PETRO-TECH
PERUANA S.A.

INTEROFFICE MEMO

EEM-060-96

TO: John Norrod
            Carlos Valdizán
            Jim Hunt
            John Meyers

FROM: Marco A. Raez

SUBJECT: PROGNOSIS - WELL LO6-21R
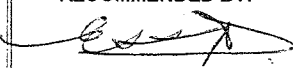
DATE: March 8, 1996

Attached please find the Geological Prognosis, plus Reservoir Analysis and Economic Evaluation for Well LO6-21R. This well is in an East-West trend of Basal Salina, with good development in both the Upper and Lower sections. Economics are focused only in the Lower Basal Salina; however, the Upper Basal Salina could be an excellent future workover, adding an important volume of proved reserves.
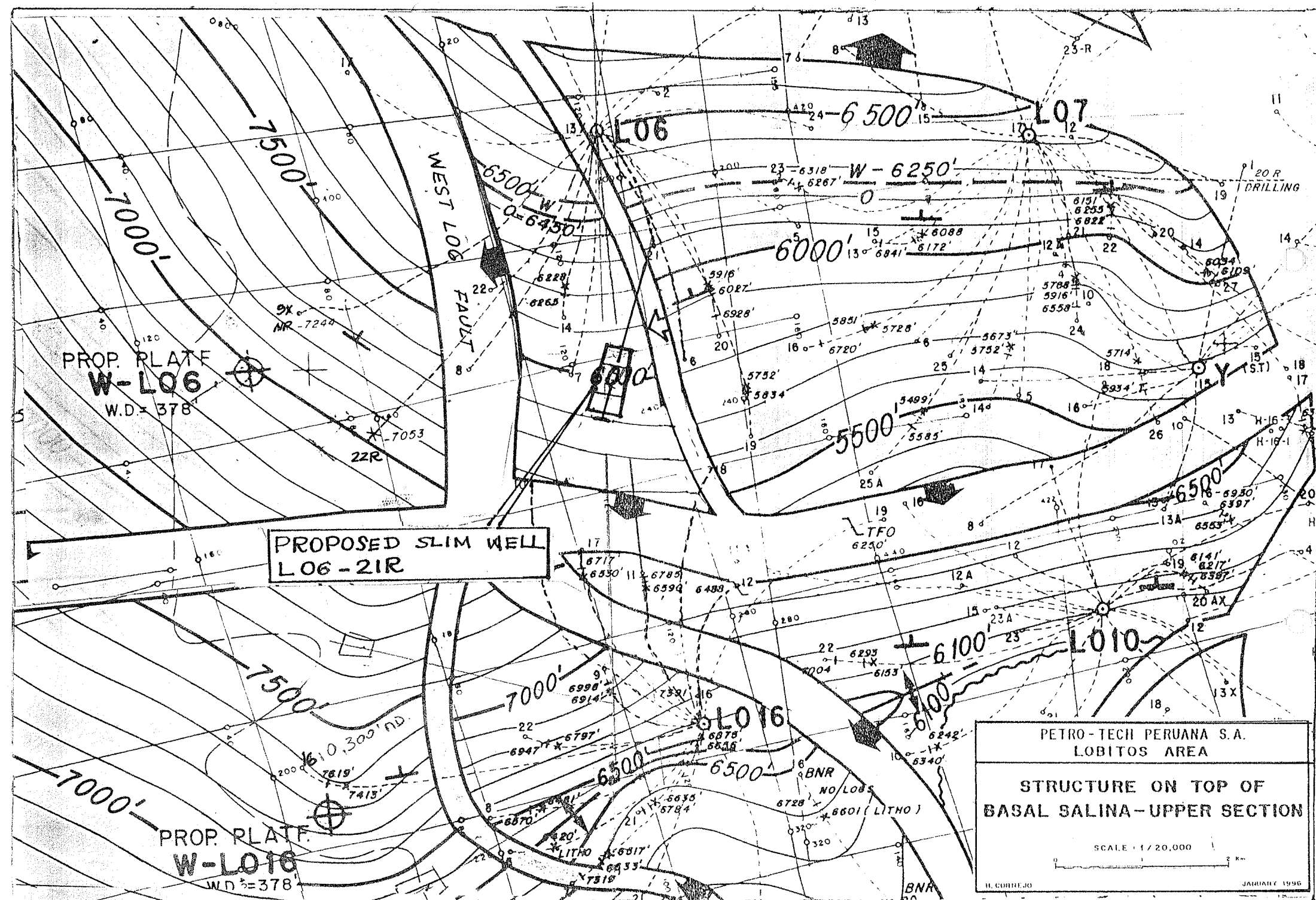
The Mogollon might also be a source of proved reserves, but its development in the upthrown side of the N-S West LO6-Fault system could not be as good as in the recently drilled LO6-22R.
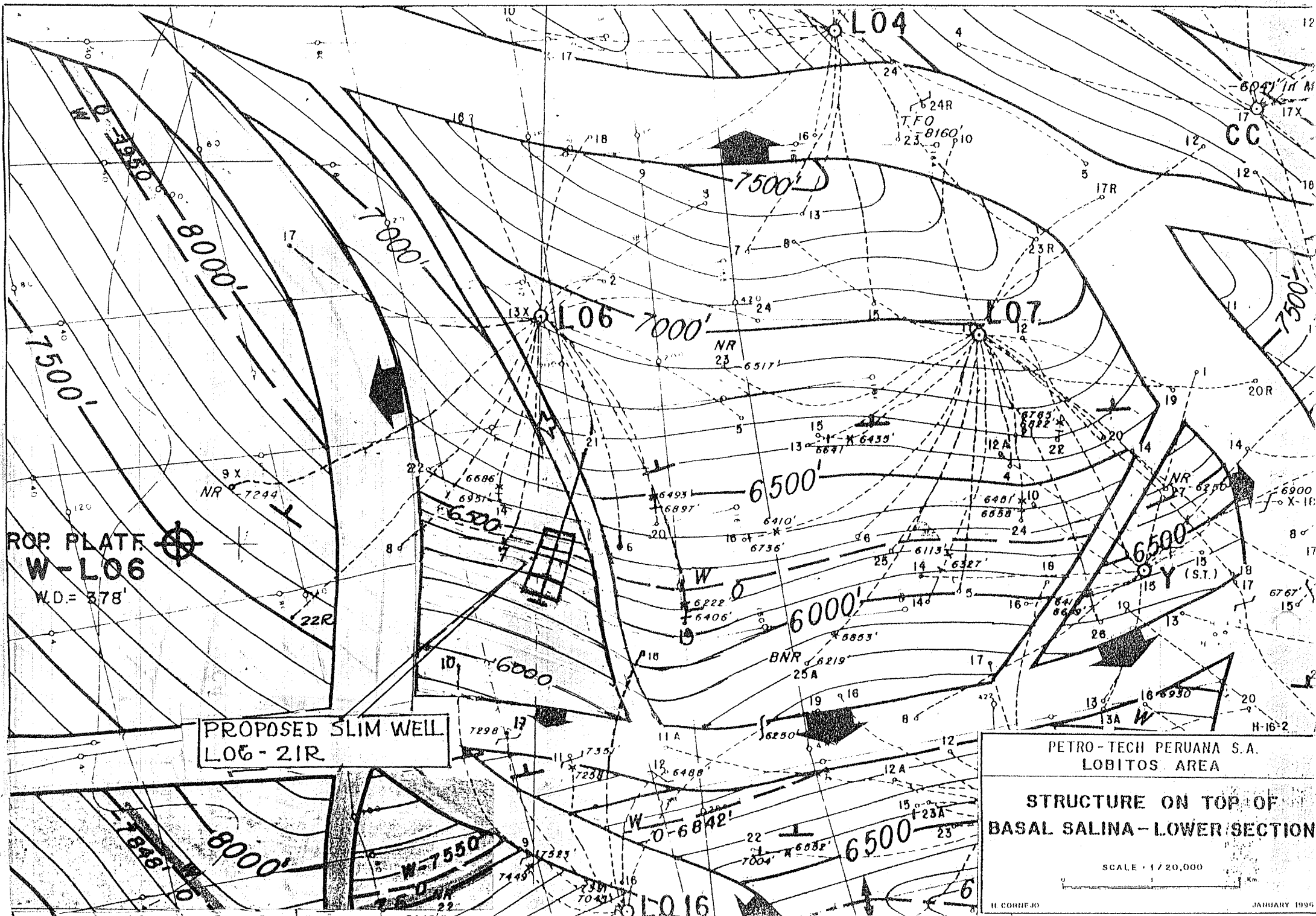
Marco A. Raez

