Independent Geologist's Report
PPL 326, Eastern Papuan Basin, Papua New Guinea

Prepared for
Newport Energy Limited

Date: March 29th 2010

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1. EXECUTIVE SUMMARY

The Papua New Guinea region, in particular the Papuan fold/thrust belt, and more recently onshore Aure Trough to the northwest of PPL 326, continue to prove to be 'world class' hydrocarbon provinces. PPL 326 itself is unexplored as is the surrounding frontier province of the Eastern Papuan Basin. The existing licences in the Aure Trough discovery blocks to the northwest are also considered to be under-explored. Data is sparse to non-existent in PPL 326 and only a fraction (460 kms) of the 13,000 km Fugro/Searcher non-exclusive speculative seismic survey impacts on the southern part of the block.

PPL 326 resides within the eastern frontier part of the Eastern Papuan Basin and straddles an onshore/offshore region of over 16,752 square kilometres between Port Moresby and the south eastern tip of the Papuan Peninsular. Approximately 53% of the block lies offshore. Water depths are generally less than 200m but in part extend to 1000m beyond the edge of the continental shelf. The licence is well located with respect to road and sea transport and the western limit is in close proximity to the capital, Port Moresby.

PPL 326 lies between the Papuan Peninsula and Papuan Plateau in the eastern Papuan Basin. The tectonic fabric is related to tectonism along the northern Australian margin which ultimately led to opening of the Coral Sea Basin. Early Miocene, collision of the Eastern and Papuan plateaus produced the fold/thrust belt through PPL 326, a composite accretional terrain in the Papuan Peninsular, and flexure of the leading edge of the margin to form the Moresby Trough foreland basin. The relatively narrow, tight Aure fold/thrust belt within PPL 326 extends along the southern edge of the Papuan Peninsular. The block is underlain in part by the southeastern extension of the asymmetric Moresby Trough which is contiguous with the southern Aure Trough,

Basin development is characterised by three regional tectonic events associated with structural rotation and sub-aerial erosion. Regional interpretation recognises three tectonically-related unconformities and associated megasequences which includes a previously unrecognised Mesozoic petroleum system between the Late Cretaceous "Coral Sea Unconformity and Early Jurassic "Breakup Unconformity" in the region of PPL326. The Mesozoic megasequence resides in a sub-thrust relationship to the main Pliocene thrust detachment. The sub-thrust model and Mesozoic petroleum system concept is contingent on correct identification of the "Coral Sea Unconformity".

Cenozoic stratigraphic development of the Moresby Trough and eastern Aure Trough reflects formation of the foreland basin adjacent to the Papuan Peninsular. Without well control, the stratigraphic framework of the trough is poorly defined but represents deposition during a period of active thrusting along the juxtaposed margin in a foreland basin setting during Neogene convergence.

Mesozoic (Late Jurassic to Cretaceous) stratigraphic development in the PPL 326 area would be related to syn-rift deposition following Gondwana breakup in the Early Jurassic. Seismic evidence suggests this older section has been preserved having not been as extensively eroded in the PPL 326 area. Seismic character is suggestive of an overall fining up progression from probable terrestrial facies near the base to 'seismically-transparent' deep marine shale-prone or carbonate facies in the Late Cretaceous. Presence of Jurassic coals is inferred from impedance contrast within strong reflection packages. It is plausible that reservoir facies equivalent to productive Mesozoic sands in the Papuan fold/thrust belt might be developed as associations of low stand estuarine through shallow marine shoreface sands.

The essence of petroleum prospectivity in PPL 326 is two-fold, chiefly its structural configuration and its stratigraphic setting. Structurally the block includes the Aure fold/thrust belt and extension of the contiguous Moresby Trough/Aure Trough through to the eastern part of the block. Stratigraphically, stacked, overthrust Tertiary play systems overlie a potential Mesozoic play system in a sub-thrust configuration. An underlying Mesozoic megasequence would be analogous to the productive western Papuan fold/thrust belt setting. The absence of previous exploration and limited seismic data acquisition preclude confident recognition of critical petroleum geology components for both megasequences, however.

The limited geological and geophysical data available to evaluate this permit is insufficient to form a clear understanding of its prospectivity. It is, however, sufficient to validate an understanding of potential plays and in part to identify potential traps. RPS considers that there is considerable prospectivity in the block. Significant structuring and potential development of a productive Miocene reefal and platform carbonate play exists as an extension of the Aure fairway. Several large potential buried reef traps are recognised within the block

The main exploration plays include both Tertiary clastic and carbonate exploration targets and Jurassic/Triassic clastic reservoir targets in the sub-thrust setting. Each of the plays potentially incorporate the primary components for hydrocarbon accumulations of source, reservoir and seal, Other critical factors including effective trap development and charge mechanisms to the PPL 326 frontier setting are presently unconstrained and combine to be important risks

Newport's primary exploration strategy is underpinned by potential for a Mesozoic sub-thrust play beneath Base Tertiary detachment underlying a Tertiary over-thrust complex. RPS was unable to confirm the geological model with the available dataset. However, by applying regional concepts RPS believes that a sub-thrust Mesozoic play is a valid and plausible model. The potential play is nonetheless very high risk. Prospectivity rating of PPL 326 would be significantly enhanced if presence of an underlying Mesozoic basin can be proven. Structural trap development in the sub-thrust setting could potentially reveal similar prospectivity to the western Papuan fold/thrust belt. Acquisition of new seismic, gravity and magnetics will be optimised to evaluate the sub-thrust play.

The main play horizons and clastic/carbonate reservoir targets are:

Play	Age	Reservoir	Seal	Trap Type
1	Late Miocene	Lavao/Talama Sst	Orubadi Sh	Thrust anticline
2	Mid-Late Miocene	Puri Lst equiv.	Orubadi Sh	Reefal trap
3	Mid-Late Miocene	Puri Lst equiv. (fractured)	Orubadi Sh	Thrust rollover
4	Mid-Late Miocene	Puri Lst equiv. (fractured)	Orubadi Sh	Sub-thrust trap
5	Mid Miocene	Chiria Fm basin fan sands	Intraformational	Thrust rollover
6	Paleocene/Late Cretaceous	Pale/Barune Sst	Paleocene Sh	Structural trap
7	Early Cretaceous	Toro Sst.-equivalent	Intraformational	Sub-thrust anticlines
8	Jurassic	Fluvio-lacustrine sands	Intraformational	Sub-thrust anticlines
9	Triassic	Fluvio-lacustrine sands	Intraformational	Sub-thrust anticlines

Similar structural styles to those in the transitional Aure/Papuan fold/thrust belt setting of the productive onshore central Aure Trough are recognised in the eastern trend extension through PPL 326. Hanging-wall traps are mainly evident. Sparse data precludes further definitive evaluation in the complexly faulted zone. Several large compressional reverse fault-controlled structural features have been recognised in the foreland basin fronting the thrust trend.

The potential Miocene reefal and platform carbonate play of the contiguous Aure fairway, may include fractured micritic carbonates in fold structures, structurally deformed/faulted settings or incorporation into the fold/thrust zone. The key to this Oligocene/Early Miocene (Puri-equivalent) play is to determine the focus of structural reactivation along fault zones, or association with intersecting fault trends. Where involved in thrust fault settings, this carbonate play would require a 'relatively low risk' shale or tight lithology lateral seal to be present across the controlling fault.

The carbonate reefal/mound facies is becoming an important play in the foreland basin. The potential buried reefal trap play appears to extend through to eastern PPL 326, particularly in association with steep, reactivated fault zones. Several substantial possible buried reef-form/carbonate mound features have been identified on seismic. High relief, Late Miocene pinnacle reef complexes superimposed on extensive platform carbonates and incorporating suitable reservoir facies are productive in the Aure Trough. Potential traps in PPL 326 rely on 'low-risk' juxtaposed basinal shale seal and source facies downdip. The Moresby Trough/Aure Trough region probably constitutes a maturation/generation site to source the carbonate reservoirs. Key to expanding this play is identification of deformed ridges or reactivated fault trends which have been enhanced by Oligocene wrenching/reverse faulting to form platformal foundations to the reefs. Currently, poor seismic control precludes a full evaluation of this play potential.

Due to data constraints, it is not possible to provide a confident quantitative geological assessment of the undiscovered petroleum potential of PPL 326 including number of fields likely to be discovered or their potential size. It is however, possible to assess chance of existence of postulated plays and therefore, chance of at least one hydrocarbon accumulation being present in the block. The concept of a 'play' is the fundamental unit to analyse prospectivity of the un-drilled PPL 326 regional province and Play Chance necessarily carries most of the risk at this stage of exploration in this frontier area. RPS has derived a probability estimate for the block that a potentially productive play actually exists within its boundaries. The estimate reflects a degree of confidence that at least one field of a minimum economic size is present within the play trend covered by the block.

For simplicity, three play 'chance of adequacy' elements (trap, reservoir and source) have been assessed. Critical regional factors suggest a particular importance for the first two factors (trap/reservoir) as there is ample regional evidence for presence of a working source, commonly in close proximity to structures. A chance of adequacy judgement of the three critical factors as they individually relate to Tertiary clastic and carbonate (platform carbonate/pinnacle reef) reservoirs in the overthrust complex and trough setting and sub-thrust Mesozoic clastic reservoirs, is summarised as:

Chance of Adequacy/Rating

Play Element	Trap	Reservoir	Source	Play Chance
1. Late Miocene Lavao/Talama Sst	0.5 (Probably present)	0.4 (Possibly present)	0.7 (Likely)	0.14
5. Mid-Miocene Chiria fan sands	0.5 (Probably present	0.3 (Possibly present	0.7 (Likely)	0.11
6. Paleocene/Late Cret. Barune Sst	0.5 (Probably present	0.5 (Probably present	0.7 (Likely)	0.17

Tertiary clastic reservoirs: Chance of adequacy of play elements

Chance of Adequacy/Rating

Play Element	Trap	Reservoir	Source	Play Chance
2. Mid-Late Miocene Puri Reefal	0.6 (Probably present)	0.6 (Probably present)	0.7 (Likely)	0.25
3. Mid-Late Miocene Puri Lst. Equiv. (Fractured - Thrust rollover)	0.6 (Probably present	0.6 (Probably present	0.7 (Likely)	0.25
4. Mid-Late Miocene Puri Lst. Equiv. (Fractured - Sub-thrust)	0.5 (Probably present	0.6 (Probably present	0.7 (Likely)	0.21

Tertiary carbonate reservoirs: Chance of adequacy of play elements

Chance of Adequacy/Rating

Play Element	Trap	Reservoir	Source	Play Chance
7. Early Cretaceous Toro Ss Equiv. (Sub-thrust play)	0.5 (Probably present)	0.2 (Unlikely)	0.7 (Likely)	0.07
8. E-L. Jurassic sandstone reservoirs (Sub-thrust play)	0.5 (Probably present	0.3 (Possibly present	0.6 (Likely)	0.09
9. Triassic sandstone reservoirs (Sub-thrust)	0.5 (Probably present	0.3 (Possibly present	0.6 (Likely)	0.09

Sub-thrust Mesozoic clastic reservoirs: Chance of adequacy of play elements

For the PPL 326 frontier region, an estimated overall average Play Chance of 14% for the Tertiary clastic reservoirs, 24% for Tertiary carbonates and 8% for sub-thrust Mesozoic clastics, for the occurrence of at least one major accumulation seems appropriate. In the context of relative play chance, a Play Chance of 20% would apply to a new play in an unproved basin where most fundamental elements seem likely to be present. For the reasons noted above, we have assessed PPL 326 Play Chance below this level for the Tertiary clastic targets but relatively comparable for the carbonate play. The sub-thrust Mesozoic play is down-scaled due to its conceptual nature.

Inherent limitations of PPL 326 resource assessment is mitigated by inadequacy of the geological database, resulting in poor understanding of the petroleum system and variables that locally will influence generation, migration and hydrocarbon entrapment. The Newport work program is designed to rectify this situation by acquiring sufficient additional seismic and other geological data to constrain geological variables and fully evaluate the exploration potential of the block.

This assessment is only as good as the understanding of play concepts that is at hand. Where this understanding is reliant on projection from “structurally similar” provinces, we recognize that we are dealing with only a partial view. New comprehensive exploration data including integration of reconnaissance seismic and well data to be acquired across PPL 326, will constrain the critical play elements and may lead to development of new play concepts. Newly developed plays may ultimately prove to be as prospective as those in the Papuan fold/thrust belt and central Aure Trough.

2. INTRODUCTION

Newport Energy (PNG) Ltd, a wholly-owned subsidiary of Newport Energy Limited ("Newport"), was awarded a 100% working interest in Petroleum Prospecting Licence PPL 326 on 27th August, 2009 following its competitive application for the block.. RPS Energy Pty Ltd ("RPS") was commissioned to prepare an Independent Geologist's Report pertaining to Petroleum Prospecting Licence 326 (PPL 326) to be included in a prospectus to be lodged with the Australian Securities Investment Commission (ASIC). Newport Energy Limited is proposing to proceed to a listing on the Australian Stock Exchange.

The technical assessment includes a description of the geological setting and hydrocarbon habitat of the asset, potential play concepts and expected trap styles. The immature status of exploration in the block precludes an estimation or valuation of petroleum resources. Moreover, given the available data set and consideration of regional play elements, RPS has limited the report to an assessment of play potential validity and identification of possible prospective features on the limited seismic data set. We have derived an estimate of the chance of success of at least one oil or gas field being present within the play trend. The play analysis utilized productive geological analogy and considered exploration success in other parts of the basin as background.

PPL 326 lies in the Eastern Papuan Basin, a previously unexplored frontier basin province. Existing data consists of very limited reconnaissance seismic data offshore in mainly shallow water and onshore field geological surveys. In undertaking this review, RPS relied upon information provided by Newport and publicly available information. As part of this assessment, Newport purchased access rights to a portion of the Fugro/Searcher speculative data set that was relevant to PPL 326. These data were provided to RPS for validating potential play concepts in the block. Fugro/Searcher Seismic recently reprocessed 30,000 kms of vintage data (pre-stack reprocessing and post-stack scanned data) and acquired the non-exclusive 13,000 line-kilometre Lahara 2D regional survey in the frontier Gulf of Papua. Only a small part of this dataset (460 kms new data, 88 kms reprocessed and 18 kms scanned data) impacts on the southern part of PPL 326.

3. PPL 326 LICENCE DETAILS

3.1 Block Location

PPL 326 resides within the eastern frontier part of the Eastern Papuan Basin and straddles an onshore/offshore region of over 16,752 square kilometres between Port Moresby and the southeastern tip of the Papuan Peninsular, south of the Owen Stanley Ranges, **Figure 1.** The larger part of the block lies offshore (approximately 53% or 8,950 sq kms) and remainder onshore (47% or 7,802 sq kms) along the shallow Coral Sea coast. The regional setting of PPL 326 including all well/field locations referenced in this report is shown in **Figure 2**. Water depths are generally less than 200m but in part rapidly deepen to 1000m beyond the edge of the continental shelf. The immediate offshore area is characterised by numerous islands and shallow present-day reefs that fringe the shoreline. The licence is well located with respect to road and sea transport and the western boundary is in close proximity to the capital Port Moresby.

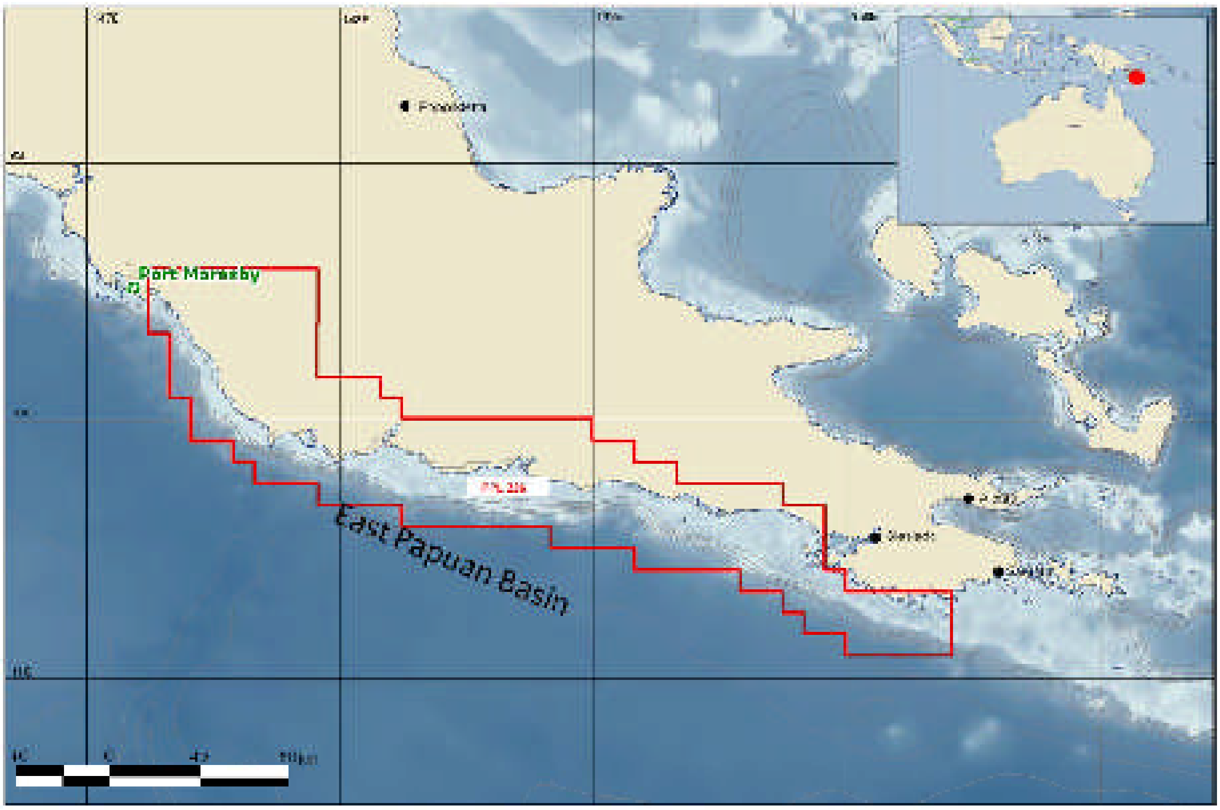

Figure 1 - PPL 326 Block Location

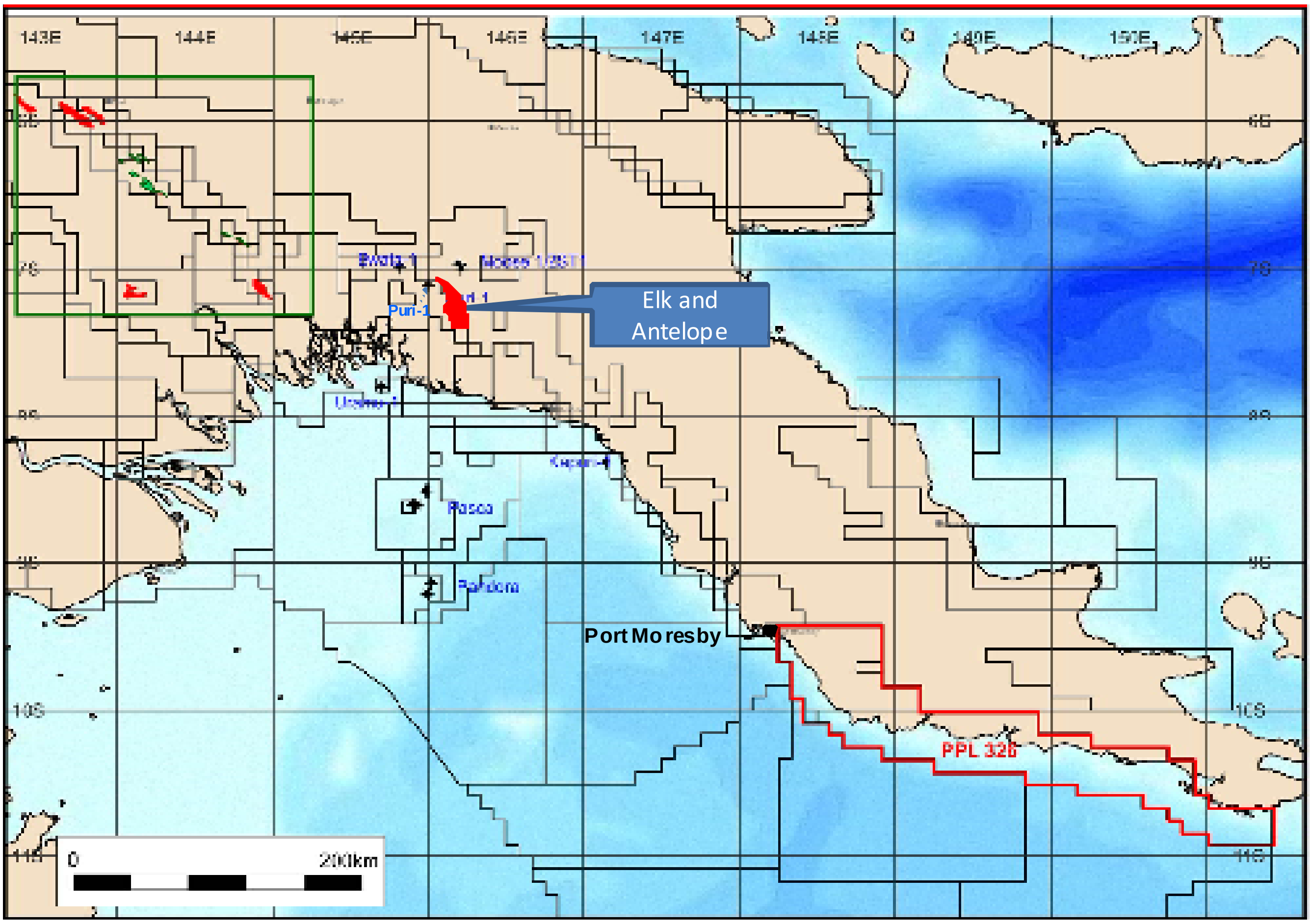

Figure 2 – PPL 326 Regional Setting Showing Well/Field Locations

3.2 Description of Licence

Newport Energy (PNG) Ltd holds a 100% working interest in Petroleum Prospecting Licence 326 (PPL 326). . The PPL was granted to Newport Energy (PNG) Ltd on 27th August, 2009 for a statutory period of six years. PPL 326 is comprised of 200 graticular blocks, **Figure 3**. A complete list of graticular blocks in PPL 326 is included in **Appendix 2**.

