BELCO PETROLEUM
CORPORATION OF PERU
(SUCURSAL DEL PERU)

TELEF. — NEGRITOS
863-864-805

APARTADO Nº 1
TALARA-PERU

RAP ✓ Mch ✓ JCS ✓ Mch — JMC — JJ ✓

WELL FILE

May 22, 1985.-
DE- 27, 1985.-

WELL FILE
JJ

To : Drilling Superintendent
From : Drilling Engineering
Ref : Drilling prognosis for the Exploratory Well
Z2A-21-629-XD-L06 (L06-9X)
Lobitos - Offshore

File

Attached is the drilling prognosis for the above mentioned well to be drilled by rig III.

The primary objective is the Basal Salina at an expected measured depth of 7600 feet. The secondary objective being the Rio Bravo at ± 3400'MD.

The proposed TD is 8200'MD, estimated drilling time : 32 days, comple - tion time : 3 days.

The drilling procedure is as follows :

17'' Interval

- Spud well with 17'' bit and drill to ± 800'MD. The depth to coincide with appropiate csg. measurement to facilitate cementing head instal - lation at desired height above rotary. (Do not drill any rat hole).

- Circulate ± 5 min before making each connection to assure cuttings re- moval from the drill collar annulus at expected reduced annular veloci ties.

- Circ. and condition hole to run 13 3/8'' csg.

- Centralize, run, and cement ± 20 joints of 13 3/8'' J-55, 61#/ft LT&C as per attached cement program (set csg. on bottom to cement).

- Report cementing results (ie. volume and slurries used, cement returns, bump plug press. and status of float valve. Note : any irregularities in the cement job).

12 1/4'' Interval

- Drill 12 1/4'' hole from 13 3/8'' csg. shoe to ± 2500'MD as per at - tached hydraulics and mud programs.

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- Immediately upon drilling out of 13 3/8'' csg. commence increasing chlorides to 150,000 ppm and controlling fluid loss to comply with mud program.

- Circulate ± 3 min. prior to making each connections to assure hole cleaning in drill collar annulus.

- Use Super Visbestos (2-4#/bbl) to control rheology - addition of National bentonite will improve filter cake characteristics.

- Utilize same procedure previously described to obtain 9 5/8'' csg. point at ± 2500' MD.

- Circulate and condition hole to run csg.

- Centralize, run, and cement ± 61 joints of 9 5/8'' J-55, 40#/ft LTC as per attached cement program. (set csg. on bottom to cement).

- Report cementing results as per previous format.

7 7/8'' Interval

- Drill 7 7/8'' hole to the proposed T.D. of 8200' MD as per attached hydraulics and mud programs.

- Continue use of Super Visbestos for rheology control. Caution : SWAB/SURGE pressures are excessive using Visbestos in this hole configuration.

- Maintain 4#/bbl graphite in mud system as a lubricant. (Do not add diesel).

- Control pump output at maximum 188 gpm to insure laminar flow around the drill collars. This parameter will reduce the odds of sloughing shale.

- During a bit trip a ± 7100' MD, test BOP's with cup tester as per published procedure.

- Upon reaching TD circulate and condition hole to log.

- Log and evaluate (side wall cores may be taken) Go Well scheduled to provide logging services.

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- RIH and condition mud to run 5 1/2'' csg. Control yield point from 15-18 cps.

- Centralize, run, and cement csg. as per program (Program will follow log evaluation). Bottom and top plugs will be utilized.

Nelly Carrascal
Drlg. Engineer

V°B°: Claude Clark
Sr. Drlg. Eng.

G. Villanueva : Approved
Drlg. Supt.

Approved: C. R. Schmalhausen
Eng. Superintendent

NC/rzz
cc: O.M.
Drlg. Spt (2)
Geology
S.M.D.Co.
Petroperu-Lima
Finance
Well file

BELCO ENGINEERING

DRILLING PROGNOSIS

WELL	Z2A-21-629-DX-L06 (OFFICIAL NUMBER)	L06-9X (BELCO NUMBER)	Lobitos Offsh (AREA)	Exploratory (TYPE OF WELL)	01470 (AFE No.)
OBJETIVE	PRIMARY: Basal Salina	SECONDARY: Rio Bravo			
RIG: III	National 55-A (DRAWWORKS)	G. Denver PY-7 (PUMP No. 1)	G. Denver PY-7 (PUMP No. 2)		

