5 inch

Schlumberger

SIMULTANEOUS
COMPENSATED NEUTRON-LITHO-DENSITY

COUNTY	COLUMBIA
FIELD	MIST
LOCATION	899'W AND 1537'N
WELL	"STEELHEAD" #43-33-75
COMPANY	NAHAMA & WEAGANT ENERGY CO

COMPANY NAHAMA & WEAGANT ENERGY CO.

Columbia Co

WELL ~~"STEELHEAD"~~ #43 33 75

FIELD MIST

COUNTY COLUMBIA **STATE** OREGON

LOCATION 899'W AND 1537'N
FROM SE CORNER

Other Services:
DIL
SLT
LDT
CNL
SHDT

API SERIAL NO.	SECT.	TWP.	RANGE
36 009-00295	33	7N	5W

Permanent Datum	GL	Elev.	1041.0 F	Elev.: KB 1051.0 F
Log Measured From	KB	10.0 F	above Perm. Datum	DF
Drilling Measured From	KB			GL 1041.0 F

Date	17-JUN 1992				
Run No.	ONE				
Depth Driller	2548.0 F				
Depth Logger (Schl.)	2547.0 F				
Btm. Log Interval	2545.0 F				
Top Log Interval	1900.0 F				
Casing-Driller	9 5/8" @ 520.0 F		@		@
Casing-Logger	520.0 F				
Bit Size	8 1/2" @ 2548.0 F		@		@
Type Fluid in Hole	POLYMER/GEL				
Dens. | Visc.	9.50 LB/G	410 S			
pH | Fld. Loss	8.5	6.0 C3			
Source of Sample	FLOWLINE				
Rm @ Meas. Temp.	2.970 OHMM @ 76.0 DEGF		@		
Rmf @ Meas. Temp.	4.550 OHMM @ 76.0 DEGF		@		
Rmc @ Meas. Temp.	2.660 OHMM @ 76.0 DEGF		@		
Source: Rmf | Rmc	MEASURED	MEASURED			
Rm @ BHT	2.595 OHMM @ 88.0 DEGF		@		
TIME Circulation Ended	15:00 6/17				
TIME Logger on Bottom	20:14 6/17				
Max. Rec. Temp.	88.0 DEGF				
Equip. | Location	8504	SACRAMENTO			
Recorded By	SCOTT PILCH				
Witnessed By	JEFF VAUGHAN,BOB PINOTTI				

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

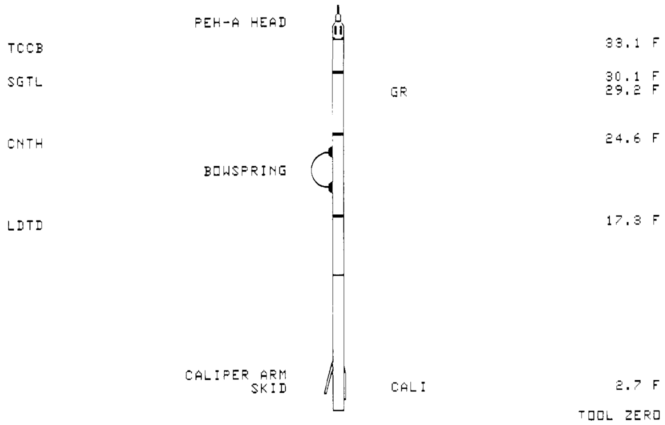
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation 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.	ONE			
Service Order No.	595051			
Magnetic Declination	20.0 DEG			
Drilling Fluid Level	5.0 F			
Salinity	650.0 PPM			
Rmf @ BHT	3.975 OHMM	@	88.0 DEGF	@
Rmo @ BHT	2.324 OHMM	@	88.0 DEGF	@
Logging Speed	3600.0 F/HR			
EQUIPMENT DATA				
Tool Number 1	DRS-B 3756			
Tool Number 2	NSC-E 2939			
Tool Number 3	CNC-HA 2524			
Tool Number 4	SGC-SA 680			
Tool Number 5	TCC-B 1414			
Tool Number 6	TCM-AB 1515			
Tool Number 7				
Tool Number 8				
Tool Number 9				
Tool Number 10				
Tool Number 11				
Tool Number 12				

REMARKS:

MAXIMUM HOLE DEVIATION IS 13.6 DEGREES AT 1778 FT.