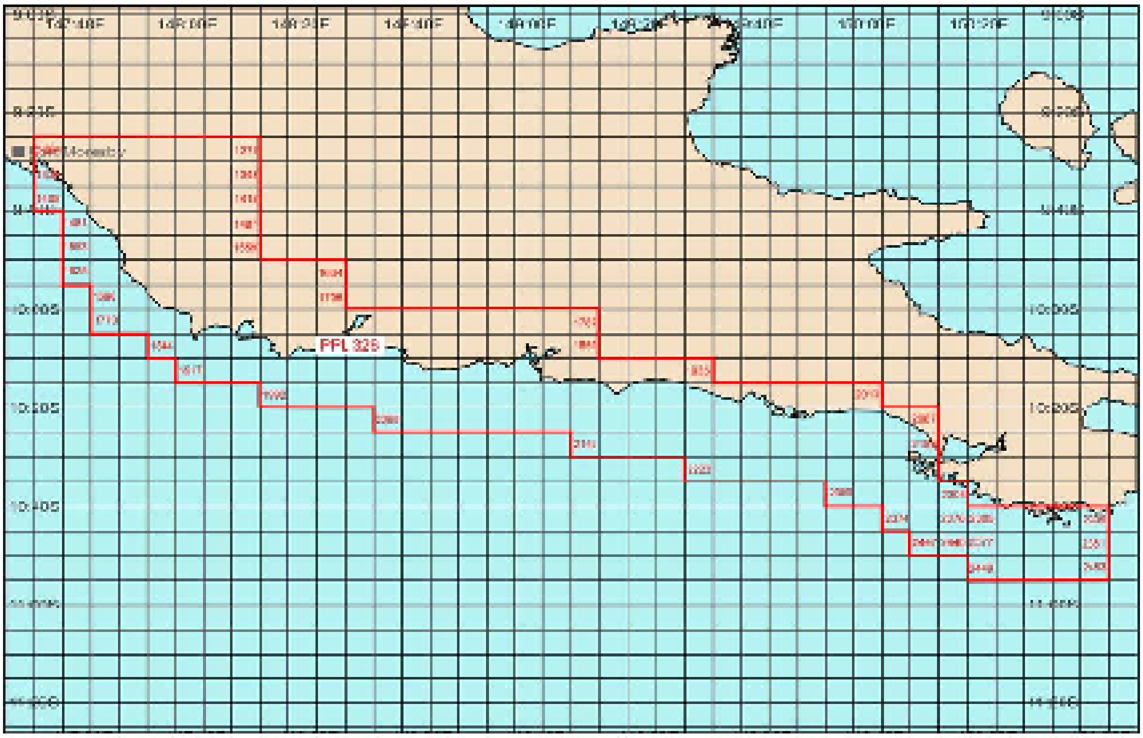

Figure 3 - PPL 326 Graticular Blocks

3.3 Permit History

PPL 326 straddles both onshore and offshore blocks and Newport is the first licensee to hold exploration rights. The licence area is previously un-drilled. Historically, this area has not been leased.

3.4 Committed Work program

The agreed work program is divided into three periods, each of two years duration. The minimum work commitments and estimated expenditure for the work programme agreed at the time of award are shown in **Table 1**. Under the licence terms, exploration work and expenditure carried out in excess of the minimum agreed program may be carried forward in credit against obligations in future years. RPS has examined the committed work program and expenditure estimates as set out below, and is of the opinion that they are realistic and justifiable to evaluate prospectivity of the block.

PERMIT PERIOD	START OF PERIOD	END OF PERIOD	MINIMUM WORK REQUIREMENT	ESTIMATED EXPENDITURE (US$)
Period 1 (Years 1 and 2)	27.08.09	26.08.11	1. Standardized aeromagnetic and gravity data and plan future surveys 2. Conduct complete geological and geophysical review of the licence area 3. Field geological mapping, seep sampling and analysis, where applicable 4. Interpret remote sensing of data including aerial photographs and SAR where available 5. Compile preliminary prospects and leads inventory 6. Plan new seismic acquisition program to mature best leads into prospects	2,000,000
Period 2 (Years 3 and 4)	27.08.11	26.08.13	1. Plan and acquire up to a minimum of 300 kms seismic data 2. Drilling of an onshore exploration well or stratigraphic well 3. Review results of well, revise inventory and establish a final work program for the final term of the license 4. Provision of financial resources particulars of the Licensee to carry out the work program or an acceptable schedule of actions to ensure the availability of necessary financial resources	15,000,000
Period 3 (Years 5 and 6)	27.08.13	26.08.15	1. Drilling of an offshore exploration well 2. Conduct complete license review to establish a summary of the licence prospectivity 3. Decide on the future of the licence 4. If required, provide financial resources particulars of the Licensee to carry out the work program and an acceptable schedule to ensure availability of necessary financial resources	20,000,000

Table 1 - PPL 326 Minimum Work Commitments and Estimated Expenditure

3.5 Work Program Strategy

During Period 1, Permit Years 1 and 2, the work program is designed to generate and validate structural or stratigraphic leads from existing exploration data and establish a prospect and leads inventory through reprocessing of existing seismic lines. As well, this work will form the basis for planning of further block-wide seismic acquisition. Limitations may exist if original data tapes are unavailable and only original paper copy sections are used. As part of the program, reprocessing of regional gravity data will be undertaken to determine the viability of acquiring new regional gravity and/or magnetics surveys. The program is initially focussed on validating and developing the new Mesozoic sub-thrust play.

During Period 2, Permit Years 3 and 4, the most attractive leads will be matured and upgraded to prospect status through acquisition of new 2D seismic data and/or airborne gravity survey. Leads/prospects will be highgraded using regional time/depth maps and play fairway maps. This assessment will be followed by drilling of the most attractive prospect (onshore) or drilling of a stratigraphic well. It is anticipated that a full permit review will determine the future exploration program based on drilling results and a revised prospect inventory. Flexibility in the licence terms allows for relinquishment in the event prospectivity is downgraded.

Progression to Period 3, Permit Years 5 and 6, is contingent on the results of assessments during the first two periods. Assuming the exploration licence progresses to Permit Years 5 and 6, drilling of an offshore prospect would be undertaken followed by a complete permit prospectivity review. In the event of a commercial oil or gas discovery being made, it would be necessary for Newport to apply to the Minister for Petroleum and Energy for grant of a Petroleum Production Licence prior to development.

3.6 Previous Exploration

PPL 326 is previously unexplored and no wells have been drilled within the block. Moreover, there has been no exploration drilling east of Pandora-1X which found gas within a patch reef approximately 250 km to the west northwest. In 2006 Fugro/Searcher acquired the speculative Lahara 2D Seismic Survey over the Eastern Papuan Basin area. Existing vintage seismic over the Eastern Papuan Basin was either reprocessed (1,167 kms) or scanned and vectorised (130 kms). The Eastern Papuan Basin acquisition formed part of a larger Gulf of Papua/Eastern Papuan Basin survey of 12,972 line kilometres new acquisition, 16,436 kms reprocessing and 14,377 kms scanned data. Of this new dataset, only 461.85 kms of new data was acquired within PPL 326 with the reprocessing of 88.55 kms and scanning/vectorising of 18.208 kms additionally made available, **Figure 4**. Newport arranged for RPS to have access to all of the Fugro/Searcher Lahara seismic data within PPL 326 block for the purpose of this evaluation.

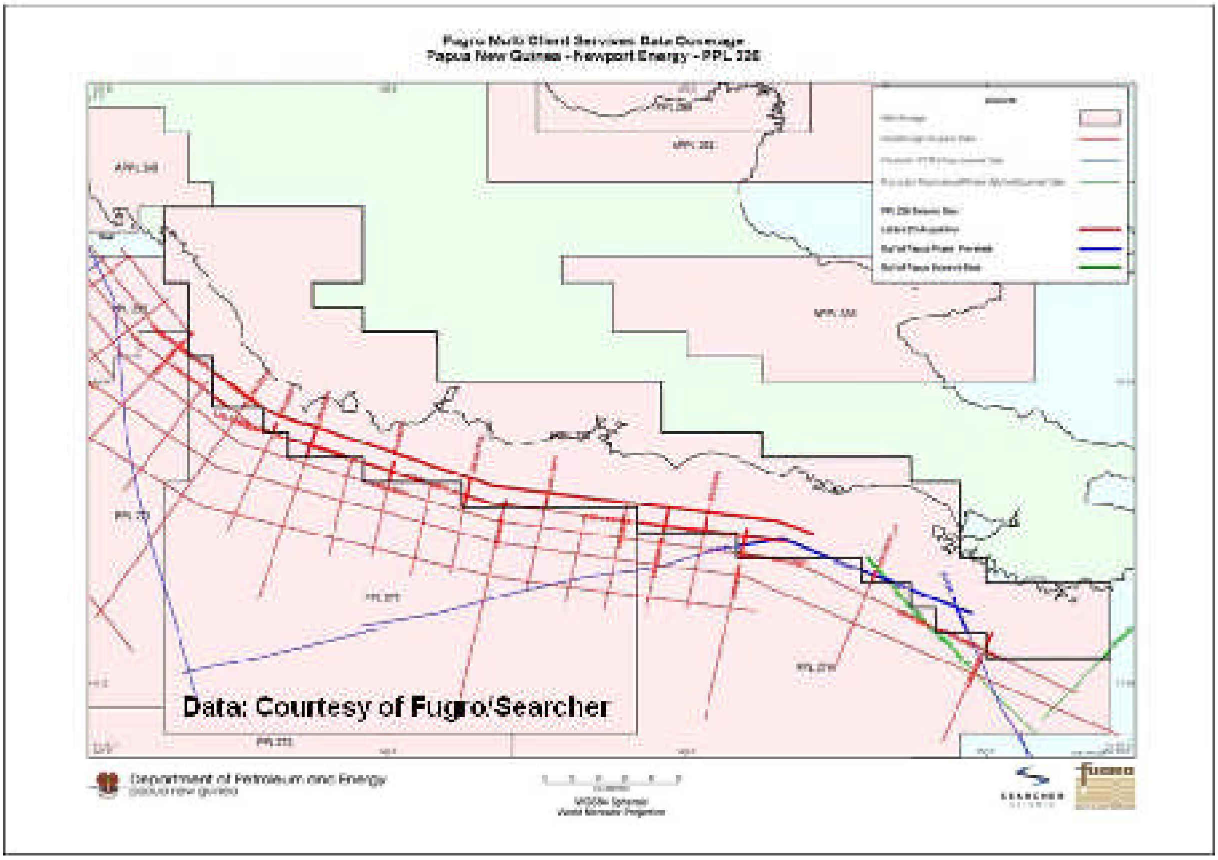

Figure 4 - Seismic Data Base Within and Adjacent to PPL 326

4. REGIONAL GEOLOGY

4.1 Geological Setting

PPL 326 is an onshore/offshore tract which lies between the Papuan Peninsula and Papuan Plateau in the eastern Papuan Basin, **Figure 5** and **Figure 6**. The tectonic fabric evident in the surrounding province is related to tectonism along the northern Australian margin which ultimately led to opening of the Coral Sea Basin. The province to the west and south of PPL 326 is a continuation of the foreland basin to the New Guinea Orogen. The Papuan peninsular immediately north of PPL 326 is largely occupied by the New Guinea Orogen.

The New Guinea Orogen was initiated in Oligocene time. The foreland basin in eastern New Guinea is considered to be no older than Early to Middle Miocene. During the Early Miocene a collision of the Eastern and Papuan plateaus produced the fold/thrust belt through PPL 326, a composite accretional terrain in the Papuan Peninsular and flexure of the leading edge of the margin to form the Moresby Trough foreland basin. The Moresby Trough was initiated in the Early Miocene as a flexural basin formed in front of the thrust zone. The trough developed in response to loading of the Papuan Peninsular onto thinned continental crust at the northern edge of the marginal Papuan Plateau. The Aure Trough probably originated slightly earlier in the Oligocene. Importantly, the Moresby and Aure Troughs did not exist during Late Cretaceous to Early Tertiary time. Initiation of orogenesis from the mid-Oligocene was responsible for regional reactivation of pre-existing Late Cretaceous to Early Tertiary structures.

The tight fold/thrust belt developed within PPL 326 occupies a narrow shelf to the south of the Papuan Peninsular (Owen Stanley Obduction Complex). The relatively narrow Aure fold/thrust belt extends along the southern edge of the peninsular and diminishes in intensity near the southeastern end. The Aure thrust belt broadens to the west and northwest and has its strongest expression in the Aure Trough, an Oligocene-Middle Miocene depocentre northwest of PPL 326. The Aure thrust belt is considered to be probably transitional to the western Papuan fold/thrust belt and their development is considered to be broadly coeval, **Figure 5**. The PPL 326 block is underlain in part by the southeastern extension of the asymmetric Moresby Trough which is contiguous with the southern Aure Trough, **Figure 6**.

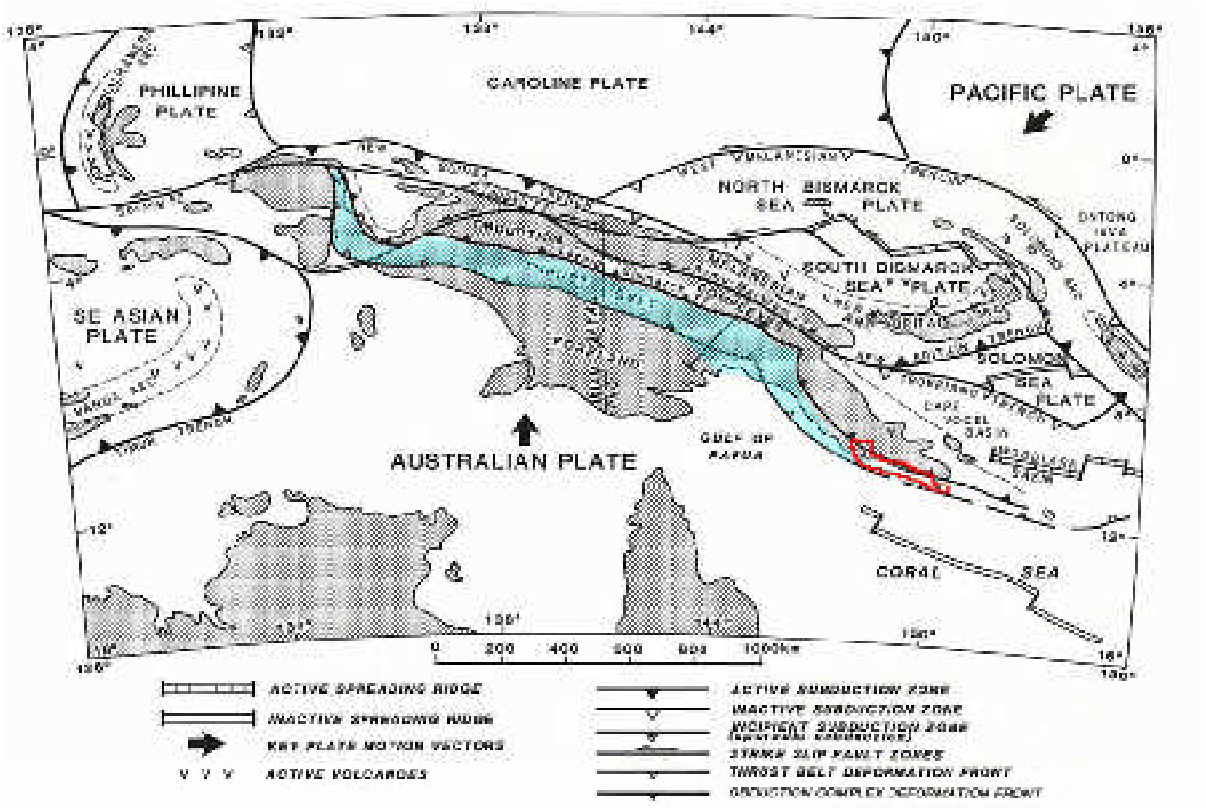

Figure 5 - Present Day Structural Setting of PPL 326 and the Aure fold/thrust Belt (Modified after Smith, 1990)

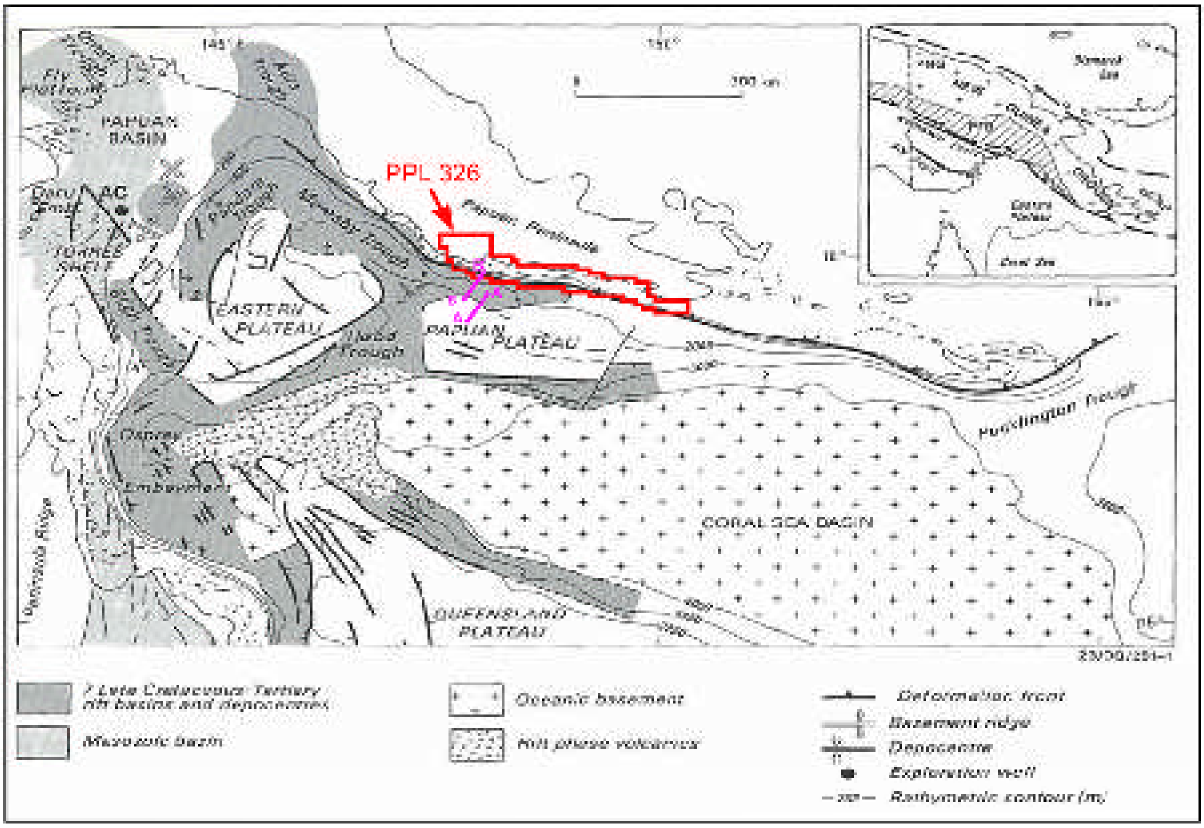

Figure 6 - Major Tectonic Elements Relevant to PPL 326 (After Pigram et al., 1993)

The deep water Moresby Trough separates the Papuan and Eastern plateaus from the Papuan Peninsular. The northern trough margin is formed by the fold/thrust belt which defines the southern margin of the Papuan Peninsular. A published regional interpretation of the foreland basin character of the Moresby Trough is illustrated in the schematic profile shown in **Figure 7**. This interpretation is based on a 1986 vintage single channel, single air gun, unprocessed field acquisition sparker survey line (see **Figure 5** for location)..

An alternative interpretation of this profile based on interpretation of recent 2007 120-fold, full processed high resolution regional seismic data is shown in **Figure 8**. The interpretation relies on limited regional data but recognises three tectonically-related unconformities and associated megasequences. Published interpretation of the vintage 1986 line did not recognise all three unconformities. This interpretation is the basis for interpreted presence of a previously unrecognised Mesozoic petroleum system in the region of PPL 326. The Mesozoic megasequence resides in a sub-thrust relationship to the main Mio-Pliocene thrust detachment. The sub-thrust model and Mesozoic petroleum system concept is contingent on correct identification of the “Coral Sea Unconformity” (**Figure 9**) which was previously unrecognised. Significant crustal thickening is evident towards the northeast end of this line and is attributed to overthrusting. Crustal thickening is also supported by seismic refraction results (BMR) in conjunction with a positive geoid anomaly of 127m over Port Moresby. Younger crustal sheets could conceal older crust in the sub-thrust.

Seismic-stratigraphic interpretation of the key regional line (**Figure 9**) through PPL 326, however, is unconstrained by well data. RPS is unable to verify the interpretation with additional limited data in the block, but considers the geological concept to be plausible.

The Papuan Plateau, consists of thinned continental crust and is formed in the foreland basin. The northern margin of the Papuan Plateau has been deformed as a result of collision with the Papuan Peninsular terrane. The Hood Trough separates the Papuan Plateau from the Eastern Plateau and is believed to be contiguous with the Moresby Trough. The southern part of PPL 326 in part straddles the northern flank of the Moresby Trough in water depths of between 200m and 1000m. The seafloor deepens rapidly to the south to in excess of 2000m over the Papuan Plateau-Eastern Plateau regions.

