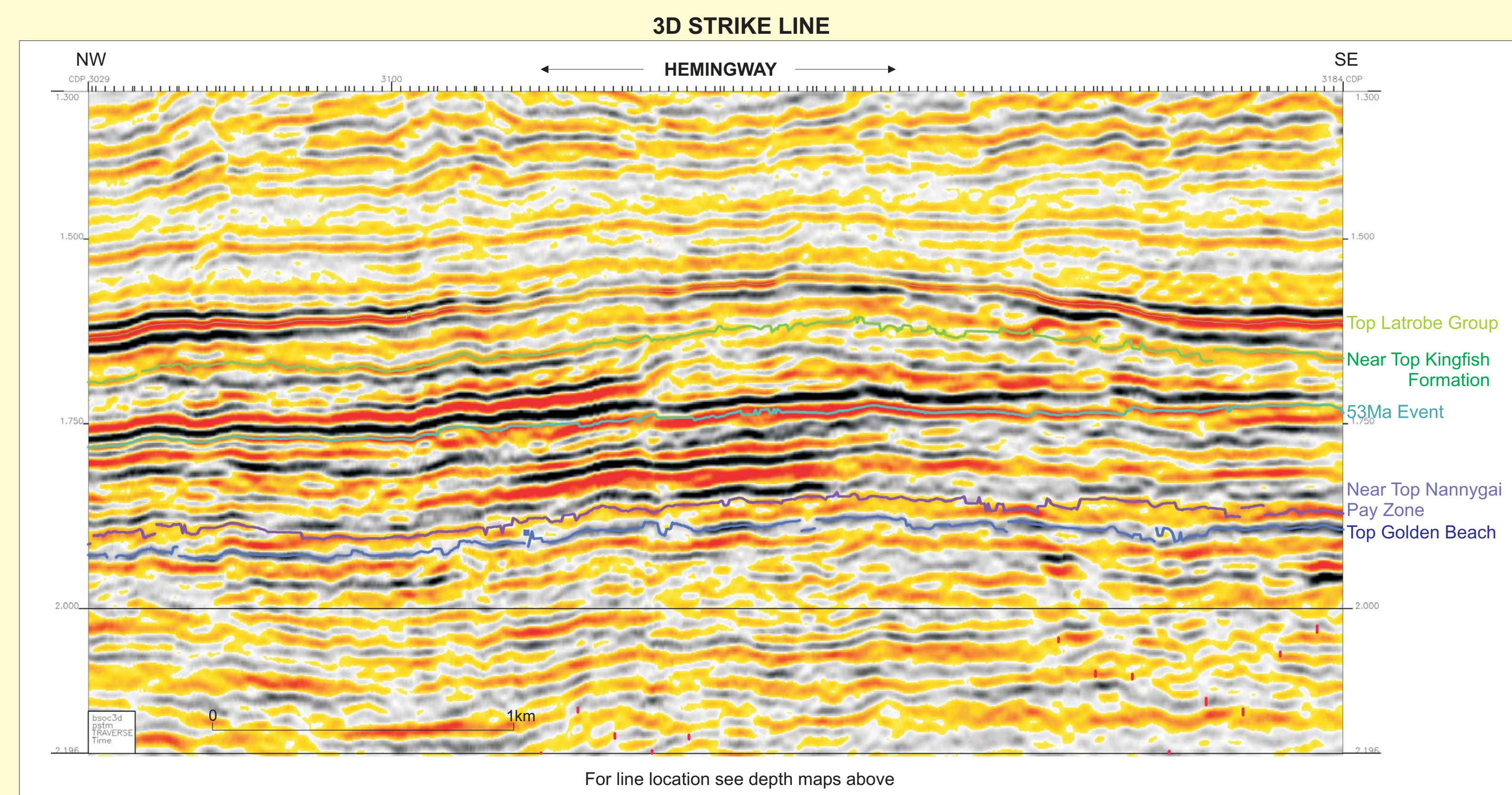