LOGGING TOOL STRING SKETCH



TOTAL TOOL STRING LENGTH IS 36.1 F.
TOTAL TOOL STRING WEIGHT IS 658. LB IN AIR.

MAIN LOG

ACCUMULATED INTEGRATION VALUES SUMMARY:

```
Integrated Hole Volume:    269.155 F3    FROM 2548.00 F     TO 1900.00 F
Integrated Cement Volume:  197.587 F3    FROM 2548.00 F     TO 1900.00 F
  (ASSUMING 4.50000 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

TENS(LBF)
20500. 500.00

DRHO(G/C3)
-.2500 .2500

CALI(IN)
6.0000 16.000

NPOR(V/V)
.60000 0.0

GR(GAPI)
0.0 150.00

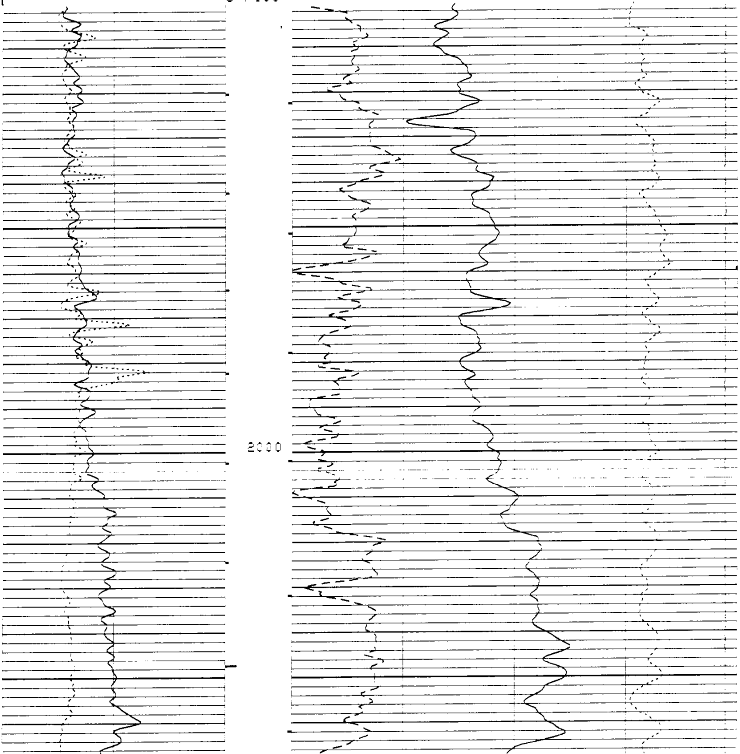
DPHI(V/V)
.60000 0.0

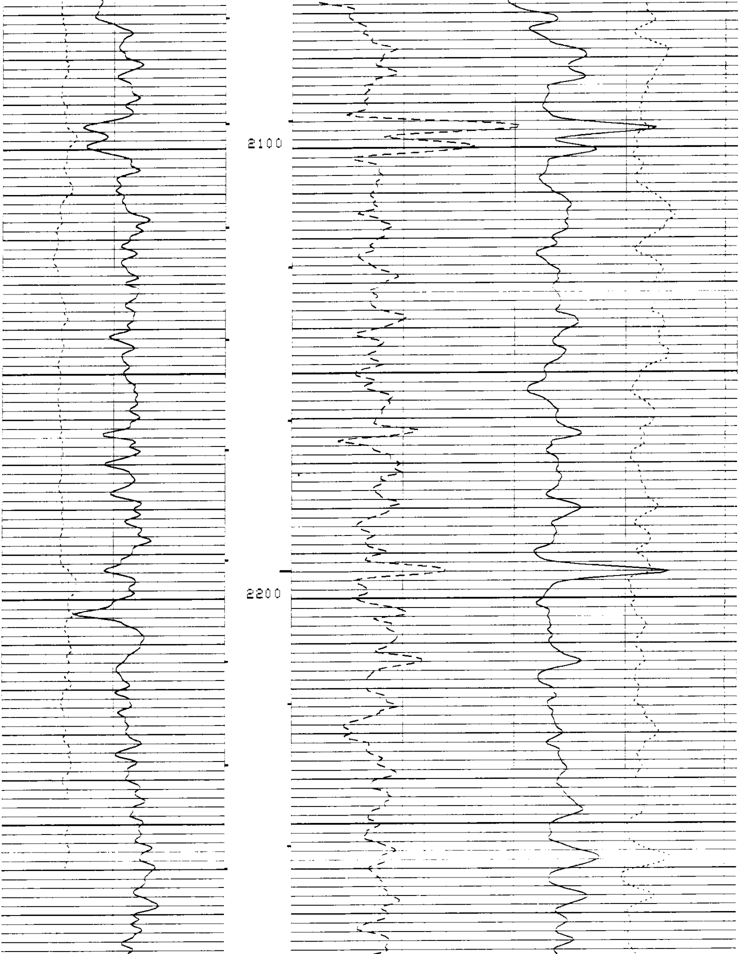
CROSSOVER

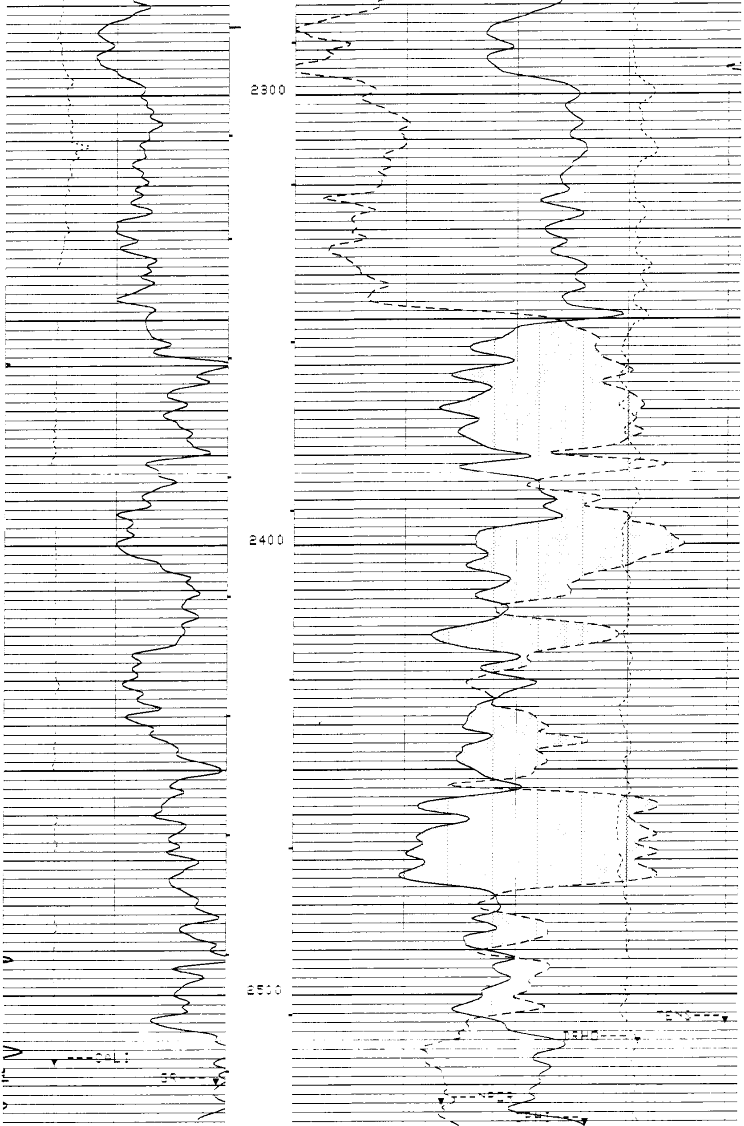
CP 32.6 FILE 25 17-JUN-1992 21:47

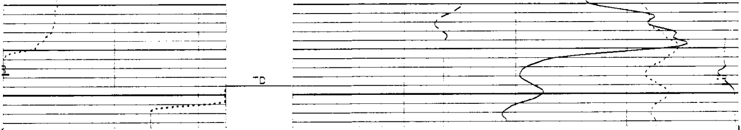
INPUT FILE(S) CREATION DATE
18 17-JUN-1992 20:11

5"/100'









5"/100'

CP 32.6   FILE 25   17-JUN-1992 21:42

INPUT FILE(S)   CREATION DATE
18   17-JUN-1992 20:11