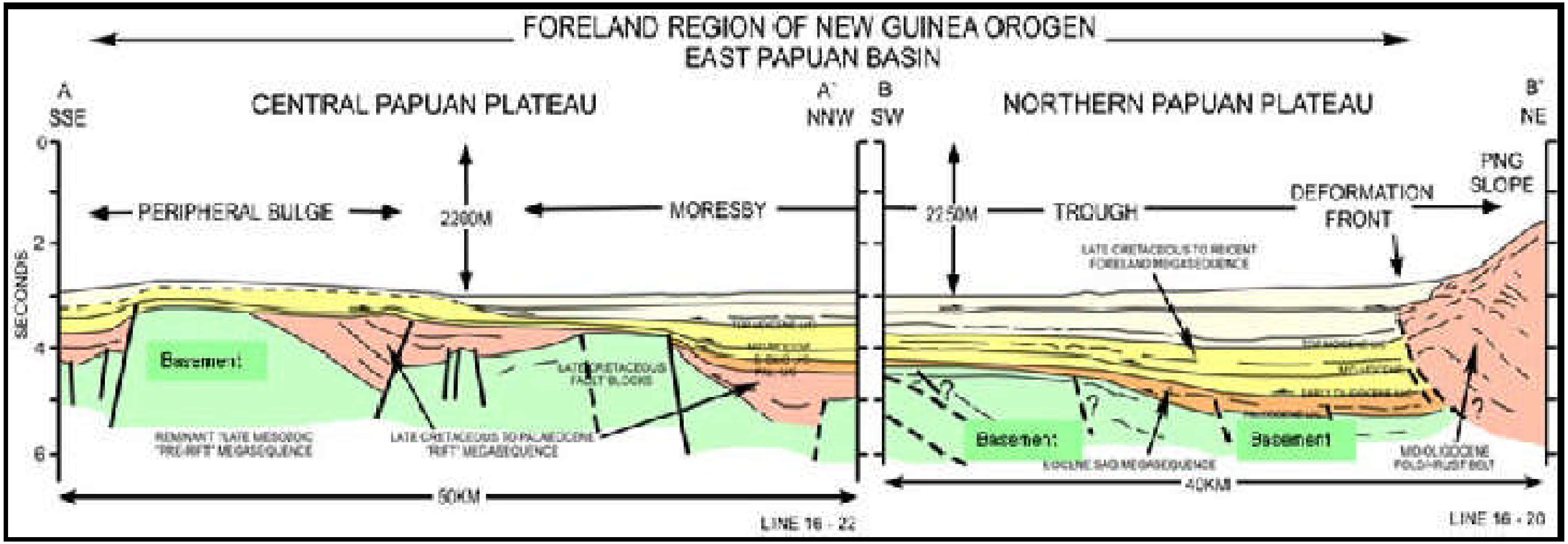

Figure 7 - Schematic Structural Profile Across the Papuan Plateau and Moresby Trough (After Pigram et al., 1993)

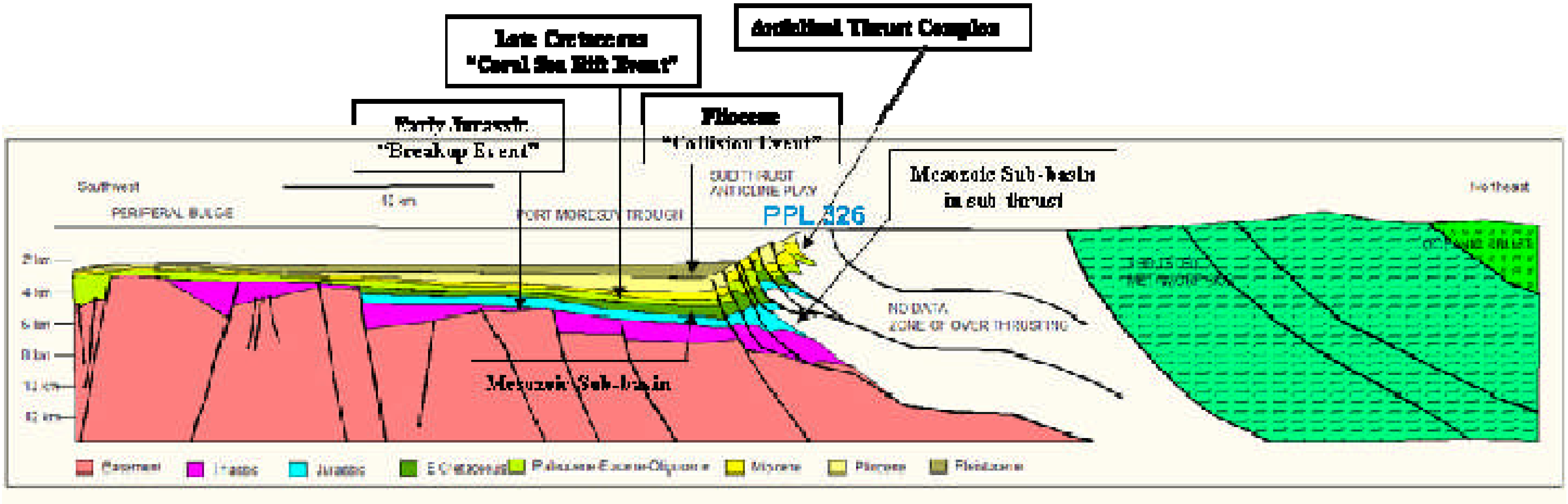

Figure 8 - Schematic Structural Profile based on Sub-thrust Model

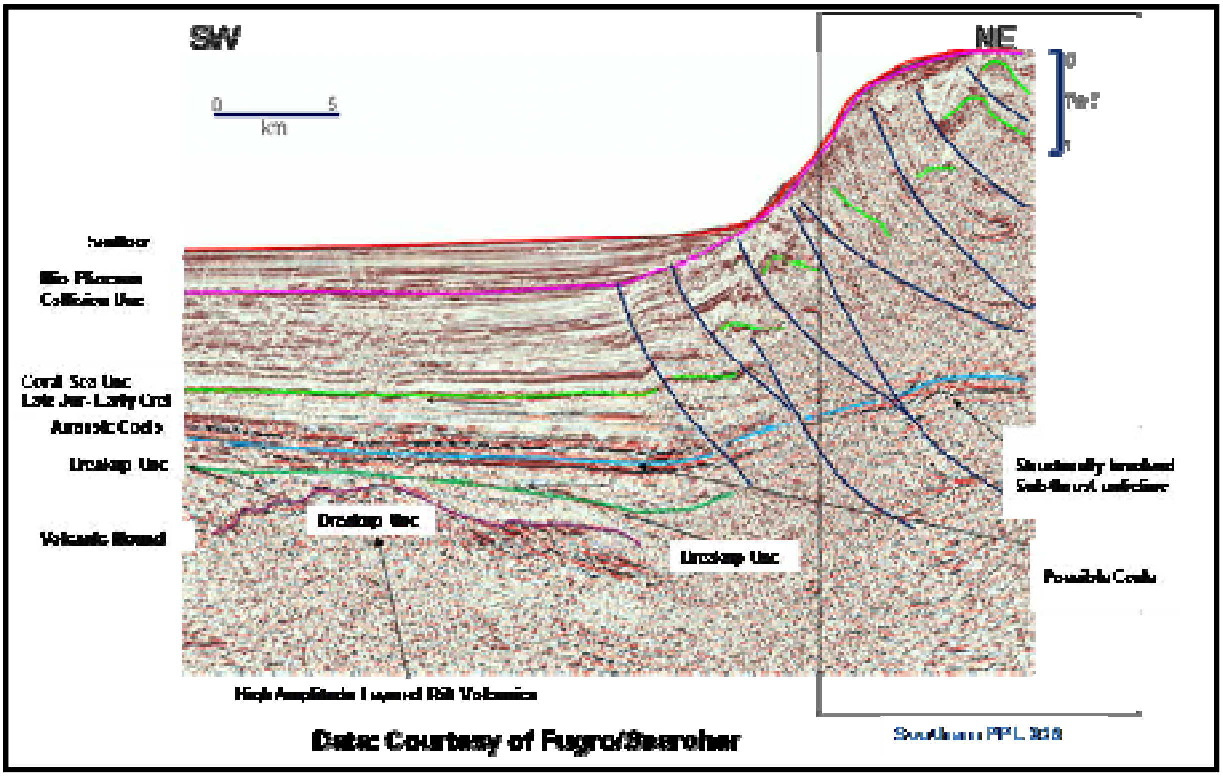

Figure 9 – Regional Seismic-Stratigraphic Interpretation Extending into PPL 326

The onshore mainland accretionary terrain within PPL 326 lies between the Owen Stanley Ranges and the Eastern Papuan Basin and has been informally described as “suspect composite terrain” or “Scrapland” based on mapped surface exposures (see onshore geological mapping – **Figure 10**). Within PPL 326, this onshore terrain consists of a belt of Palaeogene (Eocene-age) marine tholeiitic (basalt-gabbro-dolerite ultramafic) volcanic complexes. Kutu Volcanics outcrop in the southeastern part of the block and consist of Eocene basalt, gabbro and dolerite, **Figure 10**. The volcanics are thrust-faulted against Cretaceous-Early Tertiary Owen Stanley Metamorphics to the north and transcurrently faulted against Cretaceous-Early Miocene sediments near Port Moresby. The Eocene Sadowa Intrusive Complex (basalt, gabbro, dolerite, hemipelagics) outcrops near Port Moresby and has a gradational boundary with the Kutu Volcanics, **Figure 10**. The Sadowa is faulted against Owen Stanley Metamorphics and unconformably overlain by a latest Miocene-Pliocene overlap agglomerate assemblage. This accretionary complex lies to the south of a terrain of Cretaceous-Tertiary metamorphics and the Papuan Ultramafic Belt. Palaeozoic and Mesozoic crystalline basement blocks, have been mapped to the northwest, but not within PPL 326. The region is overprinted by folding and thrusting of the foreland. The north-northwest-trending Tauri Fault, significantly west of PPL 326, has been proposed as the western boundary of “Scrapland” with the Aure Trough.

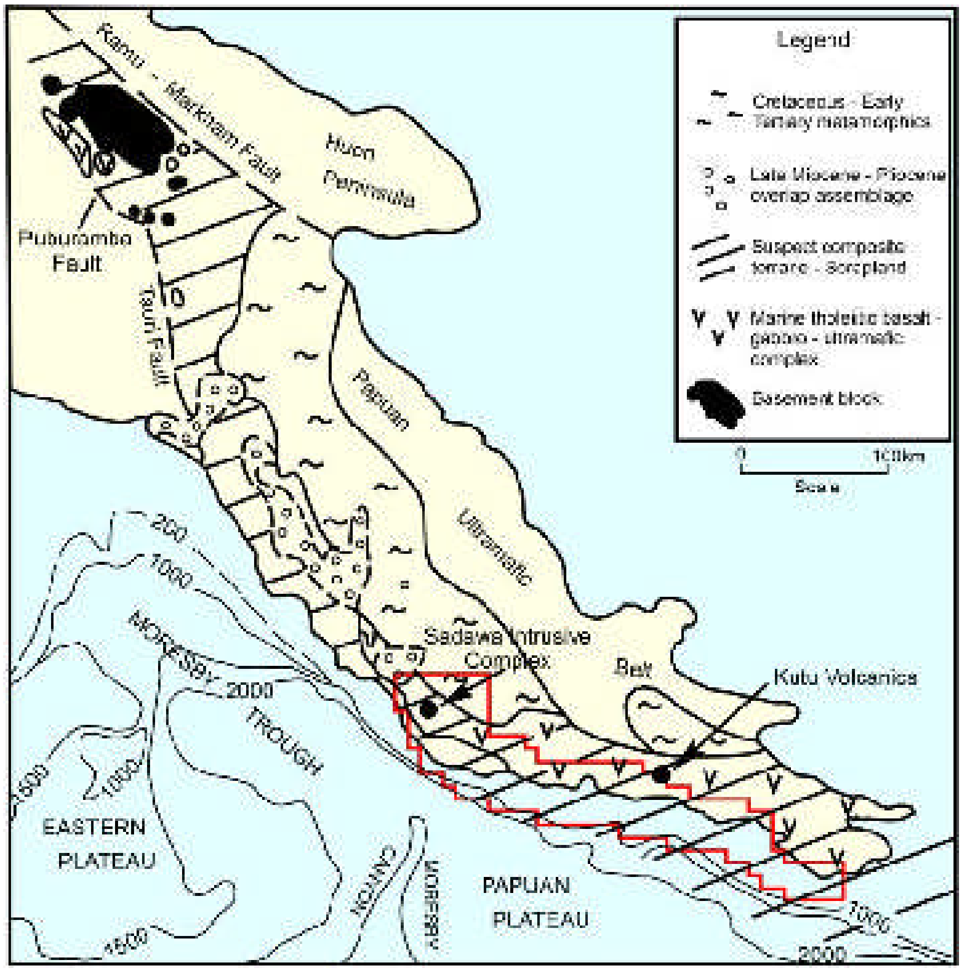

Figure 10 - Simplified Onshore Geology Within and Adjacent to PPL 326 (After Rogerson et al., 1990)

4.2 Tectonic Development

The present day plate tectonic configuration of Papua New Guinea is the result of oblique convergence between the northern Australian plate and western Pacific plate which controlled Tertiary evolution of the Papuan Basin. The Papuan Basin region is an extension of the Palaeozoic-Mesozoic Westralian Super-basin which is characterised by Gondwana sag deposition during the Permian superposed by Triassic through Cretaceous Gondwana syn-rift/post-rift development. The Gondwana rift axis was located to the north along the leading edge of the Australian plate. A subsequent rift event in the Late Cretaceous-Early Tertiary was associated with the Coral Sea opening. During the Late Mesozoic, an active plate boundary was probably located adjacent to the Gulf of Papua along the western edge of the Eastern Plateau and projected northward into PNG, **Figure 6**. Doming to the south and dislocation along the plate boundary transfer zone resulted in Cretaceous-Palaeocene development of the Eastern and Papuan marginal plateaus. The present-day eastern New Guinea Orogen formed from multiple subduction and obduction events and collision with the northern Australian craton. The Papuan and Aure fold/thrust belts reflect Late Miocene-Pleistocene deformation of the northern Australia passive margin. The plate boundary configuration in eastern New Guinea/eastern part of northern Australia during the latest Cretaceous and early Tertiary is shown in **Figure 11**. A north-northeast-trending regional transfer fault separates continental crust in the west from dislocated continental crust of the marginal plateaus and oceanic crust and was the focus for opening of the Coral Sea Basin. The fault system extended along the western margin of the Eastern Plateau beneath the Bligh and Pandora troughs The Pandora Trough was initiated in the Cretaceous as a "pull-apart" basin along the fault system which extends northward to the proto-Aure Trough.

Basin development is characterised by three regional tectonic events associated with structural rotation and sub-aerial erosion. These events have resulted in three principal megasequences. From stratigraphically oldest to youngest, these are: an Early Jurassic "Breakup Unconformity" marking the top of the "pre-rift" Gondwana sequences, the Late Cretaceous "Coral Sea Rift" event defining an erosional top to the Mesozoic petroleum system and the Pliocene collision event with associated folding, thrusting and later inversion. The "Collision Unconformity" is clearly defined within the thrust environment. The Papuan Plateau was subaerially exposed and deeply eroded during the Late Cretaceous "Coral Sea Unconformity" event. However, regional seismic suggests that an underlying Mesozoic section is preserved. This unconformity has a northerly subcrop aspect with evidence of truncation and onlap. The :Breakup Unconformity" is recognisable from angular truncation, fault block orientation and associated onlap. Although there are potential age and stratigraphic similarities between the western and eastern Papuan rift basins, it is possible they are separate basins. Potential stratigraphic affinities may exist with the Laura Basin in Queensland and offshore Queensland Plateau. If so, the productive Toro Sandstone equivalent reservoir, the primary target in the western Papuan fold/thrust belt, may also be present. It has been presupposed that this reservoir or its age-equivalents would have been eroded out during the Coral Sea opening.

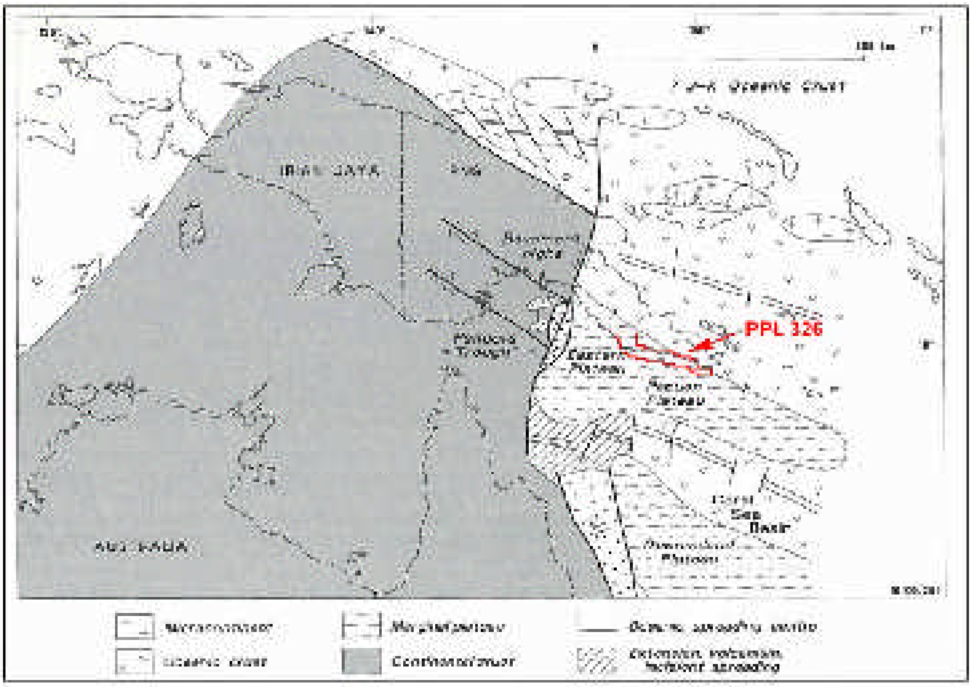

Figure 11 - Latest Cretaceous and Early Tertiary Plate Boundary Configuration

(After Pigram et al., 1993)

The Aure Trough resides over the suture between eastern Papuan terrain and the Australian craton. Movement along the fault system formed incipient structural highs. Regionally, structural highs were reactivated in the Oligocene and Miocene, and were enhanced to form ridges as sites for subsequent reef growth such as the Pandora and Pasca complexes and possibly further north in the Aure Trough at Antelope/Elk fields. Areas of uplift may have also been sources for clastics derived from older eroded 'pre-rift" sediments.

4.3 Stratigraphic Setting

4.3.1 Cenozoic

Tertiary stratigraphic development of the Moresby Trough and eastern Aure Trough reflects formation of the foreland basin south and southwest of the Papuan Peninsular, respectively. Without well control, the stratigraphic framework of the Moresby Trough is poorly defined. RPS' seismic interpretation is not constrained by direct well control. The Tertiary stratigraphic succession would represent deposition during a period of active thrusting along the juxtaposed margin in a foreland basin setting during Neogene convergence. Stratigraphy of the northeast margin of the Aure Trough is a guide to the expected Tertiary sequences in the Moresby Trough although they are likely to be thinner in the latter area. Stratigraphic trends in the Aure Trough are related to Tertiary regional tectonic events. Oligocene to Early Miocene sediments are entirely influenced by highstand conditions. Middle to Late Miocene and Pliocene sedimentation is influenced by uplift of the Papuan Peninsular, localised deformation, onset of magmatic arc volcanism in the New Guinea Orogen and Pliocene deformation of the Aure fold/thrust belt.

The Papuan Peninsular north of the Moresby Trough and east of the Aure Trough is underlain by the Papuan Ultramafic belt, Owen Stanley metamorphics, the eastern volcanic plateau and a coastal and offshore area of folded and faulted Palaeogene/Neogene sediments west of the orogen margin near Port Moresby. In the Port Moresby area, an intrusive complex (Sadowa Intrusive Complex) separates the metamorphics from the folded/faulted sediments, **Figure 10**. The probable regional stratigraphic setting of PPL 326 in the Tertiary is established from stratigraphic relationships in the onshore and offshore Aure Trough, **Figure 12**. However, it is noteworthy that the Moresby Trough in PPL 326 is younger and structurally less well developed.

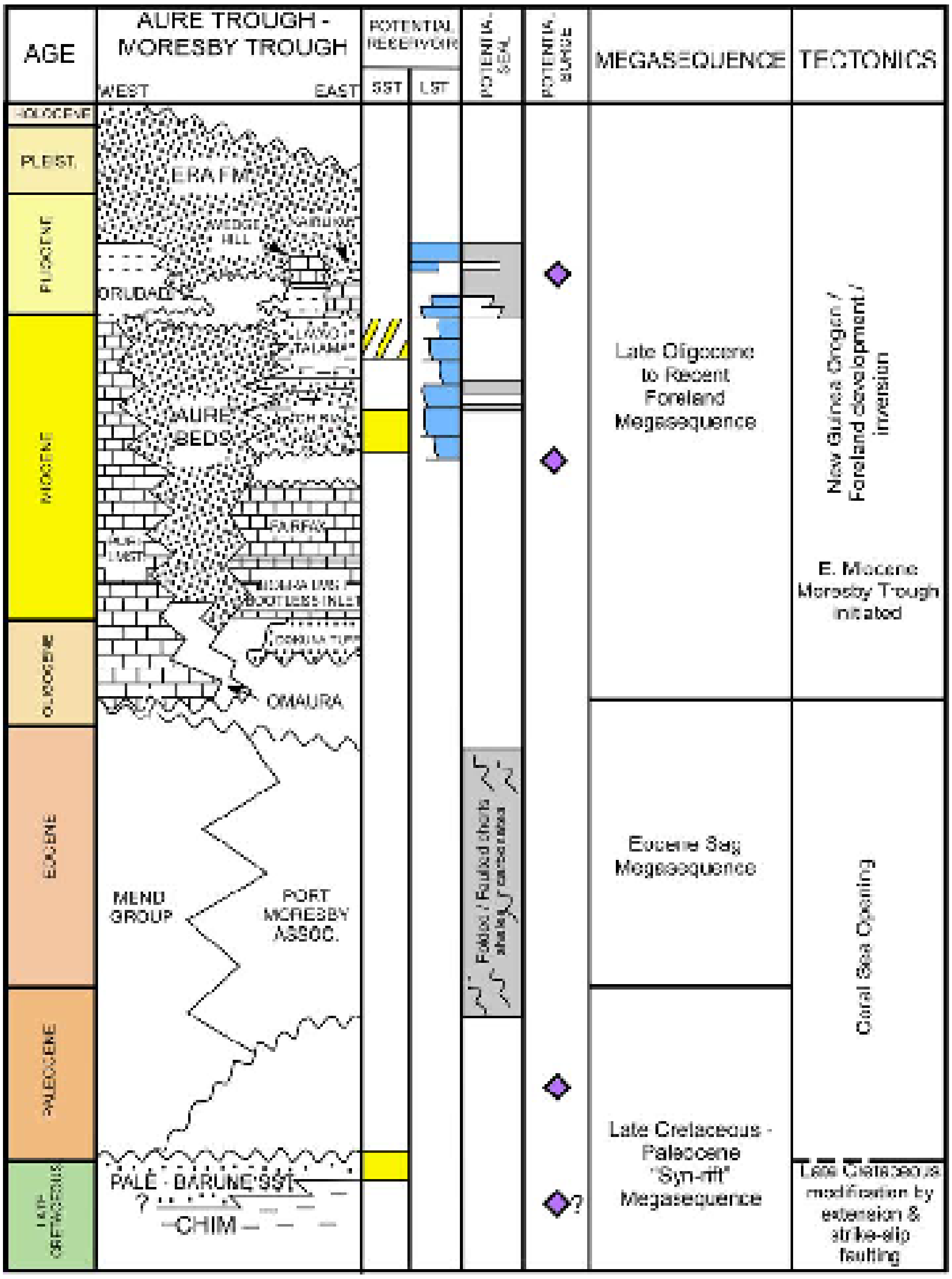

Figure 12 - General Stratigraphic Column for the Aure Trough-PPL 326 Area (Modified after Slater et al., 1993; Kendrick et al., 1997)

With respect to onshore geology in PPL 326, outcropping sediments in the coastal folded/faulted zone include Palaeocene to Middle Eocene chert, shale, and fine-grained carbonates of the Port Moresby Association or Mendi Group-equivalent. This is part of the Palaeogene accretionary wedge, commonly referred to as "Scrapland" terrain, **Figure 10**. Campanian-age shallow marine (neritic) sandstones (Barune Sandstone) also outcrop in the Port Moresby area, and may be an exploration target offshore. The Barune Sandstone appears to be tectonically-emplaced adjacent to the Koki Fault Zone and is in a thrust relationship against Palaeocene/Eocene sediments. The lithofacies is well-bedded, calcareous sandstone with interbedded arenaceous skeletal limestone. The Barune is stratigraphically-equivalent to the Pale Sandstone which outcrops on the south side of the Aure Fault scarp, in the northern onshore Aure Trough, **Figure 12**.

