

TO: General Manager

FROM: Exploration-Production Planning Manager

SUBJECT: **WORKOVER PROPOSAL FOR LO16-21, LO16-11,
AND LO16-7 WELLS - MOGOLLON FORMATION**

DATE: March 17, 1995

Attached you will find our proposal to open Mogollon Formation in LO16-21, LO16-11, and LO16-7 Wells. This recommendation is based on good results of these sands previously proven in LO16-9, LO16-17 and LO16-19 Wells, recent workovers made in LO16-13 and LO16-16 Wells, and the geological and reservoir evaluation of Mogollon Formation around LO16 Platform.

It is expected an average final recovery of 180 MBO and 400 BOPD as initial production during the first month for each well.


Alberto Arispe
Manager

AL/VP/mts
Att.

CENTRAL FILE
Geosciences

cc: Assistant General Manager
Operations Manager
Assistant Operations Manager - Engineering
Well Files
200.2.5

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GEOLOGICAL AND RESERVOIR EVALUATION OF MOGOLLON FORMATION AROUND LO16 PLATFORM FOR WORKOVER PROPOSAL IN LO16-21, LO16-11 AND LO16-7 WELLS

The main objective of LO16 Platform was the development of Basal Salina Formation. The Mogollon Sands --secondary target-- were found showing good potential oil reserves. Geological, petrophysical and reserves evaluations have been carried out to analyze these sands.

CONCLUSIONS

- The LO16 Wells have found good development of Mogollon Formation (see Attachment 1).
- The Mogollon of LO16 Wells is located in a structural megablock where the depth of top is reached between 4500' SS and 5500' SS (see Attachment 2).
- According to the oil net sand map of Mogollon, there is a trend NE-SW toward east of LO16-16 vertical Well, and another next to LO16-17 Well (see Attachment 3).
- Estimation of Ultimate Recovery Reserves per well has been made based on Volumetric Method. This estimation shows 3,100 MBIs of oil for the structural megablock. It is expected to recover 833 MBIs (EUR) of oil from wells currently producing. The remaining reserves are good potential to develop.
- It is estimated 180 MBO of primary reserves and an IPR of 400 BOPD for Mogollon Formation (see Attachment 6).

RECOMMENDATIONS

It is recommended to perform the following workovers:

Well	Interval	Net Sand Thickness		Average Porosity (%)	Average Water Saturation (%)
		MD	VD		
LO16-21 ⁽¹⁾	5650 - 4890	79	75	9.04	30.34
LO16-11 ⁽²⁾	5940 - 4970	68	63	9.57	45.93
LO16-7 ⁽³⁾	5900 - 5450	57	52	12.70	40.21

(1) LO16-21, is 22 acres distant from LO16-16

(2) LO16-11, is 18 acres from LO16-17 and LO16-9 respectively

(3) LO16-7, is 12 acres from LO16-21 and 58 acres from LO16-16

GEOLOGICAL AND RESERVOIR ASPECTS

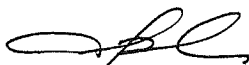
Mogollon Formation

Around LO16 Platform, the vertical gross thickness of Mogollon is from 500' to 1000'. The average porosity is 9.37%, and vertical oil net sand varies from 18 to 130 Ft. (see Attachments 1 and 4).

Structurally, the Mogollon top was found between 4280' to 5532' of depth. All the wells are located in the same block. The structural block of LO13-21 Well is located southward (see Attachment 2).

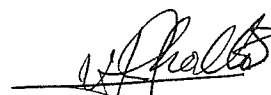
With respect to reserves and production estimates, the Volumetric Method has been used. From log analyses, it is considered an average of 63' of vertical oil net sand, with an average porosity of 9.37%, an average water saturation of 38.5%, and 50 acres as drainage area. Then, oil reserves calculated by well can be of 170 MSTB.

