Western Atlas International

ATLAS WIRELINE SERVICES

COMPENSATED DENSILOG® COMPENSATED NEUTRON GAMMA RAY

FINAL PRINT

FILE NO. 3960
API NO. 36-009-00269
5" = 100'

COMPANY NORTHWEST NATURAL GAS COMPANY
WELL I. W. 23d - 3
FIELD MIST
COUNTY COLUMBIA STATE OREGON

LOCATION:
2475.11' EAST & 299.39' SOUTH
FROM THE WEST 1/4 CORNER OF:
SEC 3 TWP 6N RGE 5W

OTHER SERVICES
DIFL-SP-CAL
BHC AL-GR-CAL
DIPLOG

PERMANENT DATUM GROUND LEVEL ELEV. 1187.8
LOGGING MEASURED FROM K. B. 11.4 FT. ABOVE P.D.
DRILLING MEASURED FROM K. B.

ELEVATIONS
KB 1199.25'
DF ---
GL 1187.85'

DATE	15-OCT-91		20-OCT-91					
RUN	1		2					
SERVICE ORDER	66915		66917					
DEPTH-DRILLER	2730'		3079'					
DEPTH-LOGGER	2725'		3072					
BOTTOM LOGGED INTERVAL	2722'		3069					
TOP LOGGED INTERVAL	684'		2708'					
CASING - DRILLER	13 3/8"	@ 684'	8 5/8"	@ 2715'		@		@
CASING - LOGGER	684'		2708'					
BIT SIZE	12 1/4"		7 7/8"					
TYPE FLUID IN HOLE	GEL/POLYMER		GEL/CACL/HEC 10					
DENSITY / VISCOSITY	9.6+	40	8.6	38				
PH / FLUID LOSS	8.7	5.6	11.5	15.0				
SOURCE OF SAMPLE	FLOWLINE		FLOWLINE					
RM AT MEAS. TEMP.	2.72	@ 79 F	.297	@ 72F		@		@
RMF AT MEAS. TEMP.	2.97	@ 79 F	.286	@ 72F		@		@
RMC AT MEAS. TEMP.	2.29	@ 79 F	.315	@ 72F		@		@
SOURCE OF RMF / RMC	MEASURED	MEASURED	MEASURED	MEASURED				
RM AT BHT	2.13	@ 101 F	.212	@ 101 F		@		@
TIME SINCE CIRCULATION	6 HRS.		5 1/2 HRS.					
MAX. REC. TEMP. DEG. F	102 F		101 F					
EQUIP. NO. / LOC.	HL 6399	BAKRSFLD	HL 6399	BAKRSFLD				
RECORDED BY	TORGERSON		TORGENSON					
WITNESSED BY	CLAYTON ROTH		CLAYTON ROTH					

FOLD HERE

IN MAKING INTERPRETATIONS OF LOGS OUR EMPLOYEES WILL GIVE CUSTOMER THE BENEFIT OF THEIR BEST JUDGEMENT, BUT SINCE ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS, WE CANNOT, AND WE DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION. WE SHALL NOT BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COST, DAMAGES, OR EXPENSES WHATSOEVER INCURRED OR SUSTAINED BY THE CUSTOMER RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR EMPLOYEES.

REMARKS RUN (1)

TAYLOR RIG NO. 4
BHT 102 F & 102 F
VOLUME COMPUTED FOR 8 5/8" CASING = 960 FT3

REMARKS RUN (2)

TAYLOR RIG NO. 4
BHT 101 F & 101 F
TOTAL BOREHOLE VOLUME RECORDED
NOTE: PULLED WEIGHT WHEN CALIPER ARM ENTERED CASING

EQUIPMENT DATA

RUN	TRIP	TOOL	SERIAL NO.	SERIES NO.	POSITION
1	1	CDL	74178	2227XA	DECENT.
1	1	CAL	74178	2227XA	DECENT.
1	1	CN	53264	2435XA	DECENT.
1	1	GR	78607	1309XA	DECENT.
1	1	TEMP			
1	1	PCM	73007	3506XA	DECENT.

EQUIPMENT DATA

RUN	TRIP	TOOL	SERIAL NO.	SERIES NO.	POSITION
2	1	CDL	74178	2227XA	DECENT.
2	1	CAL	74178	2227XA	DECENT.
2	1	CN	53264	2435XA	DECENT.
2	1	GR	78607	1309XA	DECENT.
2	1	TEMP			
2	1	PCM	73007	3506XA	DECENT.

5" = 100'

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**************************************************************************************************

                              FILE:   3

          CURVE  DELAY  REPORT
          --------------------

                                          PHYS.
                              CURVE       DELAY      UNITS
                              -----       -----      -----

                              SSD           0,3      FT,IN
                              LSD             0      FT,IN
                              CAL           0,3      FT,IN
                              SSN          10,3      FT,IN
                              LSN          10,9      FT,IN
                              GR           16,6      FT,IN
                              TEMP            0      FT,IN
                              DTEM            0      FT,IN


