

COMPANY: NORTHWEST NATURAL GAS
WELL: OM-32-22-65
FIELD: CALVIN CREEK GAS STORAGE
COUNTY: COLUMBIA STATE: OREGON

Schlumberger
PLATFORM EXPRESS
ARRAY INDUCTION /SONIC
TRUE VERTICAL DEPTH LOG

LOGGING DATE: 22-JUL-1998
 RUN NUMBER: 2585 F
 DEPTH NUMBER: 2357 F
 BOTTOM LOG INTERVAL: 2357 F

COUNTY: COLUMBIA
 FIELD: CALVIN CREEK GAS STORAGE
 LOCATION: 1884.04 S 1261.26 E FROM
 WELL: OM-32-22-65
 COMPANY: NORTHWEST NATURAL GAS

LOCATION: 1884.04 S 1261.26 E FROM THE
 NE CORNER OF SECTION 22
 PERMITS: 733 F
 LOGGING MEASURED FROM: KELLY BUSHING
 DRILLING MEASURED FROM: 80.0 F ABOVE PERMITS DATUM
 ART SERIAL NO. SECTION TOWNSHIP RANGE
 22 22 6N 5W

LOGGING DATE: 22-JUL-1998
 RUN NUMBER: 2585 F
 DEPTH NUMBER: 2357 F
 BOTTOM LOG INTERVAL: 2357 F

LOGGING DATE: 22-JUL-1998
 RUN NUMBER: 2585 F
 DEPTH NUMBER: 2357 F
 BOTTOM LOG INTERVAL: 2357 F

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 INTERPRETATION AND WE SHALL NOT BE LIABLE FOR 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 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.

OTHER SERVICES1
 OS1:
 OS2:
 OS3:
 OS4:
 OS5:

OTHER SERVICES2
 OS1:
 OS2:
 OS3:
 OS4:
 OS5:

REMARKS: RUN NUMBER 1
 Thank you for choosing Schlumberger!

REMARKS: RUN NUMBER 2

AIT run with 1" standoffs
 CNL run with bow spring for eccentricization
 Log run on sandstone matrix = 2.65 g/cc.

