Schlumberger

FORMATION DENSITY COMPENSATED NEUTRON GAMMA RAY 5"

COUNTY	COLUMBIA
FIELD	MIST GAS FIELD
LOCATION	S 03-05-16 W 2267.48' & S 86-54-44 E
WELL	OM 12-22-65
COMPANY	NORTHWEST NATURAL GAS

COMPANY NORTHWEST NATURAL GAS

WELL OM 12-22-65

FIELD MIST GAS FIELD

COUNTY COLUMBIA **STATE** OREGON

LOCATION S 03-05-16 W 2267.48' & S 86-54-44 E
1224.03' FROM THE NW COR OF SEC 22

API SERIAL NO.	SECT.	TWP.	RANGE
36-009-00326	22	6N	5W

Other Services:
SONIC
FMS
LDT
CNL
GR
CALIPER

Permanent Datum	GROUND LEVEL	**Elev.** 556.0 F		**Elev.:** K.B.565.0 F
Log Measured From	KELLY BUSHING	9.0 F	**above Perm. Datum**	D.F.
Drilling Measured From	KELLY BUSHING			G.L.556.0 F

Date	09-SEPT-1997				
Run No.	TWO				
Depth Driller	2337.0 F				
Depth Logger (Schl.)	2324.0 F				
Btm. Log Interval	2300.0 F				
Top Log Interval	333.0 F				
Casing-Driller	8 5/8" @ 343.0 F		@		@
Casing-Logger	341.0 F				
Bit Size	@		@		@
Type Fluid in Hole	DRILLING MUD/LSND				
Dens. | Visc.	9.30 LB/G	40.0 S			
pH | Fld. Loss	9.5				
Source of Sample	FLOWLINE				
Rm @ Meas. Temp.	1.480 OHMM @ 83.0 DEGF		@		
Rmf @ Meas. Temp.	1.220 OHMM @ 83.0 DEGF		@		
Rmc @ Meas. Temp.	1.860 OHMM @ 83.0 DEGF		@		
Source: Rmf | Rmc	FLOWLINE	MUD TESTER			
Rm @ BHT	1.138 OHMM @ 110. DEGF		@		
TIME Circulation Ended	9-9-97 12:30				
TIME Logger on Bottom	SEE LOG				
Max. Rec. Temp.	110. DEGF				
Equip. | Location	8303	BAKERSFIELD			
Recorded By	GREG PERRY				
Witnessed By	MR MEYER/MR. THOMAS				

The well name, location and borehole reference data were furnished by the customer

All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretations made by any of our officers, agents or employees. These interpretations are also subject to Clause 4 of our General Terms and Conditions as set out in our current Price Schedule

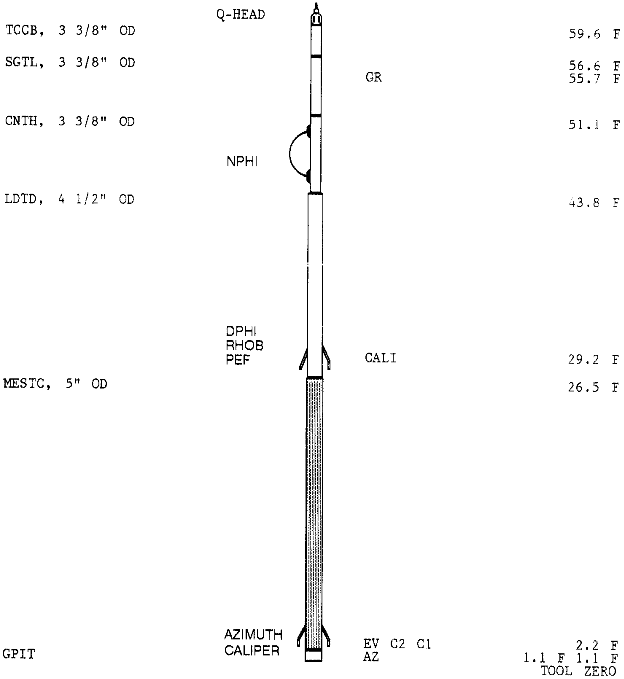
Run No.	TWO	
Service Order No.	1024934	
Drilling Fluid Level	0.0 F	
Salinity		
Rmf @ BHT	.938 OHMM @ 110. DEGF	@
Rmc @ BHT	1.431 OHMM @ 110. DEGF	@
Logging Speed	1800.0 F/HR	
EQUIPMENT DATA		
Tool Number 1	FMS	
Tool Number 2	DRS 4768	
Tool Number 3	NSCE 2979	
Tool Number 4	CNCHA 1345	
Tool Number 5	SGCSA 483	
Tool Number 6	TCCB 1289	
Tool Number 7	TCM 353	
Tool Number 8		
Tool Number 9		
Tool Number 10		
Tool Number 11		
Tool Number 12		

REMARKS:

MDEN=2.65 GR/CC
MATRIX=SAND

CREW: DAN LEE.
THANKS FOR CHOOSING SCHLUMBERGER

LOGGING TOOL STRING SKETCH



TOTAL TOOL STRING LENGTH IS 61.6 F.
TOTAL TOOL STRING WEIGHT IS 1115. LB IN AIR.

