ONSHORE UK
SOUTH HUMBER BASIN
PROJECT AREA – PEDL032

Status Report – Licence Relinquishment

PREPARED BY

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Ref: Tech 2325

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1 Executive Summary

Licence PEDL 032 was awarded in 1997 with a seismic and well commitment. The licence is located mostly south of the river Humber and originally had an extension north of the river. The focus of the application was a structural lead, Bradley, on a significant structural feature the Caistor Horst. This was identified principally on a single 2D line CAN85-A.

Roc has purchased all available seismic data through UKOGL (UK Onshore Geophysical Library) comprising 734km of Digital data. This database has been interpreted together with supplemental lines purchased for the interpretation of PEDL005 to the south and EXL251 to the west. In 1999 a 2D programme of 22.8km (3lines) was shot through the town of Grimsby at the eastern end of the licence and in 2002 approximately 50% of the Immingham 3D extended across PEDL032. This significantly exceeded the seismic work programme for the licence.

No hydrocarbon exploration wells have been drilled in the PEDL032 licence area and the obligation to drill an exploration well remains unfulfilled. The initial 1st term of the licence was extended to the 17th March 2005 to allow for the drilling of a well, but to date no robust drilling candidate has been defined.

Delays in evaluation of the PEDl032 licence have been encountered as a result of the Foot & Mouth epidemic in 2001 which halted the 3D acquisition and delays associated with problems in processing the data. The 3D data set is still believed to be a very poor quality product. The poor 3D image quality has been interpreted with the involvement of a number of interpreters. Despite the data quality concern the Immingham 3D and the adjacent Howsham 3D has provided a more stable tie platform for the 2D dataset across the remainder of PEDL032 and improved 2D interpretation in these areas.

Identification of prospective structures in the PEDL032 area is not as intuitive as areas to the south (Saltfleetby area) where the target reservoir directly overlies the good Dinantian seismic event. In the PEDL032 area the Early Westphalian reservoir target is close to 200metres above the Dinantian reflector and thickening of early Namurian sediments are recognised on seismic and in nearby well control. This requires the picking with confidence of poorer Intra Westphalian events to determine likely top reservoir structure. Additionally the difference between Dinantian and Intra Westphalian structure is complicated by the higher density of faulting seen in the Intra Westphalian Section by comparison with that identified at Dinantian level. It is believed that some of the faulting soles out in the Early Namurian shale resulting in lateral offset of the Intra Westphalian structural crests from those seen at Dinantian level.

The included mapping has used the legacy interpretation of the Howsham and Immngham surveys which included a difficult Intra Westphalian pick across the Immingham survey and extended the interpretation across the 2D data.

This revised 2D interpretation supports the existence of reasonable sized structures in the 2D coverage at the north western end of the licence. Three principle structures Wooton, North Worlaby and Burnham West have structural definition at both Dinantian and Intra Westphalian and mean oil reserve estimates of 4.5mmbo, 6.6mmbo and 2.9mmbo respectively. If assumed to be gas bearing reserves of 12bcf, 16.5bcf and 7.5bcf are determined. It should be noted that a significant portion of North Worlaby extends into the adjacent EXL251 to the west and open acreage to the south.

These 2D prospects are not yet believed to be drill ready and require improved seismic definition. Seismic quality is reasonable and it is only the North Worlaby structure that is likely to benefit from seismic reprocessing. Infill of all three will require up to 64km of new seismic. This can obviously be reduced if one or two of the prospects are focused on. 3D seismic of 67sqkm would cover the Wooton and Burnham West closures as well as poorer defined structures of Wooton West and Kingforth. 3D seismic across the whole of northwest PEDL032 including the full extent of North Worlaby would extend to 112sqkm.

Eastern PEDL032, predominantly covered by the Immingham 3D, lacks any defined prospects. The Pre 3D defined lead of Aylesby is located at the eastern end of the Caistor Horst, but is in a particularly poor portion of the 3D. There are hints of reversal of the regional dip on the 3D data but the image is not coherent enough to define a closure with confidence. Additionally the Bradley structure, obvious on the 2D line (CAN85-A) and the reason for the licence application is not defined at all on the 3D. Defined closures within the Immingham 3D (East Keelby and Great Limber) are located in PEDL005.

It is evident from trials conducted by Robertson on two selected lines from the Immingham 3D that improvement can be expected. The trial identified an inappropriate match between dynamite and Vibroseis source and provided a significant improvement in the reflector coherence. The top Sherwood (Triassic) reflector absent on the initial processing was evident on the trial as it is on adjacent 2D and the Howsham 3D data. The Dinantian reflector could be traced over the entire line and trace, something which was not intuitive on the full 3D.

It was requested that the licence be extended with the relinquishment of the entire eastern half of the licence. A proposed work programme comprising the acquisition of 34km of new 2D or 67sqkm of 3D over the Wooton and Burnham West was suggested. If the 2D acquisition was to be pursued then lines SH81-R and SH81-N should also be reprocessed. Expected costs were £185,000 for the 2D option or £530,000 for the 3D option. Acquisition would have to start in March 2005 to be complete in April 2005. Processed data delivery would be expected in July allowing time for reprocessing and a decision on drilling before December 2005. The proposal to reprocess the 3D and acquire new 2D whilst allowing extension of the licence to 17th March 2006 was rejected.

Future consideration should still be given to reprocessing the Immingham 3D to firm up the East Keelby and Great Limber prospects. If improved 3D processing defines prospects in the relinquished portion of PEDL 032 the area should be considered for re-licencing.

2 Licence Exploration History

2.1 Summary Of Previous Exploration

Most of the area surrounding the PEDL032 licence is currently licenced, the exception being areas recently relinquished by Roc. Figure 2.1 indicates the current licence coverage adjacent to PEDL032. A 50% relinquishment was made to the licence at the end of 2003, Figure 2.2. There has been several phases of hydrocarbon exploration in the area; initiated in the late 1950's by D'Arcy (later becoming BP) who shot a regional pattern of single fold seismic. This was followed by more focused seismic campaigns by Amoco, BP, Candecca, Croft and Tricentrol, mostly in the mid to late 1980's. The last seismic shoot before the award of PEDL032 in 1997 was by Croft in 1991. Figure 2.3, below, shows the layout of this historical 2D seismic effort, together with work completed by ROC since award of the licence.

No exploration drilling has taken place in the current or initial areas of PEDL032. Exploration wells were however drilled at Brigg1 by BP in 1981 and Glanford 1 by Candecca in 1998. Each of these wells encountered poor oil accumulations, and in each case had appraisal drilling slightly updip; Brigg 2 and Glanford 1y..

The closest drilling to the PEDL 032 area was the Cleethorpes well by the BGS and DTI in 1984. This was not located on a structure and had no intention of hydrocarbon exploration. The well reached TD in the top of the Carboniferous and did not penetrate to the reservoir sands equivalent to the Saltfleetby field. A summary of the nearby drilling activity is tabulated below:

Well Name	*Operator*	*Distance from PEDL032 Boundary*	*Year*	*TD Depth, metres*	*TD Formation*	*Status/Results*
Alkborough 1	BP	12km WNW	1987	1999	Dinatian Carbonates	P&A Poor Oil Shows
Brigg 1	BP	3km S	1981	1937	Dinatian Carbonates	Initially high production rate of 534bopd rapidly watered out during production testing in Upper Namurain.
Brigg 2	BP	3km S	1983	1990 (dev)	Upper Namurian	Updip Apraisal of Brigg1 found poorer quality reservoir sands.
Broomfleet 1	BP	13km NW	1986	2024	Dinatian Carbonates	Good Oil and Gas shows. DST in Permian Carbonates produced very low rates of gas.
Broughton B1	BP	5km W	1984	1920	Dinatian Carbonates	Production tested Oil from Penistone Flags(Early Westphalian A); produced 1.78mbo, rapid water cut increase after propped fracture stimulation.
Cleethorpes	DTI/BGS	0.5km E	1984	2100	Upper Westphalian	P&A Dry, Not a Hydrocarbon target well
Crosby Warren 1	RTZ	8km W	1986	1854	Dinatian Carbonates	Oil Discovery;produced 586mbo, initial rate 412bopd. DST's Basal Westphalian - 170bopd, Beacon Hill Flags - 43bopd, Kinderscout - 4.5bopd
Crosbty Warren 2	RTZ	8km W	1988	2050 (dev)	Dinatian Carbonates	Suspended, later sidetracked. Encountered structure deep of forecast. Zones of CW1 were water bearing.
Glanford 1	Candecca	2km S	1998	2012 (dev)	Dinatian Carbonates	P&A, encountered 5metre oil column in upper Namurian
Glanford 1z,y	Candecca	2km S	1998	2059 (dev)	Dinatian Carbonates	Sidetracked near horizontal target of oil column. Sand had thinned, tested water at *bpd with low oil cut.
Hibaldstow 1	BP	6km SSW	1984	1879	Dinatian Carbonates	P&A Poor Oil Shows
Tetney Lock 1	D'Arcy	3km E	1963	2851	Lower Namurian	P&A Poor Oil Shows
Winestead 1	Candecca	4km N	1972	2004	Upper Westphalian	P&A Dry.

Table2.1 Exploration and Appraisal drilling in near the PEDL032 Area

Nearest commercial production has been at Crosby Warren (Oil - 8km west, basal Westphalian, Ashover and Kinderscout Sands), Saltfleetby (Gas - 20km to the south, basal Westphalian) and Hatfield Moors (Gas – 30km west, Late Westphalian B – Oaks Rock). Production testing was also conducted on Basal Westphalian Sands at Brigg, Early Westphalian sands at Broughton and Late Namurian sands at Glanford. A high and rapidly increasing water cut was observed in all three production tests and the discoveries were not developed.

