

## Middle Lower Miocene Fan 1 Play

### LM2 F1, #2581

#### *Siphonina davisii*

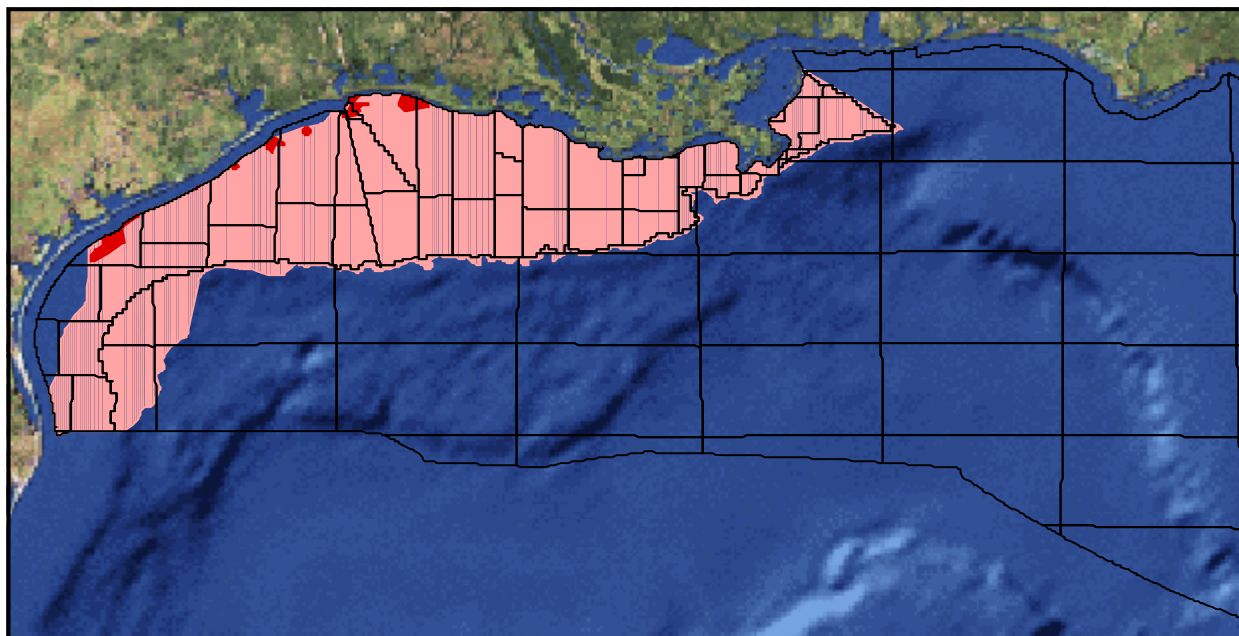


Figure 331. LM2 F1 map showing location of play. Play limit shown in light red; hydrocarbon limit shown in dark red.

## Overview

The Middle Lower Miocene Fan 1 Play (LM2 F1) contains reserves of 1,483.666 Bcfg and 14.096 MMbo (278.094 MMBOE) in 54 sands in 17 fields. The play extends continuously from the South Padre Island to Destin Dome Area ([Figure 331](#)).

## Description

LM2 F1 is defined by (1) a deep-sea fan depositional style representing sediments deposited basinward of the LM2 shelf edge, (2) an extensional structural regime with salt-withdrawal basins and extensive listric, growth faulting rooting into salt detachments on the modern GOM shelf, and (3) the LM2 Chronozone, the top of which is defined by the *Siphonina davisii* biozone ([Figure 8](#)).

LM2 F1 extends continuously from the South Padre Island Area offshore Texas, along and updip from the modern GOM shelf edge to the west-central Destin Dome Area east of the modern Mississippi River Delta ([Figure 331](#)). Hydrocarbons have been found in discontinuous clusters from the Matagorda Island to East Cameron Areas.