CROSSOVER

TENS(LBF)
20500   500.00

DRHO(G/C3)
-.2500   .25000

CALI(IN)
6.0000   16.000

NPOR(V/V)
.60000   0.0

GR(GAPI)
0.0   150.00

DPHI(V/V)
.60000   0.0

SENSOR MEASURE POINT TO TOOL ZERO

CFTC	20.2	FEET	GR	29.2	FEET
LITH	2.6	FEET	CNTC	19.7	FEET
LS	2.6	FEET	LL	2.6	FEET
PARI	2.1	FEET	LU	2.6	FEET
SS2	2.1	FEET	SS1	2.1	FEET
TENS	0.0	FEET	CALI	2.7	FEET
TNRA	20.7	FEET			

PARAMETERS

PARAMETER	VALUE	UNIT
PP - Playback Processing	RECO	
DO - Depth Offset for Logical Unit LI1	0.0	F
WMUD - Weight of Mud	9.50000	LB/G
TD - Total Depth	2548.00	F
FCD - Future Casing Diameter	4.50000	IN
DHC - Density Hole Correction	BS	
BFM - Borehole Fill Medium	LIQU	
MDEN - Matrix Density	2.65000	G/C3
FD - Fluid Density	1.00000	G/C3
DPPM - Density/Porosity Processing Mode	HISP	
MATR - Matrix	SAND	
HC - Hole Correction Origin	CALI	
NPDC - Neutron Alpha Process Depth Constant	2	
HSCO - Hole Size Correction Option	YES	