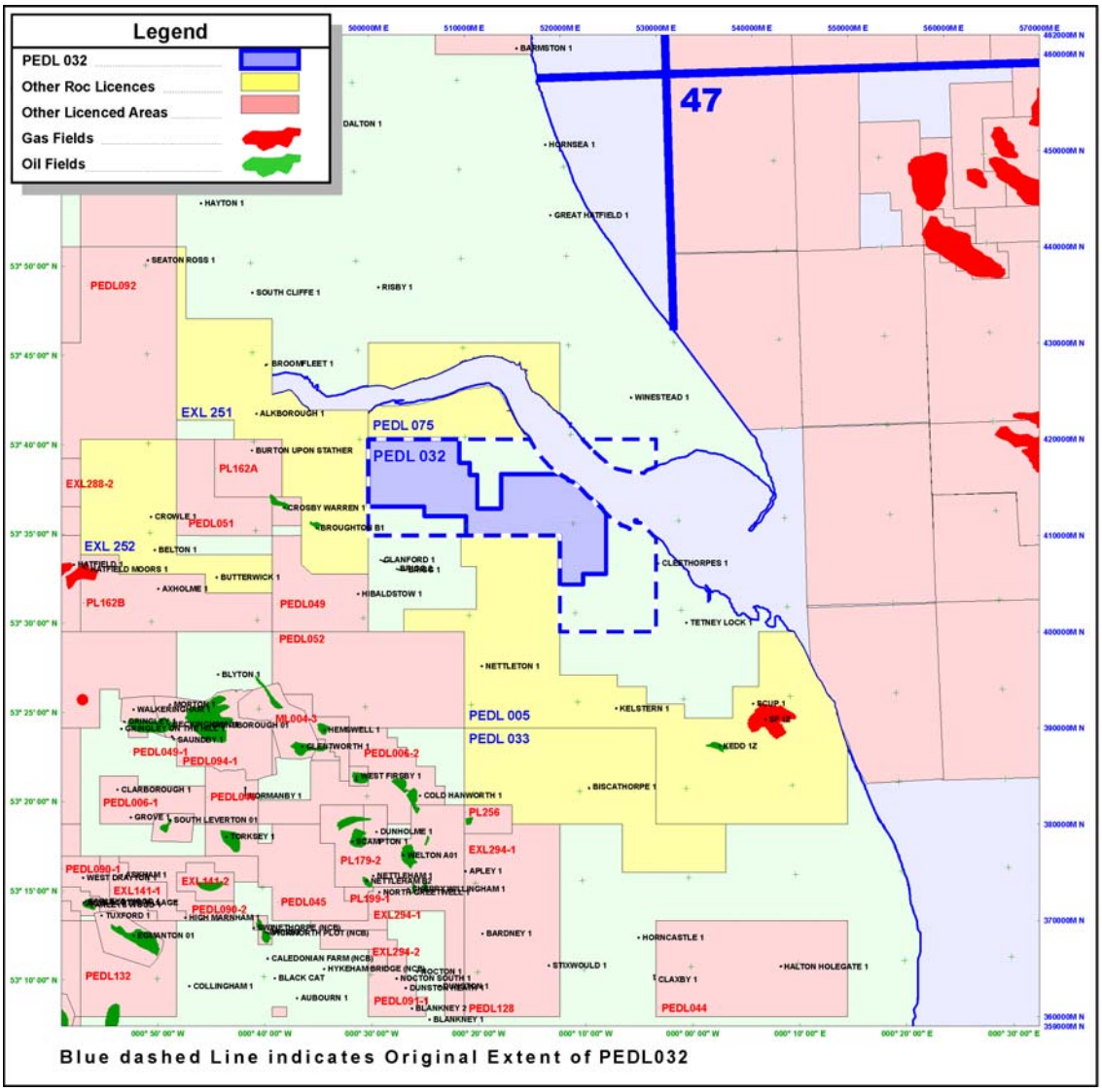

Figure 2.1 PEDL032 Location Map

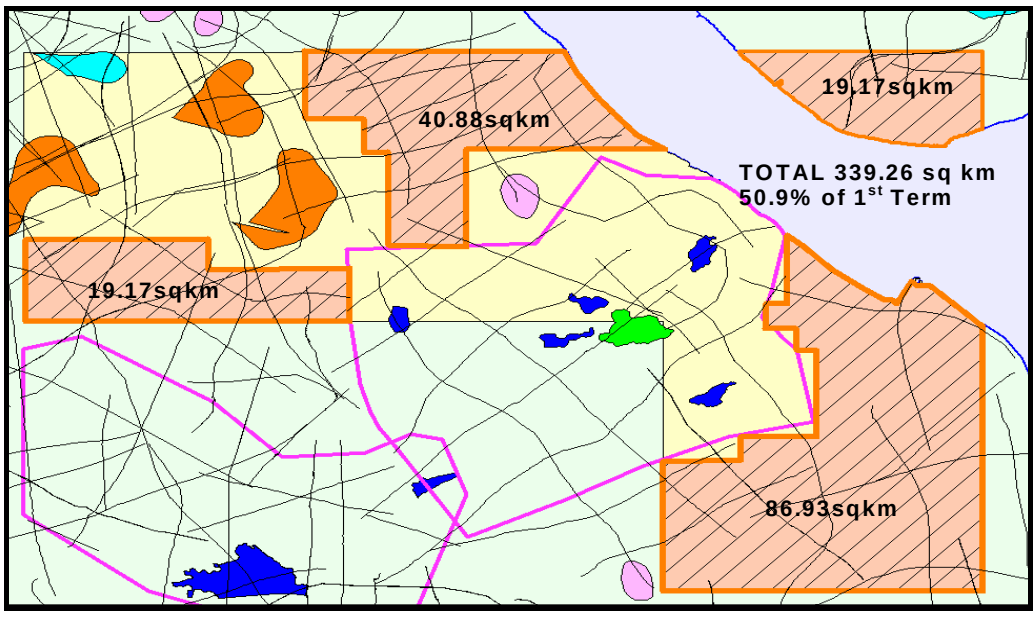

Figure 2.2 PEDL032 Initial 50% Relinquishment 2003

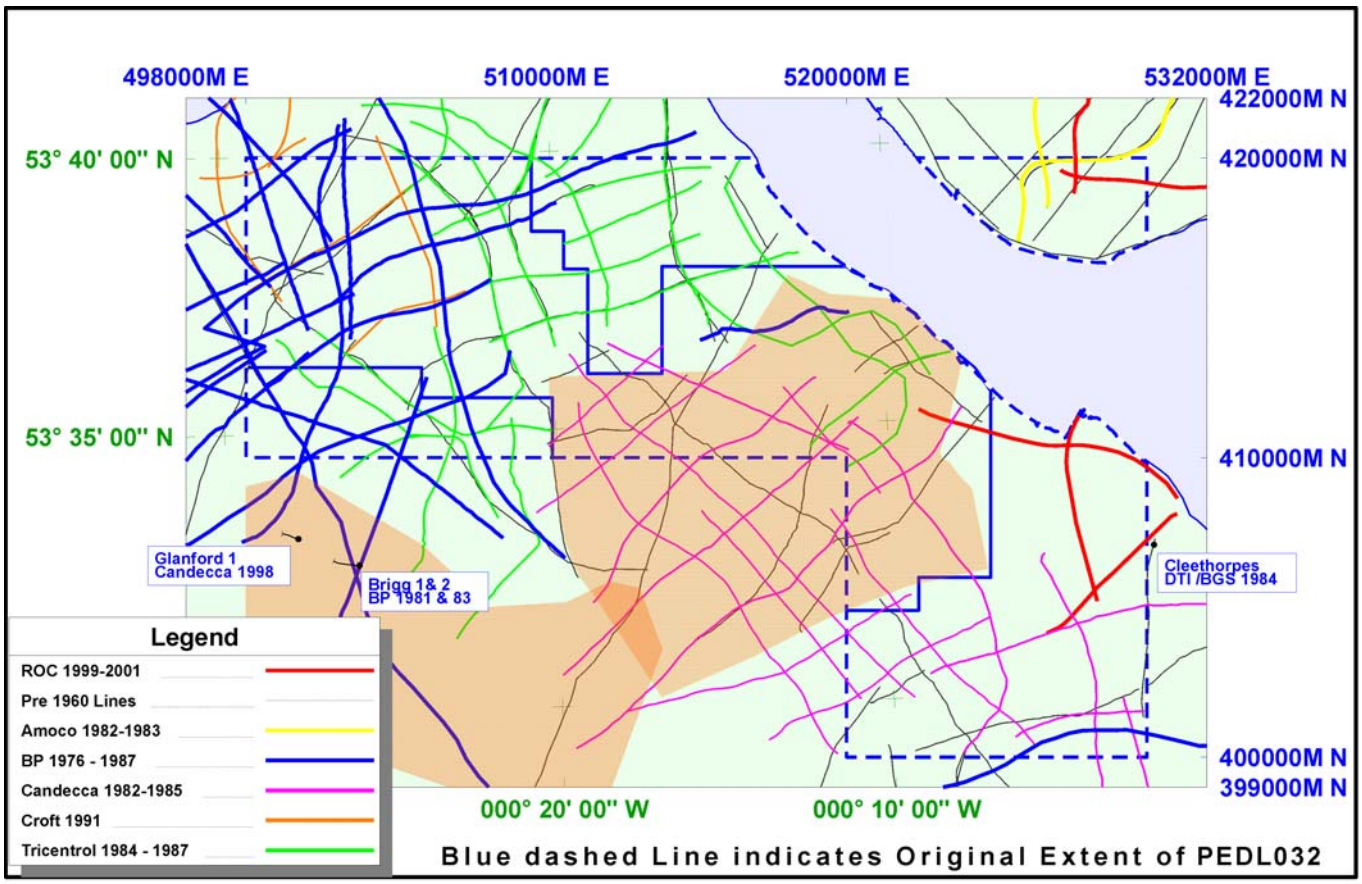

Figure 2.3 Seismic & Drilling History In the PEDL032 Area

Immediately prior to the award of PEDL032 Candecca acquired the Howsham 3D survey of 100sqkm over the Brigg boreholes. This provides key well tie into the PEDL032 area.

Since award of the licence Roc acquired 22.8km of 2D seismic in the extreme east of the licence through the town of Grimsby. This 1999 survey targeted a gravity feature, supported by indications of associated structure on Candecca Lines CAN85-C.

A portion of the original PEDL032 licence extended to the north of the river Humber and Roc acquired 2D seismic in the area in 2001, targeted at the PEDL031 Patrington lead immediately to the north but the tail ends of these lines extended into PEDL032.

The Immingham 3D seismic survey recorded during 1Q 2002 targeted a number of small 2D leads and a dominant structural trend “The Caistor Horst”.

Portions of PEDL032 and the adjacent PEDL005 are covered by the Immingham survey and PEDL032 has a commitment exploration well due to be drilled before the end of the first licence term which has been extended to 17th March 2005.

2.2 Rationale for PEDL032 Licence Application

The PEDL032 licence application was made in October 1997 by Candecca Resources Limited and Cambrian Exploration Limited. The application was for four contiguous 10km by 10km UK blocks (TA01, TA11, TA20, and TA21.

The application focused on five structural leads within the Carboniferous:

- Bradley – 22.1mmbo STOIIP
- Brockelsby – 44mmbo STOIIP
- Worlaby – 5.6mmbo STOIIP
- Kingsford – 4.9mmbo STOIIP
- Elsham – 2.8mmbo STOIIP

The prospects were defined on the interpretation of a crude seismic grid at Top Dinantian Limestone. Predrill Structural mapping and the location of the leads is indicated in Figure 2.4 below. The Bradley lead was described as a Saltfleetby look alike at the northern edge of the deepest landward portion of the South Humber Basin.

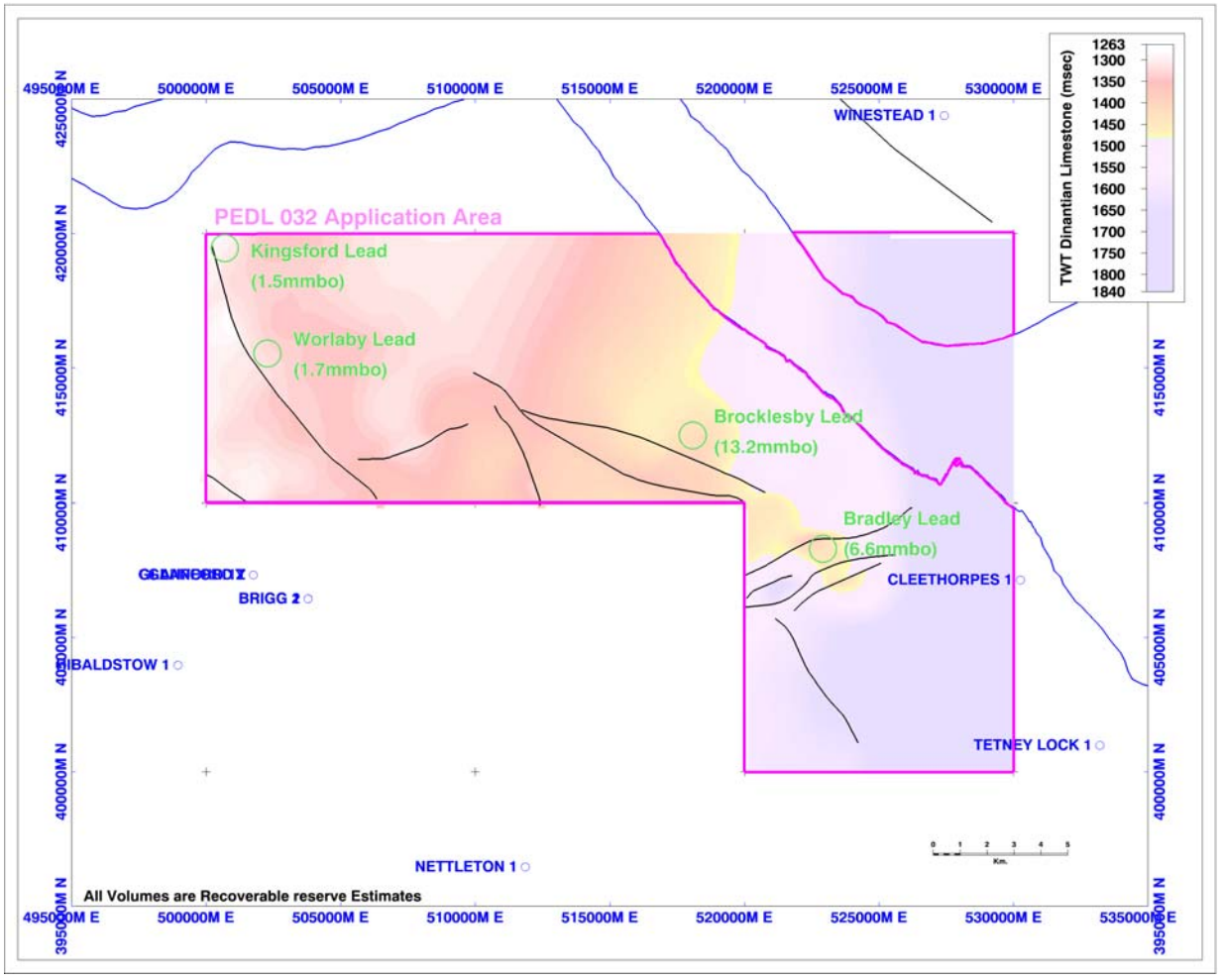

Figure 2.4 Dinantian Structural Mapping in 1997 Licence Application

A work programme was offered including :

- Gravity & Magnetic Study
- Purchase of all available 2D seismic through UKOGL
- Well on the Bradley lead to at least 30metres into the Dinantian Limestone

The licence was awared on the 18th March 1998 with an amended work programme as follows:

i) acquire 806 km of existing 2D seismic data within one year

of award of the licence, and reprocess where appropriate;

ii) acquire 30 km of new 2D seismic data within 2 years of award of the licence if required following the interpretation of the acquired and reprocessed seismic data;

iii) drill one well 30 metres into the Dinantian within four years (ie:- by 18/03/2002) of the award of the licence;

iv) drill one additional well within 4 years of award of the licence contingent upon the interpretation of the acquired and reprocessed seismic data.

Parts i and ii have been completed, but no exploration well has been drilled.

3 Data Coverage

3.1 Seismic Dataset

Roc's digital seismic database for the PEDL032 licence area was almost entirely purchased from UKOGL (UK Onshore Geophysical Library) in 1999 and comprises 734km of digital 2D seismic including the full length of lines which are partly outside of the original licence area. 22.8km of new 2D seismic was shot in the licence as part of the dedicated evaluation of the Grimsby area by ROC.

Most of the 2D seismic is of reasonable quality, the best data being that acquired by Candecca in 1985, Croft in 1991, Tricentrol during 1984-1987 and Amoco 1982 -1983. Figure 3.1 below indicates a line from the 1985 Candecca survey at the eastern edge of the PEDL032 licence. This covers the Bradley structural lead which was the impetus for the PEDL032 licence application.

