COUNTY Malheur
FIELD Vale
LOCATION 101'S AND 718'E
WELL ESI A-S ALT
COMPANY Trans-Pacific Geothermal

Schlumberger

BOREHOLE COMPENSATED SONIC LOG

COMPANY Trans-Pacific Geothermal
WELL ESI A-S ALT
FIELD Vale
COUNTY Malheur STATE Oregon

LOCATION 101'S AND 718'E FROM THE N 1/4 CORNER
Other Services: DIL-BHC-GR FMS-TEMP

API SERIAL NO.	SECT.	TWP.	RANGE
	33	18S	45E

Permanent Datum GL Elev. 2465.0 F
Log Measured From KB 22.0 F above Perm. Datum
Drilling Measured From KB
Elev.: K.B. 2487.0 F
D.F.
G.L. 2465.0 F

Date	05-MAR-1994		
Run No.	TWO		
Depth Driller	5758.0 F		
Depth Logger (Schl.)	5700.0 F		
Btm. Log Interval	5694.0 F		
Top Log Interval	3010.0 F		
Casing-Driller	7" @ 3010.0 F	@	@
Casing-Logger	3010.0 F		
Bit Size	6 1/4" @ 5758.0 F	@	@
Type Fluid in Hole	GEL/LINE/PAC		
Dens. / Visc.	8.70 LB/G / 43.0 S		
pH / Fld. Loss	10.0 / 7.0 C3		
Source of Sample	FLOWLINE		
Rm @ Meas. Temp.	1.820 OHMM @ 80.0 DEGF	@	@
Rmf @ Meas. Temp.	2.900 OHMM @ 50.0 DEGF	@	@
Rmc @ Meas. Temp.	2.270 OHMM @ 50.0 DEGF	@	@
Source: Rmf / Rmc	MEASURED / MEASURED		
Rm @ BHT	.915 OHMM @ 166. DEGF	@	@
TIME Circulation Ended	09:00 5-MAR-1994		
TIME Logger on Bottom	13:29 05-MAR-1994		
Max. Rec. Temp.	166. DEGF		
Equip. / Location	8271 / SACRAMENTO		
Recorded By	SCOTT PILCH		
Witnessed By	B. TEPLOW / G. SUEMNICHT		

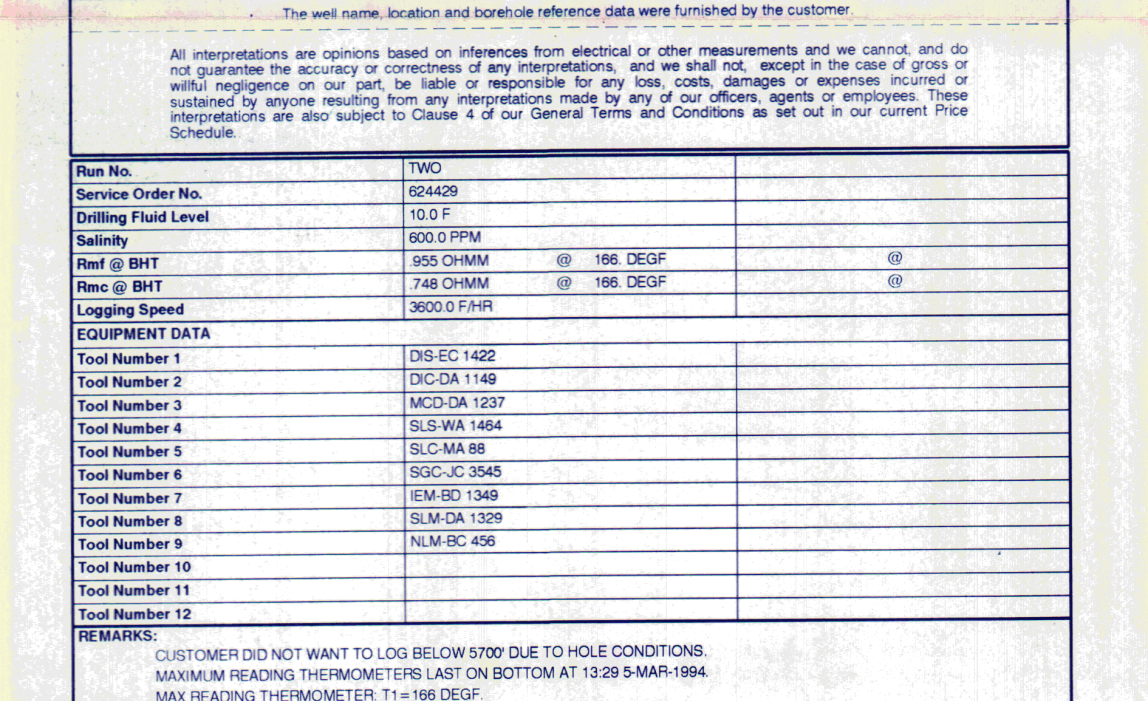
The well name, location and borehole reference data were furnished by the customer.