Discontinuous outcrops of Oligocene tuffaceous sandstone and Oligocene-Lower Miocene bioclastic/volcanoclastic wackestone and packstone are also noted. These units were deposited as gravity slumps in bathyal conditions. Coastal exposures of Middle Miocene and younger sediments (northwest near Delena) include the Chiria Formation, a lower siliciclastic unit and overlying Lavao Formation consisting of a mixed clastic-carbonate lithofacies, **Figure 12**. The mid-Miocene Chiria sands are a valid exploration target. The lower part of the Chiria consists of thin to thickly bedded sandstone, shale and conglomerate which were probably deposited as submarine fans by gravity flow in upper bathyal or deeper water. The sandstones are lithic having a provenance in the volcanic-metamorphic terrain of the Papuan Peninsular. The upper part of the Chiria is interpreted as a deepwater distal turbidite sequence consisting of thinly bedded shale and minor sandstone units. This facies is overlain by thickly bedded shales/pebbly mudstones deposited as slumps and mudflows in bathyal conditions.

The Middle to Late Miocene Lavao/Talama sequence overlying the Chiria consists of a lower carbonate mudstone/bioclastic wackestone facies probably deposited on a carbonate slope and overlain by neritic alternating sandstone-conglomerates and carbonate intervals, **Figure 12**. Carbonates (sandy bioclastic packstone, bioclast floatstone to rudstone) are interpreted to represent mainly a redeposited facies, however, several intervals are interpreted as shallow marine reefal facies. Development of reefal carbonate reservoirs offshore is a proven exploration target. The central Aure Trough is much deeper than the Moresby Trough and contains up to 10,000m of post-Oligocene submarine fan facies (Aure Beds). The Auri Beds range in age from Late Miocene through Early Miocene and comprise interbedded lithic sandstones and mudstones deposited as a suprafan/distal turbidite sequence in bathyal conditions. These indurated but poorly cemented, friable sediments do not constitute a primary exploration target.

Latest Miocene to Early Pliocene/Pleistocene sediments include the upper bathyal marine Orubadi Beds which is a shale-prone facies with minor neritic sands near the top and shallow marine to continental sandstone, conglomerate, shale and diamictite of the Era Formation, **Figure 12**. Local carbonate build-ups are also known in the Pliocene.

4.3.2 Mesozoic

Presence of Mesozoic section concealed beneath an over-thrust Tertiary complex is inferred from regional seismic-stratigraphic interpretation. There is no evidence of Mesozoic outcrop onshore. Mesozoic (Late Jurassic to Cretaceous) stratigraphic development in the PPL 326 area would be related to syn-rift/post-rift deposition following Gondwana breakup in the Early Jurassic. The Coral Sea hinge zone is identified as the area of the ‘peripheral bulge’ (see **Figure 8**) where there is a transition zone between south-dipping faults associated with the Coral Sea opening and north-dipping faults related to Gondwana breakup. Seismic evidence suggests this older section has been preserved having not been as extensively eroded in the PPL 326 area. Timing of fold/thrust development is consistent with the concept that northeasterly thickening towards the block is probably related to degree of erosion at the Coral Sea Unconformity rather than downloading along the thrust front. Depositional thickening is confined to the Tertiary. Seismic character is suggestive of an overall fining up progression from probable terrestrial facies near the base to ‘seismically-transparent’ deep marine shale-prone or carbonate facies in the Late Cretaceous.

Presence of Jurassic coals is inferred from impedance contrast within strongly coherent reflection packages. The high amplitude seismic events are believed to represent bifurcating coals and are cyclic in character. Coaly facies would suggest additional evidence for association with local unconformities and lower coastal plain to estuarine clastic reservoirs. It is plausible that reservoir facies equivalent to productive Mesozoic sands in the Papuan fold/thrust belt might be developed as associations of low stand estuarine through shallow marine shoreface sands. Interbedded lower shoreface sands through offshore facies may be present in more distal settings.

4.4 Hydrocarbon Habitat

The primary play and principal producing zone in the western Papuan Basin are the Early Cretaceous Toro Sandstone reservoirs sourced by organic-rich Middle-Late Jurassic source rocks. The best clastic reservoirs occur in the western Papuan Basin associated with the stable platform area. The best source facies is developed in basinal deeps further east. These Late Jurassic to Early Cretaceous productive reservoir facies (including Toro Sandstone equivalents), may also be developed in the eastern fold/thrust belt of PPL 326. Mesozoic source facies may similarly be present. Where sufficiently mature, inferred coal facies would constitute an important source.

The primary Cenozoic and sub-thrust Mesozoic reservoir, seal and source zones anticipated in PPL 326 are highlighted in **Figure 12** and **Figure 13**, respectively. Emplacement of Mesozoic reservoir facies would have taken place during breakup and rifting events from the Early Jurassic. Presence of a Jurassic clastic reservoir/source/seal association is inferred from the interpreted presence of a Mesozoic-age sedimentary package. Indirect evidence for presence of reservoir/source/seal associations lies in the suggestion of a Jurassic coal facies.

Emplacement of Tertiary clastic reservoirs would have occurred in response to uplift and erosion of the Papuan Basin in the Late Cretaceous to Palaeocene. Sands of this age, may have been deposited in the Aure Trough along the faulted continental margin, eg Pale Sandstone associated with the Aure Scarp in the Aure Trough. A potentially stratigraphic-equivalent facies (Barune Sandstone) may be developed in the western part of PPL 326. Without well control, distribution into the block is conjectural. Potential reservoir sands of this age may also be discontinuous and confined to basinal areas such as the Bligh/Pandora Troughs and proximal to major strike-slip lineaments within associated transtensional basins and/or on the flanks of structural highs. Trapping mechanisms may have developed through mid-Tertiary reactivation.

Oligocene-Miocene structural events formed NNE-trending reactivated structural highs which are probably confined to pre-existing lineaments, and primarily along the plate boundary fault extending into the Aure Trough. This structural setting is preferred as a focus for hydrocarbon migration and as potential reservoir provenance. The fault-bound Hood Trough separating the Papuan and Eastern Plateaus is also thought to be associated with a north-trending strike-slip fault. Folded rift sediments are believed present and the trough is underlain by complexly faulted basement. Structural reactivation may have provided a source for locally reworked clastics. Similar possible strike-slip fault style is interpreted further east in PPL 326 (**Section 7**).

Rejuvenated structural highs form the focus for carbonate reef growth within the Oligocene to Miocene carbonate platform sequences of the Papuan Basin. The carbonate reefal/mound facies is becoming an important play in the foreland basin, examples of these are the Pandora, Pasca, Uramu pinnacle reefs and Elk/Antelope reef complexes. Similarly, this play may be developed in PPL 326. In particular, there appears to be an association between apparent reactivated strike-slip fault zones and sites of reef development. Current seismic control precludes a full evaluation of this play potential or complete evaluation of reefal form, however. Hydrocarbon charge to these buried reefs/carbonate mounds could be provided by flanking coeval post-Oligocene facies in the Moresby Trough foredeep, from the Aure Trough and/or Late Jurassic/Early Cretaceous passive margin sediments downdip to the west. The Moresby Trough/Aure Trough region probably constitutes a maturation/generation site to source the carbonate reservoirs.

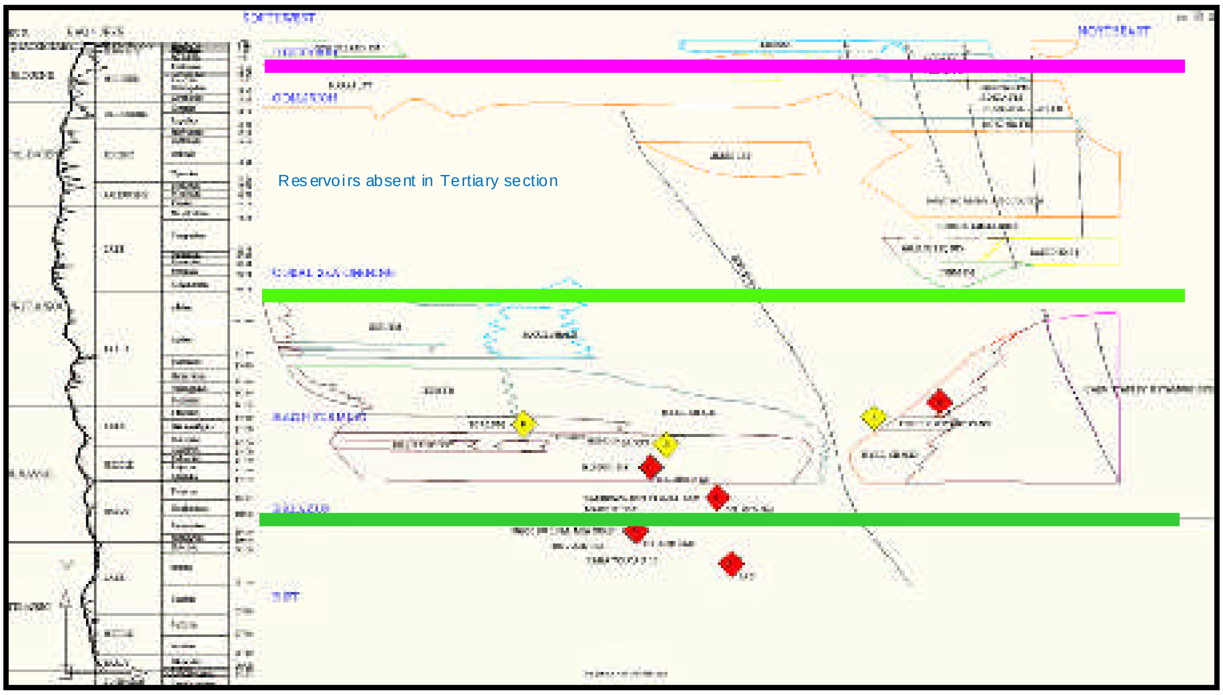

Figure 13 – Mesozoic Petroleum System

4.4.1 Potential Tertiary Reservoirs

The Campanian-age Barune Sandstone has the potential to form an excellent hydrocarbon reservoir. Regional distribution is poorly understood and may be restricted to a narrow belt around the Aure Trough margin. The Barune/Pale is understood to have not been previously encountered in wells. However, reports from InterOil Corporation, regarding the onshore Aure Trough, suggest that this facies has recently been encountered in the subsurface. Its distribution is likely to be affected by degree of sub-aerial erosion and faulting at the Base Tertiary unconformity. A potential narrow fairway may be present beneath the Palaeogene/Neogene foreland basin sequence across PPL 326, but its eastern extent is conjectural. The Barune/Pale fairway may fringe the eastern "Scrapland" boundary, **Figure 14**. Good poroperm characteristics are evident in outcrop section.

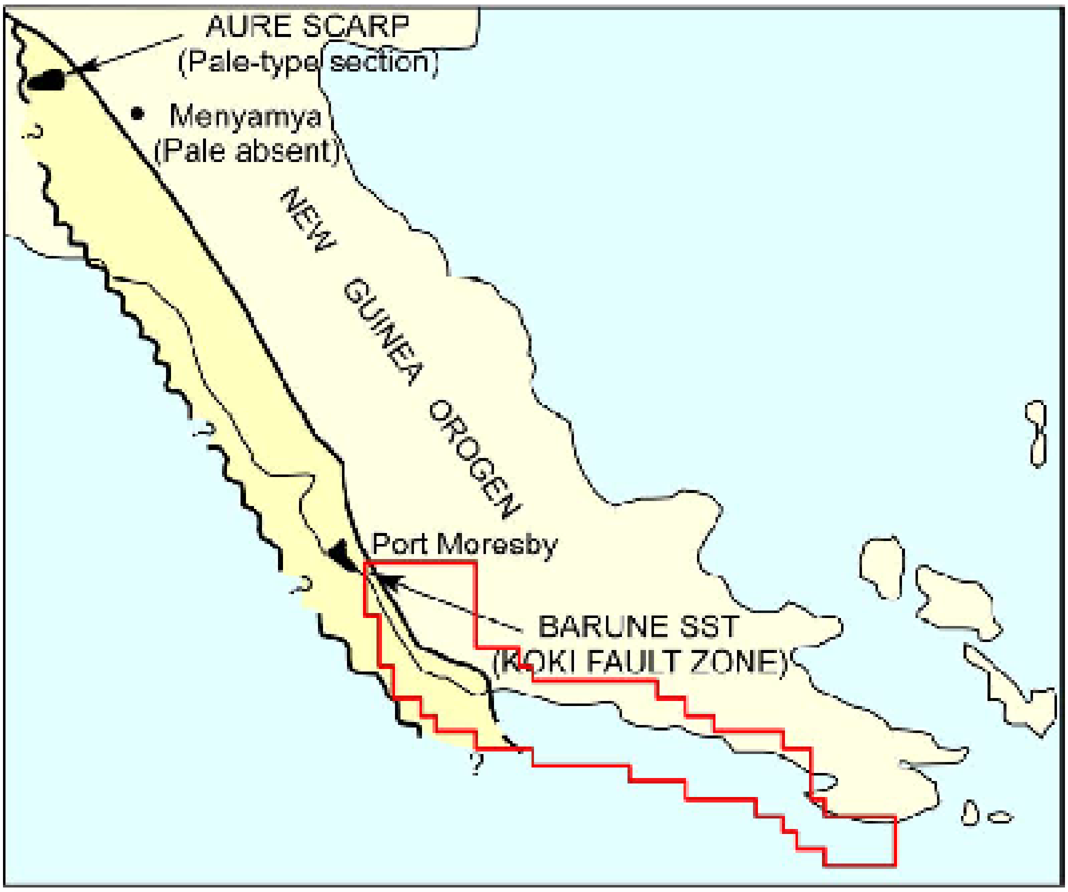

Figure 14 - Potential Barune Sandstone fairway in western PPL 326 (Modified after Slater et al., 1993)

In the Aure Trough, the oil and gas productive Oligo-Miocene Puri Limestone and its equivalents form good reservoirs at Puri-1, Kuru-1 and Bwata-1. These micritic limestone reservoirs have good potential where fractured by involvement in thrust anticline structures. Outcrop evidence indicates that at least the older part of the carbonate facies becomes a more distal siliceous and cherty deepwater facies eastwards. Deepwater limestones may be more prevalent in PPL 326 but are equally prospective as reservoirs where fractured.

Stratigraphic equivalents of the Miocene Aure Beds may be prospective in PPL 326, Regionally, reservoir quality is variable for the poorly sorted, volcanoclastic sands. Shallow marine lateral equivalents to the Aure Beds are more likely in the block. These include Mid-Miocene Chiria sandstones, Middle to Late Miocene sandstones of the Lavao Formation and volcanoclastic Talama Formation sandstones. Both of the latter two units outcrop along the eastern margin of the Aure Trough. The lower part of the Chiria consists of thin to thickly bedded sandstone, shale and conglomerate deposited as a submarine fan facies. The Lavao is an alternating sequence of shallow marine shoreface sandstone-conglomeratic intervals. Talama sands locally provide good reservoir potential.

Late Miocene pinnacle reefs and Mio-Pliocene shelf limestones are also prospective reservoir targets. Good productive quality reservoir of this age is evident at Kapuri-1 in the eastern trough. Distribution of this reefal limestone reservoir facies will in part be reliant on suitable structural enhancement providing sites for reef growth. RPS identified potential reef forms on seismic (**Figure 31**) within PPL 326 but was unable to fully assess this potential due to insufficient seismic coverage.

4.4.2 Potential Mesozoic Reservoirs

There is no nearby well control to derive direct evidence for the nature of Jurassic reservoir facies and no onshore occurrence of rocks of this age. Jurassic and earliest Cretaceous reservoirs are possibly comprised of Toro Sandstone equivalents and older sands, which are productive in the western Papuan fold/thrust belt. Known productive Toro sands are shelfal to estuarine and deepwater Toro-equivalent low stand fans may be present basinward of the Late Jurassic shelf edge. Previous concepts of restricted Toro distribution may not apply.

4.4.3 Potential Seal

Regional top seal is provided by the Pliocene Orubadi Shale and/or its stratigraphic equivalents. The Pliocene is effectively shale-prone and forms an effective overlying seal to both conventional anticlinal fold and overthrust fold traps. Effective top seal for the Barune/Pale reservoir sands would rely on overlying tight limestones to be present. Eocene/Oligocene carbonate reservoirs would be sealed by shales in the basal part of the Aure Beds. Late Miocene reefs would be sealed by virtue of inherent dip closure as well as possible Pliocene shale drape. Topseal to Mesozoic reservoirs would be intra-formational or provided by Late Cretaceous shales in an overall upward-fining sequence.

4.4.4 Potential Source

In the western Papuan Basin, Late Jurassic Maril-Imburu shales are probably the main hydrocarbon source. Coeval Late Jurassic sediments may also be present in close proximity to PPL 326. There is no subsurface control to constrain source potential in the area of the block. Distribution of potential Late Cretaceous source rocks will be influenced by the degree of sub-aerial erosion at the Base Tertiary “Coral Sea Unconformity”. However, the Jurassic part of the Mesozoic petroleum system has probably been preserved in the area of PPL 326..

The primary Tertiary source in PPL 326 is probably in Neogene shale-prone facies, however, there is limited regional information on distribution and quality. The Pandora, Pasca and Uramu accumulations are believed to be sourced from the Tertiary. Absence of well control near the block precludes any meaningful conclusions on Tertiary source potential and generation history at this stage. Migration from mature source rocks in the deeper western part of the Moresby Trough and Aure Trough is the most likely mechanism to charge traps in PPL 326. The primary Mesozoic source would be Late Jurassic/Early Cretaceous marine shales and Jurassic coals with possible contribution from Triassic coal measures. Late Cenozoic sediment thickening related to foreland basin development (late timing for the Moresby Trough) would be required to enhance maturity in kitchen areas adjacent to these plays. Hydrocarbon generation/migration from the Mesozoic sequence would likely be synchronous with structuring, ie. in response to downloading from the developing over-thrust and sub-thrust anticline development. The drainage envelope to structures in PPL 326 is extensive given the large area of the sub-thrust play.

Numerous surface indications of hydrocarbons by way of oil and gas seeps are recorded from the onshore part of the Aure Trough and over a large area of the offshore Gulf of

Papua, Presence of seeps is indicative of a working hydrocarbon generation system. Offshore PPL 326 has not been sampled for oil/gas seeps but verified seeps have been observed on trend, **Figure 15**. The known onshore trend of oil and gas seeps follows the orientation of the mobile Aure fold/thrust belt. Two oil seep locations are reported from the onshore PPL 326 area, however, evidence is anecdotal, **Figure 16**. RPS has not been provided with any direct evidence of the hydrocarbon seeps and therefore cannot validate reported occurrences. Onshore reconnaissance is planned by Newport to confirm their presence and nature. If existence of seeps can be substantiated, then this would provide evidence of migration from an active petroleum system. Alternatively, presence of seeps could be indicative of leaking traps. Presence of seeps would be considered positive for prospectivity of PPL 326..

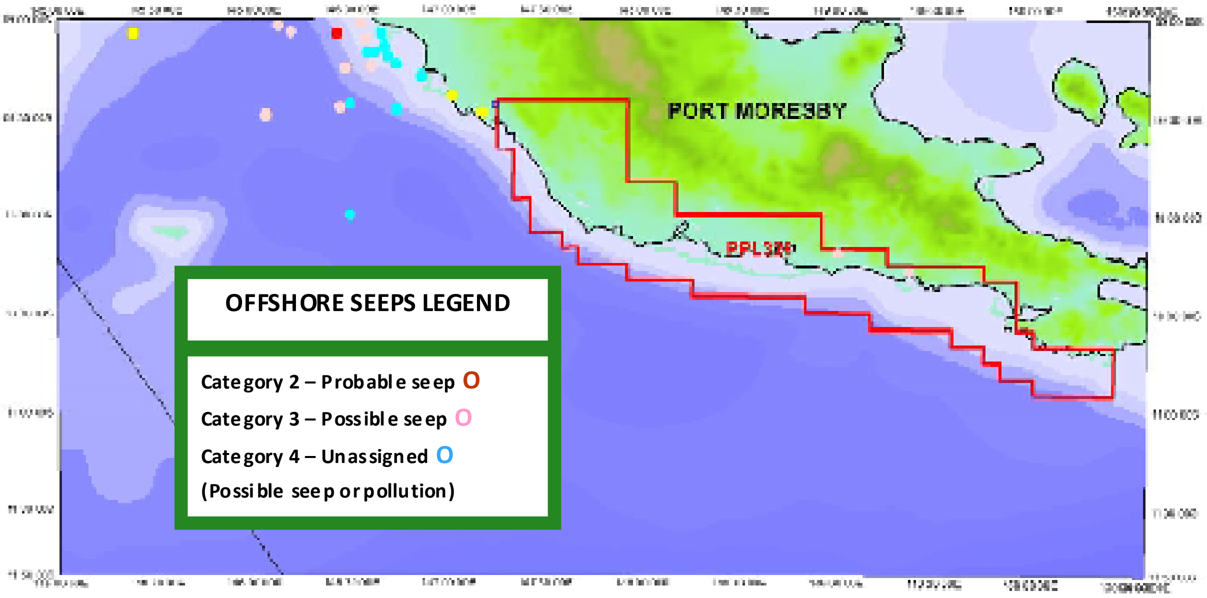

Figure 15 – Offshore Oil Seep Locations Near PPL 326 (Source: Newport)

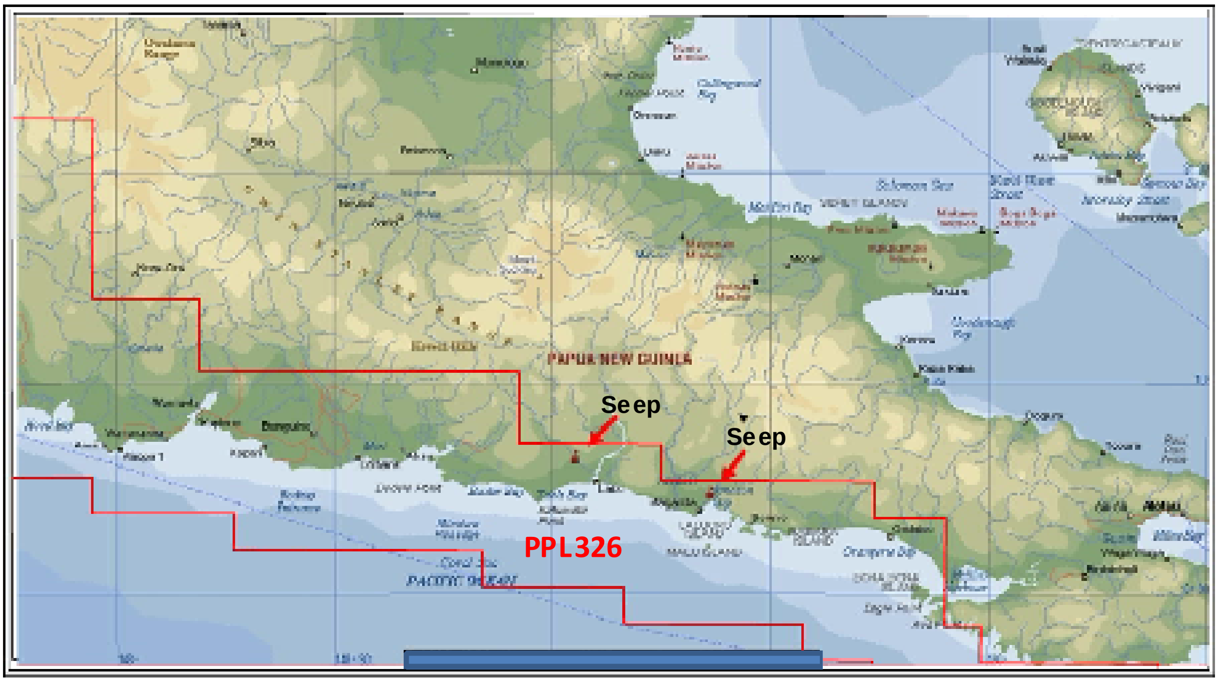

Figure 16 – Reported Oil Seep Locations Onshore PPL 326 (Source: Newport)

5. PLAY CONCEPTS

The essence of petroleum prospectivity in PPL 326 is two-fold, chiefly its structural configuration and its stratigraphic setting. Structurally the block includes the Aure fold/thrust belt and extension of the contiguous Moresby Trough/Aure Trough through to the eastern part of the block. Both the Moresby and Aure Troughs are Tertiary features but the Aure is probably slightly older (Oligocene) compared to the Moresby which didn't exist prior to Early Miocene time. Analogy with the main Aure Trough plays is not direct where the fold/thrust is developed over a wide imbricated area. The fold/thrust belt complex through PPL 326 tends to be relatively narrow between the Papuan Peninsular and the Papuan Plateau. Thickened continental crust is attributed to overthrusting rather than imbrication. Stratigraphic and structural similarities are evident between the two provinces.