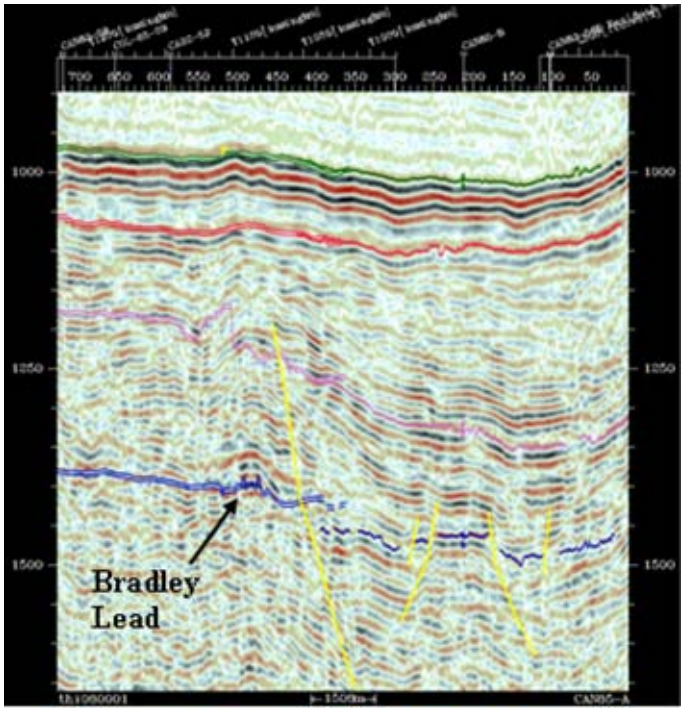

Figure 3.1 Best quality Candecca1985 seismic in the PEDL032 Licence

Other data is usable for interpretation with the exception of the 48km BP 1981 "SH" survey. This survey comprises poor quality scans lacking any amplitude character and has severe variable static misties to the other surveys. Figure 3.2 below indicates the quality of this survey. Portions of two of the lines were reprocessed by BP. These are good quality and tie to the other surveys. A listing of the seismic lines with further comments on quality is included in Appendix 1.

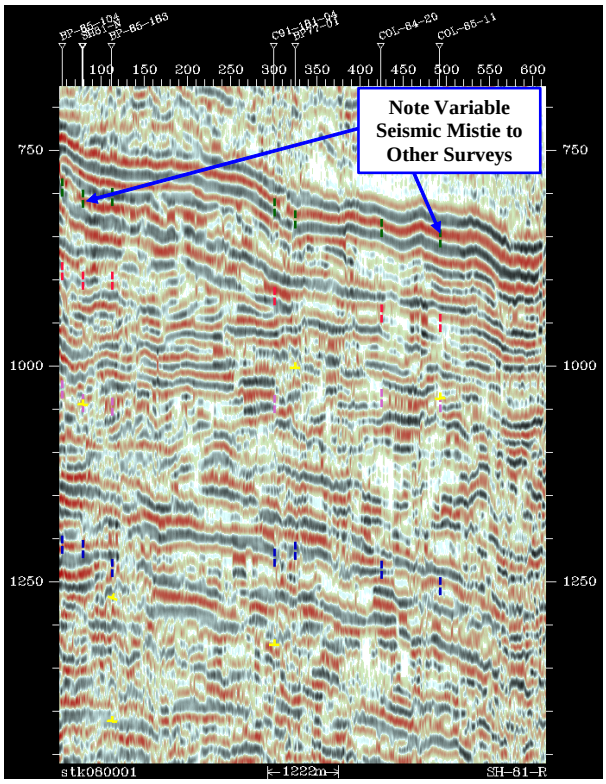

Figure 3.2 Poor quality 1981 seismic in the PEDL032 Licence

Almost 50% of the Immingham 3D survey extends into PEDL032. This was acquired for ROC in 1Q 2003 by IMC Geophysics. The survey covered a total area of 131sqkm (Figure 2.3) and had the following acquisition parameters:

- 840m source line spacing with a source interval of 15metres.
- 480m receiver line spacing with 60 metre interval.

Use of roads and track was maximised for Vibroseis source resulting in a non linear pattern of source layout. Nominal fold of 12 was recorded at maximum offset of 2400metres, some dynamite infill was added mostly at the western end of the survey.

The data was processed as Pre-Stack Time Migration and had an FKK filter and Spectral Whittening applied as final process enhancement.

The 3D data has varying quality and in comparison with the Howsham 3D, and older 2D data it provides an inferior database for interpretation.

4 History of Roc's Evaluation & Mapping

4.1 Seismic Interpretation

The Seismic data set has been reviewed at several stages with a variety of rigour.

First Pass 2D Screening

First pass review of the 2D data was conducted in 2000 when a simple blob map (Figure 4.1) of structural features was compiled identifying 8 leads in the PEDL032 licence area as indicated in the map below.

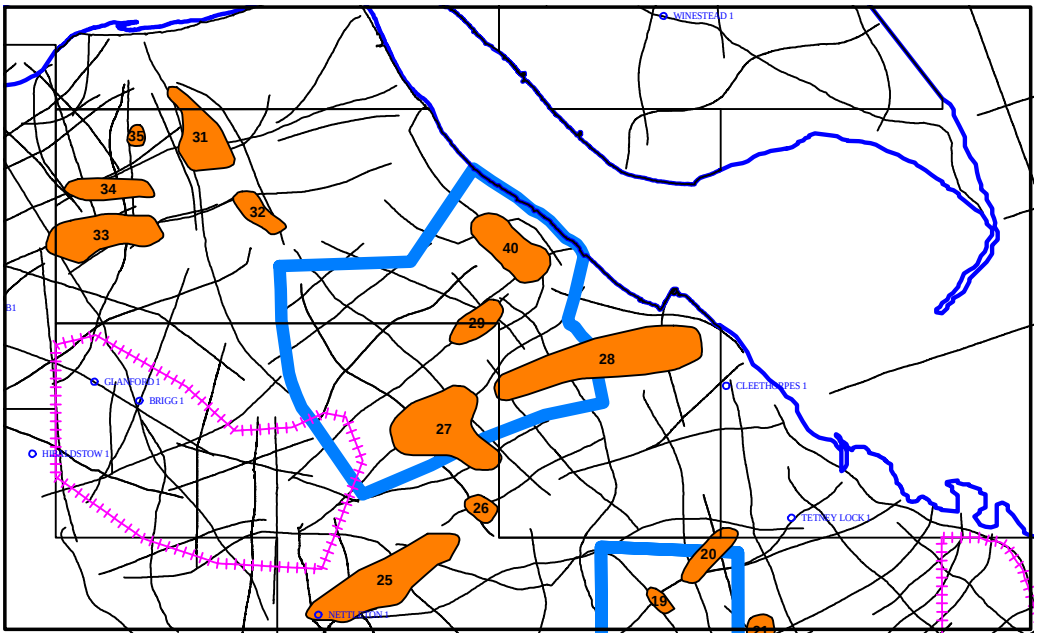

Figure 4.1 Simple Blob Map of Structural Leads from Initial 2D screening

Pre 3D Proposal 2D Supplemental Interpretation

A supplement to the screening review was conducted in 2000 and consisted of structural mapping of the 2D data to define a forward work programme. This was restricted to mapping only the Brotherton Limestone and Dinantian Limestone reflectors. The structural mapping from this interpretation was used to define the layout of the acquisition area for the Immingham 3D. This mapping is documented in TECH284. The strategy for the layout of the 3D was to cover as many as possible leads adjacent to the deeper portion of the South Humber Basin. Eight leads were covered by the Immingham 3D, two of which were mapped as having mean reserves larger than 20bcf, Table 4.1 below. It should be noted that additional leads were located in the adjacent PEDL005; Figure 4.2.

Output	area	units	SQ-KMS								
Output	volume	units	CUBIC-METRES								
				Oil Reserve(mmbo):				*Gas Reserve(bcf):*			
Polygon	**Area**	**B.RockVolume**		***P90***	***Mean***	***P50***	***P10***	***P90***	***Mean***	***P50***	***P10***
Kirmington	1.95	16,778,983		0.636	1.241	1.196	1.923	1.965	4.056	3.981	6.240
Keelby	0.29	355,569		0.013	0.027	0.026	0.042	0.041	0.086	0.085	0.132
East Keelby	1.31	13,533,814		0.491	1.021	0.999	1.589	1.520	3.242	3.138	5.011
Stallingborough	2.03	33,050,276		1.220	2.451	2.379	3.772	3.733	8.003	7.800	12.339
Aylesby	3.98	83,413,814		3.072	6.318	6.100	9.680	9.238	20.453	19.810	31.566
				PARAMETERS USED				**PARAMETERS USED**			
				Net/Gross:	0.4	0.5	0.7	Net/Gross:	0.4	0.5	0.7
				Porosity:	0.11	0.14	0.17	Porosity:	0.11	0.14	0.17
				Oil Saturation:	0.6	0.7	0.8	Gas Saturation:	0.75	0.8	0.9
				FVF:	1.2	1.14	1.08	GEF:	100	150	200
				Recovery Factor:	0.15	0.2	0.3	Recovery Factor:	0.65	0.75	0.85

Table 4.1 Listing of Oil & Gas Reserve potential prior to acquisition of the Immingham 3D

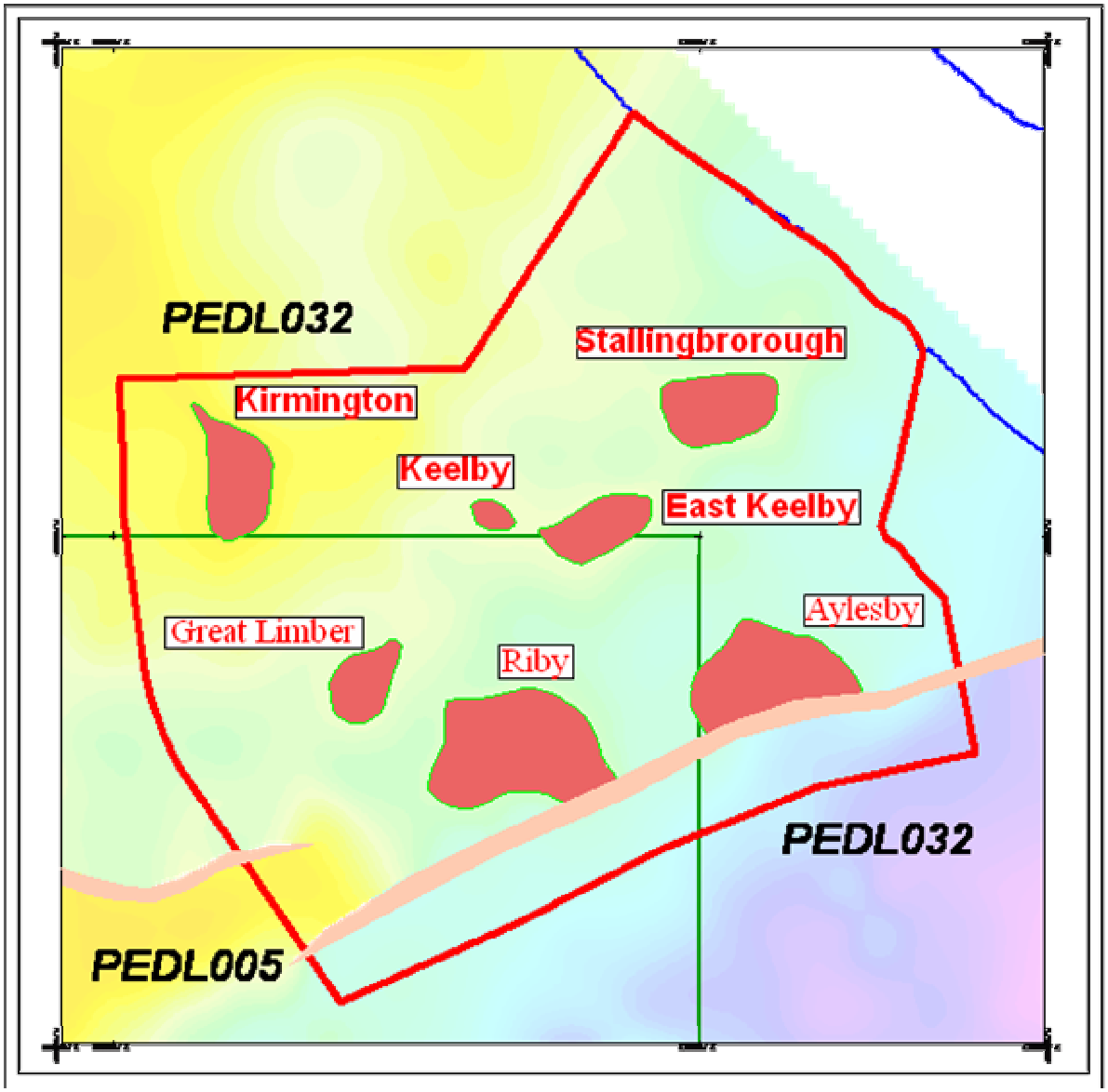

Figure 4.2 Structural leads prior to Immingham 3D acquisition

Extensive South Humber Basin 2D Interpretation

In 2001 a comprehensive evaluation of the South Humber Basin 2D was completed (TECH1484) with mapping at Sherwood Sandstone, Brotherton Limestone, Rotligende Sandstone and Dinantian Limestone. Intra Westphalian mapping was attempted, but the interpretation was not completed and maps were not produced. This phase of mapping suggested reduced prospectivity within the confines of the proposed Immingham 3D area but indicated the presence of larger structures in north western PEDL032 away from the deeper portion of the South Humber Basin.

First Pass 3D Mapping

After completion of the Immingham 3D processing, in early 2003, an initial quick look interpretation was conducted, but it was evident that even at the generally good Dinantian reflector a significant portion of the survey was very difficult to interpret. Figure 4.3 below indicates the area over which initial Dinantian interpretation was conducted without to much difficulty. It is suggested that there is very low confidence in the interpretation outside this

area. It should be noted that the interpretation only covers the Keelby, East Keelby and a portion of the Aylesby leads identified prior to the 3D acquisition. Some areas of the 3D dataset has data quality that precludes any sensible interpretation, especially over the Caistor Horst at the southern edge of the survey.