Depositional systems included the North Padre Delta System in the southern Texas area and the Calcasieu Delta System along the Texas-Louisiana border (Galloway et al., 1986). No aggradational or retrogradational sediments are identified for the LM2 Chronozone, presumably because the delta systems had prograded only far enough basinward through LM2 time to deposit progradational and deep-sea fan sediments in the Federal OCS.

## Play Limits

LM2 F1 extends onshore in an updip direction, except in the northern South Padre Island to southwestern Matagorda Island Area and the northeastern Galveston through High Island Area, where the play is limited by the LM2 shelf edge and grades into the sediments of the Middle Lower Miocene Progradational Play (LM2 P1). To the northeast, the play onlaps the lower Cretaceous carbonate slope. The play continues to the southwest into onshore Texas and Mexican national waters. Downdip, LM2 F1 is limited by the Middle Lower Miocene Fan 2 Play (LM2 F2) (Lore et al., 2001).

## Depositional Style

LM2 F1 is characterized by deep-sea fan systems deposited basinward of the LM2 shelf edge. Component facies include channel/levee complexes, sheet-sand lobes, interlobe/fringe sediments, and slump sediments that were deposited on the LM2 upper and lower slopes, in topographically low areas between salt structure highs, and abyssal plain. These deep-sea fan systems are often overlain by thick shale intervals representative of zones of sand bypass on the shelf, or sand-poor zones on the slope.

The LM2 deep-sea fan interval varies from approximately 500 to more than 3,000 ft in thickness. Individual sands in the play are usually tens of feet thick, though they can obtain a thickness of over a 100 ft. Stacked sand sequences with an upward-coarsening or upward-fining log character indicate sheet-sand lobe progradation and channel fill/abandonment, respectively, in proximal fan areas. Thin sands, interstratified with shales that display a spiky log character, suggest deposition in more distal interlobe/fringe areas. Interbedded shales are, at the most, usually tens of feet thick, but shales separating sand packages can be several hundreds of feet thick.

## Structural Style

The majority of fields in LM2 F1 are structurally associated with normal faults and anticlines. Other less common structures are associated with growth faults with rollover anticlines, and shale diapirs with traps on the flanks of the diapir or in sediment drape over the diapir.

## Quantitative Attributes

On the basis of reserves calculations, LM2 F1 contains 95% gas and 5% oil. The 54 sands in the play comprise 123 reservoirs, of which 122 are non-associated gas and 1 is saturated oil. All reserves are proved and estimated to be 1,483.666 Bcfg and 14.096 MMbo (278.094 MMBOE) (Table 159).

	No. of Sands	Oil (MMbbl)	Gas (Bcf)	BOE (MMbbl)
Proved	54	14.096	1,483.666	278.094
Cum. production	52	11.541	1,177.240	221.015
Remaining proved	28	2.555	306.426	57.079
Unproved	0	0.000	0.000	0.000

Table 159. LM2 F1 reserves and cumulative production.

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These reserves account for 39% of the reserves for the LM2 Chronozone.

Cumulative production from LM2 F1 totals 1,177.240 Bcfg and 11.541 MMbo (221.015 MMBOE) from 52 sands in 16 fields. This production accounts for 40% of the LM2 Chronozone's total production. Remaining proved reserves in the play are 306.426 Bcfg and 2.555 MMbo (57.079 MMBOE) in 28 sands in 13 fields.

Table 160 summarizes that water depths of the fields in LM2 F1 range from 29-103 ft, and play interval discovery depths vary from 9,360-15,450 ft, subsea. Additionally, porosity and water saturation range from 18-32% and 16-48%, respectively.

54 Sands	Min	Mean	Max
Water depth (ft)	29	50	103
Subsea depth (ft)	9,360	12,655	15,450
Reservoirs per sand	1	2	9
Porosity	18%	25%	32%
Water saturation	16%	29%	48%

Table 160. LM2 F1 sand attributes. Values are volume-weighted averages of individual reservoir attributes.