DIRECTION OF DEVIATED WELL: S 60° W	ESTIMATED DEVIATION (MAX ANGLE): 40°	ELEVATIONS	K.B: 50'
CONDUCTOR SIZE AND ANGLE: 14°	RECOMMENDED K. O. P.: 800 ft		☒ WATER DEPTH: 335
ESTIMATED TOTAL DEPTH: 8200 ft	ESTIMATED TO REACH T. D.: 32 days		☐ GROUND LEVEL

SURFACE HOLE PROGRAM

BIT SIZE: 17''

CASING POINT: 800'

CASING

13 3/8'', J-55, 61#/ft LT&C

FLOATING EQUIPMENT
- Guide shoe
- Insert float valve with wooden ball guide.

CENTRALIZERS
One on each of the bottom six joints.

CEMENT

SLURRY 1: 500 sxs 4% Gel

SLURRY 2: 100 sxs neat

	SLURRY—1	SLURRY—2
DENSITY (lb/gl)	14.1	15.6
YIELD (ft^3/sx)	1.55	1.18
WAT. REQ (gl/sx)	7.8	5.2
T.T. (hr. min)	2	2

REMARKS
- Cement returns are expected.
- Average hole 19''.
- Do not weld casing shoe or the first two joints of casing. Use baker lok or Howco weld.

INTERMEDIATE HOLE PROGRAM

BIT SIZE: 12 1/4''

CASING POINT: 2500'

CASING

9 5/8'', J-55, 40#/ft LT&C

FLOATING EQUIPMENT
- Guide shoe
- Insert float valve with wooden ball guide.

CENTRALIZERS
One on each of the bottom six joints.

CEMENT

SLURRY 1: 550 sxs 4% Gel

SLURRY 2: 400 sxs, neat.

		SLURRY—1	SLURRY—2
DENSITY	(lb/gl)	14.1	15.6
YIELD	(ft^3/sx)	1.55	1.18
WAT. REQ.	(gl/sx)	7.8	5.2
T.T.	(hr. min)	2:0	1:30

REMARKS
- Cement returns are expected.
- Average hole 14 1/2''.
- Be sure report volume of cement returns.
- Do not weld casing shoe or the first two joints of casing. Use baker lok or Howco weld.

PRODUCTION HOLE PROGRAM

BIT SIZE: 7 7/8''

CASING POINT: 8200'

CASING

5 1/2'', J-55 & N-80 17 #/ft LT&C

FLOATING EQUIPMENT

Guide shoe
Diff. float collar

CENTRALIZERS
As the pay zone requirements.

*** CEMENT**

SLURRY 1: 4% + additives

SLURRY 2: neat + additives

		SLURRY—1	SLURRY—2
DENSITY	(lb/gl)		
YIELD	(ft^3/sx)		
WAT. REQ.	(gl/sx)		
T.T.	(hr. min)		

REMARKS

* Casing and cement program will be provided after open electrical logs are available.

Do not weld casing shoe or the first two joints of csg. Use baker lok or Howco weld.

WELLHEAD

SIZE: 13 3/8'' x 9 5/8'' x 5 1/2'' x 2 7/8''

WORKING PRESSURE: 2000 - 3000 - 5000 PSI.

ASSEMBLY:

Well : Z2A-21-629-XD-L06 (L06-9X)

MUD PROGRAM

MUD TYPE: High Salinity - Low Lime

DEPTH (ft)	MUD WEIGHT (lb/gal)	FUNNEL VISCOSITY (sec)	PLAST VISC. (CP)	YIELD POINT (lb/100 ft²)	FLUID LOSS (cc)	SOLIDS (%)	OIL (%)
Surf-800	9	55	Spud mud - No control				
at 2500	9.5	50	12	12	below 8	below 6	0
at 3500	10.2	45	10	14	below 6	below 10	0
at 5500	10.5	45	16	18	below 5	below 10	0
at 6500	11	45	20	22	below 4	below 12	0
at 7500	11.5	42	22	24	below 4	below 12	0
at 8200	11.5	42	22	24	below 4	below 12	0