          PARAMETERS
          ----------

                     NAME       DEPTH INTERVAL      VALUE       UNITS
```

A	2728	TO	656	1.000	
CAL COR	2728	TO	656	CAL	
CASING CNC	2728	TO	656	NOT ACTIVE	
CHISM CN	2728	TO	656	NOT ACTIVE	
CHISM DEN	2728	TO	656	NOT ACTIVE	
M	2728	TO	656	2.000	
MATRIX	2728	TO	656	SANDSTONE	
O.D.	2728	TO	656	8.625	INCH
RHO F	2728	TO	656	0.980	G/CC
RHO M	2728	TO	656	2.650	G/CC
SALINITY	2728	TO	656	0.000	PPK

DISPLAY SCALE CHANGES

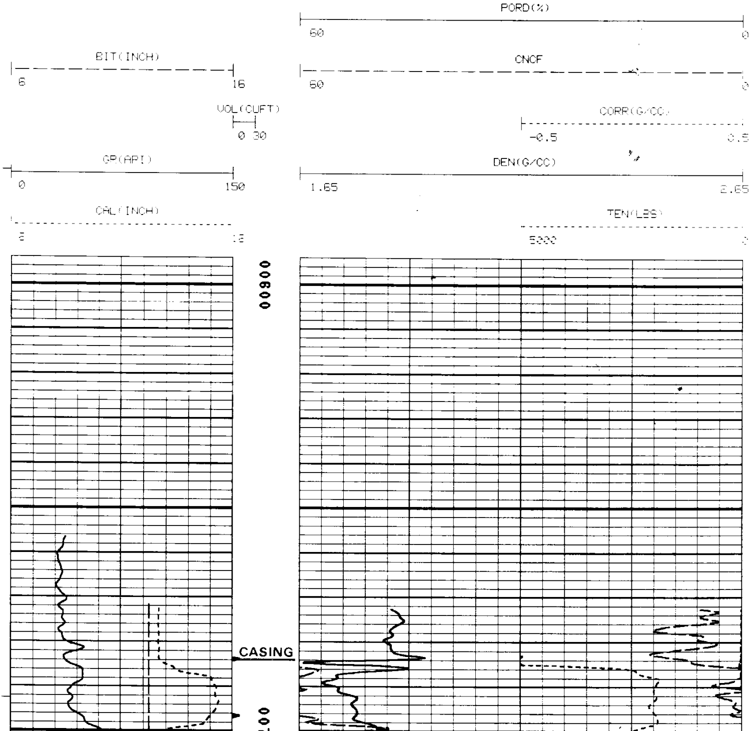
*** NONE ***

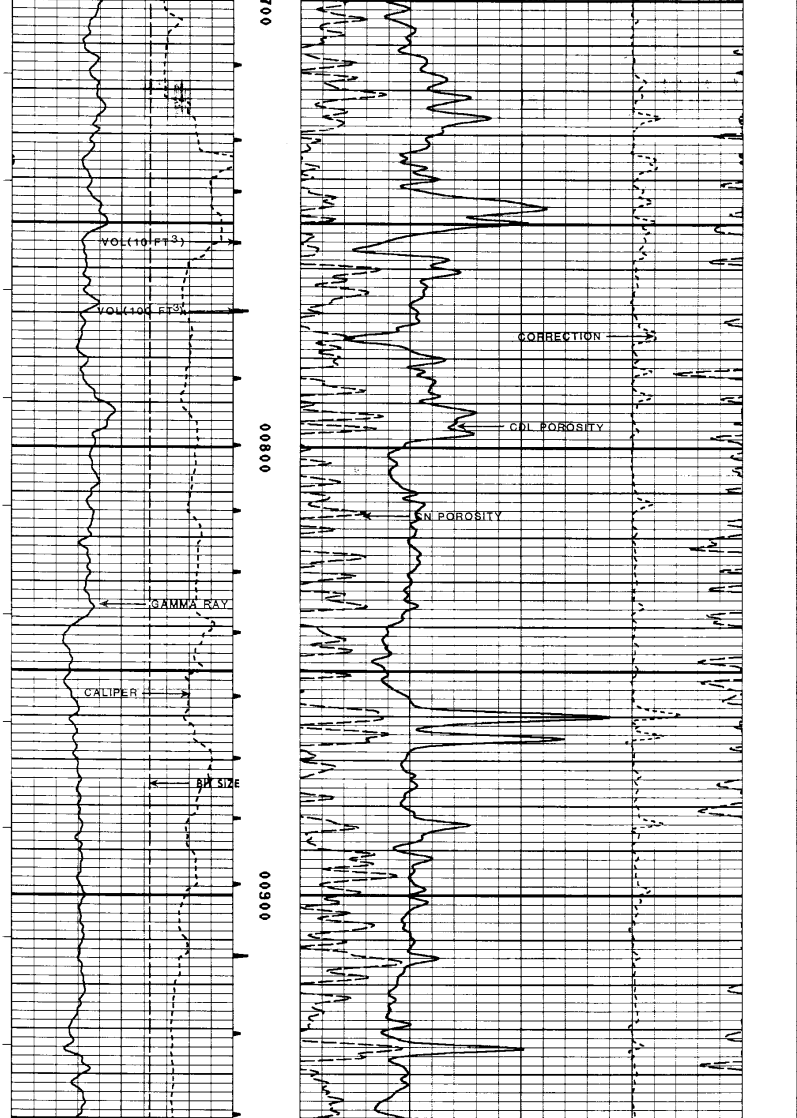
COMPANY: NORTHWEST NATURAL GAS COMPANY
RUN: 1

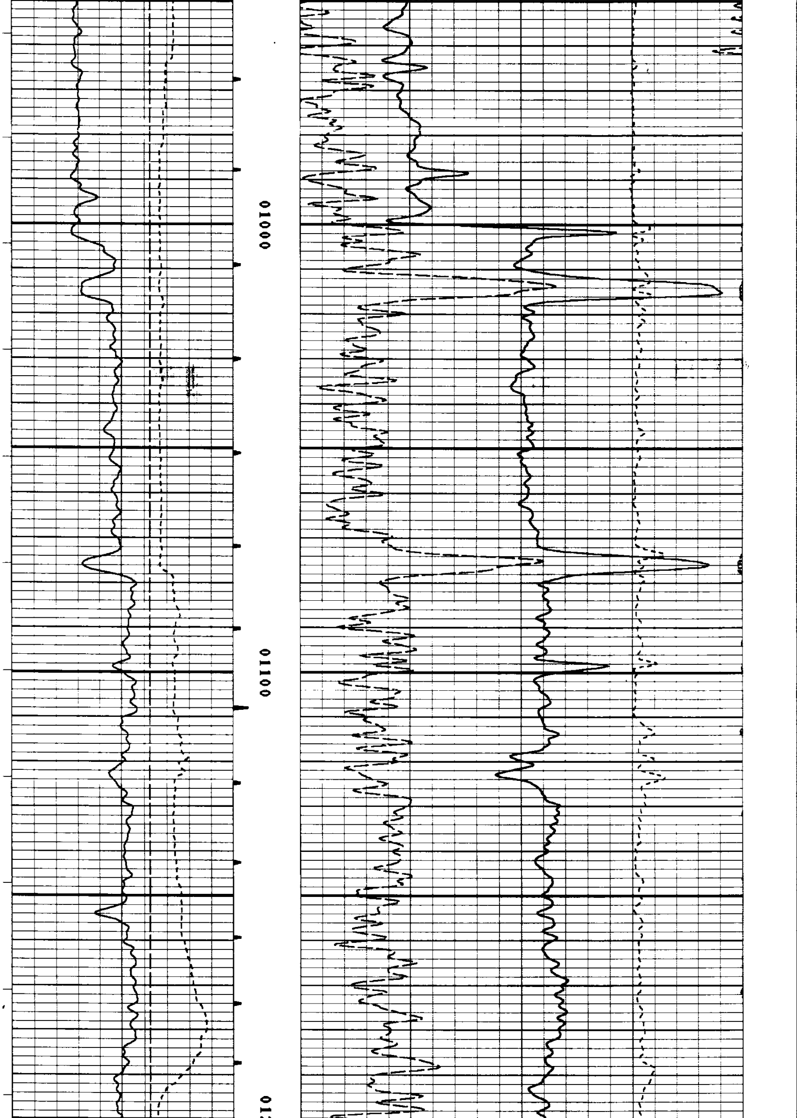
WELL NAME: I. W. 23d - 3
TRIP: 1

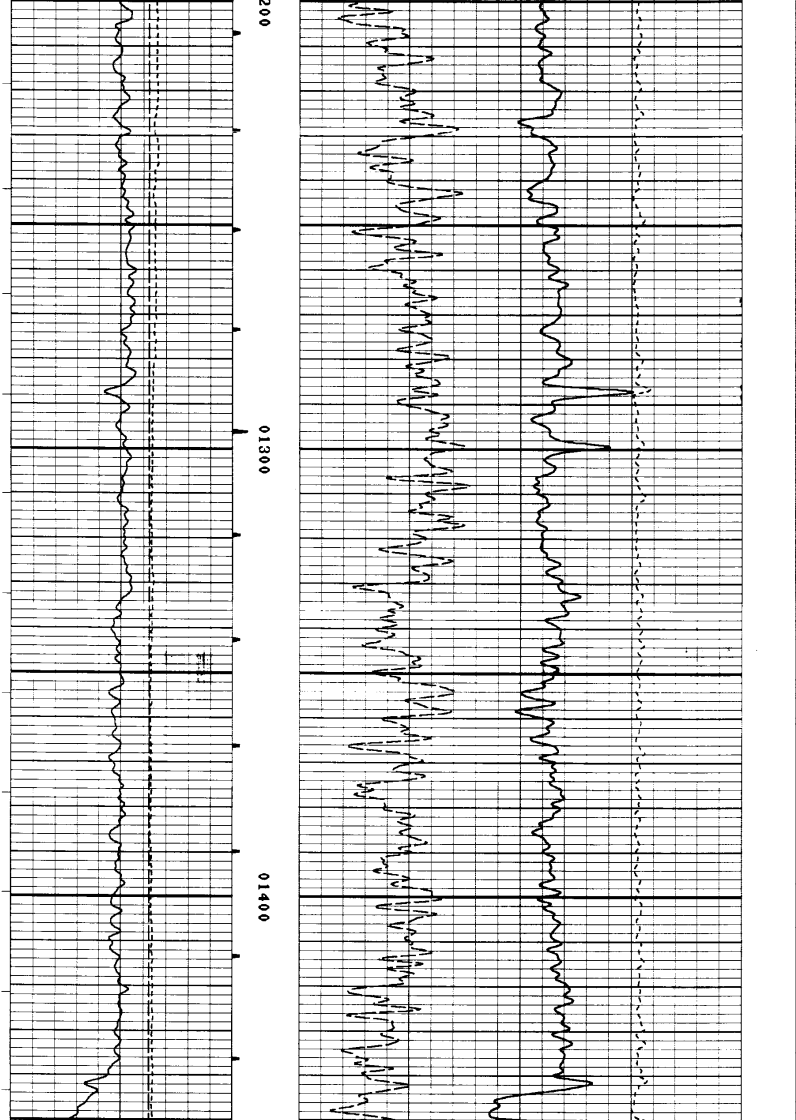
SERVICE: BK013A
FILE: 3
DATE: 10/15/91
TIME: 04:24:03

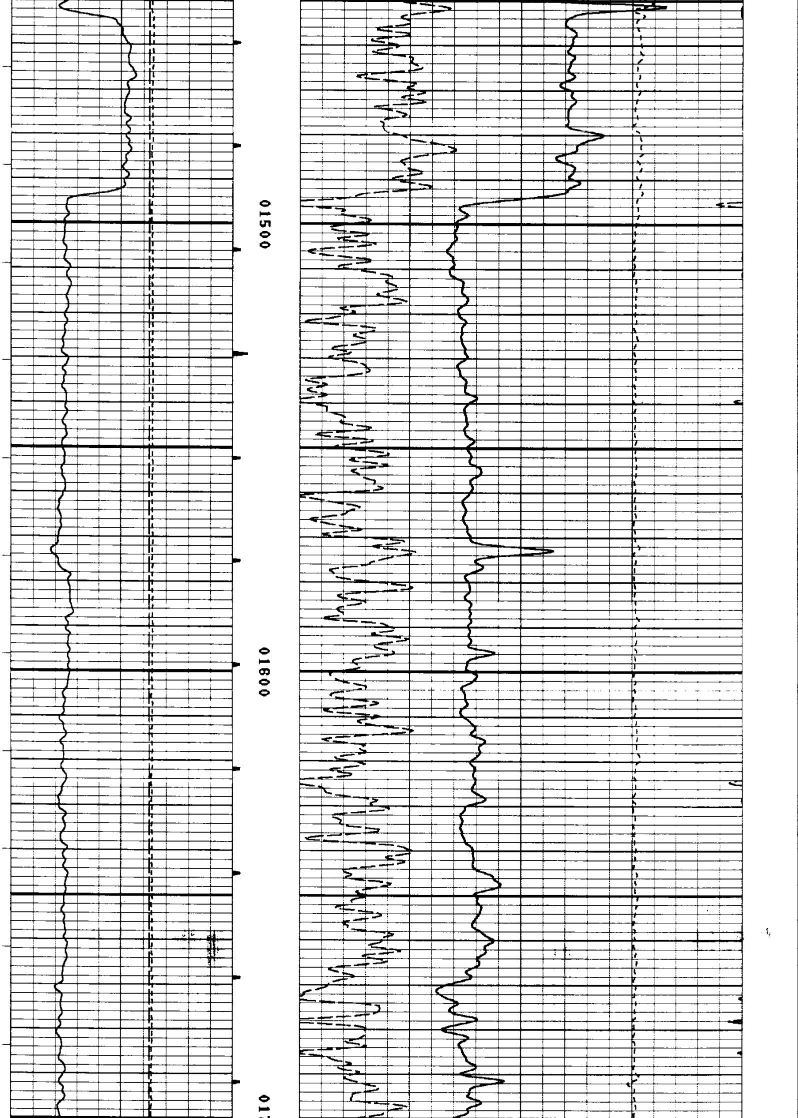
REVISION: FSYS256 REV:G002 VER:2.0
MODE: RECORD

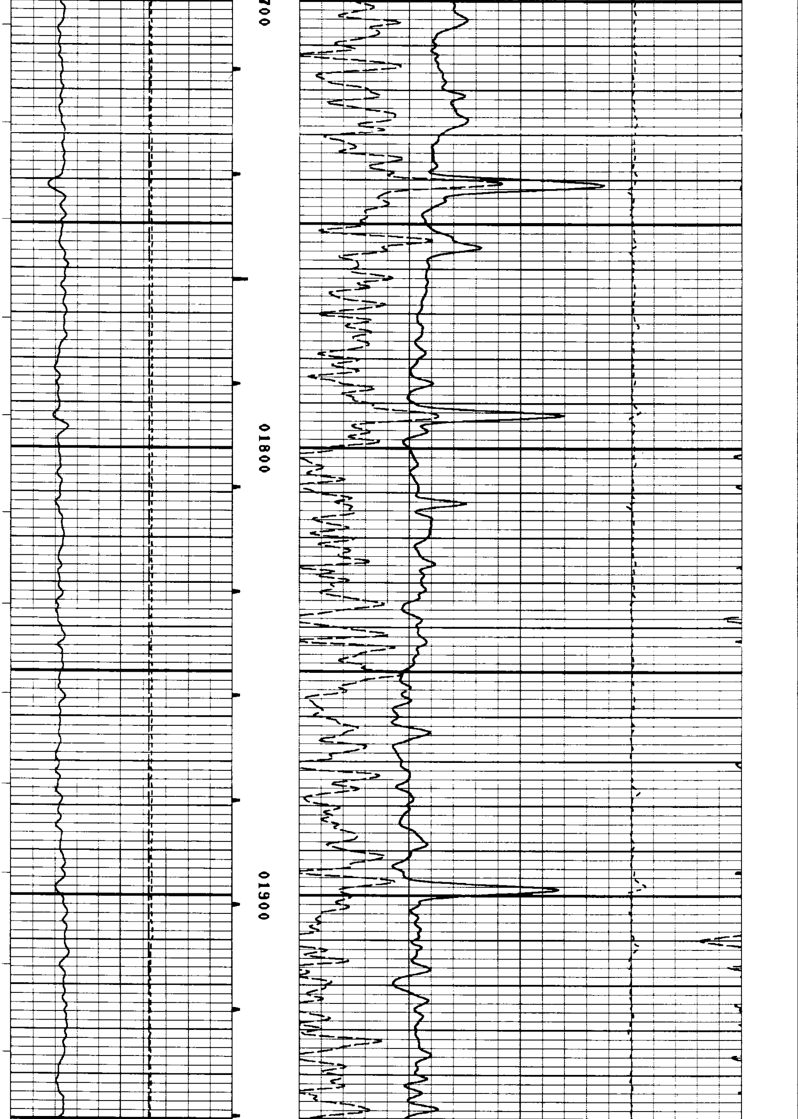


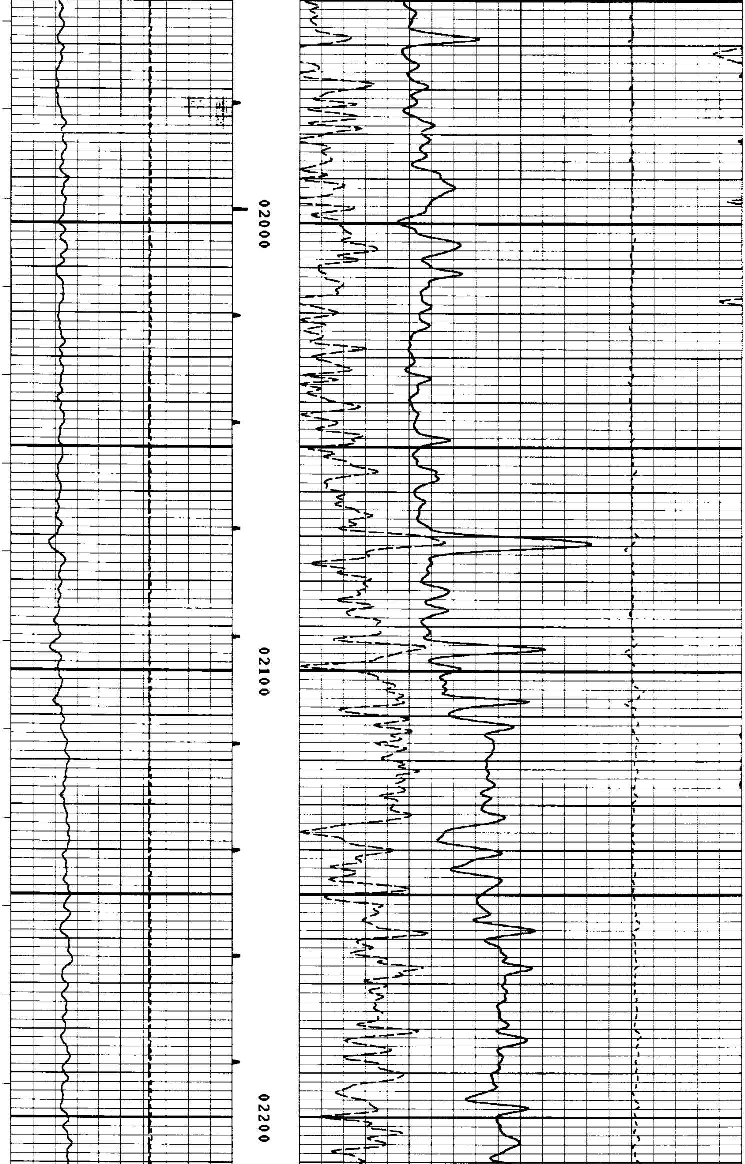


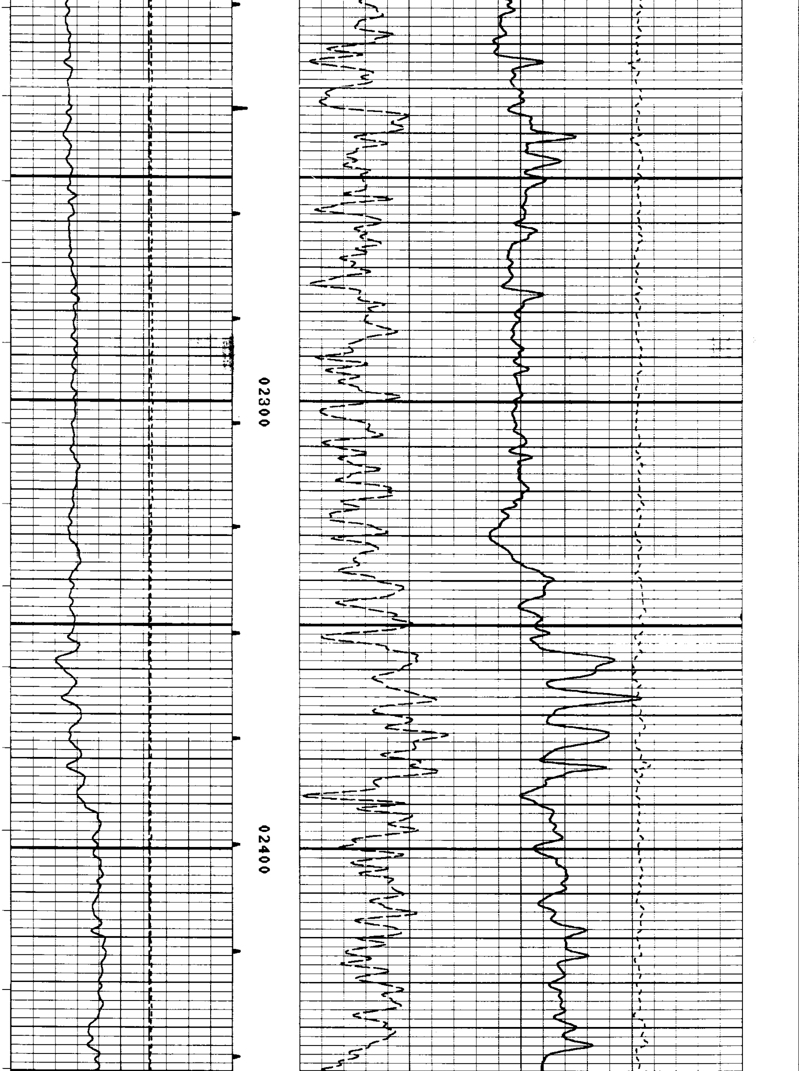


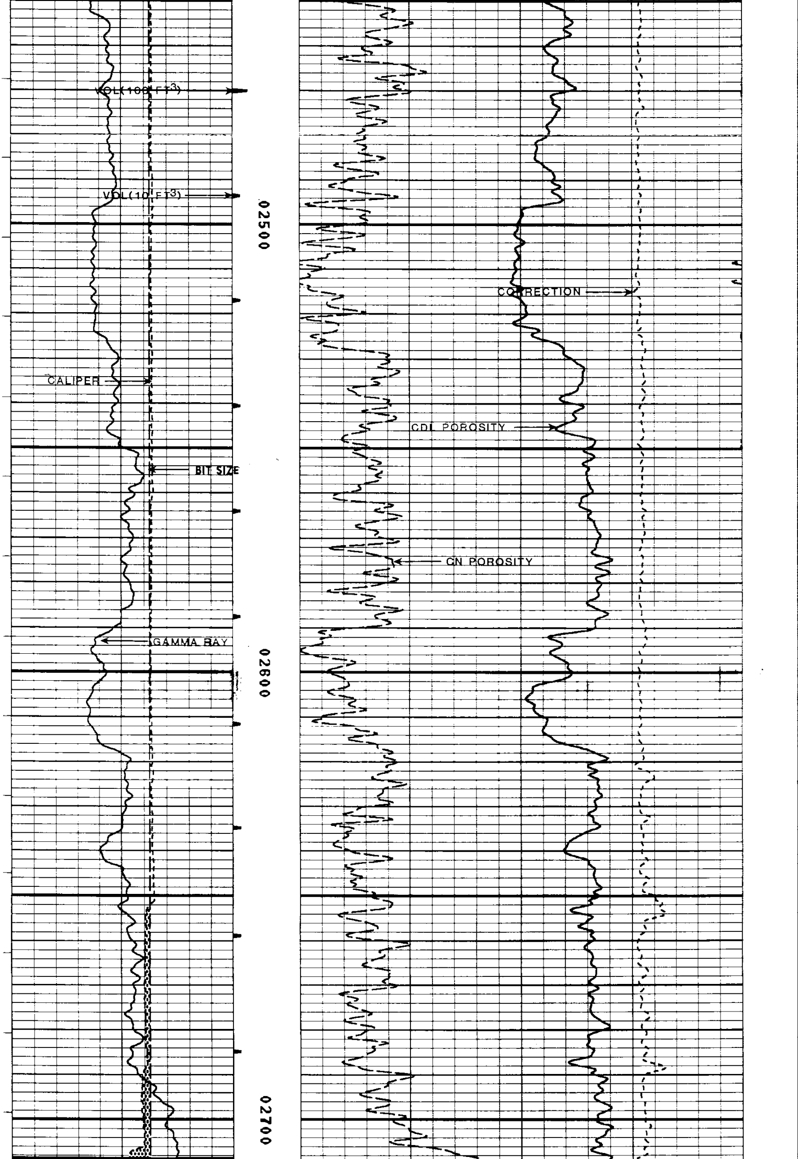


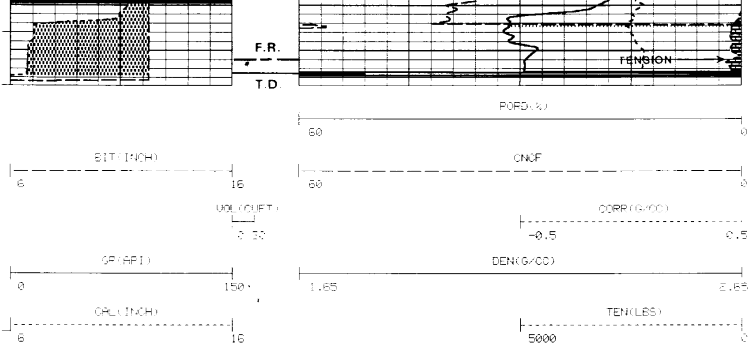












FILE: 3

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5" = 100'

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FILE: 3

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CURVE   DELAY   REPORT
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            PHYS.
   CURVE    DELAY    UNITS
   -----    -----    -----

   SSD        0.3    FT,IN
   LSD          0    FT,IN
   CAL        0,3    FT,IN
   SSN       10,3    FT,IN
   LSN       10,9    FT,IN
   GR        16,6    FT,IN
   TEMP         0    FT,IN
   DTEM         0    FT,IN
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PARAMETERS
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      NAME        DEPTH INTERVAL      VALUE      UNITS
   ---------     ---------------   ----------    -----
   A              3082 TO  2663         1.000
   CAL COR        3082 TO  2663    CAL
   CASING CNC     3082 TO  2663    NOT ACTIVE
   CHISM CN       3082 TO  2663    NOT ACTIVE
   CHISM DEN      3082 TO  2663    NOT ACTIVE
   M              3082 TO  2663         2.000
   MATRIX         3082 TO  2663    SANDSTONE
   O.D.           3082 TO  2663         0.000    INCH
   RHO F          3082 TO  2663         0.980    G/CC
   RHO M          3082 TO  2663         2.650    G/CC
   SALINITY       3082 TO  2663         0.000    PPK
