



Multi-TCF Wet Gas Exploration Opportunities Close to Existing and Imminent LNG Export Infrastructure Onshore PNG

Richard Schroder

Kina Petroleum & Heritage Oil

1. Introduction & Background

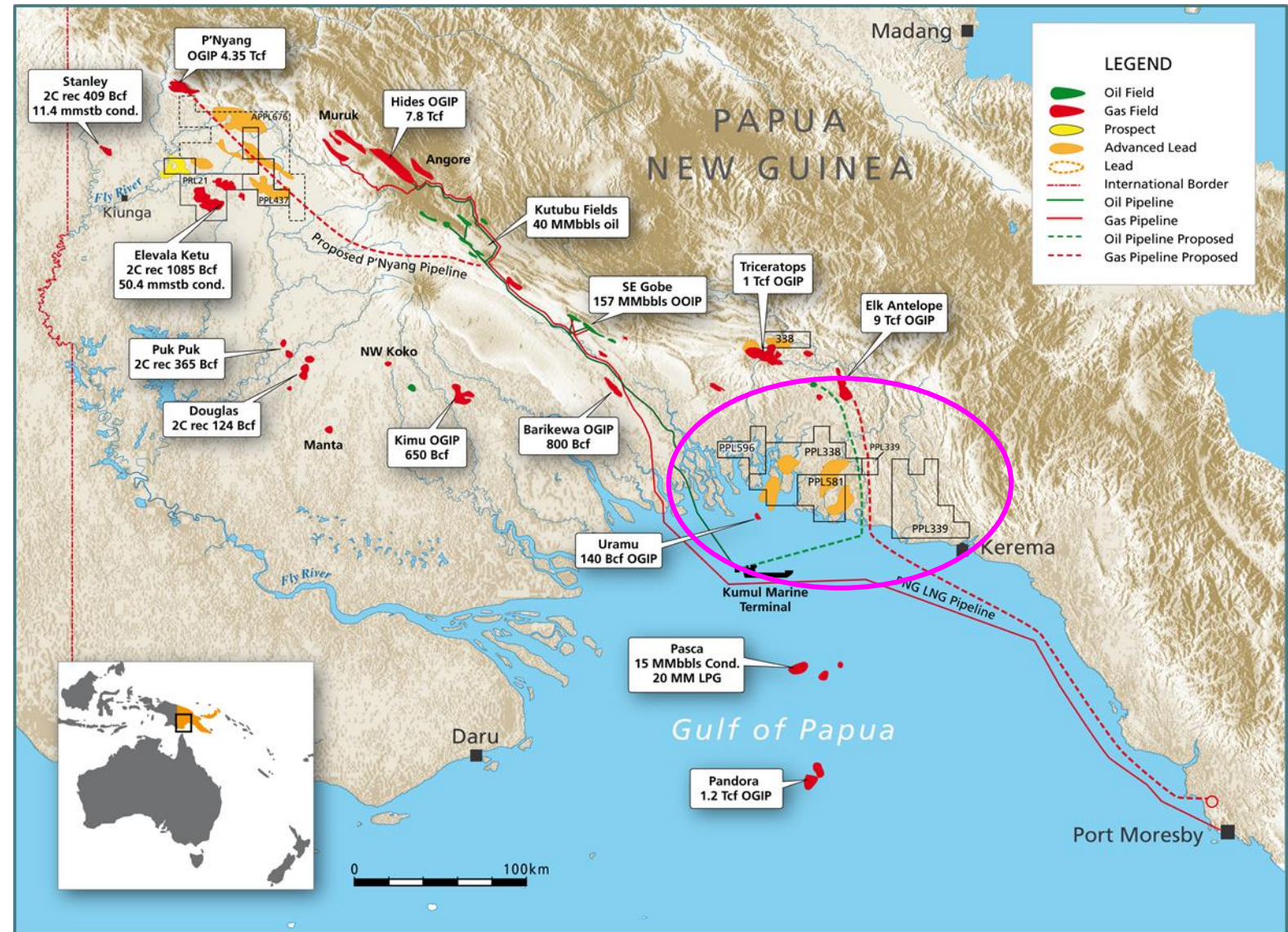
- Kina rationalisation in the east, focus on the western PNG petroleum system
- Heritage Oil
- APDL 12

2. PPL437 & PPL676 – Multi-TCF Opportunities - Western Province PNG

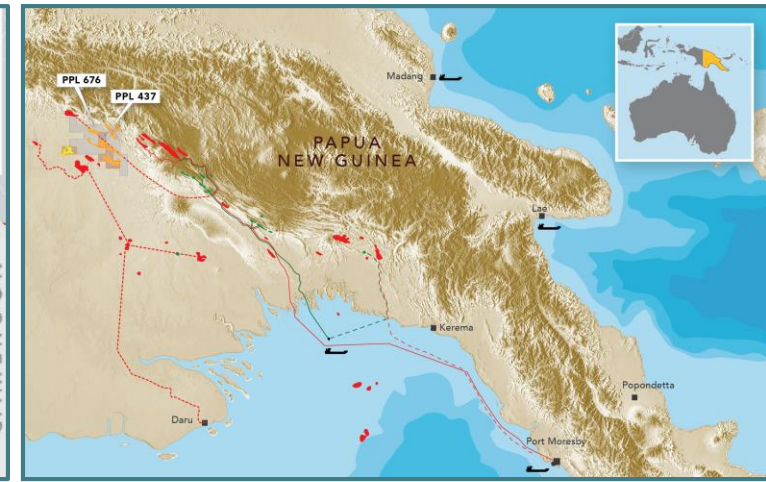
- TCF+ wet gas opportunity in the western clastic play of the Papuan Basin comprising late Jurassic to early Cretaceous sandstone reservoirs charged from deeper Jurassic source and sealed by intact early to mid Cretaceous shales
- Very high gas wetness ratios present early liquids monetisation opportunity in advance of gas sales

- Since the Covid Pandemic Kina has had to downsize and relinquish its 100% owned exploration licences in the eastern petroleum play:
 - This has not been due to the lack of prospectivity of the exploration assets but more because of prevailing uncertainty over the future of our industry and the less than clear fiscal regime in PNG

- Our remaining assets of focus are Joint Ventures where we have supportive joint venture participants in the western petroleum play:
 - PPL 437 & PPL 676 – Partner Heritage Oil where Kina is the operator
 - PRL 21 – Operator Arran Energy Kina equity 16.75%