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 willful 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.	624429		
Drilling Fluid Level	10.0 F		
Salinity	600.0 PPM		
Rmf @ BHT	.955 OHMM @ 166. DEGF		@
Rmc @ BHT	.748 OHMM @ 166. DEGF		@
Logging Speed	3600.0 F/HR		
EQUIPMENT DATA			
Tool Number 1	DIS-EC 1422		
Tool Number 2	DIC-DA 1149		
Tool Number 3	MCD-DA 1237		
Tool Number 4	SLS-WA 1464		
Tool Number 5	SLC-MA 88		
Tool Number 6	SGC-JC 3545		
Tool Number 7	IEM-BD 1349		
Tool Number 8	SLM-DA 1329		
Tool Number 9	NLM-BC 456		
Tool Number 10			
Tool Number 11			
Tool Number 12			

REMARKS:
CUSTOMER DID NOT WANT TO LOG BELOW 5700' DUE TO HOLE CONDITIONS.
MAXIMUM READING THERMOMETERS LAST ON BOTTOM AT 13:29 5-MAR-1994.
MAX READING THERMOMETER: T1=166 DEGF.

LOGGING TOOL STRING SKETCH



TOTAL TOOL STRING LENGTH IS 69.2 F.
TOTAL TOOL STRING WEIGHT IS 993. LB IN AIR.

MAIN LOG

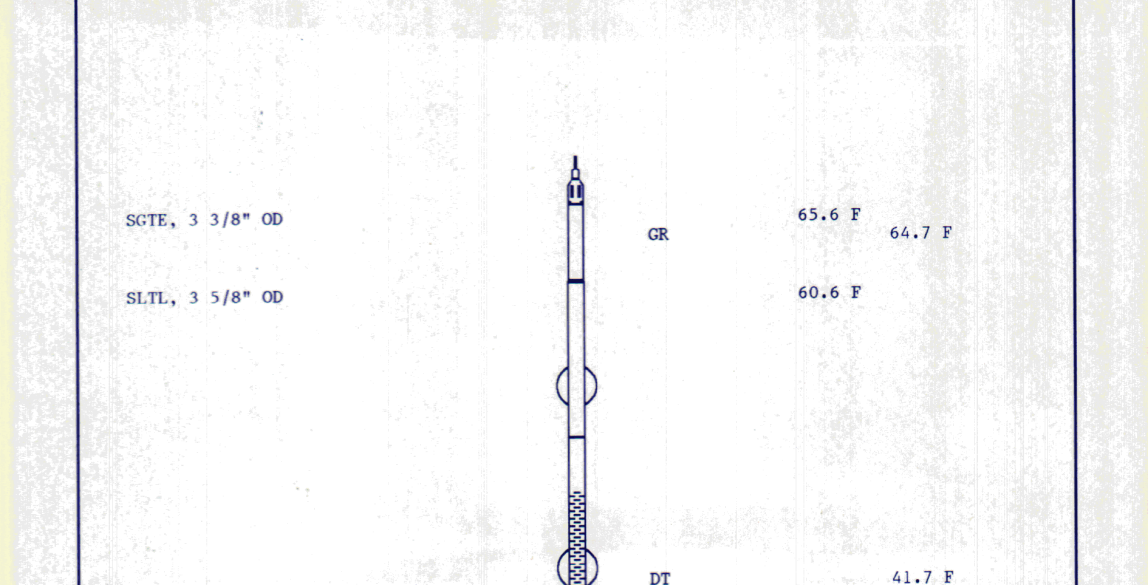
ACCUMULATED INTEGRATION VALUES SUMMARY:

```
Integrated Hole Volume:    56.9797 F3    FROM 5697.00 F    TO 5492.00 F
Integrated Transit Time:   .0159282 S    FROM 5697.00 F    TO 5492.00 F
```

