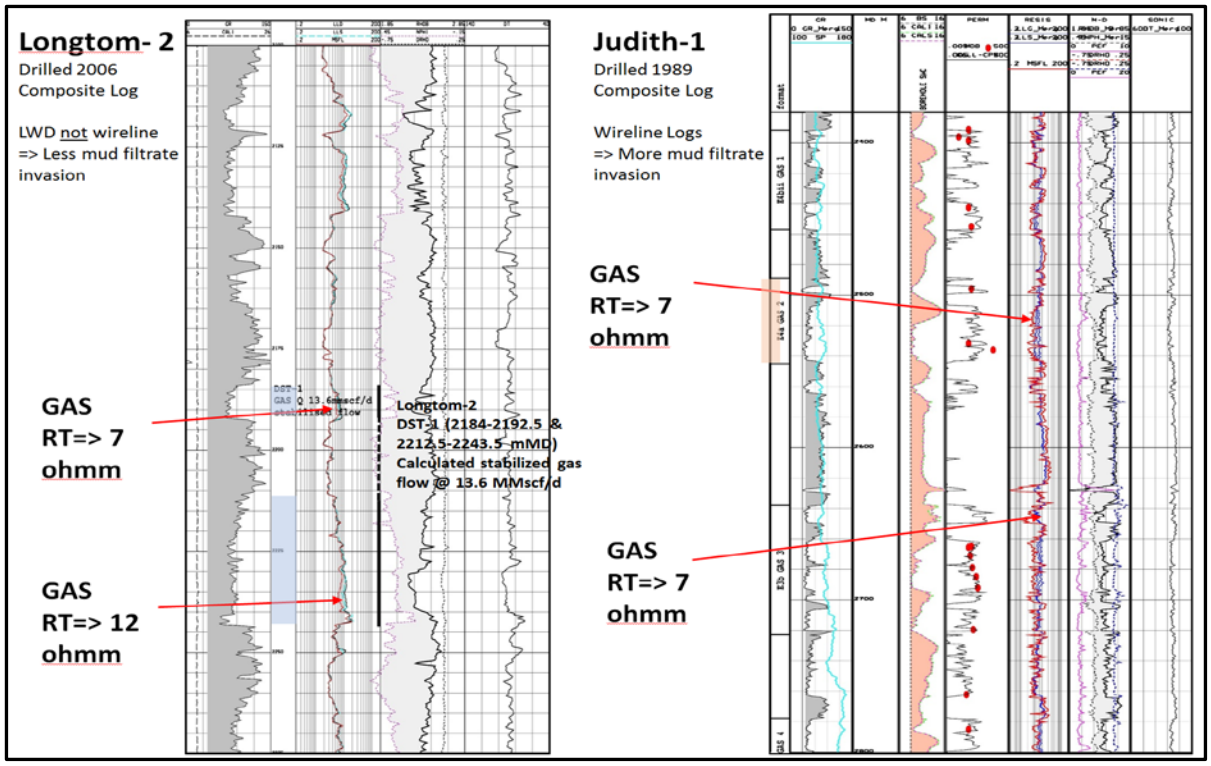

Figure 5. Comparison of low resistivity gas pay examples; Longtom-2 and Judith-1

A comparison of average reservoir properties for intervals in Longtom-2, Judith-1 and East Pilchard-1 is shown in **Table 2**. The table shows that the 300 and 200 gas sands successfully tested by DST-1 at Longtom-2 have better reservoir development than Gas Sand 2 at Judith-1 and Reservoir 3 at East Pilchard-1.

Table 2. A comparison of reservoir properties for selected reservoir intervals in Longtom-1, Judith-1 and East Pilchard-1

Emperor Sub Group Reservoir Summation											
		Top	Base	Gross Thickness	GROSS Reservoir	NET Reservoir	NET/ GROSS	Vclay	PHIE	SWE	Klogs
		mMD	mMD	m	m	m	%	%	%	%	md
Judith-1	GAS SAND 2	2489.0	2545.0	56.0	56.0	38.2	68.2	33.8	14.9	54.6	1.9
Longtom-2 DST-1	300 + 200 Sands	2184.0	2243.5	59.5	42.0	29.8	71.0	36.5	22.0	38.0	20.0
East Pilchard-1	Reservoir 3	3023.0	3126.5	103.5	103.5	32	31.00	37	9.2	66.4	0.2

The variation in reservoir development for these selected intervals between wells is demonstrated by the cross-plot of Water Saturation versus Porosity in **Figure 6** and the cross-plot of Permeability versus Porosity in **Figure 7**.