REMARKS: Maintain the ph around 11.5

BIT PROGRAM

DEPTH (ft)	BIT SIZE (in)	BIT N°	BIT TYPE	WEIGHT ON BIT (1000 lbs)	ROTARY SPEED (RPM)	REMARKS
0-800	17	1	DSJ	20-25	110	
800-2500	12 1/4	4	X3A	25-30	110-100	Kick off at 800'.
2500-4000	7 7/8	4	X3A	30-35	100	
4000-6000	7 7/8	6	X3A-J3	35-40	90	
6000-7500	7 7/8	5	J-3	40-45	90	
7500-8200	7 7/8	2	J-11	40-45	90	

TOTAL BITS TO BE USED: 22 Bits.

REMARKS

WELL : Z2A-21-629-XD-L06 (L06-9X)

HYDRAULIC PROGRAM

DEPTH	BIT SIZE	JETS	PUMPS				PUMP RATE	ΔP BIT	ΔP SYST	ANN VEL		CRITICAL Vel	HHP BIT	%HHP BIT	HHP per BIT AREA	MUD		
			N°1		N°2					Dp	Dc					MW	PV	YP
(Ft)	(in)	(1/32")	LINER	SPM	LINER	SPM	(GPM)	(Psi)	(Psi)	(fpm)	(fpm)	(fpm)	(hhp)	(%)	hhp/in^2	lb/gl	(CP)	(lb/100ft^2)
0-800	17	16-16-16	6	120	6	120	561	752	1052	51	60	118	244	71	1.07	9	6	3
800-2500	12 1/4	14-14-14	6	100	6	100	468	942	1352	88	127	240	255	69	2.17	9.5	12	12
2500-3000	7 7/8	11-10-Ø	6	80	6	-	188	1133	1227	110	233	284	124	92	2.53	10	10	14
3000-3500	7 7/8	11-10-Ø	6	80	6	-	188	1156	1260	110	233	281	126	91	2.56	10.2	10	14
3500-4000	7 7/8	10-10-Ø	6	80	6	-	188	1425	1538	110	233	306	154	92	3.13	10.3	12	16
4000-4500	7 7/8	10-10-Ø	6	80	6	-	188	1439	1561	110	233	315	157	92	3.21	10.4	14	16
4500-5000	7 7/8	10-10-Ø	6	80	6	-	188	1439	1569	110	233	315	156	91	3.19	10.4	14	16
5000-5500	7 7/8	10-10-Ø	6	80	6	-	188	1452	1592	110	233	339	159	91	3.25	10.5	16	18
5500-6000	7 7/8	10-10-Ø	6	80	6	-	188	1494	1645	110	233	381	162	90	3.30	10.8	20	22
6000-6500	7 7/8	10-10-Ø	6	80	6	-	188	1522	1684	110	233	377	167	90	3.40	11	20	22
6500-7000	7 7/8	10-10-Ø	6	80	6	-	188	1563	1739	110	233	393	170	89	3.46	11.3	22	24
7000-7500	7 7/8	10-10-Ø	6	80	6	-	188	1591	1778	110	233	388	174	89	3.54	11.5	22	24
7500-8200	7 7/8	10-10-Ø	6	80	6	-	188	1591	1778	110	233	388	174	89	3.54	11.5	22	24