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DISPLAY SCALE CHANGES
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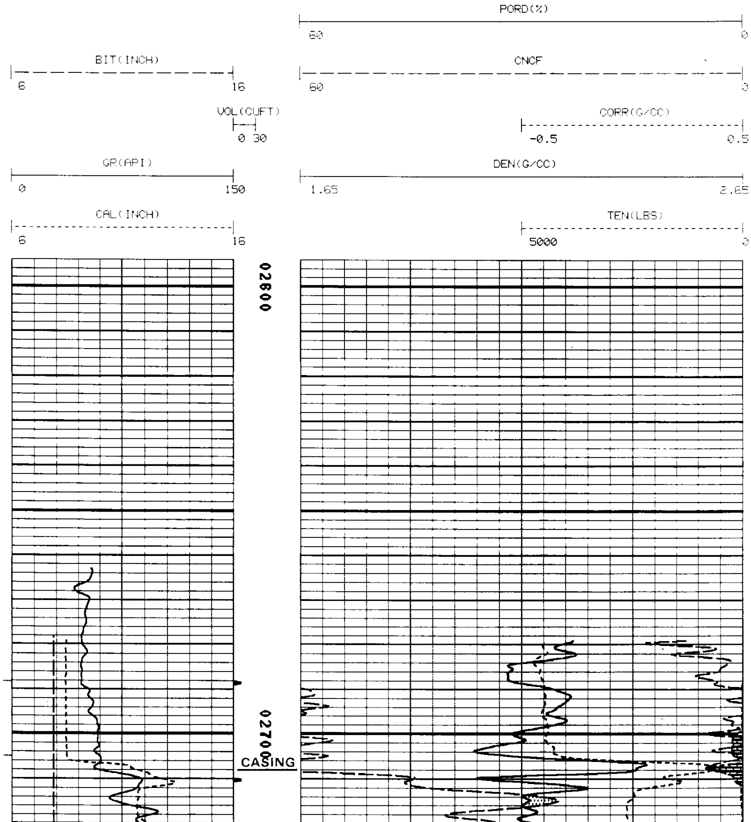
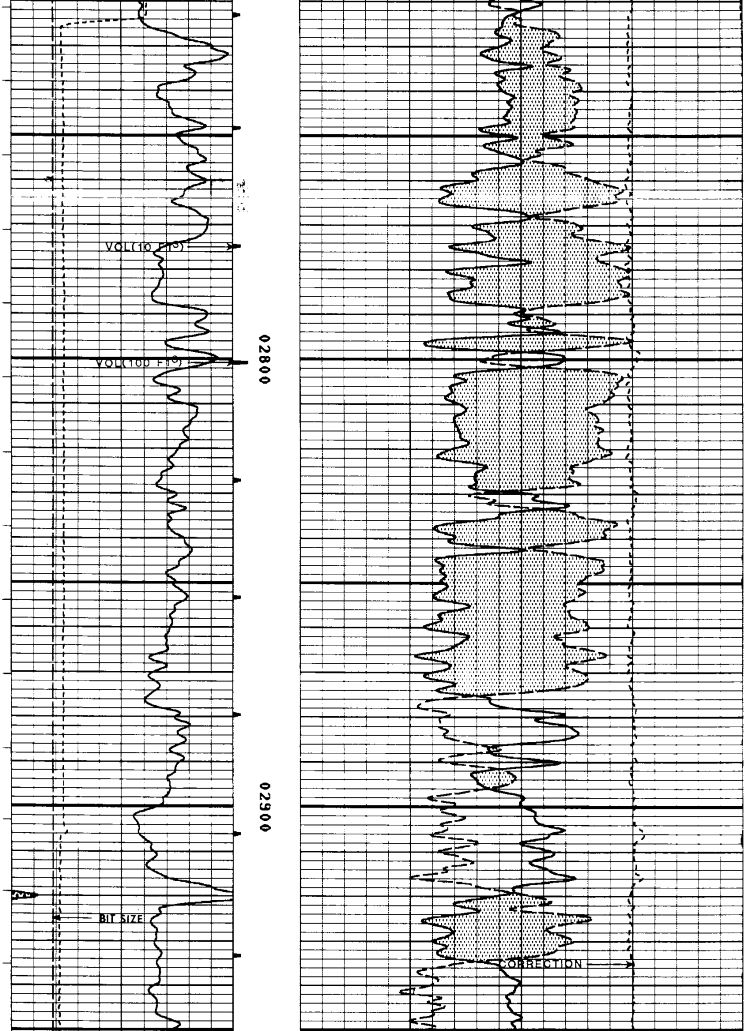
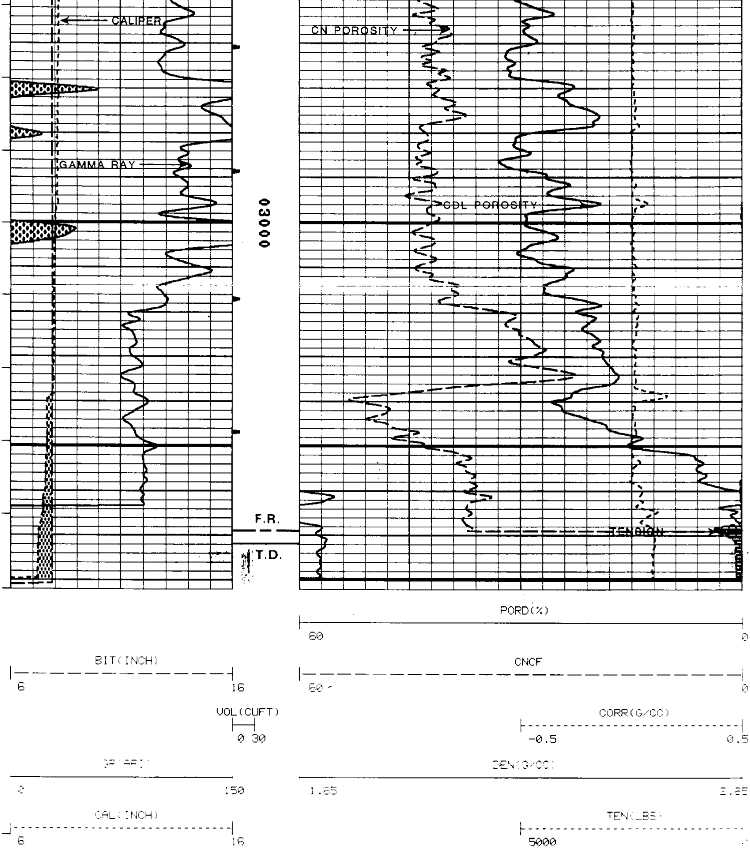
*** NONE ***

COMPANY:	NORTHWEST NATURAL GAS COMPANY		RUN: 2
WELL NAME:	I. w. 23a - 3		TRIP: 1
SERVICE:	BK013A FILE: 3	DATE: 10/20/91	TIME: 22:06:39
REVISION:	FSYS256 REV:G002 VER:2.0		MODE: RECORD







FILE: 3

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REPEAT SECTION

****

RUN # 1

FILE: 2

CURVE DELAY REPORT

CURVE	PHYS. DELAY	UNITS
SSD	0.3	FT.IN
LSD	0	FT.IN
CAL	0.3	FT.IN
SSN	10.3	FT.IN
LSN	10.9	FT.IN
GR	16.6	FT.IN
TEMP	0	FT.IN
DTEM	0	FT.IN

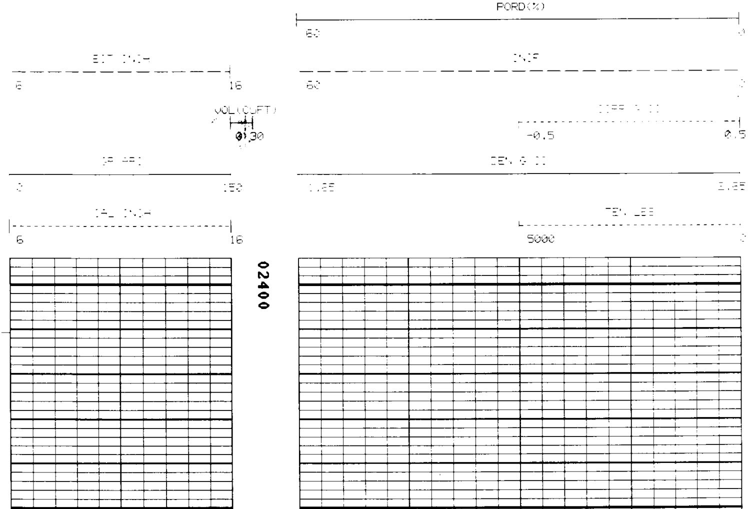
PARAMETERS

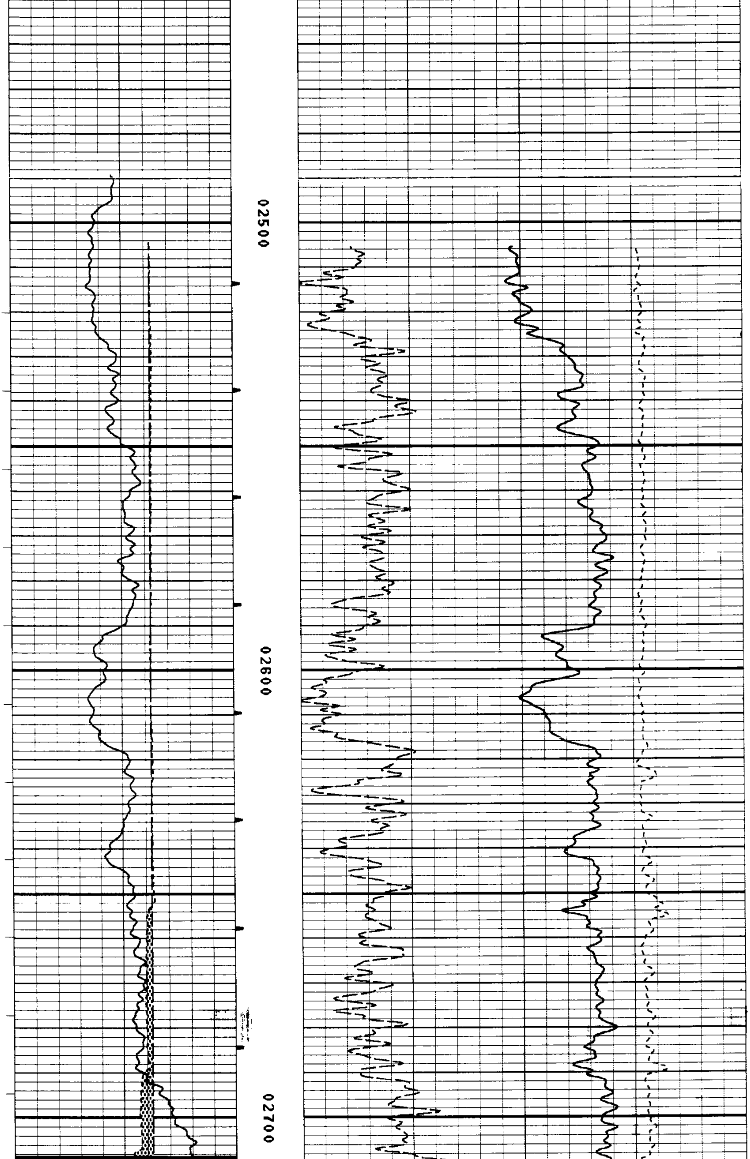
NAME	DEPTH INTERVAL	VALUE	UNITS
A	2728 TO 2489	1.000	
CAL COR	2728 TO 2489	CAL	
CASING CNC	2728 TO 2489	NOT ACTIVE	
CHISM CN	2728 TO 2489	NOT ACTIVE	
CHISM DEN	2728 TO 2489	NOT ACTIVE	
M	2728 TO 2489	2.000	
MATRIX	2728 TO 2489	SANDSTONE	
O.D.	2728 TO 2489	8.625	INCH
RHO F	2728 TO 2489	0.980	G/CC
RHO M	2728 TO 2489	2.650	G/CC
SALINITY	2728 TO 2489	0.000	PPK

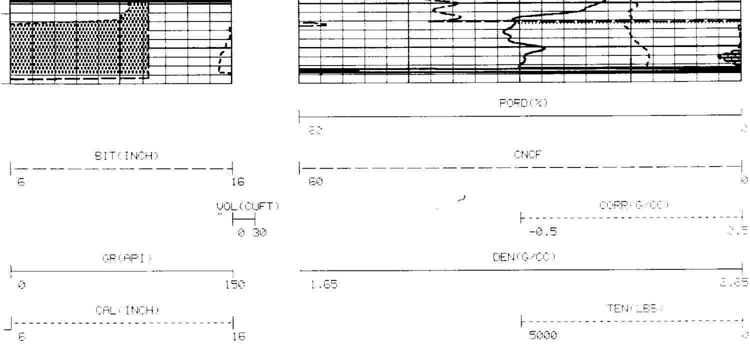
DISPLAY SCALE CHANGES

*** NONE ***

COMPANY:	NORTHWEST NATURAL GAS COMPANY		RUN: 1
WELL NAME:	I. W. 23d - 3		TRIP: 1
SERVICE:	BK013A	FILE: 2 DATE: 10/15/91	TIME: 04:05:05
REVISION:	FSYS256 REV:G002 VER:2.0		MODE: RECORD







FILE: 3

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REPEAT SECTION

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RUN # 2 FILE: 2

CURVE DELAY REPORT

CURVE	PHYS. DELAY	UNITS
SSD	0.3	FT,IN
LSD	0	FT,IN
CAL	0.3	FT,IN
SSN	10.3	FT,IN
LSN	10.8	FT,IN
GR	16.6	FT,IN
TEMP	0	FT,IN
DTEM	0	FT,IN

PARAMETERS

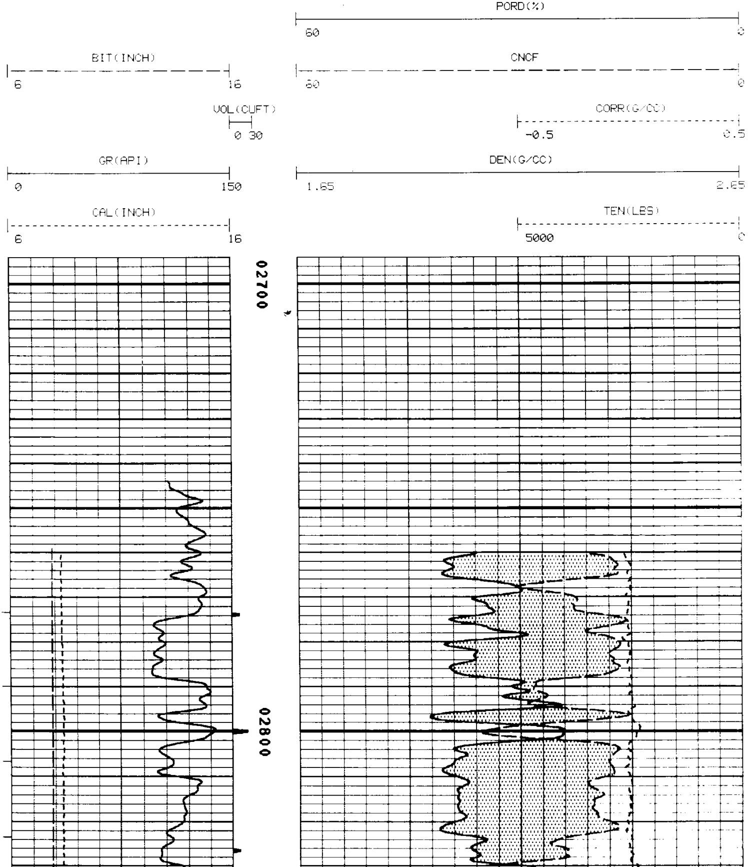
NAME	DEPTH INTERVAL	VALUE	UNITS
A	3081 TO 2744	1.000	
CAL COR	3081 TO 2744	CAL	
CASING CNC	3081 TO 2744	NOT ACTIVE	
CHISM CN	3081 TO 2744	NOT ACTIVE	
CHISM DEN	3081 TO 2744	NOT ACTIVE	
M	3081 TO 2744	2.000	
MATRIX	3081 TO 2744	SANDSTONE	
O.D.	3081 TO 2744	0.000	INCH
RHO F	3081 TO 2744	0.980	G/CC
RHO M	3081 TO 2744	2.650	G/CC
SALINITY	3081 TO 2744	0.000	PPK

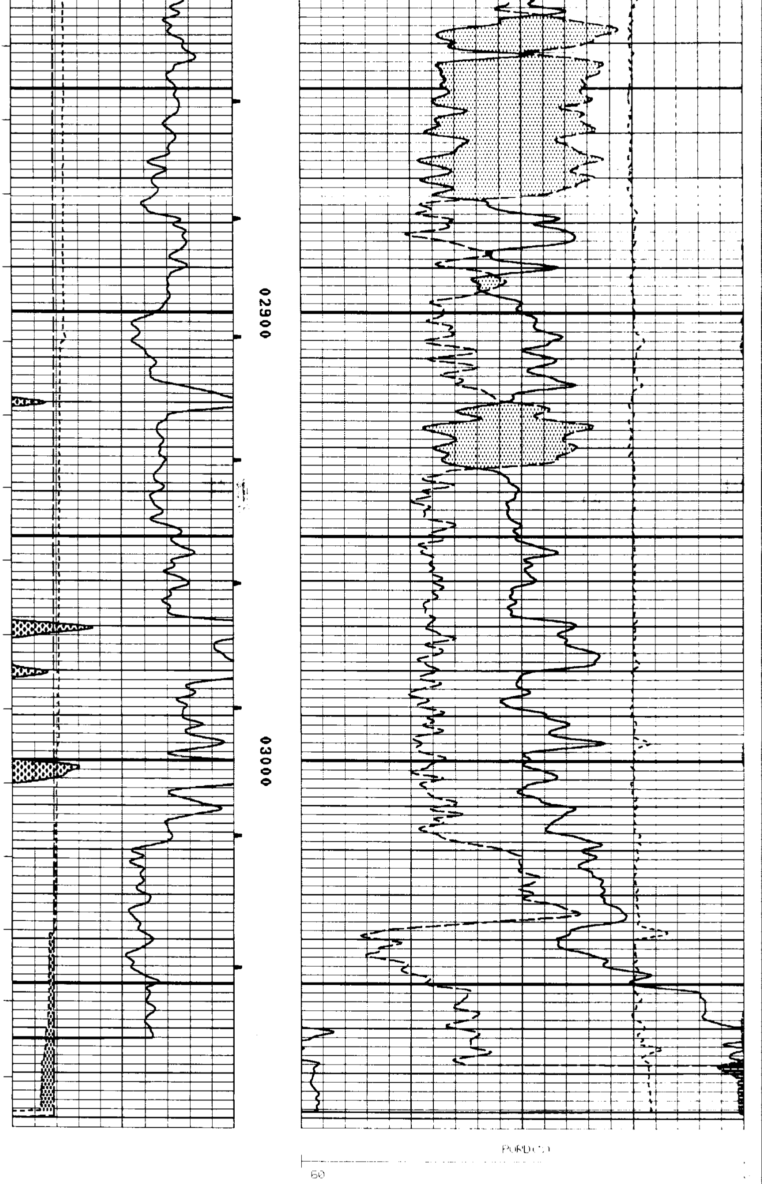
DISPLAY SCALE CHANGES

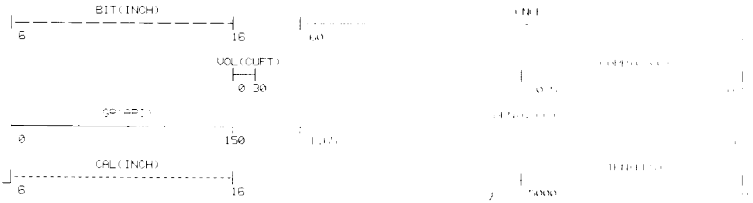
*** NONE ***

COMPANY: NORTHWEST NATURAL GAS COMPANY
WELL NAME: I. W. 23d - 3
SERVICE: BK013A FILE: 2 DATE: 10/30/91