MAIN PASS

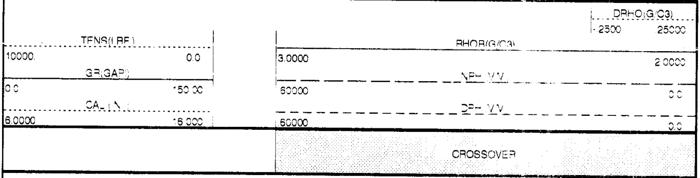
FILES SPLICED	SPLICE DEPTH
21 TO 22	919.0 F

ACCUMULATED INTEGRATION VALUES SUMMARY:

```
Integrated Hole Volume:   1236.82 F3    FROM 2336.00 F    TO 323.000 F
Integrated Cement Volume: 910.015 F3    FROM 2336.00 F    TO 323.000 F
  (ASSUMING 5.50000 IN   O.D. CASING)
```

EVENT MARK SUMMARY:

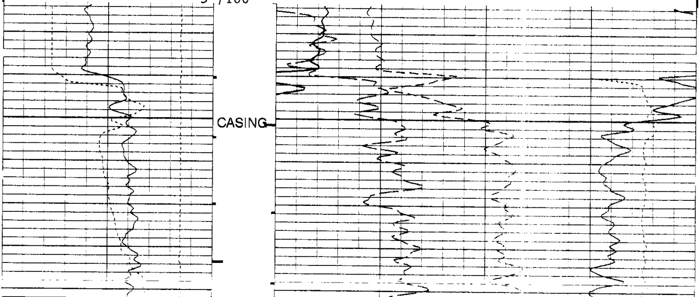
OUTPUT	INTERVAL BETWEEN PIPS	DEPTH TRACK EDGE
Integrated Hole Volume	10.0000 F3	LEFT EDGE
Integrated Cement Volume	10.0000 F3	RIGHT EDGE