EVENT MARK SUMMARY:

```
OUTPUT                        INTERVAL        DEPTH TRACK
                              BETWEEN PIPS    EDGE

Integrated Hole Volume        10.0000 F3      LEFT EDGE
Integrated Transit Time       .00100000 S     RIGHT EDGE
```



CP 38.2 FILE 6 05-MAR-1994 13:27 (UP)

CP 38.2 FILE 6 05-MAR-1994 13:23 (UP)

SENSOR MEASURE POINT TO TOOL ZERO

```
SRAT 41.7  FEET          AMPL 44.1  FEET
CBFS 43.1  FEET          CBL  44.1  FEET
TT2  44.1  FEET          TT1  43.1  FEET
TT4  39.3  FEET          TT3  40.3  FEET
TT   44.1  FEET          TO   44.1  FEET
CBSL 44.1  FEET          TTSL 44.1  FEET
CALI 31.9  FEET          GR   62.7  FEET
ILM   6.1  FEET          ILD   9.9  FEET
SP    2.5  FEET          SFL   6.8  FEET
TENS  2.5  FEET          SPAR  2.5  FEET
NOIS  2.5  FEET
```

PARAMETERS

```
        PARAMETER                                      VALUE       UNIT

SMB   - Sonic Memory Board                             DISA
VDLR  - Defn not found                                 2IN
TOCA  - TO Correction Status                           DISA
RATE  - Firing Rate                                    15          HZ
DG    - Downhole Gain                                  /5
DETE  - Detection                                      E2
NMSG  - Near Minimum Sliding Gate                      180         US
CBLG  - CBL Gate Width                                 35          US
AMPL  - Sonic Amplitude                                2
CBL   - Cement Bond Log Amplitude                      UT
WFM   - Waveform Mode                                  1
SS    - Sweep Speed                                    FAST
TOD   - TO Delay                                       DISA
DTF   - Delta-T Fluid                                  189.000     US/F
DTM   - Delta-T Matrix                                 56.0000     US/F
CDTS  - Correction for Delta-T Shale, Empirical        100.000
SPFS  - Sonic Porosity Formula Select                  R-H
WMUD  - Weight of Mud                                  8.70000     LB/G
MSEC  - Medium Sonde Error Correction                  6.80000     MM/M
SBR   - Shoulder Bed Resistivity                       1.00000     OHMM
DSEC  - Deep Sonde Error Correction                    3.30000     MM/M
FCD   - Future Casing Diameter                         0.0         IN
NCJT  - NGT Calibration Jig Type                       GSRY
FPHI  - Formation Factor Formula Porosity              SPHI
DWCO  - Digitizer Word Count                           512
DSIN  - Digitizer Sample Interval                      5           US
DDEL  - Digitizing Delay                               200         US
BS    - Bit Size                                       6.25000     IN
BHS   - BoreHole Status (Open or Cased)                OPEN
```

ACCUMULATED INTEGRATION VALUES SUMMARY:

```
Integrated Hole Volume:    982.820 F3    FROM 5700.00 F    TO 3010.00 F
Integrated Transit Time:   .197049 S     FROM 5700.00 F    TO 3010.00 F
```

