Western Atlas International®

ATLAS WIRELINE SERVICES

DUAL INDUCTION FOCUSED LOG

GAMMA RAY

FILE NO.

API NO.
-

5" = 100'

COMPANY NORTHWEST NATURAL GAS
~~OREGON NATURAL GAS DEVELOPMENT CORP.~~

WELL IW 32C-10

FIELD MIST

COUNTY COLUMBIA STATE OR.

LOCATION:
1500.05' N & 2519.6' W
FROM E/4 CORNER OF:

SEC 10 TWP 6N RGE 5W

OTHER SERVICES
BHC-AC/GR/CAL
CDL/CN/GR
DIPLOG
PRODIP

PERMANENT DATUM GL ELEV. 790.25
LOGGING MEASURED FROM KB 11.4 FT. ABOVE P.D.
DRILLING MEASURED FROM KB

ELEVATIONS
KB 801.65'
DF -
GL 790.25'

DATE	12-16-90	
RUN	1	
SERVICE ORDER	65509	
DEPTH-DRILLER	2114'	
DEPTH-LOGGER	2110'	
BOTTOM LOGGED INTERVAL	2108'	
TOP LOGGED INTERVAL	532'	
CASING - DRILLER	13 5/8"	@ 531'
CASING - LOGGER	532'	
BIT SIZE	12 1/4"	
TYPE FLUID IN HOLE	GEL	
DENSITY / VISCOSITY	9.6	40
PH / FLUID LOSS	8.8	5.1
SOURCE OF SAMPLE	FLOWLINE	
RM AT MEAS. TEMP.	1.20	@ 80 DEG. F
RMF AT MEAS. TEMP.	.90	@ 50 DEG. F
RMC AT MEAS. TEMP.	1.50	@ 50 DEG. F
SOURCE OF RMF / RMC	M	M
RM AT BHT	.96	@ 100 DEG. F
TIME SINCE CIRCULATION	3 HRS	
MAX. REC. TEMP. DEG. F	100 DEG. F	
EQUIP. NO. / LOC.	6399	BAK.
RECORDED BY	M. HINDS	
WITNESSED BY	MR. ROTH/THOMAS	

FINAL PRINT

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)

VOL COMPUTED FOR 8.625" CASING.

EQUIPMENT DATA

RUN	TRIP	TOOL	SERIAL NO.	SERIES NO.	POSITION
1	1	DIFL	77837	1503XA	1.550
1	1	AC	79731/VENT1	1609/1603	CENT
1	1	GR	72384	1309XA	CENT
1	1	CAL	38088	4202XA	4ARM

****

FILE: 4

CURVE DELAY REPORT

CURVE	PHYS. DELAY	UNITS
CFOC	0	FT,IN
CILM	6,0	FT,IN
CILD	9,3	FT,IN
SP	9,3	FT,IN
GR	48,6	FT,IN
CAL	58,3	FT,IN
ACQ	31,9	FT,IN
AC	31,9	FT,IN

PARAMETERS

NAME	DEPTH INTERVAL	VALUE	UNITS
A	2122 TO 459	0.000	
DEL-T F	2122 TO 459	N/A	MICS/FT
DEL-T M	2122 TO 459	**********	MICS/FT
DEL-T S	2122 TO 459	0.000	MICS/FT
M	2122 TO 459	0.000	
O.D.	2122 TO 459	8.625	INCH
PORA	2122 TO 459	WYLLIE	