SOCO - Stand Off Correction Option	NO	
MCCO - Mud Cake Correction Option	NO	
BSCO - Borehole Salinity Correction Option	NO	
FSCO - Formation Salinity Correction Option	NO	
MWCO - Mud Weight Correction Option	NO	
PTCO - Pressure Temperature Correction Option	NO	
CCCO - Casing & Cement Correction Option for Thick	NO	
SDAT - Standoff Data Source	[illegible]	

MCOR	- Mud Correction	NATU	
SOCN	- Stand Off for Compensated Neutron	.500000	IN
FSAL	- Formation Salinity	-50000.0	PPM
ANGL	- Angle of Well	0.0	DEG
GGRD	- Geothermal Gradient	.0100000	DF/F
BHFL	- Borehole Fluid Type	WATE	
CNPS	- Compensated Neutron Porosity Selector	NPHI	
CDSE	- Corrected Density Selector	RHOB	
NCJT	- NGT Calibration Jig Type	DSR	
GTSE	- Generalized Temperature Selection	TEMP	
SHT	- Surface Hole Temperature	60.0000	DEGF
BHT	- Bottom Hole Temperature	88.0000	DEGF
TDL	- Total Depth - Logger	2547.00	F
MRT	- Maximum Recorded Temperature	88.0000	DEGF