In terms of stratigraphic setting, stacked, overthrust Tertiary play systems overlie a potential Mesozoic play system in a sub-thrust configuration. An underlying Mesozoic megasequence would be analogous to the productive western Papuan fold/thrust belt setting. The absence of previous exploration and limited seismic data acquisition preclude confident recognition of critical petroleum geology components for both megasequences. Exploration will target a total of nine different play types (**Section 5.2**) with an emphasis on the previously unrecognised sub-thrust play. PPL 326 is areally large and multiple structural/stratigraphic targets can be expected. As such, the validity of possible play types will remain conjectural until Newport progress its planned exploration program over the term of its licence. Limited guidance to understanding potential plays and defining structural/stratigraphic potential was, however, derived from the Lahara data reviewed.

The main exploration plays are likely to involve both Tertiary clastic and carbonate exploration targets and Jurassic/Triassic clastic reservoir targets in the sub-thrust setting. Structural traps in conventional sub-thrust and over-thrust configurations may be present. The most critical element will be closure along the fold axes and absence of dip reversal along the thrust fault plane. Each of the plays potentially incorporate the primary components for hydrocarbon accumulations of source, reservoir and seal, Presence of mature source rocks in a generative Mesozoic sequence would enhance potential for both Tertiary and Mesozoic targets. However, other critical factors including effective trap development and charge mechanisms to the PPL 326 frontier setting are presently unconstrained and combine to be important risks. Late Cenozoic sediment thickening related to foreland basin development (late timing for the Moresby Trough) would be required to enhance maturity in Mesozoic kitchen areas adjacent to these plays. Geological mapping of surface exposures shows the onshore portion of PPL 326 to be underlain by a terrain of accretionary volcanic complexes. These complexes are thought to conceal the Mesozoic petroleum system in the sub-thrust. If the presence of a Mesozoic sub-thrust play is confirmed, prospectivity of the onshore would be upgraded.

5.1 Basin Setting Contrast

It is pertinent to contrast the eastern Aure fold/thrust belt (AFB) and PPL 326 setting with the western Papuan fold/thrust belt to avoid drawing specific analogy between the two provinces. The western Papuan Basin was initiated in early Mesozoic time and evolved into a passive margin sag basin, punctuated by several phases of reactivation through the Jurassic to Paleogene. Oligocene plate collision transformed the basin into an extensive foreland basin. The basinal setting of PPL 326 occupies an area of thickened continental crust probably due to overthrusting. Based on regional seismic interpretation, Mesozoic rift sediments are inferred to extend across the eastern Papuan Basin and basinal setting of the block,

Key differences/similarities between the PPL 326 region and the Papuan Fold Belt (PFB) include a much narrower, tight frontal fold and thrust zone than the PFB and absence of a wide imbricate fold belt behind the frontal fold/thrust belt. In the area of PPL 326, the structural configuration is interpreted to be over-thrust rather than imbricated. Sub-thrust anticlines involving a Mesozoic petroleum system are inferred beneath the main thrust detachment fault at the Base Tertiary level.

The foreland zone while in a similar setting is younger and tectono-stratigraphically dissimilar. All hydrocarbon discoveries in the western PFB occur in large ramp anticlines within the southwest part of the fold belt. Mesozoic section is involved above steeply dipping thrust faults. These faults were originally deep-seated extensional faults and created rollover anticlines which trapped oil generated in the Late Cretaceous. Present-day oil accumulations represent preserved oil or oil locally remigrated during Neogene thrusting and inversion. Duplex structures involving both Darai carbonates and Mesozoic section occur in a wide imbricate fold belt.

The contrasting style of the PPL 326 fold/thrust belt and Papuan fold/thrust belt in the western Papuan Basin, is in part thought to be related to different types of sediments involved in the two thrust belts. Regional seismic suggests a thin-skinned thrust sequence comprised of a complex of repeated thrust-fault blocks above the main detachment fault, formed by the Oligocene collision event, and thrust anticlines below the zone of detachment. Further, the Moresby and Aure Troughs in the foreland basin did not exist in Late Cretaceous and Early Tertiary time suggesting significant temporal contrast to the Papuan Basin foreland province. Aure Trough sedimentary fill is dominated by a very thick homogeneous and incompetent sequence of Tertiary clastics. To the northwest a much thinner Tertiary sequence of alternating competent (sands and limestones) and incompetent (shales) are present.

Structural orientation/structural styles also differ between the PFB and AFB: In the onshore Aure Trough (Aure fold/thrust belt) structural trends are predominantly north-northwest compared to west-northwest trending trends in the Papuan fold/thrust belt. This orientation difference is believed to be in response to characteristics of the underlying stratigraphy and facies. The principal structural trend in PPL 326 is E-W with a NNE overprint. The onshore Aure fold/thrust belt province is tightly folded and thrust faulted. Tertiary sediments are detached at the near base Tertiary level. This also appears to be the case in PPL 326. In the Papuan fold/thrust belt, thin-skinned structures probably detach within the Jurassic.

5.2 Potential Play Types

Regionally, structural highs are best developed along major fault lineaments and intersection of fault systems. Structuring and trap development (Late Cretaceous to Palaeocene) occurs along the plate boundary fault system and related conjugate systems where the trend extends northwards into the Aure Trough northwest of PPL 326. Sub-thrust Triassic and Jurassic through Early Cretaceous sandstone reservoirs and over-thrust Tertiary sandstone/carbonate reservoirs on and adjacent to mid-Tertiary reactivation structures in PPL 326 are considered prospective settings for hydrocarbon accumulations. The PPL 326 sedimentary section is cross-cut by several major NNE-SSW lineaments which intersect the main E-W thrust belt. Oligocene to Miocene reactivation structures have formed through uplift and inversion by way of renewed strike-slip movement along wrench faults which is also evident in the Pandora Trough and along its margins. Faulted Mesozoic clastic sequences are inferred to be present in thrust-related rollover structures beneath the overthrusted Tertiary section. Reefal carbonate plays as well appear to be associated with the reactivation zones in PPL 326.

A complement of nine potential play types are documented for PPL 326. These plays range in age from Triassic and Jurassic/Early Cretaceous through Late Miocene/Pliocene. The limited extent of available seismic precludes detailed delineation of structural fairways, but, the data is sufficient to provide indications of structuring and carbonate reef development (**Section 7**). Following is a summary of the main play types in stratigraphic order (**Table 2**). The chronostratigraphic setting of each play is shown in **Figure 17**.

Play	Age	Reservoir	Seal	Trap Type
1	Late Miocene	Lavao/Talama Sandstone	Orubadi Shale	Thrust anticline
2	Mid-Late Miocene	Puri Lst equivalent.	Orubadi Shale	Reefal trap
3	Mid-Late Miocene	Puri Lst equivalent. (fractured)	Orubadi Shale	Thrust rollover
4	Mid-Late Miocene	Puri Lst equivalent. (fractured)	Orubadi Shale	Sub-thrust trap
5	Mid Miocene	Chiria Fm basin fan sands	Intraformational	Thrust rollover
6	Paleocene/Late Cretaceous	Pale/Barune Sandstone	Paleocene Shale	Structural trap
7	Early Cretaceous	Toro Sst equivalent.	Intraformational	Sub-thrust anticlines
8	Jurassic	Fluvio-lacustrine sands	Intraformational	Sub-thrust anticlines
9	Triassic	Fluvio-lacustrine sands	Intraformational	Sub-thrust anticlines

Table 2 – PPL 326 Play Types

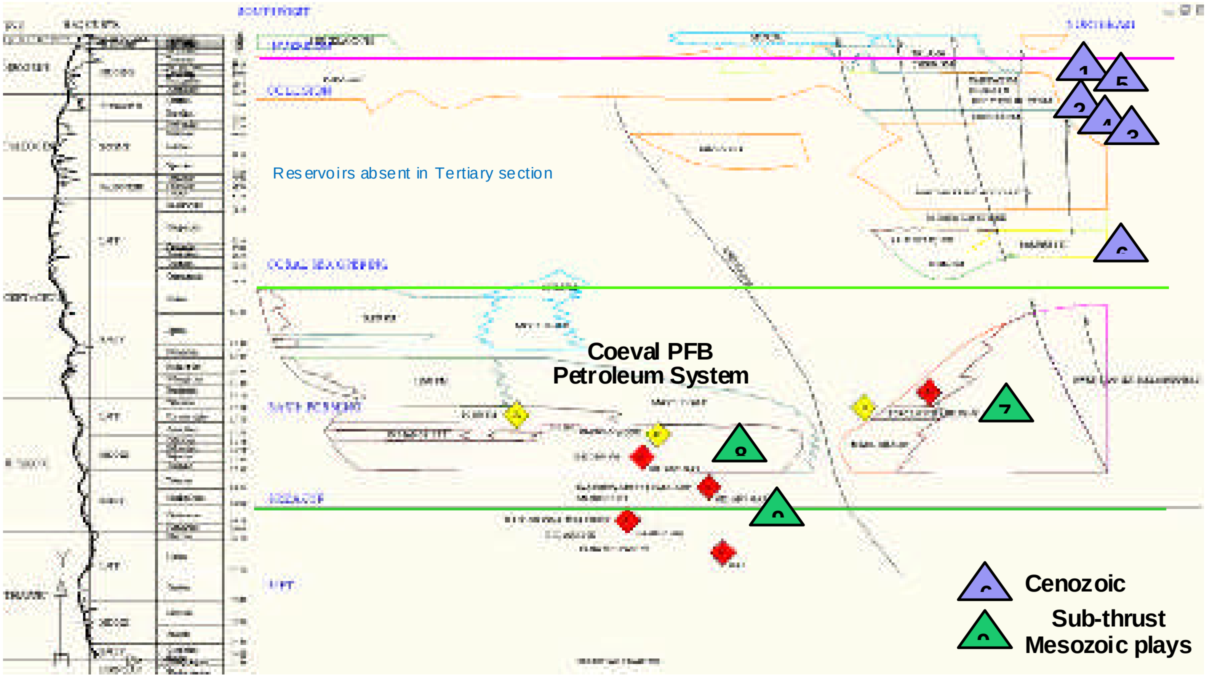

Figure 17 – Chronostratigraphic Setting of Cenozoic and Sub-thrust Mesozoic Play Types (Source: Newport)

5.2.1 Clastic Plays

Structural trapping in fold structures developed in association with thrust faults and relying on post-thrust hydrocarbon migration will be key for the clastic targets. Both hanging wall and footwall traps may be present, however, regionally there is more success with the hanging-wall trap style. Thrust faults appear to sole out within the basal Tertiary section which is common with the Aure Trough fold/thrust belt characteristics. Cross-fault seal would rely on juxtaposition of shales across the thrust fault. Structural traps may also involve drape features at the Base Tertiary unconformity developed over compressional fault blocks reactivated in the Oligocene/Miocene. Some degree of deformed pre-rift Cretaceous (or older) fault block terrain along the northern part of the Papuan Plateau beneath the Moresby Trough is evident from the limited available seismic.

The potential Mesozoic sub-thrust play is developed on the basis of crustal thickening due to thrusting and is proposed to exist below the over-thrust complex of Tertiary sediments and possible metamorphic rocks. Validation of the play will depend on correlation of seismic events on a block-wide database and balanced structural reconstruction through the complexly faulted fold/thrust belt. Critical to this play type is the nature of basement and whether a working Mesozoic petroleum system, in particular presence of mature source, is present in this eastern basin area. Strong seismic reflection events are suggested as indicating Jurassic coal facies. RPS did not have sufficient data to assess this play potential any further. RPS concur on the interpretation of the regional seismic line in **Figure 9** as suggestive of a preserved Mesozoic sequence, but acknowledge that the interpretation is unconstrained and the concept is contingent on proving the model by detailed exploration.

The main clastic reservoir targets are primarily likely to include:

1. Early Cretaceous/Late Jurassic coeval Toro and older sands (Iagifu/Hedinia) present in the western Papuan Basin or their possible basinal equivalents, fluvio-lacustrine Jurassic reservoirs as well as possible Triassic fluvio-lacustrine reservoirs.

2. Campanian nearshore/shoreface sandstones of the Barune Sandstone (equivalent to Pale Sandstone onshore Aure Trough) which outcrop at Port Moresby. Effective topseal would rely on tight platform Puri-equivalent carbonates. The Barune sequence may be present along the trough margin, extending across to the eastern part of the block. The sequence may potentially be missing depending on degree of truncation at the pre-Oligocene surface. Following earlier identification in outcrop, presence of Late Cretaceous Pale Sandstone, has been confirmed in the subsurface by recent InterOil drilling in their onshore Aure Trough blocks.

3. Mid-Miocene submarine fan sands of the Chiria Formation. These reservoirs would be sealed by Upper Chiria shale-prone deepwater facies.

4. Mid to Late Miocene Lavao/Talama sands sealed by Orubadi shales.

5.2.2 Carbonate Plays

The Miocene Darai Limestone and equivalent facies of the Puri limestone carbonate platform complex is interpreted to be extensively developed across the eastern Papuan Basin. Potential platform carbonate plays may include fractured micritic carbonates in structurally deformed/faulted settings or incorporated into the fold/thrust zone. The key to this Oligocene/Early Miocene (Puri-equivalent) play is determining the focus of structural reactivation along fault zones, or associated with intersecting fault trends. Alternatively the carbonates are likely to be fractured where folded. This play has been productive in several wells to the west and northwest at Puri-1, Bwata-1 and Kuru-1. Where involved in thrust fault settings, this carbonate play would require a 'relatively low risk' basinal shale lateral seal to be present across the controlling fault. Regional seismic shows evidence of rugosity and possible subaerial exposure of underlying limestones at the Mid-Miocene unconformity. Enhanced potential for reservoir quality through focused leaching would be developed around faulted/structured zones. The Moose feature in the eastern onshore Aure Trough is the easternmost known occurrence of this play to date.

Late Miocene reef development is superimposed on the carbonate platforms in the distal foreland province. High relief, pinnacle reef complexes incorporating suitable reservoir facies have been drilled at Pasca-1, Pandora-1 and Uramu-1. InterOil Corporation ("InterOil Corp") have as well, recently confirmed Puri Limestone and younger probable Late Miocene reefal limestones from recent drilling. The recent prolific Antelope/Elk gas/condensate discoveries are reportedly in reefal limestones and probably have a Late Miocene affinity. Importantly, the potential buried reefal trap settings are commonly juxtaposed with downdip basinal shale source facies and coeval/overlying intraformational shale seals. Key to locating this play is identification of deformed ridges or reactivated fault trends which have been enhanced by Oligocene wrenching/reverse faulting. These structural highs potentially form a foundation for carbonate reefal growth. Ideally, this play would be located to the south of the main Aure thrust front in a less structurally complicated setting. From review of available seismic, this play is confirmed to exist across PPL 326 in the foreland to the thrust front.

6. PRODUCTIVE ANALOGUES

6.1 Structural Plays involving Carbonate Reservoirs

Several onshore gas accumulations southeast of the Gobe oilfields in the Aure Trough are contained in thrust-related structural traps involving carbonate reservoirs (**Table 3**). Whilst this structural setting is associated with the transition between the Papuan fold/belt and Aure fold/thrust belt, structural styles may be analogous to those in the eastern extension of the fold/thrust belt through PPL 326. The following examples all involve carbonates but these types of traps could also include clastic reservoirs in a similar structural arrangement offshore PPL 326.

Well	Year	Result	Comment
Puri-1	1958	1610 bopd (52º API)	Subthrust Puri Lst trap
Kuru-1	1956	50-105 MMscfd	Puri surface anticline
Kuru-2	1957	61m gas column	Not tested
Bwata-1	1960	43 MMscfd	157m gas column

Table 3 - Gas Accumulations in Thrusted Carbonate Traps

Puri Field resides in a subthrust or footwall trap but oil indications were also present in the overthrust hanging wall section, **Figure 18**. Seismic control will be critical to defining traps in this structural environment in PPL 326. The structural zone will be attractive for potential traps at multiple levels as long as the structures can be imaged satisfactorily.

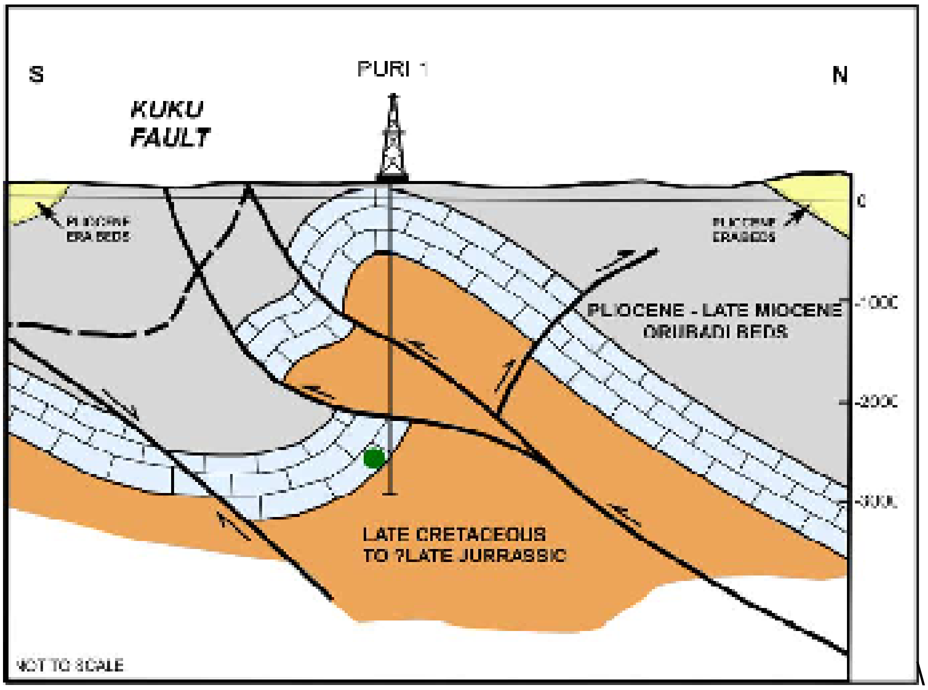

Figure 18 - Schematic Structural Representation of the Puri Field

Kuru Field resides in an anticlinal structure with gas seeps and was discovered by Kuru-1 which blew out at 340m in Puri Limestone, **Figure 19**. Flow rates were recorded at 50-105 MMscfd. Subsequent drilling proved a 61m gas column.

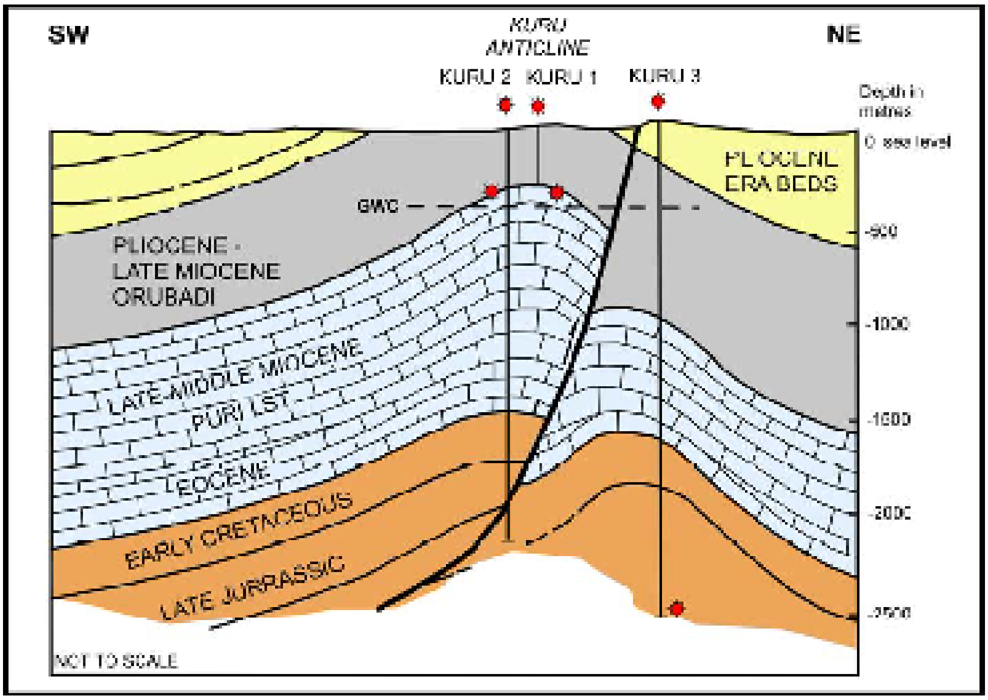

Figure 19 - Schematic Structural Representation of the Kuru Field

The Bwata gas accumulation is also in an anticlinal feature beneath a volcanic cover where there are condensate-rich gas seeps, **Figure 20**. Bwata Field hosts a 157m gas column in fractured micritic carbonates of the Puri Limestone which tested 43 MMscfd with a CGR of 7 bbls/scf.