DISPLAY SCALE CHANGES

*** NONE ***

COMPANY: OREGON NATURAL GAS DEVELOPMENT CORP.
RUN: 1

WELL NAME: IW 32C-10
TRIP: 1

SERVICE: KC214N FILE: 4 DATE: 12/16/90
TIME: 11:05:09

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

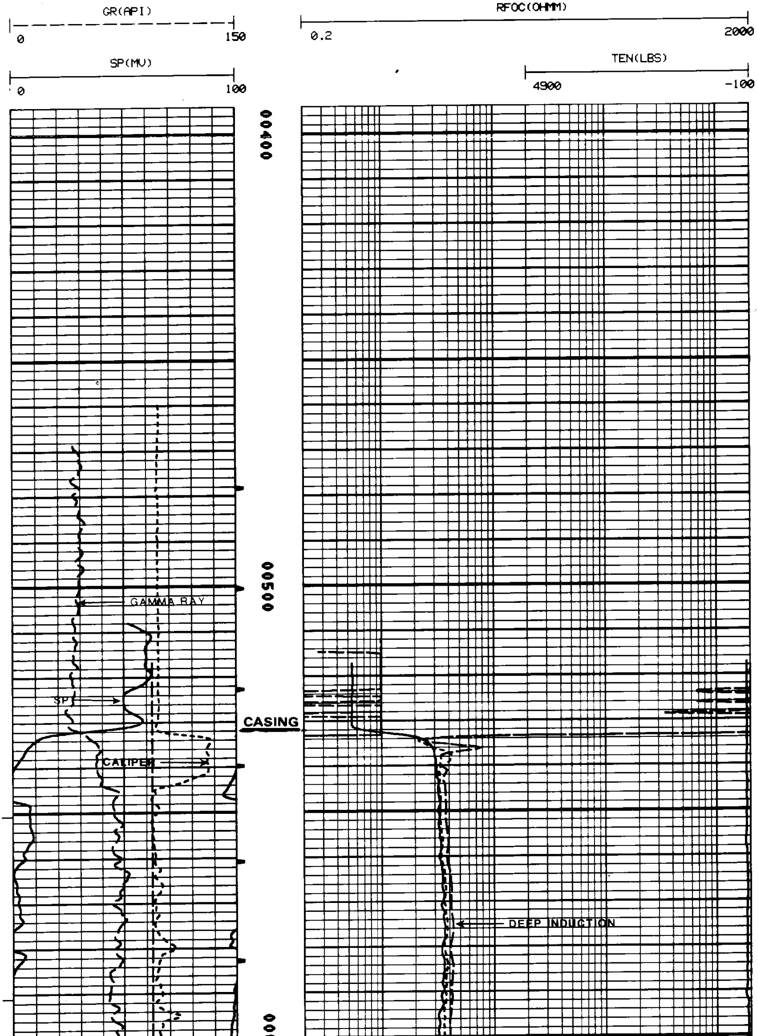
BIT(INCH)
6 16

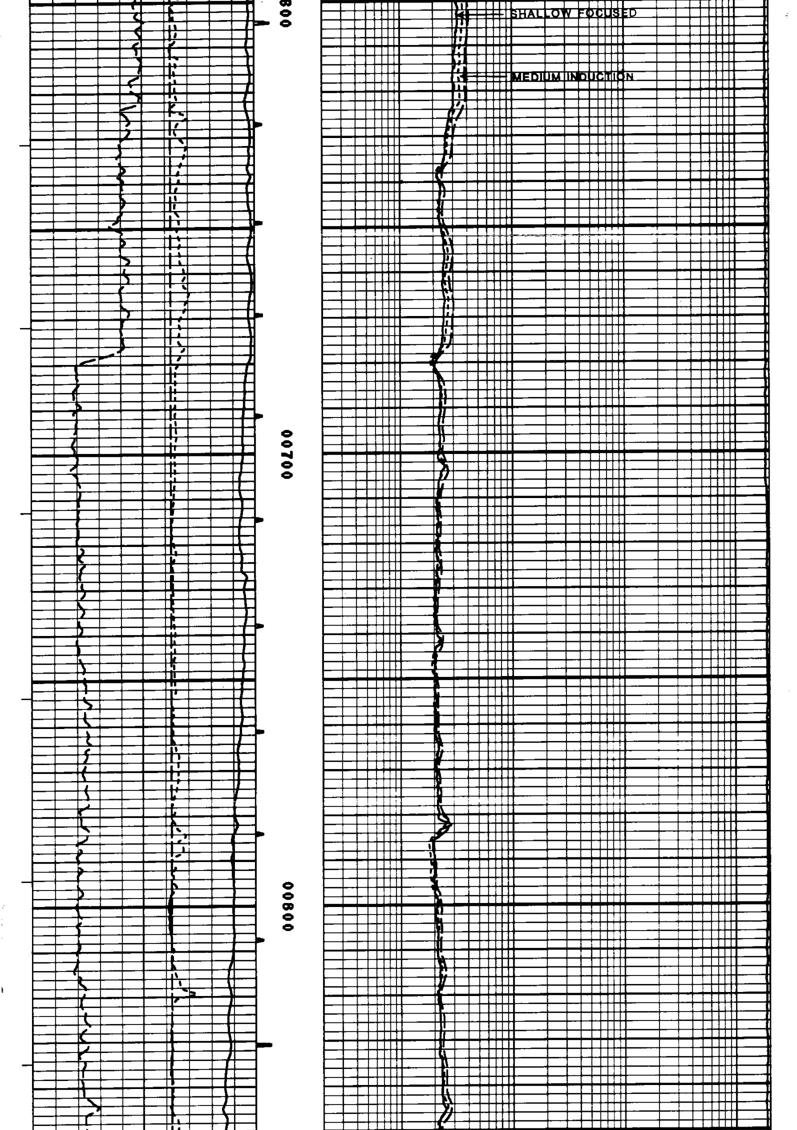
VOL(CUFT)
0 30

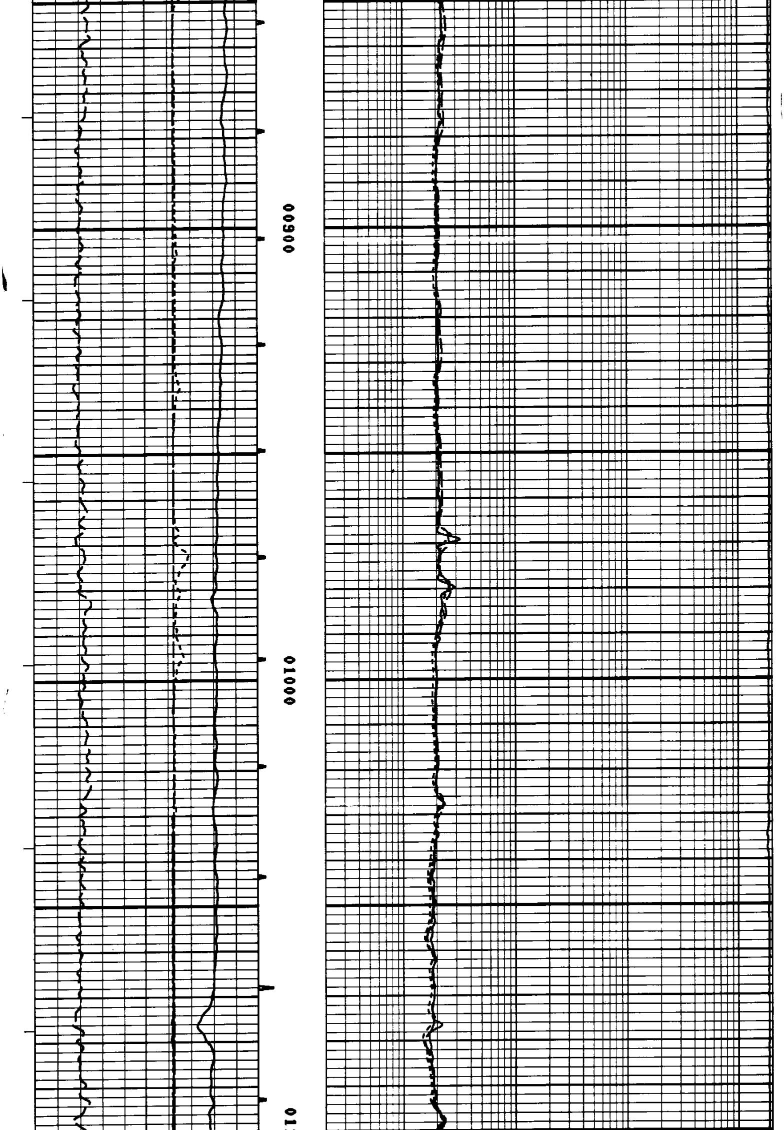
RILD(OHMM)
0.2 2000

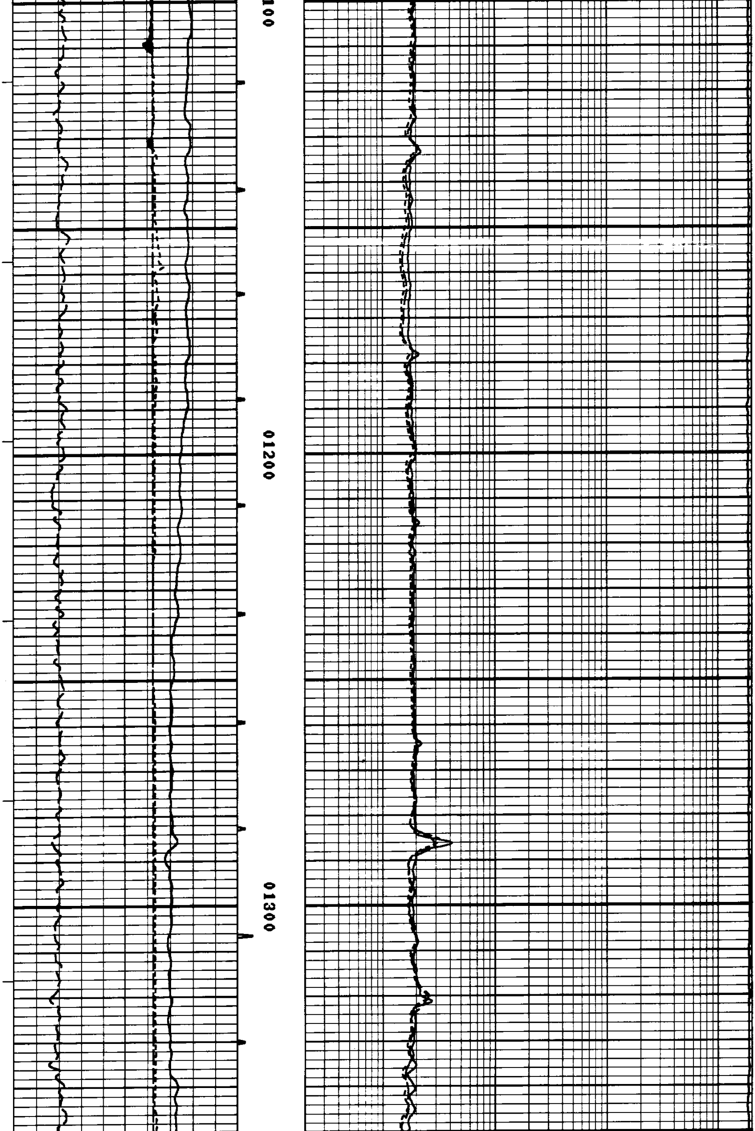
CAL(INCH)
6 16

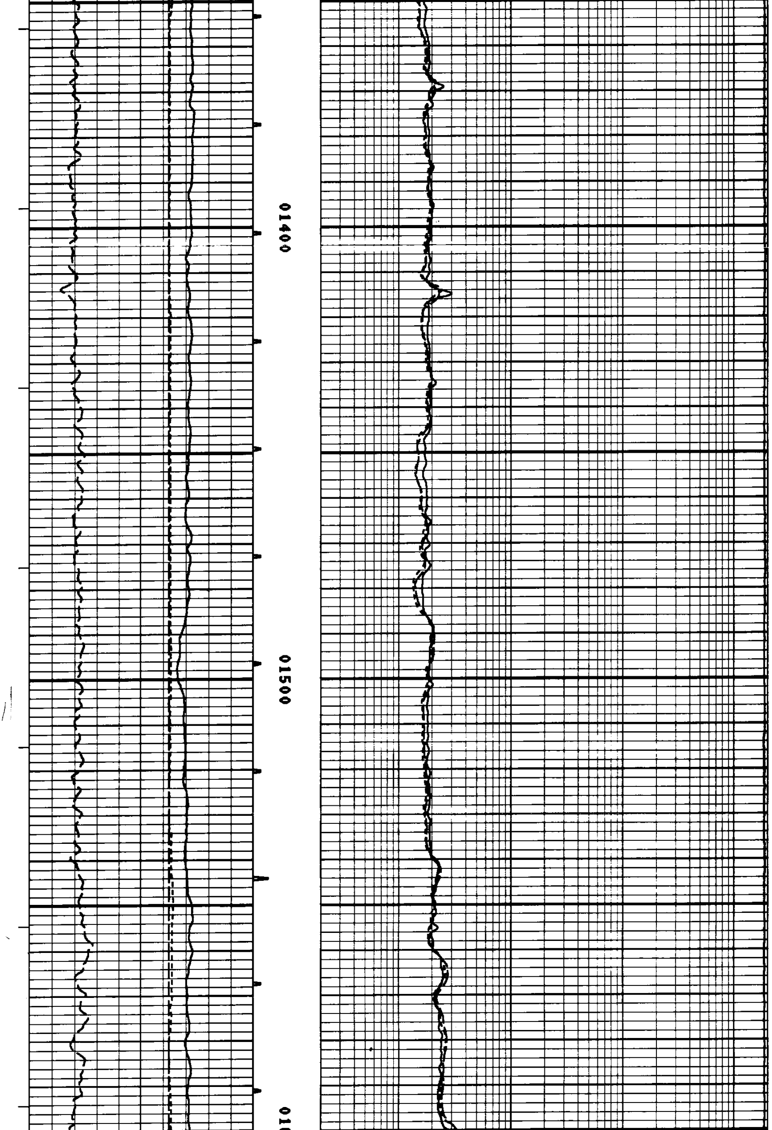
RILM(OHMM)
0.2 2000

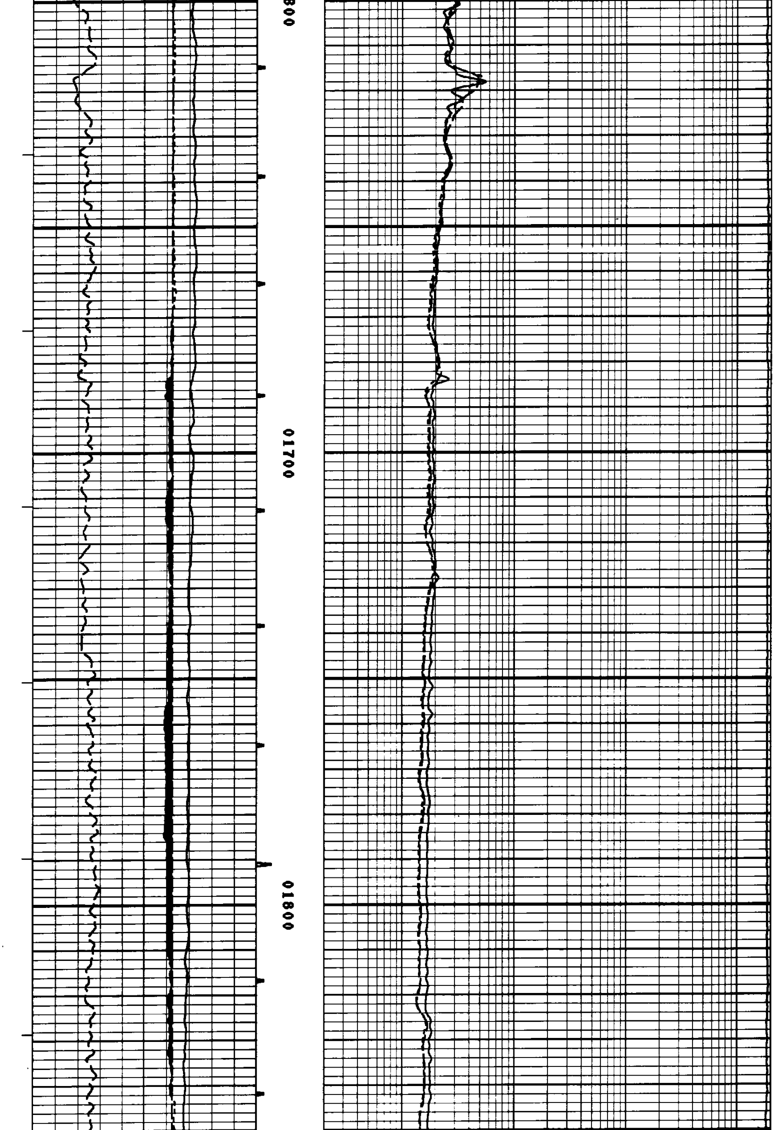