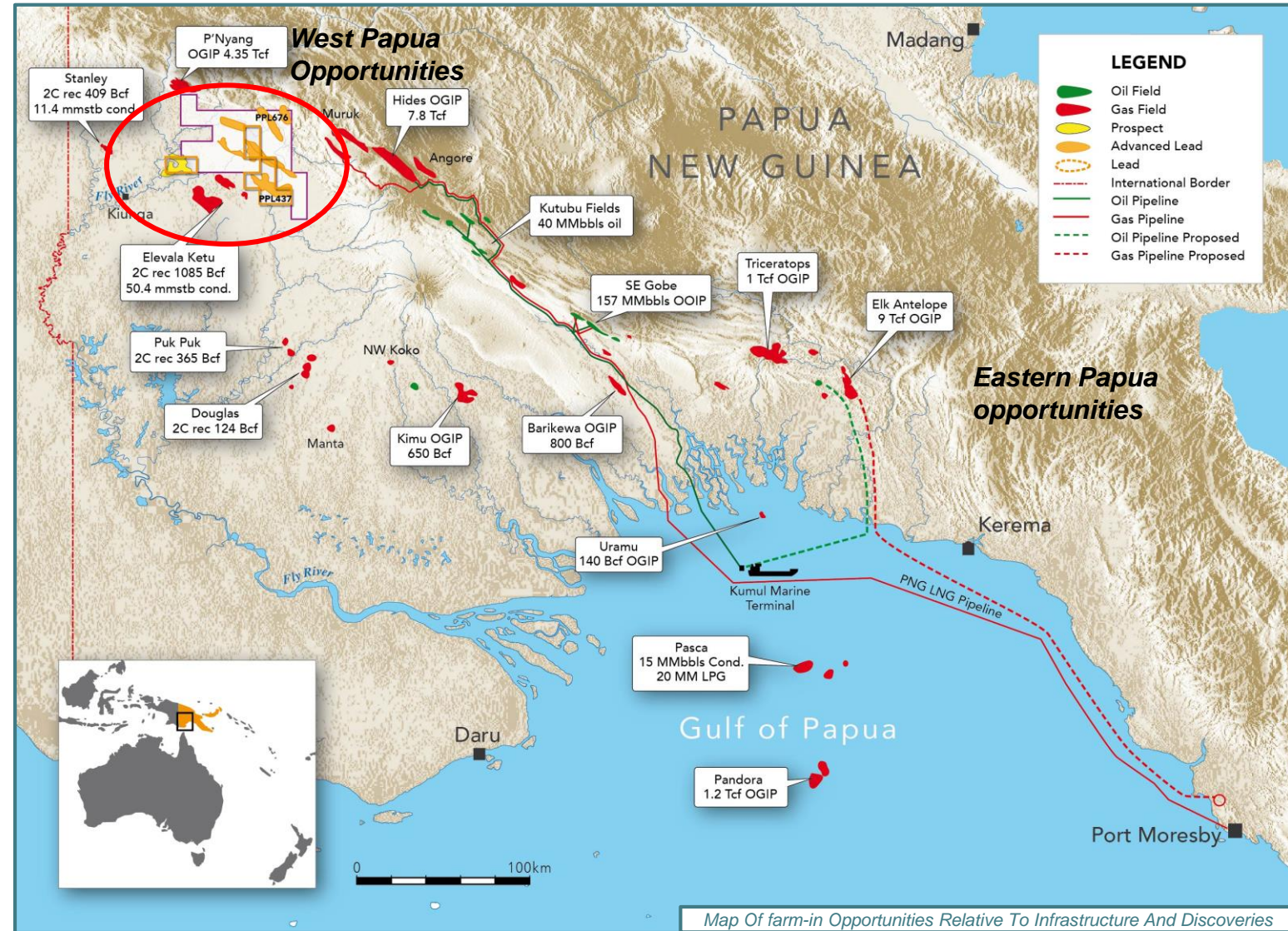
- Heritage Oil Ltd is an independent oil and gas exploration and production company, founded in 1992 and acquired by Energy Investments Global Ltd in 2014
- Heritage is a versatile organisation with a portfolio of quality assets covering near field, infrastructure-led exploration whilst optimising development options on their world class production asset in Nigeria
- The portfolio is managed by a highly experienced team with excellent technical, commercial and financial skills



- Kina has 16.75% of Elevela Ketu Fields which remains locked in a legal stalemate over APDL12 with a dispute over the Minister's powers in the process used to reject an Application for a Production Development License as well as the technical and commercial grounds on which the State evaluated and rejected the Application.
- At a time when PNG needs to reduce its reliance on imported fuels to relieve the forex burden and to reduce the carbon footprint of its industry, it is unfortunate that the State has not been more supportive of rapid development of home-grown options like PRL 21.
- Kina & its JV remain committed to the development of these long-discovered resources. once the current disputes are resolved, which we hope will be soon with the leadership of the State for the benefit of the people, land owners and industry.
- We are very encouraged by the recent withdrawal of the Minister's Notice to Cancel the PDL10 licence and hope that re-engagement by the Government with our JV could yield positive outcomes in terms of progressing development of the resource.

Background

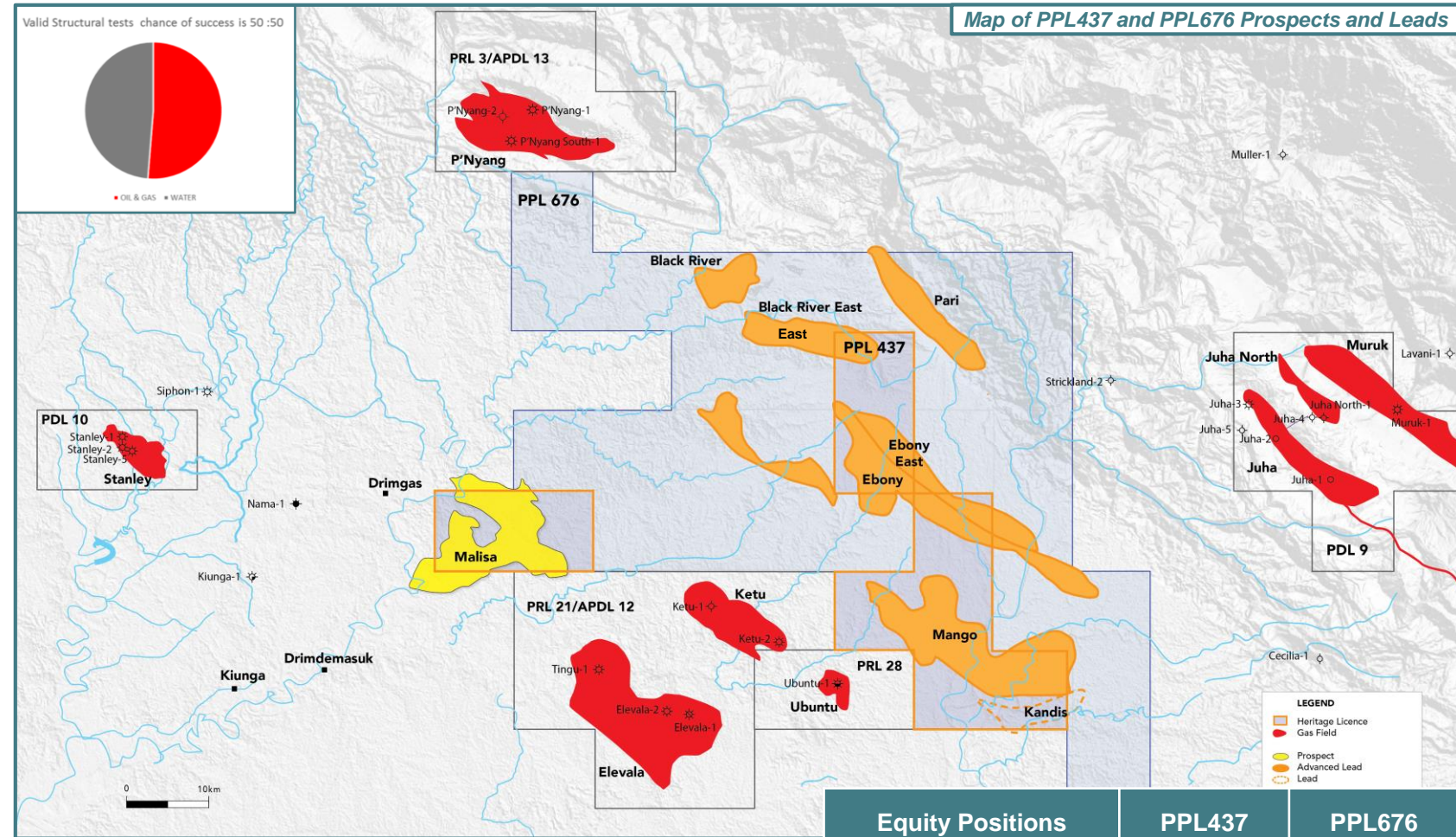
- PNG is located 6km from the Australian border and is currently exporting LNG into the Asian and international markets from Port Moresby via the Exxon PNG LNG project
- Two new multi-TCF projects Papua LNG Project; 2023 and P'Nyang; 2028 will be the next 2 LNG projects to be commercialised
- Extended infrastructure will herald the development of existing and new discoveries in the foreland basin south of the fold belt
- Here we present several onshore exploration opportunities adjacent to the P'nyang Field and proximal to proposed infrastructure:
 - PPL437 and PPL676



