

ENTREPRISE DE RECHERCHES ET D'ACTIVITES PETROLIERES

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COD 1 - 7.11.1

(PHILLIPS PETROLEUM COMPANY)

VELOCITY SURVEY

6 1968

VELOCITY SURVEY.COD 1

ELF

MA.7/11-01.6(7)

ELF R.E.

Direction Exploration
Département Géophysique Central

COD 1 - 7.11.1

(PHILLIPS PETROLEUM COMPANY)

VELOCITY SURVEY

D.40.P. - N° 8 - 2169

LP/yd

Chambourcy, June 20 th 1968

TABLE OF CONTENTS

- I - TECHNICAL SPECIFICATIONS
- II - FIELD OPERATIONS
- III - RESULTS AND INTERPRETATION
- IV - RESULTS LISTING

ENCLOSURES

- 1 - Well velocity survey - T/D, Va/D and Vi/D curves
- 2 - Computations Sheet
- 3 - Calibration curves
- 4 - Bore hole final compensated Sonic Log (1/500 e)

I - TECHNICAL SPECIFICATIONS

1°/ - Party personnel: ELF R.E. special crew based at Chambourcy (France),
consisting of :

- 1 computer
- 1 observer
- 1 shooter

2°/ - Equipment

- Well velocity survey
 - recorder : SIE P 11
 - camera : SIE PRO 11.10
 - blaster : SIE BA 2000 V
 - well geophone : GULF-GCE (+ 1 in reserv)
 - reference geophone : hydrophone HS MP 8
- Continuous velocity logging - BHC Sonic log
 - recorded by SPE
- Cable service
 - SPE Schlumberger

3°/ - Explosives supplied by ELF Norge

- Plastic explosives with 93 % nitroglycerine, in units of 4 lbs and
10 lbs - quantity used : 114 lbs
- Electric caps (4 m) - quantity used : 20 caps
- Supply boat KENT SHORE was used for explosives storage
- OCEAN VIKING 'S' life-boat was used for connection and immersion
of charges

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II - FIELD OPERATIONS

May 22 nd : 2:00 P.M. : well turned to crew for survey.
Unsuccessful attempt : time-break radio
transmitter breakdown

6:00 P.M. : well returned to electric logging

May 23 rd : 4:30 A.M. : well free after electric logging.
Velocity survey with wire line between
shooter and recorder

First shot : 6:10 A.M.

Sixteenth and last shot : 9:30 A.M.

10:30 A.M. : well returned to electric logging

Remarks :

- Weather conditions : good
- Because of the fairly important drift of the charges it has not been possible to cover certain levels by a symmetrical shot about the rig.

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III - RESULTS AND INTERPRETATION

16 shots have been executed for 13 levels.

1° - Quality

Results are good for shots from 8.600' downwards.

For shallower shots, many casing arrivals interfere with the signal, but ground breaks are easy to pick.

The 16 records can be graded as follows :

- 7 records are good
- 8 records show casing interferences
- 1 very noisy record was not used for the interpretation

Polarity of the geophone traces is correct on all records but on record N° 1.

On records 2 and 3, the gain applied on trace 4 (reference geophone) is too low and the shot for level 3.500' has consequently been repeated (record 4) with a higher gain.

2° - Charges

Fairly light charges have been used :

- 4 lbs. from 0 to 7.500'
- 8 lbs. from 7.500' to 10.405'
- 10 lbs. for 12.320' and 13.023'

Energy output is very good for all records

The last shot (16 th) was recorded with our modified portable Electrotech ER 75 recorder, used for offshore velocity survey. This equipment,

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with a sensibility lower than the SIE P 11 gives good data with slightly heavier charges.

3°/ - Reference geophone

Shot-points to rig distances have been computed from the times recorded through the reference geophone and using a correction velocity of 1.500 m/sec (4920 feet/sec).

4°/ - Calibration of the sonic-log

3 runs have been recorded :

- I from 1.483' to 6.501' (1.483' - 3.135' not satisfactory)
- II from 6.444' to 10.230'
- III from 10.250' to 13.023'

Down to 9.000', measured interval transit times are long and range from 140 to 180 microseconds/foot. A slow velocity formation drilled with 17" 1/2 and 12" 1/4 tools always gives poor results ;

the "constants of time" obtained between seismic times and sonic times are :

- from 3.135' to 8.010' : + 14,25 microseconds/foot or
+ 84,5 microseconds/millisecond (error : 8,45 % in exces)
- from 8.010' to bottom : 0

On the Bore Hole final Compenseted sonic log, (Encl. 4) the sonic curve (Δ T 2') is shown with no back of spot and corrected with the "constant of time".