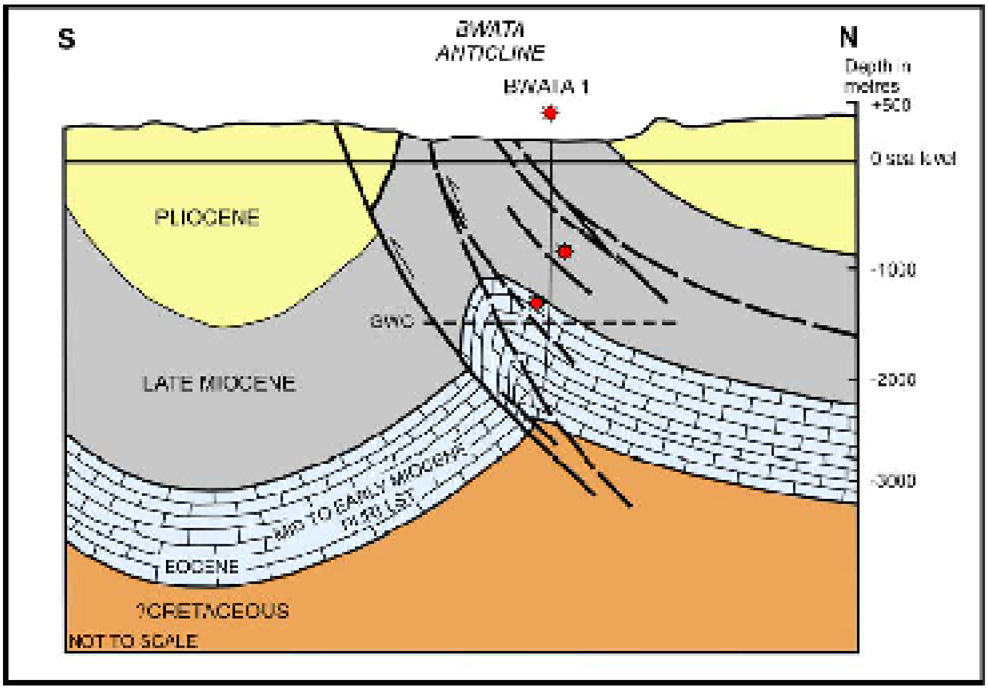

Figure 20 - Schematic Structural Representation of the Bwata Field

6.2 Reefal Carbonate Play

The recent prolific gas/condensate discoveries by InterOil at Elk and Antelope highlight the potential of the Miocene carbonate play, **Figure 21, Figure 22**, **Figure 23** and **Figure 24**. Well results support a significant hydrocarbon column and potential gas resource. A Late or Early Miocene age is unclear from company reports, but the reefal limestone reservoir is confirmed. The reservoirs may be stratigraphically-equivalent to Puri Limestone or be younger Late Miocene in age. InterOil has reported identification of three carbonate facies – Puri, Mendi and Reefal limestones. Antelope-1 encountered a dolomitized reef structure and approximately 800m of gross reservoir limestone with about 14% porosity and hosting a very thick hydrocarbon column. Between 14% and 96% of the reservoir was determined to be net across the four wells. The Elk wells intersected about 180m of limestone downdip and the Antelope wells between 370m and 800m thickness, higher on the structure. Elk/Antelope represent a verified resource of 3.8 tcf. Exploration/appraisal drilling results at Elk/Antelope are summarized in **Table 4**.

Well	Year	Result	Comment
Elk-1	2006	102 MMscfd / 510 bcpd	
Elk-4A	2008	105 Mmscfd / 1890 bcpd	Drilled in Antelope fault block
Antelope-1	2009	382 MMscfd / 5000 bcpd	
Antelope-2	2009	705 MMscfd / 11,200 bcpd	CGR 20.7 bbls/mcf + Oil

Table 4 - Elk/Antelope Field Well Results

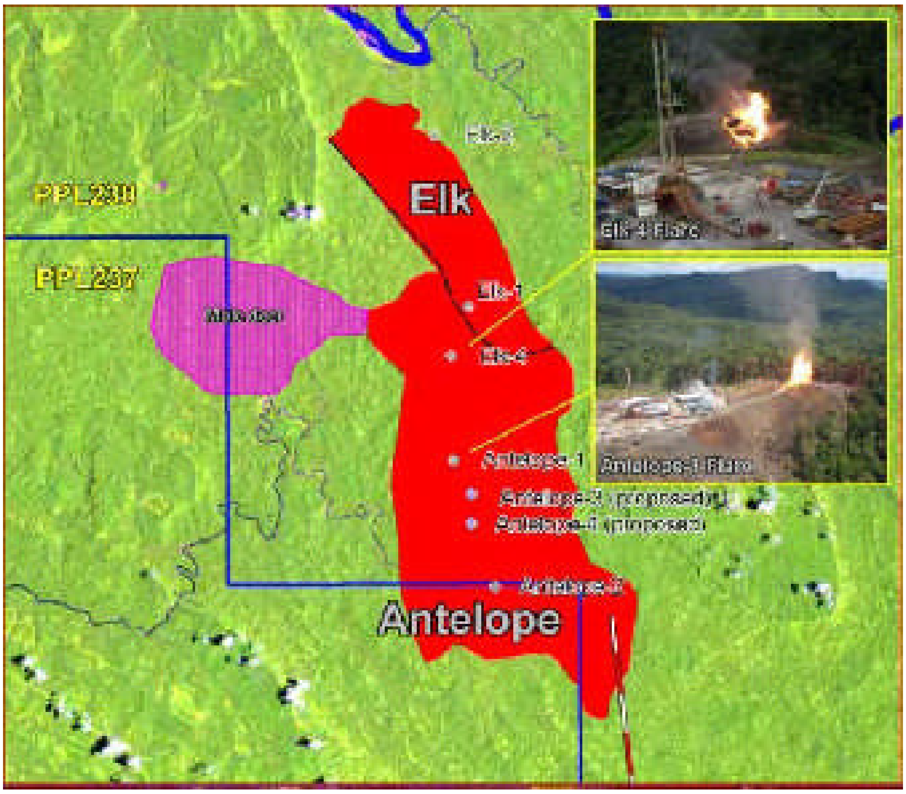

Figure 21 - Elk/Antelope Gas/Condensate Field Map (Source: InterOil Corp.)

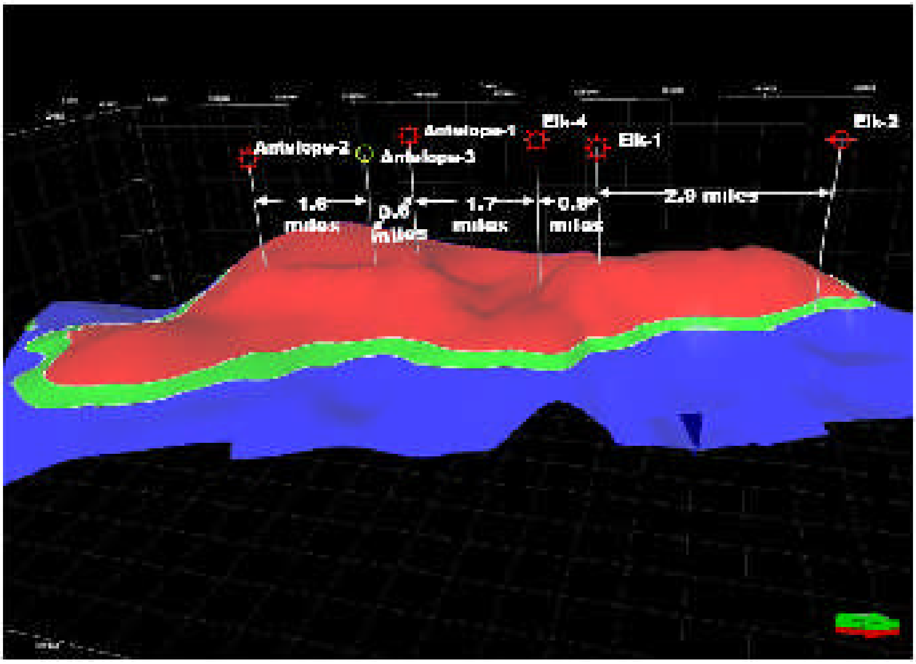

Figure 22 - Elk/Antelope Gas/Condensate Field Reefal Structure (Source: InterOil Corp.)

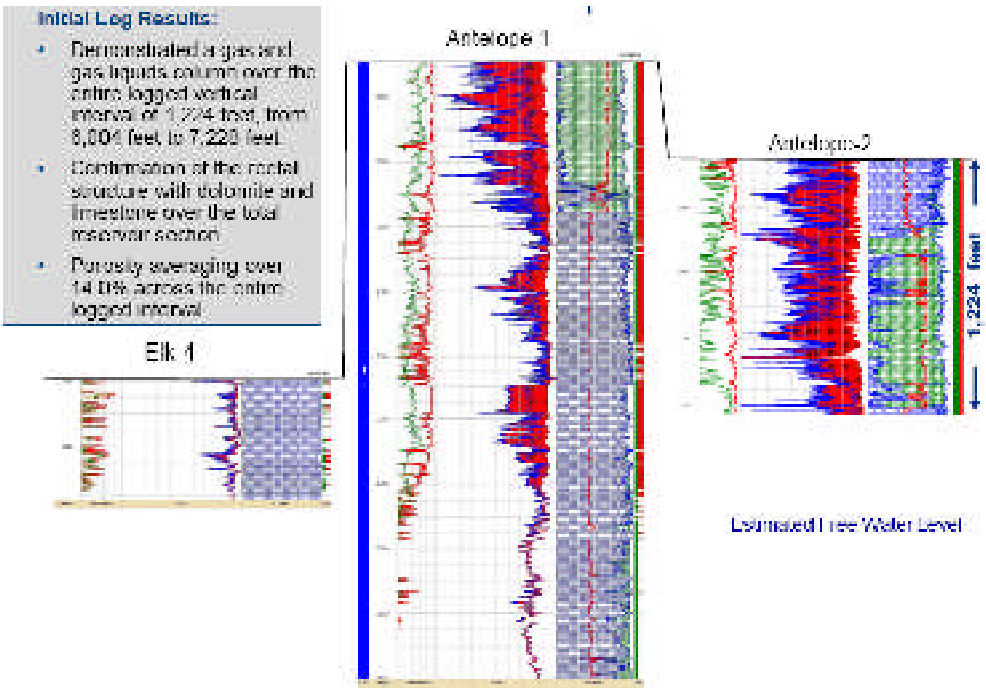

Figure 23 - Elk/Antelope Gas/Condensate Field – Well Correlation Through Reefal Limestone Reservoir (Source: InterOil Corp.)

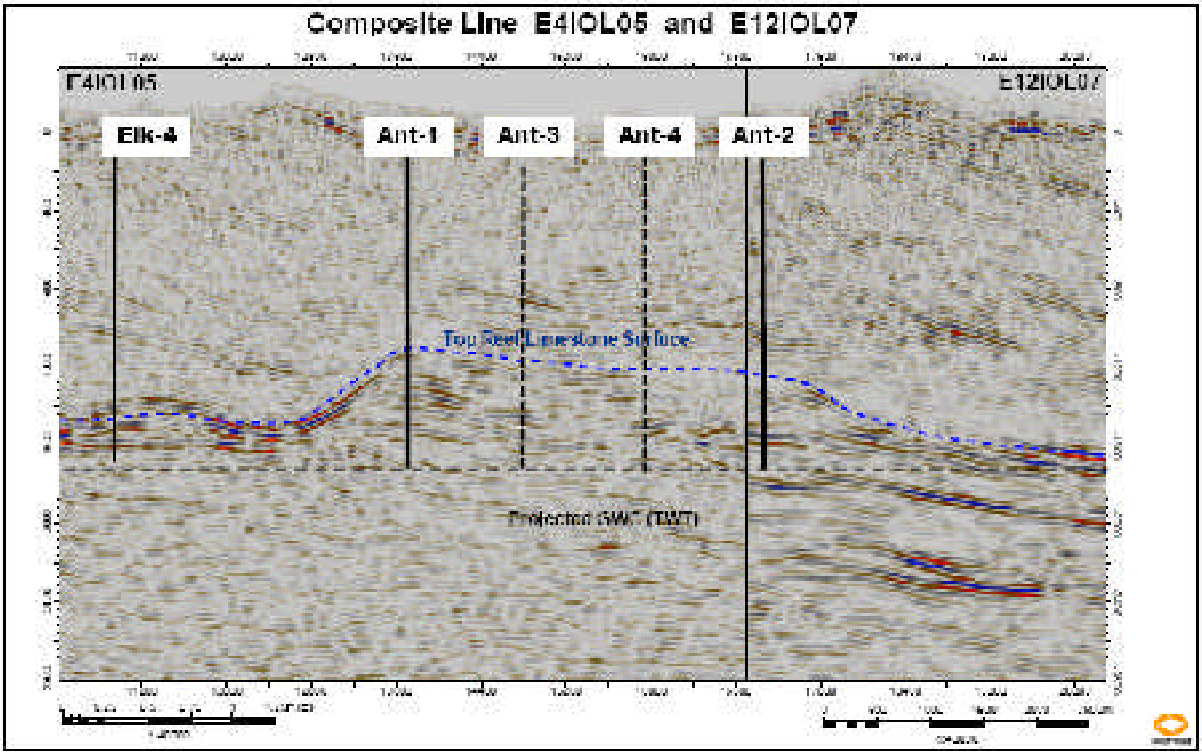

Figure 24 - Elk/Antelope Gas/Condensate Field – Seismic Profile Showing Reefal Structure (Source: InterOil Corp.)

7. STRUCTURAL ANALYSIS

The available new seismic database in PPL 326 acquired from Fugro/Searcher for this assessment was limited to the southern margin of the block. In addition, two pre-stack lines and three scanned vintage lines were examined in the eastern block area. The incomplete new spec-data set amounted to only ten partial dip lines, one full inboard strike line, one segmented strike line and a short segment of one outboard strike line. Only four short dip lines were moderately useful. All dip lines were short and represented line tails which were not full fold (about six lines less than 100 shot points long) were not useful. These lines were particularly scattered towards the western end of the block. The vintage lines were not specifically dip/strike oriented. A shot point basemap of available control lines is shown in **Figure 25.** We note that further seismic acquisition within the block will largely require both deep and shallow water recording techniques and negotiating between extensive shallow water reefs.

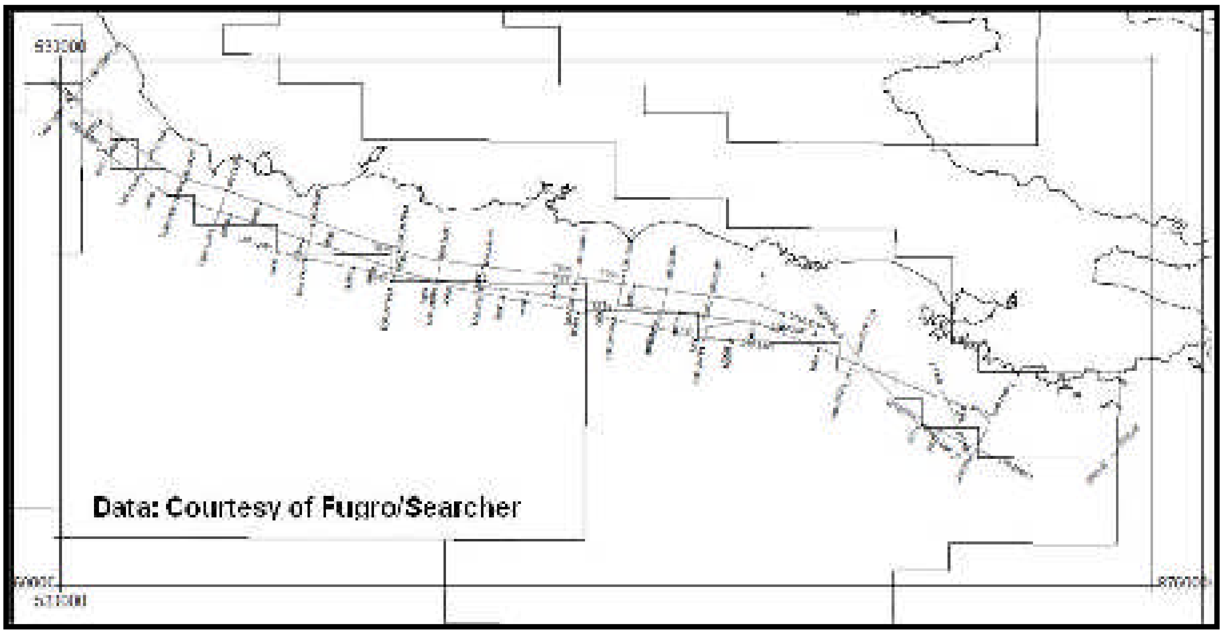

Figure 25 - PPL326 Seismic Basemap

RPS did not have access to sufficient seismic coverage to fully understand the structural complexities in the block or to identify specific structural leads. Moreover, RPS' interpretation of the stratigraphic sequences on seismic is not constrained by direct well control. However, from a prospectivity standpoint it is noteworthy that multiple structural/stratigraphic features were identifiable, even with the sparse and segmented data set. Assessment of potential structures and carbonate reefal traps was indicative only. A key result of examining the new data, although not extensive, has led to modifying several ideas, in particular the extent of the Moresby Trough, structural style in the foreland basin, possible extension of the Barune Sandstone play into the eastern block area and extended potential for Miocene reef development across into the eastern part of PPL 326. Examination of the key regional seismic line (**Figure 9**) confirmed unconformable relationships and presence of a sequence with "syn-rift" characteristics. The thin-skinned thrusting character and detachment at near-Base Tertiary was confirmed. The limited dataset did not allow age identification of older sediments deep under the thrust front beneath the "Blue" Horizon in **Figure 9** or confident extrapolation of the Mesozoic sub-thrust play from the regional seismic line into the block.

7.1 Structural Form/Trends

Based on the limited seismic examined, the relative setting of PPL 326 with respect to major regional structural trends and lineaments is better defined. The main structural elements are reasonably validated. By virtue of its orientation with respect to the regional structural grain, the block appears to straddle two principal structural provinces: which are the Aure fold/thrust belt and Moresby Trough foreland basin. The two provinces primarily involve different sedimentary sequences and thicknesses. We note that no well ties were available to constrain seismic reflectors, however, block stratigraphic setting is approximated from regional considerations. The western part of the block has very limited dip line coverage with the strike lines located within the thrust belt. These lines are impossible to interpret with confidence. Three areas (A, B, and C), have been selected to show the local structural style. These locations are shown in **Figure 26.**

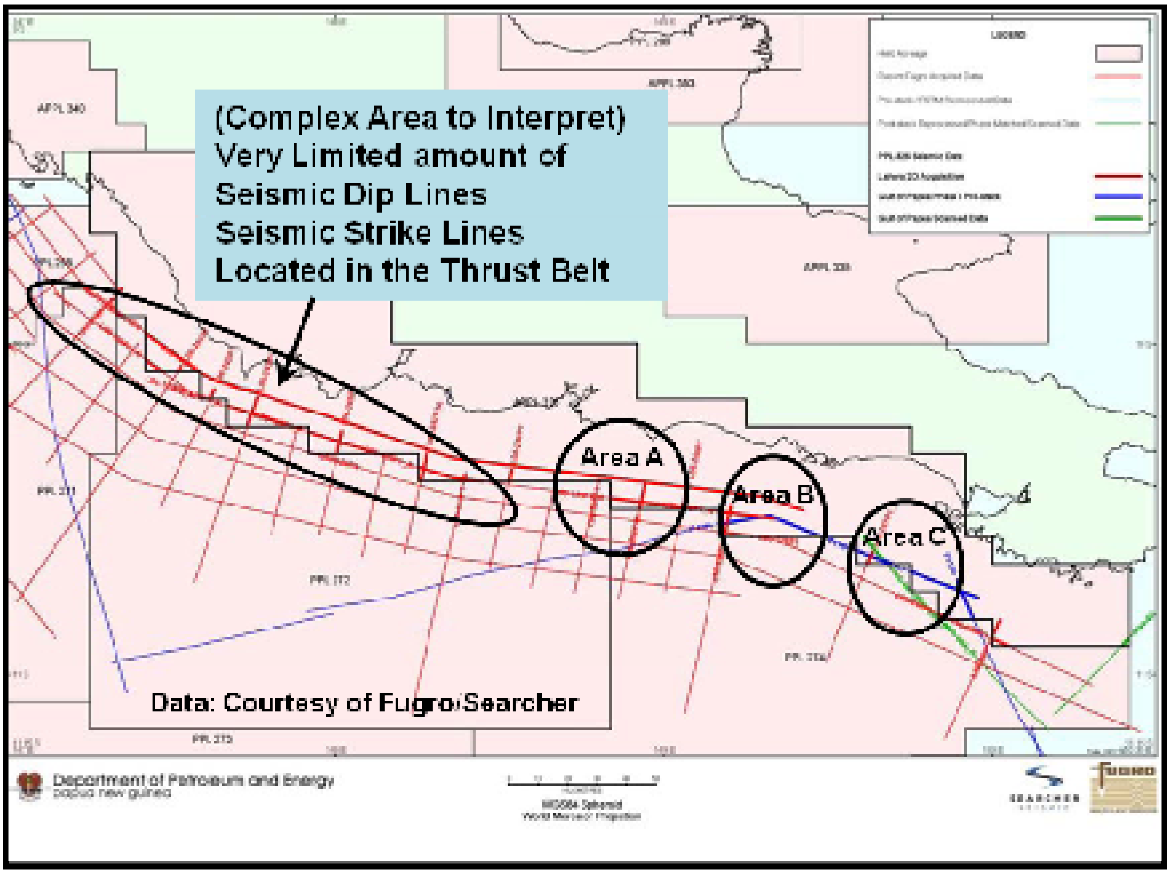

Figure 26 - Zones of Structural Development

Two structural grains are evident on the limited seismic; the main east-west thrust belt trend and cross-cutting NNE-SSW and NE grains set up by steep reverse fault sets and probable strike-slip lineaments. Structural form as determined and extrapolated from the seismic is illustrated in **Figure 27**, where –

1. Probable thrust fault development is observed in the western block area, however, paucity of dip line control precludes unravelling structural complexity. The fold/thrust belt is assumed to be very narrow and is fully covered by PPL 326. The belt trends with an approximate east-west orientation. Lines in the western block area reflect thrust tectonics only. Available data does not allow detailed mapping of the complete form of the fold/thrust belt or projection to the east.