EVENT MARK SUMMARY:

```
OUTPUT                        INTERVAL        DEPTH TRACK
                              BETWEEN PIPS    EDGE

Integrated Hole Volume        10.0000 F3      LEFT EDGE
Integrated Transit Time       .00100000 S     RIGHT EDGE
```

CP 38.2 FILE 7 05-MAR-1994 14:14 (UP)

CP 38.2 FILE 7 05-MAR-1994 13:29 (UP)

SENSOR MEASURE POINT TO TOOL ZERO

```
SRAT 41.7  FEET          AMPL 44.1  FEET
CBFS 43.1  FEET          CBL  44.1  FEET
TT2  44.1  FEET          TT1  43.1  FEET
TT4  39.3  FEET          TT3  40.3  FEET
TT   44.1  FEET          TO   44.1  FEET
CBSL 44.1  FEET          TTSL 44.1  FEET
CALI 31.9  FEET          GR   62.7  FEET
ILM   6.1  FEET          ILD   9.9  FEET
SP    2.5  FEET          SFL   6.8  FEET
TENS  2.5  FEET          SPAR  2.5  FEET
NOIS  2.5  FEET
```

PARAMETERS

```
        PARAMETER                                      VALUE       UNIT

SMB   - Sonic Memory Board                             DISA
VDLR  - Defn not found                                 2IN
TOCA  - TO Correction Status                           DISA
RATE  - Firing Rate                                    15          HZ
DG    - Downhole Gain                                  /5
DETE  - Detection                                      E2
NMSG  - Near Minimum Sliding Gate                      180         US
CBLG  - CBL Gate Width                                 35          US
AMPL  - Sonic Amplitude                                2
CBL   - Cement Bond Log Amplitude                      UT
WFM   - Waveform Mode                                  1
SS    - Sweep Speed                                    FAST
TOD   - TO Delay                                       DISA
DTF   - Delta-T Fluid                                  189.000     US/F
DTM   - Delta-T Matrix                                 56.0000     US/F
CDTS  - Correction for Delta-T Shale, Empirical        100.000
SPFS  - Sonic Porosity Formula Select                  R-H
WMUD  - Weight of Mud                                  8.70000     LB/G
MSEC  - Medium Sonde Error Correction                  6.80000     MM/M
SBR   - Shoulder Bed Resistivity                       1.00000     OHMM
DSEC  - Deep Sonde Error Correction                    3.30000     MM/M
FCD   - Future Casing Diameter                         0.0         IN
NCJT  - NGT Calibration Jig Type                       GSRY
FPHI  - Formation Factor Formula Porosity              SPHI
DWCO  - Digitizer Word Count                           512
DSIN  - Digitizer Sample Interval                      5           US
DDEL  - Digitizing Delay                               200         US
BS    - Bit Size                                       6.25000     IN
BHS   - BoreHole Status (Open or Cased)                OPEN
```

REPEAT SECTION

ACCUMULATED INTEGRATION VALUES SUMMARY:

