

The Value of Integrating Existing 3D Seismic Into Shallow Gas Studies

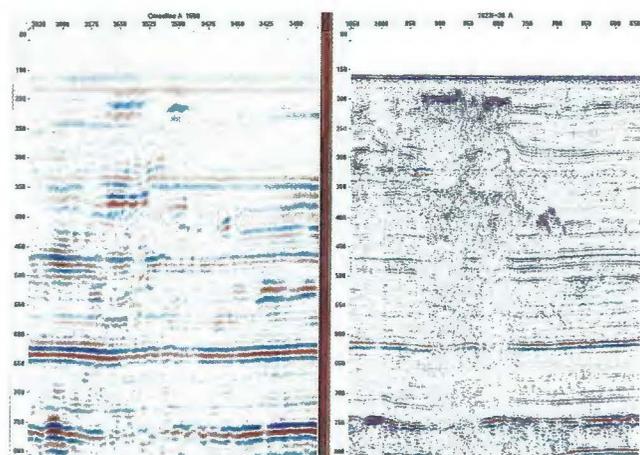


Fig1 - Comparison between exploration 3D seismic and high resolution 2D, with gas indicators at 200ms, 400ms and 750ms.

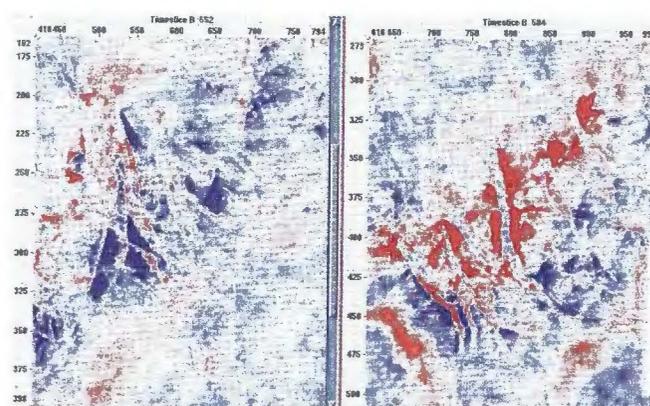


Fig2 - Two timeslices through Pliocene sediments. Left: fan-shaped area of high amplitude anomalies crossed by radiating system of channels. Right: high amplitude anomalies resembling levees either side of channel feature.

PESA WA members were recently invited to join the Hydrographic Society talk, The Value of Integrating Existing 3D Seismic into Shallow Gas Studies, which took place on the 4th February at the Park Royal Hotel, 54 Terrace Road Perth.

The talk was presented by Svitzer UK's Senior Geophysicist, Gavin Douglas.

Abstract:

Conventional 3D surveys, although designed and processed with clear exploration objectives in mind, often contain much valuable information in the shallow section, which may be incorporated into shallow geohazard studies.

The purpose of this talk is to discuss the benefits of an integrated approach to shallow gas studies and drilling hazard assessments, in which the blanket spatial coverage of exploration 3D data is combined with the superior resolution of 2D site survey data. Extensive use is made of interpretation grids and timeslices, which provide enhanced images of the shallow geology.

A number of examples were shown from the UK and Norwegian sectors of the North Sea. These illustrated shallow gas features such as gas charged regional sheet sands, discrete shallow gas pockets, gas chimneys and gas-filled, buried iceberg ploughmarks. It was shown how an integrated approach can be crucial in identifying the full extent of potential shallow gas hazards, which are not

apparent using the site survey data alone.

Regional studies using 3D data will rapidly produce outline information on hazards such as shallow gas. This can be used to identify potential drilling hazards at an early stage, and can be referred to when selecting possible drilling locations. Subsequently, the results can be used to design the 2D site survey grid in order to select the optimum line direction to image the identified shallow gas features, and to make more efficient use of the number of line kilometres acquired.

The use of 3D data significantly enhances the ability of the interpreter to image shallow gas features and increases confidence in the results. The fact that existing data is used ensures that the integrated approach is cost effective.