However, by way of regional considerations, we assume the eastern extent to be not block confined, although there is no control on extent of structural development in that direction. From regional data and observed thinness of the Tertiary sedimentary section, it is a reasonable conclusion that the fold/thrust axis probably delimits basin development and therefore prospectivity potential.

Only the western most few lines which are much more structured than elsewhere, suggest thrust-related structuring which is interpreted to involve a thin Tertiary sequence (possibly Late Miocene and younger) overlying faulted late Cretaceous or remnant eroded older Mesozoic section. Stratigraphic interpretation within the fold/thrust complex is guided by timing of the thrusting as Oligocene and in response, foreland sag basin development from Early Miocene time. Alternatively, the belt may also include a structural/stratigraphic complex involving the onshore accretionary assemblage and volcanic/metamorphic lithologies originating from the PNG orogen.

2. In the eastern part of PPL 326, the block extends further south and encroaches on the eastern extension of the Moresby Trough foreland basin. Earlier studies, as shown in the structural elements map in **Figure 5**, suggested that the trough might be limited to only the western half of the block. The sedimentary section observed, is interpreted to be principally Miocene and younger, with possible thin basal Oligocene and Eocene/Palaeocene overlying the Base Tertiary unconformity. The potential Campanian-age Barune Sandstone play may be evident in eastern PPL 326. Onlap morphology associated with bright seismic amplitudes within interpreted reverse fault blocks is observed at the interpreted Base Tertiary unconformity.

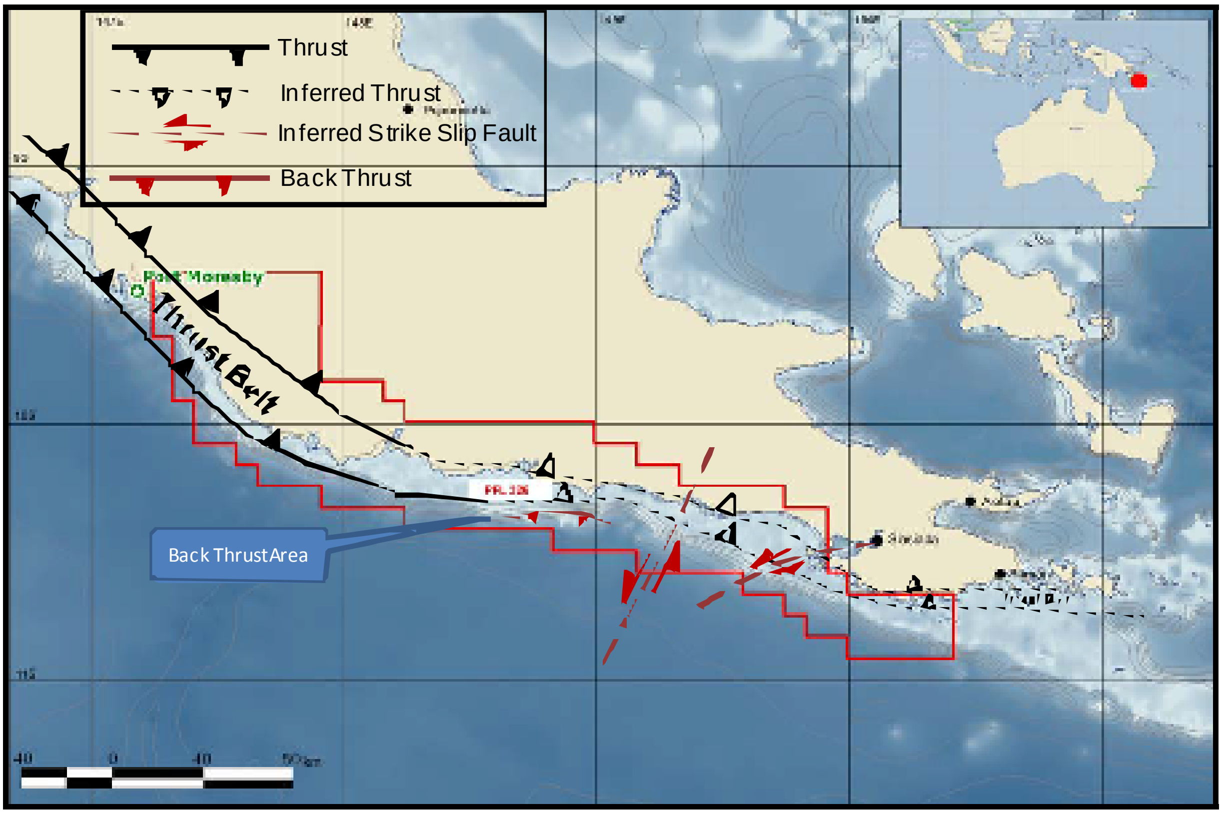

Figure 27 - PPL 326 Structural Elements

7.2 Potential Trapping Styles

7.2.1 Structural Traps

Fold/thrust belt - the primary structural targets in PPL 326 associated with the fold/thrust belt are interpreted to be mainly hanging-wall traps. This style has been proven to be productive in both the western and eastern Papuan fold belts. Crestal four way dip and faulted closures can be expected in the fold/thrust belt through PPL 326, however, data constraints have not allowed sufficient delineation to confirm lead status on any recognised features. Examples of this particular structural style that is characteristic of the western Papuan fold/thrust belt terrain are included as part of the productive analogue discussion in **Section 6.** This style is also displayed in **Figure 28**, a partial line across the thrust belt showing thin skinned thrusting in the western portion of the block. This type of structural style is also expected in the east of the block, but north of the existing seismic data set.

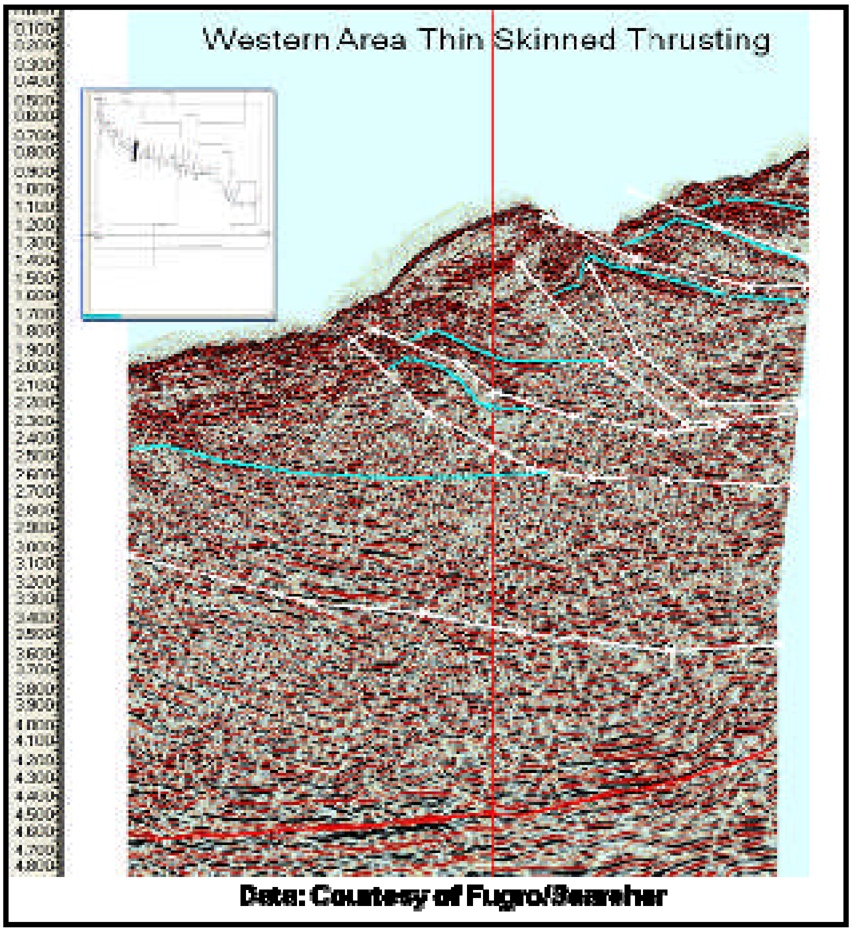

Figure 28 - Structural Style Western Area (Dip Line L06-245P1)

Foreland Basin – large compressional fault blocks controlled by steep, E-W reverse faulting are evident in the eastern block area (Area A). Hanging wall structural traps may be developed within the blocks associated with the reverse, controlling faults. An example of the RF-1 feature is shown in **Figure 29**. In Area C a possible restraining bend thrust may have caused a structural feature (RF-3) related to an inferred strike-slip fault, **Figure 30**.

The RF-2 feature (Area B) may be controlled by a NNE-SSW trending strike-slip fault, (**Figure 31)**. Associated conjugate fault sets are likely developed but are not evident. There is insufficient data to confidently determine orientation of the blocks or constrain potential closure. Bright seismic amplitudes lower in the section may represent onlap on to the Base Tertiary unconformity.

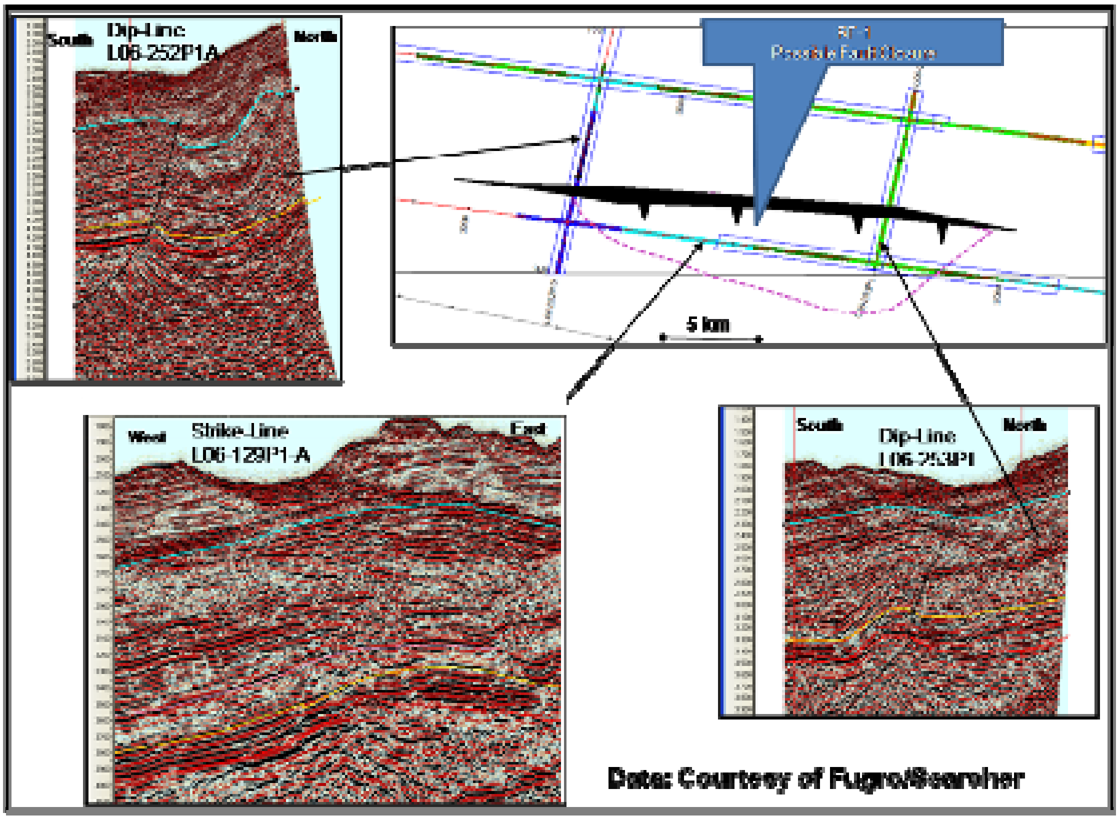

Figure 29 - Area A, Structural Style

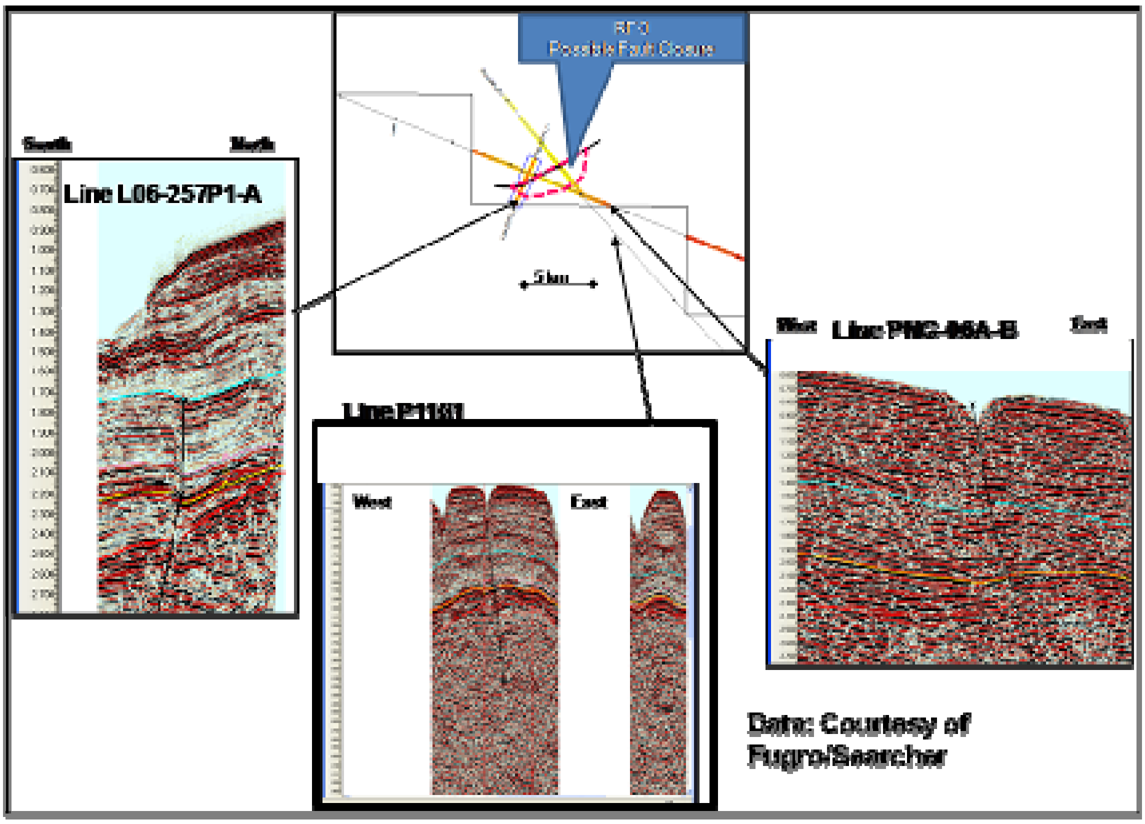

Figure 30 - Area C, Structural Style

7.2.2 Stratigraphic Traps

A possible trend of potential carbonate build-up/mound features and buried limestone pinnacle reefal traps extends across the eastern portion of PPL 326 where the block straddles the Moresby Trough. Recognition of a possible reef play may extend the fairway further east from its understood distribution in the Aure Trough. While these types of features characteristically have inherent 4-way dip closure, data constraints precluded confirmation of closure. The PR-1 feature is large and the most pronounced with a relief of approximately 240 msecs (300m) at between 2650 to 2900 msecs TWT. Laterally, PR-1 extends over 4 kms at the base. Strong layered morphology of onlapping units suggests the presence of encasing shales. Strong amplitudes within the PR-1 feature may be indicative of karstification, presence of hydrocarbons or both. The PR-1 feature is interpreted to be associated with the high relief RF-2 strike-slip fault. Regionally, buried reefs are associated with zones of reactivation along such lineaments. Interpretation of strike-slip lineaments through PPL 326 is regionally consistent. Several smaller possible pinnacle reefs and carbonate mound-form features were also identified. These features generally lie in very deep water in excess of 1000m. (**Figure 31)**

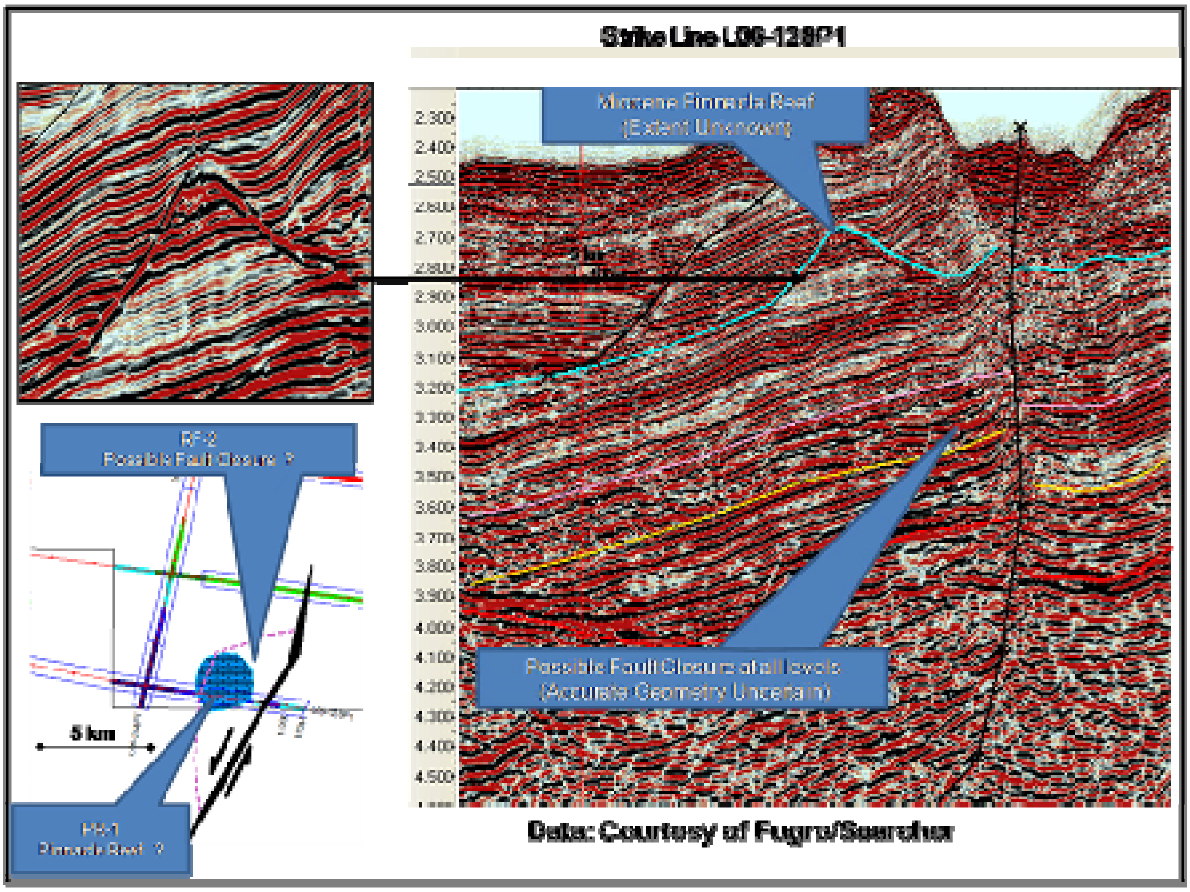

Figure 31 - Area B, Structural style and Associated Reefs

8. EXPLORATION RISK EVALUATION

8.1 Methodology

PPL 326 lies within an unexplored frontier basin. Potential analogues are located some 600 to 700 kilometres away in notably different structural terrain. Inherent limitations of PPL 326 resource assessment is further mitigated by inadequacy of the geological database, resulting in poor understanding of the petroleum system and variables that locally will influence generation, migration and hydrocarbon entrapment. The Newport work program is designed to rectify this situation by acquiring sufficient additional seismic and other geological data to constrain geological variables and fully evaluate the exploration potential of the block.

In this report RPS have estimated the chance that a potentially productive play exists within PPL 326. This has been achieved by examination of structuring on several available seismic line tails and strike lines and relating that structuring to analogies along trend in the Aure fold/thrust belt province and to a lesser extent in the western portion of the Papuan fold thrust belt. Critical evidence for a deep sub-thrust Mesozoic play has been incorporated from examination of seismic-stratigraphc relationships on a single regional seismic line across the block, (see **Figure 9**). RPS has attempted to undertake a balanced review of the acreage and its data. This subjective estimate reflects a degree of confidence that at least one field of a minimum economic size is present within the play trend covered by PPL 326.

8.2 Play Chance

A play is typically a group of prospects with a common trap style, reservoir, seal and source/migration setting which share common geological risk elements. In this sense the concept of a 'play' is the fundamental unit used to analyse the un-drilled potential of PPL 326. However, at the play level, in this frontier setting and at this preliminary stage, there are no mapped leads/prospects and there is limited pre-drilling information on which to develop an understanding of the critical geological controls on hydrocarbon habitat. Postulated play concepts in this structurally complex province are necessarily drawn from structural/stratigraphic analogy elsewhere in the PNG fold/thrust belt.

Given the state of data, it is not possible to geologically assess the undiscovered petroleum potential of the PPL 326 block including number of fields to be discovered or their potential size, with any confidence. It is, however, possible to assess chance of existence of postulated plays and therefore, chance of at least one hydrocarbon accumulation being present in the block. Play chance is defined as the chance of a particular play working somewhere in the play fairway. For simplicity in this assessment, three play 'chance of adequacy' elements are grouped. These are trap, reservoir and source. Trap play chance includes the chance that both suitable structuring and regional seal development is present in the play fairway. Reservoir play chance reflects the likelihood that effective reservoir facies will be encountered in the fairway. Source play chance is the chance that a predicted source rock sequence is present and has effectively generated hydrocarbons within the play fairway.

