1-3

JJ

Belco Lima

BELCO PETROLEUM CORPORATION OF PERU
GEOLOGICAL LOG
LITHOLOGICAL AND PALEONTOLOGICAL LOG

WELL Z2A-21-626-D-LOG (LOG-2)

PETRO–TECH PERUANA S.A.
GEOLOGIST WELL FILE

GEOLOGISTS: GEOPET A. GARRO E.
R. MORANTE

PALEONTOLOGIST: JOSE A. CASTILLO
PALINOLOGYST: R. LEVAGGI A.

AREA: LOBITOS OFFSHORE
BLOCK: Z2A PARCEL 21
PLATFORM: LOG
RIG CONTRACTOR: STORM III
TYPE OF WELL: DEVELOPMENT

WORKING FILE
GEOSCIENCES

SURFACE COORDINATES N 1'598,625.52 m E 124,657.40 m
BOTTOM COORDINATES N 1'598,765.72 m E 124,951.83 m
K.B.E 50' G.L.E —— WATER DEPTH: -335
AVERAGE DIRECTION N 64° E
AVERAGE OF VERTICAL ANGLE ON TARGET 11° 37' 38"
TOTAL MEASURED DEPTH 5353'
TOTAL VERTICAL DEPTH 5200'
DRILLING COMMENCED ON MAY 6th, 1985
DRILLING FINISHED ON MAY 19th, 1985
SURFACE CASING 13⅜" at 690'
INTER CASING 9⅝" at 1499'
PRODUCTION CASING 5½" at 5265'
ELECTRICAL SURVEYS: IEL-GR (Go well).
REMARKS:

WELL FILE

BELCO PETROLEUM CORP. OF PERU
DPTO. TECNICO
19 JUN. 1985
RECIBIDO

SCANNED
By Pelusa
Date 30-7-03

SHALE SILTSTONE SANDSTONE SAND CONGLOMERATE CLAYSTONE

DITCH SAMPLES
FROM SURF. TO 3000' EVERY 30'
FROM 3000 TO T.D. EVERY 10'
FROM ___ TO ___ EVERY
FROM ___ TO ___ EVERY

SYMBOLOGY FOR COMPOSITE AND/OR LITHOLOGIC AND PALEONTOLOGICAL LOG

IGNEOUS METAMORPHIC & SEDIMENTARY ROCKS
SHALE, CLAYSTONE, SILTSTONE, SANDSTONE, CONGLOM, LIMESTONE
CALCAREOUS SHALE, SILTY SHALE, SANDY SHALE, CALCAREOUS CLAYSTONE, SILTY CLAYSTONE, SANDY CLAYSTONE
CALCAREOUS SILTSTONE, SANDY SILTSTONE, CALCAREOUS SANDSTONE, SILTY SANDSTONE, SANDY LIMESTONE, DOLOMITIC LIMESTONE
TUFF, COAL, DOLOMITE, QUARTZITE, SCHIST, CHERT
GNEISS, INTRUSIVE, EXTRUSIVE

POROSITY TYPES
INTERGRANULAR I
VUGGY VU
FRACTURED FR
LEACHED L
CHALKY C
UNDETERMINED U

ACCESORIES
PYRITE □
GLAUCONITE
DOLOMITE △
CALCITE ◇
GYPSUM
SHELL FRAGS
SLICKENSIDES
COAL / LIGNITE
MICA
MICROFOSSILS
CAVING

FAUNE AND ACCESORIES ABUNDANCE
● > 30 V. Abundant
⊗ 21 – 30 Abundant
X 11 – 20 Common
/ 6 – 10 Rare
· 0 – 5 V. Trace