REVISION: FSYS256 REV:G002 VER:2.0

RUN: 2
TRIP: 1
TIME: 21:43:03
MODE: RECORD







FILE [illegible]

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                  *                                   *
                  *  CALIBRATION VERIFICATION SUMMARY *
                  *  DATE 10/15/91        TIME [illegible] *
                  *  RUN  1               TRIP 1      *
                  *                                   *
                  *************************************


          LOG NAME CDL     ASSET NO. 74178     UNIT NO. HL 6399
       CALIBRATION ENTERED ON  10/14/91 AT 20:15:39     2227 DUAL SCINT.
                          SOURCE NUMBER   345

     CURVE   COUNTS/SEC.    SCALING FACTORS    RATIO     ENG. VALUE  UNITS
             BLOCK  VALUE   ADD.     MULT.     MG/AL
     ----    ----------    ----------------   --------   ----------  -----

          DATE 09/19/91          CALIBRATION          TIME 11:48:53

     LSD     MG      353.8
     SSD             213.9
     DEN                                                      1.706  G/CC
     CORR                                                    -0.007  G/CC
     DENP                                                     1.685  G/CC
     CORR                                                    -0.041  G/CC
     LSD     AL       34.8    0.000    1.0000   10.1604
     SSD              33.0    0.000    1.0000    3.1531
     DEN                                                      2.697  G/CC
     CORR                                                    -0.006  G/CC
     DENP                                                     2.682  G/CC
     CORR                                                    -0.039  G/CC
     LSD     RIBL     65.2
     SSD             144.4
     DEN                                                      2.591  G/CC
     CORR                                                     0.133  G/CC
     LSD     RIBH    143.3
     SSD              99.2
     DEN                                                      1.731  G/CC
     CORR                                                    -0.324  G/CC

          DATE 09/19/91    PRIMARY VERIFICATION      TIME 12:15:21

     LSD     JIG     130.5    0.000    1.0000
     SSD             163.7    0.000    1.0000
     DEN                                                      2.186  G/CC