Western Province – PPL437 & PPL676



- PPL437 and PPL676 are highly prospective licences within the Western Papuan Basin, onshore PNG. The licences are located in the Foreland, south of the Papuan fold belt where the success rate is 1 in 2 for valid traps
- The licences are in a proven hydrocarbon fairway between the Stanley and P’Nyang fields to the northwest, the Juha and Muruk fields to the northeast and along strike from the Elevala/Tingu and Ketu gas condensate fields
- They will also benefit from proposed infrastructure for gas pipeline from P’Nyang to the LNG plant in Port Moresby and the upcoming development of the Stanley Field
- The combined licences comprise 36 graticular blocks and cover an area of 3081 km²
- The most mature prospect, Malisa, has gross prospective resource of 2TCF (whole trap), with another 4TCF in the other leads



Equity Positions	PPL437	PPL676
Kina Petroleum (Op)	57.5	57.5
Heritage Oil Ltd	42.5	42.5

Licence Commitments and Work Program



PPL437

- Licence awarded 16th November 2020 for a period of 5 years
- Work commitments are light, total minimum expenditure is \$2.3m
- Note: 12 month extension awarded on 10th August 2021 for Covid. 12 month extension from the initial date of expiry

PPL437 Work Obligations and Expenditure			
Year	Dates	Work Commitment	Minimum Expenditure Commitment (US\$)
1 & 2	29 th Jan 2021 - 28 th Jan 2024	<ul style="list-style-type: none"> • Soil gas survey • Commercial screening study • Seismic acquisition study/planning • Drilling cost studies 	200,000
3,4,5	29 th Jan 2024 - 28 th Jan 2027	<ul style="list-style-type: none"> • Drill Malisa prospect <p>OR</p> <ul style="list-style-type: none"> • Acquire 60km 2D seismic data • Permit review 	15,100,000
			2,100,000
Total 5 year commitment			15,300,000 OR 2,300,000

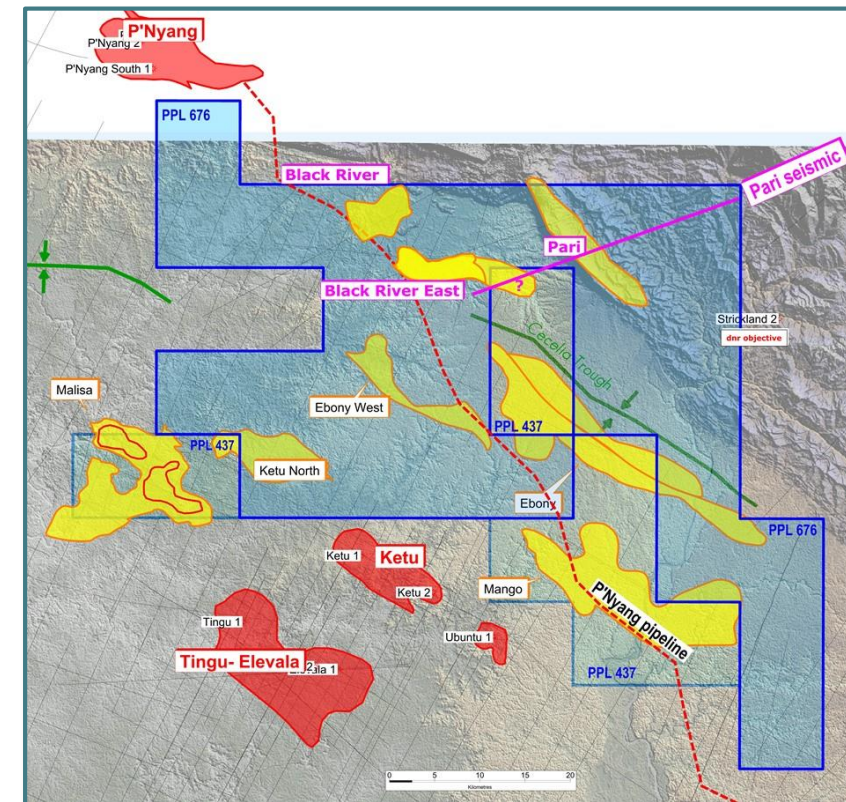
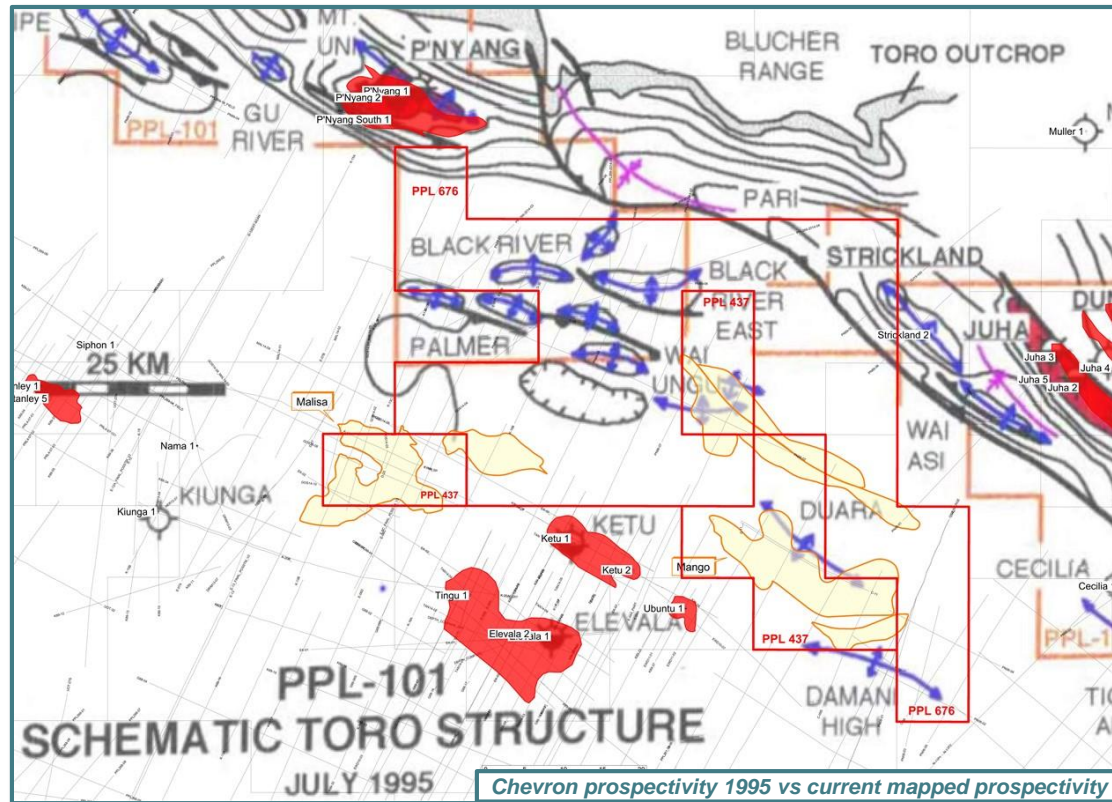
PPL676