The total time curve origin is mean sea level ; this curve is plotted by portions of 20 milliseconds i.e one division of the log horizontal scale equals one millisecond, this providing an aesy digitalization for the computing of a synthetic seismogramm.

IV - RESULTS LISTING

COD 1 - 7.11.1

Elevations : ZKB = + 90'

ZGL = - 256'

Origin of times : MEAN SEA LEVEL

Depths of shots below KB (feet)	One way times (milliseconds)	
KB :	0	
SEA LEVEL :	90'	0
GROUND LEVEL :	346'	52
	1.505'	250,5
	2.500'	407,1
	3.500'	558
	4.500'	718,5
	5.500'	876,9
	6.454'	1.022,5
	7.500'	1.179,9
	8.600'	1.335,6
	9.480'	1.452,7
	10.255'	1.521,6
	10.405'	1.532,2
	12.320'	1.643
	13.023'	1.688,5
BOTTOM	13.053'	

D.G.E.P.

DE-DGY-D.40.P. - N° 8 - 2169

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TITLE : COD 1 - 7.11.1 - PHILLIPS PETROLEUM COMPANY VELOCITY SURVEY

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VELOCITY SURVEY

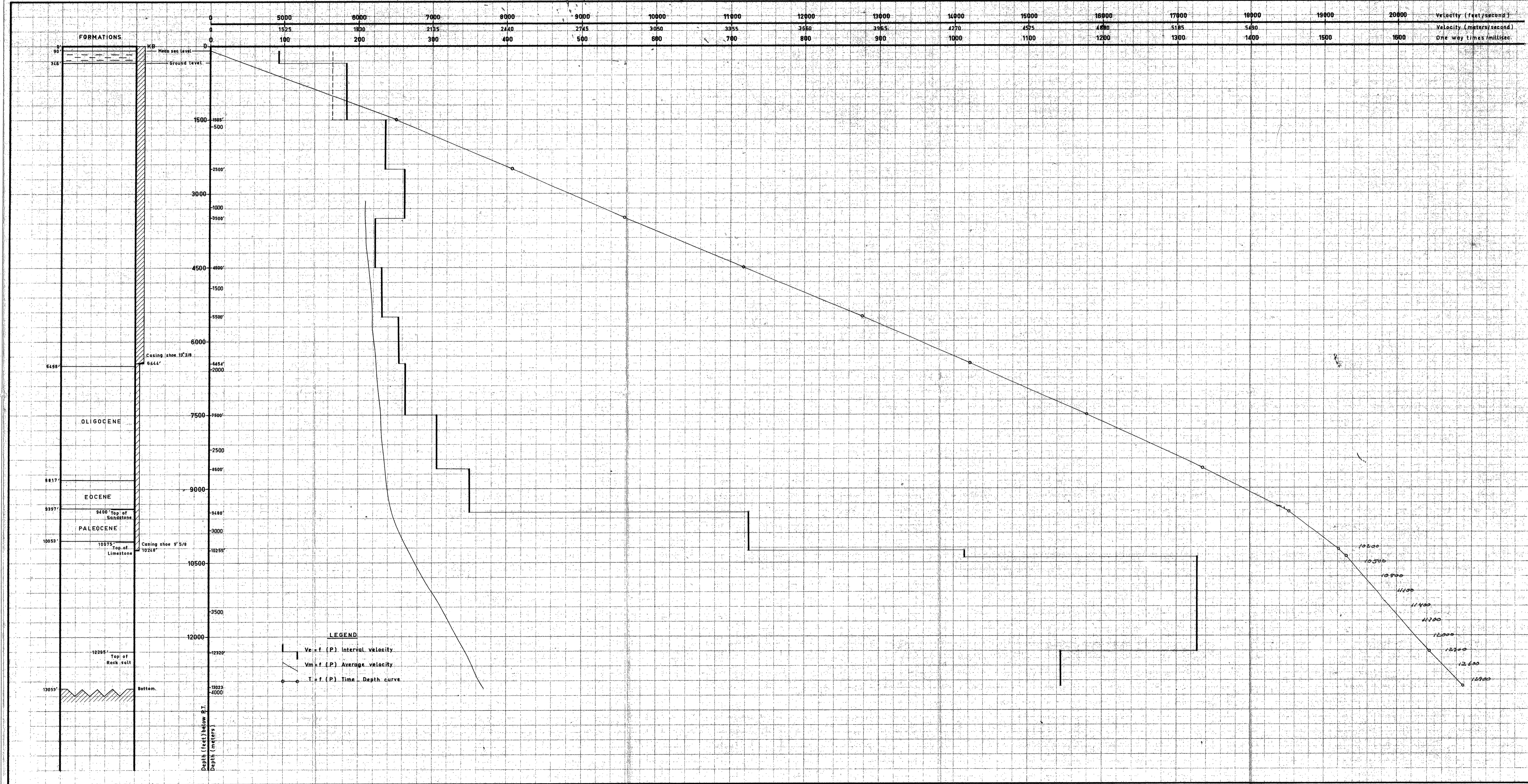
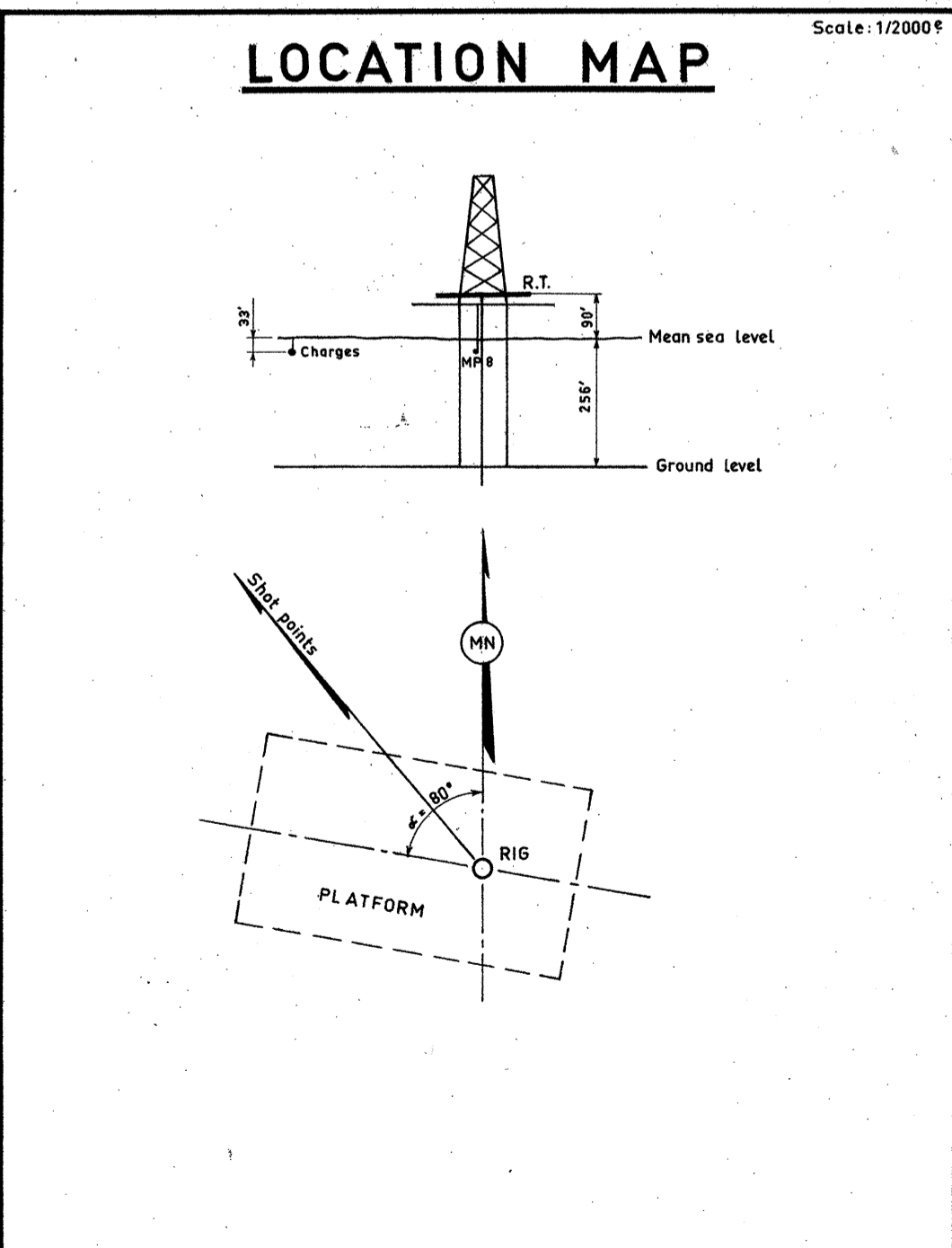
COD 1. 7-11-1

TIMES TAKEN FROM MEAN SEA LEVEL

COORDINATES:
 X : 02° 26' 24.4" E
 Y : 57° 04' 15.6" N
 Z RT : + 90'
 Z GL : + 256'

TOTAL DEPTH : 13053'
 CASING DEPTH : 10248'

ELF. RE. Ref. 1304
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SONIC CALIBRATION CURVES

DEPTH AND TIME

COD 1. 7-11-1