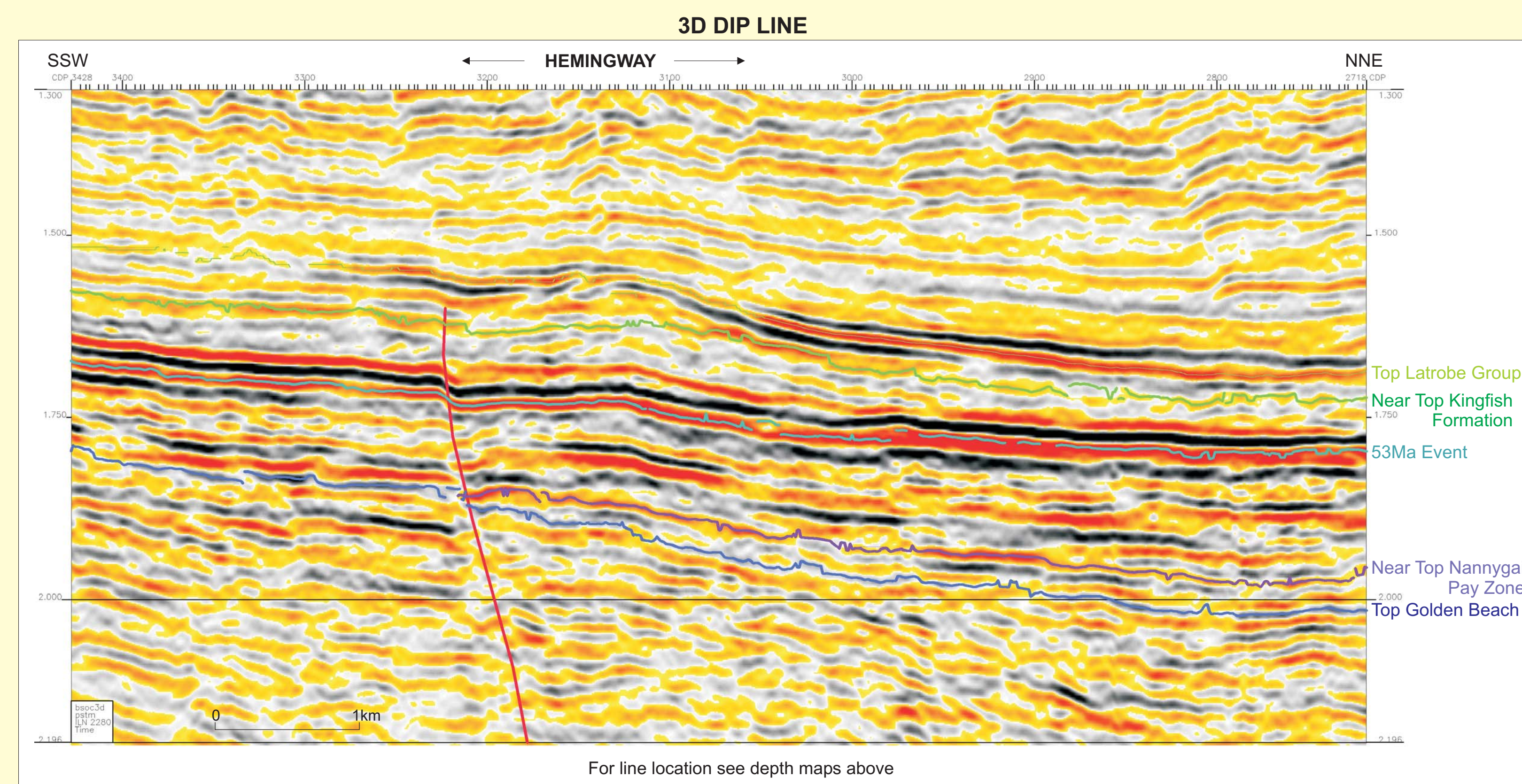
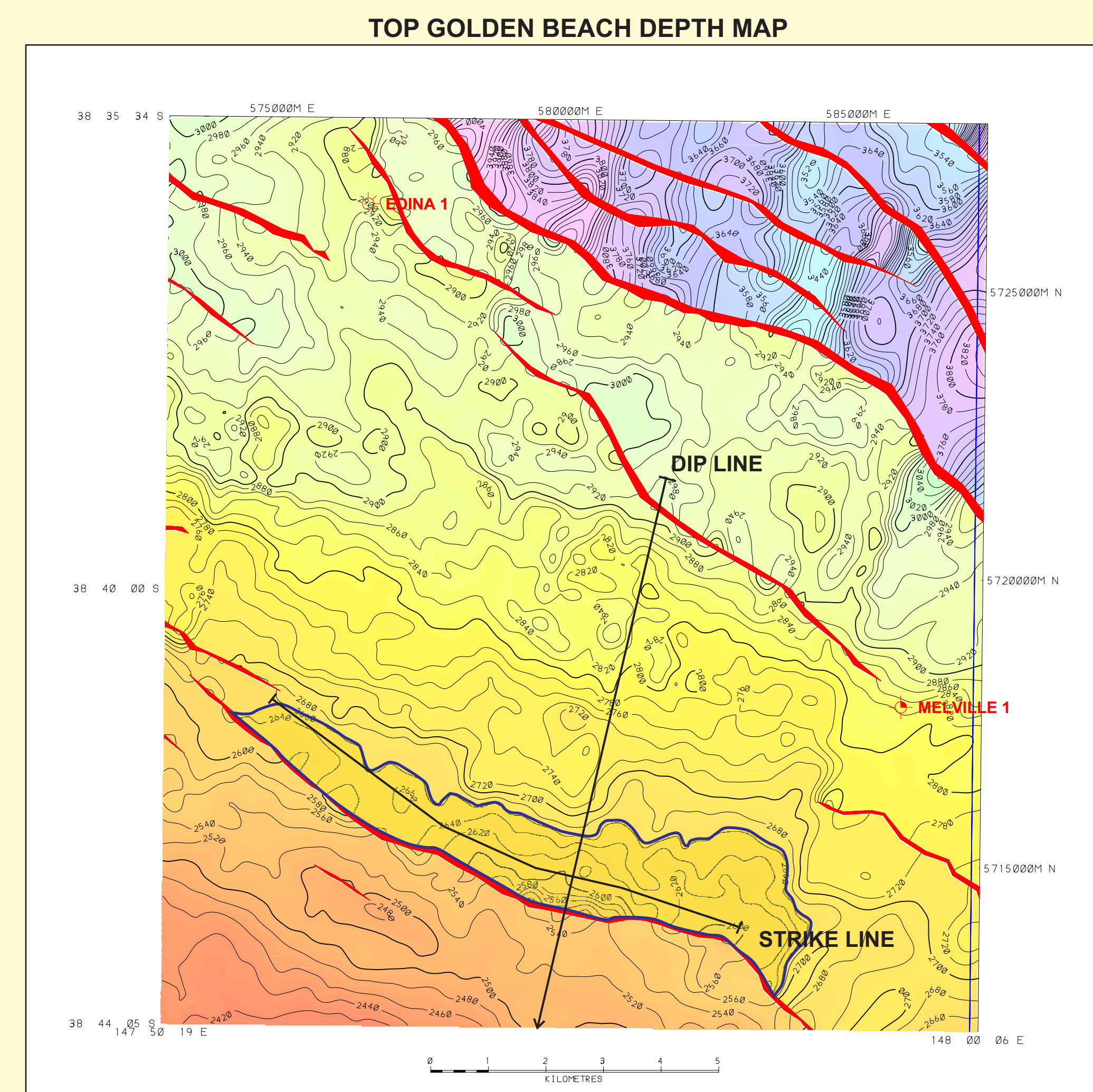