## Exploration History

LM2 F1 has a 43-year history of discoveries (Figure 332). The first sand in the play was discovered in the West Cameron 71 Field in 1956. This field also contains the largest sand discovery in the play. The sand was discovered in 1971 and is estimated to contain 47.210 MMBOE (Figure 333). The maximum yearly reserves and number of sands were added in 1980 with the discovery of eight sands in five fields, with an estimated total of 52.368 MMBOE (Figure 332). Though this play dates back

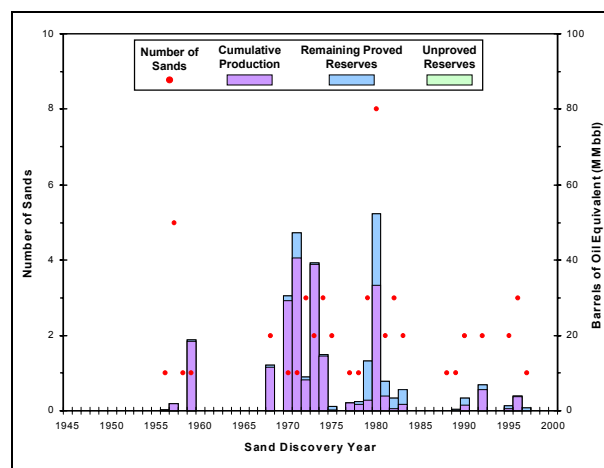


Figure 332. LM2 F1 exploration history graph showing reserves and number of sands discovered by year.

to the 1950's, all but 2 of the 15 largest sands were discovered in the 1970's or later. The mean sand size for the play is 5.150 MMBOE. Six sands, the largest of which is estimated at 2.889 MMBOE, have been discovered in the play since the first Atlas database cutoff of January 1, 1995.

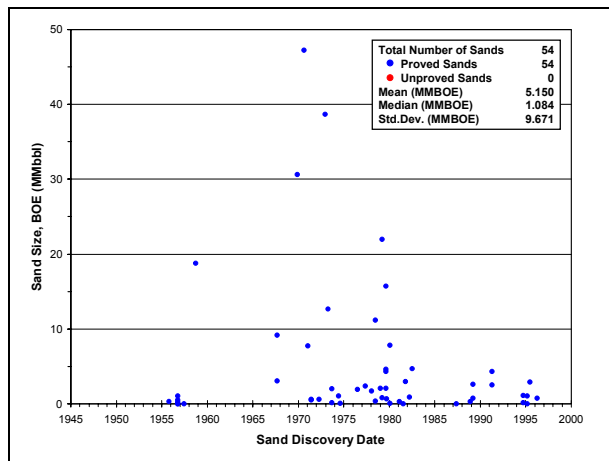


Figure 333. LM2 F1 sand discovery graph showing the size of sands discovered by year.

## Production History

LM2 F1 has a 39-year history of production (Figure 334). Production curves appear very similar, with production starting in 1959 and peaking in the mid-1980's. Since then, production has declined by over half.

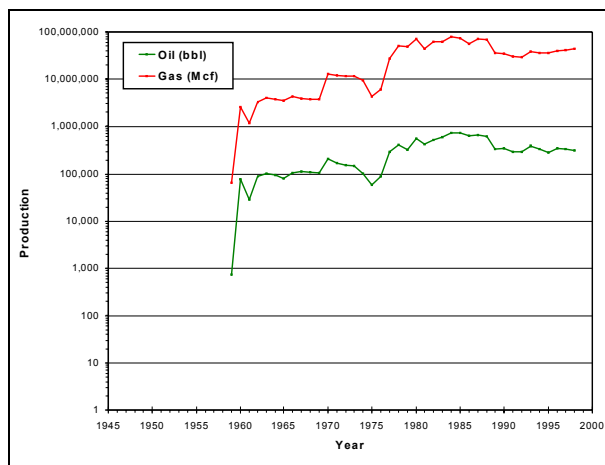


Figure 334. LM2 F1 production graph showing oil and gas production by year.