- Licence awarded 03 November 2023
- Option to “walk away” end of each two year period
- Idea is to carry joint WP between APPL676 and PPL437 – joint studies for the geological work program, soil gas survey etc

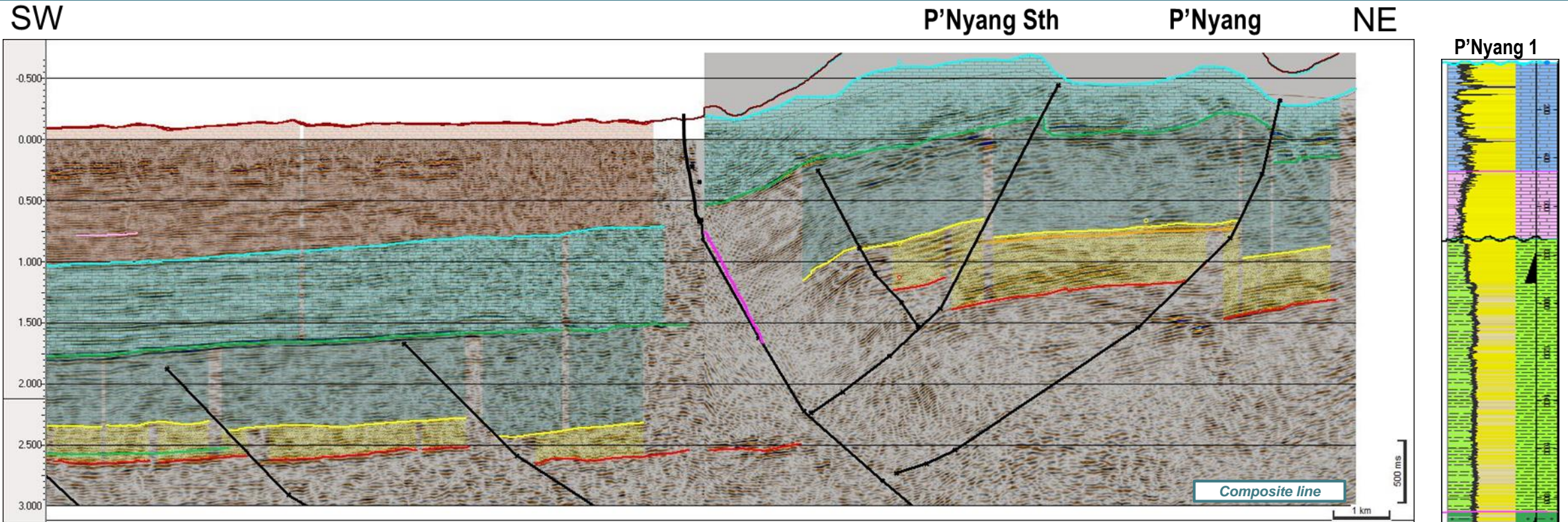
PPL676 Work Obligations and Expenditure			
Year	Dates	Work Commitment	Minimum Expenditure Commitment (US\$)
1 & 2	3 rd Nov 2023 – 2 nd Nov 2025	<ul style="list-style-type: none"> • Soil gas survey • Seismic field crew studies 	150,000 50,000
3 & 4	3 rd Nov 2025 – 2 nd Nov 2027	<ul style="list-style-type: none"> • Seismic survey • Land rig drilling study 	2,000,000
5 & 6	3 rd Nov 2027 – 2 nd Nov 2029	<ul style="list-style-type: none"> • Drill one slim hole well 	15,000,000
Total 6 year term commitment			17,200,000

P'Nyang PPL 676 & PPL437

- PPL676 was awarded in November 2023 giving a much larger contiguous acreage holding with PPL437
- PPL 676 & 437 cover the uplifted foreland from the frontal thrust to the NE into a low that separates it from Elevala Ketu in the SW
- Clear surface structures were recognised by Chevron in PPL 676 SE of P'Nyang
- New seismic identifies 3 leads in PPL 676 – Pari, Black River and Black River East – along trend from P'Nyang & up dip from Malisa Ketu North & Ebony



PPL676- Foreland to Foldbelt

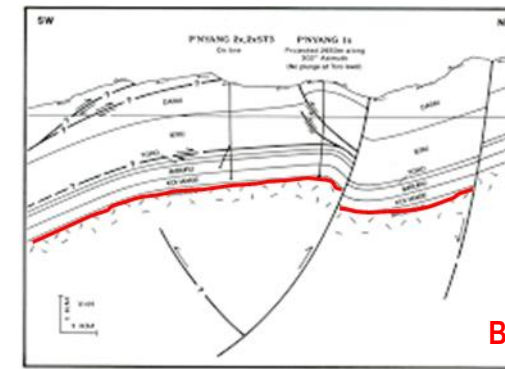
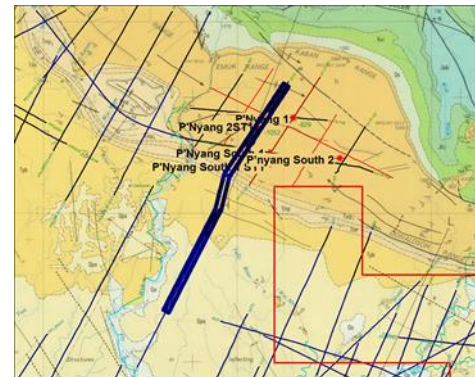


P'Nyang Resource: 4.3TCF

Basement involved structure located south of the frontal thrust- in uplifted basement block with closure generated by down to the northeast counter regional faults