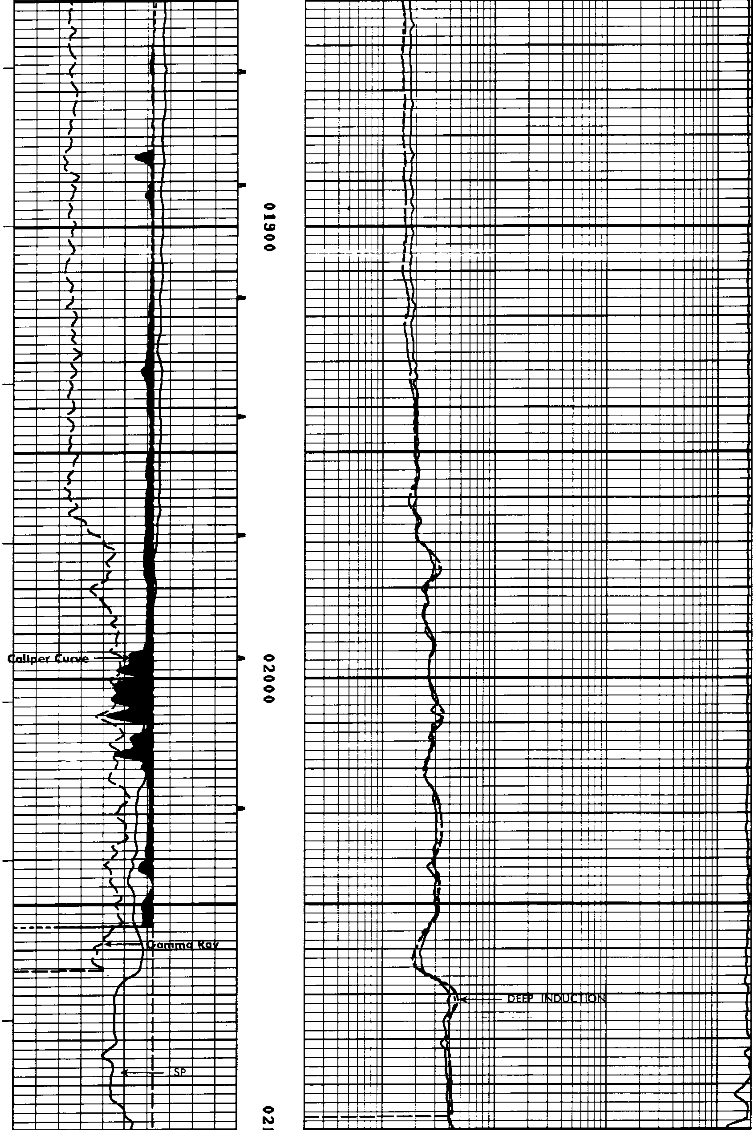


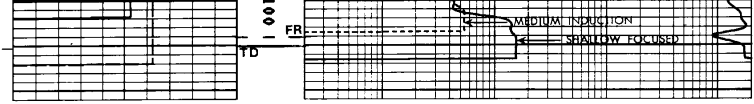












```
           BIT(INCH)
|----------------------------|
6                           16

                          VOL(CUFT)                          RILD(OHMM)
                          |--|       |--------------------------------------------------------|
                          0 30       0.2                                                   2000

           CAL(INCH)                                         RILM(OHMM)