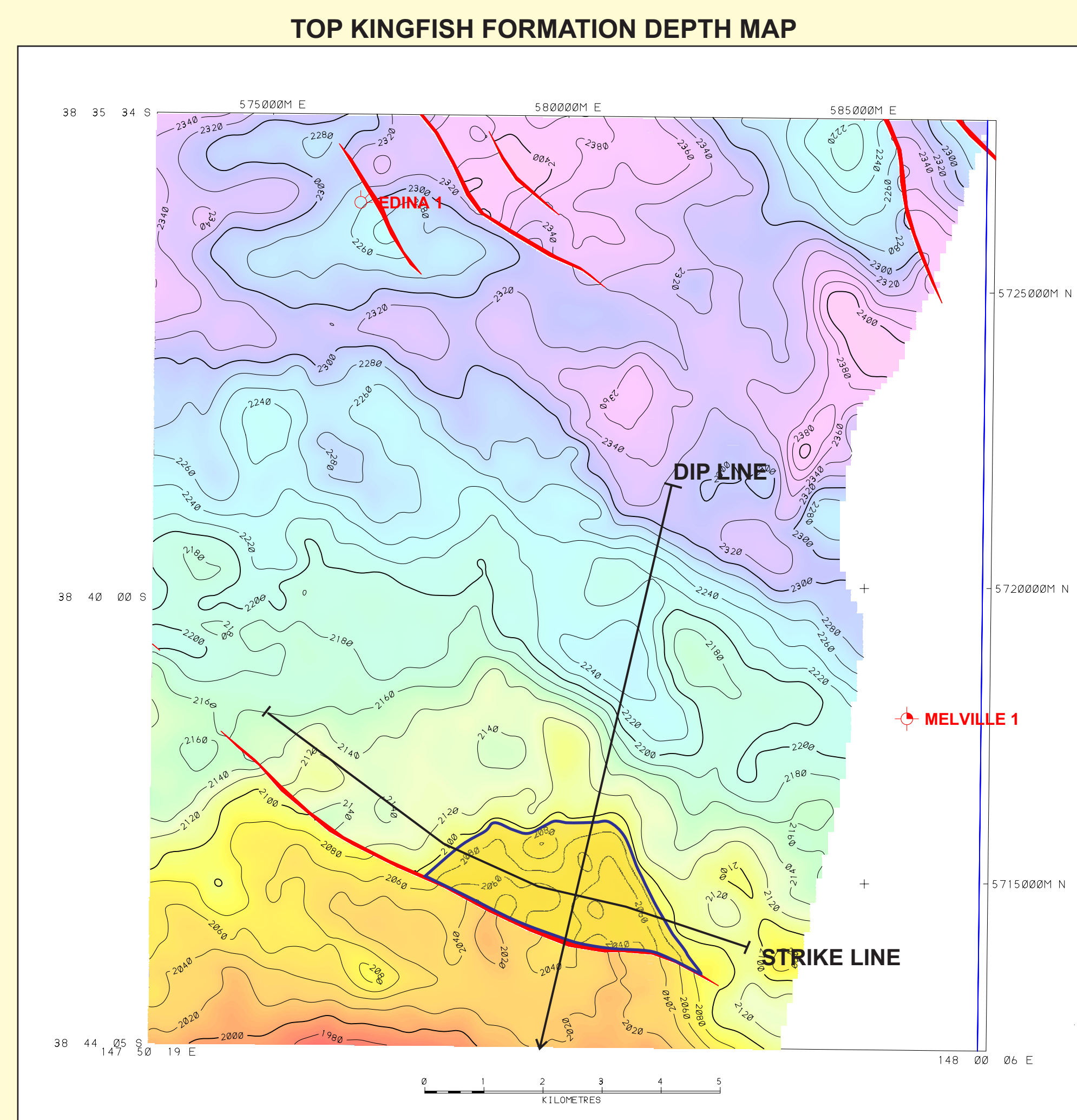