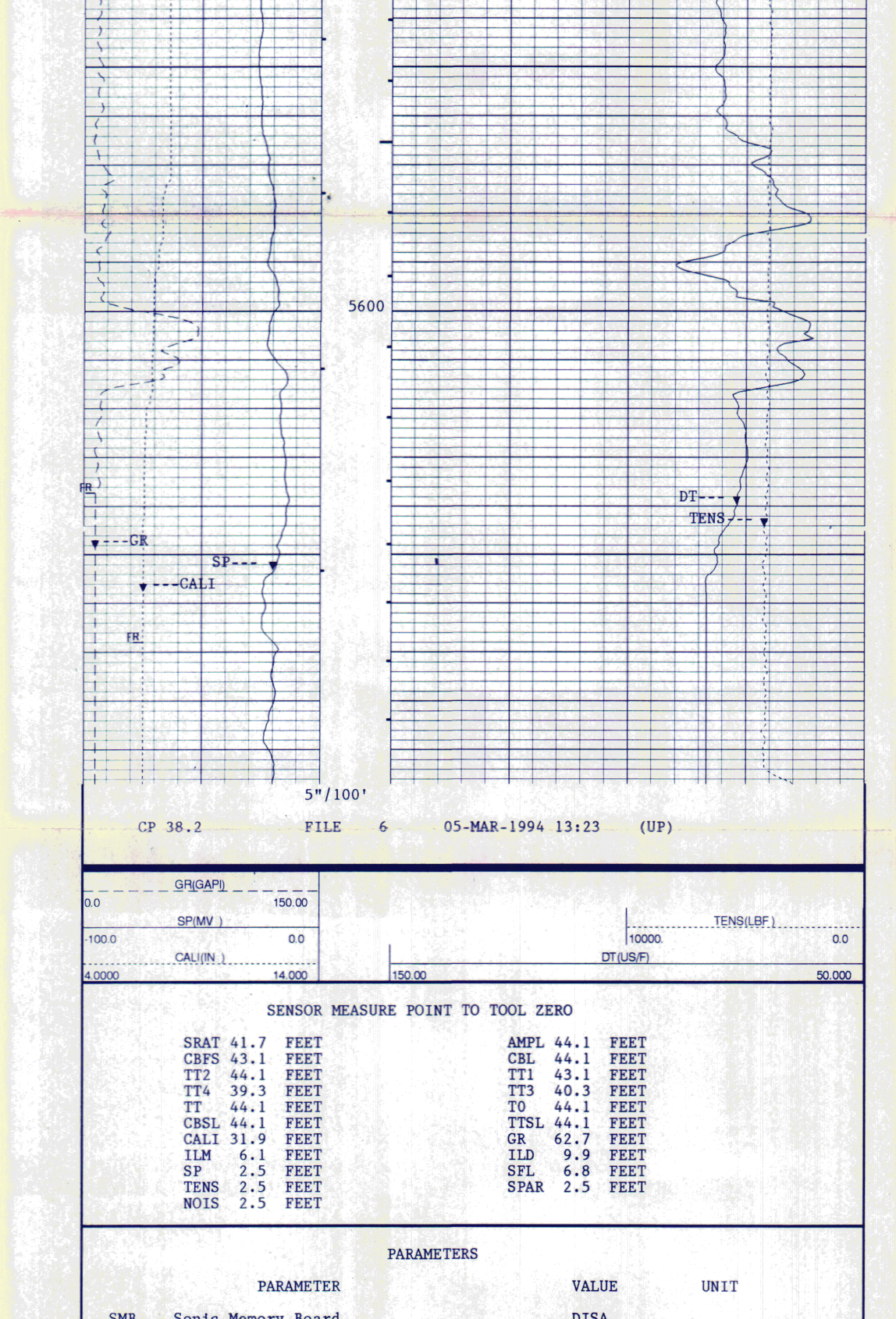
```
Integrated Hole Volume:    56.9797 F3    FROM 5697.00 F    TO 5492.00 F
Integrated Transit Time:   .0159282 S    FROM 5697.00 F    TO 5492.00 F
```

EVENT MARK SUMMARY:

```
OUTPUT                        INTERVAL        DEPTH TRACK
                              BETWEEN PIPS    EDGE

Integrated Hole Volume        10.0000 F3      LEFT EDGE
Integrated Transit Time       .00100000 S     RIGHT EDGE
```

CP 38.2 FILE 6 05-MAR-1994 13:27 (UP)



CP 38.2 FILE 6 05-MAR-1994 13:23 (UP)

SENSOR MEASURE POINT TO TOOL ZERO

```
SRAT 41.7  FEET          AMPL 44.1  FEET
CBFS 43.1  FEET          CBL  44.1  FEET
TT2  44.1  FEET          TT1  43.1  FEET
TT4  39.3  FEET          TT3  40.3  FEET
TT   44.1  FEET          TO   44.1  FEET
CBSL 44.1  FEET          TTSL 44.1  FEET
CALI 31.9  FEET          GR   62.7  FEET
ILM   6.1  FEET          ILD   9.9  FEET
SP    2.5  FEET          SFL   6.8  FEET
TENS  2.5  FEET          SPAR  2.5  FEET
NOIS  2.5  FEET
```

