

GEOLOGY

1 TECTONICS AND STRATIGRAPHY

The tectonic framework of offshore Malta belongs to that of the Pelagian domain (Fig. 1) and is the result of complex interactions between the African and Eurasian plates since the Triassic.

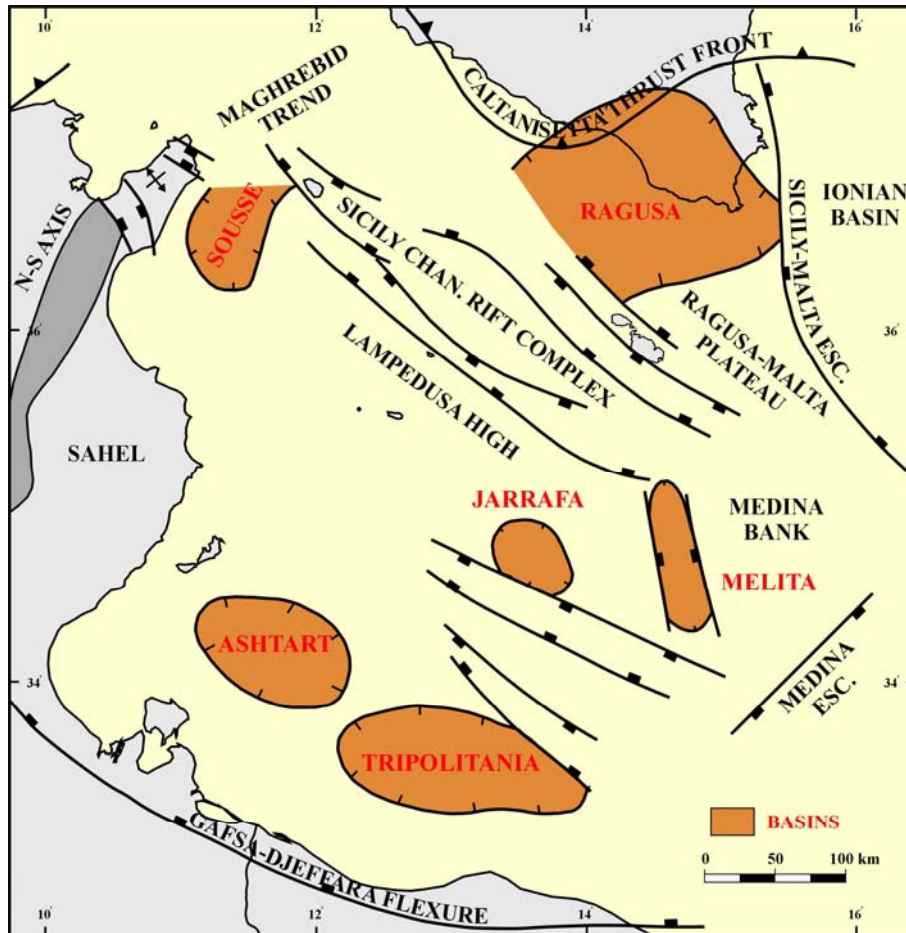


Figure 1 Tectonic framework of the Pelagian Block

The principal tectonic phases are:

Triassic-Early Jurassic	Break-up of Pangea
Middle Jurassic - Early Cretaceous	Plate divergence and formation of the Tethys Ocean
Late Cretaceous	Plate convergence and collision
Eocene-Recent	Consumption of African and European continental margins
Late Tertiary	Dextral movement of Europe with respect to Africa gave rise to renewed rifting.

The Pelagian Block was a stable promontory of the African continental margin throughout this tectonic regime. Opening of the Ionian Sea along the Sicily-Malta Escarpment began in Late Triassic-Early Jurassic time as a result of sinistral movement of the European plate. This gave rise to the NNW-SSE trends in the Ragusa basin, Melita basin and other pull-apart basins of the area. Tectonism in the western Pelagian Block was also controlled by movements of Late Triassic/Jurassic evaporites. Subsequent dextral movement of Europe in latest Tertiary time gave rise to renewed extensive rifting and formation of pull-apart basins across the area. This produced a second major tectonic trend in the area: the NW-SE trending Plio-Quaternary Sicily Channel rift complex which extends from Pantelleria to the Medina Bank.

Four distinct Upper Triassic-Jurassic palaeo-geographic domains can be recognized in offshore Malta: a strongly subsiding one characterised by basinal facies of the Noto, Streppenosa, Modica, Buccheri, Chiamonte, Hybla and Amerillo Formations, a stable one characterised by shallow open to restricted water facies of the Siracusa and Naxxar Formations, an intermediate domain characterised by open marine facies of the Siracusa-Buccheri combination and an evaporitic domain of the Krachoua Formation.