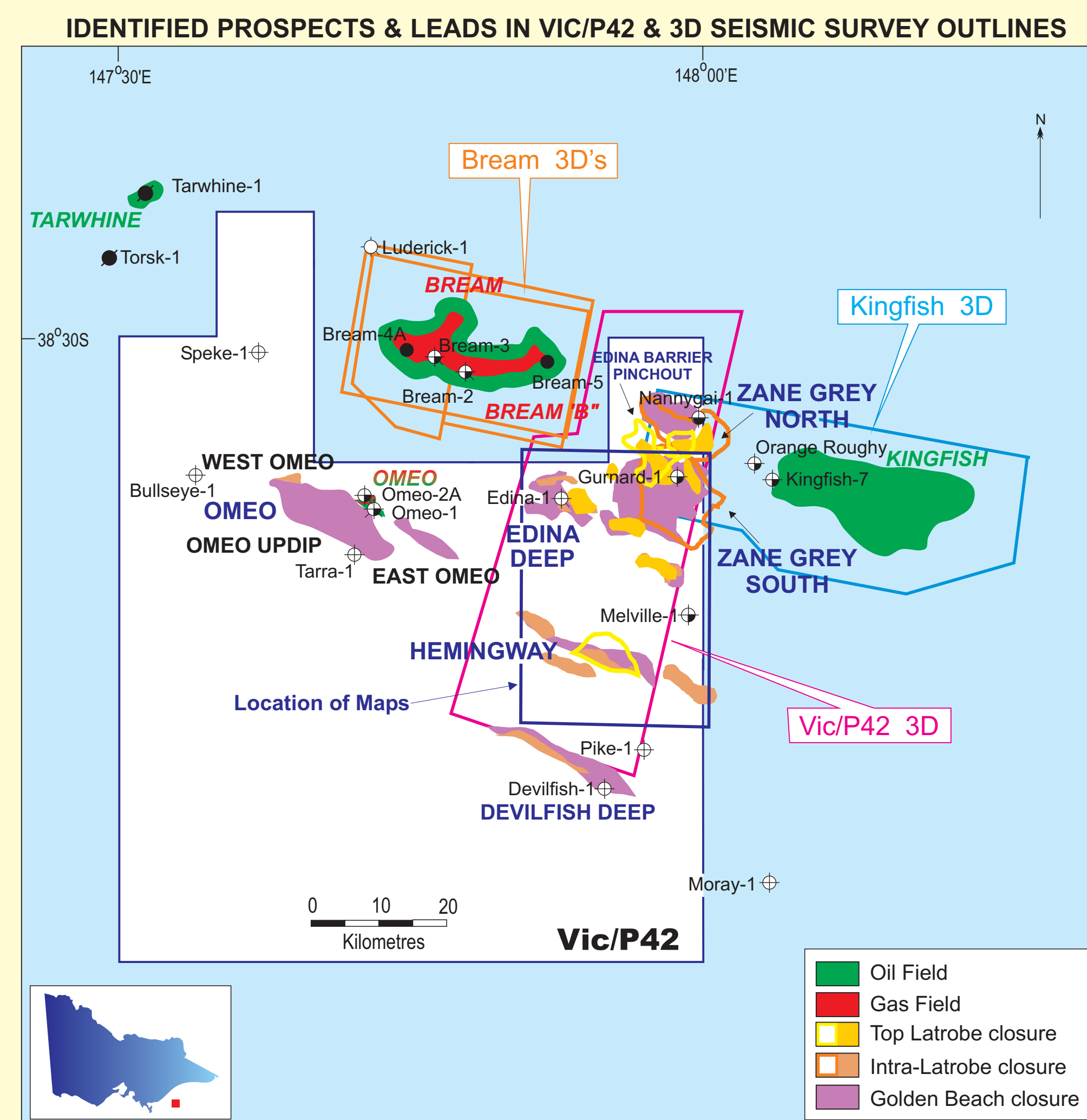