CASING, LOST CIRC., DST, CORES, SWC, RECOVERY, NO RECOVERY, HOLE DEVIATION, CEMENT PLUG

May 07th, 1985
386'-15°-N 29° E-371.8
N: 87 E: 48
#1RR-17½" SMT-DSJ
SEA WATER
347'-10 hrs 34.7'/hr
RPM 100
WOB 30
SPM 90
13⅜" CSG shoe @ 690'
May 8th, 1985
719' #2-12¼ HTC-R1
780'-20°-N33°E-748.6
N: 188.9 E: 109.4
MW: 9.4 VISC: 55
MAY 9th, 1985 AT 780'
WL: 10 PH: 11
SOL: 10% CHL: 20,000
RPM 100
WOB 20
SPM 125
249'-7 hrs 35.5'/hr
968'-21¾°-N 36°E-924
N: 244.5 E: 146.9
968' #3-12¼ HTC-R1
MW: 9.4 VISC: 56
WL: 10 PH: 11.0
SOL: 10% CHL: 20,000
1246'-18½°-N 38°E-1185
N: 321 E: 263.8
563'-16 hrs 35.2'/hr
RPM 100
SPM 125
WOB 30
9⅝ csg shoe @ 1499
May 10th 11th 1985
1531' #4-7⅞ HTC-X3A
1530'-11½°-N42°E-1466
N: 384.3 E: 354
MW: 9.9 VISC: 58
1696'-11¾°-N45°E-1633
N: 426 E: 392
WL: 4.0 PH: 11.5
SOL: 9 CHL: 140,000
1996'-11¾°-N 76°E-1846
N: 460.5 E: 315.5
RPM 100
2193'-12°-N81°E-2094
N: 500 E: 2318
WOB 35
SPM 100
1186'-23½ hrs 50'/hr
2396'-12°-N75°E-2275
N: 518 E: 481
MW: 10.2 VISC: 50
May 12th, 1985
WL: 4.2 PH: 11.5
SOL: 10 CHL: 140,000
RPM 90
WOB 35
SPM 100
#5-7⅞ HTC-X3A
2756'-11½°-N 75°E-2631
N: 553 E: 691
MW: 10.5 VISC: 52
WL: 4.6 PH: 11
SOL: 12% CHL: 140,000
May 13th, 1985
RPM 100
WOB 30
SPM 100
810'-32 hrs 25.3'/hr
MW: 10.6 VISC: 52
WL: 4.5 PH: 11
SOL: 12% CHL: 140,000
3528' #6-7⅞ HTC-X3A
3586'-10¼°-S78°E-3462.8
N: 513 E: 649.4
May 14th, 1985
MW: 10.6 VISC: 52
WL: 4.5 PH: 11
SOL: 12% CHL: 140,000
524'-23½ hrs 22.2'/hr
RPM 100
WOB 35
SPM 80
3898'-9½°-S77°E-3770'
N: 501.6 E: 701.7
May 15th, 1985
4110-10°-S79°E-3979
N: 474 E: 736.8
4110' #7-7⅞ HTC-J11
May 16th, 1985
MW: 10.7 VISC: 43
WL: 3.6 PH: 11.5
SOL: – CHL: 140,000
4425'-9¾°-S82°E-4289.6
N: 485 E: 790
RPM 85
WOB 35
SPM 80
May 17th, 1985
938'-51½ hrs 18'/hr
MW: 10.6 VISC: 42
WL: 3.4 PH: 11.5
SOL: 11% CHL: 145,000
4800-10½°-S84°E-4658'
N: 477 E: 855.5
RPM 80
SPM 80
WOB 35
May 18th, 1985
5048' #8-7⅞ HTC-J11
5111'-12°-S82°E-4963.6
N: 469.8 E: 915.7
M.W: 10.5 pH: 11.5
Vis: 45 Cl: 140,000
W.L: 3.8
May 19th, 1985 at 5164'
RPM: 80
WOB: 35
SPM: 80
305 Ft/16½ Hrs 18.5 Ft/hr
5½" csg shoe at 5265'
M.W: 10.5 pH: 11.5
Vis: 45 Cl: 135,000
W.L: 3.2
5353 12½ S76E 5200
N: 460 E: 966
TD 5353
DRILLING FINISHED ON MAY 19th, 1985 at 16:00 Hrs.

LOG-2
00'-500'