On the other hand, this volume of reserves is very similar to the calculations carried out starting from the decline curves of the Mogollon Formation around the LO16 Platform. It is estimated 180 MBIs of primary reserves with an average IPR of 400 BOPD for the first month. These oil reserves by well should be considered for the economical analysis of the proposed workovers.



Adán López

AL/VP/mts
March 1995



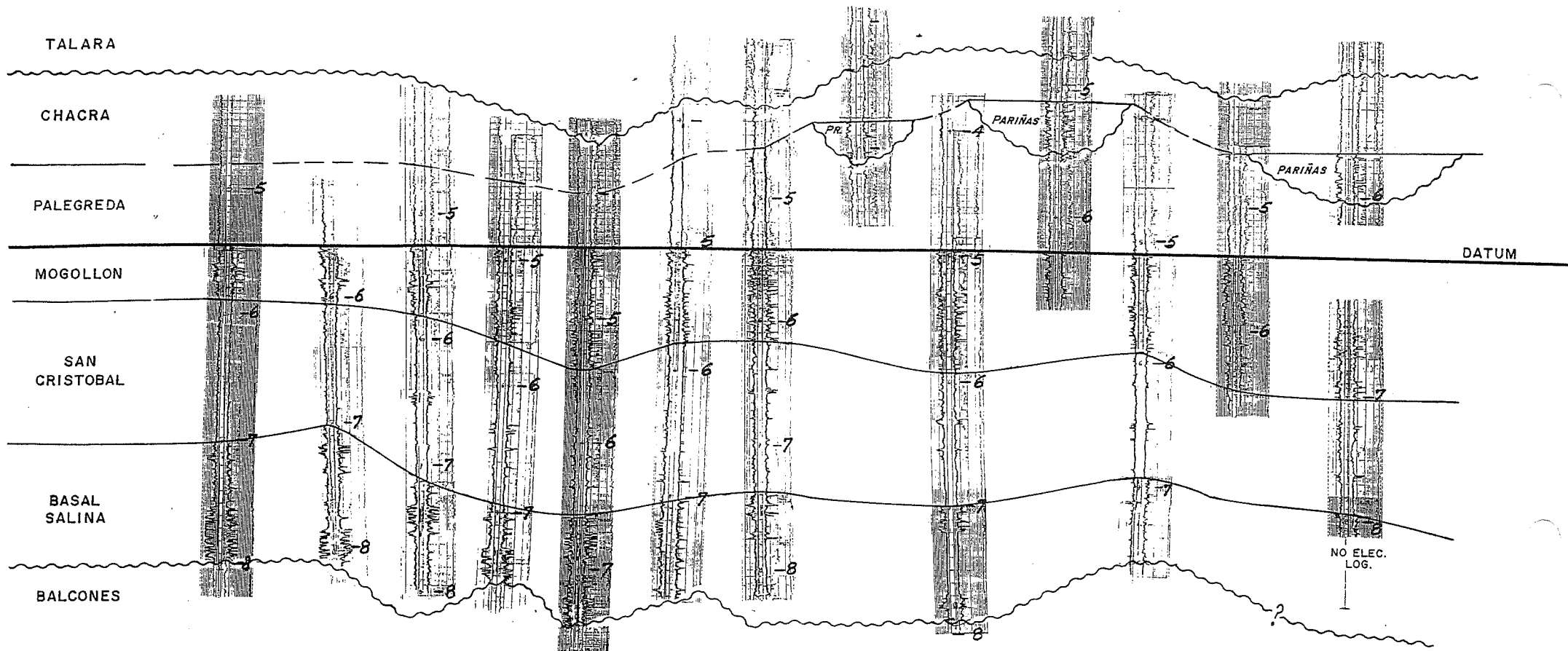
Víctor Peralta

PETRO-TECH PERUANA S.A.
LOBITOS OFFSHORE

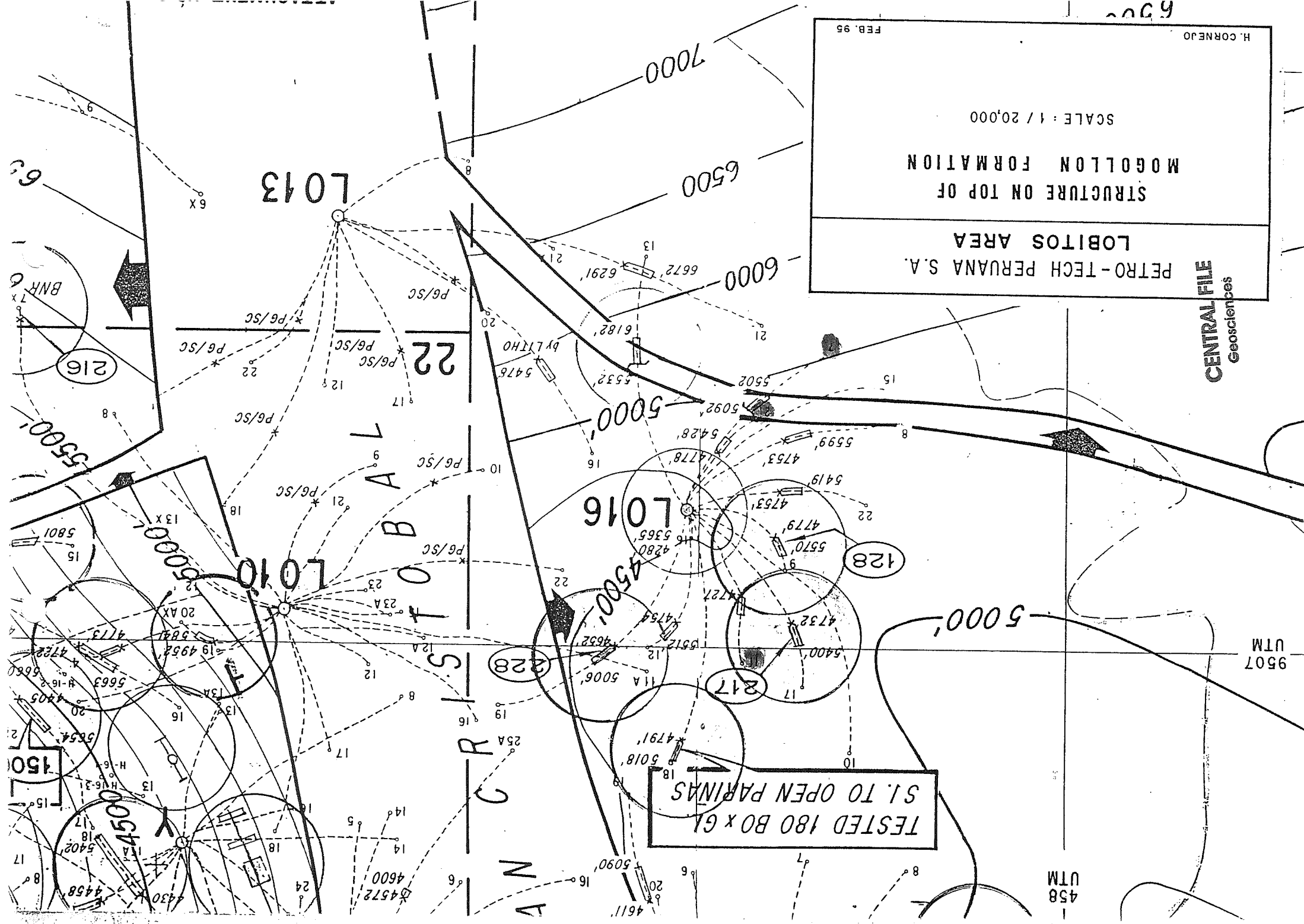
STRATIGRAPHIC CORRELATION AROUND L016 PLATFORM