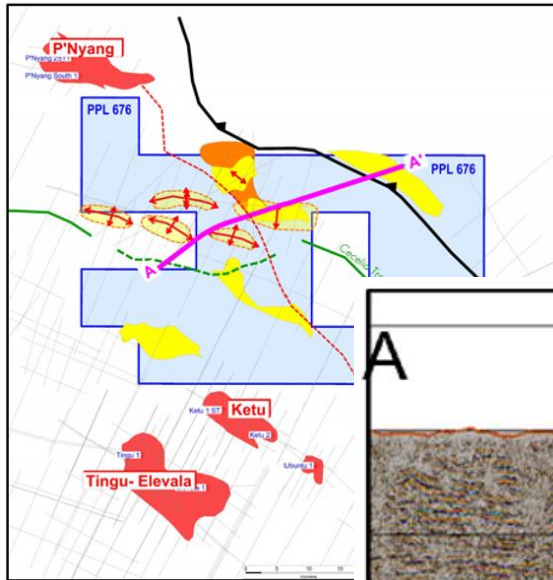
Yellow top reservoir

Red basement



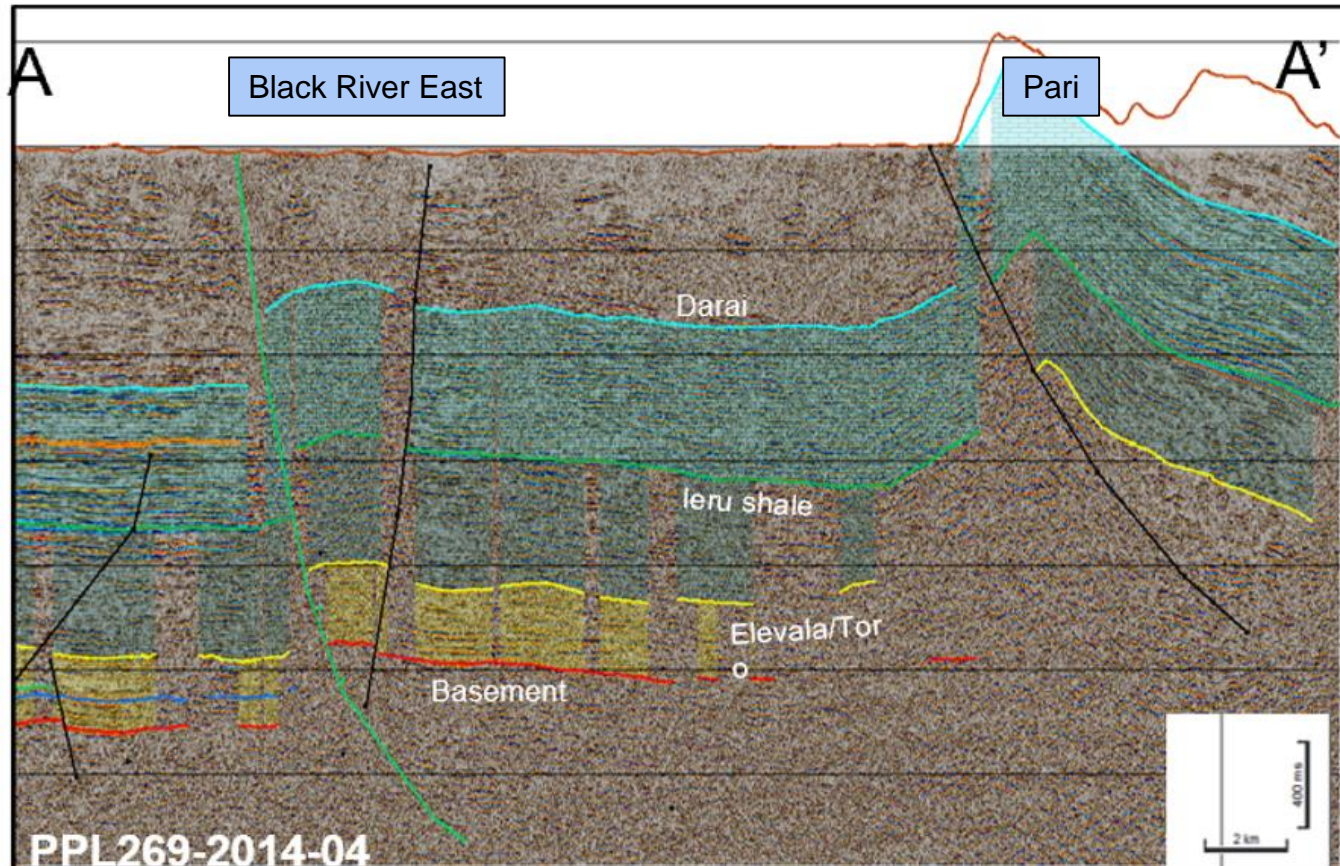
Basement

PPL676 2 Large Prospects SE of P'Nyang: Pari & Black River East



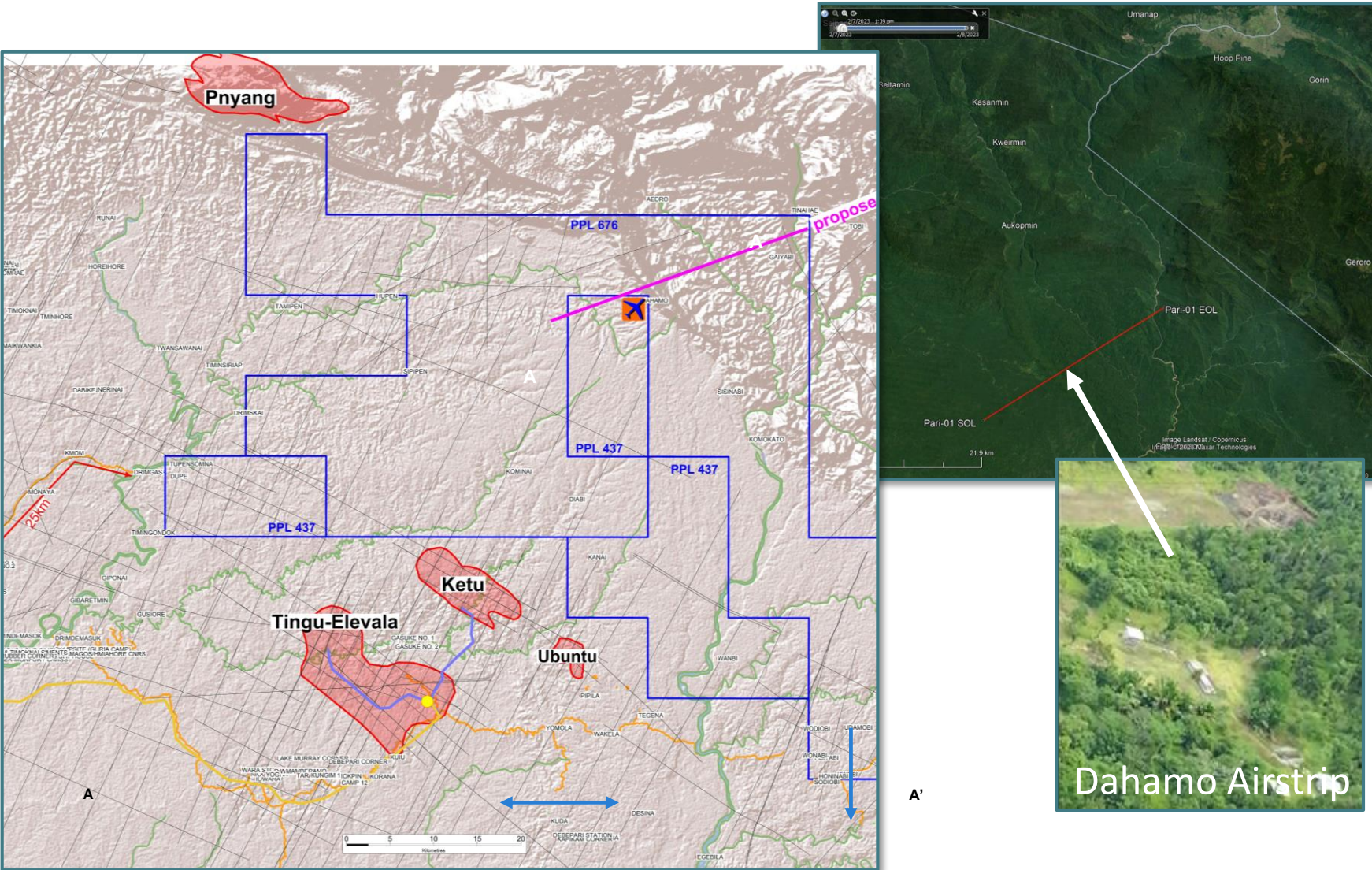
Pari Prospect

- A large possibly detached frontal thrust structure on hanging wall of frontal thrust
- Inversion of the thrust fault allows thickening of reservoirs into the bounding fault
- Potential volumes ~3tcf



- **Black River East**
- Basement involved footwall P'Nyang lookalike close to likely pipeline
- P'Nyang development sanctioned
- Toro target & basement mapped on Black River East
- Multiple follow up in the event of success
- Seismic due in 2025 but would like to bring it forward
- Yellow top reservoir
- Red top basement