     CORR                                                     0.047  G/CC

          DATE 10/14/91   BEFORE LOG VERIFICATION    TIME 20:53:06

     LSD     JIG     129.2    0.000    1.0000
     SSD             161.6    0.000    1.0000
     DEN                                                      2.180  G/CC
     CORR                                                     0.037  G/CC

          DATE 10/15/91    AFTER LOG VERIFICATION    TIME 06:50:56

     LSD     JIG     127.5    0.000    1.0000
     SSD             161.4    0.000    1.0000
     DEN                                                      2.190  G/CC
     CORR                                                     0.041  G/CC


          LOG NAME CAL     ASSET NO. 74178     UNIT NO. HL 6399
       CALIBRATION ENTERED ON  10/14/91 AT 20:15:20
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CURVE   MILLIVOLTS      SCALING FACTORS     ENGINEERING VALUES   UNITS
          LOW    HIGH    ADD.     MULT.       LOW        HIGH
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      DATE 09/19/91          CALIBRATION            TIME 12:25:34

CAL     3219.0  5597.8   -3.826    0.0246       7.000      15.000 INCH

                        PRIMARY  VERIFICATION              NOT DONE

      DATE 10/15/91    BEFORE LOG VERIFICATION     TIME 03:27:34

CAL        E      5252.7   -5.026    0.0246       E          12.640 INCH

      DATE 10/15/91     AFTER LOG VERIFICATION     TIME 06:04:47

CAL        E      5257.9   -5.026    0.0246       E          12.657 INCH


         LOG NAME CN      ASSET NO. 53284     UNIT NO. HL 6399
   CALIBRATION ENTERED ON  10/14/91 AT 20:41:11              2435
                     SOURCE NUMBER   117836

CURVE   COUNTS/SEC.     SCALING FACTORS     RATIO     ENG. VALUE  UNITS
                         ADD.      MULT.  LSN/(SSN*4)
----    ----------    ----------------  --------  ----------  -----

      DATE 09/19/91          CALIBRATION            TIME 10:32:07

LSN          82.8          0.000     1.0000
SSN         166.5          0.000     1.0000
CN                                          0.1243        25.738  %

      DATE 09/19/91     PRIMARY VERIFICATION       TIME 11:00:41

LSN          98.5          0.000     1.0000
SSN         152.2          0.000     1.0000
CN                                          0.1618        14.870  %