A. LOPEZ
SCALE $V = 1'' : 800'$
H = _____
FEBRUARY-95

L016-7 L016-8 L016-22 L016-21 L016-16 L016-9 L016-17 L016-10 L016-11 L016-18 L016-12 L016-19 L016-13



FORMATION OPEN : BASAL SALINA BASAL SALINA BASAL SALINA BS. SN. BASAL SALINA BASAL SALINA BASAL SALINA BASAL SALINA PARÍÑAS BASAL SALINA MOGOLLON BASAL SALINA MOGOLLON BASAL SALINA MOGOLLON PARÍÑAS



6500

H. CORNEJO

SCALE: 1 / 20,000

STRUCTURE ON TOP OF
MOGOLLON FORMATION

PETRO-TECH PERUANA S.A.

LOBITOS AREA

CENTRAL FILE
Geosciences

TESTED 180 BOX GI
S.I. TO OPEN PARINAS

458
UTM

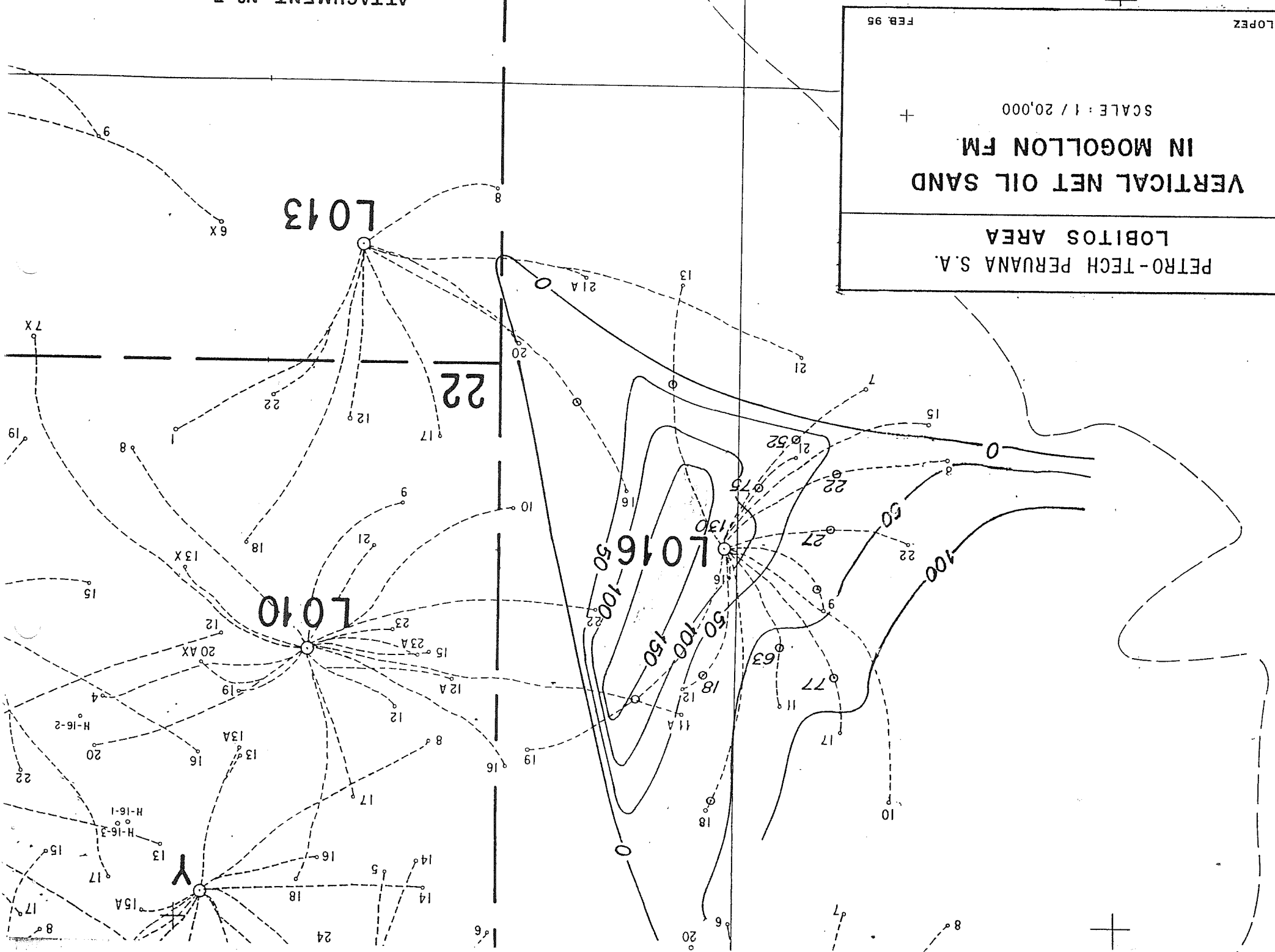
9507
UTM

A. LOPEZ
FEB. 95

+
SCALE: 1 / 20,000

VERTICAL NET OIL SAND
IN MOGOLLON FM

PETRO-TECH PERUANA S.A.
LOBITOS AREA



PETRO-TECH PERUANA S.A.
EXPLORATION-PRODUCTION PLANNING MANAGEMENT

LOG ANALYSIS - WELLS LO16 PLATFORM - MOGOLLON FORMATION

Well	Interval (Ft.)	Mid. GR		Net Oil		Average Porosity (%)	Average Water Saturation (%)
		Sands M.D.	Thickness V.D.	Sands M.D.	Thickness V.D.		
LO16-7	5521 - 5900	95	87	57	52	12.70	40.21
LO16-8	5721 - 6000	60	51	26	22	7.41	37.83
LO16-11	5201 - 6600	170	157	68	63	9.57	45.93
LO16-12	5171 - 5800	128	120	19	18	8.61	40.82
LO16-16	4431 - 5461	326	326	130	130	9.46	39.63
LO16-17	5451 - 6200	154	140	84	77	8.62	36.66
LO16-21	5251 - 6530	81	76	79	75	9.04	30.34
LO16-22	5401 - 5900	88	81	29	27	7.19	39.03