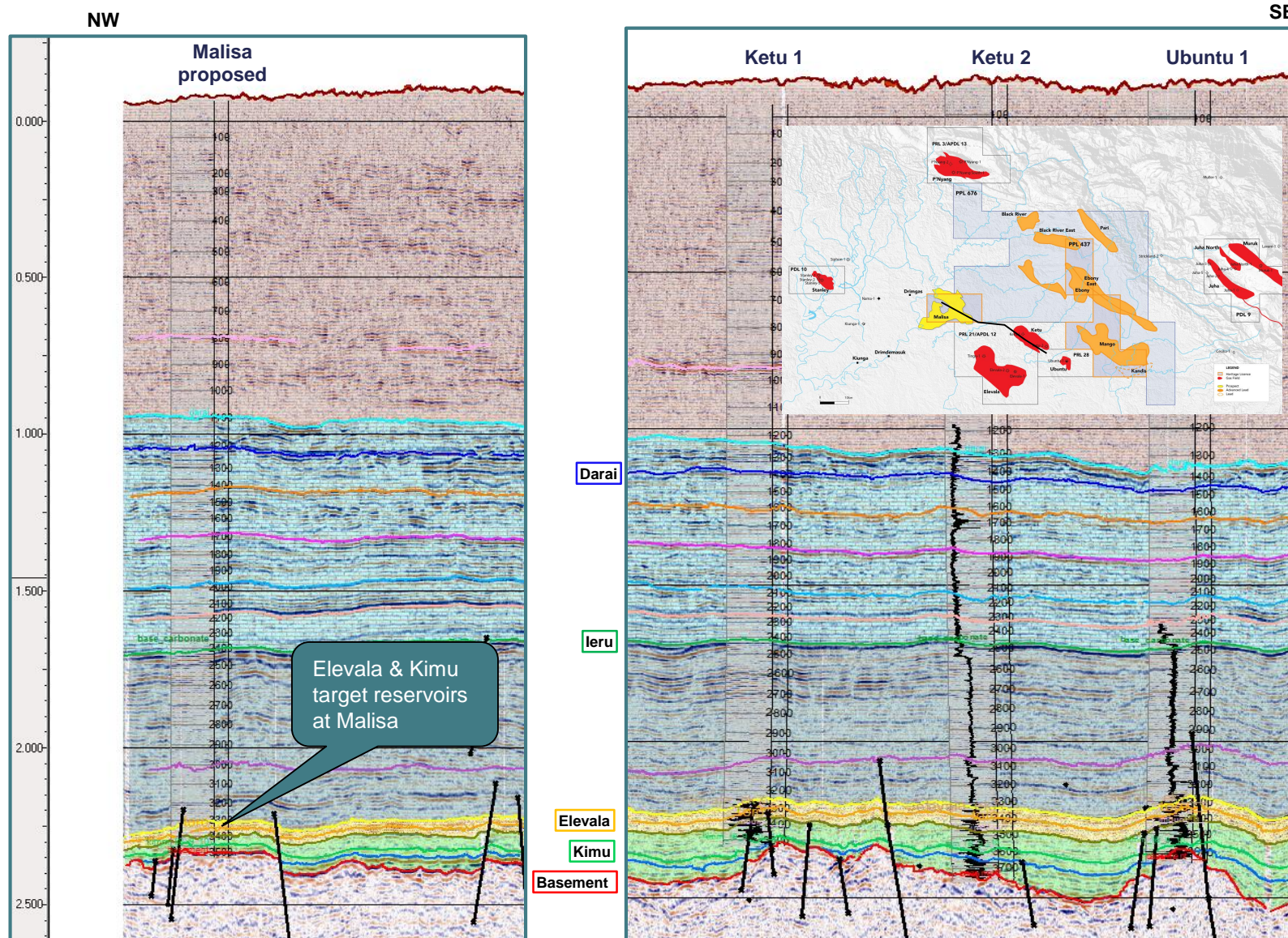
PPL676 - Proposed Pari Seismic Line



- Single line proposal to cover the Pari and the Black River East Prospects
- Perpendicular to Pari geometry to best resolve the structure
- Orientation of proposed line intersects 2 existing seismic lines allowing for tie in and control points:
 - PN88-07
 - PN89-07
- Line length 30km
- 75m shot point spacing & 12.5m receiver spacing.
- Nearby central camp site with airstrip
- Costs are dependent on heli-support
- Range USD\$1,350,000 and \$2,550,000
- Man portable drills could this figure

