

Deep water exploration in T&T: A new frontier in an old province

By David Renwick

The deep water in Trinidad and Tobago is one of the holy grails of geologists, who have long suspected its vast hydrocarbon potential

The eagerness of Trinidad and Tobago's Ministry of Energy and Energy Affairs (MEEA) to channel international exploration companies' attention to the deep water region offshore Trinidad's north and east coasts is clearly evident in the fact that three offers of deep water acreage have been made in the last three years, involving 16 different blocks.

One block, Trinidad and Tobago Deep Atlantic Area 1 (TTDAA 1), has been put out three times, most recently in the auction launched on August 1, 2013, which closed on March 28, 2014.

TTDAA 2, TTDAA 3 and TTDAA 7 have made an appearance on two occasions, the most recent being the auction currently in progress.

Deep water is defined by the MEEA as ranging between 600 to 3,500 metres, though, for tax purposes, companies drilling in 400 metres of water can also claim the incentives offered, which include an 80 per cent write-off against reserves for "cost oil or gas", 35 per cent petroleum profits tax (PPT) and 18 per cent supplemental petroleum tax (SPT) – payable on oil only – which allows companies to retain a higher share of "profit oil or gas" under the production sharing contract (PSC) system that applies to all offshore arrangements between the MEEA and the companies.

Of the 16 blocks offered, seven have been awarded and exploration activity has already commenced, starting with 3D seismic, an obligatory requirement under PSCs.

The BP Exploration Operating Co, a BP special purpose vehicle, successfully bid for 23(a) and TTDAA 14, from the 2010-2011 block auction and BHP Billiton for TTDAA 5, TTDAA 6, TTDAA 28 and TTDAA 29 from the 2012 round. BHP/Repsol were also recently awarded block 23(b) from the 2010/2011 round after lengthy negotiations led to "a mutually acceptable proposal for the block". A PSC was signed on November 5, 2013.

BP is obliged to drill one exploration well in each of its two blocks, one to 4,250 metres, the other to 2,500 metres. BHP Billiton, for its part, must drill

six wells in its four blocks.

To facilitate this, extensive 3D seismic work will have to be undertaken – 4,000 sq km in the case of BP and 5,330 sq km by BHP Billiton.

As a cost-saving measure, approved by the ministry, the two international giants are collaborating on seismic activity and also the operatorship of the two BP blocks which BHP Billiton will undertake.

"The proximity of both companies' blocks allows for one big seismic shoot," as Minister Ramnarine himself points out. "This has an advantage for the country, because the companies have less costs to recover and the government gets its full profit share faster."

Why is the MEEA so keen to focus companies' attention on the deep water?

It has been relatively undrilled, for one thing.

Another reason is that substantial amounts of hydrocarbons have been discovered in deep water acreage in various parts of the world – the Zaedyus find by Shell, Tullow and partners in French Guiana waters in 2011 being one of the most recent examples – and the MEEA believes there's no geological reason why the same should not happen in Trinidad and Tobago too. After all, the country's land acreage has been producing oil for 105 years now and the shallow waters off the east coast for 41 years (oil and gas), so why should the deep water be any different? It has to be said that eight wells were sunk in the "shallower" part of the deep water in the late Nineties/early 2000s but all proved uncommercial. This is not regarded by geologists as invalidating the "real" deep water acreage at depths of around 2,000 metres or more.

Certainly, the companies, who have to commit to spending the hundreds of millions of dollars involved in deep water activity, seem confident that the effort is worthwhile.

No fewer than 19 blocks caught the companies' attention in relation to the most recent deep water round and they indicated this to the Ministry ("nominated" is the formal term used), out of which blocks TTDAA 1, TTDAA 2, TTDAA 3, TTDAA

7, TTDAAs 30 and TTDAAs 31 were put out for bidding in the current auction.

The companies' optimism about the Trinidad and Tobago deep water is reflected in statements like those of Norman Christie, regional president of BP who agrees that "the deep water certainly holds the promise of being a new hydrocarbon province for the country" though he is careful to add that "but it is wildcat exploration, subject to the vagaries of wildcat exploration. The chances of success are not high but high enough for us to address the deep."