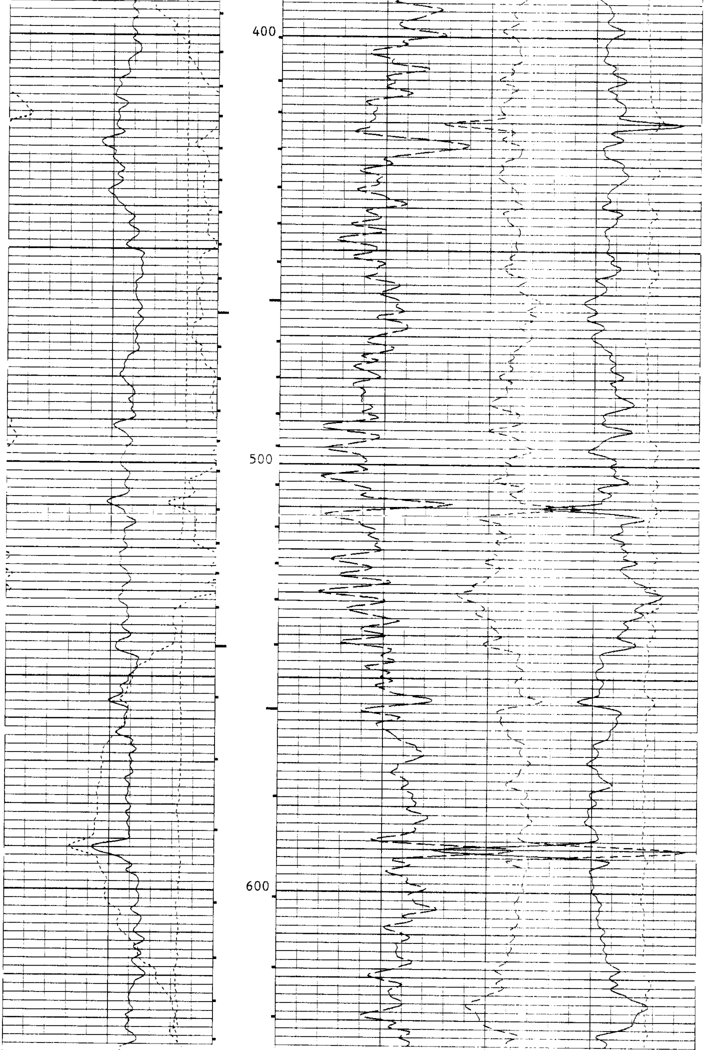


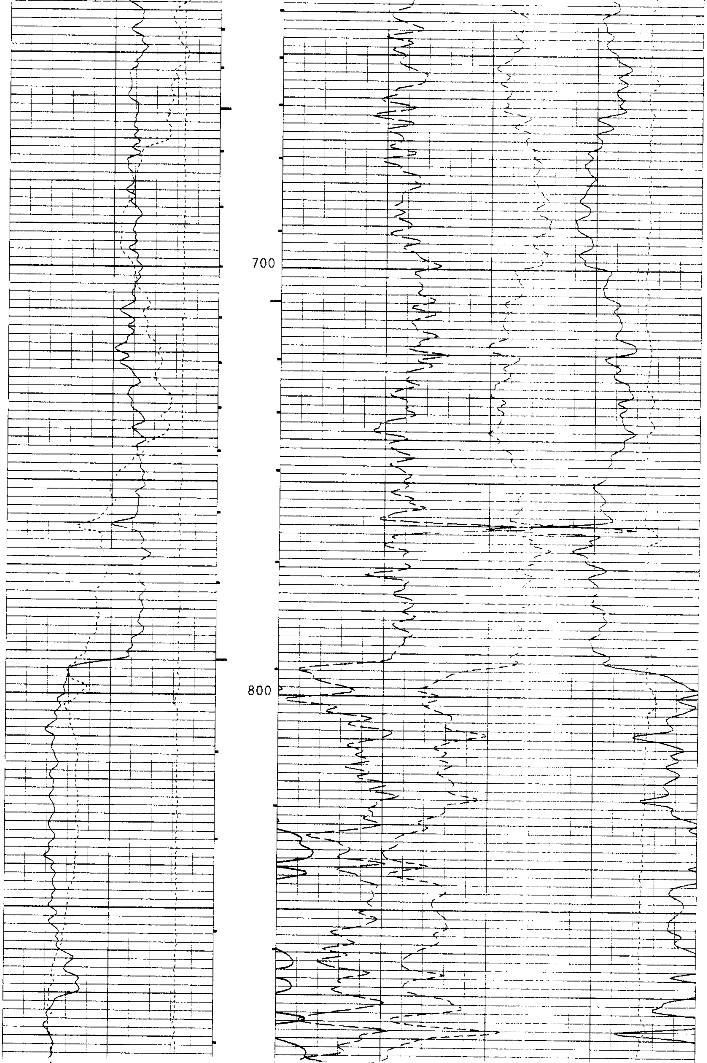
CP 44.2 FILE 24 10-SEP-1997 01:21

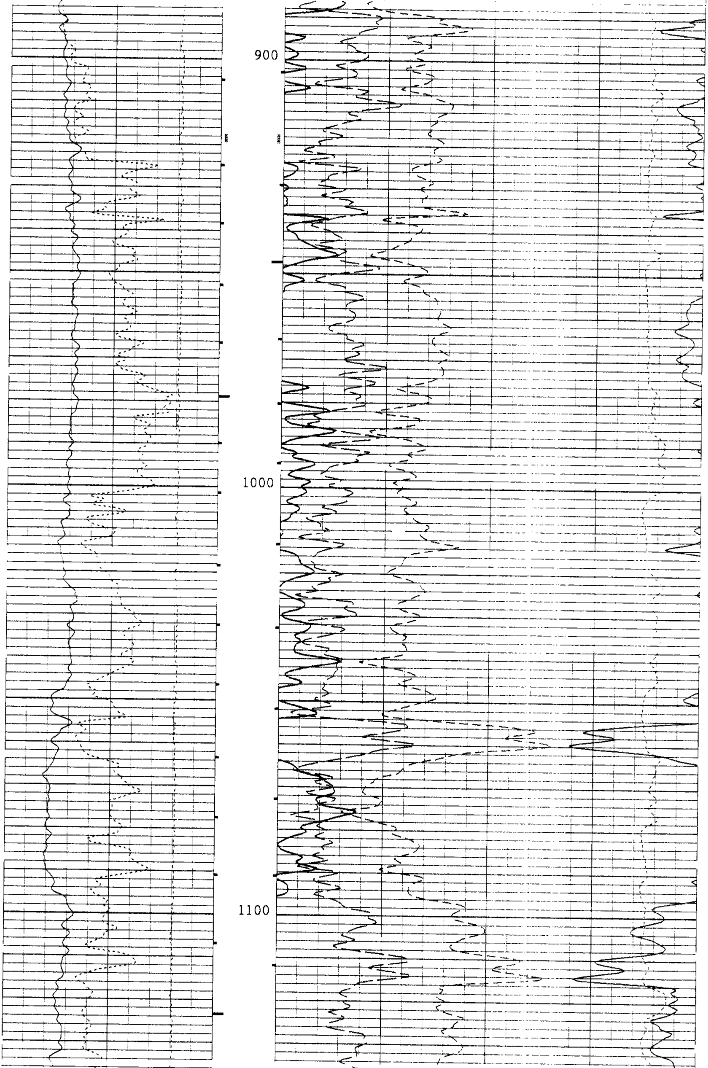
INPUT FILE(S) CREATION DATE
22 10-SEP-1997 00:48