With respect to productive analogy, it is a simplistic model to suggest the Papuan fold/thrust belt extends through PPL 326 (**Figure 5**). Based on the data available, however, RPS considers that PPL 326 looks sufficiently similar in structural style to the Aure fold/thrust belt to offer similar potential for structural trap development along the frontal thrust. Significant potential exists for development of a productive Tertiary carbonate play. Moreover, where the PPL 326 area differs from both the Papuan and Aure fold/thrust belts is the potential for an underlying thick Mesozoic basin sub-thrust beneath a Base Tertiary detachment. An imbricate fold belt to the north of the thrust and seaward of the orogenic belt is either narrow or absent. The block's long, narrow shape limits lateral exposure to the Moresby Trough but includes a significant length of the fold/thrust belt including potential Mesozoic anticlines in the sub-thrust. Conclusive analogy needs to be scaled to compensate for the structural differences, conceptual Mesozoic sub-thrust play and possible differences in geology of the stratigraphic section involved in the over-thrust complex. Potential presence of the Miocene carbonate play is similarly scaled, but encouraged by features identified on seismic.

The productive plays, and associated "world class" fields, established in the western Papuan fold/thrust belt necessarily carry the lowest exploration risk because the geological controls on hydrocarbon accumulations is relatively better known. Similarly, this is the case for the recent carbonate discoveries in the central fold/thrust belt (Aure). Typically, the early success rate in the Papuan fold/thrust belt has diminished over time. Early success through to the 1990's was about 25 to 30% from exploration. The Papuan Highlands fold/thrust belt hosts such fields as Kutubu, Gobe/SE Gobe, P'nyang, Hides, Juha, Angore, Iagifu, Agogo, Hedinia, Mananda, Makas, Moran and Paua. Proving validity of a Mesozoic subthrust play model in PPL 326, potentially has significant prospectivity implications.

In the onshore central Aure fold/thrust belt region and shallow offshore, success has emerged much later after exploration over about 100 years. Following the Puri-1 (1958) and Bwata-1 (1960) discoveries there was no further success until 2006 with Elk-1 and then Antelope-1 in 2008. These latter discoveries have opened up a new productive play fairway of Miocene carbonate reefs. The Elk/Antelope results indicate prolific production potential. Looking back at a partial complement of exploration drilling in the onshore northern and eastern trough area and shallow offshore, however, reveals some 56 wells with only four discoveries or a success rate of only 7% (**Appendix 3**). Future success may likely be higher now that a new fairway has been revealed. This carbonate reef fairway would extend through PPL 326 and is in part confirmed by seismic.

Intuitively, the two methods of assessing prospectivity (analogy and success ratio) may not prove to be the most realistic and meaningful approach to assessing potential of PPL 326. Success or otherwise of PPL 326 plays, and ultimately prospects/leads, will probably rely more on differences to the productive provinces rather than similarities. One key difference is underpinned by the Mesozoic sub-thrust play model. These geological differences will only be revealed once exploration begins.

We assess a probability that the three geological play factors (trap, reservoir and source) combine somewhere to trap at least one hydrocarbon accumulation. Critical regional factors suggest a particular importance for the first two factors (trap/reservoir) as there is ample evidence that working source is present regionally, and commonly in close proximity to structures. The assigned source chance indicates a judgement that adequate source exists somewhere in the play. Regionally, problems exist with structural trap integrity as not all exploration tests of valid structures are successful. In the light of data constraints as well, adequacy of trap is accordingly downgraded. Without well control, proof of reservoir existence is unconstrained. Regional considerations suggest clastic reservoir facies may not be as well developed as in the western Papuan Basin or possibly the Aure Trough. However, this observation is unproven, in particular for the potential Mesozoic sub-thrust play. Carbonate reservoir facies are, however, productive in the Aure Trough region. At the prospect stage, primary risks for the PPL 326 potential plays will be identifying suitable structural closures followed by identifying target reservoirs within those closures.

CRITICAL UNCERTAIN ELEMENTS TO CONSTRAIN	PROVEN WORKING ELEMENTS
	Adequate organic content, quality, thickness,
Sufficient time / temperature for maturation	
Palaeodrainage area of source rock	
Adequate expulsion from source and secondary migration to trap	
Sufficient reservoir net thickness, porosity, permeability and continuity	Possible reservoir facies development at multiple levels
Adequate areal and vertical closure of effective traps	
	Probable effective thickness and lithology of vertical and lateral seals
	Proper trap timing relative to migration
Preservation - Freedom from serious meteoric flushing, biodegradation, diffusion or overcooking	
Hydrocarbon fill	

Table 5 - Play Risking – Uncertain Elements versus Proven Working Elements

The PPL 326 frontier area has the possibility of working structural traps and good source/reservoir but an high geological risk is inherent due to lack of data. By way of a simplified assessment summary relevant to the PPL 326 frontier setting, **Table 5** highlights critical uncertain controls that require constraint versus those that are considered adequately constrained proven play elements from regional experience. These are independent for both clastic and carbonate reservoirs. Each element is considered to be common to all stratigraphic levels.

The following three tables represent RPS's estimate of adequacy of the three critical play factors as they individually relate to the plays listed in **Table 2** for Tertiary clastic and carbonate (platform carbonate/pinnacle reef) reservoirs in the overthrust complex and trough setting and sub-thrust Mesozoic clastic reservoirs, respectively. This subjective judgement is derived from both regional observations and from consideration of the limited data available, (**Table 6**, **Table 7 and Table 8)**.

Chance of Adequacy/Rating

Play Element	Trap	Reservoir	Source	Play Chance
1. Late Miocene Lavao/Talama Sst	0.5 (Probably present)	0.4 (Possibly present)	0.7 (Likely)	0.14
5. Mid-Miocene Chiria fan sands	0.5 (Probably present	0.3 (Possibly present	0.7 (Likely)	0.11
6. Paleocene/Late Cret. Barune Sst	0.5 (Probably present	0.5 (Probably present	0.7 (Likely)	0.17

Table 6 – Tertiary Clastic Reservoirs: Chance of Adequacy of Play Elements in PPL 326

Chance of Adequacy/Rating

Play Element	Trap	Reservoir	Source	Play Chance
2. Mid-Late Miocene Puri Reefal	0.6 (Probably present)	0.6 (Probably present)	0.7 (Likely)	0.25
3. Mid-Late Miocene Puri Lst. Equiv. (Fractured - Thrust rollover)	0.6 (Probably present	0.6 (Probably present	0.7 (Likely)	0.25
4. Mid-Late Miocene Puri Lst. Equiv. (Fractured - Sub-thrust)	0.5 (Probably present	0.6 (Probably present	0.7 (Likely)	0.21

Table 7 – Tertiary Carbonate Reservoirs: Chance of Adequacy of Play Elements in PPL 326

Chance of Adequacy/Rating

Play Element	Trap	Reservoir	Source	Play Chance
7. Early Cretaceous Toro Ss Equiv. (Sub-thrust play)	0.5 (Probably present)	0.2 (Unlikely)	0.7 (Likely)	0.07
8. E-L. Jurassic sandstone reservoirs (Sub-thrust play)	0.5 (Probably present	0.3 (Possibly present	0.6 (Likely)	0.09
9. Triassic sandstone reservoirs (Sub-thrust)	0.5 (Probably present	0.3 (Possibly present	0.6 (Likely)	0.09

Table 8 – Sub-thrust Mesozoic Clastic Reservoirs: Chance of Adequacy of Play Elements in PPL 326

On a worldwide basis, average play chance in a known basin ranges up to 0.60 and averages 0.35 overall. For the PPL 326 frontier region, an estimated overall average play chance of 0.14 for the Tertiary clastic reservoirs, 0.24 for Tertiary carbonates and 0.08 for sub-thrust Mesozoic clastics, for the occurrence of at least one major accumulation seems appropriate. In the context of relative play chance, a Play Chance of 20% would apply to a new play in an unproved basin where most fundamental elements seem likely to be present.

For the reasons noted above, we have assessed PPL 326 Play Chance below this level for the Tertiary clastic targets but relatively comparable for the carbonate play. The sub-thrust Mesozoic play is down-scaled due to its conceptual nature. By way of comparison, the chance of continued discoveries for the Papuan fold/thrust belt productive plays would be 1.0. Similarly, a high value of 1.0 could be attributed to the emerging Aure Trough carbonate reef play. Exploration risk in those regions is solely prospect specific.

We note that this assessment is only as good as the understanding of play concepts that is at hand. Where this understanding is reliant on projection from “structurally similar” provinces, we recognize that we are dealing with only a partial view. New comprehensive exploration data including integration of reconnaissance seismic and well data to be acquired across PPL 326, will constrain the critical play elements and may lead to further development and confirmation of new play concepts. Importantly, proof of a working Mesozoic sub-thrust play will be reliant on better definition from new exploration data. Newly developed plays may prove to be as prospective as those in the Papuan fold/thrust belt and central Aure Trough, but for possibly different geological reasons.

9. CONCLUSIONS

The very limited amount of geological and geophysical data available to evaluate this permit is insufficient to form a clear understanding of its prospectivity. It is, however, sufficient to validate an understanding of potential plays and in part to identify potential traps. This situation will remain until the new exploration data, planned to be acquired by Newport over the next two years, is available.

From published regional geological interpretation and offshore seismic data, RPS considers that there is considerable prospectivity in the block. In particular we note significant structuring and potential exists for development of a productive Miocene reefal and platform carbonate play, as an extension of the Aure fairway. Several large potential buried reef traps are recognised within the block. Moreover, Newport's exploration strategy is underpinned by potential for a Mesozoic sub-thrust play beneath Base Tertiary detachment underlying a Tertiary over-thrust complex. RPS was unable to confirm the geological model with the available dataset, however, by applying regional concepts believes that a sub-thrust Mesozoic play is a valid and plausible model. The potential play is nonetheless very high risk. Prospectivity rating of PPL 326 would be significantly enhanced if presence of an underlying Mesozoic basin can be proven.

The PPL 326 frontier area has the possibility of working structural traps and good source/reservoir but high geological risk is mainly attributed to lack of data. Similar structural styles to those in the transitional Aure/Papuan fold/thrust belt setting of the productive onshore central Aure Trough are recognised in the eastern trend extension through PPL 326 where either carbonate or clastic reservoirs may be involved. Sparse data precludes further definitive evaluation in the complexly faulted zone. Based on the available data, PPL 326 looks similar in structural style to the Aure fold/thrust belt and is therefore expected to offer similar potential for structural trap development for both Tertiary clastic and carbonate plays along the frontal thrust. Structural trap development in the sub-thrust setting may ultimately reveal similar prospectivity to the western Papuan fold/thrust belt. The fold/thrust belt axis was confirmed to transect the PPL 326 block. Furthermore, large reverse fault-bound potential traps are recognised within the foreland basin portion of the block.

Typically in a frontier exploration block such as this one, petroleum prospectivity is often assessed by analogy with similar drilled basins. However the lack of subsurface data results in insufficient knowledge for a confident quantitative geological assessment of the undiscovered petroleum potential of PPL 326, including number of fields to be discovered or their potential size.

Play Chance necessarily carries most of the risk at this stage of exploration in this frontier area. RPS has derived a probability estimate for the block that a potentially productive play actually exists within its boundaries. The estimate reflects a degree of confidence that at least one field of a minimum economic size is present within the play trend covered by the block. Utilizing the three play 'chance of adequacy' elements (trap, reservoir and source) we have assessed an average overall Play Chance for Tertiary clastic plays as 0.14, for Tertiary carbonate plays as 0.24 and for the sub-thrust Mesozoic clastic plays as 0.08. This subjective estimate should be regarded in the context of a 0.35 worldwide average for frontier basins and 0.20 for a new play in an unproved basin where most fundamental elements seem likely to be present.

The outcome of this prospectivity assessment is only equivalent to our understanding of proposed play concepts. Views are largely reliant on long distance projection from “structurally similar” provinces in hand with a very limited dataset, and as such is only a partial view. New exploration data to be acquired across PPL 326 in the future, will constrain the critical play elements and may lead to development of new play concepts. Newly developed plays may ultimately prove to be as prospective as those in the Papuan fold/thrust belt and central Aure Trough.

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11. APPENDIX 1: GLOSSARY OF TERMS AND ABBREVIATIONS

API	American Petroleum Institute
asl	above sea level
B	billion
bbl(s)	barrels
bbls/d	barrels per day
Bcm	billion cubic metres
B_g	gas formation volume factor
B_{gi}	gas formation volume factor (initial)
B_o	oil formation volume factor
B_{oi}	oil formation volume factor (initial)
B_w	water volume factor
bopd	barrels of oil per day
BTU	British Thermal Unit
Bscf	billions of standard cubic feet
bwpd	barrels of water per day
CO_2	Carbon dioxide
condensate	liquid hydrocarbons which are sometimes produced with natural gas and liquids derived from natural gas
cP	centipoise
C_{ROCK}	rock compressibility
C_w	water compressibility
DBA	decibels
E_a	areal sweep efficiency
EMV	Expected Monetary Value
EPSA	Exploration and Production Sharing Agreement
ESD	emergency shut down
E_{vert}	vertical sweep efficiency
FBHP	flowing bottom hole pressure
FTHP	flowing tubing head pressure
ft	feet
ftSS	depth in feet below sea level
GDT	Gas Down To
GIP	Gas in Place
GIIP	Gas Initially in Place
GOR	gas/oil ratio
GRV	gross rock volume

GWC	gas water contact
H_2S	Hydrogen sulphide
HIC	hydrogen induced cracking
IRR	internal rate of return
KB	Kelly Bushing
k_a	absolute permeability
k_h	horizontal permeability
km	kilometres
km^2	square kilometres
kPa	kilopascals
k_r	relative permeability
k_{rg}	relative permeability of gas
k_{rgcl}	relative permeability of gas @ connate liquid saturation
k_{rog}	relative permeability of oil-gas
k_{roso}	relative permeability at residual oil saturation
k_{roswi}	relative permeability to oil @ connate water saturation
k_v	vertical permeability
LNG	Liquefied Natural Gases
LPG	Liquefied Petroleum Gases
M	thousand
MM	million
M$	thousand US dollars
MM$	million US dollars
MD	measured depth
mD	permeability in millidarcies
m^3	cubic metres
m^3/d	cubic metres per day
MMscf/d	millions of standard cubic feet per day
m/s	metres per second
msec	milliseconds
mV	millivolts
Mt	thousands of tonnes
MMt	millions of tonnes
MPa	mega pascals
NTG	net to gross ratio
NGL	Natural Gas Liquids
NPV	Net Present Value
OWC	oil water contact

P_b	bubble point pressure
P_c	capillary pressure
petroleum	deposits of oil and/or gas
phi	porosity fraction
p_i	initial reservoir pressure
PI	productivity index
ppm	parts per million
psi	pounds per square inch
psia	pounds per square inch absolute
psig	pounds per square inch gauge
p_{wf}	flowing bottom hole pressure
PVT	pressure volume temperature
rb	barrel(s) of oil at reservoir conditions
rcf	reservoir cubic feet
RFT	repeat formation tester
RKB	relative to kelly bushing
rm^3	reservoir cubic metres
SCADA	supervisory control and data acquisition
SCAL	Special Core Analysis
scf	standard cubic feet measured at 14.7 pounds per square inch and 60° F
scf/d	standard cubic feet per day
scf/stb	standard cubic feet per stock tank barrel
SGS	Sequential Gaussion Simulation
SIS	Sequential Indicator Simulation
sm^3	standard cubic metres
S_o	oil saturation
S_{or}	residual oil saturation
S_{orw}	residual oil saturation (waterflood)
S_{wc}	connate water saturation
S_{oi}	irreducible oil saturation
SSCC	sulphur stress corrosion cracking
stb	stock tank barrels measured at 14.7 pounds per square inch and 60° F
stb/d	stock tank barrels per day
STOIIP	stock tank oil initially in place
S_w	water saturation
$	United States Dollars
t	tonnes

THP	tubing head pressure
Tscf	trillion standard cubic feet
TVDSS	true vertical depth (sub-sea)
TVT	true vertical thickness
TWT	two-way time
US$	United States Dollar
V_{sh}	shale volume
W/m/K	watts/metre/° K
WC	water cut
WUT	Water Up To
ϕ	porosity
μ	viscosity
μ_{gb}	viscosity of gas
μ_{ob}	viscosity of oil
μ_{w}	viscosity of water

12. APPENDIX 2: LISTING OF GRATICULAR BLOCKS

Listing of graticular blocks

contained in

Petroleum Prospecting Licence PPL 326.

5’ x 5’ Graticular Blocks

Map Sheets: Port Moresby SC55/Woodlark SC56

Total no. of Blocks: 200

Approximate Area: 16,752 sq kms

Port Moresby SC55

1264	1703	1932	2154
1265	1704	1933	2155
1266	1705	1934	2156
1267	1706	1935	2157
1268	1770	1992	2158
1269	1771	1993	2159
1270	1772	1994	2223
1271	1773	1995	2224
1336	1774	1996	2225
1337	1775	1997	2226
1338	1776	1998	2227
1339	1777	1999	2228
1340	1778	2000	2229
1341	1779	2001	2230
1342	1780	2002	2231
1343	1781	2003	2300
1408	1782	2004	2301
1409	1783	2005	2302
1410	1784	2006	2303
1411	1785	2007	2304
1412	1786	2008	2374
1413	1787	2009	2375
1414	1844	2010	2376
1415	1845	2011	2447
1481	1846	2012	2448
1482	1847	2013	
1483	1848	2068	
1484	1849	2069	
1485	1850	2070	
1486	1851	2071	
1487	1852	2072	
1553	1853	2073	
1554	1854	2074	

1555	1855	2075
1556	1856	2076
1557	1857	2077
1558	1858	2078
1559	1859	2079
1625	1917	2080
1626	1918	2081
1627	1919	2082
1628	1920	2083
1629	1921	2084
1630	1922	2085
1631	1923	2086
1632	1924	2087
1633	1925	2147
1634	1926	2148
1698	1927	2149
1699	1928	2150
1700	1929	2151
1701	1930	2152
1702	1931	2153

Woodlark SC56

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13. APPENDIX 3: WELL LISTING

Partial listing of wells in the Aure Trough region relevant to PPL 326 plays

Well	Original Well Operator	TD (m)	Year	Onshore	Current Permit or Application Area	Potential Reservoir / Reservoir	Age	Result
Upoia Bosso 1 to 9	Anglo Pet	30-340	1913-1919	Yes	PPL 238	No data	No data	3 Dry, 3 oil shows, 1 gas show
Popo B1 to B8	Anglo Pet	270-525	1923-1924	Yes	PPL 238	No data	No data	Gas show
Popo B4-B5	Anglo Pet	212-424	1921-1922	Yes	PPL 238	No data	No data	Gas show
Koaru-1	Australasian Petco	312	1937	Yes	APPL 340	No data	No data	Dry
Apinaipi-1	F. Jean	500	1938	Yes	PPL 238	No data	No data	Gas show
Apinaipi-2	F. Jean	545	1938	Yes	PPL 238	No data	No data	Gas show
Puri 1 to 9	Papol	200-700	1938	Yes	APPL 312	No data	No data	Dry
Kukai B-1	Papol	700	1938	Yes	PPL 238	No data	No data	Dry
Oiapu 1 to 5	Papuan Petroleum	200-700	1938-1941	Yes	PPL 238	No data	No data	3 Dry, 1 oil and 1 gas show
Kariava-1	Australasian Petco	3245	1948	Yes	Near PPL 233	No data	No data	Gas show
Orai-1	Australasian Petco	1831	1949	Yes	PPL 238	Orai Fm	Unknown	Dry - Flowed water
Hohoro-1	Apelco	1430	1950	Yes	APPL 312	No data	No data	Oil show (trace seep)
[illegible]-1	Oroi Oil	1830	1950	Yes	APPL 339	No data	TD in Mid Miocene	Dry (some gas shows, No test)
Hohoro-2	Apelco	3244	1952	Yes	APPL 312	No data	No data	Gas show
Puri-1	Australasian Petco	3078	1958	Yes	PPL 237	Puri Lmst	Mid Miocene	Discovery, Tested Oil. Watered out after 30 hrs. Rate 1510 bopd.
Kaukau-1	Papuan Petroleum	1030	1958	Yes	PPL 238	No data	No data	Dry
Bwata-1	Apelco	2225	1960	Yes	PPL 237	Puri Lmst	Mid Miocene	Discovery, Tested Gas. Rate unknown.
Kapuli Creek-1	Kalcoo	3023	1961	Yes	APPL 312	No data	TD in Miocene	Dry
Iokea-1	Phillips Petroleum	1175	1968	No	PPL 238	Partial Carbonate Target - unclear if intersected	Upper Miocene	Oil show
Karau-1	Phillips Petroleum	1568	1968	No	PPL 238	Partial Carbonate Target - unclear if intersected	Pliocene/Miocene	Dry
Maiva-1	Phillips Petroleum	2230	1968	No	PPL 238	Partial Carbonate Target - unclear if intersected. Encountered Pliocene Sand.	Miocene/Pliocene	Dry
Orokolo-1	Phillips Petroleum	3657	1968	No	APPL 312	Poor res - Thin sand in upper Pliocene.	TD Lwr Plio	Dry
Tovala-1	Exxon Oil	1413	1972	Yes	PPL 238	No data. Blew out due to over pressured fluid.	No data	Gas show (mainly C1)
Bodiga-1	BP	3023	1984	No	PPL 238	No Res - Repeat sections of Aure Beds, U Mio shales and volcanoclastics	TD in Upper Miocene	Dry
Puri South-1	Kundu Petroleum Ltd	1649	1988	Yes	PPL 237	No data - Puri Lmst assumed target.	No data	Dry
Au Kabua-1X	Petro-Canada	3285	1990	No	APPL 312	Carbonates targeted - No Res - Repeat sections of Aure Beds, U Mio shales and volcanoclastics	TD in Upper Miocene	Dry
Moose-1	InterOil Corp	1101	2003	Yes	PPL 238	Encountered fractured and porous limestone	Miocene-Eocene	Oil shows and gas shows
Moose-2	InterOil Corp	1212	2004	Yes	PPL 238	Encountered a limestone with shows	Miocene-Eocene ?	Oil shows
Sterling Mustang-1	InterOil Corp	2253	2004	Yes	APPL 333	Mendi and Pale targeted - unclear if these were found	Eocene-Late Cret	HC shows (level unclear)
Black Bass-1	InterOil Corp	1700	2005	Yes	PPL 238	Encountered Wedge Hill Lmst and Orubadi Fm	Pliocene to Miocene ?	Gas show. Tested - no flow recorded
Triceratops-1	InterOil Corp	2000	2005	Yes	PPL 237	Puri Lmst	Mid Miocene	Gas shows (Formation untested)
Elk-1	InterOil Corp	1923	2006	Yes	PPL 238	Puri/Mendi ?	Miocene	Discovery. Tested Gas/condensate. Flowed gas and condensate at max. 100 MMscf/day
Antelope-1	InterOil Corp	2400	2008	Yes	PPL 238	Antelope Dolomitised Reef	Pliocene-Miocene ?	Discovery. Tested Gas/condensate. Gas flow rate of 383 MMscf/d and condensate at 5000 bopd