PPL437 Primary Prospect: Malisa- Southern Foreland

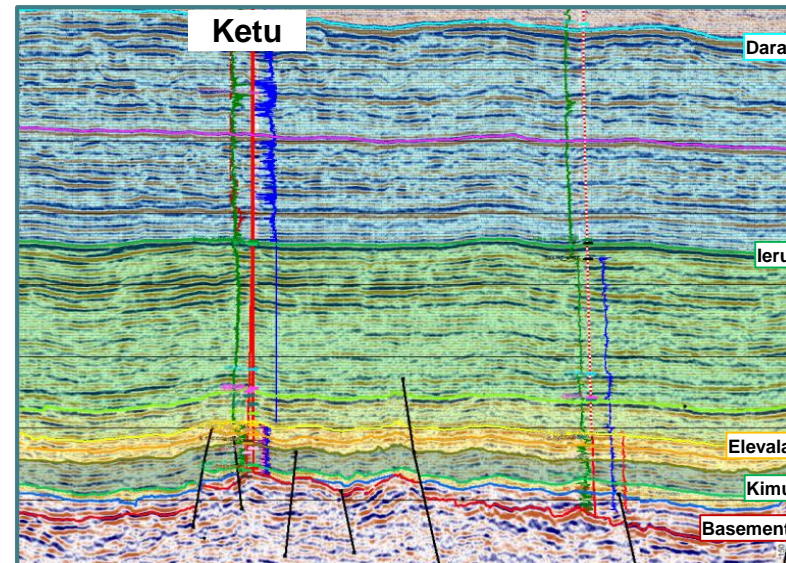
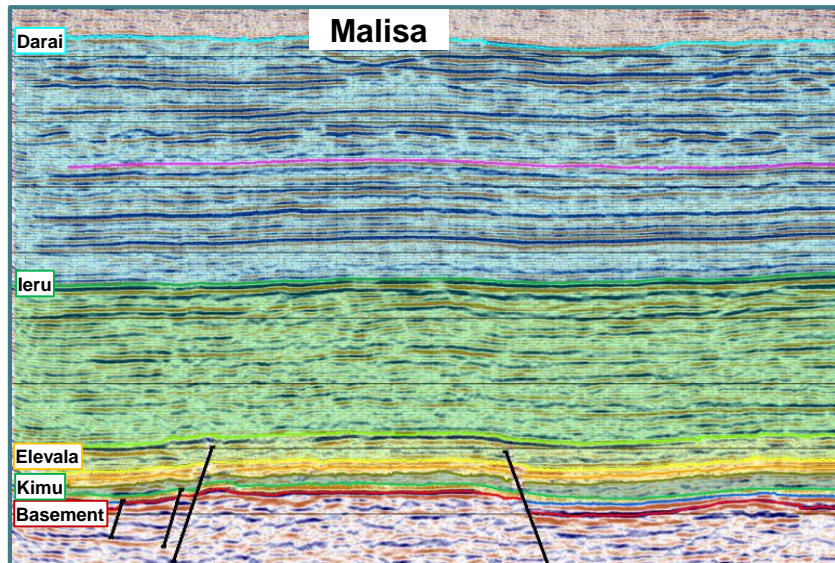
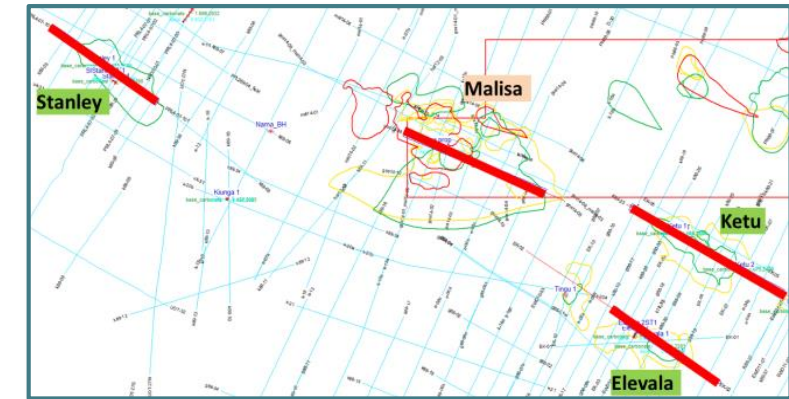
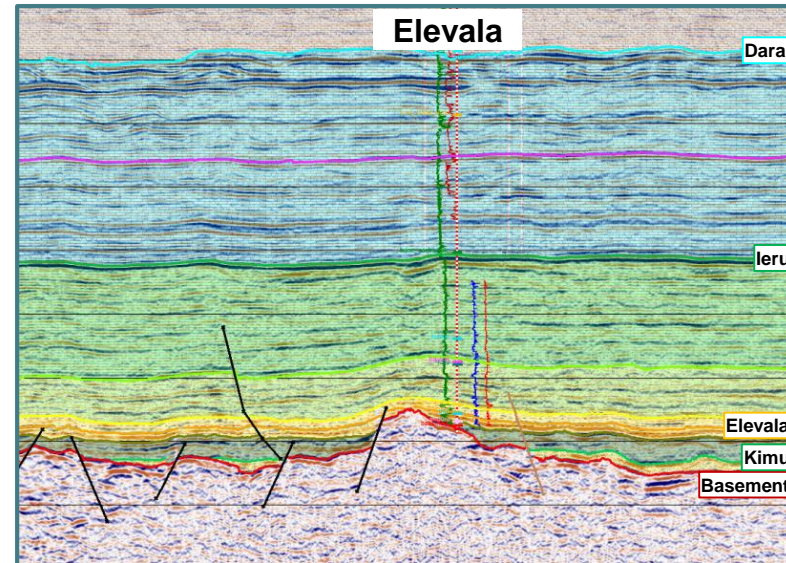
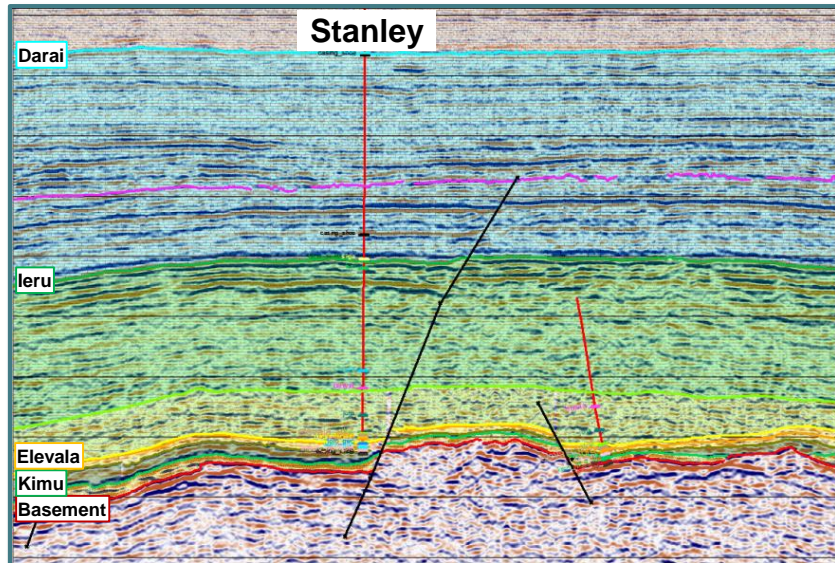
Line through Malisa Prospect and Ketu/Ubuntu discoveries



West province Petroleum Systems	
Play	Gas/Condensate in basement drape/ inversion structures
Nearby Fields	Elevala, Tingu, Ketu, Stanley, P'Nyang
Reservoirs	<p>Oligocene Stanley Sandstone</p> <p>Cretaceous Bulago sandstones</p> <ul style="list-style-type: none"> Shows in Elevala, Ubuntu (gas) <p>Cretaceous Elevala Sandstone</p> <ul style="list-style-type: none"> Proven in Elevala, Ketu, Ubuntu and Tingu (gas) <p>Cretaceous Toro Sandstone</p> <ul style="list-style-type: none"> Proven in Stanley, P'Nyang (gas) <p>Jurassic Kimu Sandstone</p> <ul style="list-style-type: none"> Proven in Stanley (gas)
Seal	Ieru shales Imburu intraformational shales
Source	Middle - Late Jurassic
Trap	Structural, basement drape, possible stratigraphic components
Prospects/ Leads	Malisa, Ebony, Mango, Kandis, Ketu Nth

PPL437 - Malisa Prospect

Seismic Comparison with Nearby Fields



- Malisa has a similar structural style to nearby discoveries at Elevala, Ketu and Stanley
- These are all basement drape structures overlain by Elevala, Toro, Kimu reservoir sands
- The seal for these reservoirs is the Ieru formation and they are sourced from the Jurassic Magobu formation

Legacy Work & Proposed Farm in Program

- The JV has obtained a contemporary seismic database of >1400km through acquisition, reprocessing and data trades:

- In 2014 the JV acquired 106km modern 2D seismic data
- 884km legacy seismic data has been reprocessed

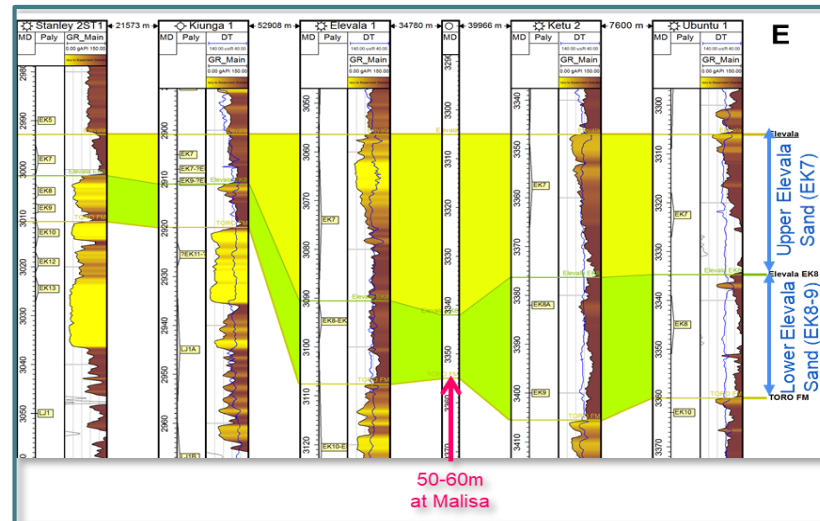
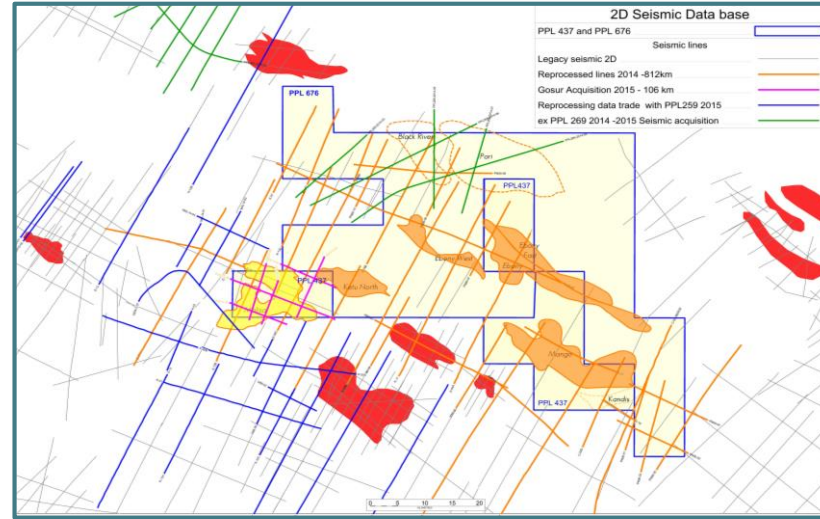
- Further reprocessing is proposed for PPL 676