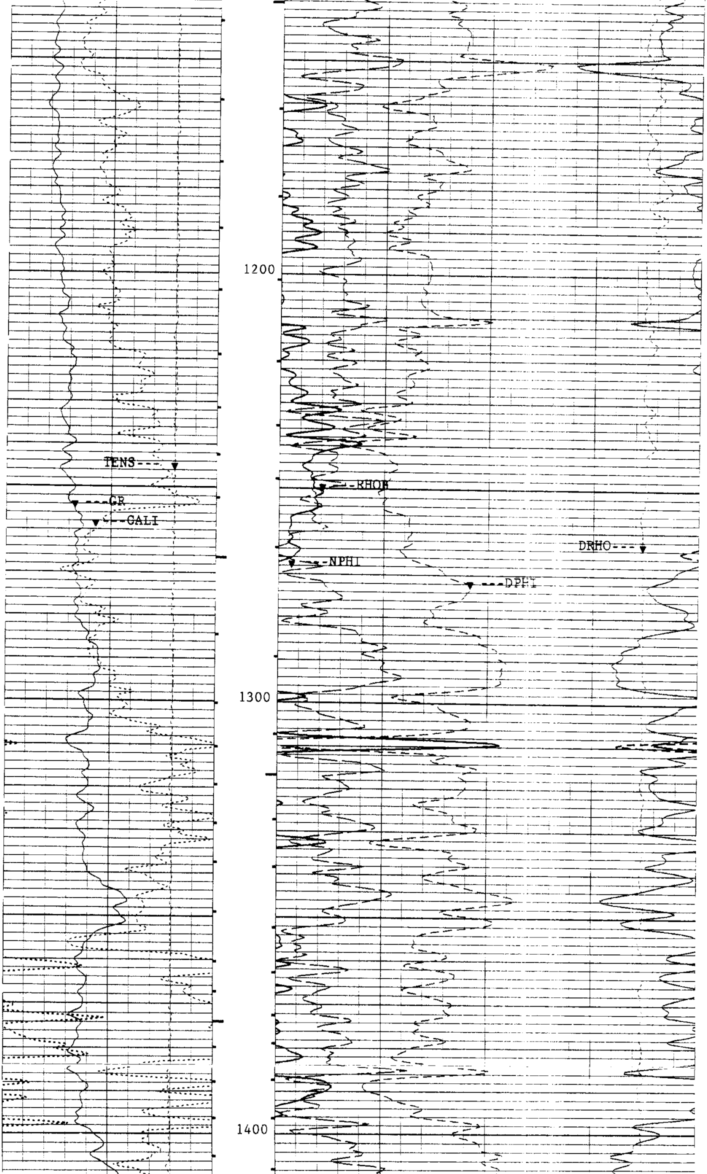
5"/100'