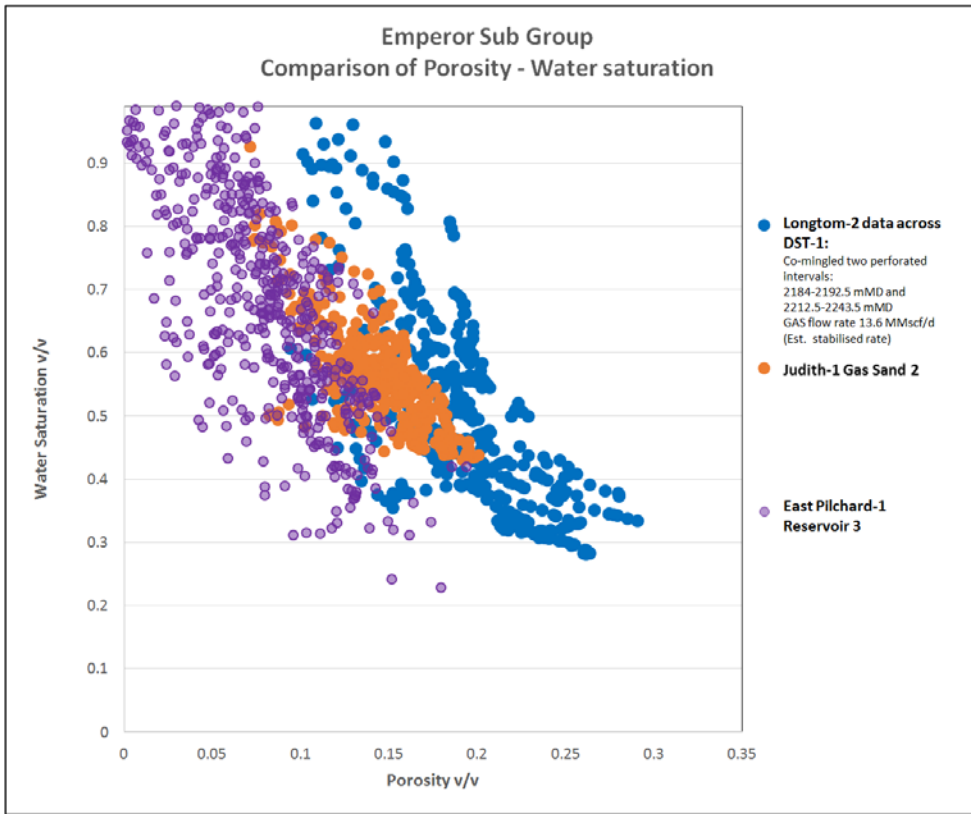

Figure 6. Cross-plot of Water Saturation versus Porosity for selected reservoir intervals in Longtom-2, Judith-1 and East Pilchard-1