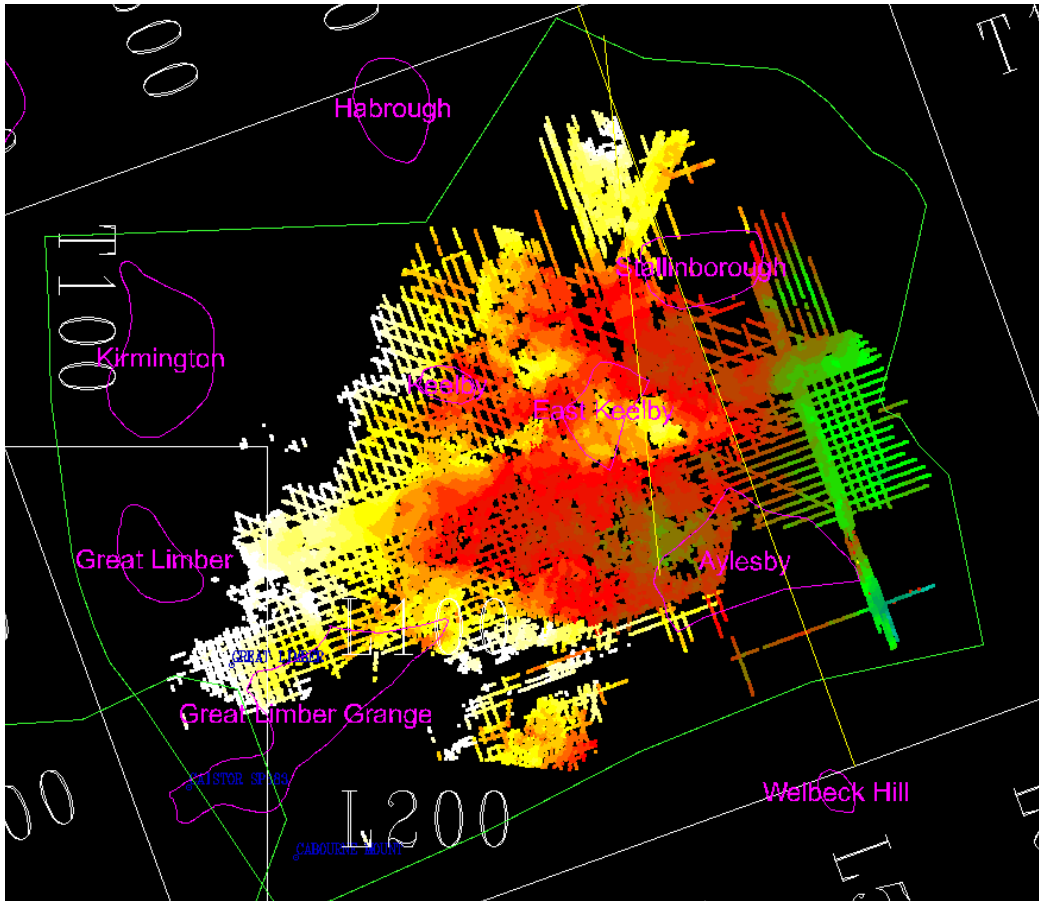

Figure 4.3 Area of easier interpreted Dinantian reflector, Immingham 3D survey

Initial mapping at Top Dinantian Limestone (below the deepest reservoir objectives), Brotherton Limestone and Rotligende sand was eventually completed. These are the strongest and most laterally persistent events in the survey. Only the East Keelby prospect was identified with any confidence to provide impetus for further evaluation.

No Well tie exists within the Immingham 3D survey, but there is a narrow overlap to the Howsham 3D survey recorded in 1997 which has well ties to Glanford 1 and the two Brigg wells.

Within the Immingham 3D the high frequency response of coals continuing upto and truncating underneath an obvious unconformity demonstrates that the Carboniferous section is very similar to that covered by the Howsham survey and that drilled by the Glanford 1 and Brigg 1 wells. No Westphalian C represented by thick sand dominated section to the south at Saltfleetby is believed to be present. Westphalian B coal bearing section is expected either directly below the Rotligende or an Intra Westphalian unconformity.

Interpretation of some of the intra Westphalian events was attempted but with poor confidence. It was decided that the Dinantian mapping was the best that could be provided for definition of the East Keelby prospect volumetrics.

Extensive Howsham and Immingham 3D Interpretation

In Late 2003 an extensive interpretation effort was made on interpreting the Howsham and Immingham 3D surveys. The focus of this project was to generate an intra Westphalian mapping and verify the previously interpreted Brotherton, Rotligende and Dinantian events.

Several Intra Westphalian events were attempted and one was completed throughout both the Immingham and Howsham surveys which tied to the Vanderbecki Marine Band in the Brigg and Galanford wells. This is Top of the Westphalian A and generally conformable with the basal Westphalian reservoir.

Current 2D Interpretation tie to 3D Mapping

The current interpretation has extended the 3D interpretation throughout the 2D dataset and has benefited from the ties to the two 3D's providing a better bulk shift baseline. It is evident from interpreting the ties between the 2D and 3D data that the Immingham survey is very poor quality and significantly lacks the coherency of other surveys. The difficult Intra Westphalian event mapped in the 3D is more evident in the 2D and also demonstrates portions of the 3D where it is in error.

The interpretation has been mapped in conjunction with the 3D interpretation and viability and volumetric potential of closures has been assessed.

4.2 Regional Setting

The PEDL032 licence is located on the Humberside platform at the northern edge of the major early Namurian thickening of the South Humber Basin. There is also evidence for gradual Namurian thickening Northward within the licence from seismic (Figure 4.4) and well evidence (Enclosure 9).

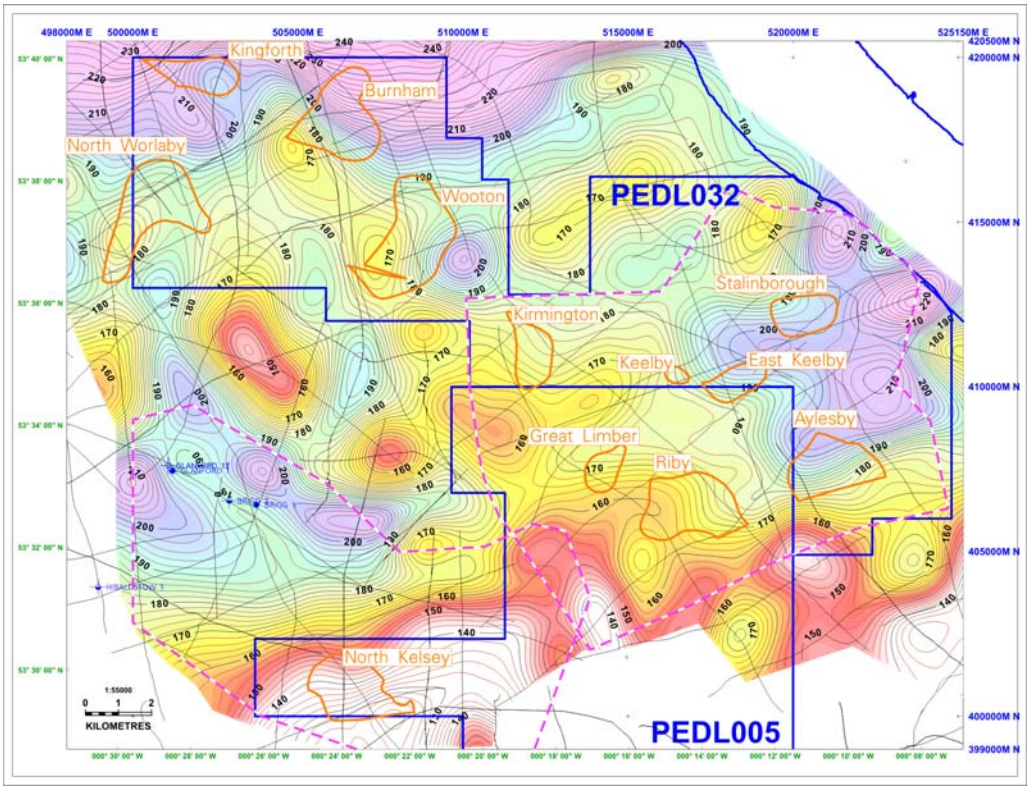

Figure 4.4 Isochron from Dinantian to Vanderbecki Marine Band demonstrating northward thickening

The South Humber Basin is a landward extension of a major Silesian depocentre located just offshore of the current day coast line. An indication of the thickened Basin to the east of PEDL032 is demonstrated by a seismic line extending from the Brigg 1 drilling location, through the Immingham 3D and on to Tetney Lock 1 the thickest landward penetration of the Silesian basin (Figure 4.5).

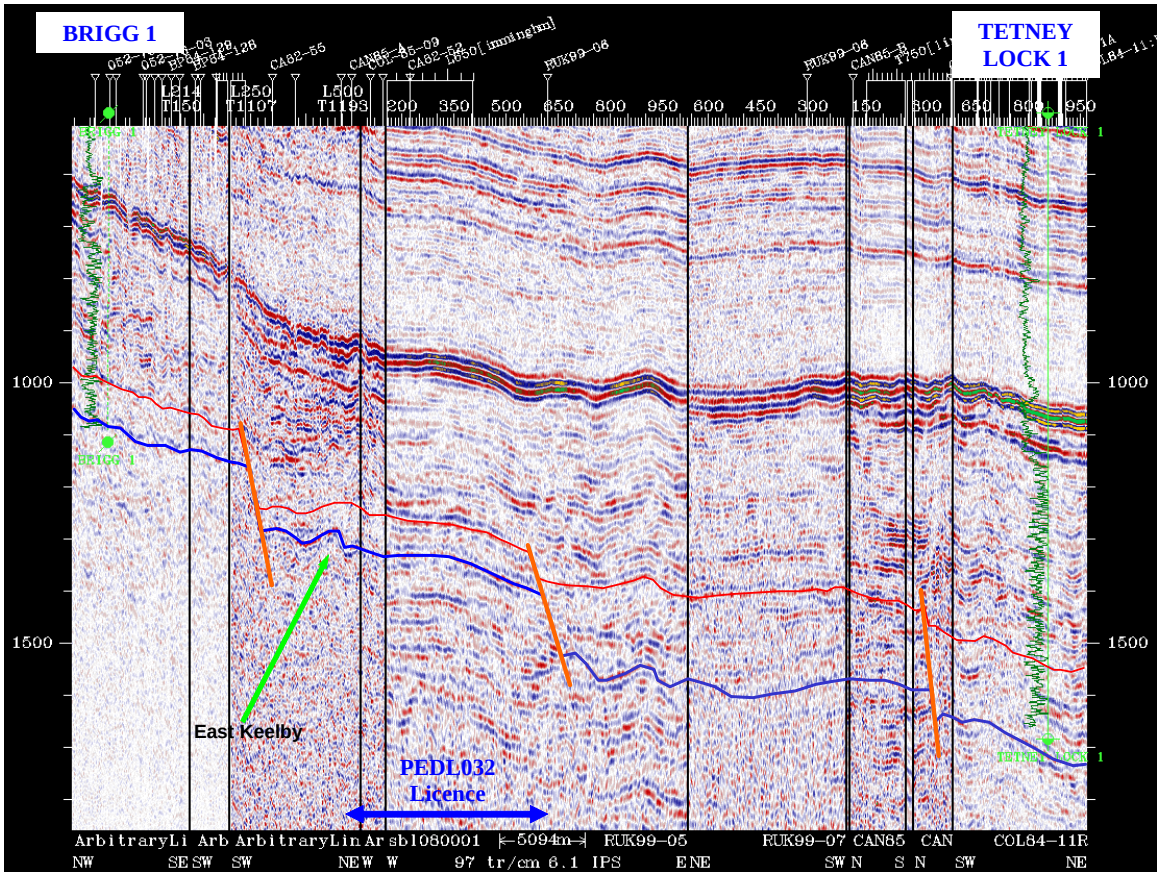

Figure 4.5 PEDL 032 licence in relation to the South Humber Basin Tetney Lock well

The basin is one of a series of late Dinantian to early Namurian sub-basins that formed in response to crustal extension in the region. Namurian sedimentation in the basin initially consisted of deepwater mudstones in the basin centres. As time passed, the area of sedimentation expanded and included deltaic and fluvio-deltaic facies in the upper Namurian and basal Westphalian. Ultimately, late Westphalian coastal plain deposition blanketed the entire region, leading to formation of the Carboniferous Coal Measures. The deep water and Pro delta mudstones have in adjacent basins (Gainsborough Trough & Widmerpool Gulf) been conclusively linked to the generation of hydrocarbons.

At Saltfleetby to the south, sand-rich channel and delta complexes make up the primary reservoir and dominate deposition within the Late Namurian and early Westphalian. The thickness of the Namurian is much more variable than that of the overlying basal Westphalian. Over the Saltfleetby field, c. 30 km southwest of the prospect, the Namurian varies from 20 m to 40 m, while at Tetney Lock 1, some 16 km to the Southwest between the PEDL032 licence and Saltfleetby the section is 250metres thick with a total depth shallow of the Dinantian. To the west the Brigg 1 well demonstrates a Namurian section of 180m overlying Dinantian Carbonates. Seismic interpretation suggests a similar sequence thickness for the East Keelby prospect.

Coastal plain deposition continued through the Westphalian, comprising mud dominated deposition with frequent very thin coals. Sand deposition is sporadic, generally fine-grained sediments. The late Westphalian which is dominated by thick, coarser grained sand deposition to the south at Tetney Lock and Saltfleetby is expected to be absent, truncated following Variscan uplift and erosion prior to Permian, Rotligende deposition of Aeolian sands, followed by Carbonate and evaporite formation. Upto 500metres of Late Westphalian section in the Tetney Lock 1 well is expected to have been eroded over the East Keelby area. The remainder of the Overburden and the tectonic history is briefly summarised in Figure 4.6.