- Equity is available in both licences for funding proposed seismic over Black River East & Pari prospects in PPL 676

- Malisa is drill ready along trend from Elevala Ketu: Well cost US\$14.5m (2019)

- Work Program Goals:

- Confirm Pari & Black River East Prospects
- Drill the well once Stanley Development sanctioned
- High-grade follow up leads using reprocessed seismic



Correlation from Stanley to Ubuntu with Proposed Reservoir Section at Malisa

PERIOD	EPOCH	LITHO-STRAT	LITHOLOGY	TARGETS	HOLE SIZE	CASING	DEPTH (metres)
NEOGENE	Pliocene	Orubadi Formation	[Lithology: Yellow/Orange]	[Target: Sun]	36" Hole from surface 20" Hole	30" Stove Pipe 18 5/8" Conductor	1000m
	Miocene	Darai Limestone	[Lithology: Blue/White]	[Target: Sun]	17 1/2" Hole	13 3/8" Casing	
PALEO-GENE	Oligocene	Sirga Formation	[Lithology: Blue/White]	[Target: Sun]	12 1/4" Hole	9 5/8" Casing	2000m
CRETACEOUS	Late	teru Formation Upper teru (undiff.)	[Lithology: Yellow/Orange]	[Target: Sun]	8 1/2" / 6" Hole	Contingent Casing set in Bawia Claystone Mbr. Contingent 7" Liner	3000m
	Early	Bulago Sst., Bawia Mbr., Elevala, Toro Fm.	[Lithology: Yellow/Orange]	[Target: Sun]			
PALAEOZOIC	Jurassic	Upper Kimu Sst.	[Lithology: Pink]	[Target: Sun]		Planned T.D ~3550m MDBRT	
		Basement	[Lithology: Pink]	[Target: Sun]			

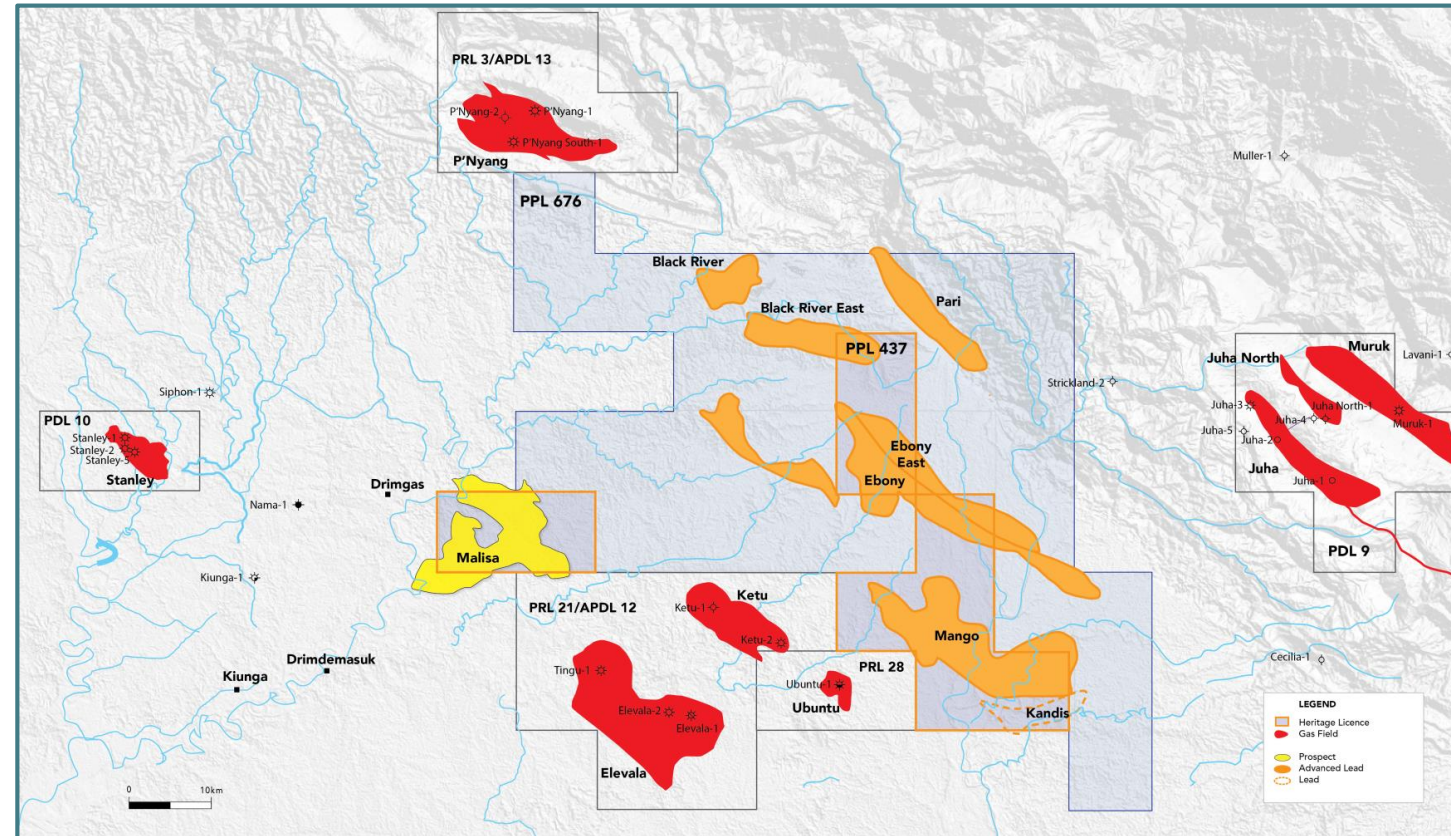
Malisa-1 Preliminary Well Plan

Monetisation & Export Options

- An immediate monetisation opportunity exists due to the gas condensate nature of the prospective resource
- The Stanley development to the west is an example of a condensate stripping/gas recycling project. Stanley CGR is 30bbls/mmscf. We expect Malisa to be condensate richer and more profitable
- The stripping is achieved by relatively simple J/T expansion not by Turbo expander and deep recovery
- Development economics are enabled by export of dead condensate via river barge avoiding significant pipeline costs
- Medium to longer term gas can be monetized by blowdown as ullage appears in existing LNG developments and/or additional LNG projects are identified through exploration
- Any proposed P’Nyang gas pipeline is likely to be close Malisa and likely run through the PPL437/676 blocks

PPL437 and 676 Volumes

- PPL437 volumes of 6.9tcf in 6 prospects and leads. The primary prospect, Malisa, has 2tcf GIIP
- In PPL676, multi-tcf potential exists in 3 leads along trend from P’nyang





Thank you!