BSAL	- Borehole Salinity	650.000	PPM
DFD	- Drilling Fluid Density	9.50000	LB/G
RMFS	- Resistivity of Mud Filtrate Sample	4.55000	OHMM
MFST	- Mud Filtrate Sample Temperature	76.0000	DEGF
BS	- Bit Size	8.50000	IN
BHS	- BoreHole Status (Open or Cased)	OPEN	

REPEAT SECTION

ACCUMULATED INTEGRATION VALUES SUMMARY:

Integrated Hole Volume:	79.9332 F3	FROM 2548.00 F	TO 2331.00 F
Integrated Cement Volume:	55.9667 F3	FROM 2548.00 F	TO 2331.00 F

(ASSUMING 4.50000 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

TENS(LBF)
2050C. 500.CC

DRHC(G/C3)
-.2500 .25CCC

CALI(IN) 6.CCOC 16.COC

NPOR(V/V) .6CCCC C.C

GR(GAPI) 0.0 150.CC

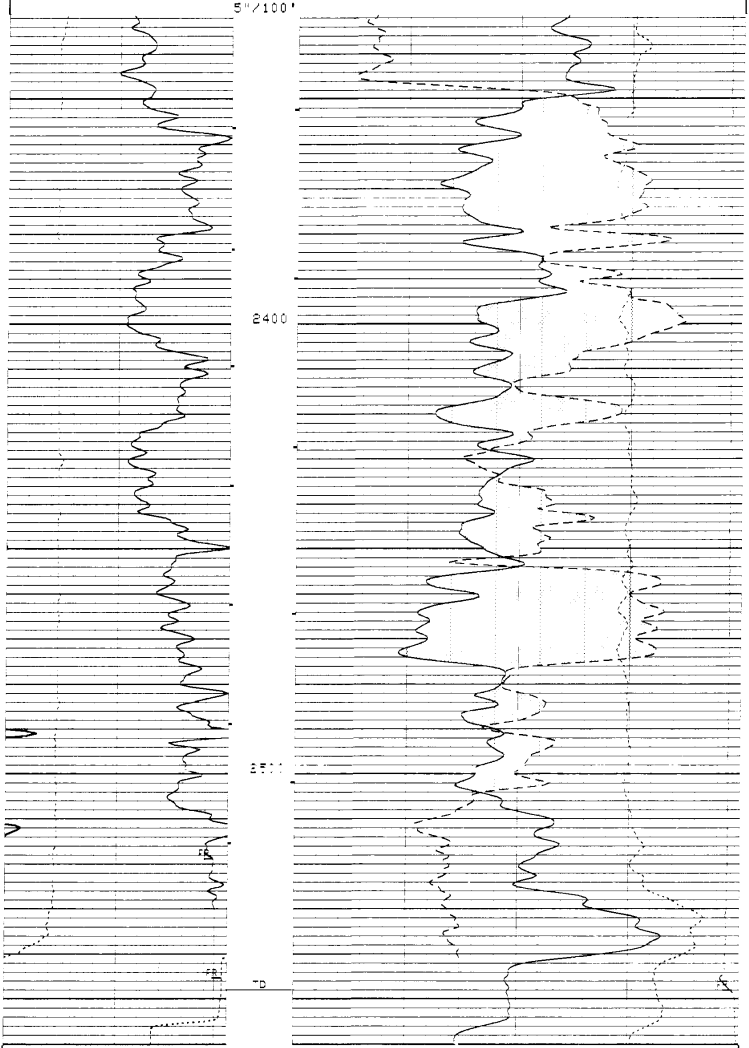
DPHI(V/V) .6C000 C.C

CROSSOVER

CP 32.6 FILE 24 17-JUN-1992 21:40

INPUT FILE(S) 17

CREATION DATE 17-JUN-1992 19:56



5"/100'

CP 32.6 FILE 24 17-JUN-1992 21:38

INPUT FILE(S) 17

CREATION DATE 17-JUN-1992 19:56