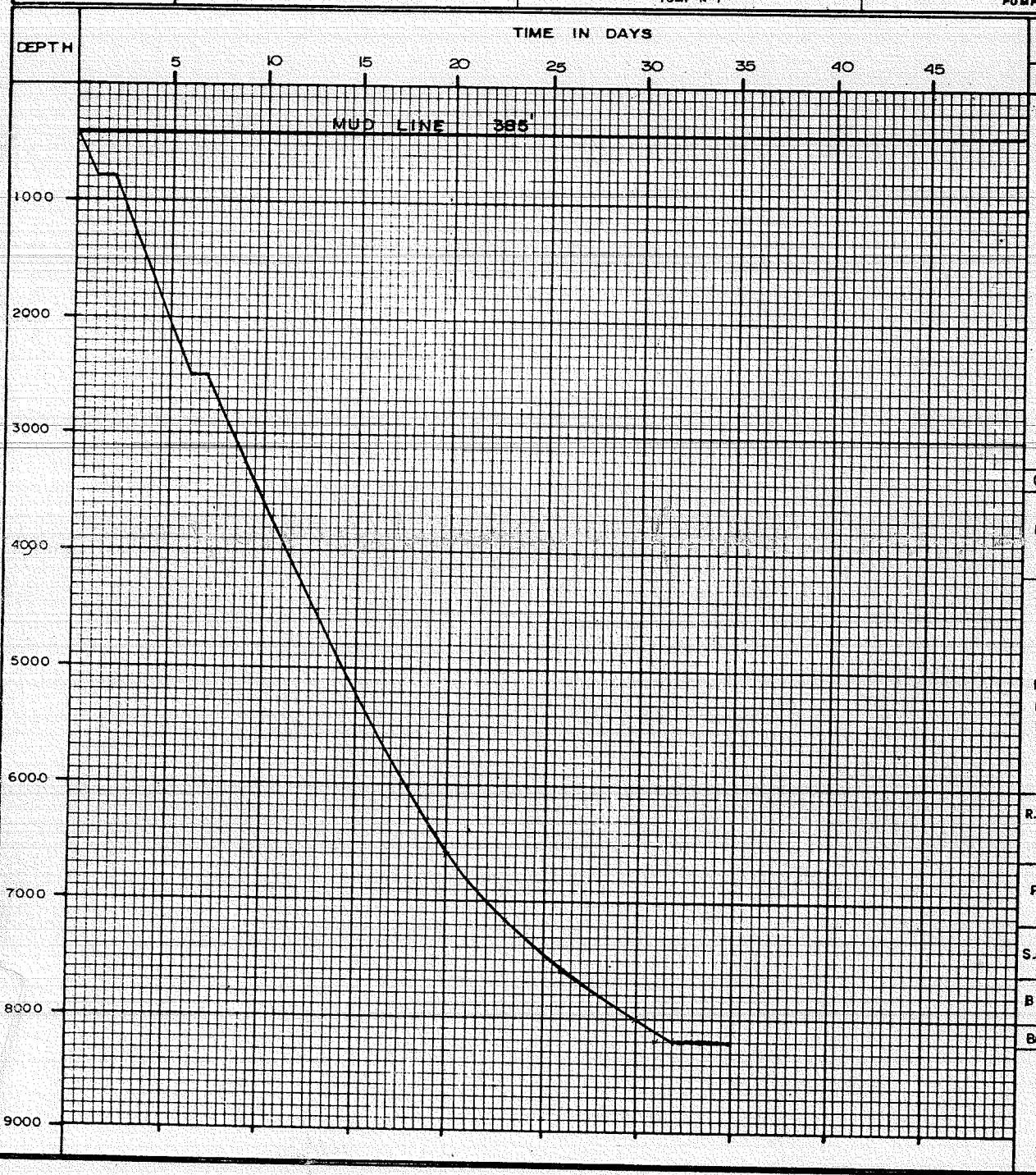
Note : If 5 1/2" liners are used while drilling 7 7/8" hole - stroke pump a 94 SPM to maintain 188 GPM (do not exceed).

NC/rzz

BELCO ENGINEERING

DRILLING TIME PROGNOSIS

WELL	Z2A-21-629-XO.LO6 (OFFICIAL NUMBER)	LO6 - 9X (BELCO NUMBER)	LOBITOS OFFSH. (AREA)	EXPLORATORY (TYPE OF WELL)	01470 (AFE)
OBJETIVE	PRIMARY	BASAL SALINA	SECONDARY	RIO BRAVO	
RIG :	NATIONAL 55 - A (DRAWWORKS)	G. DENVER PY-7 (PUMP Nº 1)	G. DENVER PY-7 (PUMP Nº 2)		



FORMATION TOP		
	PROGN.	DRILLED
TALARA		
CHACRA		
R. BRAVO SANDY		
R.BRAVO M. MASS SAND.		
R.B.SHLY		
PALEG.		
S.CRISTOBAL		
B.SALINA		
BALCONES		

DATE : MAY -22 - 1985

PREPARED BY N. CARRASCAL