FLUORESCENCE	LITHOLOGICAL DESCRIPTIONS	PALEONTOLOGICAL DETERMINATIONS
	DRILLING SPUDDED ON May 6th, 1985 at 18:00 Hrs.	
	DRILLING WITH SEA WATER NO RECOVERY SAMPLES NO FLOW LINE.	
	No representative samples cement from casing shoe	
	SS: Whysh, Wh-Gysh inpt, Qtz grs, M grs mainly, Fr vis por, p.srt, w/DK mnrls & gn grs incls, abut calc cmt, calc mtx, sl cln, Fri/v.Fri.	PRACT. BARREN HELICO
	SH: Pred. Gy-brnsh, sft, sl micr-carb diss, calc, v. smooth on surf, blky.	
	SS: Wh-Gysh, Qtz grs, F40% M60% grs, p. vis por, w/ Coal mat & calc incls, abut calc cmt, sl sty mtx	PRACT. BARREN
	SD: Why, Hy, occ Mlky, Qtz grs, C80%, VC20% grs, sb-rd/sb-ang, p.srt.	
		PRACT. BARREN
	SH: Brn, Lt brn, sft, sl micr-carb diss, mass, sl calc, v. smooth on surf, sb-blky	Bathy. eoc. brn. Bathy. eoc. waxy TALARA V. POOR
	SLST: Lt Gy, Wh-Gysh, Frm/sl Fri, VF grs, grde to ss, v. calc, rough on surf, blky/sb-blky.	Bathysiphon eoc. brn. Cib. grimsdalei Claviger. colombiana Robulus inornatus Spiroplect. acricola TALARA-RICA: POOR
	SH: Lt brn, brn, sft/mod. Frm, sl micr-carb diss, calc inpt, occ micr-pyr diss, dull, blky.	
	SLST: Lt Gy, Gy-brnsh inpt, sl Fri/hrd inpt, VF grs, sl micr-carb diss, rough, slty, sb-blky.	
	SH: Lt brn, Gy-brnsh, Frm/sl sft, micr-carb diss, dull, v. smooth on surf, sl sdy inpt, sl calc, sb-blky/blky.	
	SLST: Gy-brnsh, Lt Gy, Frm/sl Fri, VF grs, grde to ss, sl micr-mica, slty, calc, blky/sb-blky.	Claviger. colombiana. Trocham. sp. Ellipsobul. oviformis.
	SH: Gy-brnsh, Lt brn, sft, sl micr-carb diss, occ micr-mica inpt, sl calc, v. smooth on surf, sb-plty/sb-blky.	Trocham. samanica Rotalia compressa? Claviger. colombiana. Spiroplect. acricola.
	SS: Wh-Gysh, Qtz grs, VF60% F40% grs, Fr vis por, p.srt, abut calc cmt, slty, sl sty mtx, hrd.	Microgastropods. Bathy. eoc. brn Troch. samanica (light col.) Cassidolina cladara. Ostracod smooth. Discorbis berryi
	SLST: Wh-Gysh, Lt Gy, Frm/sl Fri, VF grs, grde to ss, v. rough on surf, calc, blky, sl micr-mica inpt.	
	SH: Lt Gy, Gy-brnsh, Lt brn inpt, sft/occ sl Frm, mod micr-carb diss, occ micr-mica, sl calc/non calc, dull, sb-blky.	
	SS: Wh-Gysh, Lt Gy inpt, Qtz grs, VF70% grs, F30% grs, p/v.p. vis por, p.srt, calc cmt, slty, w/DK mnrls & coal mat incls, hrd, Tt.	Ostracod (channeled) Trocham. samanica/ Cassidolina cladara. Bolimina brachicostata. Boliminell. qoem. Ostracod smooth II Valv. soturalis X Boliminell. quemadana Discorbis berryi QDA. POOR + CC RWK COMM.
	SS: Wh-Gysh, Whysh inpt, Qtz grs, VF-F grs, p.srt, sl micr-carb diss, calc cmt, slty, sl hrd.	Trocham. samanica / Valv. soturalis (brK) Rotalia compressa. Bolin. quemadana.
	SLST: Lt Gy, Wh-Gysh inpt, sl hrd/Fri, micr-mica diss, VF grs, grde to ss, rough on surf, v. calc, w/coal mat incls, blky	Valv. soturalis / Cassidol. cladara Trocham. samanica.
	SH: Gy, Lt Gy, sft, sl micr-mica, occ micr-carb diss, v. smooth on surf, sb-blky	Valv. soturalis (RwK) X Virg. restinensis / Plancktonics.
	SD: Why, Hy, Qtz grs, M30%, C50%, VC20% grs, sb-ang/sb-rd, occ ang, p.srt.	BARREN TEREBRATULA SDY. FACIES
	SS: Whysh, Qtz grs, F50%, M50% grs, Fr srt, p. vis por, w/gn grs incls, calc cmt, slty mtx, sl cln	BARREN TEREBRATULA SDY. FACIES FINNING UPWARD SEQ.