```
                                                  CROSSOVER

                                                        TENS(LBF )
                                              20500                          500.00
                                                        DRHO(G/C3)
                                              -.2500                         25000
         CALI(IN)                                      NPOR(V/V)
6.0000                16.000      .60000                                       0.0
         GR(GAPI)                                      DPHI(V/V )
0.0                   150.00      .60000                                       0.0
```

```
                    SENSOR MEASURE POINT TO TOOL ZERO

          DPTC 21.2  FEET                         GR    29.2  FEET
          LITH  2.6  FEET                         CNTC  19.7  FEET
          LS    2.6  FEET                         LL     2.6  FEET
          PARI  2.1  FEET                         LU     2.6  FEET
          SS2   2.1  FEET                         SS1    2.1  FEET
          TENS  0.0  FEET                         CALI   2.7  FEET
          TNRA 20.7  FEET
```

```
                                  PARAMETERS

               PARAMETER                                   VALUE        UNIT

PP   - Playback Processing                                 RECO
DO   - Depth Offset for Logical Unit LI1                   0.0          F
WMUD - Weight of Mud                                       9.50000      LB/G
TD   - Total Depth                                         2548.00      F
FCD  - Future Casing Diameter                              4.50000      IN
DHC  - Density Hole Correction                             BS
BFM  - Borehole Fill Medium                                LIQU
MDEN - Matrix Density                                      2.65000      G/C3
FD   - Fluid Density                                       1.00000      G/C3
DPPM - Density/Porosity Processing Mode                    HISP
MATR - Matrix                                              SAND
HC   - Hole Correction Origin                              CALI
NPDC - Neutron Alpha Process Depth Constant                2
HSCO - Hole Size Correction Option                         YES
SOCO - Stand Off Correction Option                         NO
MCCO - Mud Cake Correction Option                          NO
BSCO - Borehole Salinity Correction Option                 NO
FSCO - Formation Salinity Correction Option                NO
MWCO - Mud Weight Correction Option                        NO
PTCO - Pressure Temperature Correction Option              NO
CCCO - Casing & Cement Correction Option for ThickNO
SDAT - Standoff Data Source                                SOCN
MCOR - Mud Correction                                      NATU
SOCN - Stand Off for Compensated Neutron                   .500000      IN
FSAL - Formation Salinity                                  -50000.0     PPM
ANGL - Angle of Well                                       0.0          DEG
GGRD - Geothermal Gradient                                 .0100000     DF/F
BHFL - BoreHole Fluid Type                                 WATE
CNPS - Compensated Neutron Porosity Selector               NPHI
CDSE - Corrected Density Selector                          RHOB
NCJT - NGT Calibration Jig Type                            GSRY
GTSE - Generalized Temperature Selection                   TEMP
SHT  - Surface Hole Temperature                            80.0000      DEGF
BHT  - Bottom Hole Temperature                             88.0000      DEGF
TDL  - Total Depth - Logger                                2547.00      F
MRT  - Maximum Recorded Temperature                        88.0000      DEGF
BSAL - Borehole Salinity                                   650.000      PPM
DFD  - Drilling Fluid Density                              9.50000      LB/G
RMFS - Resistivity of Mud Filtrate Sample                  4.55000      OHMM
MFST - Mud Filtrate Sample Temperature                     76.0000      DEGF
BS   - Bit Size                                            8.50000      IN
BHS  - BoreHole Status (Open or Cased)                     OPEN
```

CALIBRATION SUMMARY

```
                BEFORE SURVEY CALIBRATION SUMMARY

   PERFORMED:      17-JUN-1992 21:34
   PROGRAM FILE: TDH    (VERSION    32.6     91/08/28  91/08/28)


 SGTL               DETECTOR CALIBRATION SUMMARY

            MEASURED
          BKGD    JIG           CALIBRATED           UNITS
    GR      31     194              165              GAPI

 BACK: 17-JUN-1992 19:42   JIG: 17-JUN-1992 19:48  COMP: 17-JUN-1992 19:48


 LDTD               DETECTOR CALIBRATION SUMMARY

         DENSITY RESISTIVITY SONDE NUMBER     :     3756
         NUCLEAR SERVICE CARTRIDGE NUMBER     :     2939
         POWERED DETECTOR HOUSING NUMBER      :     2942
         POWERED GAMMA-GAMMA DETECTOR NUMBER  :     2453
         LDT LOGGING SOURCE NUMBER            :     7137
         LDT CALIBRATION MODE                 :     WATE