MAR/mts
Attch.

cc: R. Samaniego   Geology Negritos
     F. Majocha   Well File
     J. Mego   200.2.1
     A. Erazo

PETRO-TECH PERUANA S.A.

GEOLOGIC PROGNOSIS

AREA	OFFICIAL WELL NUMBER	PETRO-TECH Nº	TYPE OF WELL	RIG Nº
LOBITOS OFFSHORE	Z-2B-21-031-D-LO6	LO6-21R	DEVELOPMENT	PETREX 114

| OBJECTIVE | PRIMARY: BASAL SALINA | | SECONDARY: - - - - - | |

ELEVATION

SURFACE COORDINATES (UTM)		TARGET COORDINATES (UTM)	
9'509,020.94mN; 459,308.78mE		9'508,076.06mN; 459,384.98mE	

KB: **50** FT.

WATER DEPTH **335** FT.

GROUND LEVEL

DIRECTION OF DEVIATED WELL: **S04ºE**

(INITIAL) CONDUCTOR ANGLE FROM VERTICAL: - - - - -

RECOMMENDED DEPTH OF K.O.P. (5 ½" CSG): From 5 ½" CSG **5250** FT.

ESTIMATED DRILLING TIME TO T. D. - - - - -

BUILD UP ANGLE AT - - - - -

TARGET

DRILLED DEPTH: **7,200** FT.

VERTICAL DEPTH: **6,130** FT.

HORIZONTAL DRIFT: **3,100** FT.

ESTIMATED FINAL DRILLED DEPTH: **8,500** FT.

HORIZONTAL DRIFT TO TOTAL DEPTH: **4,100** FT.

MAX. ANGLE: **60º**

TARGET LIMITS (DIAMETER): TOP: **400** BASE: **600**

STRATIGRAPHIC SEQUENCE

FM/MEMBER	DRILLED TOP	SUBSEA TOP	OBSERVATIONS
PALEGREDA	5,100	4,750	
MOGOLLON	5,500	5,150	
SAN CRISTOBAL	6,000	5,450	
BASAL SALINA	7,200	6,080	OBJECTIVE
BALCONES	8,300	6,600	
TD	8,500	6,750	

CONTROL LOGGING EVALUATION

BIT SAMPLES TO BE TAKEN	EVERY – FT. FROM SURF. TO — AND EVERY 10 FT. FROM 5250' TO TOTAL DEPTH
RECOMMENDED FOR PALEO-PALYNOLOGY	FROM 5250 FT.
RECOMMENDED OPEN HOLE	DLL-MSFL-GR, FDC-CNL-GR
RECOMMENDED AFTER CASING	GR-CCL
NEARBY WELLS FOR CORRELATION	LO6-14, LO6-20, LO6-22R, LO7-14
SIDEWALL CORES	SWC ☐ HRCT ☐ NOT CONSIDERED
CONVENTIONAL CORES	NOT CONSIDERED
GAS LOGGER	NOT CONSIDERED
FORMATION TESTING	NOT CONSIDERED

REMARKS

5 ½" CSG @ 5250 FT.

ESTIMATED SECTION TO BE DRILLED BY SLIM HOLE 3250 FT.

RECOMMENDED BY:	DATE	APPROVED BY:	DATE
H.CORNEJO	1996.02.22	MARCO A. RAEZ	1996.02.22

STRUCTURE ON TOP OF
BASAL SALINA—UPPER SECTION

PETRO-TECH PERUANA S.A.
LOBITOS AREA

SCALE : 1/20,000

PROPOSED SLIM WELL
LO6-21R

PROP. PLATF.
W-LO6
W.D.= 378'

PROP. PLATF.
W-LO16
W.D.= 378'