      DATE 10/14/91    BEFORE LOG VERIFICATION     TIME 20:59:29

LSN          93.7          0.000     1.0000
SSN         150.9          0.000     1.0000
CN                                          0.1553        16.241  %

      DATE 10/15/91     AFTER LOG VERIFICATION     TIME 06:55:04

LSN          93.2          0.000     1.0000
SSN         148.2          0.000     1.0000
CN                                          0.1573        15.702  %


         LOG NAME GR      ASSET NO. 75607     UNIT NO. HL 6399
   CALIBRATION ENTERED ON  10/14/91 AT 20:16:33

CURVE   COUNTS/SEC.     SCALING FACTORS     ENGINEERING VALUES   UNITS
          LOW    HIGH    ADD.     MULT.       LOW        HIGH
----   --------------  ----------------  -------------------- -----

      DATE 09/19/91          CALIBRATION            TIME 17:04:50

GR        72.0   290.8    0.000    0.6854      0.000     150.000 API

      DATE 09/19/91     PRIMARY VERIFICATION       TIME 17:07:43

GR        73.6   291.0    0.000    0.6854     50.411     199.452 API

      DATE 10/14/91    BEFORE LOG VERIFICATION     TIME 21:03:47

GR       257.5   479.7    0.000    0.6854    176.474     328.821 API

      DATE 10/15/91     AFTER LOG VERIFICATION     TIME 06:58:22

GR       241.2   460.5    0.000    0.6854    165.319     315.627 API


               ****************************************
               *                                      *
               *  CALIBRATION/VERIFICATION SUMMARIES  *
               *  DATE 10/20/91         TIME 23:29:46 *
               *  RUN  2                TRIP 1        *
               *                                      *
               ****************************************
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          LOG NAME CDL     ASSET NO. 74178    UNIT NO. HL 6399
     CALIBRATION ENTERED ON  10/20/91 AT 20:29:59     2227 DUAL SCINT.
                      SOURCE NUMBER   845

CURVE    COUNTS/SEC.     SCALING FACTORS     RATIO     ENG. VALUE   UNITS
         BLOCK  VALUE    ADD.      MULT.     MG/AL
----     ----------    -----------------   --------   ----------   -----

        DATE 09/19/91           CALIBRATION           TIME 11:48:53

LSD       MG       353.8
SSD                213.9
DEN
CORR                                                       1.706   G/CC
DENP                                                      -0.007   G/CC