|----------------------------|       |--------------------------------------------------------|
6                           16       0.2                                                   2000

            GR(API)                                          RFOC(OHMM)
|----------------------------|       |--------------------------------------------------------|
0                          150       0.2                                                   2000

            SP(MV)                                                         TEN(LBS)
|----------------------------|                             |------------------------------|
0                          100                             4900                          -100
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FILE: 4

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REPEAT SECTION

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FILE: 3

CURVE DELAY REPORT

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

  CFOC          0    FT,IN
  CILM        6,0    FT,IN
  CILD        9,3    FT,IN
  SP          9,3    FT,IN
  GR         48,6    FT,IN
  CAL        58,3    FT,IN
  ACQ        31,9    FT,IN
  AC         31,9    FT,IN
```

PARAMETERS

```
   NAME        DEPTH INTERVAL       VALUE       UNITS
 --------      --------------    -----------    -----
 A              2122  TO  1852         0.000
 DEL-T F        2122  TO  1852           N/A    MICS/FT
 DEL-T M        2122  TO  1852   ***********    MICS/FT
 DEL-T S        2122  TO  1852         0.000    MICS/FT
 M              2122  TO  1852         0.000
 O.D.           2122  TO  1852         8.625    INCH
 PORA           2122  TO  1852        WYLLIE
```