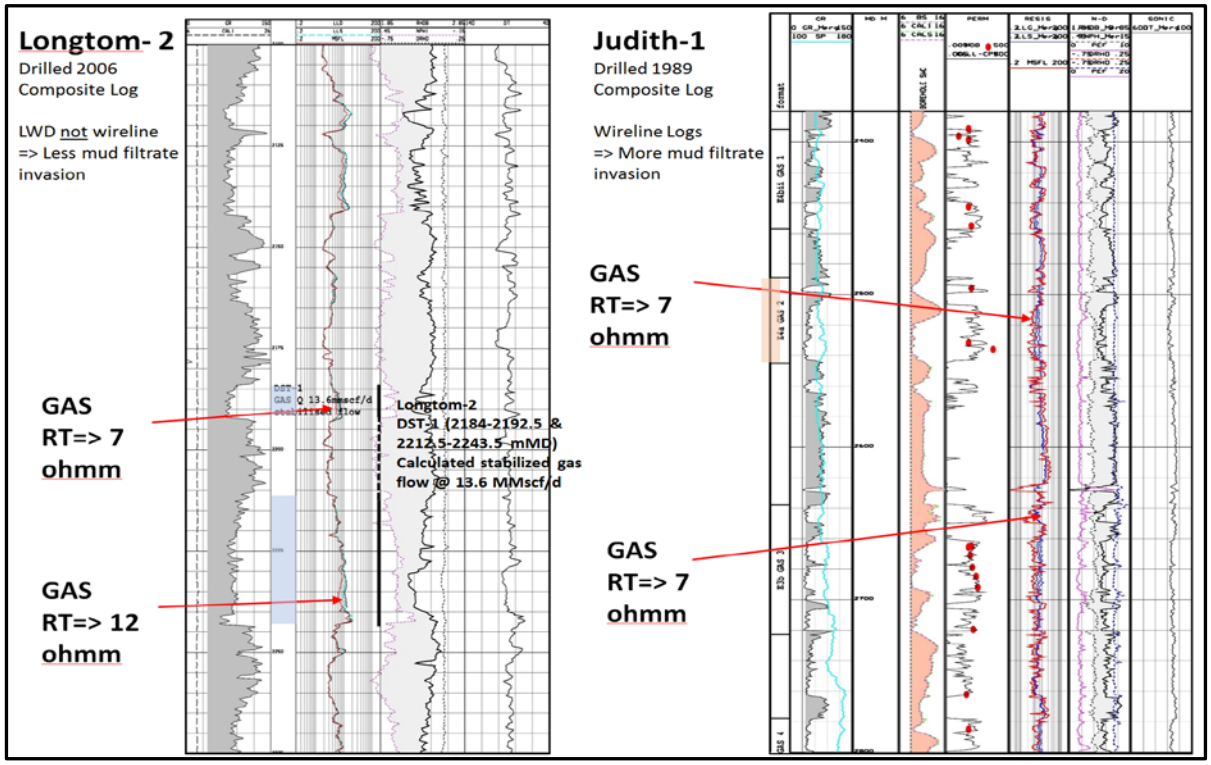

Figure 7. Cross-plot of Permeability versus Porosity for selected reservoir intervals in Longtom-2, Judith-1 and East Pilchard-1

With all of the sandstone reservoirs being of similar lithological facies, increasing depth-of-burial appears to be the main and significant factor controlling of reservoir degradation. This is apparent when Porosity is cross-plotted against Depth as shown in **Figure 8.**

The strong relationship of reservoir (porosity and permeability) degradation with increased depth for these Emperor reservoir sandstones has very important implications for exploration potential over the Judith structure. Current depth mapping over Judith at the 'Top Emperor Gas Sands' **(Figure 9)** shows that the crest of the Judith structure lies to the north of Judith-1 towards the Rosedale Fault, above -1700 mSS, some 750 m up-dip of the well above. Much of mapped structural closure lies above the depth of -2200 m SS, the approximate depth tested by DST-1 at Longtom-2. Given that reservoir properties are expected to improve at shallower depths, then reservoirs are expected to be as good as, if not better than, those at Longtom-2 and other wells in the Longtom Gas Field.