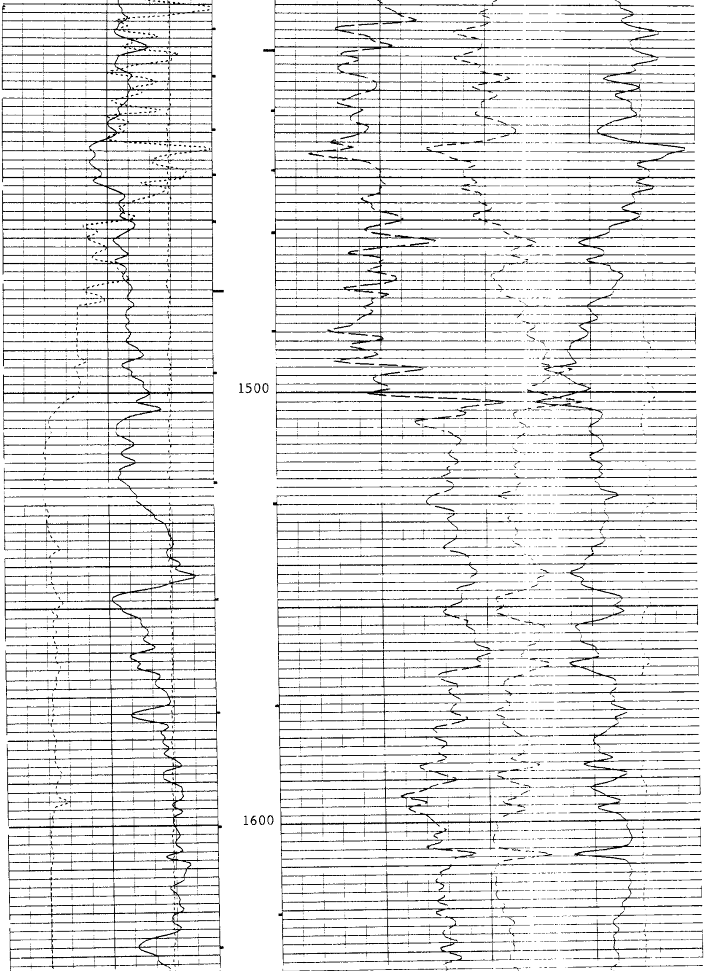


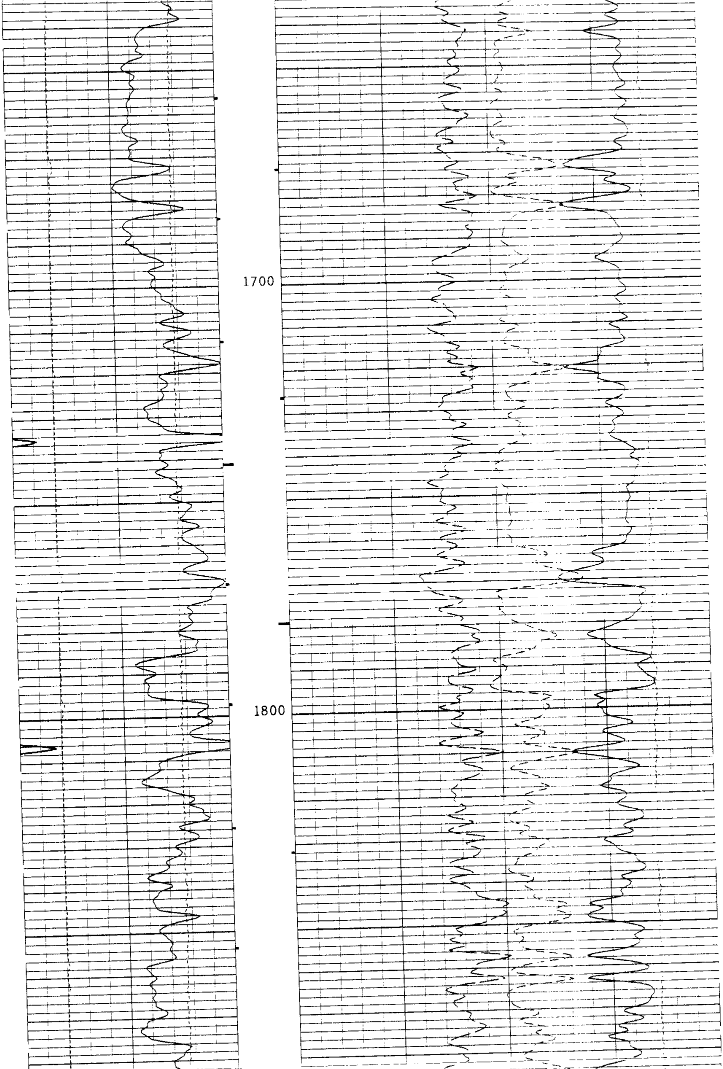


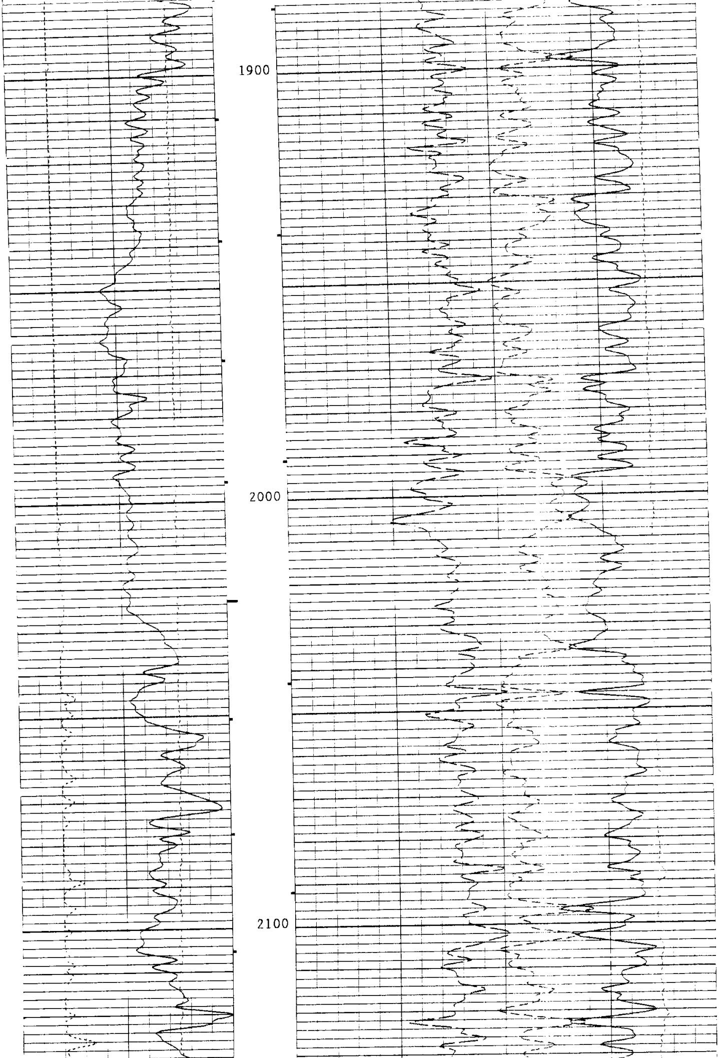


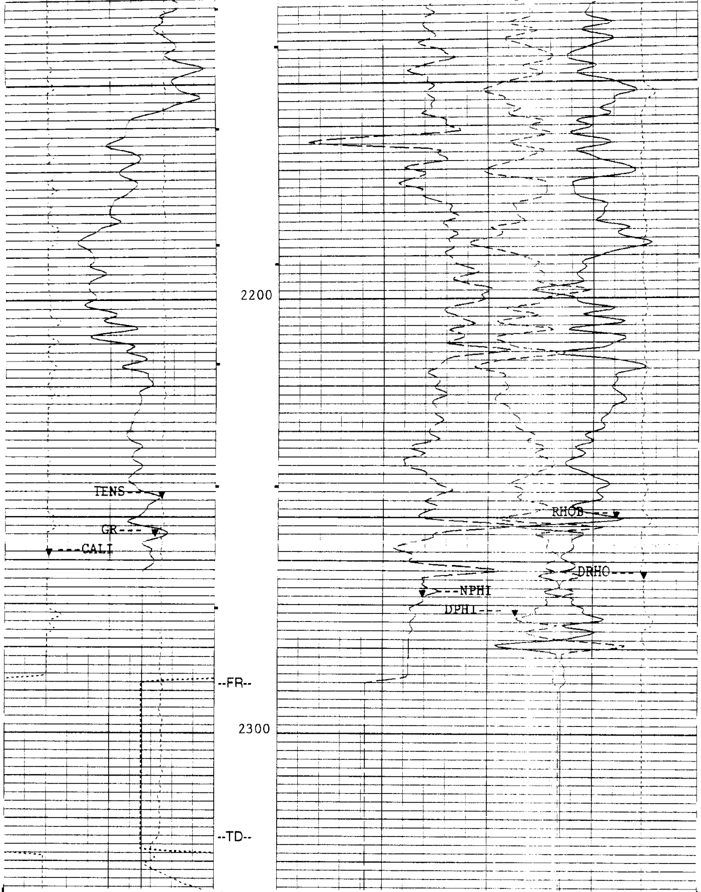












5"/100'

CP 44.2   FILE 24   10-SEP-1997 01:03

INPUT FILE(S)   CREATION DATE
21   09-SEP-1997 23:04

CROSSCVER

DRHO(G/C3)
-.2500 25000

TENS(LBF)
10000. 0.0
GR(GAPI)
0.0 150.00
CALI(IN.)
6.0000 16.000

RHOB(G/C3)
3.0000 2.0000
NPHI(V/V)
.60000 0.0
DPHI(V/V)
.60000 0.0

SENSOR MEASURE POINT TO TOOL ZERO

LDTD	2.7	FEET	SGTL	29.2	FEET
CNTH	20.7	FEET	DTT	-2.9	FEET

PARAMETERS

NAME	VALUE	UNIT	NAME	VALUE	UNIT
PP	NORM		DO	0.0	F
WMUD	9.30000	LB/G	NCJT	GSRY	
DHC	BS		BFM	LIQU	
NPDC	0		HSCO	YES	
SOCO	NO		MCCO	NO	
BSCO	NO		FSCO	NO	
MWCO	NO		PTCO	NO	
CCCO	NO		SDAT	SOCN	