DISPLAY SCALE CHANGES

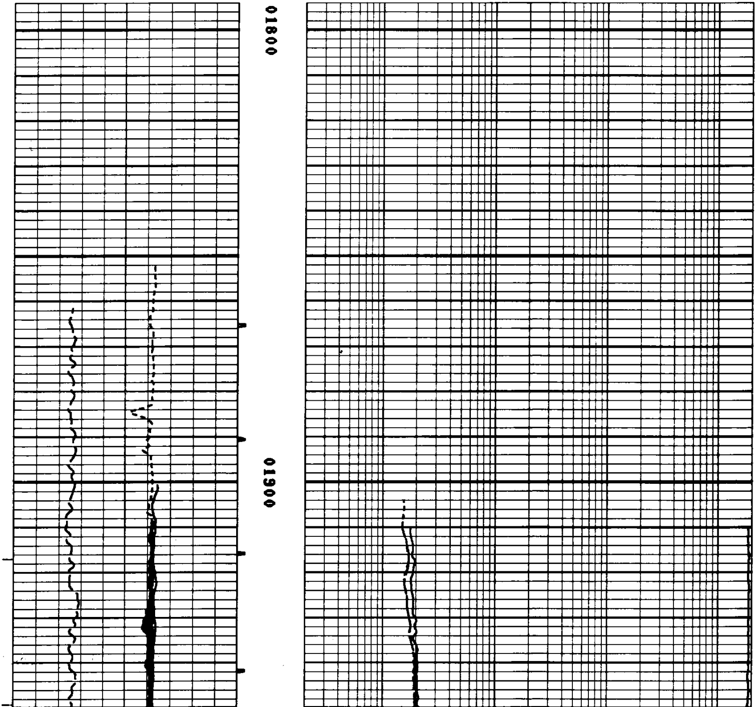
*** NONE ***

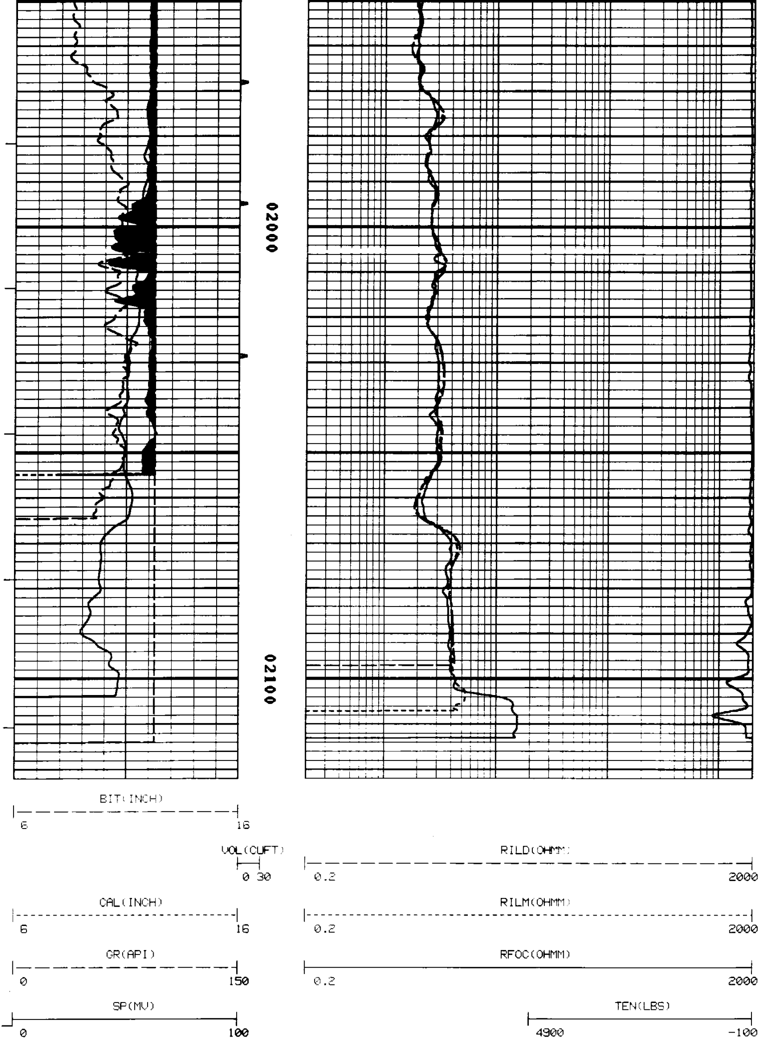
COMPANY: OREGON NATURAL GAS DEVELOPMENT CORP.
WELL NAME: IW 32C-10
SERVICE: KC214N FILE: 3 DATE: 12/16/90
REVISION: FSYS256 REV:G002 VER:2.0