Your crew today is Forthard & Tye

SERVICE ORDER # 1222172
 PROGRAM VERSION 8C1-205

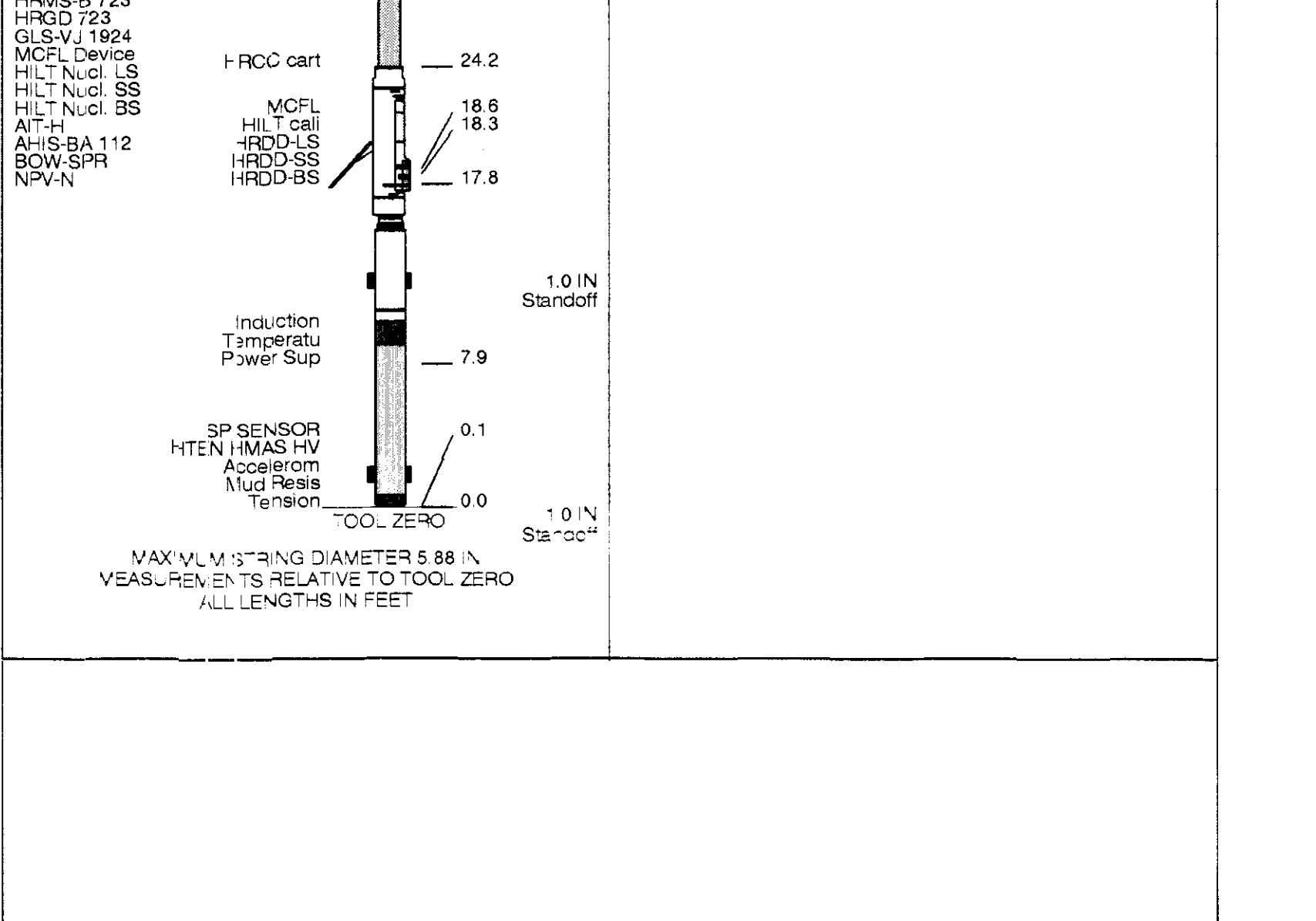
SERVICE ORDER #
 PROGRAM VERSION

LOGGED INTERVAL START STOP LOGGED INTERVAL START STOP

EQUIPMENT DESCRIPTION

RUN 1 SURFACE EQUIPMENT WITH (CTS)-A
 RUN 2

DOWN-HOLE EQUIPMENT



MAXIMUM STRING DIAMETER 5.88 IN
 VEAS-REVENTS RELATIVE TO TOOL ZERO
 ALL LENGTHS IN FEET

Directional Survey Manually-Entered Inclinometry Summary

Tie In Point : Measured Depth True Vertical Depth
 425.00 FT 425.00 FT

Depth	Deviation	True Vertical Depth	Depth	Deviation	True Vertical Depth
482.00 FT	0.00 DEG	482.00 FT	943.00 FT	18.00 DEG	935.44 FT
542.00 FT	2.00 DEG	541.99 FT	1004.00 FT	19.00 DEG	993.29 FT
632.00 FT	6.00 DEG	631.75 FT	1143.00 FT	20.00 DEG	1124.31 FT
695.00 FT	9.00 DEG	694.20 FT	1380.00 FT	20.00 DEG	1347.02 FT
788.00 FT	12.5 DEG	785.60 FT	1615.00 FT	20.50 DEG	1567.49 FT
850.00 FT	13.75 DEG	846.01 FT	2365.00 FT	18.50 DEG	2274.44 FT

Input DLIS Files
 DEFAULT HILTB_056 FN:48 FIELD 22-Jul-1998 15:16 2279.0 FT 374.5 FT

Output DLIS Files
 DEFAULT HILTB_058 FN:50 FIELD 22-Jul-1998 15:21 2279.0 FT 374.5 FT

Playback indexed by True Vertical Depth

OP System Version: 8C1-205
 MCM

HILTB-DTB A*CV-98Q1
 TCC-B A*CV-98Q1

DSLT-TCC 8C1-205

PIP SUMMARY

Integrated Transit Time Minor Pip Every 1 MS
 Integrated Transit Time Major Pip Every 10 MS

Time Mark Every 60 S

AIT-H 10 Inch Investigation (AHT10) (OHMM) 6
 AIT-H 90 Inch Investigation Conductivity (AHTC090) (MM M) 0

AIT-H 10 Inch Investigation (AHT10) (OHMM) 30
 AIT-H 90 Inch Investigation Conductivity (AHTC090) (MM M) 1000

AIT-H 90 Inch Investigation (AHT90) (OHMM) 30
 Delta-T (DT) (US F) 75

AIT-H 10 Inch Investigation (AHT10) (OHMM) 6
 AIT-H 90 Inch Investigation Conductivity (AHTC090) (MM M) 0

AIT-H 10 Inch Investigation (AHT10) (OHMM) 30
 AIT-H 90 Inch Investigation Conductivity (AHTC090) (MM M) 1000

AIT-H 10 Inch Investigation (AHT10) (OHMM) 6
 Delta-T (DT) (US F) 75

PIP SUMMARY

Integrated Transit Time Minor Pip Every 1 MS
 Integrated Transit Time Major Pip Every 10 MS

Time Mark Every 60 S

Format: 2SONIC Vertical Scale: 2' per 100' Graphics File Created: 22-Jul-1998 15:21

OP System Version: 8C1-205
 MCM

HILTB-DTB A*CV-98Q1
 TCC-B A*CV-98Q1

DSLT-TCC 8C1-205

Playback indexed by True Vertical Depth

Input DLIS Files
 DEFAULT HILTB_056 FN:48 FIELD 22-Jul-1998 15:16 2279.0 FT 374.5 FT

Output DLIS Files
 DEFAULT HILTB_058 FN:50 FIELD 22-Jul-1998 15:21 2279.0 FT 374.5 FT

COMPANY: NORTHWEST NATURAL GAS

WELL: OM-32-22-65

FIELD: CALVIN CREEK GAS STORAGE

COUNTY: COLUMBIA

STATE: OREGON

BOTTOM LOG INTERVAL: 2357 F

SCHLUMBERGER DEPTH: 2365 F

DEPTH DRILLER: 2365 F

KELLY BUSHING: 762 F

DRILL FLOOR: 762 F

GROUND LEVEL: 753 F

Schlumberger

PLATFORM EXPRESS
ARRAY INDUCTION /SONIC
TRUE VERTICAL DEPTH LOG