MCOR	NATU		SOCN	.500000	IN
FSAL	-50000.0	PPM	ANGL	0.0	DEG
GGRD	.0100000	DF/F	BHFL	WATE	
MDEN	2.65000	G/C3	FD	1.00000	G/C3
DPPM	STAN		MATR	SAND	
HC	CALI		FCD	5.50000	IN
TDL	2324.00	F	MRT	110.000	DEGF
DFD	9.30000	LB/G	RMFS	1.22000	OHMM
RMS	1.48000	OHMM	MST	83.0000	DEGF
MFST	83.0000	DEGF	BS	7.87500	IN
BHS	OPEN				

REPEAT SECTION

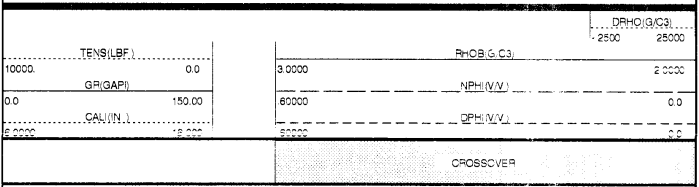
SPEED CORRECTION NOT APPLIED

ACCUMULATED INTEGRATION VALUES SUMMARY:

Integrated Hole Volume: 95.4148 F3 FROM 2328.50 F TO 2100.50 F
Integrated Cement Volume: 57.7975 F3 FROM 2328.50 F TO 2100.50 F
(ASSUMING 5.50000 IN O.D. CASING)

EVENT MARK SUMMARY:

OUTPUT	INTERVAL BETWEEN PIPS	DEPTH TRACK EDGE
Integrated Hole Volume	10.0000 F3	LEFT EDGE
Integrated Cement Volume	10.0000 F3	RIGHT EDGE