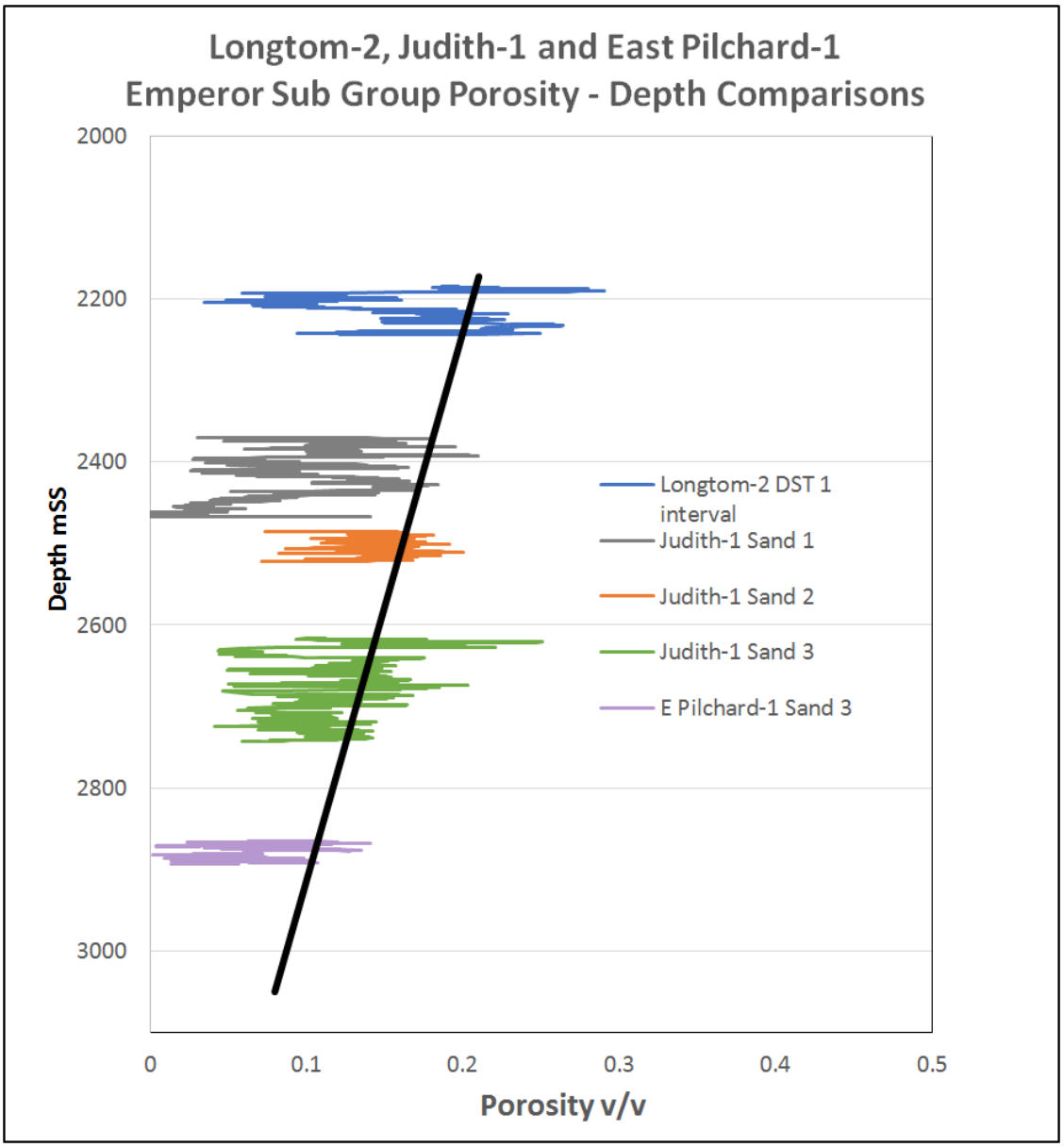

Figure 8. Cross-plot of Depth versus Porosity for selected reservoir intervals in Longtom-2, Judith-1 and East Pilchard-

