ajg CER 24-18-64

HALLIBURTON LOGGING SERVICES, INC.

DUAL INDUCTION SHORT GUARD LOG

FINAL PRINT 5"=100'

COMPANY	ARCO OIL AND GAS COMPANY
WELL	LUNGREN CREEK NO.24-18-64 (CER)
FIELD	MIST
COUNTY	COLUMBIA
STATE	OR
LOCATION	FEET NORTH AND FEET EAST FROM THE CORNER OF:
TWP	6N
RGE	4W
OTHER SERVICES	AVL/GR, DSN/SDL
PERMANENT DATUM	G.L. ELEV. 636.1
LOG MEASURED FROM	KELLY BUSHING 11.5FT. ABOVE PERM. DATUM
DRILLING MEASURED FROM	KELLY BUSHING
ELEV.: K.B.	647.6
D.F.	-----
G.L.	636.1

Fold Here

Service Ticket No.: 12306	API Serial No.: N/A	PGM Version: 1.31 PC				
Change in Mud Type or Additional Samples			RESISTIVITY SCALE CHANGES			
Date/Sample No.	09/19/89:ONE	/ / :	Type Log	Depth	Scale Up Hole	Scale Down Hole
Depth-Driller						
Type Fluid in Hole						
Dens. : Visc.	:	:				
pH. : Fluid Loss	:	:				
Source of Sample						

			RESISTIVITY EQUIPMENT DATA					
			Run No	Tool Type & No		Pad Type	Tool Pos.	Other
Rm @ Meas.Temp.	@	@						
Rmf @ Meas.Temp.	@	@	ONE	DUAL	W109432	N/A	1.5"S.O.	M412
Rmc @ Meas.Temp.	@	@	ONE	SGRD	W108932	N/A	1.5"S.O.	M416
Source: Rmf:Rmc	:	:						
Rm @ BHT	1.93 @112	@						
Rmf @ BHT	2.00 @112	@						
Rmc @ BHT	1.79 @112	@						

EQUIPMENT DATA

GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No.	ONE	Run No.	ONE	Run No.	ONE	Run No.	ONE
Serial No.	W108581	Serial No.	W112458	Serial No.	W109740	Serial No.	W108749
Model No.	432	Model No.	305	Model No.	465	Model No.	434
Diameter	3 5/8	No.of Cent.	FOUR	Diameter	4 1/2	Diameter	3 5/8
Detector Model No.	N/A	Spacing	1 FOOT	Log Type	GAMMA	Log Type	NEUTRON
Type	SCINT.			Source Type	CS137	Source Type	AM241BE
Length	4 IN.	LSA	Y	Serial No.	118	Serial No.	66
Distance To Source	N/A	FWDA	N	Strength	1.5 CU.	Strength	19.5 CU

LOGGING DATA

GENERAL				GAMMA		ACOUSTIC			DENSITY			NEUTRON		
Run No.	Depth From	Depth To	Speed Ft/Min	Scale L	Scale R	Scale L	Scale R	Matrix	Scale L	Scale R	Matrix	Scale L	Scale R	Matrix
ONE	1808	456	30	0	50	150	50	57	1.65	2.65	2.65	60PU	0PU	SAND
					API			US/FT			G/CC			

Remarks: ANNULAR HOLE VOLUME CALCULATED USING 4 1/2 INCH CASING.

CREW ON LOCATION: J.JOHNSON, R.JEFFERY
THANK YOU FOR USING HALLIBURTON LOGGING SERVICES!

Halliburton Logging Services, Inc. does not guarantee the accuracy of any interpretation of log data, conversion of log data to physical rock parameters or recommendations which may be given by HLS personnel or which may appear on the log or in any other form. Any user of such data, interpretations, conversions or recommendations agrees that HLS is not responsible except where due to gross negligence or wilful misconduct, for any loss, damages, or expenses resulting from the use thereof.