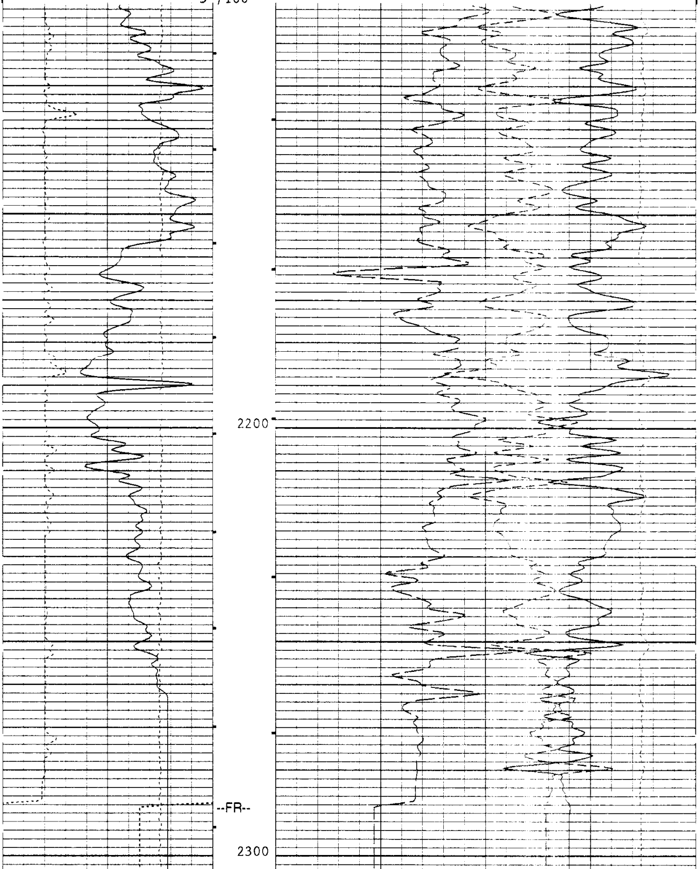

DRHO(G/C3)
-.2500
25000
TENS(LBF)
10000.
0.0
GR(GAPI)
0.0
150.00
CALI(IN.)
6.0000
16.000
RHOB(G/C3)
3.0000
2.0000
NPHI(V/V)
.60000
0.0
DPHI(V/V)
.60000
0.0
CROSSOVER

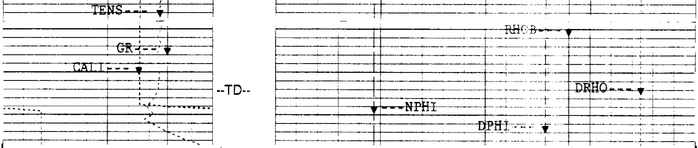
CP 44.2 FILE 20 09-SEP-1997 23:04

INPUT FILE(S) 13

CREATION DATE 09-SEP-1997 20:30

5"/100'





5"/100'

CP 44.2 FILE 20 09-SEP-1997 22:50

INPUT FILE(S) 13
CREATION DATE 09-SEP-1997 20:30

CROSSOVER

DRHO(G/C3)
-.2500 .25000

TENS(LBF)		RHOB(G/C3)	
10000.	0.0	3.0000	2.0000
GR(GAPI)		NPHI(V/V)	
0.0	150.00	.60000	0.0
CALI(IN)		DPHI(V/V)	
6.0000	16.000	.60000	0.0

SENSOR MEASURE POINT TO TOOL ZERO

LDTD	29.2	FEET	SGTL	55.7	FEET
MESTC	2.2	FEET	DTT	-2.9	FEET
CNTH	47.2	FEET	GPIT	1.1	FEET

PARAMETERS

NAME	VALUE	UNIT	NAME	VALUE	UNIT
PADT	.500000	DEG	PP	NORM	
DO	-16.5000	F	WMUD	9.30000	LB/G
NCJT	GSRY		DHC	BS	
BFM	LIQU		NPDC	0	
HSCO	YES		SOCO	NO	
MCCO	NO		BSCO	NO	
FSCO	NO		MWCO	NO	
PTCO	NO		CCCO	NO	
SDAT	SOCN		MCOR	NATU	
SOCN	.500000	IN	FSAL	-50000.0	PPM
ANGL	0.0	DEG	GGRD	.0100000	DF/F
BHFL	WATE		MDEN	2.65000	G/C3
FD	1.00000	G/C3	FCSR	0.1"	
AFMO	HAMM		ICMO	AUTO	
MDEC	19.5000	DEG	GLM	DIPM	
ICSD	-50000.0	F	RBS	AUTO	
PTYP	MEC		MLM	1800	
SOFF	-1.00000	IN	CSR	.6"	
ODFO	LIS		XMOD	AUTO	
XGAI	2		XOFF	0	
DPPM	STAN		MATR	SAND	
HC	CALI		FCD	5.50000	IN
SPCR	DISA		DSCA	40	DEG
SBUT	8		INT	4.00000	F
STEP	2.00000	F	SPAN	4	
SANG	35.0000		DPAD	AUTO	
DMAX	90	DEG	ELRA	.500000	IN
SDFA	.900000		HQUA	14	
LQUA	6		STDI	0.0	DEG
STDA	0.0	DEG	CSBL	2	
TDL	2324.00	F	MRT	110.000	DEGF
DFD	9.30000	LB/G	RMFS	1.22000	OHMM
RMS	1.48000	OHMM	MST	83.0000	DEGF
MFST	83.0000	DEGF	BS	7.87500	IN
BHS	OPEN				

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               BEFORE SURVEY CALIBRATION Summary

  Performed:    29-AUG-1997 10:13
  Program File: TOH    (Version    44.2    95/07/25  95/07/25)