CORP                                                       1.685   G/CC
LSD       AL        34.8    0.000     1.0000  10.1604     -0.041   G/CC
SSD                 99.0    0.000     1.0000   2.1591
DEN
CORR                                                       2.697   G/CC
DENP                                                      -0.006   G/CC
CORP                                                       2.682   G/CC
LSD       RIBL      65.2                                  -0.039   G/CC
SSD                144.4
DEN
CORR                                                       2.591   G/CC
LSD       RIBH     143.9                                   0.138   G/CC
SSD                 99.2
DEN
CORR                                                       1.731   G/CC
                                                          -0.324   G/CC

        DATE 09/19/91     PRIMARY VERIFICATION      TIME 12:15:21

LSD       JIG      130.5    0.000     1.0000
SSD                163.7    0.000     1.0000
DEN
CORR                                                       2.186   G/CC
                                                           0.047   G/CC

        DATE 10/20/91    BEFORE LOG VERIFICATION    TIME 20:36:26

LSD       JIG      127.6    0.000     1.0000
SSD                161.7    0.000     1.0000
DEN
CORR                                                       2.191   G/CC
                                                           0.042   G/CC

        DATE 10/20/91     AFTER LOG VERIFICATION    TIME 23:20:39

LSD       JIG      127.2    0.000     1.0000
SSD                162.6    0.000     1.0000
DEN
CORR                                                       2.199   G/CC
                                                           0.049   G/CC


          LOG NAME CAL     ASSET NO. 74178    UNIT NO. HL 6399
    CALIBRATION ENTERED ON  10/20/91 AT 20:29:40

CURVE    MILLIVOLTS       SCALING FACTORS     ENGINEERING VALUES    UNITS
          LOW    HIGH      ADD.     MULT.       LOW        HIGH
----   -------------   -----------------   ------------------   -----

        DATE 09/19/91           CALIBRATION           TIME 12:25:34

CAL      3219.0  5597.8   -3.826    0.0246     7.000      15.000 INCH

                        PRIMARY VERIFICATION            NOT DONE

        DATE 10/20/91   BEFORE LOG VERIFICATION    TIME 21:25:20

CAL        E     3789.7   -4.826    0.0246       E           7.919 INCH