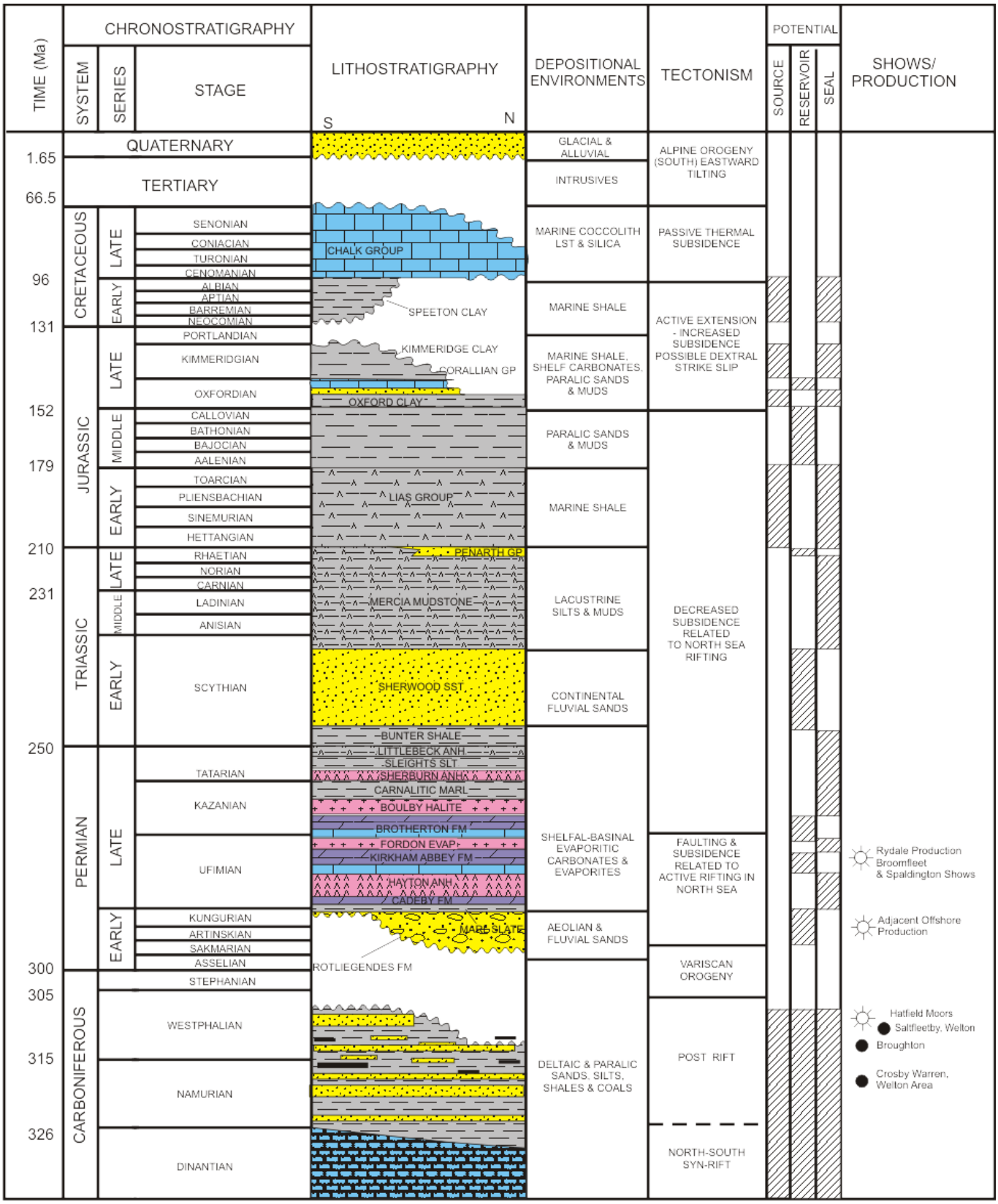

Figure 4.6 PEDL032 Stratigraphic column

4.3 Potential Reservoirs

Early Pemian – Rotligende Sands

The Rotligende is the dominant reservoir of the Gas fields in the adjacent Offshore area. As discussed above deposition was under Aeolian conditions with fluvial/wadi influxes recognised as inferior reservoir facies in the producing fields. At the Tetney Lock 1 well thickness exceeded 40metres, whilst at Brigg 1 and other wells to the west the sand is absent indicating a possible pinchout of the sand across the PEDL032 area.

Reservoir quality in the offshore area typically defines porosity in excess of 22% and permeability means in hundreds of mD. Figure 4.7 indicates a Poroperm crossplot from some adjacent penetrations of the Rotligende.

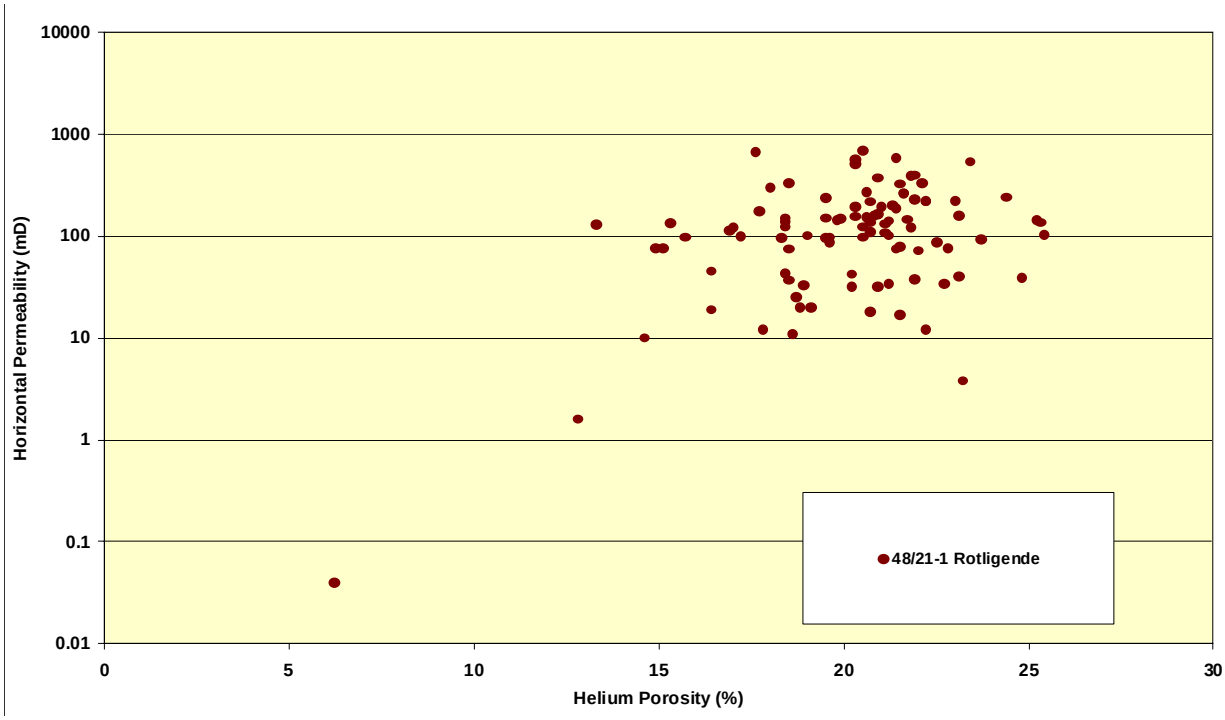

Figure 4.7 Poroperm Cross Plot indicating Rotligende Reservoir Quality

Top seal for the Rotligende over the PEDL032 area is almost certainly present in the form of a thick and persistent Hayton Anhydrite.

Late Westphalian B - Brinsley Abdy / Oaks Rock / Wooley Edge Rock

The Late Westphalian B, sands have trapped oil at Saltfleetby, Welton, Nettleham and Glentworth fields and gas at Hatfield moors. The interval represents a dramatic change in depositional environment from the quiescent coal swamp deposition to a very high-energy, probably braided stream system. Internal character is described in core as chaotic . Reservoir quality is also variable, but ranges to Darcy scale permeability. Figure 4.8 below indicates a consistently good quality section, c.20% porosity in the Hatfield Moors 3 well.

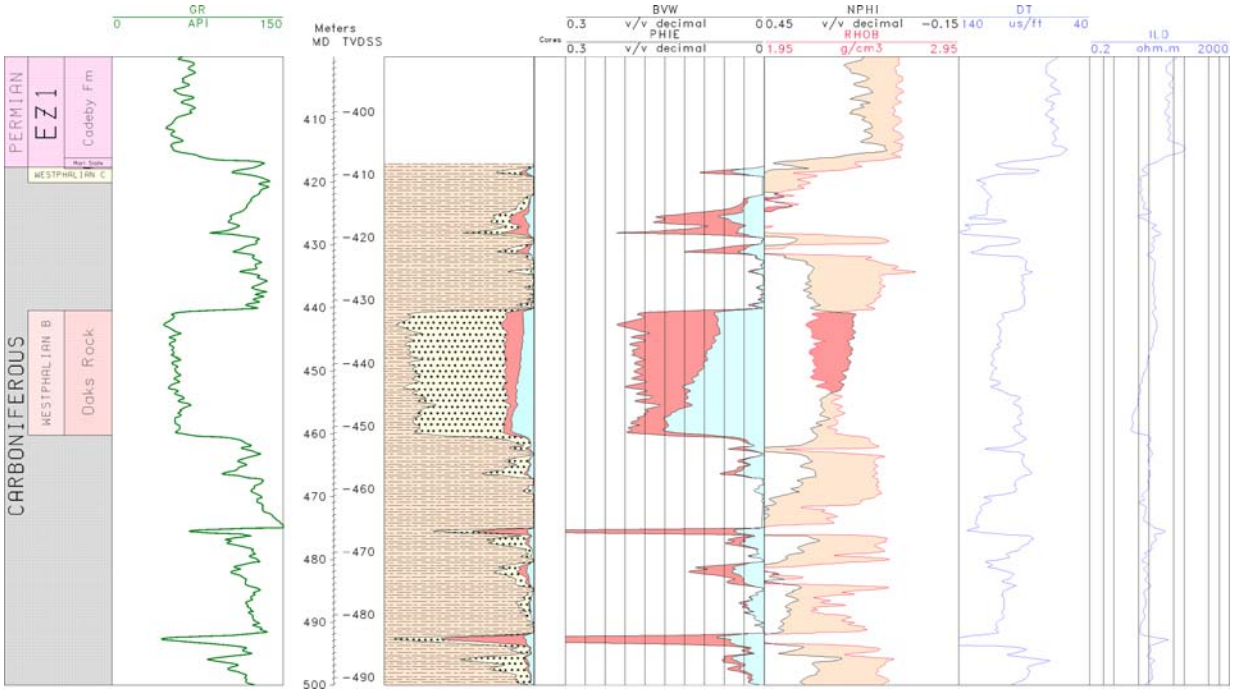

Figure 4.8 Hatfield Moors 3 reservoir Intervals

Early Westphalian A to Late Namurian Sands

The Early Westphalian sands are the most successful reservoir target in the onshore area including the main reservoir for the Saltfleetby Gas field and Welton Oil field. Sands of at least 10 metres are seen in all nearby wells over the early Westphalian A and late Namurian section, with thickness upto 30 metres at Brigg and 60 metres at Glanford. These sands have improved reservoir quality in comparison to Saltfleetby with typically 12-13% average porosity and permeability in the range of 10-100mD (Figure 4.9). In Crosby Warren (Figure 4.10 and Enclosure 10) and Brigg (Enclosure 10) hydrocarbon flow rates were recorded of 408bopd from a 10metres sand and 534bopd from a 3metres sand respectively. The Crosby Warren field has produced 586mbo oil (Figure 4.11) and continues at production rates of 50bopd with low water cut. Ultimate recovery is expected at c. 700mbo, 31% of the initially expected oil in place.

Sands above the amaliae marine band, the Penistone Flags, tested hydrocarbons at Broughton at rates of 44bopd. Propped fracture stimulation resulted in a rapid increase in water cut.