Average						9.37	38.50

Cut off:

Por. >= 5%
Sw. <= 55%
Vsh. <= 50%

Parameters:

m = 2 n = 1.71
Rw = 0.28 a 78°F a = 1

VPG/mts

March 1995

ATTACHMENT N° 4

PETRO-TECH PERUANA S.A.
EXPLORATION-PRODUCTION PLANNING MANAGEMENT

PRODUCTION OF MOGOLLON FORMATION - LO16 PLATFORM

Well	Formation	Perforated Interval (Ft.)	Completion Date	IPR BOPD		Cumulative Production Dec. 1994 (bls.)	EUR (M BLS.)	Remarks
LO16-9	Mogollon	5600 - 5094	Jul. 18, 1994	115		16,651	128	Before opening Mogollon Sands, the Basal Salina was isolated, showing a very poor oil production
LO16-16	Mogollon	5373 - 4443	Feb. 19, 1995	400	(*)	NR	200 (*)	Up to the date this Mogollon is producing 450 BOPD on casing flow
LO16-17	Mogollon	6159 - 5831	Jun. 17, 1992	179		74,101	217	Before opening Mogollon Sands, the Basal Salina was isolated, showing a very poor oil production
LO16-18	Mogollon	6619 - 6294	Jul. 30, 1992	NR		0	0	This Mogollon was abandoned on Aug. 18, 1992 due to its very poor production
LO16-19	Mogollon	5946 - 5525	Jun 2, 1992	524		133,895	228	Current production: 49 BOPD
LO16-13	Mogollon	7008 - 6516	Feb. 16, 1995	100	(*)	NR	60 (*)	Mogollon and Pariñas were opened. Up to the date the well is producing commingly (240 BOPD)

(*) IPR and EUR were estimated

VPG/mts

March 1995

ATTACHMENT N° 5

MOGOLLON FORMATION

L016-19 AND L016-17 WELLS