	SD: Why, Hy, Qtz grs, M30%, C60%, VC10% grs, sb-rd, sb-ang, occ ang, p.srt.	Valv. soturalis / Rob. multiseptae. Plancktonics / CHACRA
	SH: Pred. Lt Gy, sft, sl micr-mica, occ micr-carb diss, non calc, dull, sb-Fis, v. smooth on surf, sb-plty	Valv. soturalis / Rob. multiseptae.
	SH: Lt Gy, Gy, occ Gy-brnsh, sft/sl Frm inpt, micr-carb diss, sl micr-mica, non calc, sb-Fis, blky, sb-blky.	Valv. soturalis/ Rob. multiseptae. Valv. soturalis T. Valv. palegredensis. Chillost. polsoni. MD-LW CHACRA COM. + PG RWK POOR Valv. soturalis / Rob. multiseptae. Valv. soturalis T Chillostom. polsoni. Bulimina debilis pyr. MD-LW CHACRA: P-C + PG RWK POOR
	SH: Lt Gy, Gy, sft/v.sft, sl micr-mica, mod. micr-carb diss, non calc, dull, sb-Fis, v. smooth on surf, sb-plty.	Valv. soturalis. Valv. soturalis T. Rob. multiseptae. Trocham. sp. MD-LW CC POOR + PG RWK VP Valv. soturalis Valv. soturalis T. Rob. multiseptae.
	No representative samples abundant mud material	Valv. soturalis Valv. palegredensis Trocham. sp.
	SLST: Wh-Gysh, Lt Gy, Frm/sl Fri, VF grs, grde to ss w/DK mnrls incls, rough on surf, blky/sb-blky.	NO SAMPLES Valv. soturalis Rob. multiseptae.
	SH: Lt Gy, sft, micr-carb diss, sl micr-mica, non calc, smooth, sb-Fis/Fis inpt, sl dull, plty.	Microgastropod Valv. soturalis Rob. multiseptae II Molinia Valv. soturalis.
	SS: Whysh, Wh-Gysh inpt, Qtz grs, VF grs mainly, p. vis por, p.srt, calc cmt, sl drty, hrd.	Molinia Trocham. sp. Chillost. polsoni. Valv. soturalis.
	SLST: Wh-Gysh, Lt Gy, Frm/sl hrd, VF grs, dirty, v. calc, w/Coal mat incls, sl micr-pyr diss, rough tex, blky.	Molinia. Valv. palegred. Trocham. globig. Chillost. polsoni. Rob. multiseptae. Molinia sp / Microgastropod. Chillost. polsoni (pyr) Valv. soturalis. Rob. multiseptae.
	SH: Lt Gy, sft/v.sft, mod. micr-mica, sl micr-carb diss, non calc, sl brit, smooth on surf, sb-blky/sb-plty.	Trocham. sp. Rob. multiseptae. Molinia sp. Microgastropod. Chillost. polsoni. Valv. palegredensis II
	SS: Wh-Gysh, Qtz grs, VF grs mainly, v.p. vis por, p.srt, calc cmt, calc mtx, w/DK mnrls incls, slty, sl hrd/occ Fri.	Virgul. restinensis. Valv. soturalis T Microgastropods. Valv. soturalis. Microgastropod Valv. palegredensis. Trocham. sp Bathysiphon sp (blck)/
	SH: Gy, Gy brnsh inpt, sft, sl Frm, sl micr-carb diss, non calc, v. smooth on surf, sb-Fis, sb-blky.	Valv. soturalis Rob. multiseptae. Valv. sot. T. Bathysiphon sp brn. Cyclam. simiensis. Microgastropods. Valv. palegredensis / Troch. globigerinif.
	SLST: Wh-Gysh, Lt Gy, sl Fri/hrd, VF grs, grde to ss, w/abut calc mat incls, sl micr-carb diss, rough on surf, blky.	Valv. soturalis T Valv. soturalis. Bathysiphon sp brn / Cyclam. simiensis / Microgastropod DK arenaceous.
	SS: Whysh, Wh-Gysh inpt, Qtz grs, VF30%, F70% grs, p. vis por, p.srt, calc cmt, calc mtx, w/DK mnrls & Coal mat incls, sl Fri	Valv. soturalis. Bathysiphon eoc brn / Cyclam. simiens. (dk) / RIO BRAVO (LITHO)
	SLST: Lt Gy, Whysh, Frm/occ Fri, VF grs, micr-pyr diss, v. calc, sb-blky	Microgastropods. Cyclam. simiensis dK. Bathysiphon eoc brn /
	SS. Whysh, Wh-Gysh, Qtz grs, VF30%, F40%, M30% grs, p.srt, sl hrd.	