CNTH            Detector Calibration Summary

      Neutron Cartridge Number    : 1345
      Neutron Source Number       : 2576
      Thermal Housing Number      : 4431
      Alpha detectors             : Yes

          Input      Plus     Shop    Gain     Shop      Before     Tol.
                 Reference    Tank              Bkg        Bkg       Bkg
                   Counts    Counts           Counts     Counts    Counts

          CNTC    6031.00   5998.75   1.005    24.754    25.226     3.713
          CFTC    2793.00   2640.31   1.058    30.245    32.018     4.537

          Ratio     2.159     2.272


Before Survey Calibrations done: 29-AUG-1997 10:00


SGIL            Detector Calibration Summary

             MEASURED
           BKGD    JIG          CALIBRATED          UNITS
    GR      35     192             165              GAPI

Back: 29-AUG-1997 10:04   Jig: 29-AUG-1997 10:08  Comp: 29-AUG-1997 10:08


LDTD            Detector Calibration Summary

        Density Resistivity Sonde Number    :    4768
        Nuclear Services Cartridge Number   :    2979
        Powered Detector Housing Number     :    1989
        Powered Gamma-Gamma Detector Number :    1989
        LDT Logging Source Number           :    1925
        LDT Calibration Mode                :    WATE

                 Measured      Shop  Values
                   Bkgd        Al+Fe    Al      Units
           LL      19.7         91.5  100.0      CPS
           LU      75.7        137.2  150.3      CPS
           LS      57.5        160.1  175.1      CPS
         LITH       5.5         42.3   66.5      CPS
          SS1      18.1        174.5  191.0      CPS
          SS2      12.4        250.6  271.0      CPS

            HV Settings          Detector Resolutions
          HV LS:  1230.4 V           LS:  8.6 %
          HV SS:  1205.9 V           SS:  8.7 %

Wellsite Calibration done: 29-AUG-1997 10:03


LDTD            Caliper Calibration Summary

             MEASURED                      CALIBRATED
           Small   Large                Small     Large       UNITS
  CALI     6.40   10.72                 7.90     12.00         IN

Small: 29-AUG-1997 10:09 Large: 29-AUG-1997 10:10 Comp: 29-AUG-1997 10:10
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                 SHOP Summary


  Performed:     12-AUG-1997 11:13
  Program File: CCSHOP (Version    44.2    95/07/25  95/07/25)


CNTH             Detector Calibration Summary

      CNC #                  : 4431
      Neutron Source #       : 2576
      Thermal Housing #      : 4431
      Alpha detectors        : Yes

          Input     Plus      Shop    Gain      Shop
                 Reference    Tank               Bkg
                   Counts    Counts             Counts

          CNTC    6031.00   5998.75   1.005     24.754
          CFTC    2793.00   2640.31   1.058     30.245

          RATIO     2.159     2.272

          Shop Counts temperature and housing size corrected

Shop Tank Calibration done: 12-AUG-1997 11:13

   CP 44.2           FILE    0      12-AUG-1997 11:13



                 SHOP Summary


  Performed:     12-AUG-1997 14:06
  Program File: CCSHOP (Version    44.2    95/07/25  95/07/25)


LDTD             Detector Calibration Summary

        Density Resistivity Sonde Number     :  4768
        Nuclear Service Cartridge Number     :  2979
        Powered Detector Housing Number      :  1989
        Powered Gamma-Gamma Detector Number :  1989
        LDT Logging Source Number            :  1925
        LDT Calibration Mode                 :  WATE

                       Master Calibrated
                      Bkgd    Al+Fe    Al   Units
                LL    19.9     91.5   100.0   CPS
                LU    76.0    137.2   150.3   CPS
                LS    58.0    160.1   175.1   CPS
              LITH     5.6     42.3    66.5   CPS
               SS1    18.2    174.5   191.0   CPS
               SS2    12.4    250.6   271.1   CPS

          HV Settings            Detector Resolutions
        HV LS:  1230.1 V              LS:  8.7 %
        HV SS:  1201.1 V              SS:  8.7 %

                   Spectrum Quality Ratios
          Computed Value         Nominal Value   Tolerance
   QRLS          .666                 0.65        +/- 0.05
   QRSS          .704                 0.72        +/- 0.10
   QRLI          .380                 0.39        +/- 0.06
   QLIR         1.436                 1.39        +/- 0.06
   QR           1.000                 1.00        +/- 0.02

Shop Block Calibration done: 12-AUG-1997 13:57

   CP 44.2           FILE    0      12-AUG-1997 14:06
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COMPANY	NORTHWEST NATURAL GAS			**SCHL.**	**FR**	2300.0 F
				SCHL.	**TD**	2324.0 F
WELL	OM 12-22-65			**DRLR.**	**TD**	2337.0 F
				Elev:	**KB**	565.0 F
FIELD	MIST GAS FIELD				**DF**	
COUNTY	COLUMBIA	**STATE**	OREGON		**GL**	556.0 F

Schlumberger

FORMATION DENSITY
COMPENSATED NEUTRON
GAMMA RAY 5"