        DATE 10/20/91    AFTER LOG VERIFICATION    TIME 22:32:55

CAL        E     3910.6   -4.826    0.0246       E           8.326 INCH


          LOG NAME CN      ASSET NO. 53264    UNIT NO. HL 6399
    CALIBRATION ENTERED ON  10/20/91 AT 20:30:28            2435
                      SOURCE NUMBER   117836

CURVE    COUNTS/SEC.     SCALING FACTORS     RATIO     ENG. VALUE   UNITS
                          ADD.      MULT.   LSN/(SSN*4)
----     ----------    -----------------   --------   ----------   -----

        DATE 09/19/91           CALIBRATION           TIME 10:32:07

LSN            82.8      0.000     1.0000
SSN           166.5      0.000     1.0000
CN                                          0.1243       25.738  %
```

```
       DATE 09/19/91     PRIMARY VERIFICATION       TIME 11:00:41

LSN             98.5          0.000     1.0000
SSN            152.2          0.000     1.0000
CN
                                                   0.1618        14.870  %

       DATE 10/20/91    BEFORE LOG VERIFICATION     TIME 20:41:46

LSN             93.0          0.000     1.0000
SSN            148.8          0.000     1.0000
CN
                                                   0.1562        16.042  %

       DATE 10/20/91     AFTER LOG VERIFICATION     TIME 23:24:11

LSN             95.0          0.000     1.0000
SSN            150.2          0.000     1.0000
CN
                                                   0.1581        15.641  %


        LOG NAME GR       ASSET NO. 78607     UNIT NO. HL 6399
    CALIBRATION ENTERED ON  10/20/91 AT 20:30:53

CURVE    COUNTS/SEC.      SCALING FACTORS     ENGINEERING VALUES     UNITS
          LOW    HIGH      ADD.     MULT.        LOW        HIGH
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       DATE 09/19/91           CALIBRATION             TIME 17:04:50

GR         72.0   290.8     0.000     0.6854       0.000     150.000 API

       DATE 09/19/91     PRIMARY VERIFICATION        TIME 17:07:43

GR         73.6   291.0     0.000     0.6854      50.411     199.452 API

       DATE 10/20/91    BEFORE LOG VERIFICATION     TIME 20:44:49

GR        233.5   454.9     0.000     0.6854     160.041     311.772 API

       DATE 10/20/91     AFTER LOG VERIFICATION     TIME 23:26:53

GR        177.9   402.7     0.000     0.6854     121.916     275.994 API
```