	SS: Whysh, Wh-Gysh, Qtz grs VF40%, F30%, M30% grs, p/Fr vis por, abut calc cmt, sl drty, occ Fri/hd.	Cyclam. simiensis dK / Rob. multisept.
	SLST: Lt Gy, Wh-Gysh, Frm, rough on surf, w/coal mat incls, v. calc, blky.	Robulus multisep. Microgastropods.
wh sl yelsh fluor p. cut	SH: Lt Gy, Gy, sl Frm/sft, micr-mica, sl micr-carb diss, non calc, sb-Fis inpt, v. smooth on surf, occ sl sdy, sb-plty/plty	Bathysiphon sp dk. Valv. soturalis T. Valv. sot. Rob. multisept. Trocham. sp.
wh yelsh sl bri fluor p.cut	SD: Why, Hy, Qtz grs, M40%, C60% grs, sb-rd/sb-ang, ang some, Fr srt.	Rob. multisept.
	SS: Whysh, Wh-Gysh inpt, Qtz grs, F40%, M60% grs, p/Fr vis por, v.p.srt, abut calc cmt, sl sty mtx, v. Fri	RIO BRAVO SANDY
A/A		
wh yelsh sl bri fluor p. cut.	SS: Whysh, occ Wh-yelsh, Qtz grs, M grs mainly, p. vis por, Fr srt, abut calc cmt, calc mtx, w/DK mnrls & mica incls, hrd.	PRACT. BARREN
	SLST: Lt Gy, Wh-Gysh inpt, Frm/sl Fri, VF grs, w/DK mnrls & mica incls, rough on surf, v. calc, grde to ss, blky.	
	SD: Why, Hy, occ Mlky, Qtz grs, C80%, VC20% grs, sb-rd/sb-ang, p/Fr srt.	
wh yelsh brit fluor fst strong whgnsh cut	SS: Wh-Gysh, Whysh inpt, Qtz grs, F30%, M70% grs, sb-rd/sb-ang, p/Fr vis por, p.srt, abut calc cmt, Tr sl cln, hrd.	
wh yelsh sl bri fluor Mod strng wh gnsh cut (on res ring)	SD: Why, Hy, Qtz grs, M70%, C30% grs, sb-rd/sb-ang, occ ang grs, Fr srt.	Microgastropods.
	SS: Whysh, Qtz grs, M grs mainly, Fr vis por, Fr srt, calc cmt, sl sty mtx, cln, Fri	
	SH: Gy-brnsh, Gy, sft, mod. micr-mica diss, non calc, sl sdy, sb-blky/sb-plty, sl smooth on surf, sb-Fis	
	SS: Whysh, Qtz grs, VF30%, F30%, M40% grs, p/Fr vis por, Fr srt, calc cmt, calc mtx, sl cln, sl Fri/occ hrd.	Microgastropods. Valv. soturalis.
	SLST: Lt Gy, Wh-Gysh, Frm/occ hrd, VF grs, grde to ss, w/DK mnrls & Coal mat incls, calc, slty, abut sdy mtx, rough, blky.	
wh yelsh sl bri fluor Fst string whgnsh cut.	SD: Why, Hy, Qtz grs, M60%, C40% grs, sb-rd/sb-ang some ang grs, Fr srt.	
	SS: Whysh, Wh-Gysh inpt, Qtz grs, M grs mainly, Fr srt, Fr vis por, w/DK mnrls incls, calc cmt, sl sty mtx, v. Fri	
	SLST: Lt Gy, Wh-Gysh, Frm/occ hrd, micr-carb diss, w/DK mnrls incls, calc, sb-blky/blky.	Microgastropods /
yelsh sl bri fluor whyelsh cut	SD: Why, Hy, Qtz grs, M60%, C40% grs, sb-rd/sb-ang, Fr srt.	BARREN
	SS: Wh-Gysh, Whysh inpt, Qtz grs, F50%, M50% grs, Fr/p. vis por, p.srt, calc cmt, w/DK mnrls incls, sl hrd	
	SH: Gy, sl DK Gy, Gy-brnsh, Frm, micr-carb, sl micr-mica, sl rough on surf, sb-Fis/Fis, sb-plty.	
	SD: Why, Hy, Qtz grs, M70%, C30% grs, sb-rd/sb-ang, Fr srt.	Plancktonics sp. Valv. soturalis. Robolus sp.
wh yelsh sl dull fluor p.cut	SS: Wh-Gysh, Qtz grs, F50%, M50% grs, Fr srt, Fr/p. vis por, calc cmt, sl sty mtx, sl drty, v. Fri	
	SLST: Wh-Gysh, Lt Gy, Frm/sl hrd, VF grs, drty, v. calc, rough on surf, sl micr-carb diss, sb-blky.	Robolus sp. Chillostom. polsoni py. Valv. palegredensis
	SH: Gy, sl DK Gy, sft/sl Frm, sl micr-mica, mod. micr-carb diss, sl sdy, sl rough on surf, non calc, sb-plty.	V. palegredensis / Ostracod sp. Troch. globig. / Ostrac. Chillost. polsoni PG. FAUNA P-To Comm. Pg fauna / To sl. X

RAN GO WELL:
IEL-GR

TOTAL DEPTH
DRILLER: 5353 FT.
LOGGER: 5334 FT.

PETRO–TECH PERUANA S.A.
GEOLOGIST WELL FILE