VIC/P42 - HEMINGWAY, OFFSHORE GIPPSLAND BASIN, VICTORIA



Hemingway

Hemmingway is a downthrown fault closure within sediments of the Latrobe Group identified on the 3D seismic acquired in 2002 by BSOC. The fault strikes WNW-ESE. Fault displacement is evident from the top Latrobe Group and through the Golden Beach Subgroup. At the top Latrobe Group level the fault throw is minimal (less than 10m) and approaches sub-seismic resolution, although the displacement is clearly evident at seismic events within the deeper Latrobe Group sequence, and over 60m at the top Golden Beach Subgroup level. The vertical sequence within downthrown fault closure is approximately 600m, encompassing the Devilfish Sandstone Member and the prognosed condensed Golden Beach Subgroup sequence.

The juxtaposition of high net to gross sand prone sequences in the upthrown block indicates a significant fault seal risk. Some encouragement regarding a frequency attenuation that may represent gas bearing reservoir within the Devilfish Sandstone member was identified and further advanced quantitative geophysical analyses were undertaken to identify if this was a 'DHF'. Some encouragement was identified, but no unequivocal DHF was found. In addition, the fault is on trend with the Omeo Accumulation, which may have proven fault seal at the deeper Golden Beach level there.

Areal closure is significant within deposits of the Cobia Subgroup (the Devilfish Sandstone member), although the deeper sequences have less extensive areal closures. Closure may also extend into the L8 licence to the east. Further mapping with the seismic data acquired there may extend the closure mapped in both vertical and areal sense.

Reservoirs

The entire Latrobe Group forms the primary reservoir objectives in the prospect, although it is likely to be incomplete on the Southern Trench and comparable to the sequence penetrated in Melville-1 5km to the northeast. Excellent reservoirs are envisaged within sandstones of the Halibut and Cobia Subgroups. The Devilfish sandstone, encountered in Pike-1 and Devilfish-1 to the southeast, was mapped as a (w)mf. Sequence of the Devonian sandstones is also present in the prospect, but is not expected to be as good as the Kingfish. Reservoirs form the finest to medium grained bank barrier / lagoonal to coastal barrier sandstones with porosities of 20-30%, but much lower net to gross ratios. The deeper *T. longus* and Golden Beach Subgroup sediments are lithic, texturally immature sandstones with porosities averaging 15%. The Golden Beach Subgroup is expected to be thin or possibly absent, as only 45m of fluvial sediments were encountered in Melville-1 to the northeast, with net / gross of 68% and average porosity of 16%. Melville-1 was not expected to be as good as the Kingfish, and may be more argillaceous beneath the Golden Beach sediments. The 303 metres penetrated in Melville-1 had 51% net/gross with average porosity of 9%.