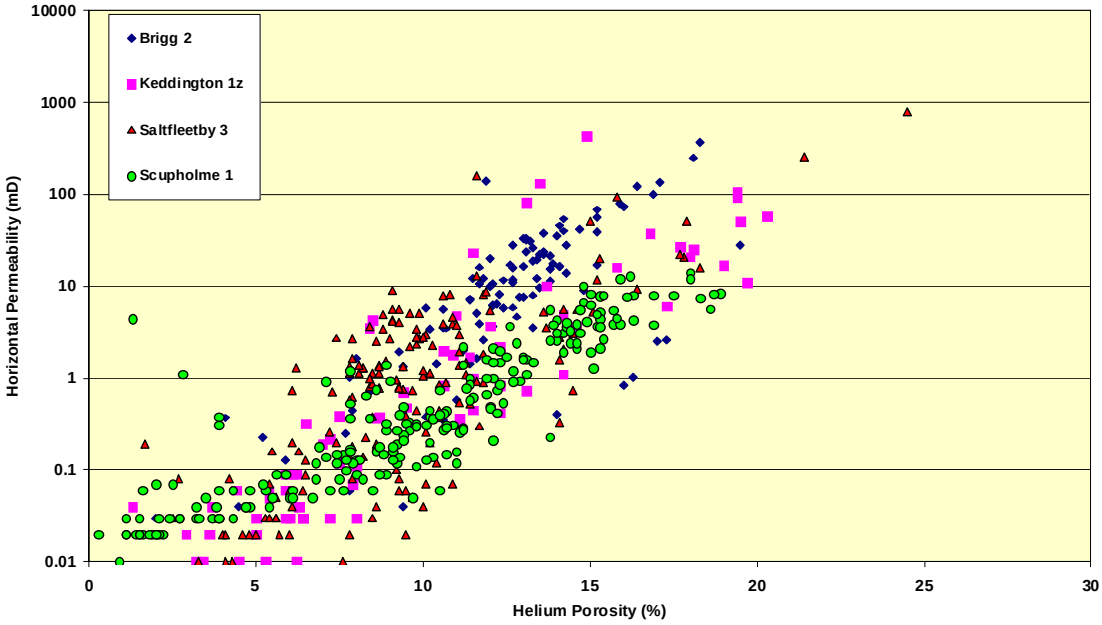

Figure 4.9 Core analysis from Brigg in comparison with Saltfleetby area

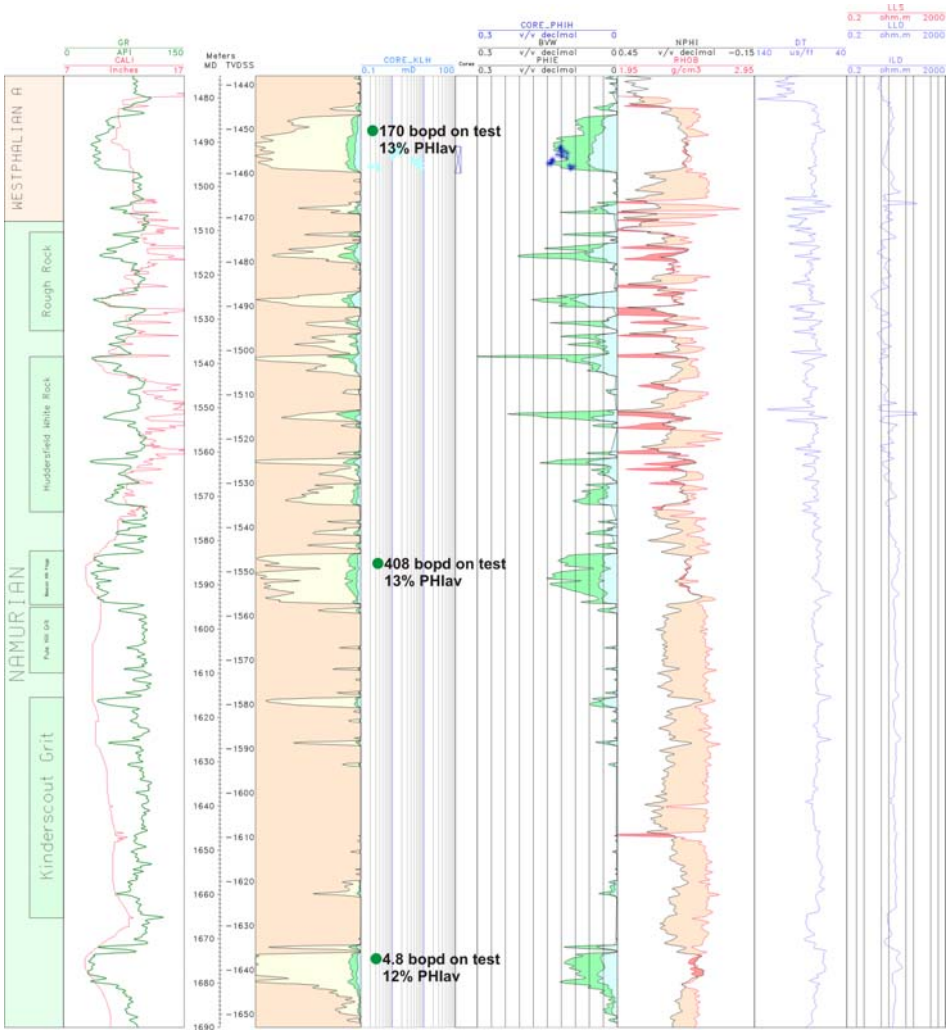

Figure 4.10 Crosby Warren 1 reservoir Intervals

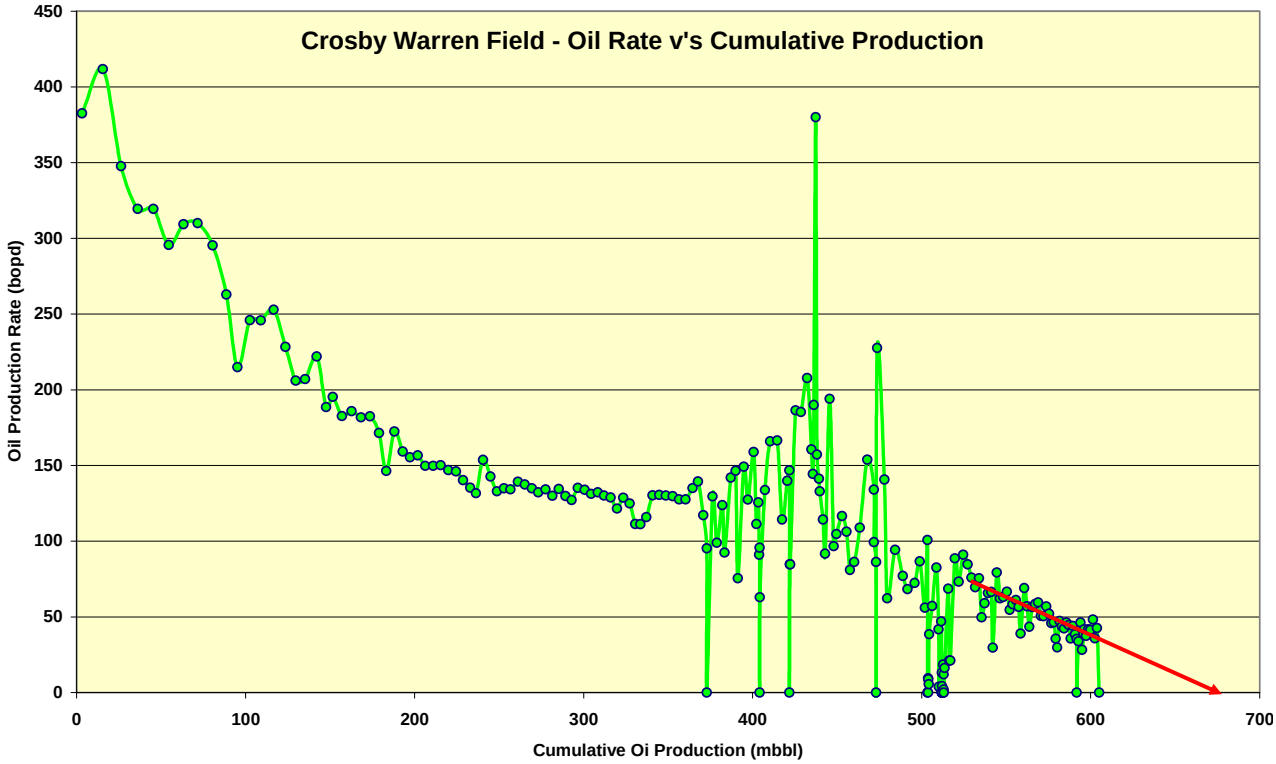

Figure 4.11 Crosby Warren Field Production

5 Prospect Definition

5.1 Key Prospect Elements

In the PEDL032 area the Early Westphalian reservoir target is close to 200metres above the Dinantian reflector and thickening of early Namurian sediments are recognised on seismic and in nearby well control. This requires the picking with confidence of poorer Intra Westphalian events to determine likely top reservoir structure. Additionally the difference between Dinantian and Intra Westphalian structure is complicated by the higher density of faulting seen in the Intra Westphalian Section by comparison with that identified at Dinantian level. It is believed that some of the faulting soles out in the Early Namurian shale resulting in lateral offset of the Intra Westphalian structural crests from those seen at Dinantian level.

The principal effect on prospectivity is that the Dinantian mapping can't be used to define reservoir structure. Instead Intra Westphalian mapping is required to provide mapping that is likely to be representative of reservoir intervals.

5.2 Prospects in PEDL032

A number of prospects are mapped over PEDL032, generally with larger determined volume based on mapping at Intra Westphalian level than at Dinantian. Tables 5.1 and 5.2 below sumarise the determined volumes for Gas and Oil reserves respectively.

Vanderbecki Mapping

	Elevation (m)			Area				GIIP (bcf)				Reserve (bcf)			
Polygon	Crest	Closure	GEF	sq Km	GRVp95	GRV(ML)	GRVp5	P90	Mean	P50	P10	P90	Mean	P50	P10
Burnham West	1434	1510.0	128.2	2.803	14.351	28.832	57.792	5.340	10.366	9.476	16.821	3.801	7.477	6.853	12.029
Wooton	1556	1592.0	133.7	4.272	21.896	44.041	88.338	8.048	15.663	14.110	25.390	6.177	12.028	10.911	19.669
North Worlaby	1476	1518.0	128.8	6.17	31.665	63.642	127.598	11.201	22.319	20.524	36.007	8.320	16.577	15.207	26.968
Kirmington NE	1736	1770.0	145.1	3.28	16.971	34.002	68.064	6.866	13.483	11.970	22.140	5.274	10.006	9.050	16.201
Easy Keelby	1768	1795.0	146.7	8.127	41.81	83.641	167.308	16.642	33.948	31.479	54.245	13.075	24.777	21.713	40.112

Dinantian Mapping

	Elevation (m)			Area				GIIP (bcf)				Reserve (bcf)			
Polygon	Crest	Closure	GEF	sq Km	GRVp95	GRV(ML)	GRVp5	P90	Mean	P50	P10	P90	Mean	P50	P10
Kingforth	1846	1856	150.4	1.199	6.183	12.395	18.608	2.658	4.556	4.418	6.611	1.952	3.368	3.255	4.969
Burnham West	1848	1873	151.5	2.143	10.968	22.017	22.017	4.559	7.051	7.135	9.296	3.375	5.263	5.266	6.967
Burnham	1860	1890	152.5	0.846	4.355	8.765	33.066	1.840	4.921	3.477	10.103	1.408	3.774	2.665	7.425
North Worlaby	1838	1878	151.8	5.263	27.205	54.424	81.644	11.838	20.108	19.490	29.028	8.371	15.149	14.461	22.201
Wooton	1926	1955	156.4	2.965	15.052	30.335	45.618	6.836	11.491	11.015	16.796	4.929	8.597	8.325	12.947
Wooton West	1908	1951	156.2	3.369	17.192	34.421	51.654	7.562	12.896	12.592	18.434	5.512	9.755	9.563	14.350
Kirmington NE	2040	2066	163.0	1.794	9.373	18.859	28.346	4.281	7.436	7.208	11.016	3.170	5.593	5.416	8.156
Kirmington	2028	2035	161.2	1.017	5.34	10.753	16.165	2.302	4.120	4.044	6.134	1.802	3.122	2.971	4.717
Stallingborough	2098	2125	166.4	2.04	10.615	21.283	31.956	5.083	8.700	8.499	12.581	3.649	6.584	6.444	9.657
East Keelby	2162	2174	169.2	1.725	8.502	37.193	26.312	5.766	11.175	11.530	15.791	4.412	8.480	8.606	11.954

Table 5.1 Listing of In Place and Reserves for PEDL032 Prospects - Gas Case

Vanderbecki Mapping

	Elevation (m)		Area				STOIIP (mmbbl)				Reserve (mmbbl)			
Polygon	Crest	Closure	sq Km	GRVp95	GRV(ML)	GRVp5	P90	Mean	P50	P10	P90	Mean	P50	P10
Burnham West	1434	1510.0	2.803	14.351	28.832	57.792	6.315	12.329	11.172	20.067	1.412	2.968	2.641	4.972
Wooton	1556	1592.0	4.272	21.896	44.041	88.338	9.610	18.769	17.036	30.354	2.172	4.556	4.085	7.635
North Worlaby	1476	1518.0	6.17	31.665	63.642	127.598	13.734	26.806	24.408	43.726	3.141	6.650	5.915	11.197
Kirmington NE	1736	1770.0	3.28	16.971	34.002	68.064	7.394	14.624	13.348	23.354	1.671	3.498	3.122	5.883
Easy Keelby	1768	1795.0	8.127	41.81	83.641	167.308	18.279	35.708	32.211	57.852	4.156	8.771	7.885	14.663

Dinantian Mapping

	Elevation (m)		Area				STOIIP (mmbbl)				Reserve (mmbbl)			
Polygon	Crest	Closure	sq Km	GRVp95	GRV(ML)	GRVp5	P90	Mean	P50	P10	P90	Mean	P50	P10
Kingforth	1846	1856	1.199	6.183	12.395	18.608	2.697	4.678	4.578	6.807	0.605	1.144	1.071	1.783
Burnham West	1848	1873	2.143	10.968	22.017	22.017	4.795	7.225	7.286	9.480	1.084	1.790	1.705	2.630
Burnham	1860	1890	0.846	4.355	8.765	33.066	1.899	5.148	3.469	10.617	0.428	1.276	0.896	2.653
North Worlaby	1838	1878	5.263	27.205	54.424	81.644	11.832	20.563	20.135	29.820	2.700	5.027	4.703	7.812
Wooton	1926	1955	2.965	15.052	30.335	45.618	6.618	11.461	11.231	16.709	1.512	2.805	2.620	4.377
Wooton West	1908	1951	3.369	17.192	34.421	51.654	7.535	12.987	12.650	18.841	1.674	3.160	2.962	4.944
Kirmington NE	2040	2066	1.794	9.373	18.859	28.346	4.127	7.102	6.911	10.350	0.930	1.723	1.615	2.667
Kirmington	2028	2035	1.017	5.34	10.753	16.165	2.338	4.062	3.974	5.915	0.520	0.992	0.936	1.543
Stallingborough	2098	2125	2.04	10.615	21.283	31.956	4.647	7.979	7.735	11.687	1.030	1.975	1.842	3.074
East Keelby	2162	2174	1.725	8.502	37.193	26.312	5.327	10.400	10.713	14.531	1.260	2.507	2.417	3.865

Table 5.2 Listing of In Place and Reserves for PEDL032 Prospects - Oil Case

Northwestern PEDL032

A number of structural closures are mapped along a high extending southeast to northwest from the middle of the eastern portion of PEDL032 to the extreme northeastern boundary. The fault boundary to the south is seen to extend across EXL251 to the Spaldington well. At the southeastern end of the high the Wooton prospect is similar to that mapped in the 2001 mapping exercise. Figure 5.1 below indicates a seismic line across the Wooton prospect. Further to the North west the Burnham West prospect is mapped differently to the previous mapping. Figure 5.2 indicates a seismic line across Burnham West

Southwestern PEDL032

The North Worlaby structure in the southwestern corner of PEDL032 is mapped quite differently at the Dinantian and Intra Westphalian horizons. The Dinantian closure extends northwards along the PEDL032 / EXL251 boundary, whilst the majority of the Intra Westphalian closure extends southwards into open acreage. At 6.6mmbo mean estimation of reserve the prospect is one of the larger closures in the licence. However it should be noted that by area only 48% of the Dinantian Closure is in PEDL032 and 17% of the Intra Westphalian closure. Figure 5.3 indicates a seismic line across North Worlaby. Several lines across this prospect might be considered for reprocessing.