He concedes: "The geoscientists think there could be material quantities of either oil or gas, depending on whom you talk to. Based on bpTT's existing offshore infrastructure in Trinidad and Tobago, we could handle either. Oil would be good obviously because of price. Good for the country, good for whoever finds it. But we can also monetise gas, which not every company can do."

BHP Billiton Trinidad and Tobago President, Vincent Pereira, is more definitive than Mr Christie, insisting that: "We have been a long-standing advocate of the deep water in Trinidad and Tobago. We see the deep water as the next frontier for the country. I am convinced about that. I am very, very hopeful that there are hydrocarbons in the deep water."

Of the five blocks awarded to BHP Billiton, three are north east of Tobago (TTDAAs 28 and 29 and 20(b)) and two are off the east coast of Trinidad (TTDAAs 5-6).

Pereira explains that the company was attracted to "the two different geological plays" these blocks represent. "The play to the north," he says, "is an Oligocene horizon, like the rocks we

produce from in our Angostura field in block 2(c) but, hopefully, less complex. The blocks off the east coast are a Miocene play, which is more the normal type of play you have in Trinidad and Tobago."

Minister Ramnarine has even stuck his neck out and given estimates of what the MEEA thinks may lie in some of the deep water acreage signed off so far.

- In BP's 23(a) and TTDAAs 14 blocks: 4.7 to 8.2 trillion cubic feet (tcf) of natural gas; no oil figures given.

- In BHP Billiton's TTDAAs 5-6 and TTDAAs 28-29 blocks: 2.4 to 23.6 tcf (natural gas); 428 million to 4,200 million barrels (crude oil).

BHP Billiton's Pereira is reluctant to challenge the Minister's figures. "I think these are good ranges," he says. "At the end of the day, for the deep water to work, the discoveries have got to be big because of how large the investment is."

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Of the 16 blocks offered, seven have been awarded and exploration activity is scheduled to commence shortly, starting with 3D seismic

BHP Billiton's Angostura facility: the company is leading the charge in Trinidad and Tobago's deep water



There are still one or two other locations, such as the onshore or shallow water deep horizon areas, where new oil or gas has the potential to be discovered

► discovered (and in Tobago, though that does not seem likely, according to geologists). But the deep water is generally regarded as the place which could prove to be the country’s next “petroleum frontier”.

The most extreme estimate for oil in BHP Billiton’s TTDA 5-6 and TTDA 28-29 blocks - 4,200 million (4.2 billion) barrels – is more than all the oil produced in the country over the last 105 years, which the ministry says was about 3.5 billion barrels.

“So what we are talking about here is a whole new province out there waiting to be tapped,” observes Minister Ramnarine.

Indeed, at the signing ceremony for the BHP Billiton acreage, he was moved to note: “I would like us to consider the gravity of this moment. The signing here today has enormous economic potential. I would venture to say what we are signing here has the potential to radically reshape the economic landscape of the country in the coming years.”

He has also noted that “the deep water in Trinidad and Tobago is one of the holy grails of geologists

who have long suspected its vast hydrocarbon potential.”

The 2013 deep water auction has been underpinned by a number of geological studies that have served to progressively de-risk the acreage.

The 12,300 line km 2002 2D survey, for example, has undergone time and depth reprocessing by Spectrum.

GX Technologies did depth reprocessing of work undertaken in 2004 and was specifically able to image the Cretaceous. This is particularly significant, since the Cretaceous is generally regarded as the source rock for most of Trinidad and Tobago’s hydrocarbons. PGS did some additional 2D seismic in 2008 (6,834 line km).

BioStratigraphic Associates (BioStrat) provided an integrated biostratigraphic data base study that can be used for shelf to deep water well correlation and environmental modelling and Dynamic Global Advisers (DGA) produced a two-phase study, focussing on the exploration potential of the Trinidad and Tobago Deep Atlantic Area.

The MEEA concludes that: “The results of the DGA technical studies have established play concepts, analogues with other basins, identifying leads and potential hydrocarbon reserves.”

On the basis of all that, the favourable outlook for the Trinidad and Tobago deep water should come as no surprise. ■



Shallow water areas such as Petrotrin’s Trinmar acreage offer significant oil and gas potential, particularly in the deeper horizons