                 MEASURED       SHOP  VALUES
                   BKGD         AL+FE    AL      UNITS
            LL     16.6          77.8   84.4       CPS
            LU     62.2         120.0  129.4       CPS
            LS     47.7         137.8  149.1       CPS
          LITH      4.7          34.3   51.5       CPS
           SS1     12.2         159.4  172.2       CPS
           SS2      8.2         232.0  248.6       CPS

            HV SETTINGS            DETECTOR RESOLUTIONS
          HV LS:  1235.1 V              LS:  8.9 %
          HV SS:  1237.9 V              SS:  8.8 %

 BKGD: 17-JUN-1992 19:42


 CNTH               DETECTOR CALIBRATION SUMMARY

       NEUTRON COMPENSATED CARTRIDGE NUMBER: 2524
       NEUTRON SOURCE SERIAL NUMBER        : 1163
       THERMAL HOUSING NUMBER              : 3290
       THERMAL CALIBRATED NEUTRON BOX      : 2124

          INPUT      PLUS       SHOP      SHOP      BEFORE     GAIN
                  REFERENCE     TANK       JIG       JIG
                    COUNTS     COUNTS    COUNTS    COUNTS

          CNTC     6031.00    6351.09   3152.44   3121.96     .950
          CFTC     2793.00    2643.64   1456.58   1480.24    1.056

          RATIO      2.159      2.402     2.164     2.109

 BACK: 17-JUN-1992 19:42   JIG: 17-JUN-1992 19:48  COMP: 17-JUN-1992 21:30


 LDTD               CALIPER CALIBRATION SUMMARY

            MEASURED                        CALIBRATED
          SMALL   LARGE                  SMALL      LARGE        UNITS
  CALI    6.87    10.88                  8.00       12.00         IN

 SMALL: 17-JUN-1992 19:35 LARGE: 17-JUN-1992 19:36 COMP: 17-JUN-1992 19:36

   CP 32.6           FILE    22       17-JUN-1992 21:34
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                  AFTER SURVEY TOOL CHECK SUMMARY


   PERFORMED:     17-JUN-1992 21:33
   PROGRAM FILE: TOH    (VERSION    32.6    91/08/23  91/08/23)


 LDTD                    TOOL  CHECK

        DENSITY RESISTIVITY SONDE NUMBER     :     3756
        NUCLEAR SERVICE CARTRIDGE NUMBER     :     2939
        POWERED DETECTOR HOUSING NUMBER      :     2942
        POWERED GAMMA-GAMMA DETECTOR NUMBER  :     2453
        LDT LOGGING SOURCE NUMBER            :     7137
        LDT CALIBRATION MODE                 :     LATE

             MEASURED BACKGROUND                   TOLERANCE ON
             BEFORE           AFTER        UNITS    BEFORE-AFTER
      LL        16.6           16.5         CPS       +/- 1.0
      LU        62.2           61.5         CPS       +/- 1.0
      LS        47.7           47.3         CPS       +/- 1.0
    LITH         4.7            4.6         CPS       +/- 0.3
     SS1        12.2           12.1         CPS       +/- 0.5
     SS2         8.2            8.1         CPS       +/- 0.5

            HV SETTINGS           DETECTOR RESOLUTIONS
          HV LS:  1235.1 V              LS:  8.8 %
          HV SS:  1237.9 V              SS:  9.4 %