Proven source rocks of Upper Triassic and Lower Jurassic Noto and Streppenosa Formations were deposited in the basins. These formations are known to source the oil in the Ragusa Basin which extends into Blocks 1, 2, 3, 4 and 5 of Area 3 in the north.

A similar situation is inferred in the south-eastern parts of Area 4 where Jurassic faulting is observed along a NNW-SSE trend cutting through Blocks 5 and 7. Facies differentiation culminated in the Late Cretaceous.

Three similar domains developed in regions covered by Area 4 and to the west of it: a platform domain characterised by a monotonic sequence of dolomites and limestones of the Zebbag and Halk el Menzel Formations drilled in Tama 1, an intermediate domain with rudist buildups observed on the shelf edge of the Melita Rise drilled offshore Tunisia (Isis field), and a third domain characterised by Zebbag dolomites overlain by a thick sequence of organic rich shales and limestones of the Fahdene, Bahloul, Aleg, El Haria and Bou Dabbous Formations.

Transitional Cretaceous facies are present in Gozo 1 and Aqualta 1 indicating the Malta Platform limit to be close to these wells. Gozo 1, which was suspended in the Early Cretaceous, encountered a thick section of Hybla shales overlain by chinks which are reminiscent of the Abiod Formation in Tunisia. These chinks have also been encountered in Aqualta 1. Beds of porous, intertidal dolomite and shelf-edge calcarenite, altering with impermeable marl, mudstone and shale, are inferred to occur in the Cretaceous transition zone, providing good reservoirs and seal potential. Rudist-reef reservoirs, present in offshore Tunisia may extend into parts of Area 4. Cretaceous source rocks, equivalent to the Bahloul and Fahdene are also inferred to be present in this zone.

A very striking fourth domain is recognised in the western half west of Area 4. Geological and geophysical data indicate that the tectono-sedimentary history of the area followed the same pattern observed in nearby basins with important local salt movements. One observes on seismic sections a central broad structural high with thinning of the overlying Late Cretaceous sedimentary sequence as well as a rim syncline also of Late Cretaceous age.

2 PLAYS

Tectonic reconstruction shows Late Triassic-Early Jurassic pull-apart basin in parts of offshore Malta. Here, Triassic carbonates of the Gela Formation (Gela, Ragusa) are a potential play but may be too deep to be economical. Jurassic carbonates of the Siracusa (Vega, Perla) and Nara Formations (El Biban) are expected on the flanks of the Ragusa Basin in Area 3 and the Melita-Medina Basin in Area 4.

Cretaceous shelf-basin transition zone stratigraphic plays in reefal facies of the Zebbag Formation (Isis, Miskar) are likely to be widespread in Area 4 and to the west of it. Metlaoui nummulitic bank facies (Ashtart, Bouri) of Tertiary age are also likely to be present in Area 4 and to the west of it, therefore appearing in places to be conformable with Cretaceous plays, making multiple play objectives likely. Plays associated with halokinesis are also evident in the west of Area 4.

Fig. 3 shows a summary of potential plays offshore Malta.

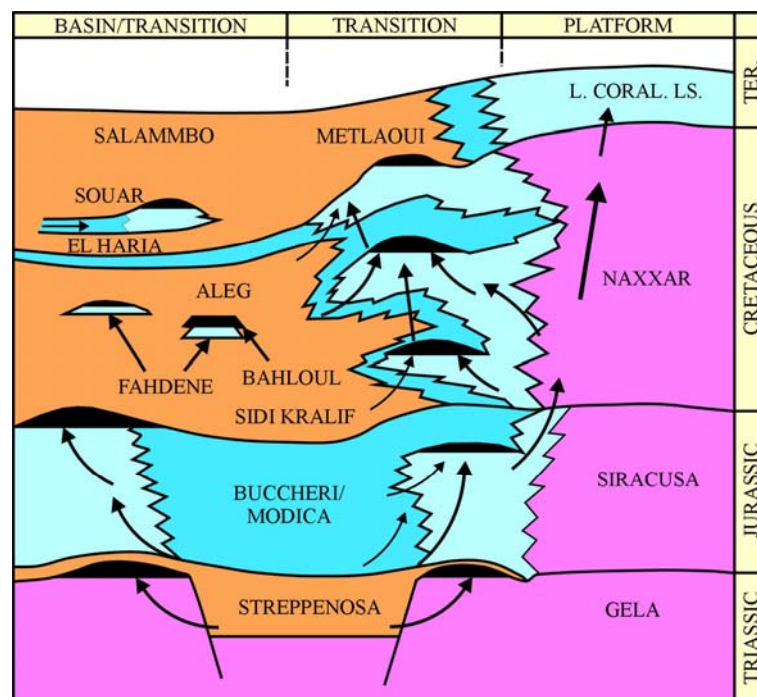


Figure 3 Summary of potential plays offshore Malta