WEST LO6 FAULT

PROPOSED SLIM WELL
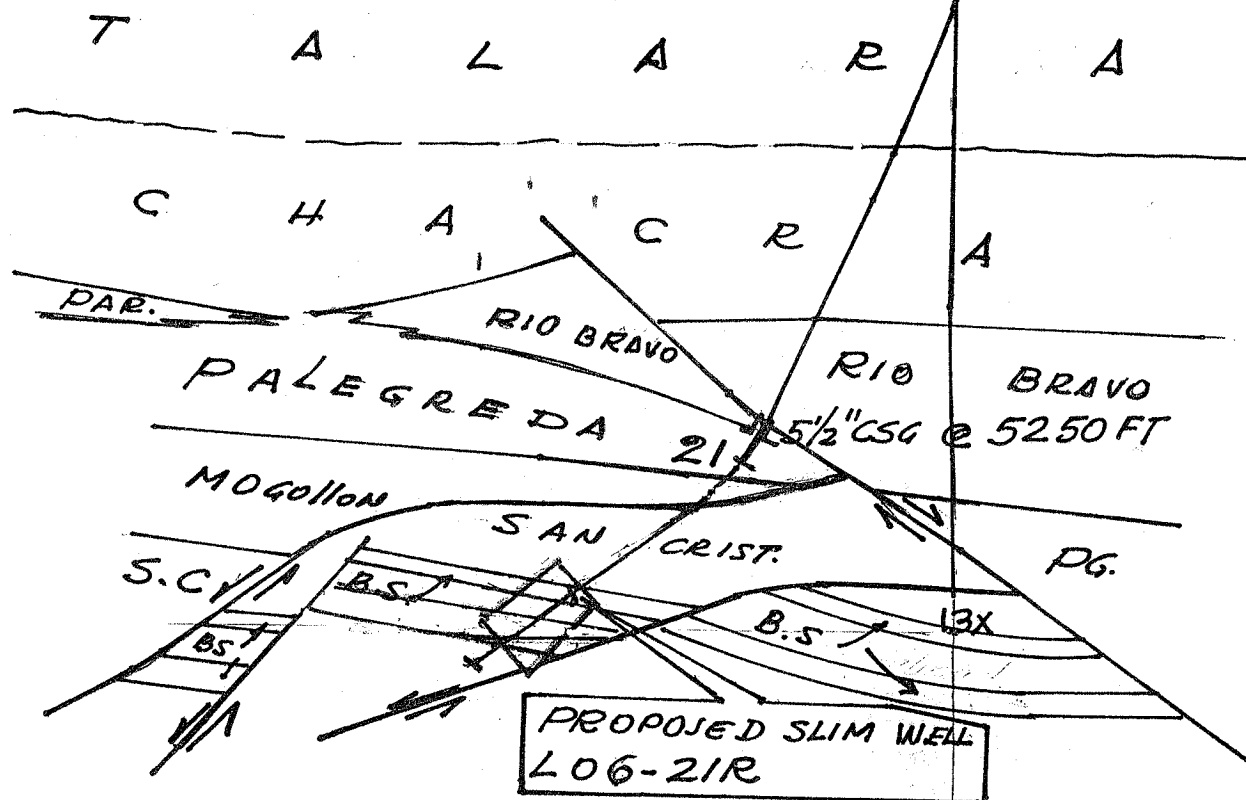LO6-21R

ROP. PLATF.
W-LO6
W.D.= 378'

PETRO-TECH PERUANA S.A.
LOBITOS AREA

STRUCTURE ON TOP OF
BASAL SALINA — LOWER SECTION

SCALE · 1/20,000

H. CORNEJO   JANUARY 1996

SW

Sea Level
Sea bottom

LOG

NE

T A L A R A

C H A C R A

PAR.

RIO BRAVO

RIO   BRAVO

PALEGREDA

21

5½" CSG @ 5250 FT

MOGOLLON

SAN   CRIST.

PG.

S.C.

B.S

B.S

13X

BS

PROPOSED SLIM WELL
LOG-21R

PETROTECH PERUANA S.A.
LOBITOS OFFSHORE

SW-NE STRUCTURAL CROSS SECTION
FOR PROPOSED SLIM WELL LOG-21R
SCALE: 1:20,000

H.Cornejo   Feb.'96

PETRO-TECH
PERUANA S.A.

PROPOSED WELL LO6-21R

RESERVOIR ANALYSIS AND ECONOMIC EVALUATION

The main objective of the well LO6-21R is the Basal Salina formation. As proposed, the objective sand will be in the same reservoir where the LO6-14 is located. This well tested water production from the lower sand, with top at 6685 ft.-ss. In the proposed well, it is expected to reach the Lower Basal Salina at 6300 ft.-ss.

In log analysis of the LO6-14, the Lower Basal Salina shows 60 ft. of vertical net sands with an average porosity of 9.5%. Since Sw calculation was in the wet sand, average value is not applicable for the oil zone. An average Sw of 50% is assumed for volumetric reserves calculation. Considering a recovery factor of 20% of the OOIP, the volumetric reserves for the reservoir block are estimated in 420 Mbbls.

Due to the risk of finding the oil/water contact higher than expected, for economic evaluation purpose, only 320 Mbbls. of oil reserves are considered. An initial production of 800 BOPD, average for the first month, is forecasted.

This well should be the only one oil producer of the reservoir. It is expected to find an initial formation pressure gradient of 0.60 psi/ft.

In addition, the Upper Basal Salina will also be drilled by the proposed well and will be located in a good trend of sands, this reservoir could be a good prospect for future workover.

In the economic evaluation, it is only considered the expected production of the lower reservoir. A summary of the results is as follows:

	Prod. w/o Risk	Break even Point
Oil Reserves, MBO	320	115
Total Investment, MUS$ (*)	755	755
Present Worth at 15%, MUS$	1,408	0
Rate of Return, %	>100	15
Pay Out, years	0.42	10
P/I Ratio (Discounted), $/$	2.39	0

(*) Cost estimated by Operations-Negritos

Parameters for economic evaluation:

Oil Price, $/Bbl	16.00
Rate of Discount, %	15
Tax Rate, %	30
Operating Cost, M$/Well/Year	110
Production Share, %	84

H. Chang
March 8, 1996