East Keelby & Eastern PEDL032

Mapping of the East Keelby structure is very similar to previous presentations at Dinantian level and is contained entirely within PEDL005. At the Intra Westphalian horizon the closure has a much larger extent and continues northeast into PEDL032. Even as mapped, based on the 3D there is doubt over the confidence of the Intra Westphalian closure. Figure 5.4 is a poor quality 2D line across the prospect which is overposted with the 3D interpretation. This suggests continued elevation of the Intra Westphalian closure from its spill point in the west.

Eastern PEDL032, predominantly covered by the Immingham 3D, lacks any defined prospects. The Pre 3D defined lead of Aylesby is located at the eastern end of the Caistor Horst, but is in a particularly poor portion of the 3D. There are hints of reversal of the regional dip on the 3D data but the image is not coherent enough to define a closure with confidence. Additionally the Bradley structure, obvious on the 2D line (CAN85-A) and the reason for the licence application is not defined at all on the 3D. Defined closures within the Immingham 3D (East Keelby and Great Limber) are located in PEDL005.

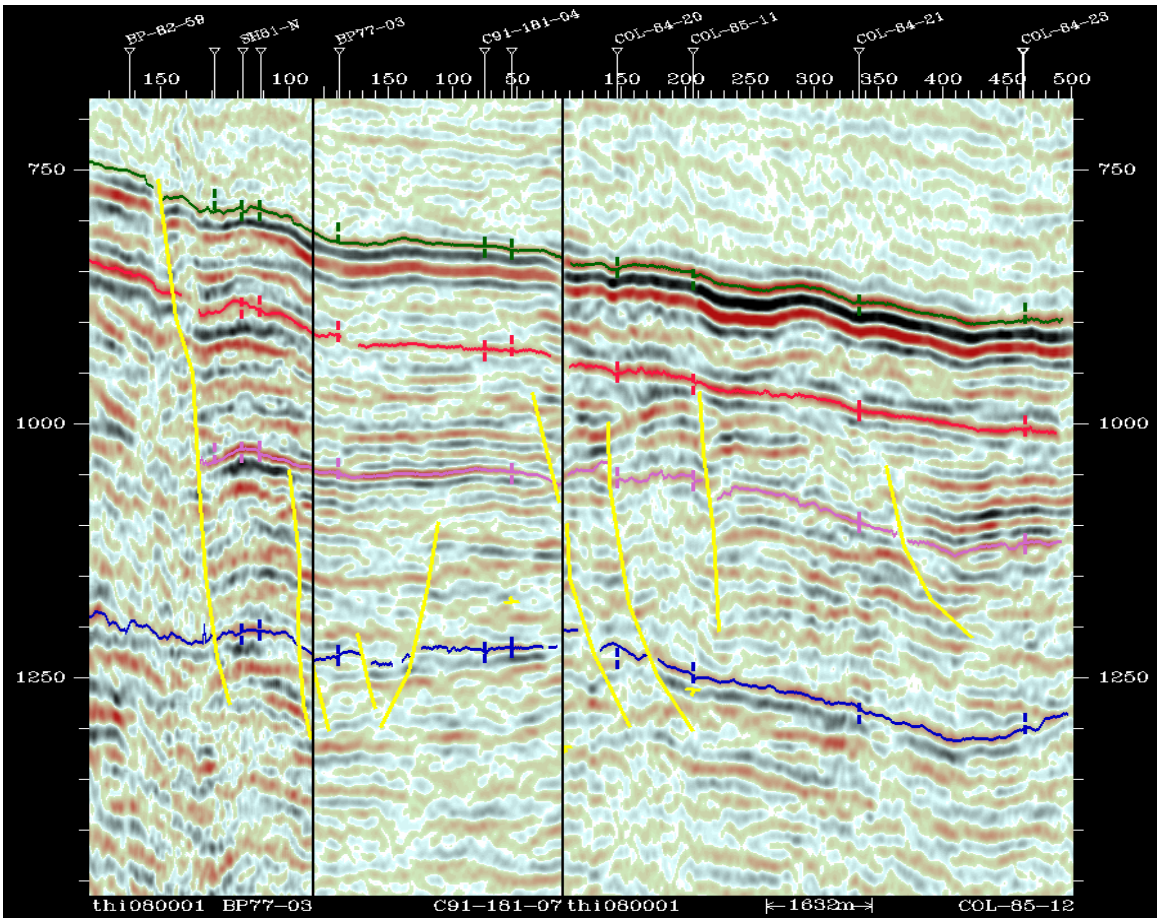

Figure 5.1 2D Seismic across the Wooton and Wooton West Prospects

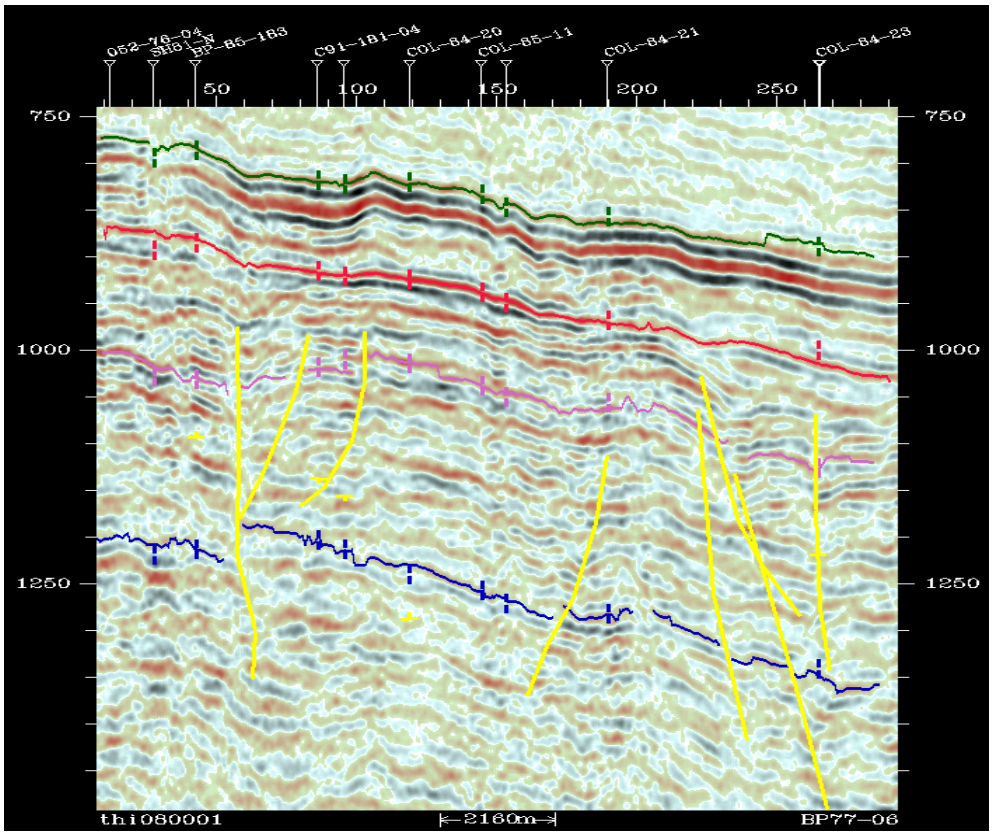

Figure 5.2 Seismic Across the Burnham West Prospect

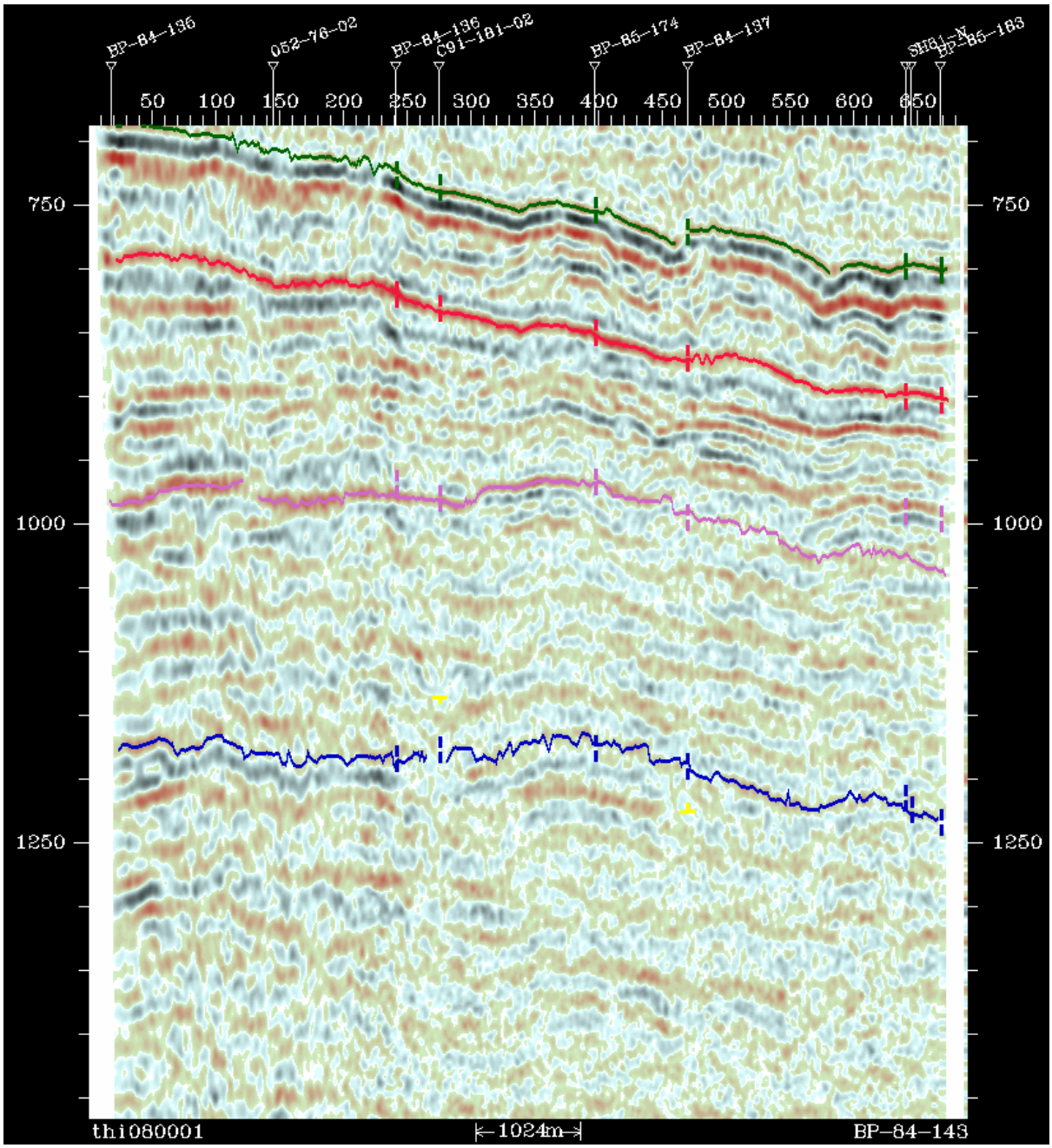

Figure 5.3 2D Seismic across the North Worlaby Prospect

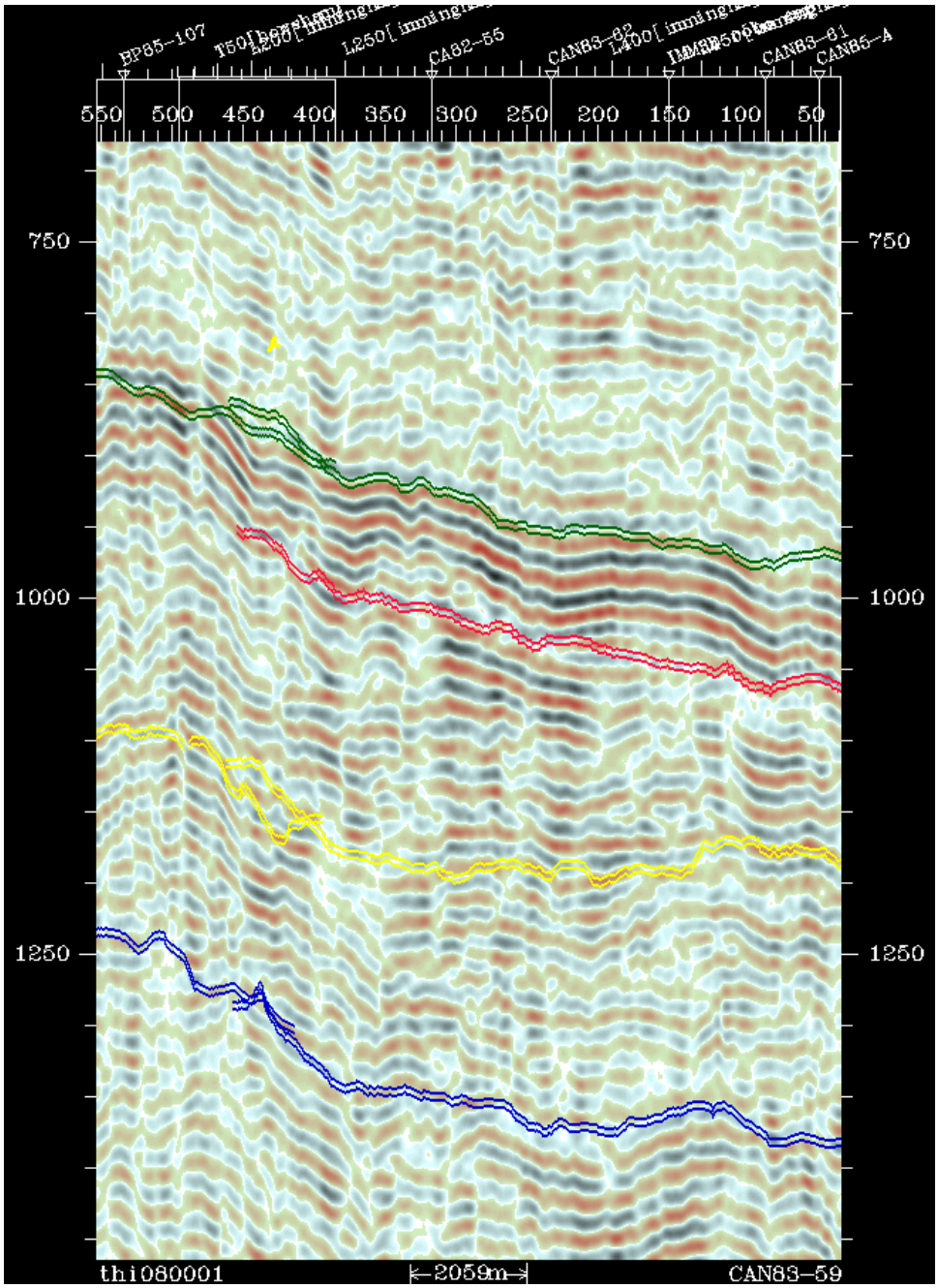

Figure 5.4 2D Seismic with 3D Interpretation across the East Keelby Prospect

6 Future Work Programme Recommendations & Costs

It is evident from trials conducted by Robertson on two selected lines from the Immingham 3D that improvement can be expected. The trial identified an inappropriate match between dynamite and Vibroseis source and provided a significant improvement in the reflector coherence. The top Sherwood (Triassic) reflector absent on the initial processing was evident on the trial as it is on adjacent 2D and the Howsham 3D data. The Dinantian reflector could be traced over the entire line and trace, something which was not intuitive on the full 3D. With the exception of the difficult interpretation over the Pre 3D defined, Aylesby lead the most significant effect of reprocessing the 3D would be on the East Keelby closure, which is predominantly mapped in PEDL005. On this basis a recommendation for reprocessing the survey for PEDL032 prospectivity could not be argued.

A work programme comprising the acquisition of 34km of new 2D, lines A to E in Figure 6.1. (included as a 2005 budget item) or 67sqkm of 3D over the Wooton and Burnham West would firm up potential of these two structures. If the 2D acquisition is pursued then lines SH81-R and SH81-N should also be reprocessed. Expected costs would be £185,000 for the 2D option or £530,000 for the 3D option.

Further 2D cover could be suggested to cover the North Worlaby prospect, lines F to I, increasing the total acquisition to 64km. Further reprocessing would be recommended to complement this increased acquisition, shaded orange in Table 6.1 below.

Consideration should still be given to reprocessing the Immingham 3D as part of the broader area prospectivity to firm up the East Keelby and Great Limber prospects.

	km	*Intent*
LINE A	8.5	Confirm Western Closure of Wooton
LINE B	8.7	Confirm along trend closure of Wooton and crestal area
LINE C	6.4	Confirm Western Closure of Wooton
LINE D	5.9	Confirm southern fault position and crest of Burnham West
LINE E	7.3	Confirm Western Closure of Burnham West
LINE F	10.4	Confirm southern fault position and crest of Burnham West and North Worlaby crest area