 BKGD                            BKGD
   BEFORE SURVEY: 17-JUN-1992 19:42   AFTER SURVEY: 17-JUN-1992 20:50


 CNTH                    TOOL  CHECK


          INPUT    BEFORE JIG   AFTER JIG


          CNTC       3121.96     3167.77

          CFTC       1480.24     1461.32


 CHANGE IN THERMAL POROSITY AT 20 PU IS    .945  PU


 BEFORE SURVEY:            BACK: 17-JUN-1992 19:42   JIG: 17-JUN-1992 19:48
 AFTER SURVEY CHECK:       BACK: 17-JUN-1992 20:50   JIG: 17-JUN-1992 21:14

    OP 32.6            FILE  22        17-JUN-1992 21:33
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                 SHOP SUMMARY


   PERFORMED:     28-MAY-1992 10:35
   PROGRAM FILE: CCSHOP (VERSION    32.6    91/08/23  91/08/23)


 CNTH            DETECTOR CALIBRATION SUMMARY

      NEUTRON COMPENSATED CARTRIDGE NUMBER: 2545
      NEUTRON SOURCE SERIAL NUMBER        : 1163
      THERMAL HOUSING NUMBER              : 3290
      THERMAL CALIBRATED NEUTRON BOX      : 2124
```

```
         INPUT      PLUS       SHOP       SHOP      GAIN
                 REFERENCE     TANK        JIG
                   COUNTS     COUNTS     COUNTS

         CNTC     6031.00    6351.09    3152.44     .950
         CFTC     2793.00    2643.64    1456.58    1.056

         RATIO      2.159      2.402      2.164

         SHOP COUNTS TEMPERATURE AND HOUSING SIZE CORRECTED

  BKGD: 28-MAY-1992 10:15 TANK: 28-MAY-1992 10:23  COMP: 28-MAY-1992 10:24

     CP 32.6            FILE    4       28-MAY-1992 10:35



                  SHOP SUMMARY


    PERFORMED:     28-MAY-1992 09:34
    PROGRAM FILE: CCSHOP (VERSION    32.6    91/08/23  91/08/23)


  LDTD            DETECTOR CALIBRATION SUMMARY

         DENSITY RESISTIVITY SONDE NUMBER     :  3756
         NUCLEAR SERVICE CARTRIDGE NUMBER     :  2939
         POWERED DETECTOR HOUSING NUMBER      :  2942
         POWERED GAMMA-GAMMA DETECTOR NUMBER :  2453
         LDT LOGGING SOURCE NUMBER            :  7137
         LDT CALIBRATION MODE                 :  WATE

                      MASTER CALIBRATED
                     BKGD    AL+FE      AL   UNITS
                LL   16.6     77.8     84.4   CPS
                LU   61.8    120.0    129.4   CPS
                LS   47.5    137.8    149.1   CPS
              LITH    4.7     34.3     51.5   CPS
               SS1   12.2    159.4    172.2   CPS
               SS2    8.1    232.0    248.6   CPS

            HV SETTINGS           DETECTOR RESOLUTIONS
         HV LS:  1233.5 V              LS:  8.8 %
         HV SS:  1230.2 V              SS:  8.7 %

                   SPECTRUM QUALITY RATIOS
           COMPUTED VALUE         NOMINAL VALUE    TOLERANCE
     QRLS         .652               0.65          +/- 0.05
     QRSS         .692               0.72          +/- 0.10
     QRLI         .345               0.35          +/- 0.06
     QLIR        1.389               1.35          +/- 0.06
     QR          1.002               1.00          +/- 0.02

  BKGD: 28-MAY-1992 09:01   AL: 28-MAY-1992 09:27  AL+FE: 28-MAY-1992 09:33

     CP 32.6            FILE    2       28-MAY-1992 09:34
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COMPANY	NAHAMA & WEAGANT ENERGY CO.			SCHL. FR	2546.0 F
				SCHL. TD	2547.0 F
WELL	"STEELHEAD" #43-33-75			DRLR. TD	2548.0 F
FIELD	MIST			Elev: KB	1051.0 F
				DF	
COUNTY	COLUMBIA	**STATE**	OREGON	GL	1041.0 F

Schlumberger

SIMULTANEOUS

COMPENSATED NEUTRON-
LITHO-DENSITY