Seals

Top seals are likely to be provided (in a stacked pay) by back barrier lagoonal and intertidistributary shales of the Latrobe Group. Top seal is also likely to be provided by shales of the Lakes Entrance Formation. Seal seal may separate the Gurnard and Kingfish formations and any hydrocarbon fill (as was the case in Kingfish). This may generate lateral sealing within stratigraphically trapped Gurnard Formation reservoirs (as was the case in Kingfish between P.1.1 and M.1.2 reservoirs). An eastwards truncation of the Kingfish Formation strata leads to the potential for 'rim' plays, with top seal from Gurnard Formation shales and lateral seals from intraformational marine shales of the Kingfish Formation. However, lateral fault seal is a significant risk due to the high net to gross of the Gurnard Formation and the low net to gross of the Kingfish Formation. The early 1000' thickness for in situ seal is a significant fault throw. Lateral sealing would require clay smearing or development of a catactilase zone, which suggests a very high lateral fault risk. Deeper in the sequence the lower net to gross suggests some fault seal potential is more likely, especially in the deeper Halibut and Golden Beach subgroup sequences, likely to be fault juxtaposed against Strzelecki or Emperor group sediments. This is suggested by the results of Omeo-1 to the northwest where hydrocarbons in the Golden Beach Subgroup reservoirs may be fault sealed laterally by deposits of the Strzelecki Group. Analysis of the clay smear potential in wells Gurnard-1, Nannygai-1 and Melville-1 suggests CPSF over 45 (likely sealing) do not occur until deeper in the Kingfish Formation (lower L. *Balmi* palynozone) and are likely to be associated with a thick, similar Kate Shale, if present, is likely to be an effective top seal for the Roundhead Member play. Top Golden Beach volcanic rocks, similar to those encountered in Melville-1, if present, are expected to be an effective top seal to any Golden Beach Subgroup reservoirs. The fault throw in excess of 60m would suggest the Golden Beach Subgroup sediments, if present in Hemingway, would be juxtaposed against Strzelecki or Emperor groups, which augurs well for fault sealing.

Source Rocks

Non-marine coastal plain organic-rich mudstones and coals represent the source rocks for both oil and gas in the basin. These are dominantly of terrestrial plant origin and widely distributed throughout the Latrobe Group. Gas and oil mature source rocks for the Hemingway Prospect are interpreted to occur in the Central Deep to the northeast and northwest. Potential oil mature source rocks are interpreted within the Latrobe Group Halibut Subgroup immediately to the northeast, which is interpreted to have provided an oil charge to the undersaturated giant Kingfish oil field. Gas mature charge is interpreted to the northwest beneath the Bream Oil and Gas field. Migration distance to mature oil and gas charge is around 20km and is not considered a significant risk. Therefore, both gas and oil charge is predicted to occur in Hemingway.

Any oil encountered in Hemingway is likely to have properties comparable with Bream and Kingfish. The Bream oil is described as a paraffinic crude with 45° API and a pour point of 60°F. Kingfish oil is 47° API and a pour point of 60°F. The Bream oil is saturated at reservoir conditions and is in contact with a large, low CO₂ gas cap. No indication of H₂S is identified in nearby wells.

Risks

The main risks for the Hemingway Prospect relate to the lateral fault seal. Attempts to identify a DHI to support the existence of fault seal have been only partially successful. The lack of an unequivocal DHI makes the lateral fault seal risk, at least for the high net to gross Devilfish Sandstone Member, a very high risk to the Hemingway Prospect. The lateral fault seal for the Golden Beach section is considered only a moderate risk and may be supported by the occurrence of gas along trend at Omeo-1.

Reserves Potential

Riskd and unriskd reserves potential has been estimated for the potential plays in the prospect and are summarised below. These reserve estimates are for Vic/P42 only.

	UNRISKED RESERVES (RECOVERABLE)		RISKED RESERVES (RECOVERABLE)					
			POS	MSV		P90	P50	P10
	OIL Mmb	GAS Bcf		OIL Mmb	GAS Bcf	OIL Mmb	OIL Mmb	OIL Mmb
Hemingway	131.4	6.2	21%	54.6	4.5	3.2	53.0	104.8

VIC/P42

HEMINGWAY
OFFSHORE GIPPSLAND BASIN

January, 2004