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SHORT GUARD SHOP CALIBRATION SUMMARY
PERFORMED: 10:57:24 08/31/89 LAST SHOP CALIBRATION: 14:26:45 08/10/89
SERIAL NUMBER: 108932 PROGRAM VERSION: 1.31 PC
MODEL: #405
PERFORMED BY: MCDANIEL

	MEASURED	CALIBRATED	UNITS
EXT. CAL. POINT #1	1.996	2.000	OHM-M
EXT. CAL. POINT #2	20.018	20.000	OHM-M
EXT. CAL. POINT #3	192.589	200.000	OHM-M
INTERNAL REFERENCE	19.974	19.942	OHM-M

SHORT GUARD BEFORE SURVEY FIELD CHECK SUMMARY
PERFORMED: 08:34:17 09/19/89 LAST SHOP CALIBRATION: 10:57:24 08/31/89

	SHOP	FIELD	UNITS
INTERNAL REFERENCE	19.941	19.940	OHM-M

SHORT GUARD AFTER SURVEY FIELD CHECK SUMMARY
PERFORMED: 10:43:28 09/19/89 LAST SHOP CALIBRATION: 10:57:24 08/31/89

	BEFORE	AFTER	UNITS
INTERNAL REFERENCE	19.940	19.904	OHM-M

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DUAL INDUCTION SHOP CALIBRATION SUMMARY
PERFORMED: 11:05:42 08/31/89 LAST SHOP CALIBRATION: 14:34:51 08/10/89
SERIAL NUMBER: 109432 PROGRAM VERSION: 1.31 PC
MODEL: #412
PERFORMED BY: MCDANIEL

	DEEP INDUCTION MEASURED	DEEP INDUCTION CALIBRATED	MEDIUM INDUCTION MEASURED	MEDIUM INDUCTION CALIBRATED	UNITS
TOOL ZERO	-.003	.000	-.007	.000	MMHOS/M
INTERNAL REFERENCE	494.528	496.539	499.505	502.422	MMHOS/M
WHEEL	496.019	500.000	497.376	500.000	MMHOS/M
MANDREL BASE	4.517	3.727	5.650	5.096	MMHOS/M

DUAL INDUCTION BEFORE SURVEY FIELD CHECK SUMMARY
PERFORMED: 08:35:49 09/19/89 LAST SHOP CALIBRATION: 11:05:42 08/31/89

	DEEP INDUCTION SHOP	DEEP INDUCTION FIELD	MEDIUM INDUCTION SHOP	MEDIUM INDUCTION FIELD	UNITS
TOOL ZERO	.000	.990	.000	-.032	MMHOS/M
INTERNAL REFERENCE	496.539	501.210	502.420	509.025	MMHOS/M
MANDREL BASE	3.727	3.727	5.896	5.896	MMHOS/M

DUAL INDUCTION AFTER SURVEY FIELD CHECK SUMMARY
PERFORMED: 10:45:02 09/19/89 LAST SHOP CALIBRATION: 11:05:42 08/31/89

	DEEP INDUCTION BEFORE	DEEP INDUCTION AFTER	MEDIUM INDUCTION BEFORE	MEDIUM INDUCTION AFTER	UNITS
TOOL ZERO	.990	.371	-.032	.056	MMHOS/M
INTERNAL REFERENCE	501.209	499.811	509.024	510.068	MMHOS/M
MANDREL BASE	3.727	3.727	5.896	5.896	MMHOS/M

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GAMMA SHOP CALIBRATION SUMMARY
PERFORMED: 10:05:26 09/01/89 LAST SHOP CALIBRATION: 14:24:17 08/08/89
SERIAL NUMBER: 108594 PROGRAM VERSION: 1.31 PC
MODEL: #432 FIELD CALIBRATOR: #2141
PERFORMED BY: MCDANIEL

	MEASURED	CALIBRATED	UNITS
BACKGROUND	13	13	API-CPS
BACKGROUND+CALIBRATOR	269	271	API-CPS
CALIBRATOR	256	258	API-CPS

GAMMA BEFORE SURVEY FIELD CHECK SUMMARY
PERFORMED: 08:30:08 09/19/89 LAST SHOP CALIBRATION: 10:05:26 09/01/89
FIELD CALIBRATOR: #2141