PARAMETERS

```
        PARAMETER                                      VALUE       UNIT

SMB   - Sonic Memory Board                             DISA
VDLR  - Defn not found                                 2IN
TOCA  - TO Correction Status                           DISA
RATE  - Firing Rate                                    15          HZ
DG    - Downhole Gain                                  /5
DETE  - Detection                                      E2
NMSG  - Near Minimum Sliding Gate                      180         US
CBLG  - CBL Gate Width                                 35          US
AMPL  - Sonic Amplitude                                2
CBL   - Cement Bond Log Amplitude                      UT
WFM   - Waveform Mode                                  1
SS    - Sweep Speed                                    FAST
TOD   - TO Delay                                       DISA
DTF   - Delta-T Fluid                                  189.000     US/F
DTM   - Delta-T Matrix                                 56.0000     US/F
CDTS  - Correction for Delta-T Shale, Empirical        100.000
SPFS  - Sonic Porosity Formula Select                  R-H
WMUD  - Weight of Mud                                  8.70000     LB/G
MSEC  - Medium Sonde Error Correction                  6.80000     MM/M
SBR   - Shoulder Bed Resistivity                       1.00000     OHMM
DSEC  - Deep Sonde Error Correction                    3.30000     MM/M
FCD   - Future Casing Diameter                         0.0         IN
NCJT  - NGT Calibration Jig Type                       GSRY
FPHI  - Formation Factor Formula Porosity              SPHI
DWCO  - Digitizer Word Count                           512
DSIN  - Digitizer Sample Interval                      5           US
DDEL  - Digitizing Delay                               200         US
BS    - Bit Size                                       6.25000     IN
BHS   - BoreHole Status (Open or Cased)                OPEN
```

CALIBRATION SUMMARY

BEFORE SURVEY CALIBRATION SUMMARY

```
PERFORMED:     05-MAR-1994 13:19
PROGRAM FILE: ISN    (VERSION    38.2    92/10/12  92/10/12)

DITD              ELECTRONICS CALIBRATION SUMMARY

            MEASURED                     CALIBRATED
          ZERO     PLUS               ZERO      PLUS           UNITS
   ILD     .45    514.6               0.0       495.5          MM/M
   ILM    -.07    530.4               0.0       499.7          MM/M
   SFL    -.30    516.4               0.0       500.0          MM/M

ILD SONDE ERROR CORRECTION :        3.3 MM/M
ILM SONDE ERROR CORRECTION :        6.8 MM/M

ZERO: 05-MAR-1994 13:18  PLUS: 05-MAR-1994 13:18   COMP: 05-MAR-1994 13:18

SGTE              DETECTOR CALIBRATION SUMMARY

            MEASURED
          BKGD     JIG          CALIBRATED          UNITS
   GR      26      175             165              GAPI

BACK: 05-MAR-1994 12:51   JIG: 05-MAR-1994 12:54   COMP: 05-MAR-1994 12:54

MCDB              CALIPER CALIBRATION SUMMARY

            MEASURED                    CALIBRATED
          SMALL    LARGE              SMALL     LARGE          UNITS
   CALI    7.36    10.76               8.00     12.00           IN

SMALL: 05-MAR-1994 12:46 LARGE: 05-MAR-1994 12:47 COMP: 05-MAR-1994 12:47

   CP 38.2           FILE    5        05-MAR-1994 13:19
```

COMPANY	Trans-Pacific Geothermal		SCHL. FR	5694.0 F
WELL	ESI A-S ALT		SCHL. TD	5700.0 F
FIELD	Vale		DRLR. TD	5758.0 F
COUNTY	Malheur	STATE Oregon	Elev: KB	2487.0 F
			DF	
			GL	2465.0 F

Schlumberger

BOREHOLE COMPENSATED SONIC LOG