LINE G	5.8	Confirm Western Closure of North Worlaby
LINE H	5.7	Add definition to crestal Area of North Worlaby
LINE I	5.2	Confirm Western Closure of North Worlaby and southern extent

Table 6.1 Possible 2D seismic infill

	km	*Intent*
SH81 - R	8.48	Improved mapping of structural trend between Wooton and Burnham West
SH81-N	12.9	Improved definition of westerly closure of Burnham West and tie to Howsham3D
SH81-M	9.86	Improved tie between Howsham3D and Wooton area
052-76-02	24.9	Improved definition of North Worlaby
052-76-04	12.69	Improved definition of North Worlaby
BP82-57	11.97	Improved definition of North Worlaby
BP82-59	8.51	Improved definition of North Worlaby
BP84-137	6.55	Improved definition of North Worlaby
COL84-08	11.78	Improved definition of North Worlaby

Table 6.2 Possible 2D Reprocessing

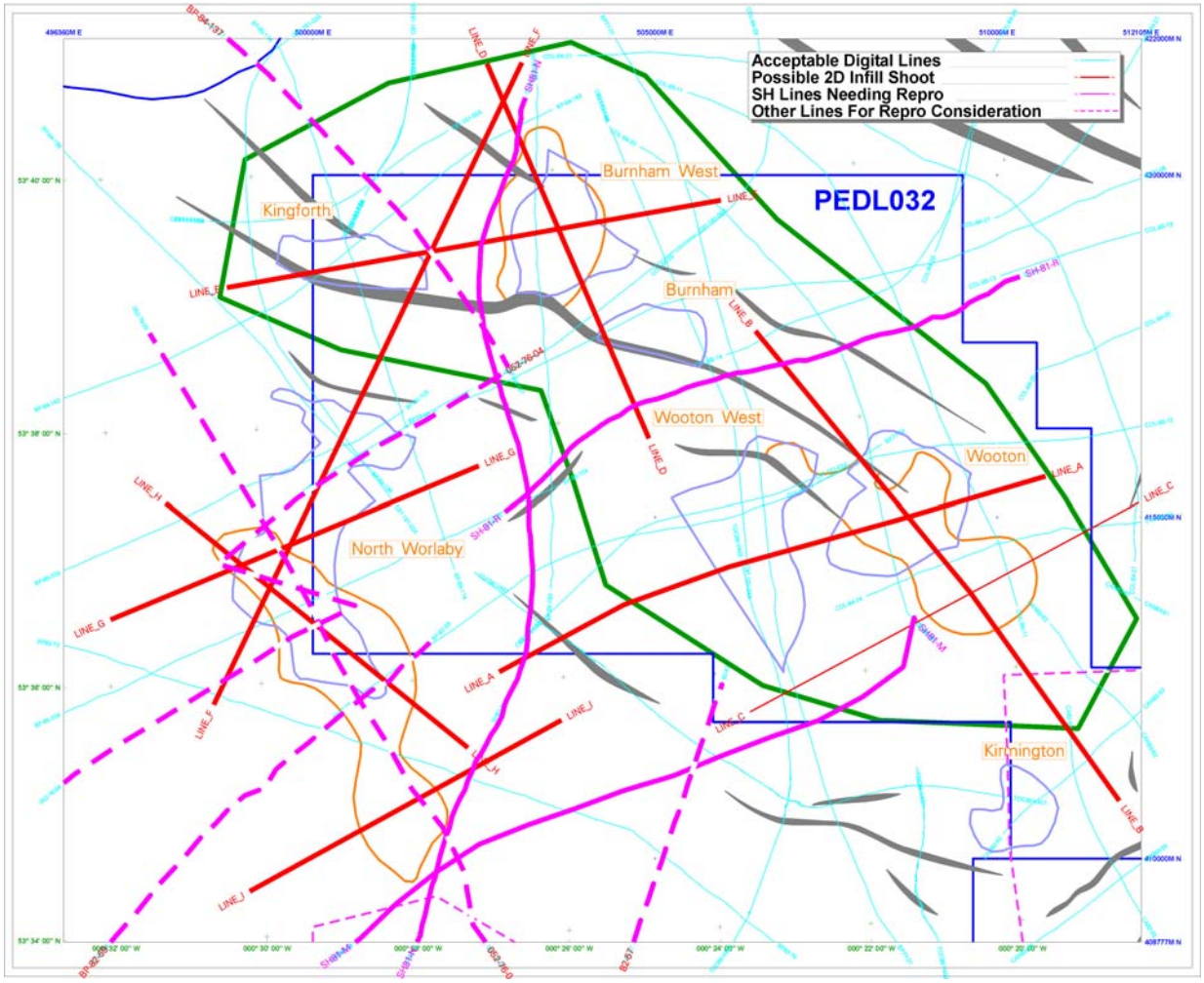

Figure 6.1 Northwest PEDL032 Possible Reprocessing and Acquisition Programme

7 References

Roc Oil (UK) Ltd 1997 — Eigth Round of Onshore Licensing, October 1997 Applications by Candecca Resources Limited & Cambrian Exploration Limited November 1995, TECH1754

Roc Oil (UK) Ltd 1999 — Field Area Report on a 2D seismic acquisition survey in PEDL032 Grimsby North-East Lincs by IMC for ROC November 1999, TECH270

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Roc Oil (UK) Ltd 2001 — South Humber Basin 2D Seismic Review, PEDL005, PEDL032, PEDL,033, PEDL075 & PEDL076 21st November 2001, TECH1484

APPENDIX 1

List Of 2D Seismic Lines

	CDP RANGE		Length	Quality
052-76-01A	12	490	22.8	Mod -Poor
052-76-02	1	332	24.93	Moderate
052-76-04	3	147	12.69	Moderate
BP77-01	8	365	18.02	Mod - Good
BP77-03	8	184	8.71	Mod - Good
BP77-06	7	293	14.5	Mod - Good
SH-81-R	52	615	8.48	Poor Scan
SH-81-X	46	397	5.3	Moderate
SH81-08	32	1521	21.89	Poor Scan
SH81-M	54	1437	19.35	Poor Scan
SH81-N	49	1065	15.3	Poor Scan
AUK82A-29-R01	1	328	8.18	Good
82-57	76	472	11.97	Moderate
BP-82-59	95	377	8.51	Mod -Poor
CA82-51	1	435	10.89	Mod -Poor
CA82-52	1	700	17.55	Mod -Poor
CA82-55	1	600	15.01	Mod -Poor
CAN82-50	1	204	5.09	Poor Scan
CAN82-53	1	337	8.44	Poor Scan
CAN82-54	1	193	4.86	Poor Scan
CAN82-56B	1	264	6.61	Moderate Scan
CAN82-56D	1	213	5.32	Moderate Scan
CAN82-56E	2	227	5.62	Poor Scan
AUK83A-185-R01	1	1019	15.28	Good
BP83-70	10	1088	16.22	Mod - Good
CAN83-58	2	374	9.28	Poor Scan
CAN83-59	29	553	13.24	Poor Scan
CAN83-60	27	449	10.47	Poor Scan
CAN83-61	29	376	8.73	Poor Scan
CAN83-62	2	661	16.37	Poor Scan
BP-84-136	1	820	10.24	Moderate
BP-84-137	1	525	6.55	Moderate
BP-84-143	1	689	8.61	Moderate
COL84-08	24	611	11.78	Good
COL-84-20	26	440	8.29	Good
COL-84-21	26	655	12.72	Mod - Good
COL-84-23	1	611	12.2	Mod - Good
COL-84-24	1	551	11.1	Mod - Good
COL-84-25	9	260	5.02	Mod - Good
COL-84-27	17	336	6.4	Mod - Good
COL-84-28	12	377	7.28	Mod - Good
COL-84-29	26	299	5.47	Mod - Good
BP-85-103	1	594	7.43	Mod - Good
BP-85-104	1	652	8.15	Mod - Good
BP-85-174	1	650	8.17	Mod - Good
BP-85-183	1	590	7.44	Mod - Good
CAN85-A	3	728	13.47	Good
CAN85-B	3	434	10.57	Good
CAN85-C	4	549	13.46	Good
COL-85-09	101	806	13.94	Good
COL-85-10	101	392	5.75	Good
COL-85-11	101	570	9.32	Good
COL-85-12	101	508	8.08	Good

	CDP RANGE		***Length***	***Quality***
COL-85-13	101	379	5.59	Good
COL-85-14	101	365	5.28	Good
COL-85-16	101	602	9.89	Good
TOC86-V401	203	921	14.96	Good
TOC86-V402	235	925	17.37	Good
TOC86-V403	203	896	15.72	Good
C91-181-02	30	551	7.81	Good
C91-181-03	2	261	3.89	Good
C91-181-04	31	480	6.72	Good
C91-181-05	130	388	3.87	Good
C91-181-06	2	447	6.66	Good
C91-181-07	3	306	4.55	Good
RUK99-05	104	1044	9.41	Moderate
RUK99-06	107	745	6.39	Moderate
RUK99-07	101	694	5.93	Moderate
RUK01-12	1	613	6.13	Good
RUK01-13	1	558	5.57	Good
			716.79	**km**