	SHOP	FIELD	UNITS
BACKGROUND	13	27	API-CPS
BACKGROUND+CALIBRATOR	271	289	API-CPS
CALIBRATOR	258	262	API-CPS

GAMMA AFTER SURVEY FIELD CHECK SUMMARY
PERFORMED: 11:02:47 09/19/89 LAST SHOP CALIBRATION: 10:05:26 09/01/89

	BEFORE	AFTER	UNITS
BACKGROUND	27	29	API-CPS
BACKGROUND+CALIBRATOR	289	291	API-CPS
CALIBRATOR	262	262	API-CPS

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CALIPER SHOP CALIBRATION SUMMARY
PERFORMED: 08:19:38 09/19/89 LAST SHOP CALIBRATION: 08:17:59 09/19/89
SERIAL NUMBER: TAN PROGRAM VERSION: 1.31 PC
MODEL: #202
PERFORMED BY: JOHNSON

	MEASURED	CALIBRATED	UNITS
VALUE 1	7.896	8.000	INCHES
VALUE 2	16.000	16.000	INCHES

CALIPER BEFORE SURVEY FIELD CHECK SUMMARY
PERFORMED: 08:21:41 09/19/89 LAST SHOP CALIBRATION: 08:19:38 09/19/89

	SHOP	FIELD	UNITS
VALUE 1	8.000	7.957	INCHES

CALIPER AFTER SURVEY FIELD CHECK SUMMARY
PERFORMED: 10:54:59 09/19/89 LAST SHOP CALIBRATION: 08:19:38 09/19/89

	BEFORE	AFTER	UNITS
VALUE 1	7.957	8.097	INCHES

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TENSION SHOP CALIBRATION SUMMARY
PERFORMED: 08:15:29 09/19/89 LAST SHOP CALIBRATION: 20:19:50 09/12/89
SERIAL NUMBER: TOP PROGRAM VERSION: 1.31 PC

H L S CALIBRATION SUMMARY TABLE

SERVICE or SIGNAL	SHOP	BEFORE	AFTER	CHANGE	TOLERANCE
GUARD	19.941	19.940	19.904	.036	+/-.80
DEEP INDUCTION	496.539	501.209	499.811	1.398	+/- 20
MEDIUM INDUCTION	502.420	509.024	510.068	-1.043	+/- 20
GAMMA	258	262	262	0	+/- 9.0
CALIPER VALUE 1	8.000	7.957	8.097	-.140	+/- 0.50

EVENTS

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 1  7:47:21 00000 >DATE OF LOG: MMDD                        919
 2  7:50:20 00000 >PLS SOFTWARE REVISION                   1.31
 3  7:50:20 00000 >CURRENT REVISION UPDATE NUMBER PC
 4  8:45:55 00617 >CASING SIZE O.D. (INCHES)            5.500+0
 5  8:45:55 00617 >BIT SIZE? (INCHES)                   7.875+0
 6  8:45:58 00617 >DT-MATRIX(40=DOL<DT<70=SHALY)        5.700+1
 7  8:45:58 00617 >DT-SHALE (100=MIN<DT<160=MAX)         1.000+2
 8  8:45:58 00617 >FOR FORMATION FACTOR(.5<A<2.5)       1.000+0
 9  8:45:58 00617 >FOR FORMATION FACTOR(1.2<M<2.5)      2.000+0
10  8:46: 8 00617 >FOR FORMATION FACTOR(.5<A<2.5)       8.100-1
11  8:46:17 00617 >BIT SIZE? (INCHES)                   6.250+0
12  8:46:25 00617 >CASING SIZE O.D. (INCHES)            4.500+0
13  8:46:32 00617 >>LOG PARAMETERS UPDATED HERE
14  9: 5:35 01400 >LOGGING SECTION NO.                        2
15  9:13:49 01143 >"HALTING" END OF SECTION
16  9:13:49 01143 >"HALTING" END OF SECTION
17  9:21:18 01812 >LOGGING SECTION NO.                        3
18 10:11:19 00444 >"HALTING" END OF SECTION
19 10:11:19 00444 >"HALTING" END OF SECTION
20 10:21:42 01550 >LOGGING SECTION NO.                        4
21 10:40:51 01040 >"HALTING" END OF SECTION
22 10:40:51 01040 >"HALTING" END OF SECTION
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