RUN: 1
TRIP: 1
TIME: 10:56:11
MODE: RECORD

BIT(INCH) 6 16
VOL(CUFT) 0 30
CAL(INCH) 6 16
GR(API) 0 150
SP(MV) 0 100

RILD(OHMM) 0.2 2000
RILM(OHMM) 0.2 2000
RFOC(OHMM) 0.2 2000
TEN(LBS) 4900 -100





FILE: 3

* * *

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              ******************************************
              *                                        *
              *   CALIBRATION/VERIFICATION SUMMARIES   *
              *   DATE 12/16/90        TIME 12:05:07   *
              *   RUN  1               TRIP 1          *
              *                                        *
              ******************************************


        LOG NAME DIFL    ASSET NO. 77837    UNIT NO. BBB0A=BaQD
    CALIBRATION ENTERED ON  12/16/90 AT 08:17:14

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

       DATE 11/21/90          CALIBRATION          TIME 18:45:20

  CILD      1.1   524.4   -0.376    1.8629      0.500      500.000 MMHO
  CILM     -4.3   495.4    4.470    2.2562      0.500      500.000 MMHO
  CFOC      4.1   498.4   -3.130    2.4633      1.000      500.000 MMHO

       DATE 11/21/90     PRIMARY VERIFICATION      TIME 18:54:07

  CILD      0.3   517.4   -0.376    1.8629     -0.143      492.126 MMHO
  CILM     -0.2   498.6    4.470    2.2562      4.385      503.342 MMHO
  CFOC      6.7   503.3   -3.130    2.4633      3.683      504.988 MMHO

       DATE 12/16/90   BEFORE LOG VERIFICATION    TIME 10:35:40

  CILD      2.5   502.3   -2.149    1.9273     -0.143      492.126 MMHO
  CILM      2.3   484.8    2.038    2.3324      4.385      503.343 MMHO
  CFOC      7.1   496.6   -3.544    2.4986      3.683      504.989 MMHO

       DATE 12/16/90    AFTER LOG VERIFICATION    TIME 11:48:33

  CILD      0.4   517.6   -2.149    1.9273     -1.800      509.384 MMHO
  CILM      0.0   498.7    2.038    2.3324      2.100      518.787 MMHO
  CFOC      6.1   493.2   -3.544    2.4986      2.672      501.553 MMHO


        LOG NAME GR      ASSET NO. 72384    UNIT NO. XP$ΓCDXX□□
    CALIBRATION ENTERED ON  12/16/90 AT 08:08:13

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

       DATE 11/21/90          CALIBRATION          TIME 10:21:14

  GR       62.6   256.9    0.000    0.7720      0.000      150.000 API

                         PRIMARY VERIFICATION            NOT DONE

       DATE 12/16/90   BEFORE LOG VERIFICATION    TIME 08:10:09

  GR       68.9   261.7    0.000    0.7720     53.172      202.033 API

       DATE 12/16/90    AFTER LOG VERIFICATION    TIME 12:03:04

  GR       74.3   260.0    0.000    0.7720     57.360      200.720 API


        LOG NAME CAL     ASSET NO. 38088    UNIT NO. 6399
    CALIBRATION ENTERED ON  12/16/90 AT 08:15:09

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

       DATE 12/16/90          CALIBRATION          TIME 08:15:09

  CAL    5256.4 10251.3   -0.314    0.0088      6.000       12.000 INCH

                         PRIMARY VERIFICATION            NOT DONE

       DATE 12/16/90   BEFORE LOG VERIFICATION    TIME 10:41:03

  CAL       E   10648.3   -0.314    0.0088      E           12.477 INCH

       DATE 12/16/90    AFTER LOG VERIFICATION    TIME 11:47:44

  CAL       E   10676.2   -0.314    0.0088      E           12.510 INCH
```