

Exploration History Of The Timor Sea Area, Bonaparte Basin And Surrounds

Onshore Exploration

Exploration in the onshore Bonaparte Basin was initiated in 1839 when the crew of the *HMS Beagle* found bitumen in a well dug for water at Holdfast Reach in the Victoria River estuary.

By the turn of the 20th Century several coal bores, less than 304.8 m (1000 ft) deep, had been drilled around Port Keats on the coast of the Joseph Bonaparte Gulf. There was little further exploration until the early 1960s when Spirit Hill-1 and Bonaparte -1 were drilled onshore, the latter drilled by Alliance Oil Development to a depth of 3210 m.

Field mapping in the onshore Bonaparte Basin was initiated by the BMR and CSIRO, later in conjunction with Australian Aquitaine Petroleum. This resulted in publication in a series of 1:250,000 geological map sheets covering the onshore Bonaparte Basin. More recently, Laws and Brown (1976) and Laws (1981), published summaries of the onshore geology and drilling results.

Experimental seismic surveys were conducted by the BMR in 1956, but the first use of the seismic method in the Bonaparte Basin for

petroleum exploration began in 1960 with a 100 km length reflection survey conducted near Spirit Hill. Further seismic was acquired through to the early seventies, the most significant drilling results being a gas flow from Bonaparte -2 and oil shows in Kulshill-1. Seismic acquisition recommenced in 1980 to 1984 and the gas discovery, Weaber-1 was drilled in 1982. Additional small discoveries occurred through the 1980s (eg Waggon Creek) but none has been commercialised.

Offshore Exploration

In the offshore, early work focussed on the Browse and Bonaparte basins and the initial wells were drilled by BOCAL/Woodside in 1967-1969 in the west of the basin (Ashmore Reef-1 and Sahul Shoals-1). The Mesozoic was the main target of this exploration. ARCO and Aquitaine targetted the Palaeozoic as they explored the southeast of the basin (Lacrosse-1 and Petrel-1).

These exploration groups dominated exploration in the basin until the 1980s when BHP, Western Mining Corporation and Bond Corporation led new joint ventures into relinquished areas. Oil discoveries at Skua, Jabiru and Challis triggered an extended

period of oil exploration in the Vulcan Sub-basin which has continued through to the present day.

Exploration drilling in the northern Bonaparte Basin began in 1971 with the drilling of Flamingo-1 but exploration was frozen in 1976 due to a seabed boundary dispute between Australia and East Timor.

The period leading up to the gazettals by the Australia-Indonesia Joint Authority for the Timor Gap Zone of Cooperation (ZOCA) saw only minor exploration in surrounding platform areas. Once exploration got underway in ZOCA a number of oil and gas discoveries followed, the largest being the Bayu-Undan gas-condensate discovery.

In 1994 the Laminaria/Corallina oil discoveries sparked renewed exploration in the northern Bonaparte Basin which continued through the turn of the century, resulting in several small oil discoveries.

During the past five years, 55 exploration wells in the Timor Sea have yielded 15 technical discoveries with a discovery rate of 27%, very close to the Timor Sea average success rate of 25%.

However, these were mainly gas/ gas liquids and small oil discoveries, which could not be commercialised. Significant discoveries during this period included extensions to the Greater Sunrise field (gas-condensate, Sunset West -1, Bard -1), Chuditch-1 (gas-condensate), Crux-1 (gas-condensate), Argus-1 (gas), Audacious-1 (oil), Blacktip-1 (gas), Abadi-1(gas-condensate) and Cash-1(gas).

The Timor Sea petroleum geoscience symposium will address technical issues crucial to improving not only the discovery rate but also the rate of commercialisation. The main goals are to establish the technical criteria to facilitate:

- 1) Discovery of remaining oil reserves.
 - 2) Discovery of new liquids rich gas deposits viewed to have commercial potential in the short term as pipeline and LNG facilities become available and markets are established.
 - 3) Discovery of gas deposits in the Petrel Sub-basin and elsewhere to lend critical mass to future gas projects in the Timor Sea which have a short to medium term chance of commercialisation.
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