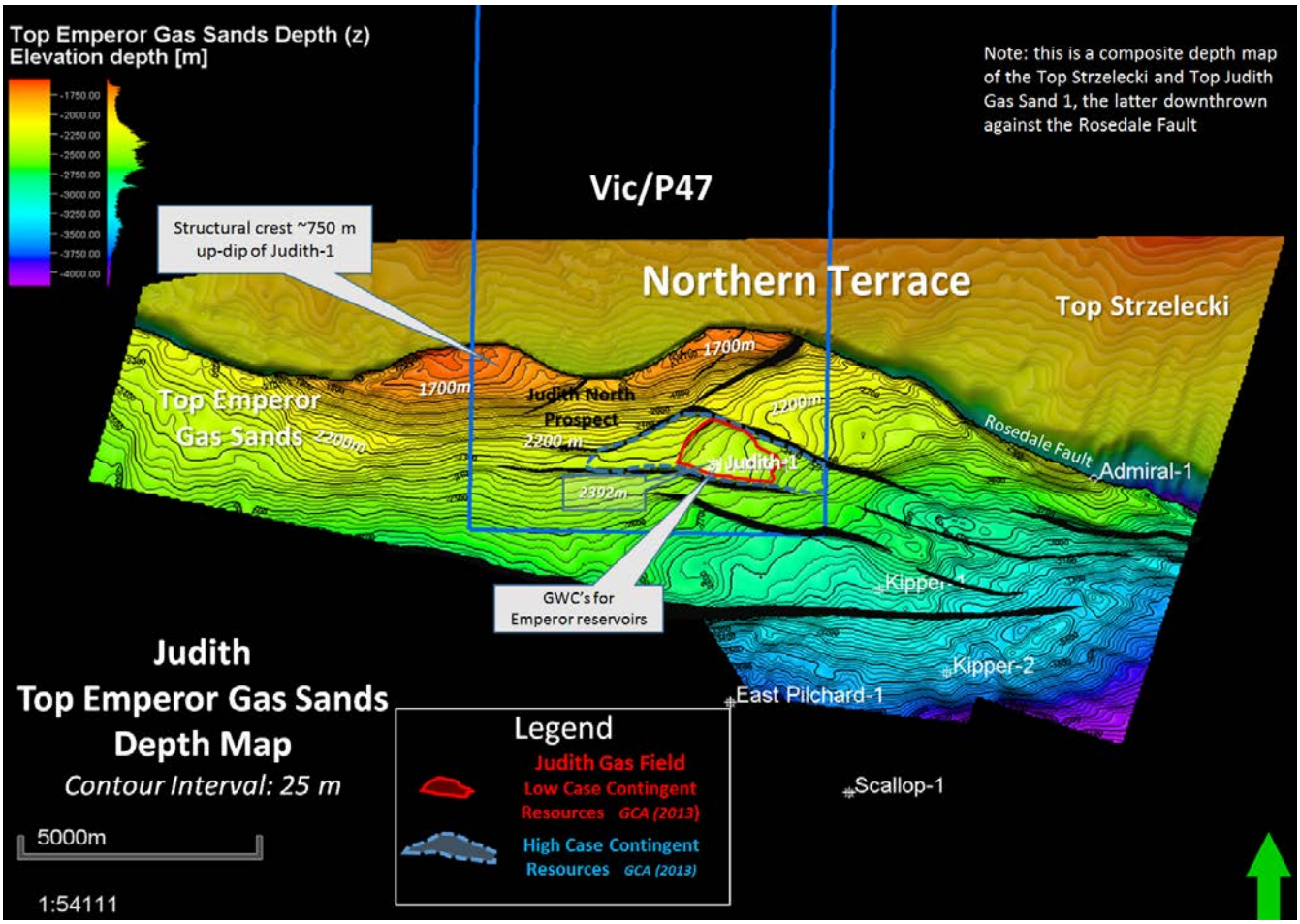

Figure 9. Judith structure: 'Top Emperor Gas Sands' depth map

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END OF REPORT

Yours faithfully

Carl Dumbrell
Company Secretary

Corporate Directory

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Vaz Hovanessian
Justyn Peters

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Capital Structure

The company currently has issued capital (as at 5 February 2018) of:

Ordinary fully paid shares	(ASX: EMP)	865,857,730
Options expiring 31 March 2020 (Ex $0.005)	(ASX: EMPOC)	518,051,398
Options expiring 17 November 2018 (Ex $0.046)	(ASX: EMPAA)	6,700,000

Top Shareholders – 22 March 2018

Position	Holder Name	Holding	%
1	Jojo Enterprises Pty Ltd <SFI Family A/C>	86,163,828	9.95%
2	Citicorp Nominees Pty Limited	80,003,158	9.24%
3	Raxigi Pty Ltd	79,421,287	9.17%
4	Sama Zaraah Pty Ltd	48,855,000	5.64%
5	Bond Street Custodians Limited	48,247,101	5.57%
6	Scintilla Strategic Investments Limited	40,000,000	4.62%
7	Daniel J Peters	25,962,954	3.00%
8	Merrill Lynch (Australia) Nominees Pty Ltd	23,968,096	2.77%
9	Melshare Nominees Pty Ltd	17,146,891	1.98%
10	Philip McNamara	15,000,000	1.73%
11	Lilyfield Holdings Pty Ltd <Lilyfield Super Fund A/ C>	12,600,000	1.46%
12	Colin R Searl & Cynda Searl	12,410,000	1.43%
13	BNP Paribas Nominees Pty Ltd <IB AU Noms Retail client DRP>	10,516,075	1.21%
14	Jasper Hill Resources Pty Ltd <Superannuation Account>	10,257,950	1.18%
15	T T Nicholls Pty Ltd <Super A/C>	10,257,950	1.18%
16	HSBC Custody Nominees (Australia) Limited	10,000,000	1.15%
17	Matthew Klein	10,000,000	1.15%
18	Acec Superannuation Fund Pty Ltd <Acec Super Fund A/C>	7,938,949	0.92%
19	Christopher Lindsay Bollam	6,863,816	0.79%
20	Joel David Webb	6,700,000	0.77%

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