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TOTAL MINERARIA

GEOPHYSICAL REPORT N. 119

PERMITS B.R 146.MI - B.R 147.MI

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JULY 1981

DP = E0309 474

This note summarizes the interpretations carried on permits B.R 146 and B.R147, by gathering the new 1981 seismic data and the older ones eventually reprocessed.

1. Data available

We have used:

- GSI lines 1968 (2 of them partly crossing the permits, and 1 of them going as far as the vicinity of Eterno 1)-
- WESTERN lines 1971 (surrounding the permits) -
- SEFEL lines 1978 (covering the permits) - 2 of them reprocessed by Seiscom Delta -
- CGG lines 1981 : - CGG processing on B.R147 -
  - Seiscom Delta processing on B.R146

Some special reprocessing has been run by Seiscom Delta on lines B.R147-5 - 146-6 by mid 1980. By may 1981, an exhaustive "Seischrom" processing was run by Seiscom Delta, for all the 1981 lines of the permit B.R146. Thus, we have "seischrom" average frequency and relative strength displays of all these lines.

So, we have studied four seismic levels: (1)

- horizon D 9 A
- horizon D 18
- horizon D 22
- horizon D 40

For all these levels, we have chosen the 0 time of SEFEL lines.

For good coincidence, we have had to:

- add 20 ms owt to GSI, WESTERN, CGG (B.R146) lines -
- add 15 ms owt to CGG (B.R147) lines -

We have picked everywhere the stack filter processed lines.

(1) M. CHOPPIN DE JANVRY - "Provisional geophysical report" - Oct. 1980

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2. Horizon D 9 A = ' lower · pleistocene level (encl. 1,2,3)

The seismic horizon seams to be one of the numerous fore-set beds that can be observed in the lower quaternary, strongly dipping to the N.N.E . D9A is generally easy to pick, because of its higher energy amidst the quaternary. The most dipping is the level, the strongest is the reflection, and the lowest the frequency. All along line B.R 101, the level is well picked as far as Eterno 1, where it is a flat-spot at 500 ms (owt). We know that there is a sand level in the lower pleistocene of Eterno, 900 m deep, 20 m thick, with low resistivity. But, at Eterno 1, this level is in a top situation, and we cannot be sure that, 10 km. away, and when strongly dipping, this level is still sandy.

A velocity map at D9A was established, by computing the mean stack velocities, 10% minorized.

The isobath map such obtained shows the level gently dipping NW from the edge of the Rospo platform, as far as the central part of B.R146 which looks like a relative high. Then, the level dips strongly to the north from the northern part of B.R147, and to the north-west from the northern part of B.R146, in respect to the structuration at Eterno 1.

On the isobath map, is drawn the zone of high energy and low frequency of the level D9A. According to these characters, and to the fact that D9A is sandy in Eterno 1, we were conforted in the idea of possible occurrence of gas in these levels.

But, because of the very strong dip, and of the same seismic effect possibly due to a layer of pebbles, we have to know whether:

- a gas accumulation might occur in such a dipping fore-set bed;
- such a dipping pebble bed might occur.

Some sedimentological notions may give us an answer to these questions.

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3. Horizon D18 = Top of Lower Pliocene (encl. 4)

We have picked this seismic level which is about 100 m above the messinian evaporites. All along several "seischrom" displays, it is characterised by some enhancements of relative strength, lower average frequency and increase of velocity between D18 and D20.

In spite of the absence of a "Seischrom" display of line B.R101, we notice that the seismic characteristics of D18 do not change significantly as far as Eterno, where there are only shales above Messinian.

Though we cannot explain the occurrence of this seismic contrast at D18, we do not make up our mind that there is some interest in this horizon, since it looks to be shaly.

4. Horizon D22 = base of Messinian evaporites (encl. 5)

We hoped to see the possible truncation of some pre-messinian formation. It is quite uneasy to do so, due to the seismic morphological divergences between the different surveys and processings.

Nevertheless, the map we drawn shows the disappearance of one phase, in some places:

- on B.R147:in north-western part, along the axis of the basin; however it is questionable as along line B.R 103 we do not see any variation of the reflections over this zone -
- on B.R146: out of the NW angle of the permit, at the mid-slope up to Eterno; and in a small place out of the NE part of the permit -
- on the top of Eterno 1.

But we insist again on the questionable reality and/or significance of these truncations.

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5. Horizon D40 = Near the top of the Fucoïd Marls (mid cretaceous)
(encl. 6,7,8)

The quality of the reflection D40 is variable from place to place. If it is generally poor in B.R147, it is getting better to the higher zone of B.R146. Neverthless, it is poor at Eterno 1, at the top of the main structuration.

In B.R147, D40 is coming down gently from the Rospo platform, with some small relative high areas. The axis of the basin is NW-SE and is running between the two permits. Then, the level comes up to the NE, to Eterno of course, and to some highs in B.R146. The structure of Eterno and the highs of B.R146 look to draw quite a ring, partly around a declivity which can be seen near the NE part of line B416. The slope is strong to the external part of this ring. An hinge line follows the isochron 900 ms approximately.

D40 was presumed to be the top of fucoïd marls.

The " scaglia calcarea" are underlaying, with some dolomitizations from place to place. When we look at the seismic section in the vicinity of Eterno, where the seismic reflection is poor, we think that, there, the dolomitization is light.

By looking at the "Seischrom" displays of the lines of B.R146, we see that the strength of the seismic reflection is enhanced when in top (but the enhancement of strength is never as high as for level D9A); on the other hand, the decrease of the average frequency is not significant.

We think that the increase of the strength may signify the dolomitization of the bed.

On the isochron map, we have delimited the area of enhanced reflection, both from the "Seischrom" displays and the examination of the seismic lines themselves. This area also is like the part of a ring, and covers the highest zone of D40 in B.R146. It may signify the occurrence of compact dolomite.

A velocity map at D40 was computed from the mean stack velocities, 10% minorized.

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The isobath map which was computed from it shows that the main feature in B.Rl47 is a relative low, beside a NS axis, without closing. But this may be due to imperfect velocities. Nevertheless, we do not think that there is a possibility of a truly high area in B.Rl47.

The highest area takes place in B.Rl46, where the quite circular chaplet of isochron anomalies is getting to a sub-circular ring climbing up to Eterno.

If there is some interest in D40, it looks to be outside the ring; i.e. below the isochron 900 ms or the isobath 2200 m approximately, but this is much too low with respect to Eterno (D40 = 740 ms, 1500 m).

Conclusions

- The formerly presumed quaternary prospect in B.Rl46 is limited in the northern part of the permit (encl. 1) to a mid-pleistocene fore-set bed. The occurrence of the sandy nature of such a bed, in its greatest dipping and thus the possibility of gas, has to be confirmed by sedimentological study.

- Below the Messinian evaporites, there is no good evidence of truncation of limestones (encl. 5).

- The top of cretaceous is structured in B.Rl46 according to a sub-circular ring to which Eterno belongs, however the dolomitization seems to develop even higher than the fucoïd marls in B.Rl46.

- The permit B.Rl47 does not present any interest in any place.

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LIST OF ENCLOSURES

1/50.000

1. Isochron map of horizon D9A (pleistocene level)

2. Velocity map at D9A (from stack velocities)

3. Isobath map of horizon D9A

4. Isochron map of horizon D 18 (Top of lower pliocene)

5. Isochron map of horizon D22 (basis of messinian evaporites)

6. Isochron map of horizon D 40 (fucoïd marls, top of mid cretaceous)

7. Velocity map at D40 (from stack velocities)

8. Isobath map of horizon D40.
